

2013 Annual Restoration Plan Compliance Report
Albany Rapp Road Landfill
Ecosystem Mitigation, Restoration & Enhancement Plan
City of Albany, New York

Permit #4-0101-00171/00011



Submitted to:

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Submitted by:

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Albany, NY 12205*

December 1, 2013

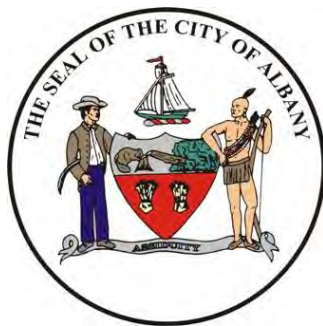


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2013 Annual Restoration Plan Compliance Report
Albany Rapp Road Landfill
Ecosystem Mitigation, Restoration & Enhancement Plan
City of Albany, New York

Permit #4-0101-00171/00011

December 1, 2013

I. Introduction

The Albany Rapp Road Landfill Ecosystem Mitigation, Restoration & Enhancement Plan (restoration plan) has been created pursuant to NYSDEC, USACE, and USFWS permit requirements associated with the expansion of the City of Albany Rapp Road Landfill. The NYSDEC Permit #4-0101-00171/00011 requires that the City prepare an Annual Restoration Plan Compliance Report to be submitted to the NYSDEC by December 1 of each project year.

The purpose of the compliance report is to:

- Describe the work accomplished during the year according to the annual work plan and work schedule prepared and submitted at the beginning of each project year (refer to the Phase III Work Plan, Albany Rapp Road Landfill Ecosystem Mitigation, Restoration & Enhancement Plan, draft (dated December 1) submitted electronically December 7, 2011; IHMT review meeting January 18, 2012; revised plan (dated March 19) submitted electronically March 22, 2012; DEC approval via email April 18, 2012 and via letter dated April 27, 2012); see the Phase III Context and Clearing Plans and Work Schedule in Attachments A and B of this compliance report).
- Describe deviations from the annual work plan, including the cause, outcomes, and implications of such deviations.
- Summarize and supplement the weekly onsite activity reports submitted to the Interagency Habitat Management Team.

The 2013 work plan schedule identified tasks that remained to be performed in areas representing Phase III of the restoration plan, which was initiated in 2012. Modifications were undertaken in selected Phase II areas, including the vernal pond and forested wetland locations, for the purpose of improving hydrological conditions supportive of the planned target community types. The Phase III enhancement treatments, which focused on upland clearing and thinning in the eastern and western sectors on either side of the 2011 Phase II stream and wetland construction zones, were largely completed in 2013. Enhancement seeding in these cleared and thinned zones will occur in spring 2014, based on monitoring conducted at the close of the 2013 growing season, which assessed early soil seed bank response and enhancement needs. The enhancement work conducted during 2013 represents a significant step toward completing the critical habitat linkage in the Preserve, which began with the Phase II wetland and stream construction in the former Fox Run Mobile Home Park and which will ultimately be completed in future phases involving the final closure and restoration of the landfill cap.

As previously reported in the 2012 Compliance, approximately 50-75% of the sand needs for capping and restoring the landfill have been acquired and stockpiled on the site, depending on actual sand depth requirements. This is sufficient to cover the GAL portion of the landfill. Future sand needs will be determined based on outcomes of the test plot study that is looking at appropriate sand depth requirements for supporting Pitch Pine Scrub Oak barrens vegetation.

Other documents useful for viewing the compliance report within the context of the larger restoration program include:

- NYSDEC Permit #4-0101-00171/00011 (containing Article 24 Freshwater Wetlands: 4-0101-00171/00015; Article 15 Section 401 Water Quality Certification: 4-0101-00171/00016; and Article 11-0535, 6 NYCRR 182, Endangered/Threatened Species License): includes requirements, stipulated conditions, roles and responsibilities, performance requirements and outcomes to guide the permittee.
- Temporary Revocable Permit issued by the Albany Pine Bush Preserve Commission (2010 TRP issued March 22, 2010; 2011 TRP issued February, 2011; 2012 TRP issued April 18, 2012, and 2013 TRP issued April 5, 2013 and addendum May 20, 2013).
- New York District USACE Permit # NAN-2005-01137
- USFWS Biological Opinion dated May 20, 2010 and revised August 4, 2010.
- Albany Rapp Road Landfill Ecosystem Mitigation, Restoration & Enhancement Plan (June 2009): describes the target restoration zones, technical specifications, and ecological monitoring and performance measures.
- Restoration plan drawings dated April 10, 2009 and last revised June 17, 2009.
- Integrated Pest and Invasive Species Management Plan (IPM Plan, June 2009): provides strategies and techniques for controlling and managing invasive plant and animal species known to occur or that could potentially occur in the project area

II. Overview of the 2013 Compliance Report

A brief summary of the information contained in the following compliance report sections (A-J) is presented below. These sections reflect those of the 2013 Work Plan, but differ in that we emphasize the work activity undertaken and completed, and provide an explanation of deviations from the plan. In some cases, the graphics in the compliance report are updated to show outcomes, changes or modifications that resulted during the construction season. Please refer to the 2013 Work Plan for the original graphics and other details.

Phase III Context Plan and 2013 Work Plan Schedule

Attachment A. Phase III Context Plan—this year’s continuation of the Phase III restoration activities focused on enhancement of existing upland and wetland communities to the east and west of the 2011 Phase II restoration construction zone. Restoration activities included major tree clearing and grubbing, along with aggressive invasive species management in PIII and all areas of the restoration project. An assessment of the response from the native soil seedbank in PIII areas, to increased understory light levels was conducted in the fall to determine the extent of enhancement seeding required and scheduled for spring 2014. Species lists have been developed for this purpose and will be included in the 2014 work plan. Activities will continue to take place in both Phase I and Phase II areas, including maintenance and operations in the constructed native

nursery; seeding, maintenance, and monitoring in the test plots; and maintenance, and monitoring in the constructed streams, wetlands, and uplands. These areas are depicted in Context Map immediately following this section.

Attachment B. 2013 Work Plan Schedule—the work schedule enumerates Phase III tasks that were conducted during the 2013 construction season. Any deviations from the schedule are explained in each of the following compliance report sections. The work plan schedule includes tasks that were initiated in 2013 and will be completed or continued in 2014, such as remaining steps in the PIII enhancement activities, and woody planting of the test plots. Several tasks are ongoing, such as invasive species control, seed collection, faunal surveys, and vegetation and hydrological monitoring.

Technical Work Plans

Attachment C. Nursery Operations & Maintenance—discusses the status of production in the onsite nursery beds and maintenance activities undertaken for controlling weeds and pests.

Attachment D. Seed/Plant Collection and Acquisition—provides an inventory of current seed stockpiled from previous collections from the Preserve and from the approved 50-mile geographic radius surrounding the Preserve. Quantities of 2013 seed collections will be reported at the end of the cleaning process that is currently underway.

Attachment E. Test Plot Seeding, Maintenance, and Monitoring—provides data and analysis from the year 2 monitoring effort to assess sand depths needed to support the establishment of the native pitch pine scrub oak barrens on the restored landfill cap.

Attachment F. Phase II Vernal Pond and Wetland Modifications—identifies the activities involved in modifying elevations to improve hydrological conditions in three locations within the Phase II area, including the vernal pond, forested wetlands in the central sector of the Phase II area, and riparian forested wetlands in the vicinity of the newly constructed pump house located on the south side of the southern stream reach.

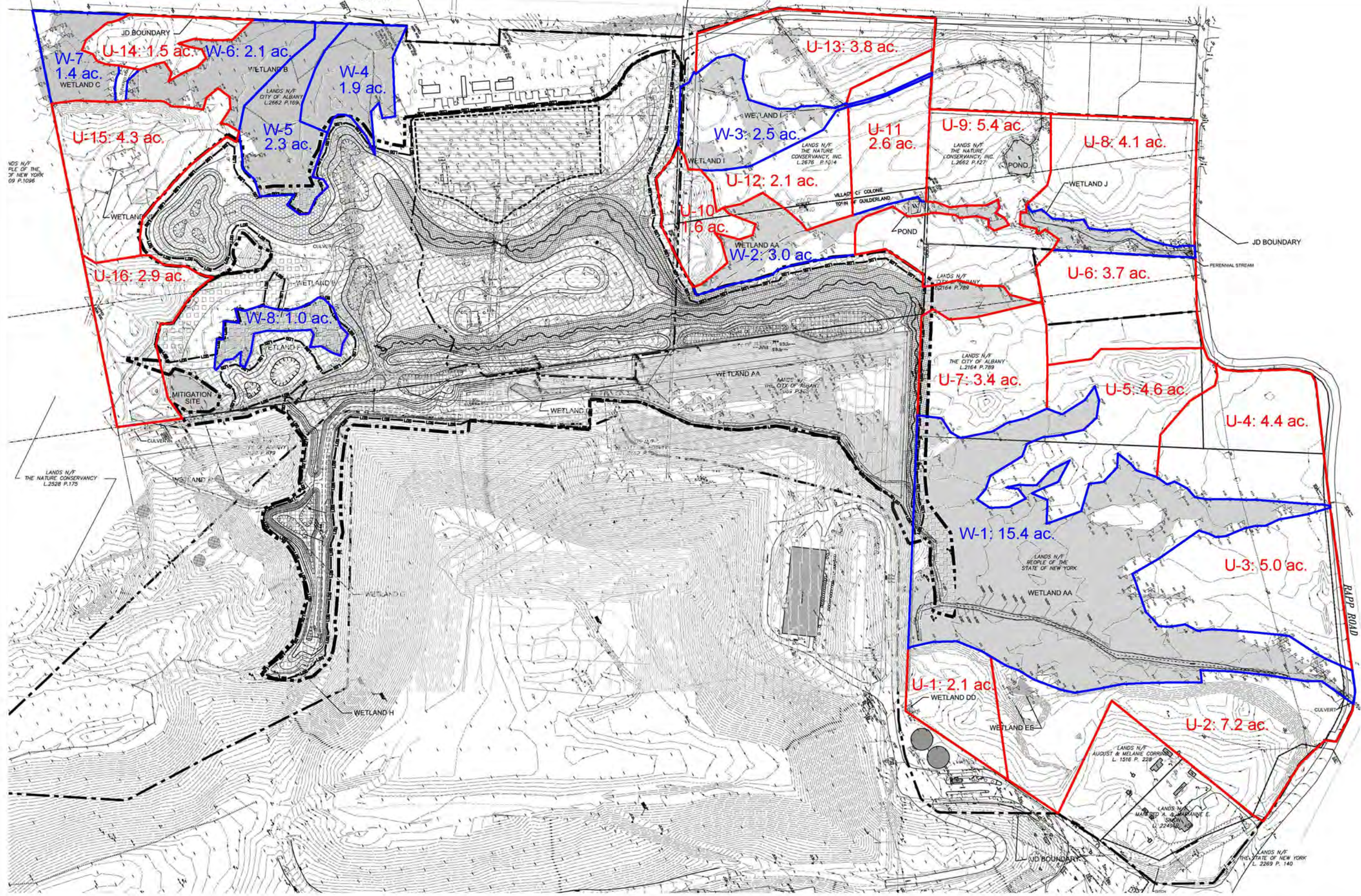
Attachment G. Phase III Enhancement Plan—describes Phase III enhancement activities that were initiated in 2012 and continued through 2013, including canopy thinning and clearing to enhance pitch pine scrub oak barrens habitat.

Attachment H. Invasive Plant Management—discusses invasive species control activities conducted throughout 2013.

Attachment I. Soil & Water Quality Control Analysis, Hydrologic Monitoring—summarizes and discusses the hydrological monitoring activities and outcomes for 2013.

Attachment J. Ecological Monitoring—provides the data and analysis from the year 2 vegetation monitoring in the PII and PIII restoration areas, including the results of the faunal surveys conducted throughout 2013.

Attachment K. Stream Stability Assessment—describes the year 2 conditions and site stability in the constructed stream corridors in Phase II.



Albany Rapp Road Landfill
 Albany, New York
 City of Albany, Dept. of General Services
 One Connors Blvd.
 Albany, New York

Phase III Work Plan
 Context Map

AES Proj #	09036
Designed By	WCC
Drawn By	WCC
Checked By	EMK
File	Phase III Work Plan.dwg
Date	01/05/2012
Coordinate System	NAD



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Phase III Project Areas

- Upland Units
- Wetland Units

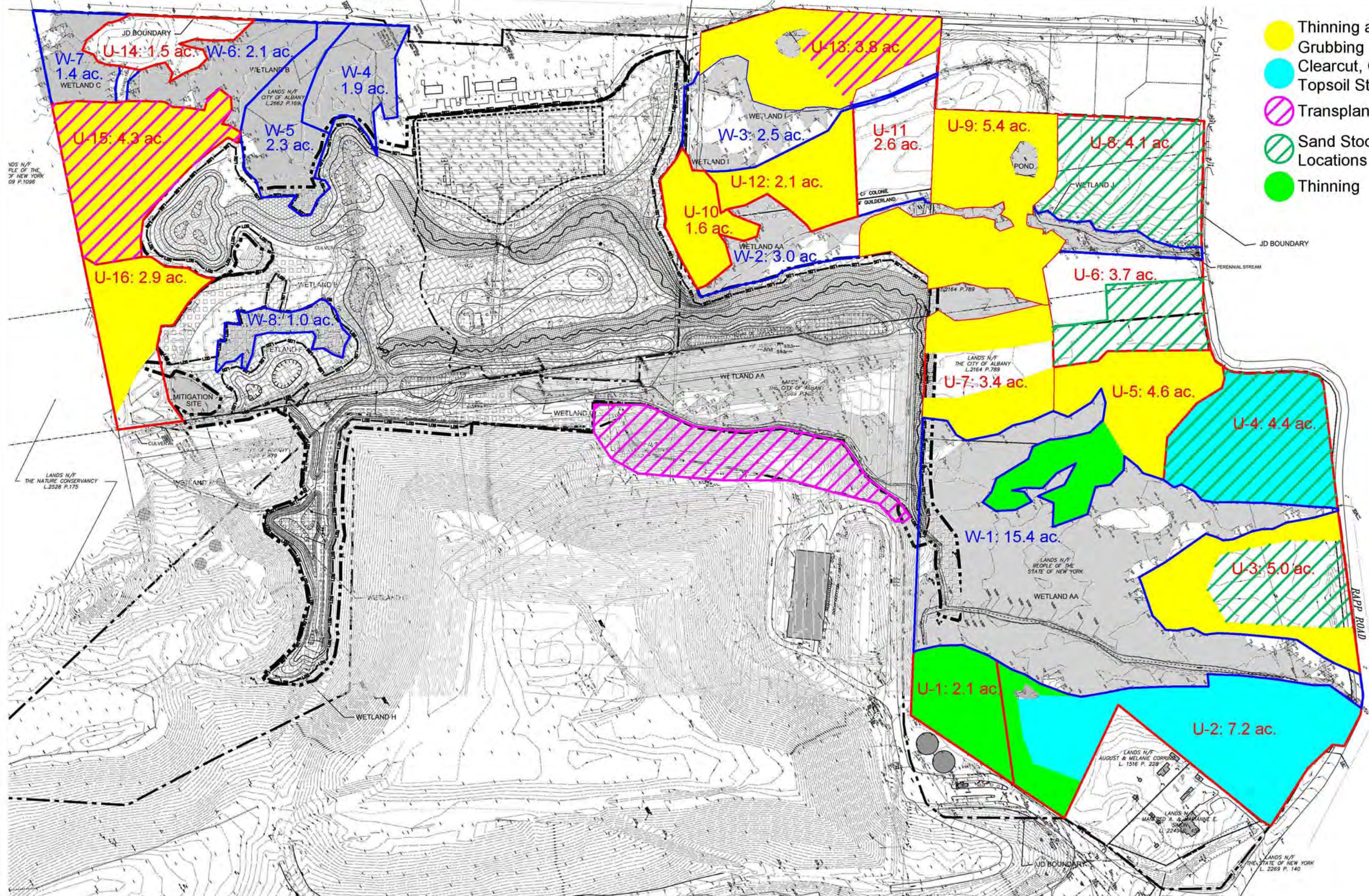
LEGEND

- Project Limit Line
- Seeding Zone Boundary 80.0 AC
- Existing 2' Contours
- Proposed 2' Contours
- Restored Stream
- Existing Stream

- Upland Grassland Communities
- Dry Prairie/Sand Flat 3.66 AC
- Dune 1.30 AC
- Upland Forest Communities
- Pitch Pine-Scrub Oak Barrens 4.85 AC
- Nursery Area 3.77
- Wetland Communities
- Filter Wetland 1.42 AC
- Pine Barrens Vernal Pond 1.12 AC
- Sedge Meadow 0.63 AC
- Forested Wetland (Red Maple Hardwood Swamp) 13.17 AC
- Forested Wetland Enhancement (Red Maple Hardwood Swamp) 3.05 AC
- Forested Riparian Wetland (Red Maple Hardwood Swamp) 6.50 AC



Scale 1" = 300'
 To Scale When Printed at 11 x 17" 2013 Albany Compliance Report



- Thinning and Grubbing
- Clearcut, Grub, and Topsoil Strip
- Transplant Material
- Sand Stockpile Locations
- Thinning

Albany Rapp Road Landfill
 Albany, New York
 City of Albany, Dept. of General Services
 One Connors Blvd.
 Albany, New York

Phase III Work Plan
 Clearing Map

AES Proj #	090036
Designed By	WCC
Drawn By	WCC
Checked By	EMK
File	Phase III Work Plan.dwg
Date	01-06-2012
Coordinate System	NAD



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Phase III Project Areas

- Upland Units
- Wetland Units

LEGEND

- | | | | | | | |
|--|----------------------|----------------------------------|--|-------------------------------------|--|---|
| Project Limit Line
Seeding Zone Boundary
80.0 AC | Existing 2' Contours | Restored Stream | Upland Grassland Communities | Upland Forest Communities | Wetland Communities | Forested Wetland Enhancement
(Red Maple Hardwood Swamp)
3.05 AC |
| Proposed 2' Contours | Existing Stream | Dry Prairie/Sand Flat
3.66 AC | Pitch Pine-Scrubs Oak Barrens
4.85 AC | Sedge Meadow
0.63 AC | Forested Wetland
(Red Maple Hardwood Swamp)
13.71 AC | Forested Riparian Wetland
(Red Maple Hardwood Swamp)
6.50 AC |
| | | Dune
1.30 AC | Nursery Area
3.77 | Bx/Filter Wetland
1.42 AC | | |
| | | | | Pine Barrens Vernal Pond
1.12 AC | | |



Scale: 1" = 300'
 To Scale When Printed at 11 x 17"

**Attachment B. 2013 Work Plan Schedule (includes continuation of activities into 2014)
Albany Rapp Road Landfill Ecosystem Mitigation, Restoration & Enhancement Plan**

Due Dates	General Task/ SpecificTask (Year)	2013												2014												Roles/ Responsibilities	Location of Task Specific Information			
		(Calendar Month)												(Calendar Month)													Restoration Plan	Construction Documents Plan Set	Invasive Species and Pest Mgmt Plan	DEC Permit
		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D					
	1. Construction Management																													
	a. Prepare and distribute weekly onsite activity reports/notifications per TRP	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	Consultant					
	b. Attend weekly landfill construction meetings	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	Consultant					
	c. Conduct SWPPP inspections and reporting	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	Consultant			p. 13		
	d. Conduct special meetings, site visits, communications and follow-up reporting	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	Consultant					
	e. Weekly management team meetings	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	Consultant					
	2. Construction Oversight																													
	a. Conduct Construction Oversight	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	Consultant					
	b. Prepare and distribute daily and weekly reports	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	Consultant					
	3. Annual Work Plan																													
30-Jan	a. Prepare and submit Draft Annual Work Plan	x											x	x	x									x	x	Consultant			p. 18	
	b. Coordinate TRP approval (concurrent w/ submittal of final approved work plan)		x	x	x										x	x	x									Consultant/City			p. 18	
	c. Coordinate and attend Interagency Habitat Management Team meeting(s) and follow-up communications for review/approval and finalization of Annual Work Plan	x	x	x	x									x	x	x	x									Consultant/City			p. 18	
	4. Annual Compliance Report																													
1-Dec	a. Prepare and submit Annual Compliance Report												x	x	x									x	x	x	Consultant/City			p. 18
	b. Follow-up discussions, communications w/ agencies and IHMT	x	x											x												Consultant/City				
	5. Nursery Maintenance																										p. 20, 21			
	a. Conduct nursery maintenance (watering, weeding, and cultivating)					x	x	x	x	x	x							x	x	x	x	x	x			Consultant/City/Contractor				
	6. Seed/Plant Collection and Acquisition																										p. 20, 21			
	a. Continue to develop and update seed collection plan	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	Consultant					
	b. Acquire collection permits as needed	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	Consultant					
	c. Conduct scouting for approved off-site seed collection sources			x	x	x	x	x	x	x	x					x	x	x	x	x	x	x	x			Consultant				
	d. Conduct hand seed collections within APBP/sites in 50-mile radius/onsite nursery					x	x	x	x	x	x							x	x	x	x	x	x			Consultant	p. 20, 21/65 - 66			
	e. Clean, process, inventory and store seed	x	x	x						x	x	x	x	x	x	x						x	x	x	x	Consultant				
	f. Identify commercially available seed, plants and woody material	x	x	x							x	x	x	x	x	x	x							x	x	Consultant				
	7. Test Plot Seeding, Maintenance, and Monitoring																													
	a. Repair any Test Plot erosion				x												x									Contractor				
	b. Install trees and shrubs in test plots (in 2013 a defined subplot within the test plot will be planted with commercially available <i>Vaccinium</i> species)					x												x								City/Contractor				
	c. Conduct Test Plot maintenance (mowing, weed control)					x	x	x	x	x	x							x	x	x	x	x	x			Consultant/City				
	d. Conduct annual performance monitoring, analysis and reporting (including faunal surveys for birds and butterflies to be conducted concurrently with faunal surveys in Task 13)			x	x	x	x	x	x	x	x	x	x			x	x	x	x	x	x	x	x	x	x	Consultant				
	8. Phase II Vernal Pond and Wetland Modifications																													
	Vernal Pond elevation modifications and planting				x	x	x																			City/Contractor				
	Forested Wetland elevation modifications, seeding and planting				x	x	x																			City/Contractor				
	Pump Station regrading, seeding, and planting				x	x	x																			City/Contractor				

Due Dates	General Task/ SpecificTask (Year)	2013												2014												Roles/ Responsibilities	Location of Task Specific Information				
		(Calendar Month)												(Calendar Month)													Restoration Plan	Construction Documents Plan Set	Invasive Species and Pest Mgmt Plan	DEC Permit	
		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D						
9. Invasive Plant Management																															
	a. Conduct herbaceous species management in Phase II and III and selected areas (e.g. all restoration construction zones, test plots, sand stockpile areas, and selected enhancement areas)					x	x	x	x	x	x	x															Consultant	p. 39 - 42		p. 27 - 49	
	b. Conduct Phragmites follow-up control (entire site)								x	x	x											x	x	x		Consultant			p. 43		
	c. Conduct woody control in forested wetland enhancement areas	x	x	x					x	x	x	x	x	x	x	x										Consultant	p. 43 - 45		p. 28 - 47		
	d. Conduct oriental bittersweet control (entire site)	x	x	x					x	x	x	x	x	x	x	x										Consultant			p. 30 - 31		
10. Plans, Specifications, and Bid Process																															
	a. Advertise bid opportunities (provided as needed - no bids anticipated for 2013)											x	x													City					
	b. Conduct bid review and contractor selection (provided as needed - no bids anticipated for 2013)																									Consultant					
	c. Coordinate and attend pre-construction meetings (provided as needed - no bids anticipated for 2013)	x	x	x										x	x	x										Consultant/Contractor					
	d. Prepare construction specifications	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	Consultant					
11. Phase III Enhancement																															
	a. Soil stripping, grubbing and site clean-up				x	x	x																			City					
	b. Tree thinning and removal		x	x																						City					
	c. Cover crop seeding				x	x	x	x																		City/Consultant					
	d. Enhancement seeding (if necessary, following fall assessment of seedbank response; this assessment will include monitoring and mapping of cleared areas for invasive species and appropriate areas for lupine)											x	x			x	x									City/Consultant					
12. Soil & Water QC Analysis																															
	a. Pre-monitoring calibration of Telog sensors and re-install soil moisture sensors		x													x										Consultant					
	b. Conduct hydrology monitoring, analysis and reporting				x	x	x	x	x	x	x	x	x			x	x	x	x	x	x	x	x	x	x	Consultant	p. 104 - 106		p. 13		
	c. End of season removal of soil moisture sensors to store for 2014 use										x														x	Consultant					
13. Ecological Monitoring																															
	a. Conduct vegetation monitoring, analysis and reporting					x	x			x	x	x	x							x	x				x	x	Consultant				
	b. Conduct wetland analysis and reporting in Phase II restoration								x	x															x	x	Consultant				
	c. Conduct bird, butterfly and moth surveys, analysis and reporting (see also Test Plots Task 7d)				x	x	x																		x	x	Consultant				
	d. Conduct reptile and amphibian surveys, analysis and reporting		x	x	x											x	x	x								x	x	Consultant			

Attachment C. Nursery Operations & Maintenance Compliance Report
Albany Rapp Road Landfill
Ecosystem Mitigation, Restoration & Enhancement Plan
City of Albany, New York

Introduction

The nursery was constructed and planted in mid-2011, making 2013 the second full growing season for installed plugs. While crops continued to establish their root systems, they also produced the first meaningful amounts of seed. *Viola sagittata*, *Monarda fistulosa*, *Helianthus divaricatus*, *Helianthus strumosus*, and *Ionactis linariifolius* all bore seed heavily, while *Lupinus perennis* production improved. Although the lupine bed has not yet reached peak capacity, replanting efforts from 2012 as well as seedling recruitment between rows has contributed to a density which should meet project goals. An early summer fungus on *Asclepias tuberosa* and *Asclepias quadrifolia*, caused by high temperatures and extremely high humidity resulted in a mid-season leaf and flower drop. Consequently, seed production in these beds was low. Plant mortality was also low, and the fungus is not expected to have long-term effects on production.

Helianthemum canadense and *Ceanothus americana* bed density was mostly unchanged from 2012, with 30% or less coverage. Both beds have or will be overseeded. *Apocynum androsaemifolium* and *Tephrosia virginiana* continued to build healthy root systems and crowns, but did not produce meaningful amounts of seed in 2013. This is typical for the early establishment years of these species.

Work Activity

Pre-emergent herbicide (LESCO PRE-M AquaCap) applications were conducted in May and July using a boom sprayer, reducing the need for foliar applications of glyphosate to control weeds. In addition to chemical controls, hand pulling was also necessary to remove weeds in the immediate vicinity of crops, where even spot applications of glyphosate could damage desirable plants. In August, a 10-10-10 granular fertilizer was applied to all beds with a walk-behind rotary spreader at a rate of 11lb./1000 ft², except for the lupine bed, where a half dose of 5-5-5 was applied. Aphids once again infested the *Asclepias* beds and were treated with safer soap in August and September.

The *Ceanothus* bed was reseeded (see Table 1) in May to control erosion and contribute to seed collection stock. Large numbers of *Solidago nemoralis* seedlings are already visible. The *Tephrosia* bed was enhanced in July with 150 additional plugs, which completed replanting efforts for the year. In addition, the nursery borders were hand-seeded (Table 2) and straw mulched in October to control runoff. Watering was unnecessary for most of the year due to heavier than normal rainfall. Most of the watering that did occur took place in the *Tephrosia* bed, in order to maintain the new plugs that were installed.

Final clean, collected weights for those species with nursery production in 2013 will be known at the end of the seed cleaning process in December.

Due to concerns about the nursery soil conditions, pH test samples were collected in September and sent to an independent lab for testing. Results and analysis will be forthcoming.

Table 1.

Ceanothus americana Bed (.12 ac) Rate 9.4431

<u>Grasses, sedges, etc.</u>		Seeding Rate		
<u>Botanical Name</u>	<u>Common Name</u>	oz	oz/ac	lbs/ac
Panicum linearifolium	Slender leaved panic grass	12.8	106.67	6.666875
		12.8	106.6700	6.6669
		70.60% of Mix		
<u>Forbs</u>				
<u>Botanical Name</u>	<u>Common Name</u>	oz	oz/ac	lbs/ac
Anemone virginiana	Thimbleweed	3.46	29	1.8019
Krigia virginica	Dwarf dandelion	0.8	6.6700	0.4169
Solidago nemoralis	Old field goldenrod	4.53	37.7500	2.3594
		5.33	44.4200	2.7763
		29.40% of Mix		

Table 2.

Nursery Border (.3 ac) Rate 12.9583

<u>Grasses, sedges, etc.</u>		Seeding Rate		
<u>Botanical Name</u>	<u>Common Name</u>	oz	oz/ac	lbs/ac
Carex swanii	Swan's sedge	6	20	1.25
Panicum acuminatum	Western panic grass	12	40	2.5
Panicum linearifolium	Slender leaved panic grass	12	40	2.5
Schizachyrium scoparium	Little bluestem	36	120	7.5
		66	140.0000	8.7500
		76.57% of Mix		
<u>Forbs</u>				
<u>Botanical Name</u>	<u>Common Name</u>	oz	oz/ac	lbs/ac
Arabis glabra	Tower mustard	0.3	1	0.0625
Asclepias syriaca	Common milkweed	3	10.0000	0.6250
Aster linearifolius	Stiff aster	6	20.0000	1.2500
Diodia teres	Poorjoe	3.6	12.0000	0.7500
Monarda punctata	Horse mint	3.6	12.0000	0.7500
Rosa carolina	Carolina rose	0.9999	3.3330	0.2083
Solidago nemoralis	Old field goldenrod	3	10.0000	0.6250
		20.1999	67.3330	4.2083
		23.43% of Mix		

Nursery Photos

1. *Lupinus perennis* bed



2. *Asclepias tuberosa* plants



3. *Tephrosia virginiana* plants



4. *Apocynum androsaemifolium* bed



5. *Helianthus strumosus* & *divaricatus* beds



6. *Monarda fistulosa* bed



**Attachment D. Seed/Plant Collection & Acquisition
Compliance Report
Albany Rapp Road Landfill
Ecosystem Mitigation, Restoration & Enhancement Plan
City of Albany, New York**

Introduction

The following seed collection activities were scheduled to be conducted from May through November 2013. Seed collections targeted during the 2013 growing season were intended for collection of upland enhancement areas, the GAL, and AIL.

May 15, 2013	Permits renewed.
June/October, 2013	Major species collections took place. Collection of nursery beds began.
November/December, 2013	Seed is processed for final cleaning in Albany, NY.

Work Activity

Seed collected in 2013 will be processed and stored through the winter at the AES facility in Albany, in anticipation of Phase III enhancement seeding, to take place in 2014.

Due to the lack of commercially available local genetic upland seed and the challenge of finding suitable collection sites outside of the Preserve, we have made a concerted effort to scout and negotiate permission to collect from other source locations. After two years of scouting within the approved 50-mile radius, we have located 51 sites (Table 2) with native habitats supporting common native pine bush species and more conservative species with populations appropriate for withstanding short-term collection pressure.

Seed collections for 2013 were initiated in May. Collaborative picking operations were also coordinated with APBPC targeting wild lupine. The following is a list of species collected through November 2013. Final clean, collected weights will be known at the end of the seed cleaning process in December.

Table 1. Species Collected in 2013.

Scientific Name	Common Name
<i>Andropogon gerardii</i>	Big Bluestem
<i>Asclepias quadrifolia</i>	Blunt Milkweed
<i>Asclepias syriaca</i>	Common Milkweed
<i>Asclepias tuberosa</i>	Butterfly Milkweed
<i>Aureolaria flava</i>	Yellow False Foxglove

<i>Carex swanii</i>	Swan's Sedge
Scientific Name	Common Name
<i>Ceanothus americana</i>	New Jersey Tea
<i>Cyperus houghtonii</i>	Houghton's Flatsedge
<i>Danthonia spicata</i>	Poverty Grass
<i>Desmodium canadense</i>	Showy Tick-trefoil
<i>Diodia teres</i>	Rough Buttonweed
<i>Elymus hystrix</i>	Bottlebrush Grass
<i>Eupatorium sessilifolium</i>	Upland Boneset
<i>Helianthemum canadense</i>	Longbranch Frostweed
<i>Helianthus divaricatus</i>	Pale Wood Sunflower
<i>Helianthus strumosus</i>	Woodland Sunflower
<i>Ionactis linariifolius</i>	Stiff Aster
<i>Leptoloma cognatum</i>	Fall Witch Grass
<i>Lupinus perennis</i>	Blue Lupine
<i>Melampyrum lineare</i>	Cow Wheat
<i>Monarda fistulosa</i>	Wild Bergamot
<i>Panicum acuminatum</i>	Western Panic Grass
<i>Panicum linearifolium</i>	Slender-leaved Panic Grass
<i>Penstemon hirsutus</i>	Hairy Foxglove
<i>Potentilla arguta</i>	Prairie Cinquefoil
<i>Pseudognaphalium obtusifolium</i>	Sweet Everlasting
<i>Solidago bicolor</i>	Silverrod
<i>Solidago hispida</i>	Hairy Goldenrod
<i>Solidago nemoralis</i>	Gray Goldenrod
<i>Symphotrichum patens</i>	Late Purple Aster
<i>Tephrosia virginiana</i>	Goat's Rue
<i>Thalictrum revolutum</i>	Skunk Meadow Rue
<i>Trichostema dichotomum</i>	Blue Curls
<i>Viola sagittata</i>	Arrow-leaved Violet
<i>Zizia aurea</i>	Golden Alexander

Over the past four growing seasons we have collected more than 200 species and 2000 lbs of seed for the Albany Landfill restoration. Each of these species is understood to play a role in the natural landscape of the Pine Bush and have a vital role in erosion control. Many also play an important role as nectar species, Lepidoptera brood species, bird nesting habitat, food for larger foragers and aesthetic beauty for the people that will appreciate it as long as it survives. The list of species in Table 3 shows the current seed inventory for all collected species from the past four years, including itemized deductions of seed removed for project use.

Table 2. Collection locations within the 50-mile approved radius from the Albany Landfill project site.

ID Site	Site Name	Origin	State	Distance in miles
NY01	Albany Pine Bush Preserve, Albany, NY	Albany	NY	0
NY02	Hwy 88, Richmondville, NY	Schoharie County	NY	40
NY03	Bernie Braun Property, Richmondville, NY	Schoharie County	NY	40
NY04	Saratoga National Monument, Stillwater, NY	Saratoga County	NY	20
NY05	Constantine Construction & Farm, Inc., Albany NY	Albany	NY	0
NY06	Albany Rd Power lines, Albany, NY	From RR tracks to Albany Rd	NY	0
NY07	Blueberry Hill, Albany, NY	Albany County	NY	0
NY08	Rogers Island, Fort Edward, NY	Columbia County	NY	45
NY09	Peebles Island	Waterford, Ny	NY	10
NY10	Rapp Rd, Colonie, NY	Albany County	NY	0
NY11	Renssaeler Lake Rest Area, Fulton Rd, Albany, NY	Albany County	NY	0
NY12	Kings Rd, Colonie, NY	Albany	NY	0
NY13	Hwy 88, Cobleskill, NY	Schoharie County	NY	35
NY14	Cobleskill Water Treatment Plant, Cobleskill, NY	Schoharie County	NY	40
NY15	Hwy 88 Bog	Otsego County	NY	45
NY16	Route 146, Rotterdam, NY	Albany County	NY	10
NY17	Diesels property, Nassau, NY	Rensselaer County	NY	12
NY18	Powerlines, Glens Fall, NY	Warren County	NY	45
NY19	Construction area, Albany, NY	Albany Pine Bush	NY	0
NY20	Nassau Powerlines, Rice rd, Nassau, NY	Rensselaer County	NY	12
NY21	Rose Sneiders, School House Rd, Nassau, NY	Rensselaer County	NY	12
NY22	Willow Street Powerlines, Albany, NY	Albany County	NY	0
NY23	Lake Desolation Rd, Lake Desolation, NY	Saratoga County	NY	35
NY24	Crossgate Powerlines, Albany NY	Albany County	NY	0
NY25	88 Brickhouse, Duanesburg, NY	Schenectady County	NY	14
NY26	Hwy 10, Mureau, NY	Saratoga County	NY	50
NY27	Peggy Ann Road Powerlines,	Warren County	NY	45
NY28	Route 7 RR tracks, Richmondville, NY	Schoharie County	NY	40
NY29	Pine Bush Bog, Albany, NY	Albany Pine Bush	NY	45
NY30	Fred Shaven Property, Nassau, NY	School House Rd	NY	12

NY31	Herb Dytric Property, Rice Rd, Nassau, NY	Rensselaer County	NY	12
ID Site	Site Name	Origin	State	Distance in miles
NY32	Kings Rd RR, Colonie, NY	Albany County	NY	0
NY33	Vly Creek, New Scotland, NY	Albany County	NY	7
NY34	Benson Rd, Caroga Lake, NY	Fulton County	NY	49
NY35	Tom Snyder, Rice RD, Nassau NY	Rensselaer County	NY	12
NY36	Tom Bushinski's property, Rt 145, Middleburgh, NY	Schoharie County	NY	29
NY37	Hwy 81, Greenville, NY	Green County	NY	20
NY38	Wolf Creek Falls Preserve, Altamont, NY	Albany County	Ny	15
NY39	Madison Ave Extension, Albany, NY	Albany County	NY	0
NY40	Apollo Rd, Albany, NY	Albany Pine Bush	NY	0
NY41	Old State Rd, Albany, NY	Albany Pine Bush	NY	0
NY42	Tivoli Park, Albany, NY	Albany County	NY	0
NY43	Ravena Powerlines, Ravena, NY	Albany County	NY	13
NY44	Mureau Powerlines, Mureau, NY	Saratoga County	NY	40
NY45	58 Lester Parkway, Greenwich NY	Saratoga County	NY	32
NY46	Joralomen Park, Ravena, NY	Albany County	NY	14
NY47	Winn Preserve, Knox, NY	Albany County	NY	18
NY48	Saratoga Airfield, Saratoga Springs, NY	Saratoga County	NY	30
NY49	Curry Rd Powerlines, Albany, NY	Albany County	NY	0
NY50	Barren Field, Dollar Gen, Cocksackie, NY	Green County	NY	20
NY51	Hwy 9W, Ravena, NY	Albany county	NY	15
NY51	RPI Tech Park, Troy, NY	Rensselaer County	NY	6
NY52	Duanesburg Church Rd, Duanesburg, NY	Schenectady County	NY	25
ME01	TNC, Kennebunk preserve, Kennebunk, NY	York County	MA	140

Table 3: Seed inventory with itemized removals.

Species	Common Name	Total Collected (oz) 2009-2012	PII Seed Mix Deduction (oz)	Nursery Production Deduction (oz)	PII Plug Production Deduction (oz)	Test Plot Mix Deduction (oz)	PII Repair Mix Deduction (oz)	Nursery Overseeding Deduction (oz)	Nursery Border Seeding (oz)	Total Removed (oz)	Total Available (oz)
<i>Actaea pachypoda</i>	White baneberry	1								0	1
<i>Actaea rubra</i>	Red baneberry	1	0.05							0.05	0.95
<i>Agalinis tenuifolia</i>	Slender false foxglove	2.37	1.77		0.6					2.37	0
<i>Ageratina altissima</i>	White snakeroot	616.18	160				17.78			177.78	438.4
<i>Agrimonia parviflora</i>	Small-flowered agrimony	18.16	14				1.6			15.6	2.56
<i>Alisma subcordatum</i>	American water plantain	43.09	15		1.21		4.48			20.69	22.4
<i>Allium tricoccum</i>	Wild leek	0.2	0.2							0.2	0
<i>Amphicarpaea bracteata</i>	Hog peanut	0.04	0.04							0.04	0
<i>Anaphalis margaritacea</i>	Pearly everlasting	0.64								0	0.64
<i>Andropogon gerardii</i>	Big bluestem	353.24	212							212	141.24
<i>Anemone cylindrica</i>	Candle anemone	8.74	4.5			4.24				8.74	0
<i>Anemone virginiana</i>	Thimbleweed	24	1				0.02	3.46		4.48	19.52
<i>Apios americana</i>	Groundnut	0.5	0.5							0.5	0
<i>Apocynum androsaemifolium</i>	Spreading dogbane	1.32		0.68						0.68	0.64
<i>Apocynum cannabinum</i>	Dogbane	31.9	23		8.9					31.9	0
<i>Apocynum sibiricum</i>	Clasping dogbane	4	4							4	0
<i>Aquilegia canadensis</i>	Columbine	8.68	0.56				0.04			0.6	8.08
<i>Arabis glabra</i>	Tower mustard	385	2.61						0.3	2.91	382.09
<i>Arisaema triphylum</i>	Jack-in-the-pulpit	7.5								0	7.5
<i>Aronia melanocarpa</i>	Black chokeberry	0.05	0.05							0.05	0
<i>Asclepias amplexicaulis</i>	Blunt milkweed	0.76		0.76						0.76	0
<i>Asclepias incarnata</i>	Swamp milkweed	53.71	50		3.71					53.71	0
<i>Asclepias syriaca</i>	Common milkweed	267.38	10			3.78	0.04		3	16.82	250.56
<i>Asclepias tuberosa</i>	Butterfly milkweed	11.18		5.36	4.32					9.68	1.5
<i>Aureolaria flava</i>	Yellow false foxglove	8.66			0.34					0.34	8.32
<i>Bidens spp</i>	Beggar ticks	170.88	120				15.36			135.36	35.52

Species	Common Name	Total Collected (oz) 2009-2012	PII Seed Mix Deduction (oz)	Nursery Production Deduction (oz)	PII Plug Production Deduction (oz)	Test Plot Mix Deduction (oz)	PII Repair Mix Deduction (oz)	Nursery Overseeding Deduction (oz)	Nursery Border Seeding (oz)	Total Removed (oz)	Total Available (oz)
<i>Blephilia ciliata</i>	Downy woodmint	0.5	0.5							0.5	0
<i>Boehmeria cylindrica</i>	Small-spike false nettle	200.28	135				21.76			156.76	43.52
<i>Bromus kalmii</i>	Arctic brome	12.15								0	12.15
<i>Calla palustris</i>	Calla lily	3.24			3.24					3.24	0
<i>Campanula rotundifolia</i>	Harebell	0.05			0.02					0.02	0.03
<i>Carex annectens</i>	Yellowfruit sedge	43.6	25		2.6					27.6	16
<i>Carex bebbii</i>	Bebb's sedge	5.84	5.84							5.84	0
<i>Carex brunescens</i>	Brownish sedge	9.48	5				4.48			9.48	0
<i>Carex comosa</i>	Longhair sedge	226.84	143.5		2.7		27.52			173.72	53.12
<i>Carex crinita</i>	Fringed sedge	144	111		7.4		13.76			132.16	11.84
<i>Carex flava</i>	Yellow sedge	28.32	12							12	16.32
<i>Carex foenea</i>	Dryspike sedge	0.11								0	0.11
<i>Carex folliculata</i>	Northern long sedge	2	2							2	0
<i>Carex frankii</i>	Frank's sedge	6.25	6.25							6.25	0
<i>Carex granularis</i>	Limestone meadow sedge	3.2	3.2							3.2	0
<i>Carex hystericina</i>	Porcupine sedge	382.12	145				24.96			169.96	212.16
<i>Carex intumescens</i>	Great bladder sedge	13.1	10		3.1					13.1	0
<i>Carex lacustris</i>	Lake sedge	39.04	24				3.84			27.84	11.2
<i>Carex lupulina</i>	Hop sedge	262.9	185		13.9		30.72			229.62	33.28
<i>Carex pennsylvanica</i> *	Penn Sedge	86.64								0	83.52
<i>Carex scabrata</i>	Eastern rough sedge	11.92	10							10	1.92
<i>Carex scoparia</i>	Broom sedge	338.2	23							23	315.2
<i>Carex squarosa</i>	Squarrose sedge	4.16								0	4.16
<i>Carex sterilis</i>	Fen star sedge	11	11							11	0
<i>Carex stipata</i>	Awlfruit sedge	85.6	52				14.72			66.72	18.88
<i>Carex stricta</i>	Tussock sedge	8.7			8.7					8.7	0
<i>Carex swanii</i>	Swan's sedge	188.16							6	6	182.16

Species	Common Name	Total Collected (oz) 2009-2012	PII Seed Mix Deduction (oz)	Nursery Production Deduction (oz)	PII Plug Production Deduction (oz)	Test Plot Mix Deduction (oz)	PII Repair Mix Deduction (oz)	Nursery Overseeding Deduction (oz)	Nursery Border Seeding (oz)	Total Removed (oz)	Total Available (oz)
<i>Carex trisperma</i>	Three-seeded sedge	15	15							15	0
<i>Carex utriculata</i>	Northwest Territory sedge	6.66	2.5				2.24			4.74	1.92
<i>Carex vulpinoidea</i>	Fox sedge	473.68	178				21.76			199.76	273.92
<i>Ceanothus americanus</i>	New Jersey tea	413.3		19.5						19.5	393.8
<i>Chamaedaphne calyculata angustifolia</i>	Leatherleaf	1.3	1.3							1.3	0
<i>Chamerion angustifolium</i>	Fireweed	0.31			0.31					0.31	0
<i>Chelone glabra</i>	Turtlehead	1.51	1.15		0.36					1.51	0
<i>Cicuta bulbifera</i>	Bulb-bearing water hemlock	3.64	3				0.64			3.64	0
<i>Cicuta maculata</i>	Spotted water hemlock	2.6	2.6							2.6	0
<i>Cimicifuga racemosa</i>	Black snakeroot	6.7								0	6.7
<i>Cinna arundinacea</i>	Sweet woodreed	45	45							45	0
<i>Cirsium muticum</i>	Swamp thistle	0.5	0.5							0.5	0
<i>Clematis virginiana</i>	Virgin's bower	28.44	15				2.24			17.24	11.2
<i>Comandra umbellata</i>	Bastard toadflax	51.65	0.77							0.77	50.88
<i>Cornus amomum</i>	Silky dogwood	6	6							6	0
<i>Cyperus houghtonii</i>	Houghton's flatsedge	80								0	80
<i>Cyperus schweinitzii</i> *	Schweinitz's flatsedge	21								0	19.52
<i>Cyperus strigosus</i>	Straw-colored flatsedge	1.72	1				0.72			1.72	0
<i>Danthonia spicata</i>	Poverty grass	1.08								0	1.08
<i>Decodon verticillatus</i>	Swamp loosestrife	1.6	0.5				0.48			0.98	0.62
<i>Desmodium canadense</i>	Showy ticktrefoil	222.15	60			13.73	0.26			73.99	148.16
<i>Desmodium nudiflorum</i> *	Naked-flowered ticktrefoil	30.4								0	29.76
<i>Dichanthelium acuminatum</i> ¹	Tapered rosette grass	141.36							12	12	129.36
<i>Diervilla lonicera</i>	Dwarf bush honeysuckle	1.54								0	1.54
<i>Diodia teres</i>	Poorjoe	157.26	16				0.14		3.6	19.74	137.52
<i>Doellingeria umbellata</i> ¹	Parasol aster	8.06	2			2.4	0.76			5.16	2.9

Species	Common Name	Total Collected (oz) 2009-2012	PII Seed Mix Deduction (oz)	Nursery Production Deduction (oz)	PII Plug Production Deduction (oz)	Test Plot Mix Deduction (oz)	PII Repair Mix Deduction (oz)	Nursery Overseeding Deduction (oz)	Nursery Border Seeding (oz)	Total Removed (oz)	Total Available (oz)
<i>Dulichium arundinacea</i>	Threeway sedge	58	10				8.96			18.96	39.04
<i>Echinocystis lobata</i>	Wild cucumber	0.64								0	0.64
<i>Eleocharis acicularis</i>	Needle spikerush	0.66	0.66							0.66	0
<i>Eleocharis obtusa</i>	Blunt spikerush	23.21	4.01				3.52			7.53	15.68
<i>Elymus hystrix</i>	Bottlebrush grass	77.92								0	77.92
<i>Elymus virginicus</i>	Virginia wildrye	12	12							12	0
<i>Epilobium coloratum</i>	Cinnamon willow-herb	159.84	35				12.2			47.2	112.64
<i>Erechtites hieracifolia</i>	Burnweed	416								0	416
<i>Eriophorum angustifolium</i>	Cottongrass	7	2		1.48		1.6			5.08	1.92
<i>Eupatoriadelphus maculatus</i>	Joe Pye weed	1222.72	196				30.72			226.72	996
<i>Eupatorium perfoliatum</i>	Boneset	575.36	168				30.72			198.72	376.64
<i>Eupatorium sessilifolium</i>	Upland boneset	33.9								0	33.9
<i>Euthamia graminifolia</i> ¹	Grass-leaved goldenrod	470.77	80.05				11.2			91.25	379.52
<i>Galium palustre</i>	Common marsh bedstraw	0.79	0.15							0.15	0.64
<i>Gaylussacia baccata</i>	Huckleberry	32.32								0	32.32
<i>Geranium maculatum</i>	Spotted geranium	2.13	0.53							0.53	1.6
<i>Geranium robertianum</i>	Herb Robert	0.62								0	0.62
<i>Geum sp.</i>	Avens	2.3	2.3							2.3	0
<i>Glyceria canadensis</i>	Rattlesnake mannagrass	92.02	55				11.2			66.2	25.82
<i>Glyceria grandis</i>	American mannagrass	570.4	260				39.68			299.68	270.72
<i>Glyceria striata</i>	Fowl mannagrass	260	260							260	0
<i>Helianthemum bicknellii</i>	Hoary frostweed	7.59	0.67				0.2			0.87	6.72
<i>Helianthemum canadense</i>	Longbranch frostweed	96.04	29	3.86		12.92	0.5			46.28	49.76
<i>Helianthus decapetalus</i>	Thinleaf sunflower	1.7	1.7							1.7	0
<i>Helianthus divaricatus</i>	Woodland sunflower	115.53	0.52	3.52						4.04	111.49
<i>Helianthus strumosus</i>	Pale-leaved sunflower	27.73		3.41						3.41	24.32
<i>Heliopsis helianthoides</i>	Smooth oxeye	0.2								0	0.2

Species	Common Name	Total Collected (oz) 2009-2012	PII Seed Mix Deduction (oz)	Nursery Production Deduction (oz)	PII Plug Production Deduction (oz)	Test Plot Mix Deduction (oz)	PII Repair Mix Deduction (oz)	Nursery Overseeding Deduction (oz)	Nursery Border Seeding (oz)	Total Removed (oz)	Total Available (oz)
<i>Houstonia cerulea</i>	Bluets	0.4								0	0.4
<i>Hypericum virginicum</i>	Marsh St. John's wort	2.64	2				0.64			2.64	0
<i>Ilex verticillata</i>	Winterberry holly	14	14							14	0
<i>Ionactis linariifolius</i> ¹	Stiff aster	148.56		3.22		1.06			6	10.28	138.28
<i>Iris versicolor</i>	Blueflag iris	26.8	26		0.8					26.8	0
<i>Juncus canadensis</i>	Canada rush	12.84	1				0.96			1.96	10.88
<i>Juncus dudleyi</i>	Dudley's rush	49.86	4.1				0.96			5.06	44.8
<i>Juncus effusus</i>	Common rush	302.38	5.1				0.96			6.06	296.32
<i>Juncus tenuis</i>	Path rush	17.58	13.1				1.92			15.02	2.56
<i>Juncus torreyi</i>	Torrey's rush	72.04	1							1	71.04
<i>Krigia virginica</i>	Dwarf dandelion	1.12						0.8		0.8	0.32
<i>Leersia orzyoides</i>	Rice cutgrass	70.3	59.1				8			67.1	3.2
<i>Leptoloma cognatum</i>	Fall witchgrass	16								0	16
<i>Lespedeza hirta</i>	Hairy bushclover	5.12								0	5.12
<i>Liatrix scariosa nieuwlandii</i>	Nieuland's blazing star	1212								0	1212
<i>Lilium canadense</i>	Canada lily	2.69	2.37				0.32			2.69	0
<i>Lilium philadelphicum</i>	Wood lily	0.96	0.96							0.96	0
<i>Lobelia cardinalis</i>	Cardinal flower	0.65	0.12		0.53					0.65	0
<i>Lobelia inflata</i>	Indian tobacco	3.84								0	3.84
<i>Lobelia siphilitica</i>	Great blue lobelia	0.15	0.09		0.01		0.02			0.12	0.03
<i>Lupinus perennis</i>	Blue lupine	1486.34	160	25.4	29.97	121.7	8.75			345.82	1140.52
<i>Lycopus americanus</i>	Water horehound	176	90		11.44		17.6			119.04	56.96
<i>Lysimachia ciliata</i>	Fringed loosestrife	9.2	7				0.92			7.92	1.28
<i>Lysimachia terrestris</i>	Swamp candles	0.16	0.16							0.16	0
<i>Maianthemum racemosum</i>	Canada mayflower	5.58								0	5.58
<i>Medeola virginiana</i>	Indian cucumber	0.02	0.02							0.02	0
<i>Melampyrum lineare</i>	Cow wheat	14.6	6				0.6			6.6	8

Species	Common Name	Total Collected (oz) 2009-2012	PII Seed Mix Deduction (oz)	Nursery Production Deduction (oz)	PII Plug Production Deduction (oz)	Test Plot Mix Deduction (oz)	PII Repair Mix Deduction (oz)	Nursery Overseeding Deduction (oz)	Nursery Border Seeding (oz)	Total Removed (oz)	Total Available (oz)
<i>Mentha arvensis</i>	Wild mint	1.4	1.4							1.4	0
<i>Mimulus ringens</i>	Monkey flower	32.92	30		0.04		2.88			32.92	0
<i>Monarda didyma</i>	Bee balm	0.07			0.07					0.07	0
<i>Monarda fistulosa</i>	Wild bergamot	190.35	40	3.2		11.65	0.7			55.55	134.8
<i>Oenothera biennis</i>	Common evening primrose	111.15	29			2.15				31.15	80
<i>Osmorhiza claytonii</i>	Sweet cicely	6.6								0	6.6
<i>Panicum capillare</i>	Witchgrass	80								0	80
<i>Panicum clandestinum</i> **	Deertongue	80	10							10	41.92
<i>Panicum linearifolium</i>	Slimleaf panicgrass	363.2						12.8	12	24.8	338.4
<i>Penstemon digitalis</i>	Beardtongue	160.88	4				0.4			4.4	156.48
<i>Penstemon hirsutus</i>	Hairy beardtongue	8.13			0.23					0.23	7.9
<i>Penthorum sedoides</i>	Ditch stonecrop	43.2	24				4.48			28.48	14.72
<i>Physostegia virginiana</i>	Obedient plant	0.81	0.08		0.73					0.81	0
<i>Polygonum sagittatum</i>	Tearthumb	17.56	15				1.92			16.92	0.64
<i>Polygonum virginianum</i>	Jumpseed	8.1	6.5				0.64			7.14	0.96
<i>Potentilla arguta</i>	Tall cinquefoil	0.61			0.29					0.29	0.32
<i>Potentilla canadensis</i>	Dwarf cinquefoil	2.56								0	2.56
<i>Pseudognaphalium obtusifolium</i>	Rabbit tobacco	69.41	4			2.27	0.1			6.37	63.04
<i>Pycnanthemum tenuifolium</i>	Mountainmint	118.52	4		0.95					4.95	113.57
<i>Pycnanthemum virginianum</i>	Virginia mountainmint	1.45	1.45							1.45	0
<i>Ranunculus hispidus</i>	Bristly buttercup	0.06	0.06							0.06	0
<i>Rhynchospora alba</i>	White beaksedge	0.15	0.15							0.15	0
<i>Rosa carolina</i>	Carolina rose	14.32	1.84						1	2.84	11.48
<i>Rubus flagellaris</i>	Dewberry	92								0	92
<i>Rudbeckia hirta</i>	Black-eyed susan	70.84	5			1.64				6.64	64.2
<i>Rudbeckia laciniata</i>	Cutleaf coneflower	6.68	5		1.36					6.36	0.32
<i>Sarracenia purpurea</i>	Pitcher plant	0.1	0.1							0.1	0

Species	Common Name	Total Collected (oz) 2009-2012	PII Seed Mix Deduction (oz)	Nursery Production Deduction (oz)	PII Plug Production Deduction (oz)	Test Plot Mix Deduction (oz)	PII Repair Mix Deduction (oz)	Nursery Overseeding Deduction (oz)	Nursery Border Seeding (oz)	Total Removed (oz)	Total Available (oz)
<i>Scheuchzeria palustris americana</i>	Rannoch rush	2.63	2.63							2.63	0
<i>Scirpus americanus</i>	Chairmaker's bulrush	10	10							10	0
<i>Scirpus atrovirens</i>	Green bulrush	540.83	158.75				36.48			195.23	345.6
<i>Scirpus cyperinus</i>	Woolgrass	324.14	199		0.42		37.36			236.78	87.36
<i>Scirpus microcarpus</i>	Panicled bulrush	214.65	141		0.37		20.8			162.17	52.48
<i>Scirpus pendulus</i>	Rufous bulrush	170.14	86.75		1.15		11.84			99.74	70.4
<i>Scoenoplectus tabernaemontanii</i>	Softstem bulrush	68.34			1.78					1.78	66.56
<i>Scutellaria lateriflora</i>	Blue skullcap	6	6							6	0
<i>Sicyos angulatus</i>	Bur cucumber	0.62	0.62							0.62	0
<i>Sisyrinchium montanum</i> *	Blue eyed grass	0.5								0	0.32
<i>Solidago gigantea</i>	Giant goldenrod	322.68	107				15.36			122.36	200.32
<i>Solidago hispida</i>	Hairy goldenrod	1.02								0	1.02
<i>Solidago juncea</i>	Early goldenrod	487.6	72				1.2			73.2	414.4
<i>Solidago nemoralis</i>	Gray goldenrod	224.1	89			2.27	0.3	4.53	3	99.1	125
<i>Solidago patula</i>	Roundleaf goldenrod	73	73							73	0
<i>Solidago rugosa</i>	Rough goldenrod	115.51	53			2.41				55.41	60.1
<i>Sorghastrum nutans</i>	Indian grass	607.72	151							151	456.72
<i>Sparganium americanum</i>	American bur-reed	12.93	12		0.93					12.93	0
<i>Sparganium eurycarpum</i>	Broadfruit bur-reed	14.24	12		2.24					14.24	0
<i>Sphenopholis intermedia</i> **	Slender wedgescale	0.9								0	0.32
<i>Sphenopholis obtusata</i>	Prairie wedgescale	0.82	0.5				0.32			0.82	0
<i>Spiraea alba</i>	Meadowseet	27.68	4				2.88			6.88	20.8
<i>Spiraea tomentosa</i>	Steeplebush	72.76	11				4.48			15.48	57.28
<i>Symphotrichum cordifolium</i> ¹	Heartleaf aster	49.1								0	49.1
<i>Symphotrichum ericoides</i> ¹	Heath aster	132.32	40				0.16			40.16	92.16
<i>Symphotrichum laeve</i> ¹	Smooth aster	89.09	35		3.23	8.24	0.06			46.53	42.56

Species	Common Name	Total Collected (oz) 2009-2012	PII Seed Mix Deduction (oz)	Nursery Production Deduction (oz)	PII Plug Production Deduction (oz)	Test Plot Mix Deduction (oz)	PII Repair Mix Deduction (oz)	Nursery Overseeding Deduction (oz)	Nursery Border Seeding (oz)	Total Removed (oz)	Total Available (oz)
<i>Symphotrichum lanceolatum</i> ¹	Panicled aster	11	11							11	0
<i>Symphotrichum lateriflorum</i> ¹	Calico aster	192.52	165				21.76			186.76	5.76
<i>Symphotrichum novae-angliae</i> ¹	New England aster	8	8							8	0
<i>Symphotrichum patens</i> ¹	Late purple aster	4.79	2.52			2.27				4.79	0
<i>Symphotrichum pilosum</i> ¹	Frost aster	131.92	2							2	129.92
<i>Symphotrichum puniceum</i> ¹	Purplestem aster	61.72	39				4.48			43.48	18.24
<i>Symphotrichum undulatum</i> ¹	Wavy-leaved aster	3.65	1.25			2.4				3.65	0
<i>Tephrosia virginiana</i>	Goat's rue	21.65		12.36	9.29					21.65	0
<i>Teucrium canadense</i>	Germander	274.83	70				5.15			75.15	199.68
<i>Thalictrum pubescens</i>	King of the meadow	36.51	20		5.95		1.92			27.87	8.64
<i>Thalictrum revolutum</i>	Waxleaf meadowrue	7.7			4.9					4.9	2.8
<i>Tradescantia ohiensis</i> *	Spiderwort	13.32								0	12.8
<i>Trichostema dichotomum</i>	Bluecurls	28.94	8				1.1			9.1	19.84
<i>Vaccinium macrocarpon</i>	American cranberry	0.1	0.1							0.1	0
<i>Veratrum viride</i>	False hellebore	176	140				36			176	0
<i>Verbena hastata</i>	Blue vervain	565.12	200				28.8			228.8	336.32
<i>Verbena urticifolia</i>	White vervain	95.84	20				22.4			42.4	53.44
<i>Viola sagittata</i>	Arrow-leaf violet	0.57		0.25						0.25	0.32
Total		20463.83	5521.3	81.52	139.57	195.13	666.44	21.59	46.9	6672.45	13756.78

* These species experienced natural drying during storage, slightly reducing their weights.

** These species were affected by rodent damage in early 2013, with a total loss of 28.66 oz. The problem was corrected with a combination of traps and impermeable storage containers.

¹The species so denoted are listed with their current scientific name. A key to the old scientific names is as follows:

Dicantbelium acuminatum accepted of syn.: *Panicum acuminatum*

Doellingeria umbellata accepted of syn.: *Aster umbellatus*

Euthamia graminifolia accepted of syn.: *Solidago graminifolia*

Ionactis linariifolius accepted of syn.: *Aster linariifolius*
Sphenopholis intermedia accepted of syn.: *Sphenopholis obtusata*
Symphyotrichum cordifolium accepted of syn.: *Aster cordifolius*
Symphyotrichum ericoides accepted of syn.: *Aster ericoides*
Symphyotrichum laeve accepted of syn.: *Aster laevis*
Symphyotrichum lanceolatum accepted of syn.: *Aster simplex*
Symphyotrichum lateriflorum accepted of syn.: *Aster lateriflorus*
Symphyotrichum novae-angliae accepted of syn.: *Aster novae-angliae*
Symphyotrichum patens accepted of syn.: *Aster patens*
Symphyotrichum pilosum accepted of syn.: *Aster pilosus*
Symphyotrichum puniceum accepted of syn.: *Aster puniceus*
Symphyotrichum undulatum accepted of syn.: *Aster undulatus*

**Attachment E. Test Plot Seeding, Maintenance & Monitoring
Compliance Report
Albany Rapp Road Landfill
Ecosystem Mitigation, Restoration & Enhancement Plan
City of Albany, New York**

Introduction

This section presents the second year monitoring and statistical analysis results in the constructed test plots on the landfill cap, as detailed in the following report in Attachment E-1. Test plot maintenance activities are summarized in the work activities section below.

Work Activities

Maintenance activities conducted in 2012 in the test plots included rill erosion repair and selective mowing, as well as initial woody plantings and installation of the electric fence, as summarized in the following table.

Date	Description of Activity	Comment
June - August	Repair of erosion on the GAL toe of slope	Grading and cover seeding completed by 6/26. Native seeding to be installed in fall. Excess sand used to repair test plot erosion.
August/Sept	Mowing of test plot outer perimeter	Goal to control weeds along test plot perimeter fence.
8/5 - 14	Test Plot vegetation monitoring	
9/4	Repair erosion at base of test plot on the north slope	Used sand recovered from the GAL toe repair; cover crop installed. Repairs delayed due to wet conditions earlier in the season
10/10	Woody plant subplot establishment (flagging & GPS)	According to the test plot woody planting plan (presented in the 2014 Work Plan)
11/___	Woody plant installation (Vaccinium)	Initial planting of commercially purchased blueberry shrubs; the balance of woody plantings to occur in spring 2014
11/___	Electric fence installation	

Deviations from Work Plan

Final repairs and native seeding of the toe-of-slope repairs at the bottom of the north slope that impacted the APBP Yellow Trail were completed later in the season versus in the early part of the season, due to wetter than normal site conditions that persisted into the summer months. Likewise, planting of the *Vaccinium* shrubs occurred as a late season planting versus spring planting, due to the combined delays associated with the repair of the GAL and test plot erosion features due to prolonged wet site conditions, which inhibited installation of the protective test plot electric fence.

**Attachment E-1. Second Growing Season Test Plot Evaluation of
Restoration Needs for Creating Pine Bush Ecosystems on the
Albany Rapp Road Landfill, Albany NY**

**Rapp Road Landfill Ecosystem Mitigation, Restoration & Enhancement Plan
City of Albany, New York**

Prepared for:

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Introduction

This report documents compliance with the construction and second year monitoring results of the test plot program according to the Albany Rapp Road Landfill Ecosystem Mitigation, Restoration & Enhancement Plan (AES 2009) and subsequent annual work plans for 2009, 2010, 2011, 2012, and 2013 (see Attachment 1 and Figures 01, 02, and 03 for test plot plans and monitoring methods).

Phase I of the restoration plan required the establishment of test plots of varying sand depths to measure and evaluate minimum sand depth and sand quantity needs for restoring desirable open native barrens grassland vegetation, the preferred Karner blue butterfly (KBB) habitat, on all current and future closed landfill cap surfaces.

For this project, the study plots and plantings have been designed to test the following variables:

1. **Substrate depth**—In the interest of economizing and balancing sand importation needs and costs with restoration outcomes, we are testing sand placement depths over a final approved cap, with 12”, 18” and 24” sandy substrate depths.
2. **Substrate chemistry**—Pine bush sand prairie and savanna/barrens substrates have a very unique chemistry that has been characterized in previous AES baseline conditions reports, and for purposes of testing, a substrate matching the pine bush substrate chemistry and one not matching the chemistry have been evaluated. Soil pH matching the pine bush community ranges from pH 4.7 – 6.3.
3. **Slope position and slope aspect**—We have learned that varying slope position (upper, middle, lower) and slope aspect (South, North, and level ridge top) require different seeding rates and species mixes because of exposure, abrupt moisture gradients, and competition from other plant species, including adventives (non-native species).
4. **Plant species composition**—In this study we have introduced a standard seeding rate and mix of the dominant grasses and key forbs of the Pitch Pine Scrub Oak Barrens community, and have applied this mix across the entire test plot (including intervening subplot borders). The seed mix includes key KBB nectar plants—*Asclepias* species, *Ceanothus americana*, *Helianthemum canadense*, *Lespedeza capitata*, *Monarda* species, *Tephrosia virginiana*, and *Vaccinium pallidum*—and the KBB host plant *Lupinus perennis*, as found in the Pine Bush ecosystems that are targeted as the final cover on the landfill.
5. **Plant biomass sampling and root development**—As measures of plant performance, biomass sampling and root development measurements were conducted in 2013. Because plantings at the time of sampling in 2012 were only two months old, it was not desirable to conduct those measurements at that time. These measurements were completed to determine precisely the preferential soil depth needs of key plant species of the Albany Pine Bush ecosystem when planted on the Albany Landfill.

Methods

Construction of the test plots occurred beginning in 2010 with placement of the first run of 24-inch depth high pH sand. The remaining placement of low pH sand and cover crop seeding for winter stabilization was conducted in late 2011. Treatment block layout and alpha-numeric coding was based on a series of seven blocks arranged over varying depths of sand (12", 18", and 24") and sand quality—high pH (B, indicating “bad” or unfavorable conditions for supporting the target native community) versus low pH (G, indicating “good” or favorable conditions for supporting the targeted pine bush ecosystem chemistry)—with 12 blocks positioned on a north-facing aspect (N), 12 on a south-facing aspect (S), and four on the landfill ridge top (R) (see test plot layout in Figure 02 in Attachment 1).

Soil preparation and seeding of the native mix using a 5-foot-wide Truax no-till drill (supplied by APBPC) was conducted from June 26 – 29, 2012 (see species mix in the table in Attachment 1). All test plot sub-plots of varying sand depths were seeded at a uniform rate using native seed collected and documented within a 50-mile radius of the Albany Pine Bush Preserve. Due to safety concerns regarding operation of equipment on sloped settings, the drill was pulled up and down (parallel to) the slopes in the steepest areas; otherwise, a perpendicular trajectory was desirable and employed elsewhere to minimize erosion.

Plot dimensions were adjusted from the original plan following storm damage, resulting in a slightly smaller size than the original approved plans (see Figure 01 in Attachment 1). Resulting rill erosion features were repaired and an approved erosion control system of dispersing swales and straw wattles, in addition to a berm at the base of the test plot “toe of slope”, was designed and installed to stabilize sand on the test plot’s steep slopes (see Figure 03 in Attachment 1). This adjustment of the test plot layout was determined to have no significant effect on the test plot program experimental evaluation.

Quadrat Sampling

Plant species composition, frequency, and cover were measured within 10, randomly placed meter square circular quadrats within each of the 28 treatment blocks. Sampling occurred during the week of August 5 – 9. Sampled data from each quadrat included an estimate of percent cover for each species rooted within each quadrat, and cover by other ground cover features including bare soil, fine and coarse litter, rock, and Bryophytes (mosses). Details of test plot layout and sampling activity are summarized and tabulated in Attachment 7.

Species Search

As a measure of diversity, a listing of vascular plant species growing in the test plot was completed by systematically walking through twelve defined sets of the subplots, grouped by slope aspect, soil

depth, and soil quality. Thus, one set included the three subplots on the south-facing slope with 12" sand depth and low pH, and the listing therefore was labeled TP-S12G. The resulting lists are presented in Attachment 10. This methodology differs from the original Timed Meander Search method, which is time-equated.

Data Summary and Statistical Analysis

Raw vegetation data from the quadrat sampling and species searches was entered into an Excel spreadsheet and QA/QC checked for entry errors and confirmation of plant species identifications for any specimens collected during the field sampling. Plant taxa were floristically analyzed using several classification criteria (Attachment 8) and raw data tabulated and analyzed (Attachment 9), using absolute and relative frequency (AF, RF; frequency measured as the number of times a species was found in each of the 10 one-meter square quadrats in each treatment block), absolute and relative cover (AF, RF; cover measured as the cumulative projected photosynthetic area of each species of plant in each of the ten one meter square quadrats in each block), and importance values (IV, the sum of RF and RC). The methods for statistical analysis are discussed in the results section.

Photo Documentation

Digital color photos were taken from a position at the west central boundary of each subplot, to represent conditions within each treatment block at the time of monitoring (Attachment 11).

Biomass Sampling

In each subplot, 3 of the sampled quadrats (quadrats nos. 3, 6, and 9) were evaluated for standing crop biomass. All plant species rooted within the sample quadrats were clipped to within 2.54 cm of the ground surface with hand clippers. Clipped native and nonnative plant species were bagged separately in large paper bags. These were then removed to the AES field office where they were immediately weighed and air-dried on ventilated drying racks to constant dry weight. A final weight of the air-dried plant biomass was computed by subtracting the tare weight of the bags. These data were entered into EXCEL and a basic summary statistical analysis was conducted to determine if quadrat plant biomass varied across slope position, substrate depth, substrate quality or slope aspect conditions in the test plots.

Root Depth Documentation

Root development was evaluated by selecting one native grass (little bluestem (*Andropogon scoparius*)) and one native forb (round headed bushclover (*Lespedeza capitata*)), both of which were broadly established across the test plots. In each test plot block, two individuals of each of these species were dug completely to preserve their entire root system. Measurements were taken of the width and depth of the plant roots, and each sample was photographed. Data were entered into

EXCEL and basic summary statistical analysis was conducted to determine if plant root growth varied across slope position, substrate depth, substrate quality or slope aspect conditions in the test plots.

Soil Sampling and Analysis

In order to assess soil quality variability across the test plot, soil samples were collected from the same quadrat hoops as the biomass samples within each subplot and combined to create a composite sample from each subplot. Soil analysis is still underway, and the results will be reported as soon as they are available.

Results

Analysis of Cover and Frequency of the Vegetation on the Test-Plots

In 2013, we identified 145 species with various covers in the 28 subplots, an increase of 39 species from the previous growing season. A descriptive analysis indicated that the plot located at the south lower slope with 24 inches depth of “good” sandy soils (pH between 4.7 and 6.3) had the highest vegetation cover. In contrast, two plots located at the south and north upper slopes with 24 inches depth of “bad” sandy soils (pH >6.3) resulted in the lowest cover (Fig. 1). Among the 11 physiognomy groups of the vegetation, in terms of cover and frequency of each type of the vegetation presence in samples at each plot, perennial grass, as well as perennial, biannual, and annual forbs were the dominants across all the plots. Tree, cryptogam, and vines were only dominant on certain plots (Fig. 1-2). Based on types of native and adventive species, covers rather than frequencies of many adventive species were higher as compared to the native plants (Fig. 3-4). Actual number of species in each plot was divergent, with the most diverse plot at the south upper slope with 18 inches depth of good soil (Fig. 5).

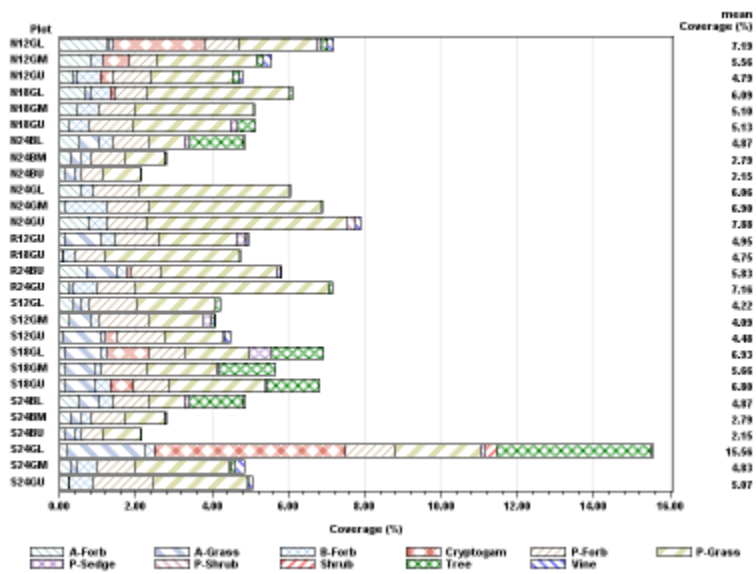


Fig. 1 Mean vegetation cover in the plots by physiognomy types

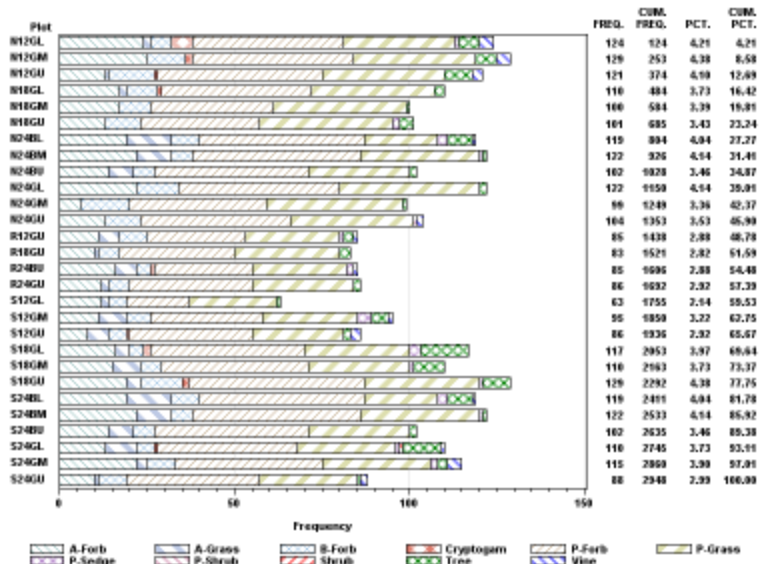


Fig. 2 Frequency of the vegetation in the plots by physiognomy types

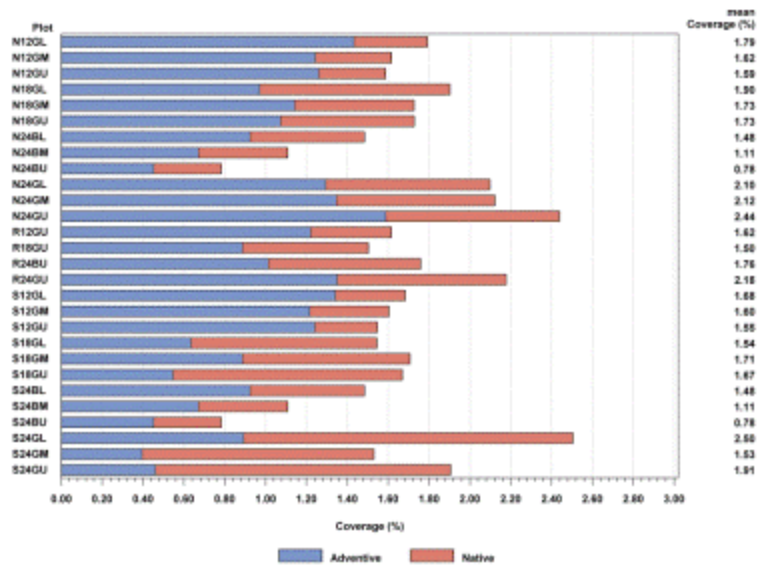


Fig. 3 Mean cover of the vegetation in the plots by types of adventive and native species

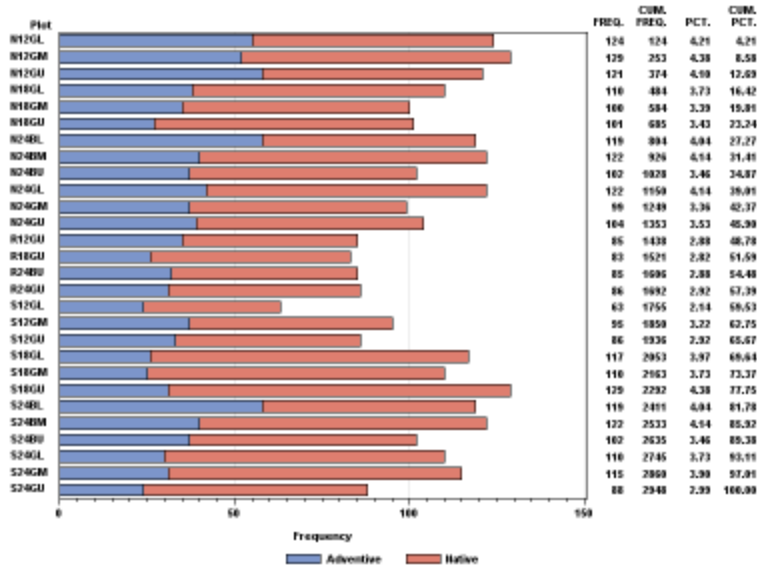


Fig. 4 Frequency of the vegetation in the plots by adventive and native types

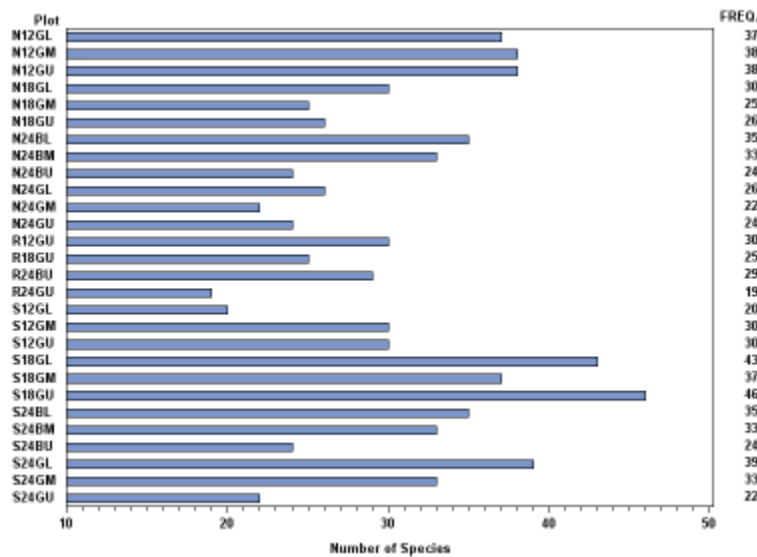


Figure 5 Number of vegetation species by plots

In order to do statistical analysis of the data on how cover and frequency of the vegetation responded to different site conditions, twenty six dominant species were identified with criterion of presence in both 2012 and 2013, sum of cover across all the plots greater than 10%, and frequency of presence greater than 5. We analyzed how the cover and frequency of each species were affected by site conditions of position (seven levels of NL, NM, NU, RU, SL, SM, and SU), soil depth (three levels of 12, 18 and 24 inches), and soil quality (two levels of B and G) with the variance analysis procedure PROC GLM in SAS. Because of the unbalanced factorial experiment design, we compared means of the cover and frequency with least-square mean (LSMEAN) method. In an initial analysis of the data, graphic diagnostics of the PROC GLM procedure suggested that assumptions of normality and homogeneity of variance associated with variance analysis were violated, and degree of violation depended on species. Therefore, the cover and frequency were

transformed by logarithm function with a base of 10 to meet the assumptions or to degrade the extent of the violation.

The variance analysis showed that cover rather than frequency of the species was affected more by the three factors. Number of species having *p*-values less than 0.05 by factors of position, depth, and quality was 19, 20, 15 for cover, and 5, 9, and 12 for frequency (Table 1). Cover of 11 species was significantly affected by all the three factors (all red dots). On the contrary, frequency for none of the species was affected by all three factors. Neither cover nor frequency of two species, *Oenothera biennis* and *Melilotus officinalis*, were affected by any one of the factors (all green dots). None of the factors had significant effects on frequency of *Populus deltoides*, *Lespedeza capitata*, *Setaria glauca*, *Lotus corniculatus*, and *Monarda punctata*. But at least one factor had effects on cover of those species. There was no one species whose frequency of presence was affected by the three factors simultaneously.

Details about how each factor affected cover and frequency of each species are in tables of overall ANOVA, fit statistics, and model ANOVA in Attachments 2 and 3. Following these tables, there were five figures for diagnosing to what degree the assumptions of variance analysis were met and checking whether certain of the data observations were outliers or not.

Species	Cover			Frequency		
	Position	Depth	Quality	Position	Depth	Quality
<i>Agrostis alba</i>	● 0.0001	● 0.002	● 0.0001	● 0.0006	● 0.9442	● 0.001
<i>Andropogon gerardii</i>	● 0.0001	● 0.0001	● 0.0001	● 0.379	● 0.181	● 0.0299
<i>Andropogon scoparius</i>	● 0.0104	● 0.0001	● 0.0001	● 0.0497	● 0.0016	● 0.1085
<i>Desmodium canadense</i>	● 0.0034	● 0.0001	● 0.0017	● 0.2208	● 0.0021	● 0.0241
<i>Digitaria sanguinalis</i>	● 0.1328	● 0.0004	● 0.5801	● 0.4308	● 0.0148	● 0.2094
<i>Echinochloa crusgalli</i>	● 0.115	● 0.0022	● 0.1501	● 0.047	● 0.0043	● 0.0964
<i>Euphorbia maculata</i>	● 0.0005	● 0.0271	● 0.0001	● 0.1073	● 0.0837	● 0.0001
<i>Festuca rubra</i>	● 0.0001	● 0.0001	● 0.0047	● 0.1589	● 0.0022	● 0.8593
<i>Lespedeza capitata</i>	● 0.0004	● 0.0001	● 0.014	● 0.1966	● 0.0892	● 0.6337
<i>Lolium multiflorum</i>	● 0.0001	● 0.0001	● 0.0001	● 0.1476	● 0.055	● 0.0383
<i>Lotus corniculatus</i>	● 0.0189	● 0.0405	● 0.7049	● 0.5467	● 0.4405	● 0.8967
<i>Lupinus perennis</i>	● 0.0021	● 0.0001	● 0.0001	● 0.1381	● 0.0001	● 0.2034
<i>Medicago lupulina</i>	● 0.06	● 0.0008	● 0.0001	● 0.4632	● 0.0189	● 0.0076
<i>Melilotus officinalis</i>	● 0.0917	● 0.0707	● 0.0766	● 0.4103	● 0.292	● 0.181
<i>Monarda punctata</i>	● 0.3878	● 0.0004	● 0.5372	● 0.7553	● 0.5665	● 0.3649
<i>Oenothera biennis</i>	● 0.0611	● 0.0509	● 0.0836	● 0.108	● 0.2095	● 0.3218
<i>Populus deltoides</i>	● 0.0001	● 0.0402	● 0.5664	● 0.4294	● 0.6706	● 0.9065
<i>Rudbeckia hirta</i>	● 0.0001	● 0.0869	● 0.0001	● 0.0014	● 0.8522	● 0.0217
<i>Setaria faberi</i>	● 0.0106	● 0.6089	● 0.0001	● 0.7627	● 0.7321	● 0.0006
<i>Setaria glauca</i>	● 0.0012	● 0.0243	● 0.7669	● 0.1288	● 0.2228	● 0.6564
<i>Sorghastrum nutans</i>	● 0.0001	● 0.0001	● 0.0791	● 0.0746	● 0.0001	● 0.0098
<i>Taraxacum officinale</i>	● 0.0476	● 0.5428	● 0.0103	● 0.1004	● 0.5234	● 0.0132
<i>Trifolium arvense</i>	● 0.0001	● 0.0001	● 0.5028	● 0.0448	● 0.3419	● 0.2908
<i>Trifolium hybridum</i>	● 0.0001	● 0.0001	● 0.0022	● 0.2943	● 0.0001	● 0.0028
<i>Trifolium repens</i>	● 0.0001	● 0.0001	● 0.0001	● 0.2952	● 0.2092	● 0.0001
Number of species with the significance	19	20	15	5	9	12

Table 1 *p*-values of the type III SS by the three factors from cover and frequency variance analysis. Red dots indicated significant effects of the factors on the cover and frequency with a significance level of $\alpha = 0.05$.

For the species with red dots (Table 1), post-hoc analysis with Tukey-kramer method revealed how the mean of cover or frequency differed by pairwise levels of each factors (e.g. 12 inches vs. 24 inches). For example, for one of the important seeded native legumes, *Desmodium canadense*, mean of its cover in the plot at the south upper slope ($LSMEAN_{SU}=1.52$) was significantly different from those at the north middle slope ($LSMEAN_{NM}=0.14$, $p_{SU \text{ vs. } NM}=0.0024$, $df_1=7$, and $df_2=270$), the ridge top ($LSMEAN_{RU}=0.23$, $p_{SU \text{ vs. } RU}=0.0123$, $df_1=7$, and $df_2=270$), and the south lower slope ($LSMEAN_{SL}=0.18$, $p_{SU \text{ vs. } SL}=0.006$, $df_1=7$, and $df_2=270$). Among the three soil depths of 12, 18 and 24 inches, cover of *Desmodium canadense* at plots with 12 inches soil depth ($LSMEAN_{12}=0$) significantly differed with those at plots with soil depth of 18 inches ($LSMEAN_{18}=0.918$, $p_{12 \text{ vs. } 18}<0.0001$, $df_1=3$, and $df_2=270$) and 24 inches ($LSMEAN_{24}=0.705$, $p_{12 \text{ vs. } 24}<0.0003$, $df_1=3$, and $df_2=270$), but between 18 and 24 inches depths, the covers were not significantly different ($p_{18 \text{ vs. } 24}=0.7388$, $df_1=3$, and $df_2=270$). Between the two levels of soil quality, covers of *Desmodium canadense* were significantly different, with cover in good (low pH) soils higher ($LSMEAN_G=0.849$) than the bad (high pH) soil conditions ($LSMEAN_B=0.118$, $p_{G \text{ vs. } B}=0.0017$, $df_1=2$, and $df_2=270$). We can interpret how each level of the three factors affected the cover and frequency of each species by the same methods as we did for *Desmodium canadense* on the bases of post-hoc pairwise comparison tables in Attachments 2 and 3.

Since we are mainly concerned about an appropriate soil depth for the land reclamation/restoration, we also summarized p -values of the pairwise comparison of cover and frequency by the three levels of depth only (Table 2). It indicated that mean covers of 62% of the species were not different between 18 and 24 inches soil depths. But the mean covers of around 58% of the species at depth 12 inches apparently differed from those at 18 and 24 inches. Frequency of the dominant species was less affected by the three factors as compared to cover (Table 2). On average, frequency of about 20% of the species responded to site conditions characterized by either one or two of the three factors. However, in the pairwise comparisons of mean cover and frequency by three levels of depth (Table 2), there was exclusively one species, native perennial forb *Lupinus perennis*, whose both mean cover and mean frequency were significantly affected by the three factors.

Species	Cover			Frequency		
	12 vs. 18	12 vs. 24	18 vs. 24	12 vs. 18	12 vs. 24	18 vs. 24
Agrostis alba	● 0.0062	● 0.0062	● 1.0000	● 0.9897	● 0.9394	● 0.9781
Andropogon gerardii	● 0.0002	● 0.0001	● 0.0087	● 0.5767	● 0.1564	● 0.6326
Andropogon scoparius	● 0.0001	● 0.0001	● 0.0180	● 0.0095	● 0.0020	● 0.7614
Desmodium canadense	● 0.0001	● 0.0003	● 0.7388	● 0.0022	● 0.0160	● 0.6413
Digitaria sanguinalis	● 0.0183	● 0.0003	● 0.4656	● 0.1372	● 0.0118	● 0.4504
Echinochloa crusgalli	● 0.0089	● 0.0054	● 0.9857	● 0.0191	● 0.0054	● 0.8299
Euphorbia maculata	● 0.1829	● 0.0227	● 0.6467	● 0.9028	● 0.0893	● 0.1914
Festuca rubra	● 0.3816	● 0.0001	● 0.0001	● 0.0103	● 0.8495	● 0.0031
Lespedeza capitata	● 0.0001	● 0.0001	● 0.2288	● 0.0809	● 0.7481	● 0.2827
Lolium multiflorum	● 0.073	● 0.0001	● 0.0879	● 0.0824	● 0.0920	● 0.9981
Lotus corniculatus	● 0.0345	● 0.6809	● 0.2204	● 0.4111	● 0.8515	● 0.7307
Lupinus perennis	● 0.0441	● 0.0001	● 0.0001	● 0.0110	● 0.0001	● 0.0445
Medicago lupulina	● 0.9949	● 0.0034	● 0.0024	● 0.9260	● 0.0245	● 0.0524
Melilotus officinalis	● 0.0795	● 0.9268	● 0.1744	● 0.2820	● 0.8998	● 0.5058
Monarda punctata	● 0.6854	● 0.0005	● 0.0083	● 0.9617	● 0.5606	● 0.7221
Oenothera biennis	● 0.9963	● 0.0952	● 0.0792	● 0.5370	● 0.7339	● 0.1858
Populus deltoides	● 0.0312	● 0.5364	● 0.3048	● 0.7201	● 0.7159	● 1.0000
Rudbeckia hirta	● 0.7439	● 0.0761	● 0.3176	● 0.8739	● 0.8781	● 1.0000
Setaria faberi	● 0.6638	● 1.0000	● 0.6638	● 0.7723	● 1.0000	● 0.7723
Setaria glauca	● 0.4076	● 0.31	● 0.0177	● 0.9922	● 0.3131	● 0.2624
Sorghastrum nutans	● 0.0001	● 0.0003	● 0.0001	● 0.7224	● 0.0003	● 0.0001
Taraxacum officinale	● 0.6201	● 0.9986	● 0.5887	● 0.5726	● 0.9991	● 0.5965
Trifolium arvense	● 0.0012	● 0.0002	● 0.8862	● 0.7258	● 0.3100	● 0.7433
Trifolium hybridum	● 0.0417	● 0.0001	● 0.0001	● 0.0738	● 0.0138	● 0.0001
Trifolium repens	● 0.0001	● 0.7496	● 0.0001	● 0.6761	● 0.5897	● 0.1831
Number of speices with the significance	14	16	10	5	8	4

Table 2 *p*-values of post-hoc pairwise comparisons of mean cover and frequency by three levels of depths. Red dots indicated significant difference of the paired-means of the cover with a significance level of $\alpha = 0.05$.

The mean cover and frequency were not only affected by the site conditions, but also differed by types of native and adventive species (Fig. 6-9). Cover and frequency of native species was the lowest at plots with 12 inches depth soil but the highest for adventive species. For native species, the covers and frequencies at 18 and 24 inches were very similar (3.44 vs. 3.23, and 4.38 vs. 4.10) (Figs. 6 & 8), although at 18 inches cover of adventive species continues to exceed slightly that of native species (3.63 vs. 3.44) (Fig. 6). Even though cover and frequency at each depth varied slightly by the positions, the cover at 12 inches was the lowest regardless of the positions for native species, and the highest except position of ridge top for adventive species (Fig. 7). For frequency, we did see similar patterns except for cover at ridge top and frequency at ridge top and the south lower plots (Fig. 9).

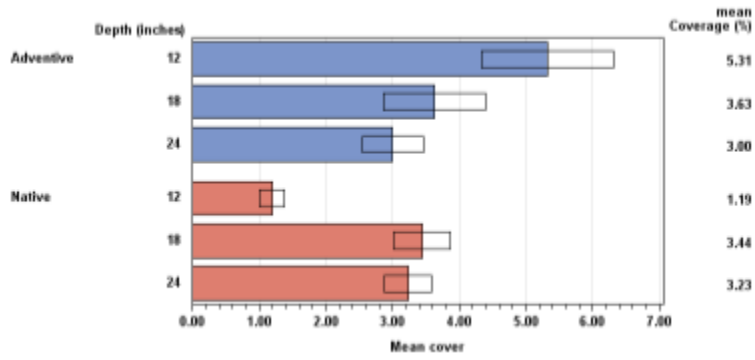


Fig. 6 Mean cover of the 26 dominant adventive and native species by three levels of soil depth.

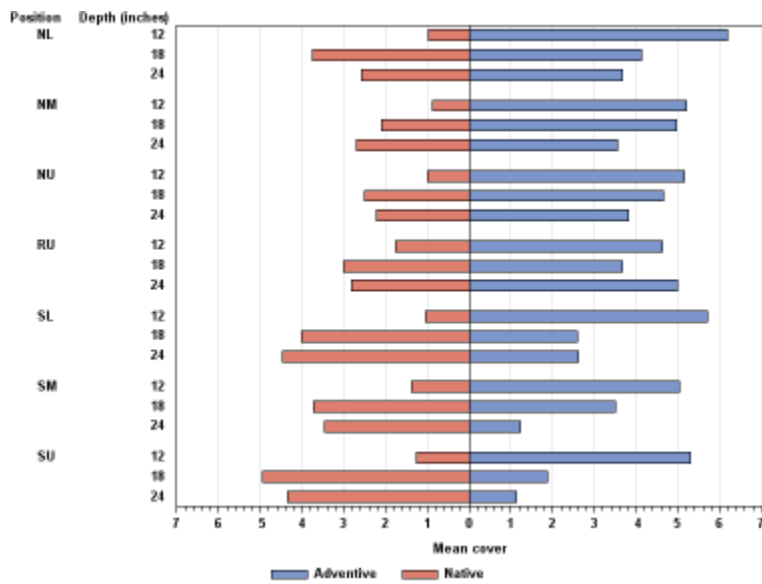


Fig. 7 Mean cover of the 26 dominant adventive and native species by three levels of soil depth and seven levels of position.

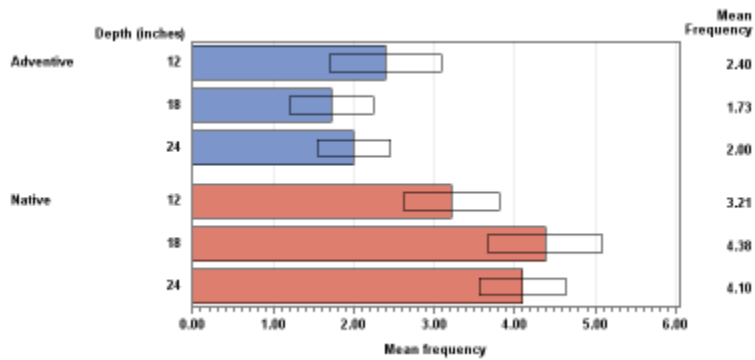


Fig. 8 Mean frequency of the 26 dominant adventive and native species by three levels of soil depth.

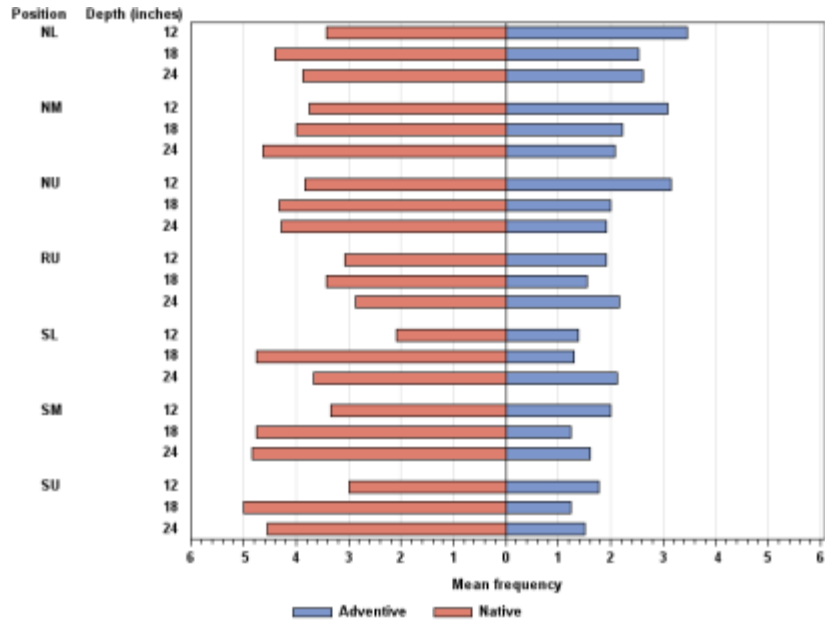


Fig. 9 Mean frequency of the 26 dominant adventive and native species by three levels of soil depth and seven levels of position.

Analysis of Biomass on the Test-Plots

Effects of three factors of position, soil depth, and soil quality on biomass of native and adventive plants were assessed at 28 subplots established on the site. The data were analyzed with PROC GLM procedure in SAS 9.3, a professional statistical software package developed by SAS Institute Inc. (<http://www.sas.com/>). The factor of position has seven levels of North Lower (NL), North Middle (NM), North Upper (NU), Ridge Top (RU), South Lower (SL), South Middle (SM), and South Upper (SU); soil depth has three levels of 12 inches, 18 inches, and 24 inches; and soil quality was characterized by PH, with two levels of high (bad quality (B)), and low PH (good quality (G)). The analysis model was designed to quantify main effects of the three factors and interaction effects of position vs. depth and position vs. soil quality. Interaction of soil quality vs. depth was not analyzed because of the lack of the other two soil depths (12 and 18 inches) on the bad soil condition. In an initial analysis of the data, graphic diagnostics of the PROC GLM procedure suggested that assumptions of normality and homogeneity of variance associated with variance analysis were violated. Therefore, in order to meet the assumptions, the biomass was transformed by logarithm function (log10). A number of tables and graphical outputs from the final run of the procedure was selected and formatted in Attachments 4 and 5.

The analysis (Type III SS) showed that, for native plants, means of the biomass significantly differed by the factor of soil depth ($F= 7.65, p=0.0012, df_1=2, \text{ and } df_2=56$). Meanwhile, both of position and soil quality did not instigate significant main effects on the mean of the biomass, but effect of their interactions was significant ($F= 3.38, p=0.0065, df_1=6, \text{ and } df_2=56$). The analysis also indicated that effect of depth was independent of position ($F= 1.66, p=0.1002, df_1=12, \text{ and } df_2=56$).

Among the three soil depths, Post-hoc analysis with Tukey-kramer method indicated that mean of biomass at 12 inches depth (232.2 g with a 95% confidence limits of 209.7 and 257.2 g) was

significantly lower than those at 18 and 24 inches depth (285.8 g with a 95% confidence limits of 258.0 and 316.2 g, and 280.5g with a 95% confidence limits of 264.6 and 297.9 g), but there was not a difference of the mean biomass at 18 and 24 inches ($p_{12 \text{ vs. } 18} = 0.0024$, $p_{12 \text{ vs. } 24} = 0.0059$, and $p_{18 \text{ vs. } 24} = 0.95$).

For the 14 experimental conditions defined by combination of the two factors of position and soil quality, the Post-hoc analysis revealed that only at two conditions of SL-G vs. NU-G and SL-G vs. NM-G, the biomass were significantly different ($p_{\text{SL-G vs. NU-G}} = 0.0246$, and $p_{\text{SL-G vs. NM-G}} = 0.0188$), indicating that at the good soil quality sites, biomass at south lower plots were significantly higher than those at north upper and middle plots. The mean is 343.6 g (95% confidence limits of 302.0 and 389.0 g) at SL-G plots, 244.9 g (95% confidence limits of 213.8 and 275.4 g) at NU-G plots, and 242.7 g (95% confidence limits of 213.8 and 275.4 g) at NM-G plots.

As compared to native plants, for the adventive plants, the analysis (Type III SS) indicated that depth was the exclusive factor having impacts on the biomass ($F = 4.45$, $p = 0.06$, $df_1 = 2$, and $df_2 = 56$), and moreover, the impact was independent on other factors. Post-hoc Tukey-kramer analysis indicated that mean of the biomass at 12 inches depth (397.2 g with a 95% confidence limits of 339.6 and 464.5 g) was significantly higher than that 24 inches depth (303.4g with a 95% confidence limits of 277.3 and 331.9 g), but not at 18 inches (344.3 g with a 95% confidence limits of 294.4 and 402.7 g), and meanwhile, means of the biomass at 18 and 24 inches were not significantly different either ($p_{12 \text{ vs. } 18} = 0.2583$, $p_{12 \text{ vs. } 24} = 0.0116$, and $p_{18 \text{ vs. } 24} = 0.3517$).

A Preliminary Analysis of Root Growth in the Test-Plots

To begin to understand patterns of root growth on the GAL, rooting architecture was measured (width and depth) for a single forb and a single grass species with high frequency distributions in the test plots. The selection of two growth habits allowed examination of a plant featuring a tap root with secondary rootlets (the forb), and a plant with fibrous roots (the grass). Selected species included the forb round-headed bush clover (*Lespedeza capitata*) and the grass little bluestem (*Andropogon scoparius*). Individual plants were hand-dug from the sand substrates, to avoid significant damage to the roots and to the surrounding vegetation. Once extracted, the plant and its roots were laid on a white plastic sheet and the root system fanned-out to approximate the original distribution in the soil. Measurements were made at the point of greatest extent of the width and of the depth of each sampled plant, and each sample was photographed at the time of measurements (a photo of a typical forb and grass specimen are pictured here). Average root depth and width was calculated for north, south, and ridge top subplots, and plant root width and depth measurements were multiplied to provide an estimate of two-dimensional root area (Attachment 6).

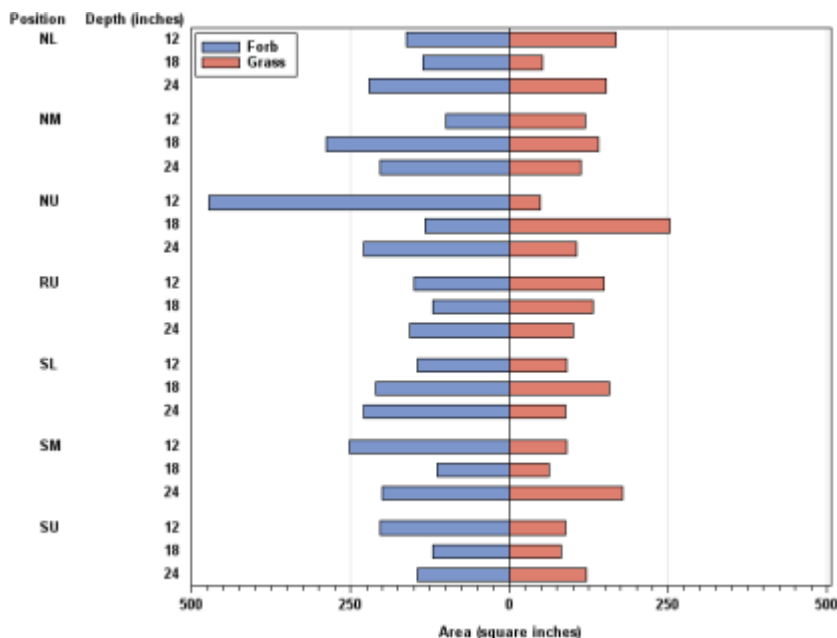


Fig. 10 Areas of root growth as measured in square inches comparing one grass species (*Andropogon scoparius*) and one forb species (*Lespedeza capitata*) by three levels of soil depth and seven levels of position.

Discussion

Trends are developing after two years of sampling in the test plots that are related to sand depth, soil quality, and slope position and aspect. These trends are generally more significant in the category of cover versus frequency and show that, although individual plant sensitivities to depth, soil quality, and slope position and aspect are variable, depth and soil quality will be an important consideration in the success of the landfill cap restoration, particularly in the ability of natives to establish and out-compete weedy species. This is particularly true for key KBB species such as lupine, which the pairwise comparisons of mean cover and frequency by three levels of depth, shows as the only species whose both mean cover and mean frequency were significantly affected by the three factors.

The following summary of trends is provided.

1. The data suggests that ten of twenty-six dominant species did not respond differently to substrate quality differences among the plots. Species in this category primarily included weedy species (e.g. crabgrass (*Digitaria sanguinalis*), barnyard grass (*Echinochloa crusgali*), birds-foot trefoil (*Lotus corniculatus*), sweet clover (*Melilotus officinalis*), foxtail grass (*Setaria glauca*), and red clover (*Trifolium arvense*). Some native species such as Indian grass (*Sorghastrum nutans*), cottonwood (*Populus deltoides*), and dotted horsemint (*Monarda punctata*) also were found to grow without significant differences in cover and frequency with indifference to the quality of the substrate.
2. The dominance of desirable and planted pine bush ecosystem grasses and forbs in general appear to be higher in deeper and better quality (low pH) soils, and cover and frequency values

have increased over the measured values in 2012. This includes species such as big and little bluestem (*Andropogon gerardii* and *A. scoparius*), Canada tick trefoil, and round headed bush clover (*Lespedeza capitata*).

3. The frequency of these same desirable native species, based on early-establishment growth response in the droughty 2012 growing season, was suggested to be highest in blocks on slopes with northern aspect and at mid and lower slope positions, and poorest in upper and ridge top positions. This early trend, which was speculated to be a likely early response to exposure from drought condition effects on seedling establishment and early growth, (which would be expected to be most pronounced in upper slopes, especially southern aspect slope positions), appears to be less influential the 2013 data, which suggests the desirable native plants are well established across both slope aspects and all slope positions. Now, soil depths influence on competing vegetation, particularly clovers appears to be more strongly correlated with reduced cover and frequency and establishment and successful growth of the desirable native pine bush plant species.
4. In 2012 and again in 2013, the frequency of lupine seedlings and advanced growth of mature flowering plants was significantly better in 18" and 24" deep sand depths in all slope positions.
5. Weeds, such as lambsquarters (*Chenopodium album*), foxtail grasses (*Setaria* spp), barley (*Hordeum vulgare*), and crabgrass (*Digitaria sanguinalis*), had comparable frequencies in all slope positions and soil depths.
6. Some planted Pine Bush species such as spotted horsemint (*Monarda punctata*) had highest importance values across all slope positions, and showed no soil depth performance patterns.
7. Some species such as desirable planted Indian grass (*Sorghastrum nutans*) were established with highest frequencies in blocks on northern aspect slopes with no early soil depth performance differences.

Plant Biomass Sampling and Root Development

The 2013, measurements of plant productivity and the depth and architecture of plant species roots suggest the following results and trends.

1. North slope test plots in most plot conditions had slightly higher average biomass levels between 260-370 grams/meter square. South slope biomass levels ranged from 242-380 grams per meter square. There are no statistical differences between the mean biomass quantities in any of the plots, as the variances overlap across all plots. This reflects the fact that some areas had a prevalence of bare patches and sparse vegetation while other areas had dense continuous cover of native vegetation. (Figures 1 and 2).
2. We would expect the variances to start narrowing over time as a continuous cover of vegetation establishes across the plots.
3. We would also expect some continued differentiation between the soil depths and good (low pH) vs bad (high pH) soils to occur over time.
4. Root development measurements found no significant differences between specimens of the native grass Little Bluestem (*Andropogon scoparius*) and the native forb round headed bushclover (*Lespedeza capitata*) sampled across the test plots. A simple computation of

of rooting area (width x depth) was further evaluated with the basic summary statistical analysis found no significant differences in plant root growth across slope position, substrate depth, substrate quality or slope aspect conditions in the test plots.

Conclusion

Summer 2013 was considered a wetter than normal growing season. In 2012, drought plagued the Albany region and moderate to severe drought afflicted 63% of the US. In addition, test plot plantings in 2012 occurred at the latest possible date typically required for successful plantings of desirable native species, particularly on exposed landfill surfaces. Overall, the successful establishment of the plantings and their survival during the 2012/2013 winter is demonstrated by the relatively high cover and frequency of seeded native plant species as measured during the 2013 growing season.

The high level of plant coverage in the test plots successfully controlled erosion in all but a few locations, where minor erosion was observed. Repairs in 2012 of eroded test plot locations (which occurred prior to the late June 2012 seeding) were found to be stable in 2013.

The sampling in 2013 continues to confirm the 2012 evaluation trends that suggested the desirable native plant communities will establish best in deeper soils in all slope positions appears to be correct. In 2013, while confirmed with plant composition data, such trends in the growth by the desirable native species were visually conspicuous in the test plots. At this time, it appears that most desirable native species will do best in 24" deep, low PH soils. And again, in 2013, it appears clearly that a soil depth of 12" and a transitional depth of 18" inches is not likely to be as successful for the growth and achieving the desirable Pine Bush vegetation, as the weedy highly competitive invasive species such as white clover (*Trifolium pretense*, *T. arvense*) and birds-foot trefoil (*Lotus corniculatus*), and cottonwood (*Populus deltoids*), are favored in these shallower soils.

Lower slope areas show an increased importance value (cover and frequency) of nonnative *Phragmites* and cottonwood seedlings in the test plots across all test plot conditions. In the southern slopes, an erosion gully has formed in a seepage area, and this alone accounted for a large percentage of the cottonwood and *Phragmites* invasion in several of the test plots on this slope. However, even lower test plot blocks removed from this conspicuous erosion gully and seepage showed similar trends favoring these and other weedy and invasive plant species.

Based on the 2012 and 2013 test plot analyses, a minimum of 24 inches of Pine Bush sand is recommended as the final topdressing treatment over the entire mid to upper slopes of the landfill, as a part of site closure. It appears at this time that, from midslope locations to the toe of the landfill, sand depths will need to be deeper than 24 inches, to ensure that seepage does not emerge at the surface or at minimum be accessible to plant root growth favoring colonization by *Phragmites*.

Attachment 1. Approved Test Plot Plan Layout & Monitoring Methods, as previously presented in Attachment E of the 2010 Phase I Annual Work Plan.

Attachment E. Test Plot Program
Albany Rapp Road Landfill
Ecosystem Mitigation, Restoration & Enhancement Plan
City of Albany, New York

Introduction

Phase I of the Albany Rapp Road Landfill Ecosystem Mitigation, Restoration & Enhancement Plan (AES 2009) required the establishment of test plots of varying sand depths to measure and evaluate minimum sand depth and sand quantity needs for restoring desirable open native barrens grassland vegetation, the preferred Karner blue butterfly habitat, on all current and future closed landfill cap surfaces. A set of 4, 1-5 acre test plots have been designed collaboratively with the project restoration team and have been installed on the level and side slope surfaces of the older Greater Albany Landfill (GAL) cap. Beginning in 2012, information will be gathered from the test plots over a minimum 5-7 year period and will provide a measure of germination and early establishment success of selected native grasses and forbs characteristic of the open grassland component of the Pitch Pine-Scrub Oak Barrens community important to the goals of the restoration for landfill cap surfaces. Results gathered from the test plots will be used during Phase IV (Years 5 & 6) to re-vegetate the GAL cap and in Phase V (Years 7-10) to re-vegetate the Eastern Expansion landfill cap. Other information gathered from the test plots will help the restoration team to understand the optimum site prep, seeding and mulching strategies, and short- and long-term management strategies necessary to ensure successful development and maturation of the plantings and site stability on the highly exposed surfaces of the landfill cap. This information will also help to determine the minimum sand quantities that the City will need to purchase and inform strategies for reducing importation, trucking, delivery, and grading costs.

Previous efforts by others in 2002 to establish and monitor test plots of native plantings on the landfill cap provide important information to help ensure the success of the current test plot program.

1. Limited availability of locally sourced pine barrens native seed from within the desired 50-mile geographic radius will require careful planning to ensure adequate seed quantities of the desired species and sufficient seed quality are obtained either commercially from reputable native seed producers or by authorized hand collection efforts within the Preserve or from accessible properties within the approved geographic range. It is anticipated that a combination of these and other seed collection and propagation strategies will be necessary to ensure an adequate seed supply for the landfill restoration work.
2. Climatic influences such as prolonged drought versus cool wet periods can influence competitive effects from non-native cool season grasses and weedy forbs and will require close monitoring and timely, effective management responses.
3. Sufficient test plot size is necessary to adequately measure test plot results.
4. Placement of test plots on representative slope and aspect conditions will be important to measure response to site variability.
5. Test plots must be clearly marked and documented with GPS to relocate boundaries over the life and monitoring period of the test plots.

Methods for designing, installing, managing, monitoring, and reporting test plot results are provided below. A schematic of the test plot layout as revised and approved in 2011 is attached. Due to two heavy tropical storm events in 2011 that severely eroded newly placed capping sands, the test plot configuration was adjusted to shorten the slope distance and to minimize erosion risk. Additional slope stabilization features (straw wattles and dispersing swales) were designed and installed (see attached detail drawings) to ensure sand stabilization during early vegetation establishment.

Test Plot Methods & Design

A. Test Plot Goals

The test plots will serve to address the following project goals:

1. Determine the minimum sand depth, sand quality, and sand quantity needs for restoring desirable Pitch Pine Scrub Oak Barrens vegetation—grasses, forbs, trees, and shrubs—to optimize Karner blue butterfly habitat on all current and future closed landfill cap surfaces.
2. Determine the optimal site prep, seeding rates, erosion control strategies, and short- and long-term management strategies needed to ensure successful development and maturation of the plantings and site stability on the highly exposed surfaces of the landfill cap.
3. Determine the minimum sand quantities that the City will need to purchase and determine strategies for bringing the greatest cost efficiency to acquiring, transporting, stockpiling, and grading imported sands to allow maximizing investment in species diversity.
4. Determine the range of sand quality available and the amendment requirements needed to achieve the permitted sand specifications and/or the targeted vegetation composition and cover.
5. Determine the suitability of the highest quality unamended sand available for use in restoring desired barrens vegetation on the landfill cap.

B. Test Plot Questions

We intend to use the test plots to address the following questions:

1. At what minimum depth will vegetation establish with the most diversity?
2. What minimum sand quantities are required to stabilize steep side slopes of the landfill cap?
3. What minimum sand quality requirements (pH, organic matter, nutrient levels, and CEC) are required to establish target vegetation?
4. What soil amendments will be needed to achieve minimum sand specifications?
5. Will the highest quality unamended sands available be suitable for achieving the target vegetation composition and cover? Or will it favor weedy growth including Phragmites?
6. What erosion control methods are needed to stabilize steep side slopes of the landfill cap?
7. What weed control strategies will be needed to reduce competition from cool season grasses, common reed, and weedy forbs to achieve the highest quality vegetation cover?
8. What species provide rapid soils stabilizing cover, greatest habitat benefits, and are most cost effective in achieving the desired barrens vegetation goals.

C. Testable Hypotheses

1. The shallowest sand depth will produce the lowest diversity and cover by each species in the seed mix.
2. The shallowest sand depth will produce the least root and above ground biomass.

3. The shallowest sand depth will stabilize the side slopes less quickly as a result of poor root and above ground biomass production.
4. The shallowest sand depth and higher pH un-amended sands will require the greatest weed control inputs.
5. The un-amended higher pH sands will favor weedy growth and Phragmites invasion.

D. Test Plot Design & Installation

The test plot layout has been modified from the original plan presented in the 2010 and 2011 Work Plan, as explained in Attachment E of the 2011 Compliance Report. The modifications made to the test plots are depicted in the attached graphics. Seeding of native seed mixes will occur in spring 2012 into the late 2011 cover crop and mulch application. The test plot design will continue to consist of the following parameters:

1. Three test plots located to represent 1) level conditions on top of the GAL cap, 2) steep side slopes with a southerly aspect, and 3) steep side slopes with a northerly aspect.
2. Each test plot will be divided into 4 subplots, each containing a different sand depth (12", 18", 24", and 24" un-amended), distributed as consistently as possible in each subplot via grading.
3. Each test plot will be permanently marked at the outside corners with permanently labeled metal t-posts and located with GPS to ensure accurate relocation of each test plot and subplot.
4. Test plot borders will be seeded with the same native seed mix and allowed to grow as adjacent test plots. Mowing of borders running parallel with the slopes will not be conducted due to erosion risk caused by operating machinery in sands on steep slopes. However, periodic mowing to control weeds will be conducted and erosion risk will be minimized by operating machinery perpendicular to slopes across adjacent test plots.
5. To minimize herbivory damage to plantings, a solar-powered electric fence suitable for excluding deer will be constructed around the entire test plot area. During winter months when the electrical fencing may be less effective, measures will be taken to protect woody plantings from browse damage. This may require the use of tree tubes suitable for shrubs.
6. Each subplot has been prepared for seeding by removing weedy growth and applying approved clean sand substrates per test plot design and grading to specified depths. (See plan specifications: Section 31 13 14 Herbaceous Species Removal; Section 32 91 14 Soil Chemistry Parameters; and applicable guidelines related to grading from Section 31 23 00 Excavation and Fill).
7. Each subplot has been seeded with a cover crop and mulched with clean straw. Native seed mixes will be installed in spring 2012. Locally grown trees and shrubs from native seed collections and approved commercial containerized stock will be installed following establishment of soil stabilizing ground cover (anticipated installation in 2013). Native seed will be applied at approved seeding rates designed to achieve optimum vegetation establishment and soil stability. Species lists were developed to be representative of the PP-SOB community, and lists were refined and adjusted during a collaborative review and approval process with the IHMT for the 2010 and 2011 work plans, and based on 2010 seed collection results. (See approved native species lists and seeding rates attached, and guidelines in plan specifications Sections 32 92 19 Seeding, 32 93 43 Trees and Shrubs).
8. Seed installation and mulching methods were modified from the 2010 and 2011 work plans to accelerate slope stabilization following a series of slope failures during heavy rains in 2010 and tropical storm events in 2011 (see 2011 Compliance Report Attachment E for details of the seeding and mulching strategy).

9. Permanent photo point locations will be established to document test plot conditions at the time of installation and at the time of all subsequent monitoring efforts.
10. Electric fencing will be installed around the test plots to discourage deer herbivory.
11. Woody plants will be installed in the test plots in 2013, or when nursery-grown plants are ready. A planting plan for woody plants will be developed as part of the 2014 annual work plan.

E. Test Plot Management & Weed Control

Test plots will be managed as needed by selective mowing to help control weedy growth. This mowing may include the outside test plot perimeter. Mowing of interior 10' subplot borders is not recommended due to risk of erosion. As a result, the interior subplot borders were seeded with the same native species mix applied to the entire test plot surface. Positions of subplot corners were permanently located by GPS to facilitate relocation for monitoring purposes. Weed control within the test plots and within the borders will utilize chemical applications as specified and approved in the project Integrated Pest and Invasive Species Management Plan. (See specifications and guidelines in the IPM Plan prepared by AES June 2009). Other plot management will include appropriate periodic mowing during early vegetation establishment. If approved, fire may be used to invigorate native growth and discourage competition from cool season grasses and other invasive species.

F. Test Plot Monitoring & Reporting

Test plots will be monitored during the growing season in late spring (late May/early June) and in late summer (late August/early September). Monitoring methods will employ at minimum the following techniques and analysis:

Quadrat sampling—ground cover vegetation will be sampled from meter square quadrats placed randomly or along a permanent study transect established within each subplot. Sampled data from each quadrat will include an estimate of percent cover for each species rooted within each quadrat, and cover by other ground cover features including bare soil, fine and coarse litter, and Bryophytes. A summary analysis of collected data will include presence, frequency, cover, relative frequency, relative cover, and importance values for each species and ground cover feature.

Timed Meander Search—a time equated measure of species diversity within each test plot will be sampled using the Timed Meander Search (TMS) method (Goff et al. 1982). This method requires walking each test plot thoroughly, recording each new species encountered during one-minute intervals until no new species are encountered. Annual TMS data will be graphed as the number of species encountered per minute and compared to graphs in subsequent years to monitor species diversity trends.

Photo Documentation—photographs will be taken at the time of each monitoring visit from the transect end points and other permanent photo point locations. Photos will be taken with digital cameras and photo files will be labeled and archived according to site, date, and location. Photos will accompany the monitoring data in the annual reports to provide a visual depiction of test plot success.

Biomass Sampling—above ground biomass will be sampled from random quadrats within each subplot. All vegetation will be clipped at ground level and separated into paper grocery bags by native versus non-native species for subsequent drying. All bags will be labeled clearly and weighed at the time of sampling. All bags will be stored in an appropriate drying room with proper ventilation to ensure optimum drying conditions. All bags will be weighed subsequently at regular intervals during the

drying process until weights stabilize. Weights will be tabulated for inclusion in the annual monitoring report.

Root Depth Documentation—in each test plot, a representative number of individual plant species will be excavated to confirm rooting architecture and depths. This disruptive sampling technique will be very limited in scope and will be limited to sampling plot margins. The primary purpose will be to understand how the plant root architecture responds to different substrate depths.

Soil Sampling & Analysis—depending upon the need for soil amendments to achieve sand quality specifications, we will annually sample and analyze amended soils from each test plot to compare to soil specification parameters.

Reporting & Management Recommendations—the early spring sampling period will allow detection of early flowering species and will assess weed management needs and at the start of the growing season. This fall monitoring assessment will document management success and provide recommendations for late season management.

G. Reporting Final Results, Recommendations & Finalizing Topsoil Specifications & Costs

During the test plot period, interim and final reports will be prepared and submitted to the Steering Committee for review. The report will contain a summary and analysis of the data collected over the test plot period, and recommendations for final topdressing of the balance of the landfill with Pine Bush sand to achieve the ecological, economic, and permitted outcomes. The report will also contain the final refined topsoil and seeding specifications for successfully restoring the remainder of the landfill cap based on the outcomes of the test plot study.

H. Schedule & Milestones

Deviations from the original test plot construction schedule and layout are explained in the 2011 Compliance Report.

Final Design and Approval of Test Plot Program	February 2010
Partial Construction, Cover Crop Seeding, Mulching	Fall 2010
Final Construction, Cover Crop Seeding, Mulching	Fall 2011
Native Seeding	Spring 2012
Woody plant (trees/shrubs) installation	Spring 2013
Monitoring and Maintenance of Test Plots	Five to seven years starting spring 2012
Test Plot Results and Recommendations	2017-2019

Attachment E. Proposed Test Plot Seed Mix

A single pitch pine-scrub oak barrens native seed mix will be applied consistently on the top and side slopes of the test plot area at a rate of 10-15 lbs/ac of grasses and 2-4 lbs/ac of forbs, or a total of 12-19 lbs/ac native seed. This seeding rate achieves a ratio of 65% grasses and 35% forbs and 800 seeds per sq/yd. A cover crop will be applied at a rate of 100 lbs/ac necessary to stabilize steep sandy slopes.

Species and quantities are estimated pending confirmation of commercial availability and quantities of hand collected seed in 2009 and early 2010. Lupine seed is now included on the list following issuance of the USFWS Biological Opinion with the USACOE permit process.

Estimated seeds per oz
Pounds available
Ounces available
Trace available
Rare in the Pine Bush
Not native to Pine Bush

Test Plot List Top of Slope 1 acre Total seeds **3,872,000** Ratio =65:35
Dry Prairie / Sand Flat **800 seeds per sqyd**

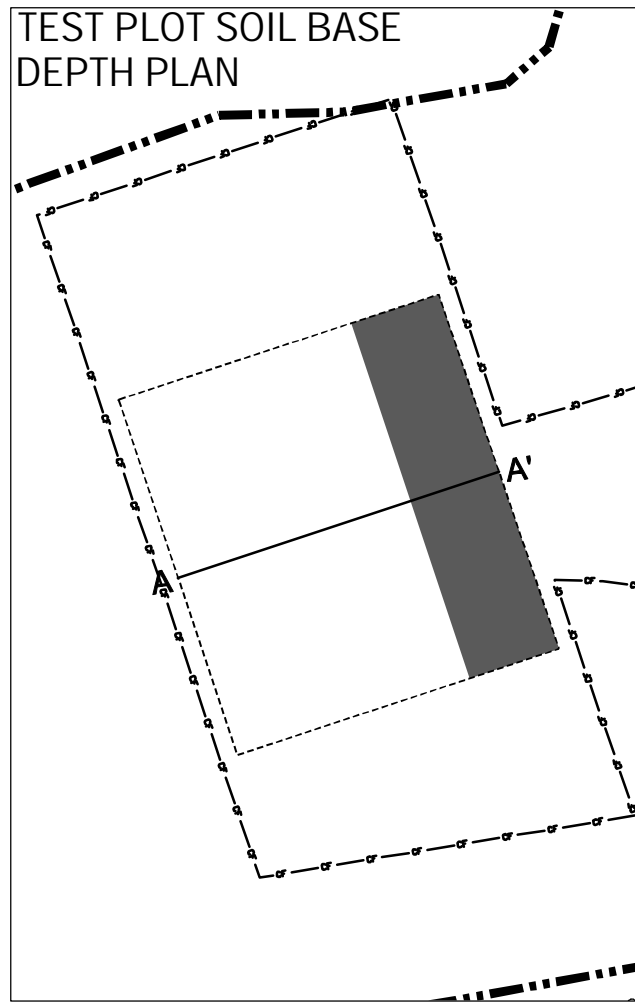
Grasses, sedges, etc.		Grasses = 10- 15 lbs				Matrix	Commer- cially Available	Available via Hand Collection	2009 Collection Available for Test Plots(OZs)	AES Nursery
Botanical Name	Common Name	Seeds per oz	% of Mix	# of seeds	oz/ac	lb / ac				
Andropogon gerardii	Big bluestem grass	8160	7.50%	290400	35.588235	2.224265	X	X	332.8	
Schizachyrium scoparium	Little bluestem grass	15000	50.00%	1936000	129.06667	8.066667	X	X		
Sorghastrum nutans	Indian grass	12000	7.50%	290400	24.2	1.5125	X	X	232	
			65.00%	2516800						
Grasses, sedges, etc					157	11.80343				
Forbs		Forbs =2-4 lbs								
Botanical Name	Common Name			# of seeds	oz/ac	lb / ac				
Anemone cylindrica	Thimbleweed	35500	1.00%	38720	1.0907042	0.068169	X	X	9.43	
Asclepias syriaca	Common milkweed	4000	1.00%	38720	9.68	0.605	X	X	70.4	
Aster laevis	Smooth blue aster	55000	3.00%	116160	2.112	0.132	X	X	54.75	
Aster linariifolius	Flax-leaved aster	70875	0.50%	19360	0.273157	0.017072	X	X	1.63	
Aster patens	Late purple aster	50000	0.75%	29040	0.5808	0.0363	X	X	2.32	
Aster umbellatus	Flat topped aster	31500	0.50%	19360	0.6146032	0.038413	X	X	3.64	
Aster undulatum	Wavy-leaf aster	31500	0.05%	1936	0.0614603	0.003841	X	X	0.48	
Desmodium canadense	Showy tick trefoil	5500	0.05%	1936	0.352	0.022	X	X	1.6	
Gnaphalium obtusifolium	Rabbit tobacco	500000	0.75%	29040	0.05808	0.00363	X	X	7.04	
Helianthemum canadense	Long-branch frostweed	35000	3.00%	116160	3.3188571	0.207429	X	X	31.6	
Lespedeza capitata	Round-headed bush clover	9960	5.00%	193600	19.437751	1.214859	X	X		
Lupinus perennis	Wild lupine	990	0.80%	30976	31.288889	1.955556	X	X	192	
Monarda fistulosa	Wild bergamot	77800	6.00%	232320	2.9861183	0.186632	X	X	23.68	
Monarda punctata	Dotted Horsemint	93700	4.60%	178112	1.9008751	0.118805	X	X	37.65	
Oenothera biennis	Common evening primrose	90000	1.50%	58080	0.6453333	0.040333	X	X	159	
Rudbeckia hirta	Black-eyed Susan	92000	1.00%	38720	0.4208696	0.026304	X	X	7.2	
Solidago nemoralis	Old-field goldenrod	300000	4.50%	174240	0.5808	0.0363	X	X	36.78	
Solidago rugosa	Rough-stemmed goldenrod	62500	1.00%	38720	0.61952	0.03872	X	X	28.03	
									667.23	
			35.00%			4.751364			41.70188	

Cover Crop

<u>Botanical Name</u>	<u>Common Name</u>	Seeds per oz	% of Mix	# of seeds	oz/ac	lb / ac
Avena sativa	Oats				800	50
Lolium multiflorum	Annual rye				320	20
Hordeum vulgare	Barley				480	30

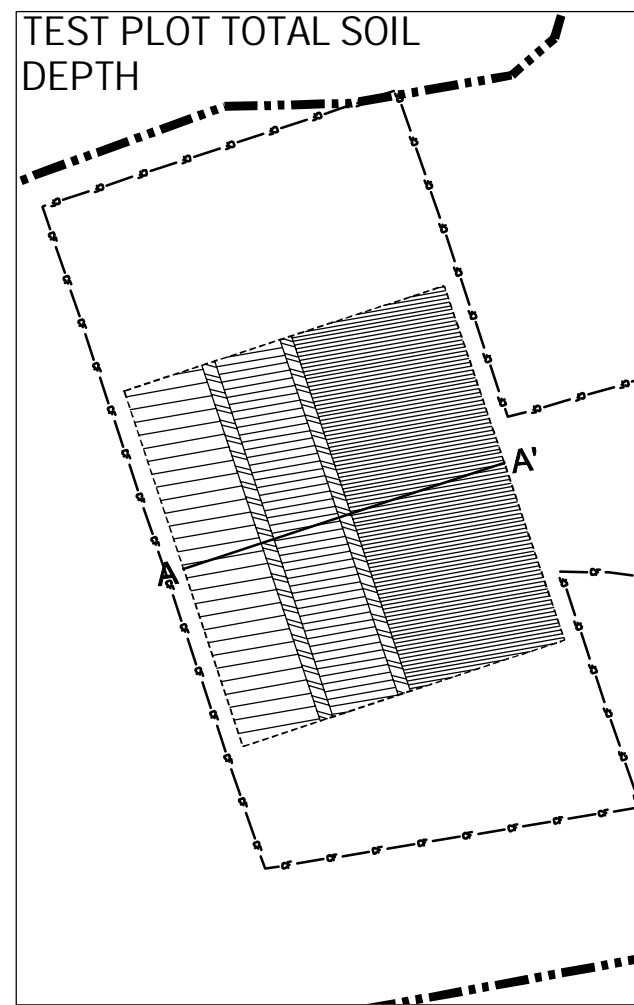
Trees and Shrubs

<u>Botanical Name</u>	<u>Common Name</u>	5 trees/ac 15 shrubs/ac units / ac	Depending on Commercial Availability
Aronia melanocarpa	Black chokeberry	2	
Ceanothus americanus	New Jersey tea		
Corylus americana	Hazelnut		
Gaylussacia baccata	Black huckleberry	2	
Pinus rigida	Pitch pine	5	
Prunus pumila	Sand-cherry	2	
Quercus ilicifolia	Scrub oak	2	
Quercus prinoides	Dwarf chinquapin oak	2	
Salix humilis	Dune willow	2	
Vaccinium pallidum	Hillside blueberry	3	
Total Trees & Shrubs / zone		20	



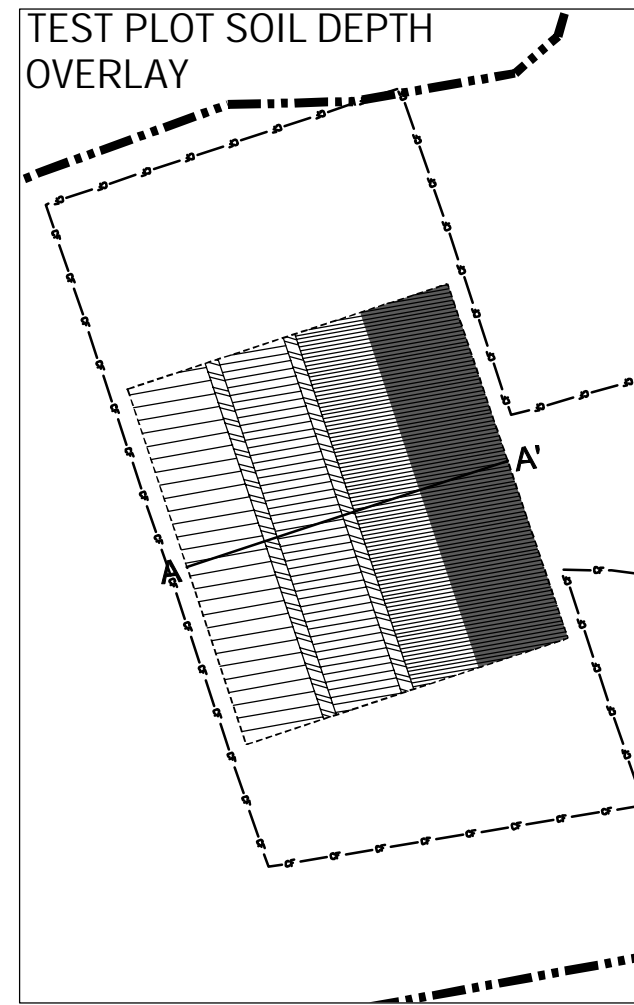
- LEGEND**
- Project Boundary
 - Test Plot Boundary
 - 24" High pH Soil Base
 - Low pH Soil Base
 - CONSTRUCTION FENCE / ELECTRIC FENCE

Scale: 1" = 100'
To Scale When Printed at 24" x 36"



- LEGEND**
- Project Boundary
 - Test Plot Boundary
 - 12" Total Soil Depth
 - 18" Total Soil Depth
 - 24" Total Soil Depth
 - Sloping Transition
 - CONSTRUCTION FENCE / ELECTRIC FENCE

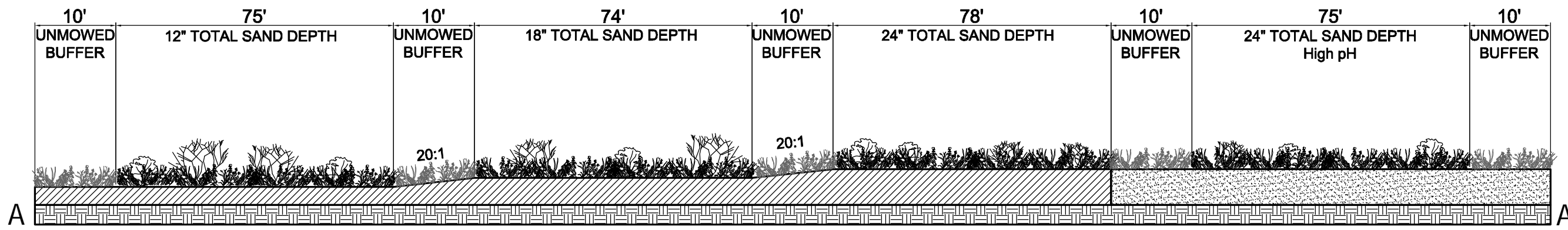
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To Scale When Printed at 24" x 36"



- LEGEND**
- Project Boundary
 - Test Plot Boundary
 - 12" TOTAL DEPTH
 - 12" Soil Depth
 - 18" TOTAL DEPTH
 - 18" Soil Depth
 - 24" TOTAL DEPTH
 - 24" Soil Depth
 - 24" High pH Soil Depth
 - SLOPING TRANSITION
 - Sloping Soil Transition
 - CONSTRUCTION FENCE / ELECTRIC FENCE

Scale: 1" = 100'
To Scale When Printed at 24" x 36"

TEST PLOT SECTION A-A'



- LEGEND**
- Low pH Sand
 - Higher pH Sand
 - Landfill Cap

Scale: N.T.S.

S:090636:11111351

Albany Rapp Road Landfill
Albany, New York
City of Albany, Dept. of General Services
One Conners Blvd.
Albany, New York

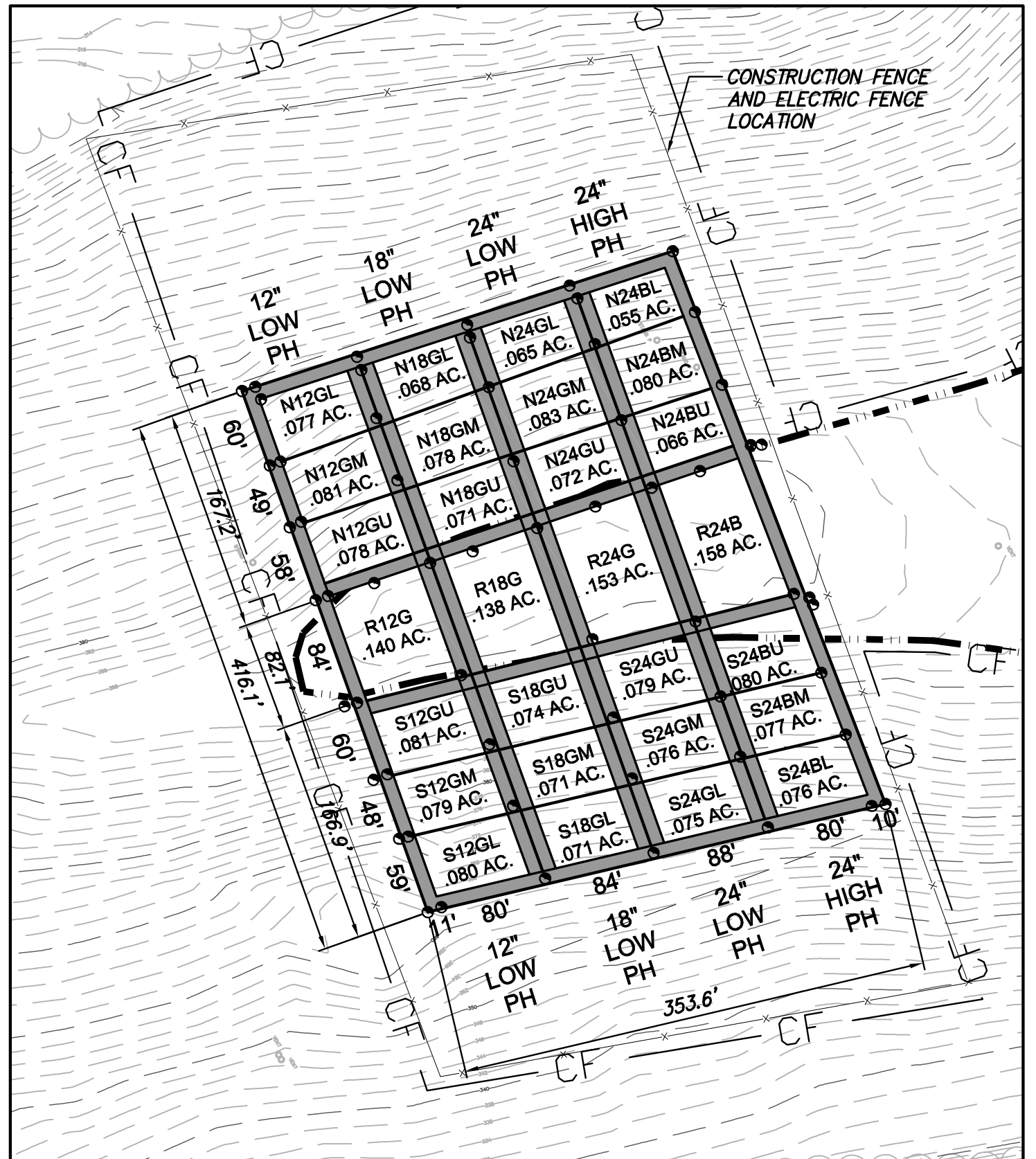
**Test Plot Plan
Cross-section
Design**

REVISE	DATE	BY
No. 1	Date: 03-13-2012	By: DM
Description: Review work plan		
No.:	Date:	By:
Description:		
No.:	Date:	By:
Description:		
No.:	Date:	By:
Description:		
AES Proj. # : 09-0636		
Checked:		
Approved:		
Drawn by: kvv		
File: 090636Tes_Plot_Plan20120312.dwg		
Date: 22 March 2011		
Coordinate System: NAD NY State Plane, East (9)		



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TEST PLOT LAYOUT

SCALE: 1"=100'



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TEST PLOT MONITORING PLAN

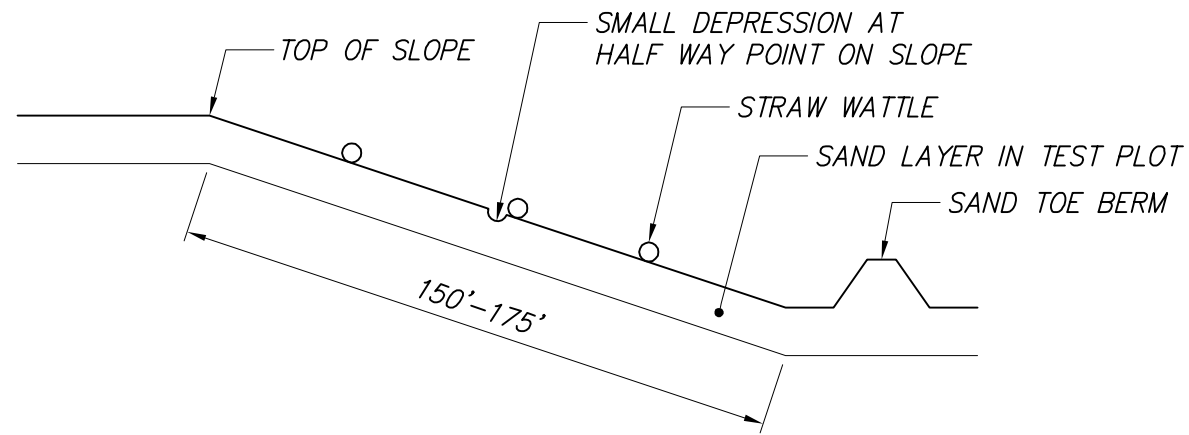
RAPP ROAD LANDFILL
RESTORATION PLAN

PROJECT NO.
21661

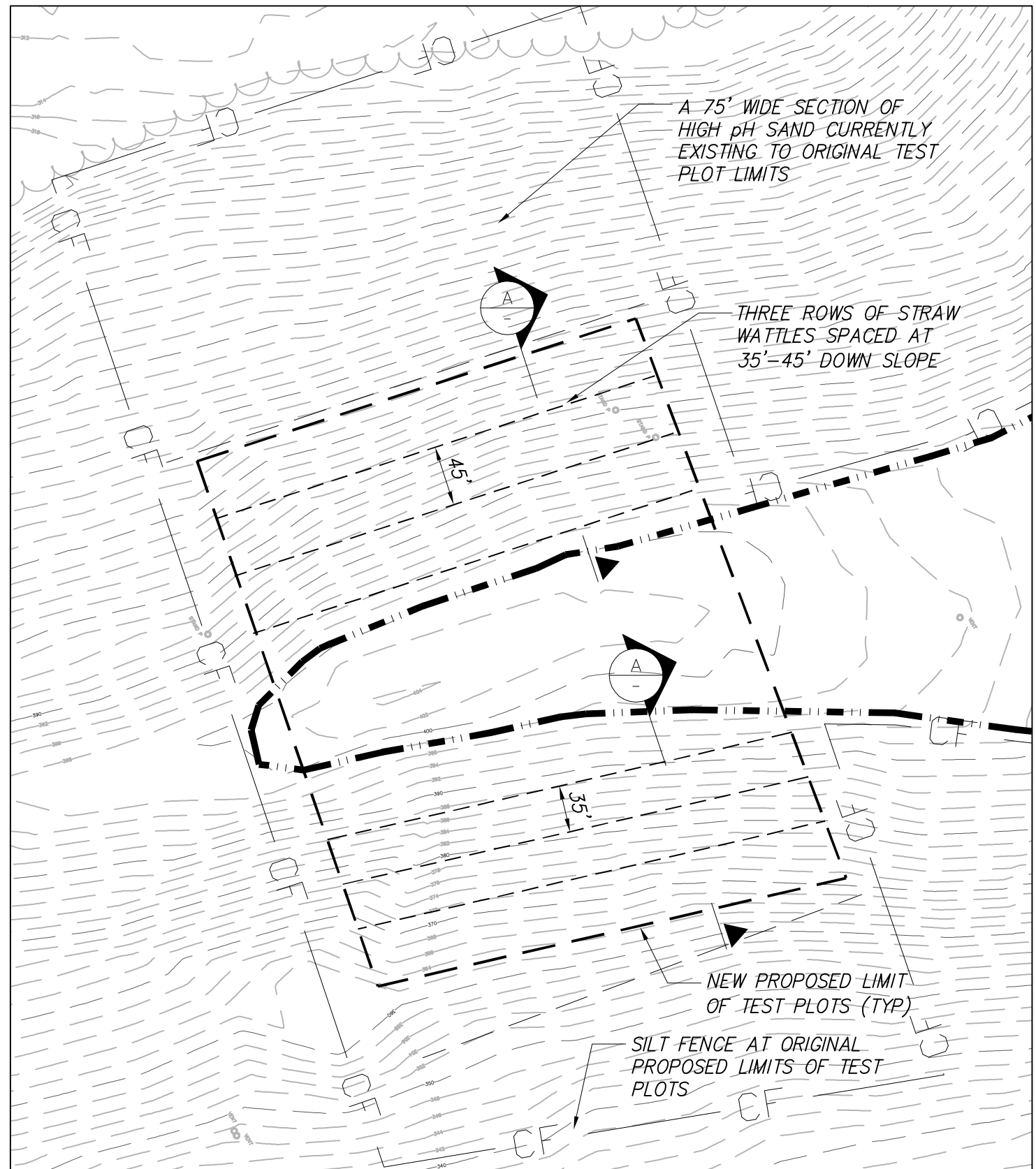
DATE: 11/02/12

FIGURE 02

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SECTION A-A'
NOT TO SCALE



TEST PLOT EROSION CONTROL

SCALE: 1"=100'



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TEST PLOT EROSION CONTROL

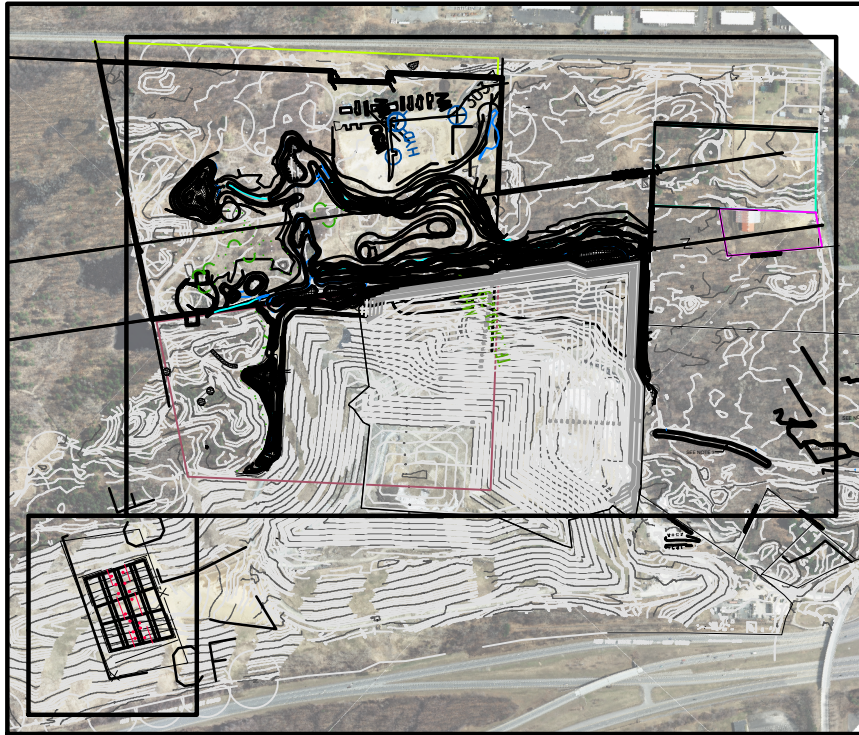
RAPP ROAD LANDFILL
RESTORATION PLAN

PROJECT NO.
21661

DATE: 11/02/12

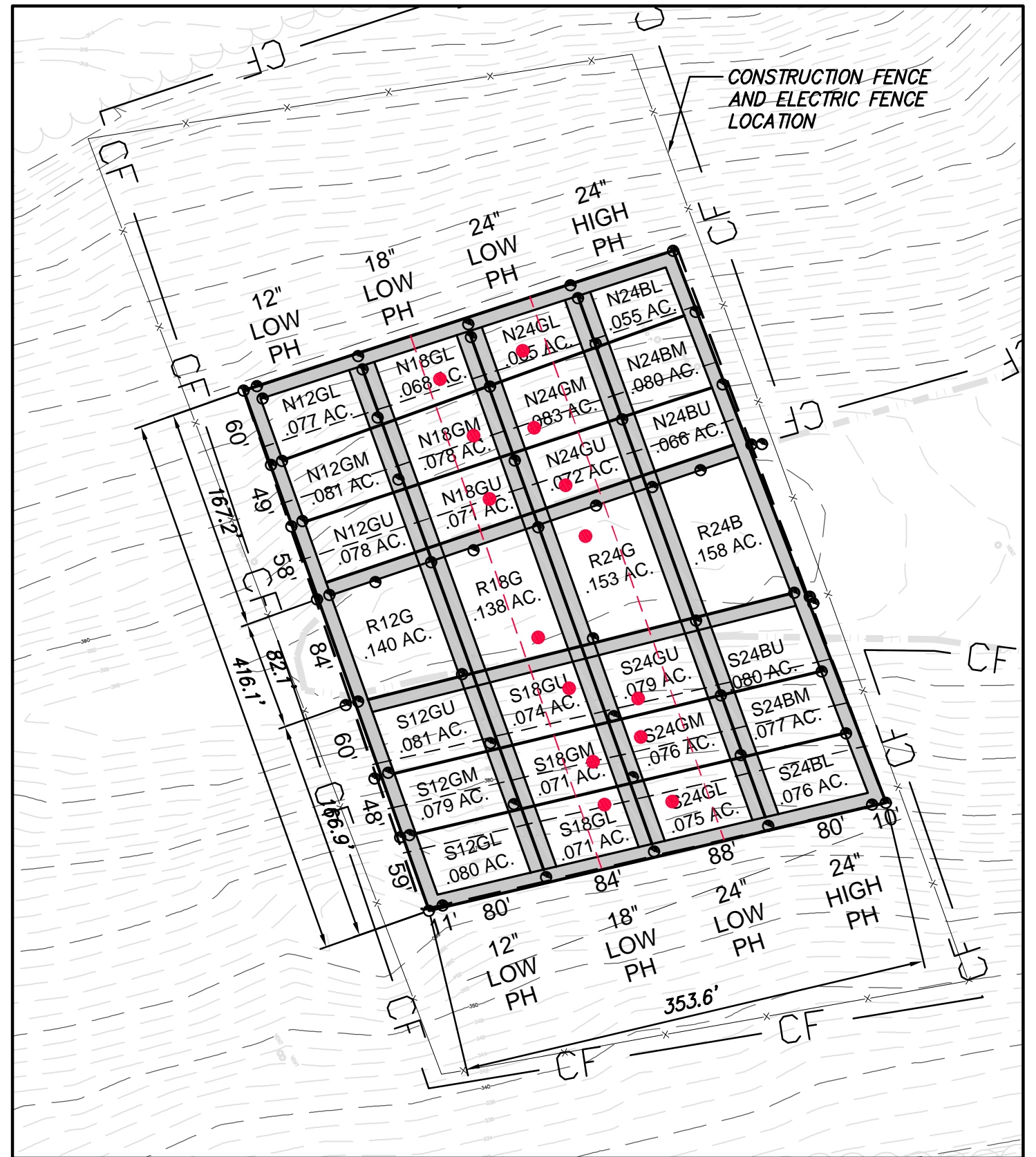
FIGURE 03

2013 Albany Compliance Report



Legend

- FLAG LOCATION FOR WOODY PLANTING ARRAY (1 STEM OF EACH OF THE 10 SPECIES)
- - - - - WOODY PLANTING SUBPLOT BOUNDARY



TEST PLOT LAYOUT

SCALE: 1"=100'

File: V:\PROJECTS\ANY\K3\25013\CADD\FIGURES\25013-TEST-FIGURES.DWG
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S:090636:1111354



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TEST PLOT WOODY PLANTING PLAN

RAPP ROAD LANDFILL
 RESTORATION PLAN

PROJECT NO.
 25013

DATE: 10/28/13

FIGURE 04

2013 Albany Compliance Report

Attachment 2. Analysis of Variance (ANOVA) for Cover

Species: *Agrostis alba*

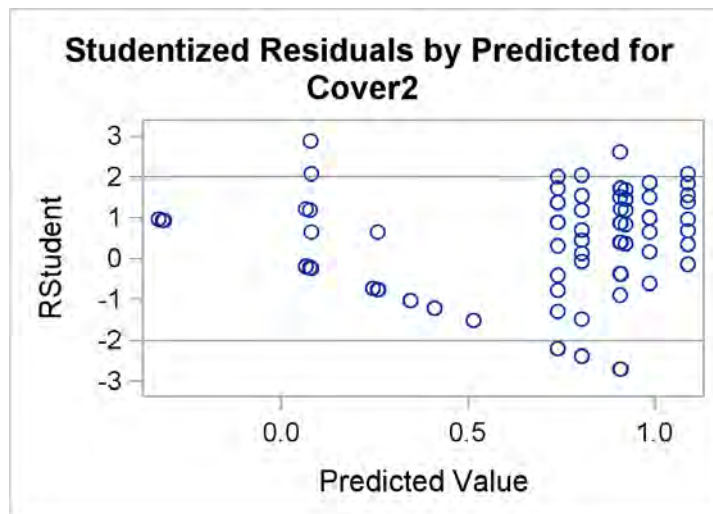
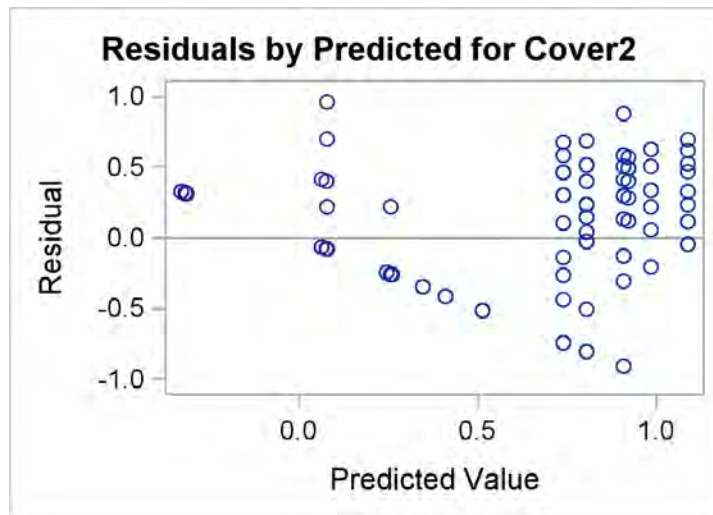
The GLM Procedure

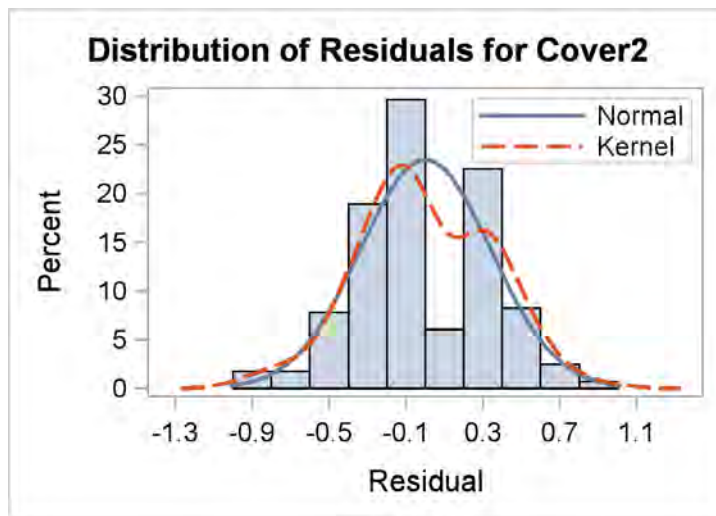
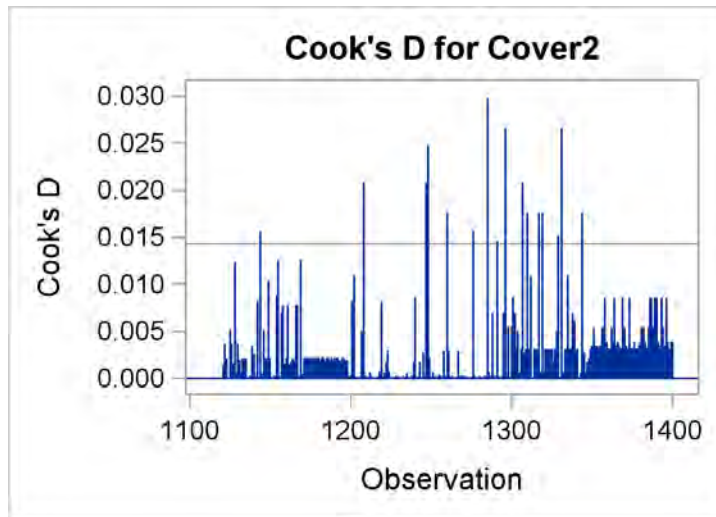
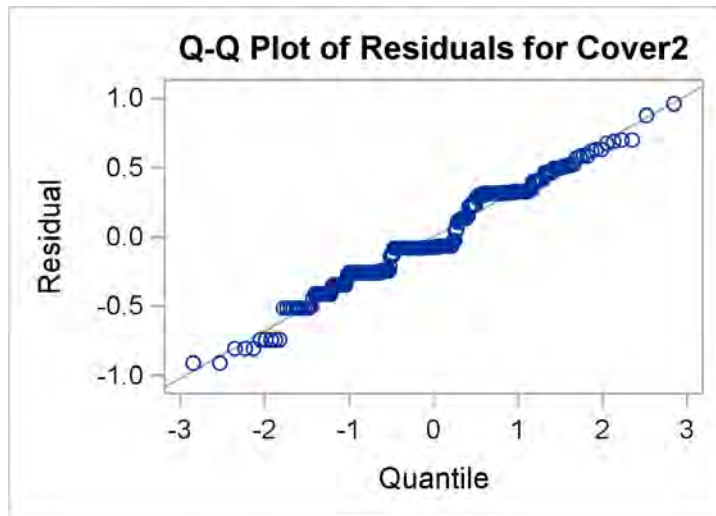
Dependent Variable: Cover2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	50.71422576	5.63491397	47.23	<.0001
Error	270	32.21631518	0.11931969		
Corrected Total	279	82.93054094			

R-Square	Coeff Var	Root MSE	Cover2 Mean
0.611527	101.4749	0.345427	0.340406

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	38.37724753	6.39620792	53.61	<.0001
Depth	2	1.52185836	0.76092918	6.38	0.0020
Quality	1	5.42700557	5.42700557	45.48	<.0001

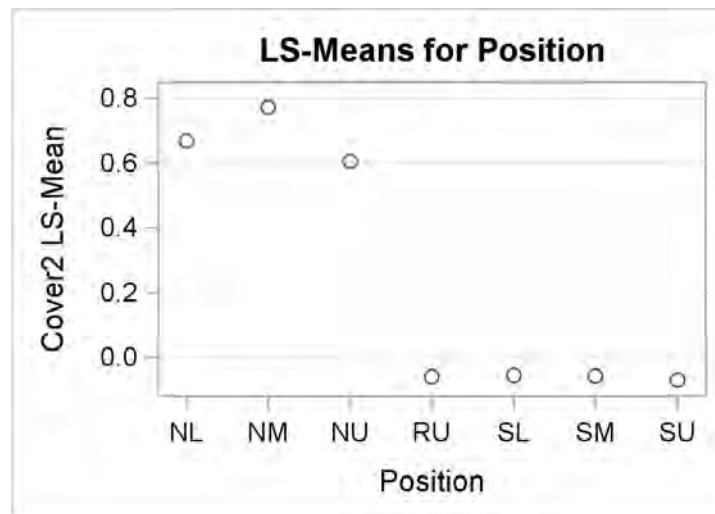




The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Position	Cover2 LSMEAN	LSMEAN Number
NL	0.66820225	1
NM	0.77139911	2
NU	0.60418893	3
RU	-0.05956183	4
SL	-0.05643836	5
SM	-0.05738308	6
SU	-0.07148986	7

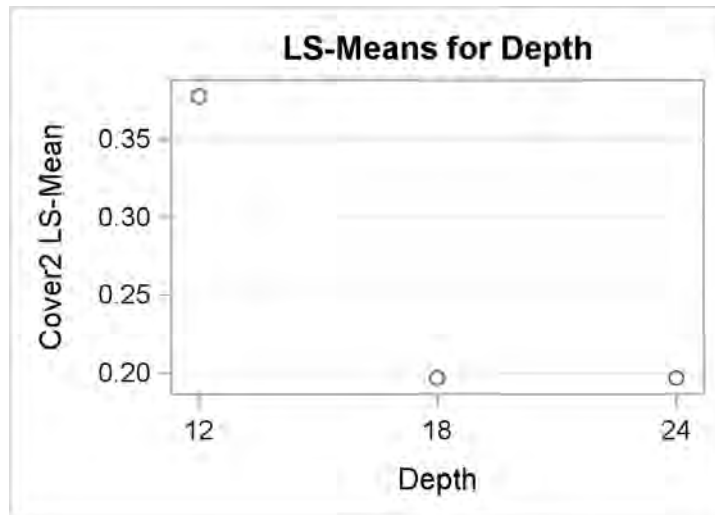
Least Squares Means for effect Position Pr > |t| for H0: LSMean(i)=LSMean(j) Dependent Variable: Cover2							
i/j	1	2	3	4	5	6	7
1		0.8344	0.9818	<.0001	<.0001	<.0001	<.0001
2	0.8344		0.3183	<.0001	<.0001	<.0001	<.0001
3	0.9818	0.3183		<.0001	<.0001	<.0001	<.0001
4	<.0001	<.0001	<.0001		1.0000	1.0000	1.0000
5	<.0001	<.0001	<.0001	1.0000		1.0000	1.0000
6	<.0001	<.0001	<.0001	1.0000	1.0000		1.0000
7	<.0001	<.0001	<.0001	1.0000	1.0000	1.0000	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

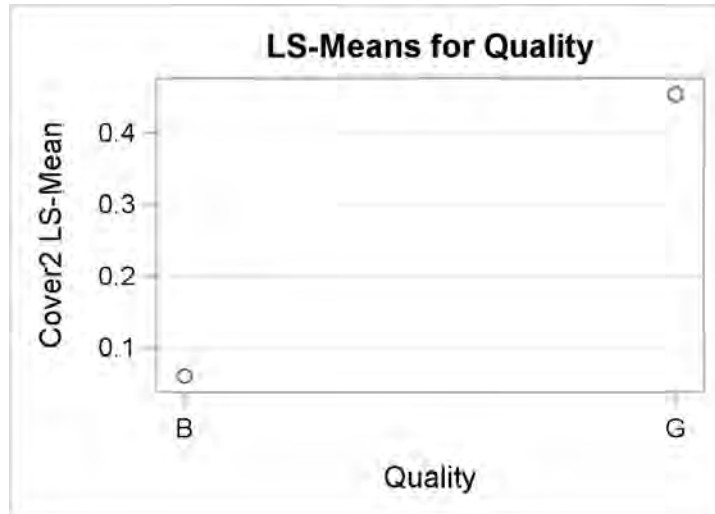
Depth	Cover2 LSMEAN	LSMEAN Number
12	0.37737868	1
18	0.19669923	2
24	0.19688658	3

Least Squares Means for effect Depth			
Pr > |t| for H0: LSMean(i)=LSMean(j)			
Dependent Variable: Cover2			
i/j	1	2	3
1		0.0062	0.0062
2	0.0062		1.0000
3	0.0062	1.0000	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Quality	Cover2 LSMEAN	H0:LSMean1=LSMean2 Pr > |t|
B	0.06010158	<.0001
G	0.45387474	



Species: *Andropogon gerardii*

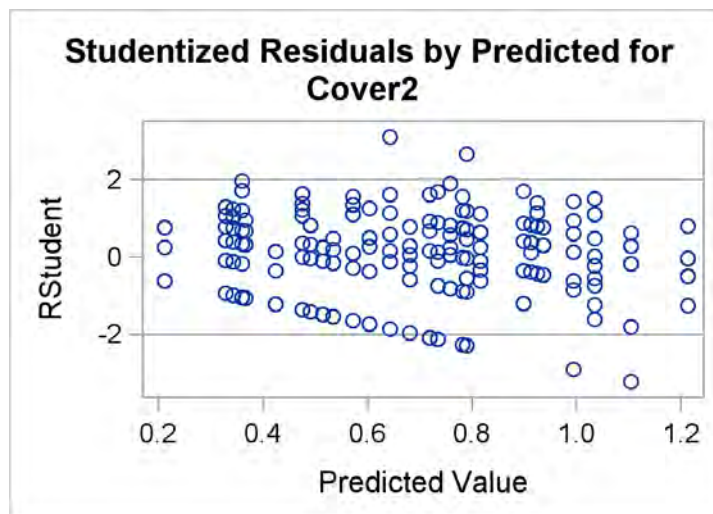
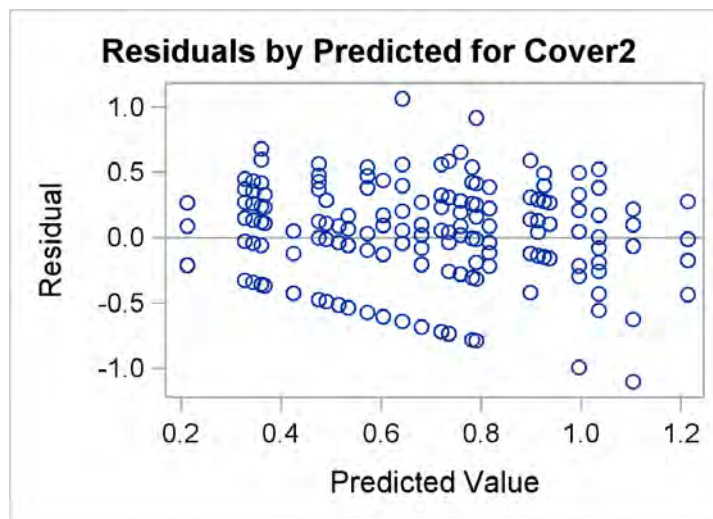
The GLM Procedure

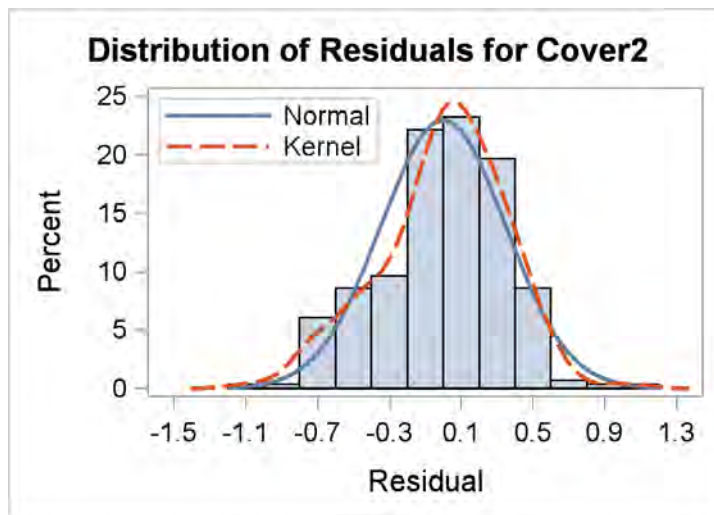
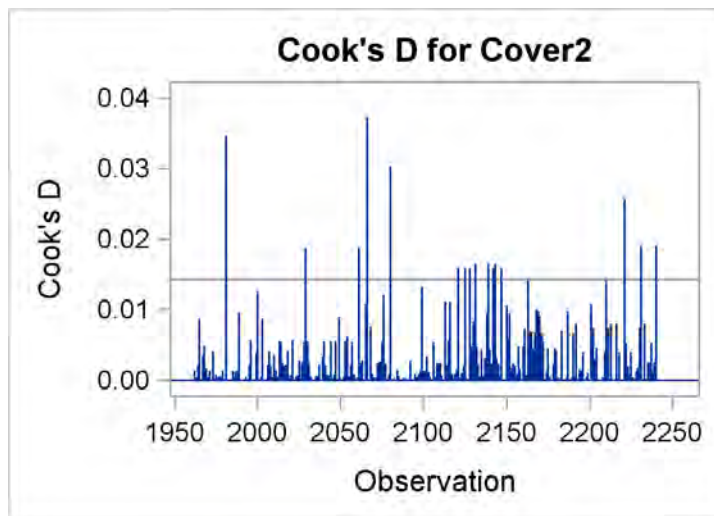
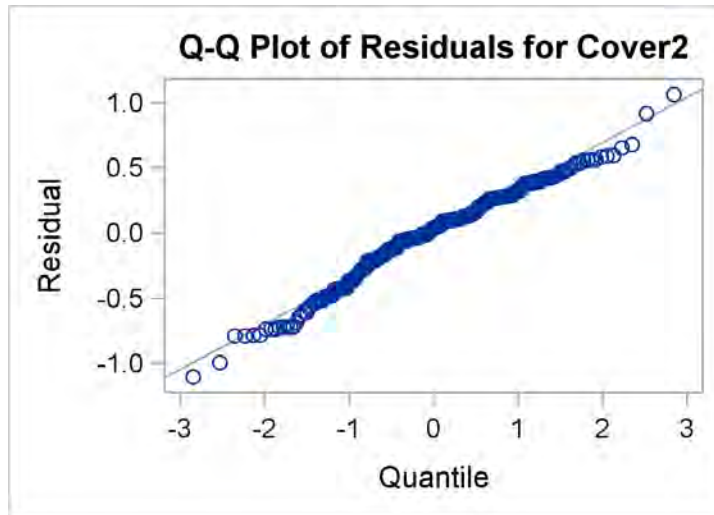
Dependent Variable: Cover2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	18.35319819	2.03924424	16.30	<.0001
Error	270	33.78879218	0.12514367		
Corrected Total	279	52.14199036			

R-Square	Coeff Var	Root MSE	Cover2 Mean
0.351985	51.65797	0.353757	0.684805

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	4.87403078	0.81233846	6.49	<.0001
Depth	2	6.30197028	3.15098514	25.18	<.0001
Quality	1	11.37654218	11.37654218	90.91	<.0001

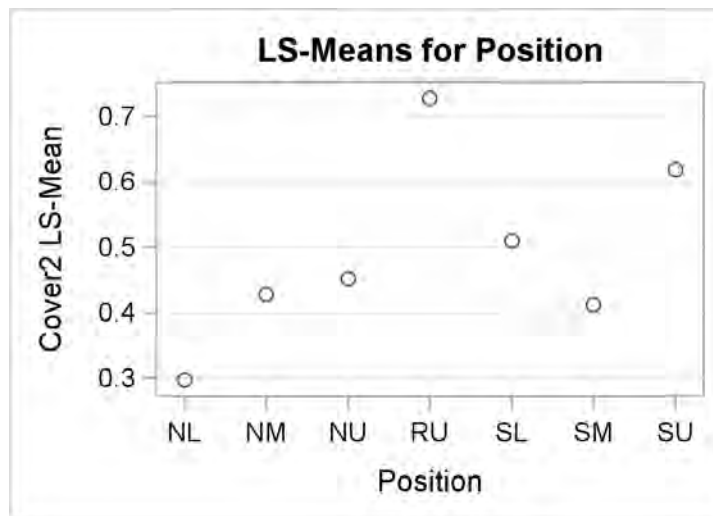




The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Position	Cover2 LSMEAN	LSMEAN Number
NL	0.29702280	1
NM	0.42805149	2
NU	0.45172277	3
RU	0.72767479	4
SL	0.50946966	5
SM	0.41279909	6
SU	0.61850152	7

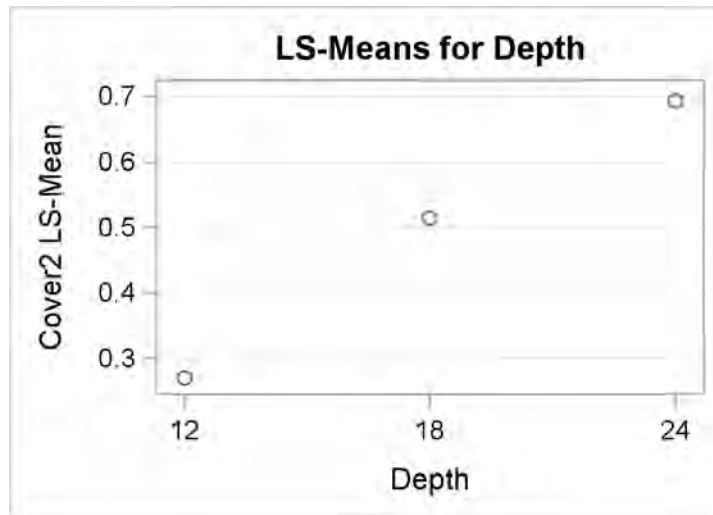
Least Squares Means for effect Position Pr > |t| for H0: LSMean(i)=LSMean(j) Dependent Variable: Cover2							
i/j	1	2	3	4	5	6	7
1		0.6456	0.4455	<.0001	0.1059	0.7661	0.0012
2	0.6456		0.9999	0.0035	0.9469	1.0000	0.1994
3	0.4455	0.9999		0.0101	0.9906	0.9989	0.3507
4	<.0001	0.0035	0.0101		0.0882	0.0017	0.8121
5	0.1059	0.9469	0.9906	0.0882		0.8851	0.8130
6	0.7661	1.0000	0.9989	0.0017	0.8851		0.1299
7	0.0012	0.1994	0.3507	0.8121	0.8130	0.1299	



The GLM Procedure
 Least Squares Means
 Adjustment for Multiple Comparisons: Tukey-Kramer

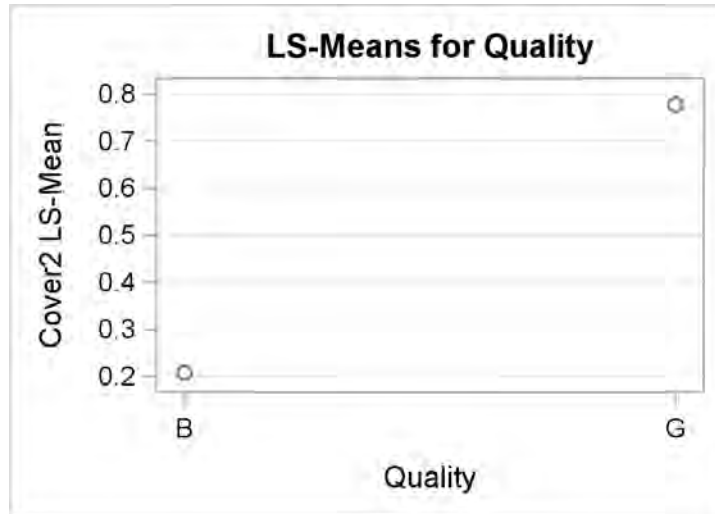
Depth	Cover2 LSMEAN	LSMEAN Number
12	0.26992584	1
18	0.51404384	2
24	0.69256266	3

Least Squares Means for effect Depth Pr > |t| for H0: LSMean(i)=LSMean(j) Dependent Variable: Cover2			
i/j	1	2	3
1		0.0002	<.0001
2	0.0002		0.0087
3	<.0001	0.0087	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Quality	Cover2 LSMEAN	H0:LSMean1=LSMean2 Pr > |t|
B	0.20711427	<.0001
G	0.77724063	



Species: *Andropogon scoparius*

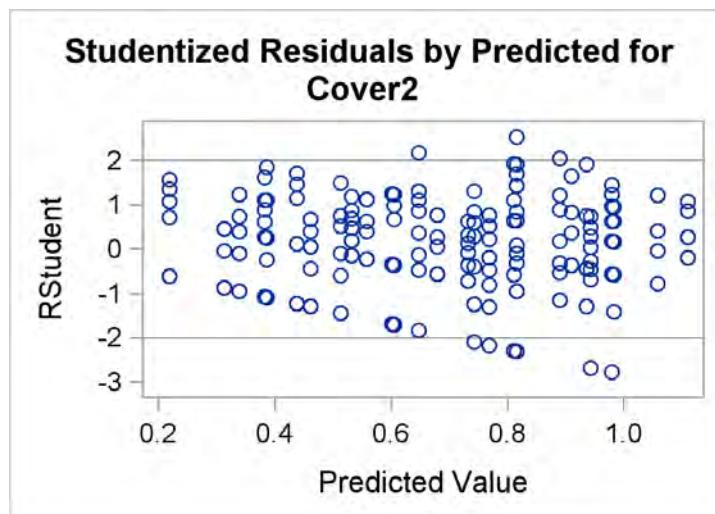
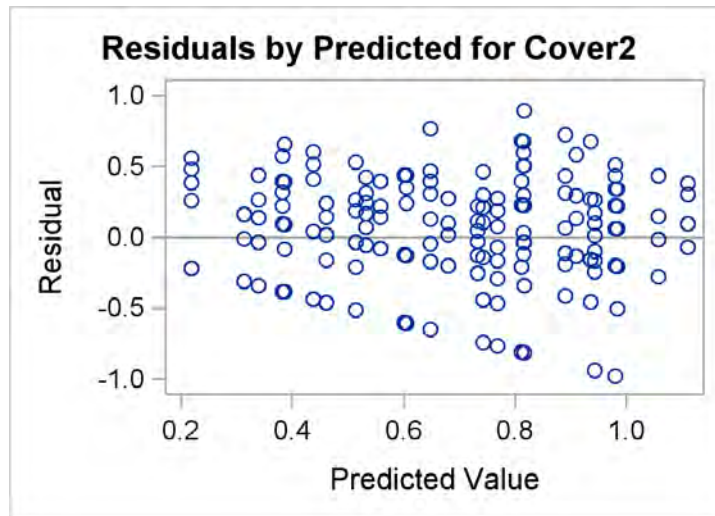
The GLM Procedure

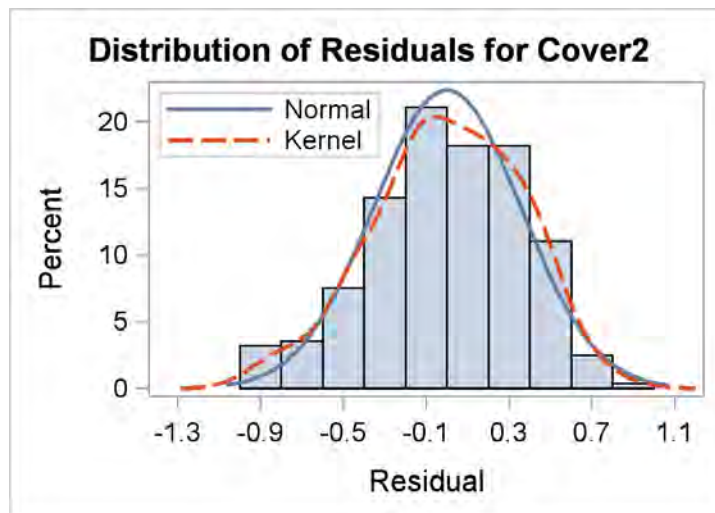
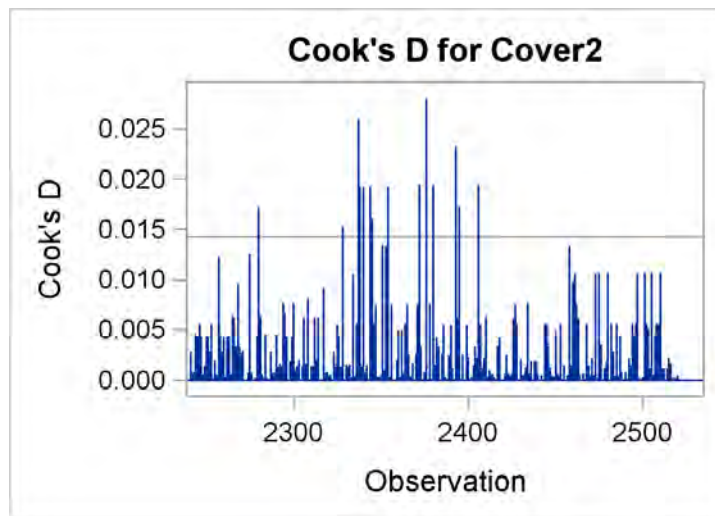
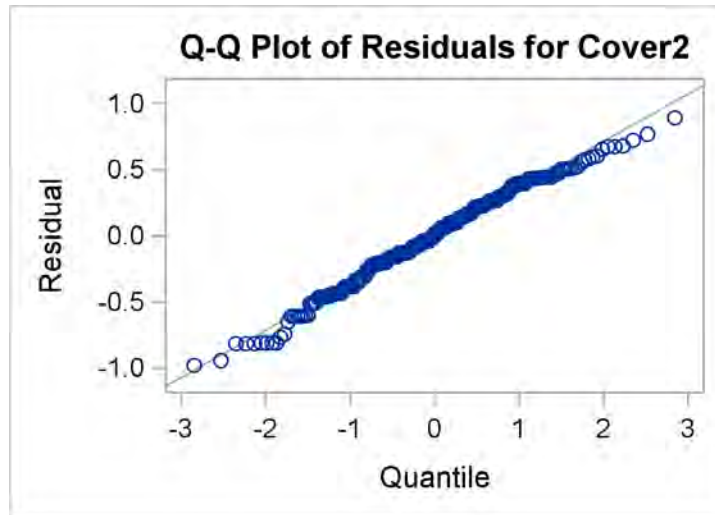
Dependent Variable: Cover2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	16.29370220	1.81041136	13.79	<.0001
Error	270	35.44572896	0.13128048		
Corrected Total	279	51.73943116			

R-Square	Coeff Var	Root MSE	Cover2 Mean
0.314918	52.91340	0.362326	0.684754

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	2.24511324	0.37418554	2.85	0.0104
Depth	2	13.25186242	6.62593121	50.47	<.0001
Quality	1	4.99931943	4.99931943	38.08	<.0001

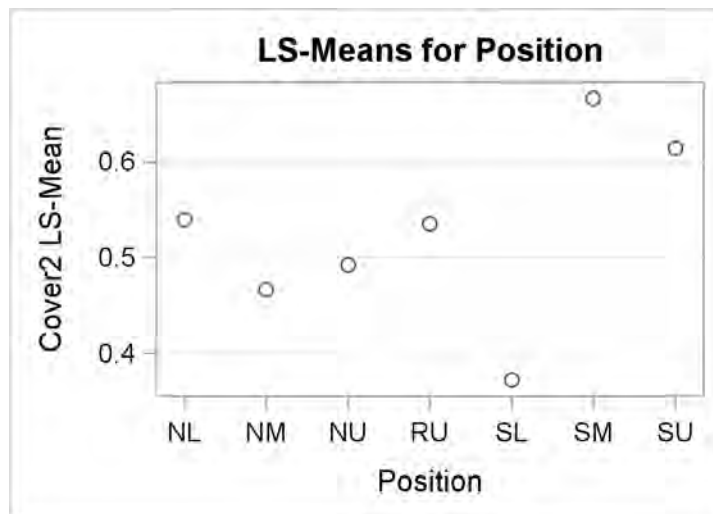




The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Position	Cover2 LSMEAN	LSMEAN Number
NL	0.53932601	1
NM	0.46647136	2
NU	0.49226740	3
RU	0.53556719	4
SL	0.37200270	5
SM	0.66641467	6
SU	0.61402326	7

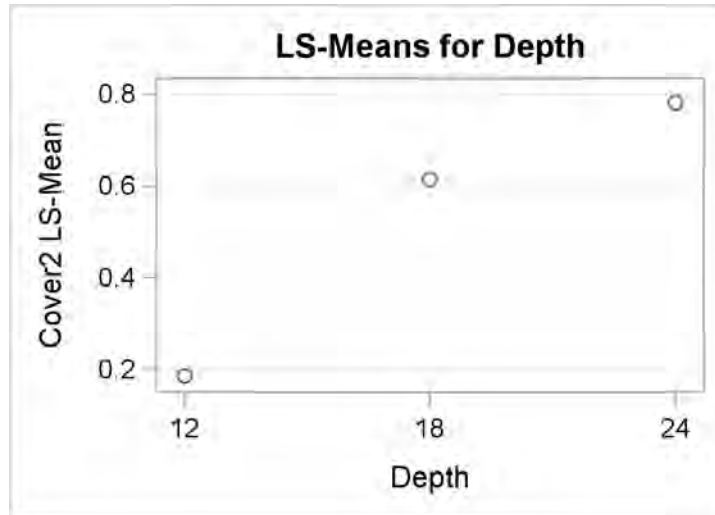
Least Squares Means for effect Position Pr > |t| for H0: LSMean(i)=LSMean(j) Dependent Variable: Cover2							
i/j	1	2	3	4	5	6	7
1		0.9725	0.9973	1.0000	0.3765	0.7025	0.9688
2	0.9725		0.9999	0.9789	0.9062	0.1753	0.5349
3	0.9973	0.9999		0.9983	0.7540	0.3269	0.7430
4	1.0000	0.9789	0.9983		0.4052	0.6728	0.9603
5	0.3765	0.9062	0.7540	0.4052		0.0061	0.0477
6	0.7025	0.1753	0.3269	0.6728	0.0061		0.9951
7	0.9688	0.5349	0.7430	0.9603	0.0477	0.9951	



The GLM Procedure
 Least Squares Means
 Adjustment for Multiple Comparisons: Tukey-Kramer

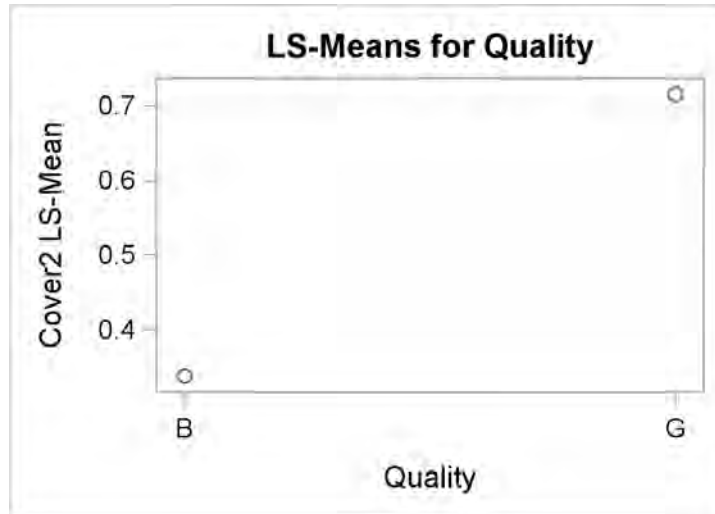
Depth	Cover2 LSMEAN	LSMEAN Number
12	0.18476992	1
18	0.61364480	2
24	0.78133068	3

Least Squares Means for effect Depth			
Pr > |t| for H0: LSMean(i)=LSMean(j)			
Dependent Variable: Cover2			
i/j	1	2	3
1		<.0001	<.0001
2	<.0001		0.0180
3	<.0001	0.0180	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Quality	Cover2 LSMEAN	H0:LSMean1=LSMean2 Pr > |t|
B	0.33761242	<.0001
G	0.71555117	



Species: *Desmodium canadense*

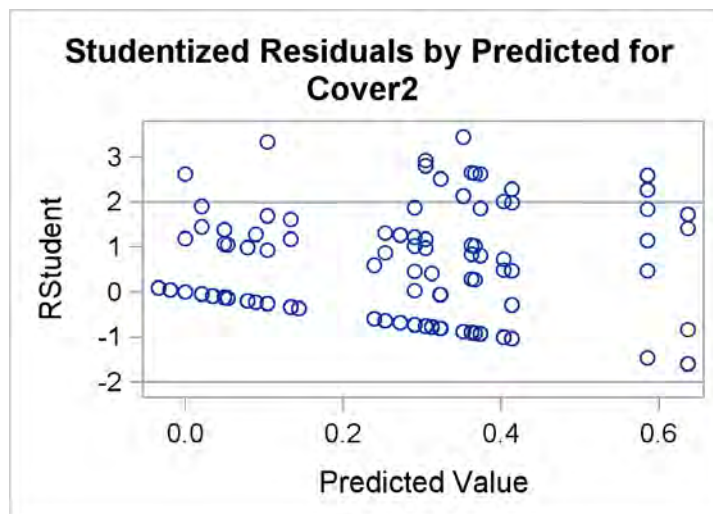
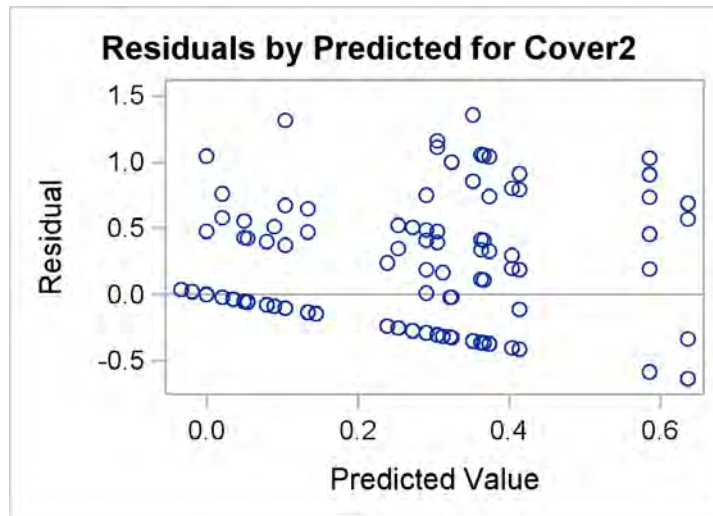
The GLM Procedure

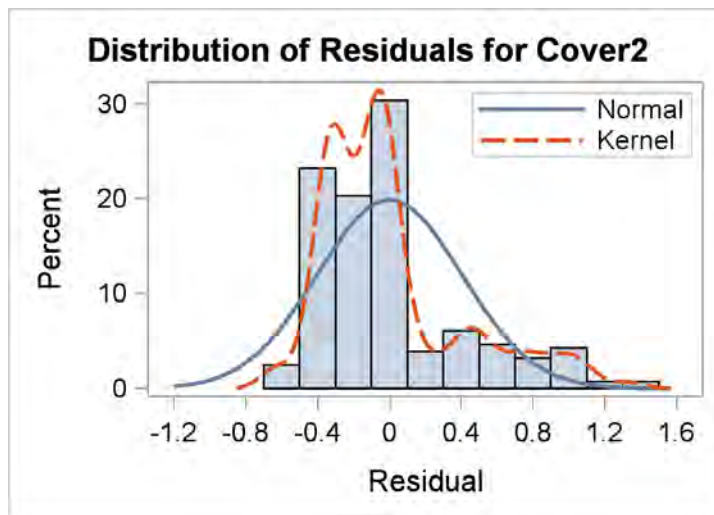
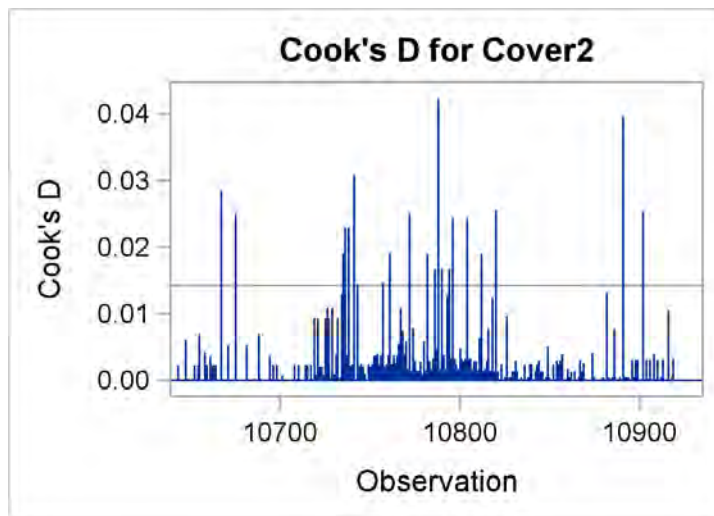
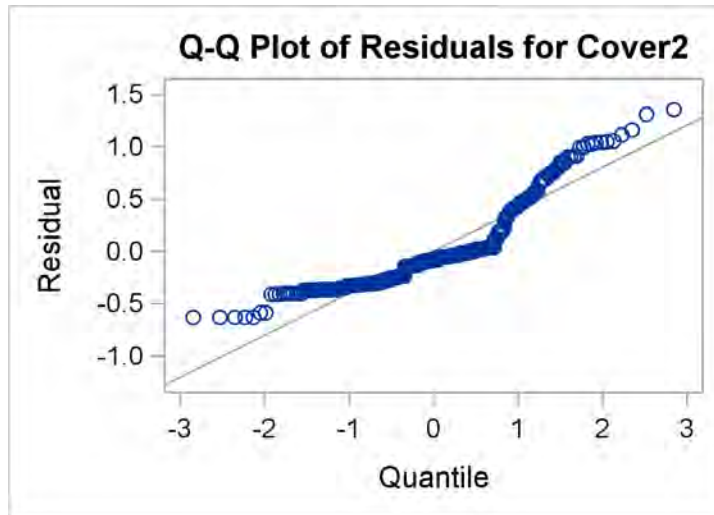
Dependent Variable: Cover2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	8.68928240	0.96547582	5.80	<.0001
Error	270	44.95154443	0.16648720		
Corrected Total	279	53.64082683			

R-Square	Coeff Var	Root MSE	Cover2 Mean
0.161990	176.6774	0.408028	0.230946

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	3.33709876	0.55618313	3.34	0.0034
Depth	2	4.25542135	2.12771067	12.78	<.0001
Quality	1	1.67128549	1.67128549	10.04	0.0017

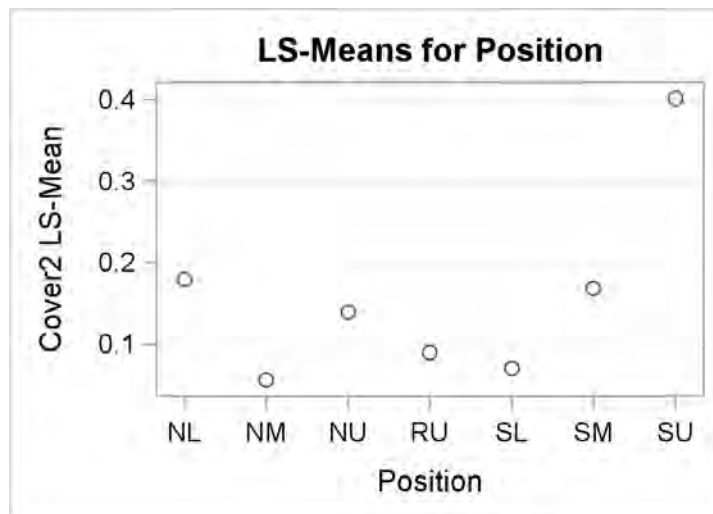




The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Position	Cover2 LSMEAN	LSMEAN Number
NL	0.17945241	1
NM	0.05572396	2
NU	0.13893562	3
RU	0.08930918	4
SL	0.07024162	5
SM	0.16893434	6
SU	0.40213957	7

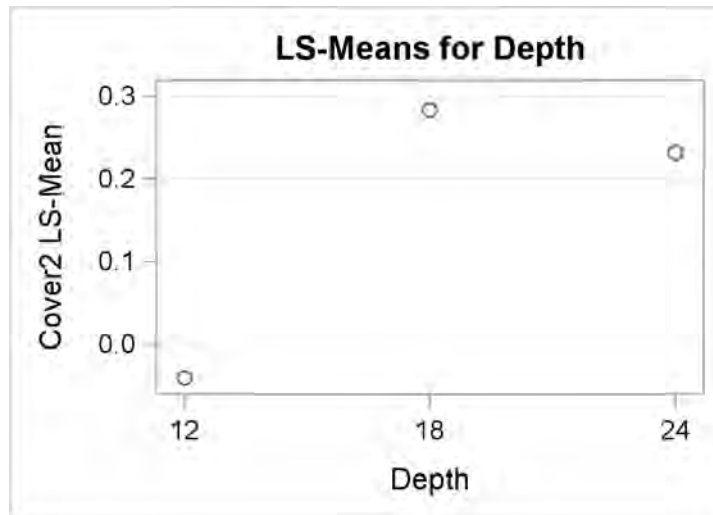
Least Squares Means for effect Position Pr > |t| for H0: LSMean(i)=LSMean(j) Dependent Variable: Cover2							
i/j	1	2	3	4	5	6	7
1		0.8244	0.9994	0.9563	0.8949	1.0000	0.1859
2	0.8244		0.9704	0.9998	1.0000	0.8775	0.0034
3	0.9994	0.9704		0.9981	0.9890	0.9999	0.0633
4	0.9563	0.9998	0.9981		1.0000	0.9763	0.0123
5	0.8949	1.0000	0.9890	1.0000		0.9331	0.0060
6	1.0000	0.8775	0.9999	0.9763	0.9331		0.1440
7	0.1859	0.0034	0.0633	0.0123	0.0060	0.1440	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

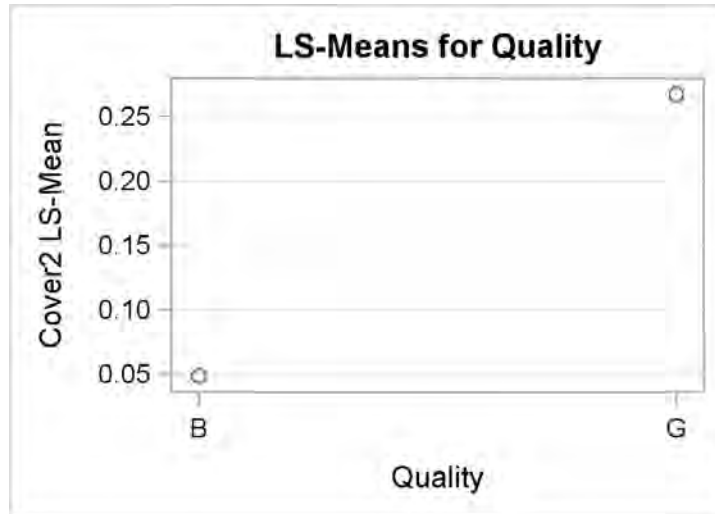
Depth	Cover2 LSMEAN	LSMEAN Number
12	-0.04131635	1
18	0.28297154	2
24	0.23180339	3

Least Squares Means for effect Depth			
Pr > |t| for H0: LSMean(i)=LSMean(j)			
Dependent Variable: Cover2			
i/j	1	2	3
1		<.0001	0.0003
2	<.0001		0.7388
3	0.0003	0.7388	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Quality	Cover2 LSMEAN	H0:LSMean1=LSMean2 Pr > |t|
B	0.04855950	0.0017
G	0.26707955	



Species: *Digitaria sanguinalis*

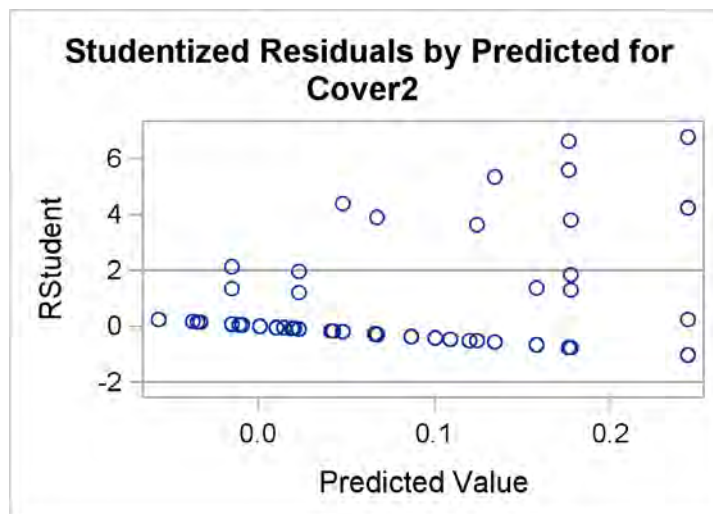
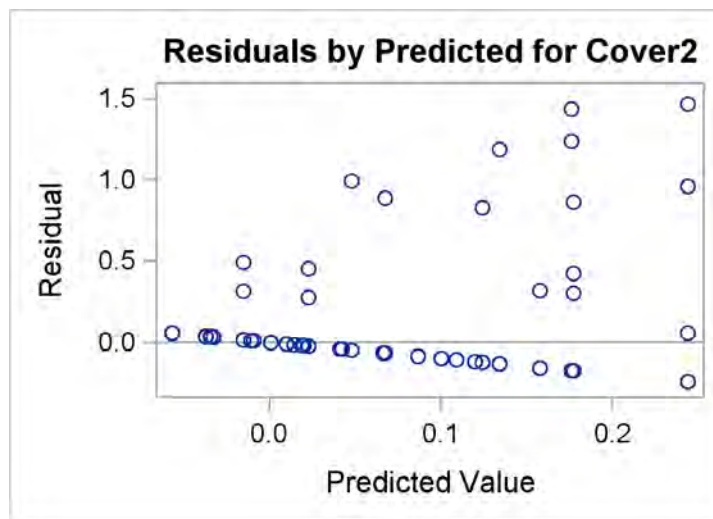
The GLM Procedure

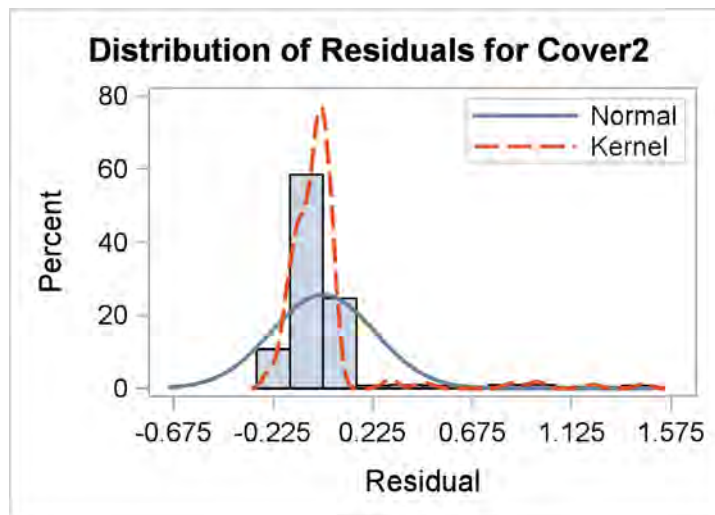
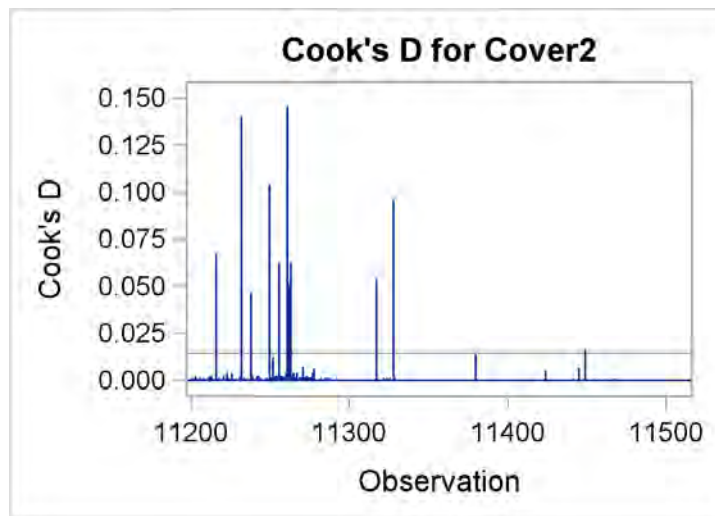
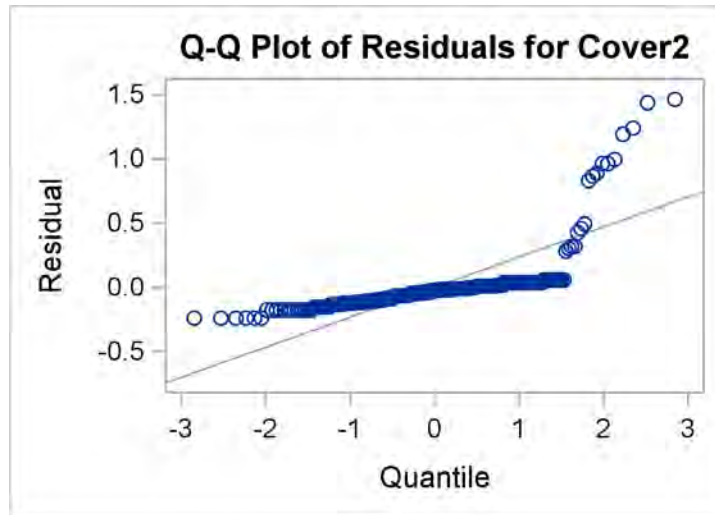
Dependent Variable: Cover2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	1.57894292	0.17543810	3.11	0.0014
Error	270	15.22364784	0.05638388		
Corrected Total	279	16.80259076			

R-Square	Coeff Var	Root MSE	Cover2 Mean
0.093970	418.9283	0.237453	0.056681

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	0.55916718	0.09319453	1.65	0.1328
Depth	2	0.90901941	0.45450971	8.06	0.0004
Quality	1	0.01730055	0.01730055	0.31	0.5801

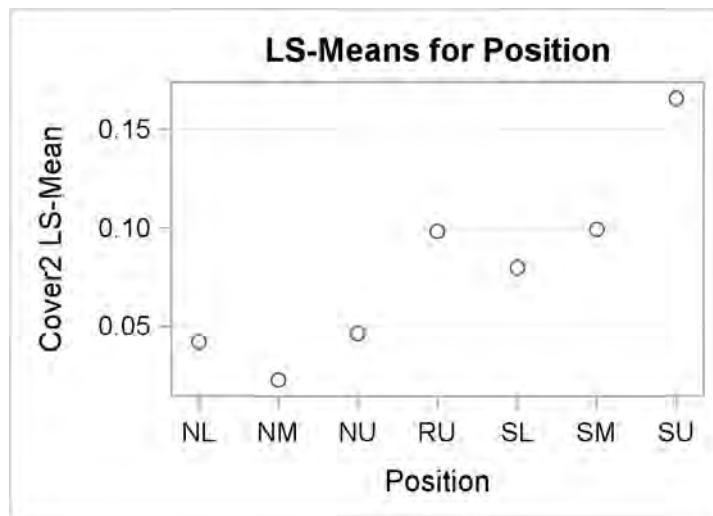




The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Position	Cover2 LSMEAN	LSMEAN Number
NL	0.04205294	1
NM	0.02259916	2
NU	0.04645523	3
RU	0.09829309	4
SL	0.08001579	5
SM	0.09946957	6
SU	0.16607565	7

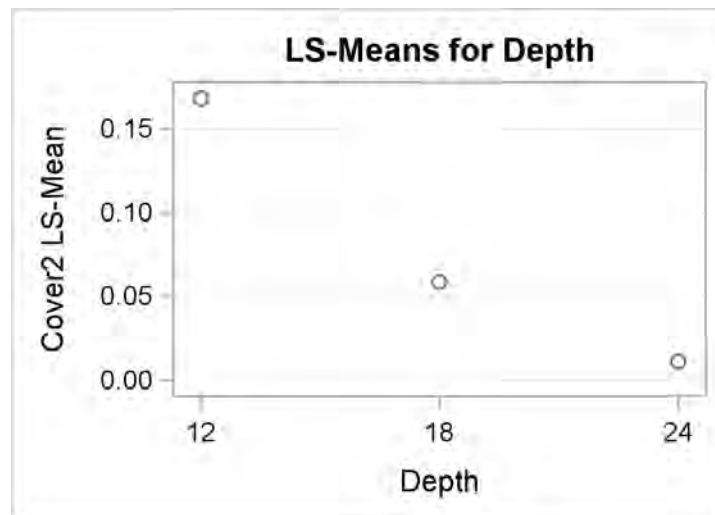
Least Squares Means for effect Position Pr > |t| for H0: LSMean(i)=LSMean(j) Dependent Variable: Cover2							
i/j	1	2	3	4	5	6	7
1		0.9998	1.0000	0.9393	0.9916	0.9332	0.2309
2	0.9998		0.9994	0.7876	0.9332	0.7752	0.1016
3	1.0000	0.9994		0.9587	0.9957	0.9540	0.2712
4	0.9393	0.7876	0.9587		0.9999	1.0000	0.8622
5	0.9916	0.9332	0.9957	0.9999		0.9998	0.6690
6	0.9332	0.7752	0.9540	1.0000	0.9998		0.8718
7	0.2309	0.1016	0.2712	0.8622	0.6690	0.8718	



The GLM Procedure
 Least Squares Means
 Adjustment for Multiple Comparisons: Tukey-Kramer

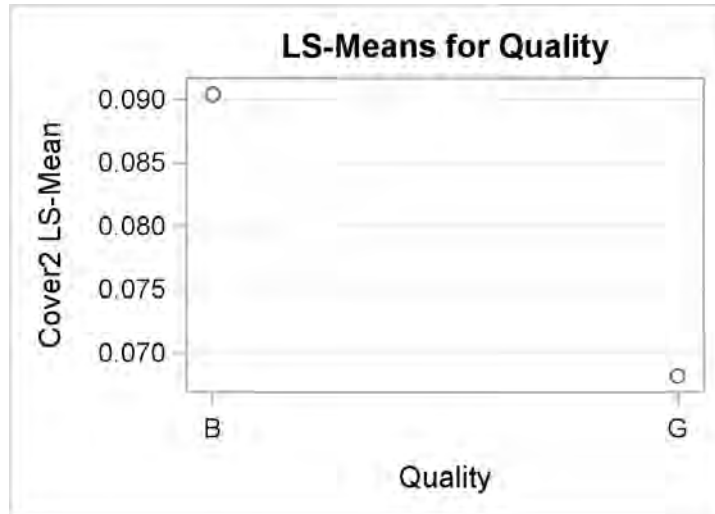
Depth	Cover2 LSMEAN	LSMEAN Number
12	0.16820980	1
18	0.05851437	2
24	0.01111645	3

Least Squares Means for effect Depth Pr > |t| for H0: LSMean(i)=LSMean(j) Dependent Variable: Cover2			
i/j	1	2	3
1		0.0183	0.0003
2	0.0183		0.4656
3	0.0003	0.4656	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Quality	Cover2 LSMEAN	H0:LSMean1=LSMean2 Pr > |t|
B	0.09039665	0.5801
G	0.06816376	



Species: Echinochloa crusgalli

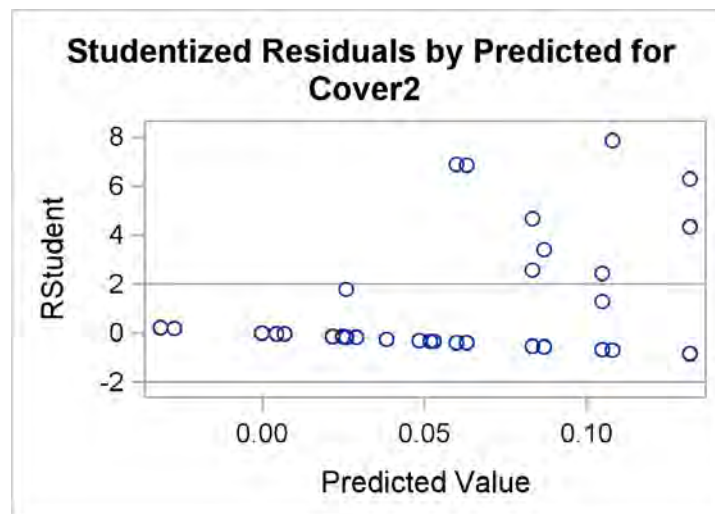
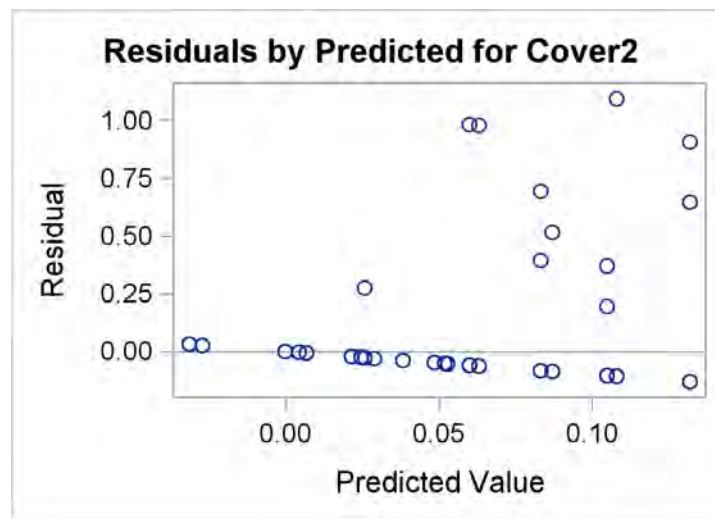
The GLM Procedure

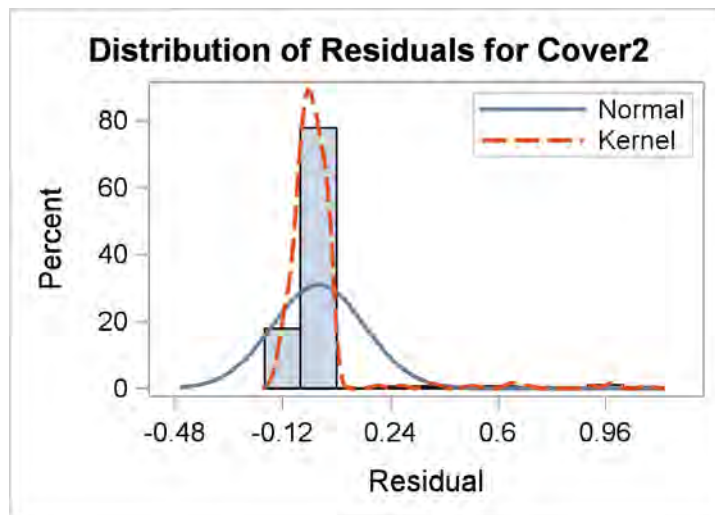
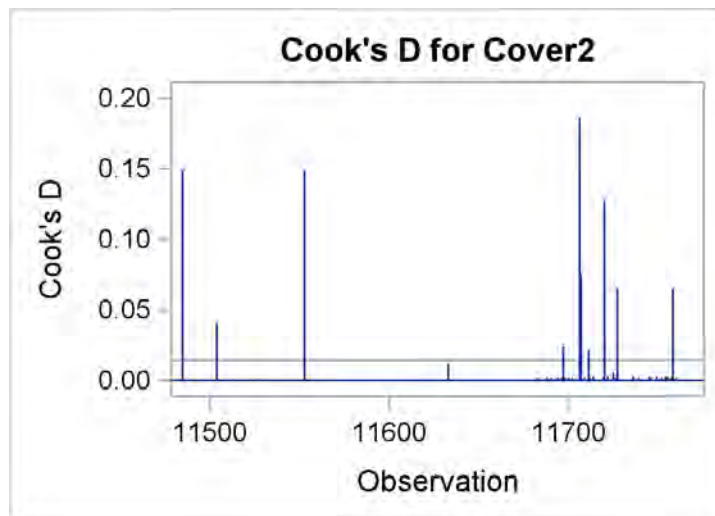
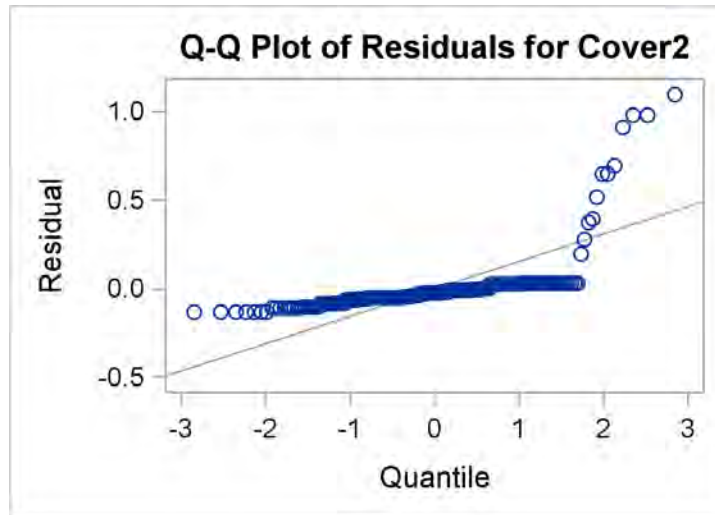
Dependent Variable: Cover2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	0.56873256	0.06319251	2.56	0.0078
Error	270	6.67233018	0.02471233		
Corrected Total	279	7.24106274			

R-Square	Coeff Var	Root MSE	Cover2 Mean
0.078543	498.9896	0.157202	0.031504

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	0.25593238	0.04265540	1.73	0.1150
Depth	2	0.30841953	0.15420976	6.24	0.0022
Quality	1	0.05148853	0.05148853	2.08	0.1501

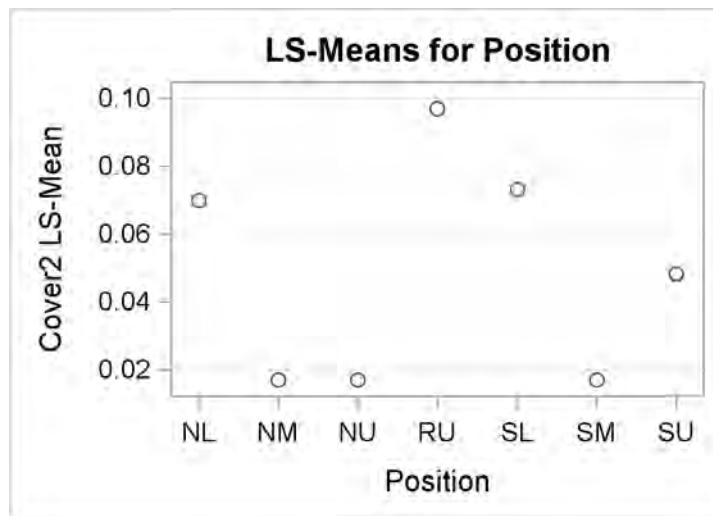




The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Position	Cover2 LSMEAN	LSMEAN Number
NL	0.06990816	1
NM	0.01689382	2
NU	0.01689382	3
RU	0.09688769	4
SL	0.07303163	5
SM	0.01689382	6
SU	0.04827563	7

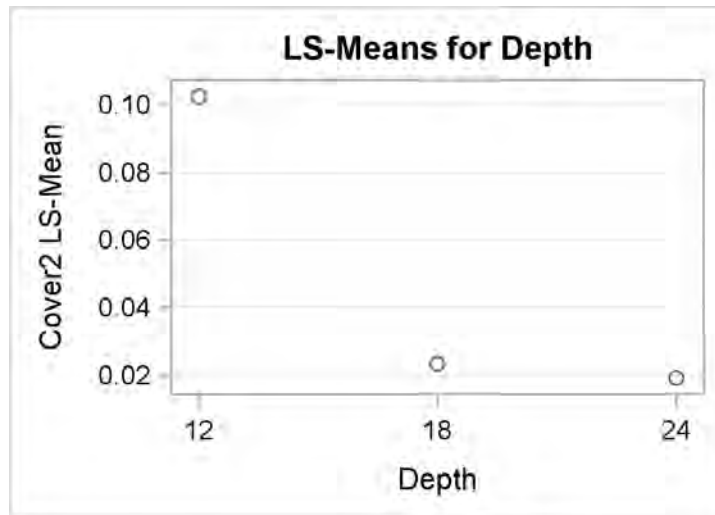
Least Squares Means for effect Position Pr > |t| for H0: LSMean(i)=LSMean(j) Dependent Variable: Cover2							
i/j	1	2	3	4	5	6	7
1		0.7398	0.7398	0.9878	1.0000	0.7398	0.9963
2	0.7398		1.0000	0.2597	0.6844	1.0000	0.9734
3	0.7398	1.0000		0.2597	0.6844	1.0000	0.9734
4	0.9878	0.2597	0.2597		0.9937	0.2597	0.8106
5	1.0000	0.6844	0.6844	0.9937		0.6844	0.9923
6	0.7398	1.0000	1.0000	0.2597	0.6844		0.9734
7	0.9963	0.9734	0.9734	0.8106	0.9923	0.9734	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

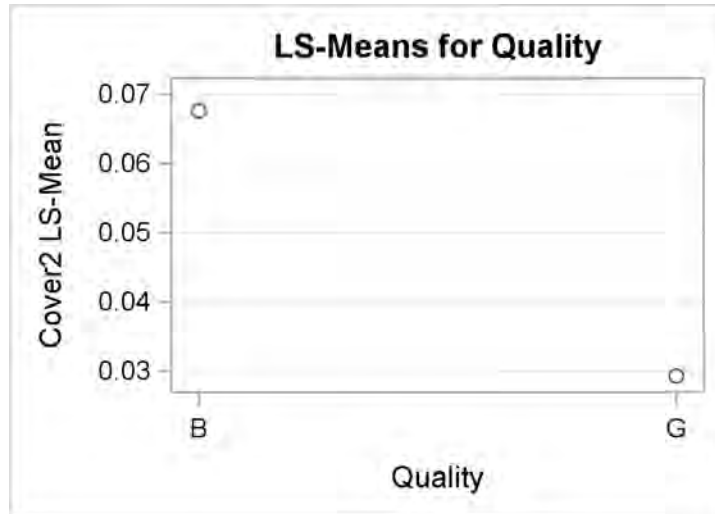
Depth	Cover2 LSMEAN	LSMEAN Number
12	0.10253802	1
18	0.02347790	2
24	0.01917747	3

Least Squares Means for effect Depth Pr > |t| for H0: LSMean(i)=LSMean(j) Dependent Variable: Cover2			
i/j	1	2	3
1		0.0089	0.0054
2	0.0089		0.9857
3	0.0054	0.9857	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Quality	Cover2 LSMEAN	H0:LSMean1=LSMean2 Pr > |t|
B	0.06757526	0.1501
G	0.02922033	



Species: Euphorbia maculata

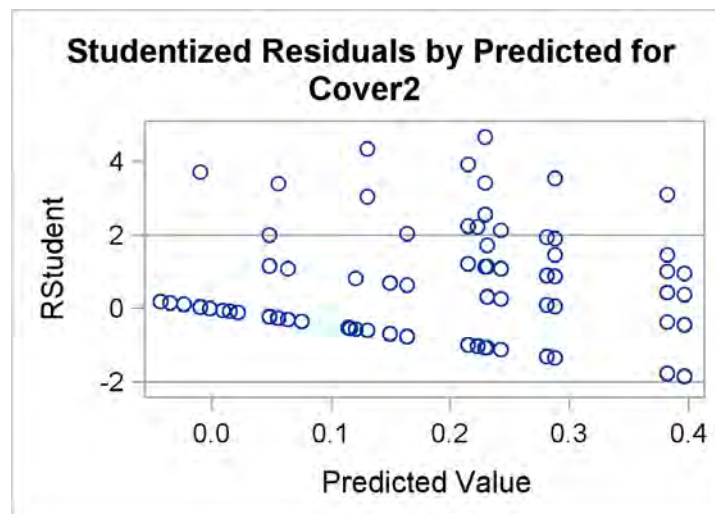
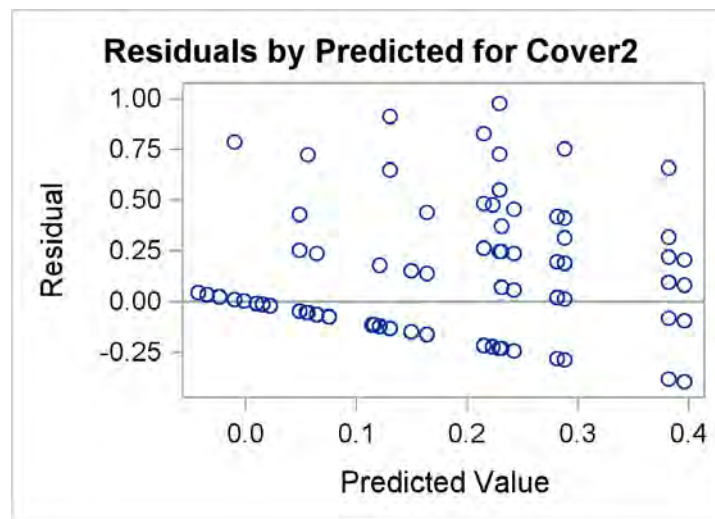
The GLM Procedure

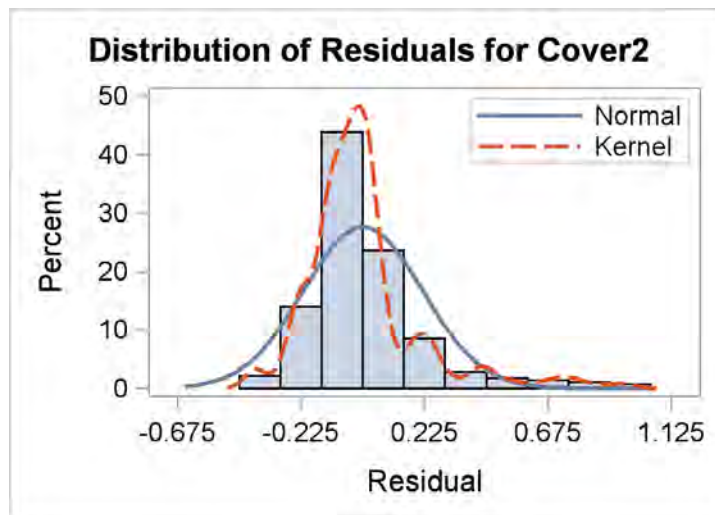
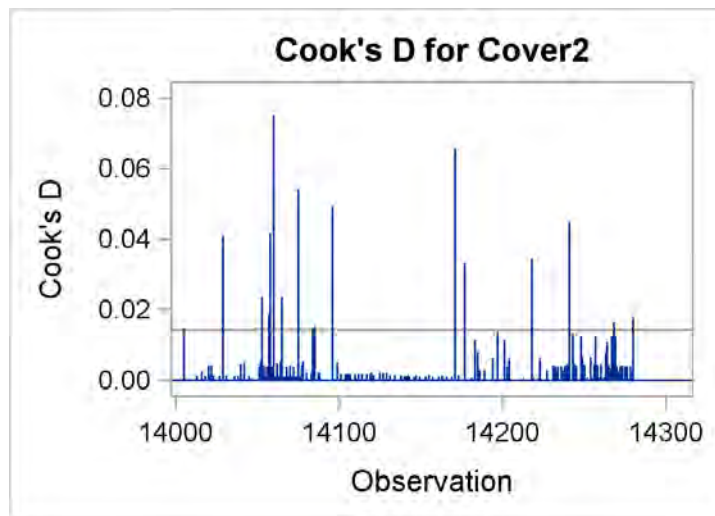
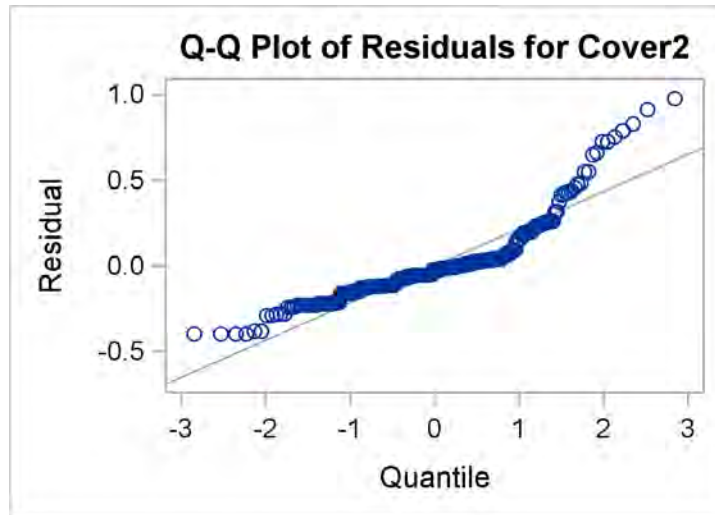
Dependent Variable: Cover2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	4.14554529	0.46061614	9.50	<.0001
Error	270	13.09718689	0.04850810		
Corrected Total	279	17.24273219			

R-Square	Coeff Var	Root MSE	Cover2 Mean
0.240423	175.4935	0.220246	0.125501

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	1.20494381	0.20082397	4.14	0.0005
Depth	2	0.35485793	0.17742897	3.66	0.0271
Quality	1	2.47559596	2.47559596	51.03	<.0001

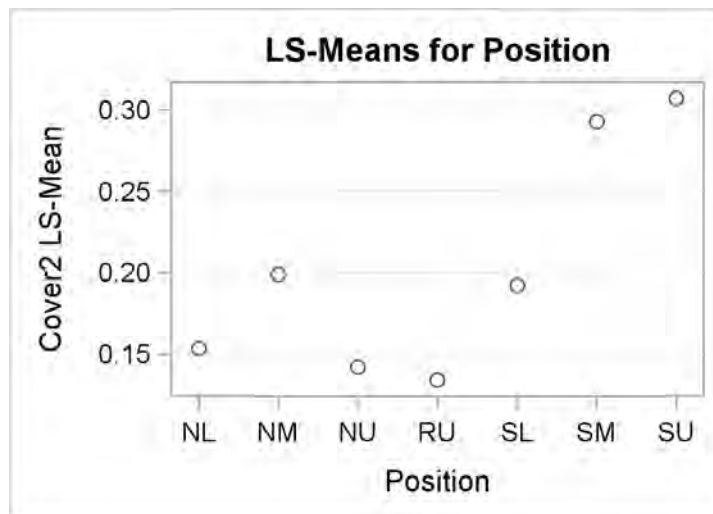




The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Position	Cover2 LSMEAN	LSMEAN Number
NL	0.15333027	1
NM	0.19881886	2
NU	0.14210295	3
RU	0.13387648	4
SL	0.19223783	5
SM	0.29316352	6
SU	0.30743771	7

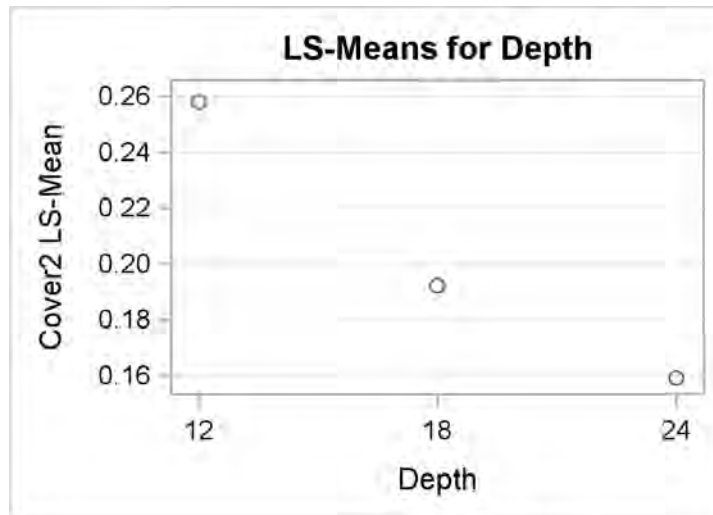
Least Squares Means for effect Position Pr > |t| for H0: LSMean(i)=LSMean(j) Dependent Variable: Cover2							
i/j	1	2	3	4	5	6	7
1		0.9685	1.0000	0.9997	0.9858	0.0715	0.0316
2	0.9685		0.9112	0.8428	1.0000	0.4717	0.2960
3	1.0000	0.9112		1.0000	0.9496	0.0379	0.0155
4	0.9997	0.8428	1.0000		0.8994	0.0229	0.0089
5	0.9858	1.0000	0.9496	0.8994		0.3862	0.2294
6	0.0715	0.4717	0.0379	0.0229	0.3862		1.0000
7	0.0316	0.2960	0.0155	0.0089	0.2294	1.0000	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

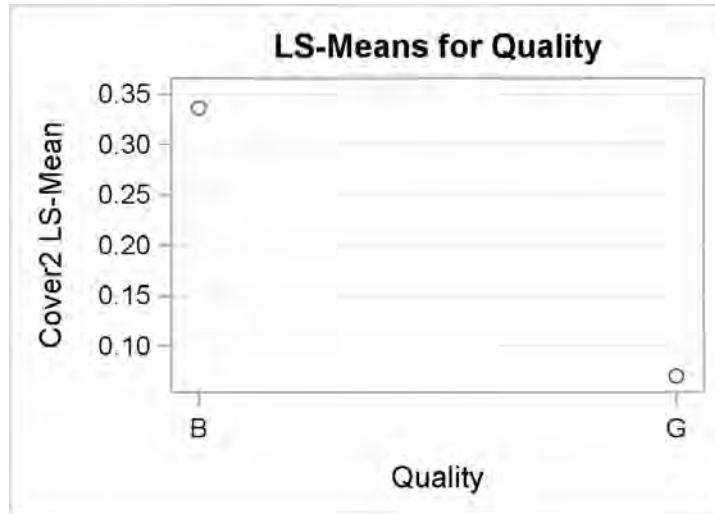
Depth	Cover2 LSMEAN	LSMEAN Number
12	0.25788714	1
18	0.19212871	2
24	0.15897028	3

Least Squares Means for effect Depth Pr > |t| for H0: LSMean(i)=LSMean(j) Dependent Variable: Cover2			
i/j	1	2	3
1		0.1829	0.0227
2	0.1829		0.6467
3	0.0227	0.6467	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Quality	Cover2 LSMEAN	H0:LSMean1=LSMean2 Pr > |t|
B	0.33597217	<.0001
G	0.07001858	



Species: Festuca rubra

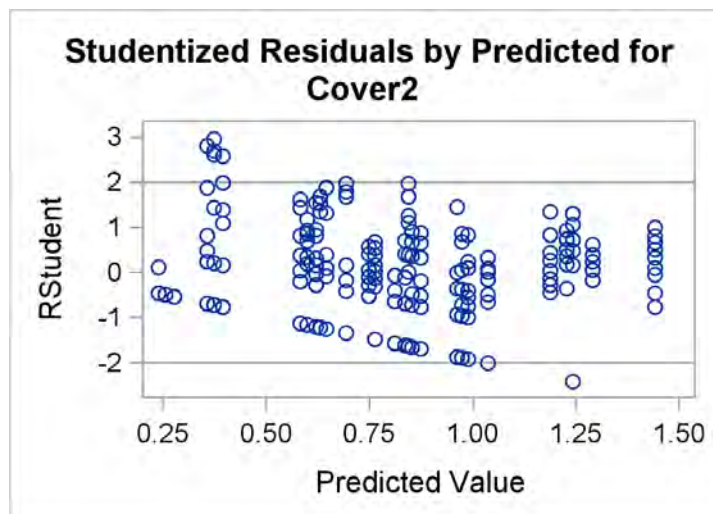
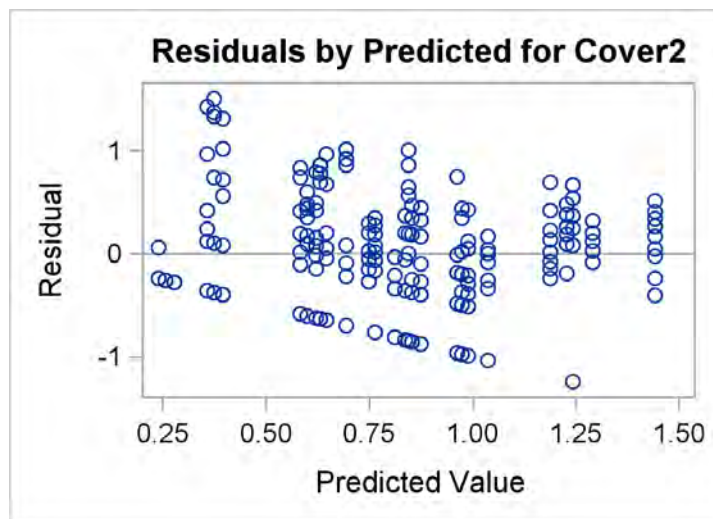
The GLM Procedure

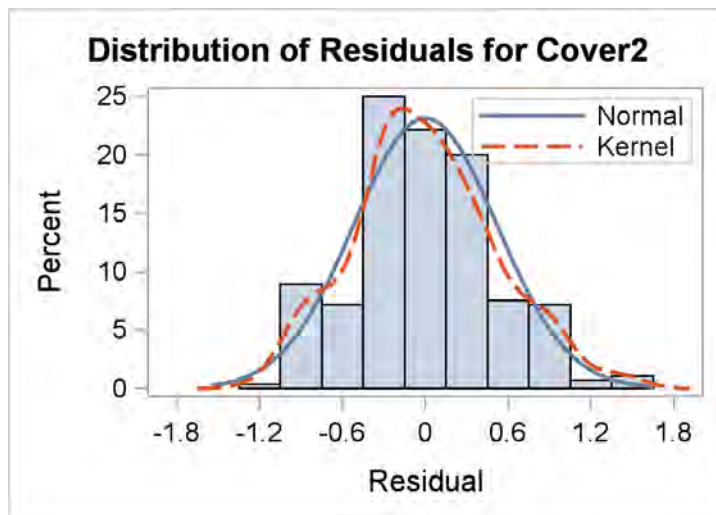
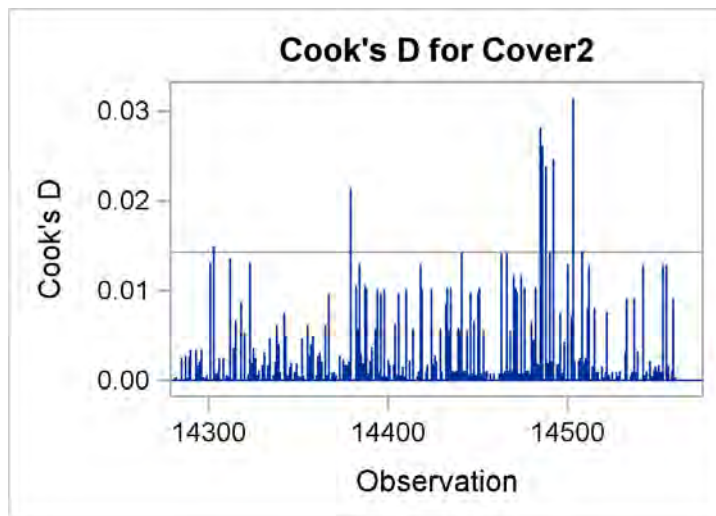
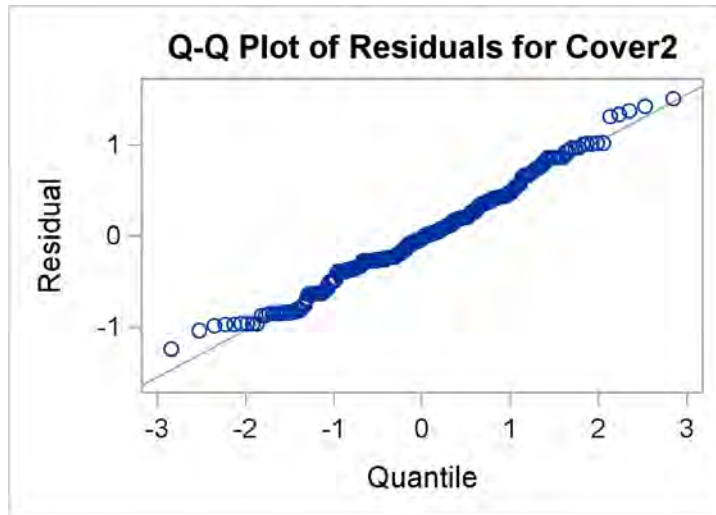
Dependent Variable: Cover2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	29.4162306	3.2684701	11.79	<.0001
Error	270	74.8376300	0.2771764		
Corrected Total	279	104.2538607			

R-Square	Coeff Var	Root MSE	Cover2 Mean
0.282160	67.73176	0.526475	0.777295

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	14.82434838	2.47072473	8.91	<.0001
Depth	2	14.01006822	7.00503411	25.27	<.0001
Quality	1	2.25081120	2.25081120	8.12	0.0047



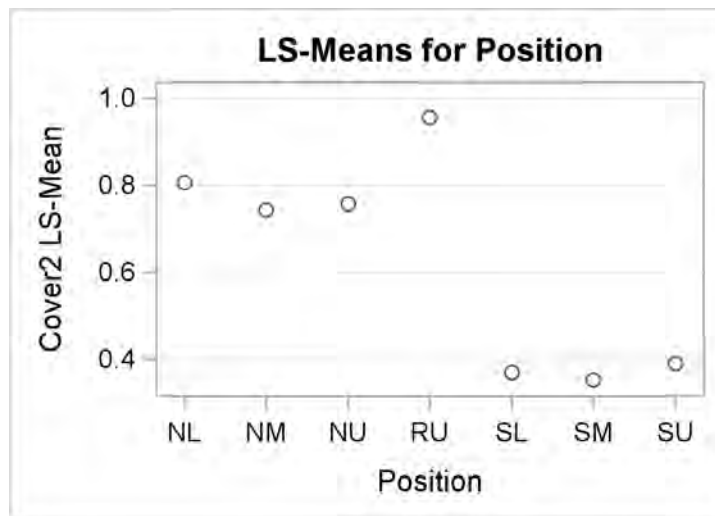


The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Position	Cover2 LSMEAN	LSMEAN Number
NL	0.80556901	1
NM	0.74296026	2
NU	0.75706434	3
RU	0.95609544	4
SL	0.36800495	5
SM	0.35089762	6
SU	0.38867424	7

Least Squares Means for effect Position
Pr > |t| for H0: LSMean(i)=LSMean(j)
Dependent Variable: Cover2

i/j	1	2	3	4	5	6	7
1		0.9984	0.9996	0.8612	0.0045	0.0027	0.0084
2	0.9984		1.0000	0.5421	0.0267	0.0169	0.0448
3	0.9996	1.0000		0.6229	0.0184	0.0115	0.0316
4	0.8612	0.5421	0.6229		<.0001	<.0001	<.0001
5	0.0045	0.0267	0.0184	<.0001		1.0000	1.0000
6	0.0027	0.0169	0.0115	<.0001	1.0000		0.9999
7	0.0084	0.0448	0.0316	<.0001	1.0000	0.9999	

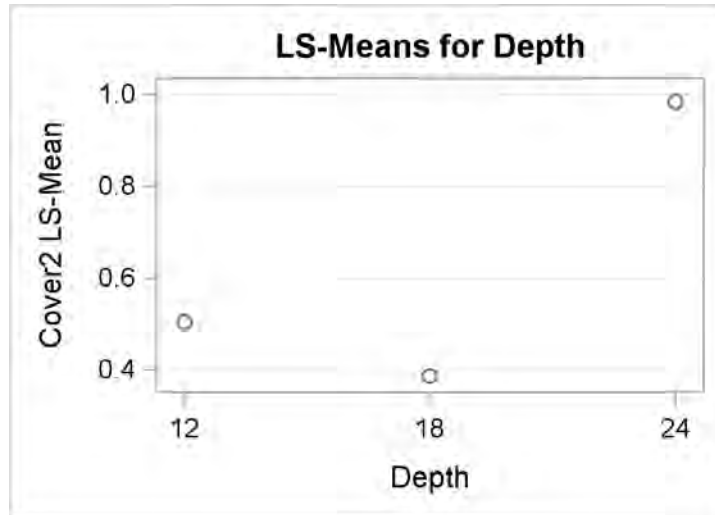


The GLM Procedure
 Least Squares Means
 Adjustment for Multiple Comparisons: Tukey-Kramer

Depth	Cover2 LSMEAN	LSMEAN Number
12	0.50377818	1
18	0.38571962	2
24	0.98304471	3

Least Squares Means for effect Depth
 Pr > |t| for H0: LSMean(i)=LSMean(j)
 Dependent Variable: Cover2

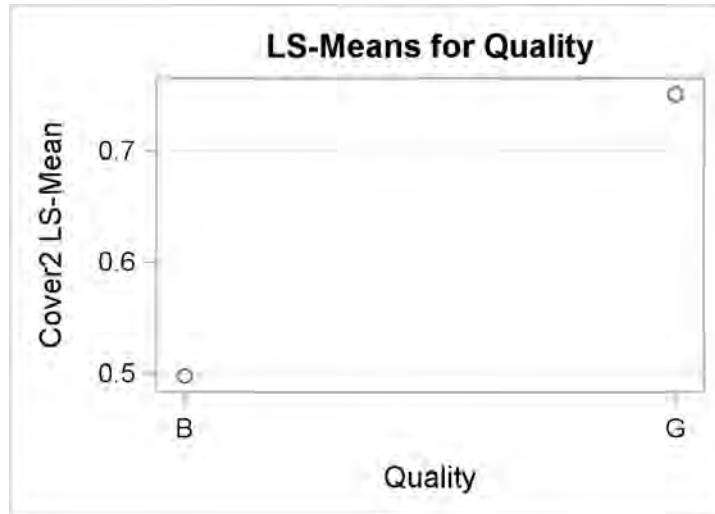
i/j	1	2	3
1		0.3816	<.0001
2	0.3816		<.0001
3	<.0001	<.0001	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

H0:LSMean1=LSMean2

Quality	Cover2 LSMEAN	Pr > |t|
B	0.49738485	0.0047
G	0.75097683	



Species: Lespedeza capitata

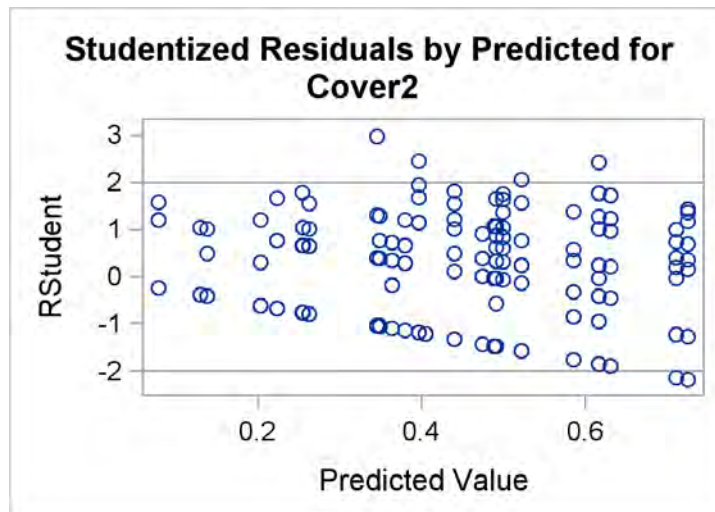
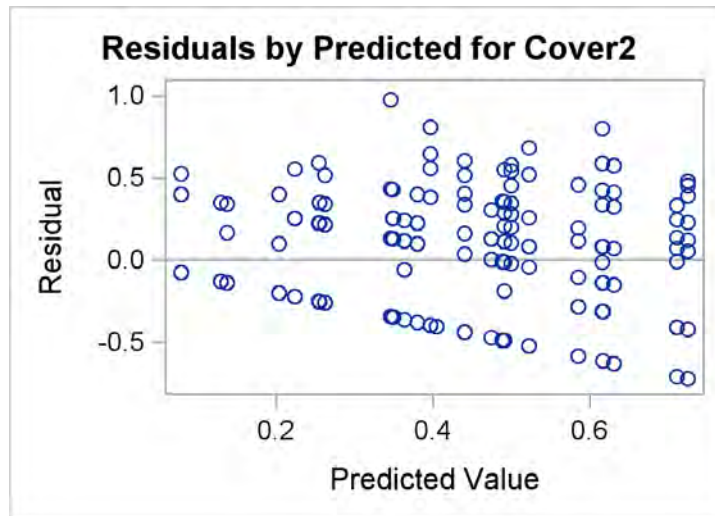
The GLM Procedure

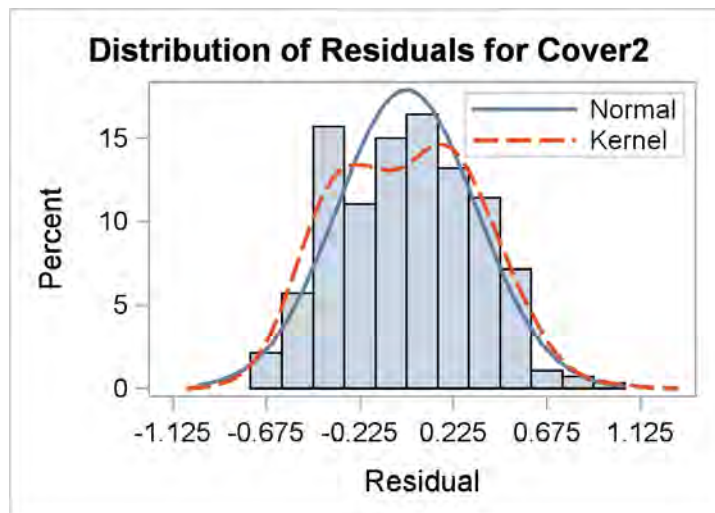
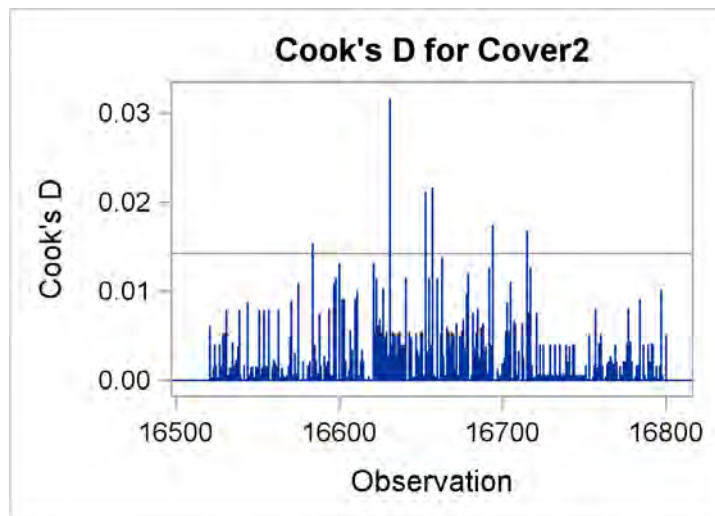
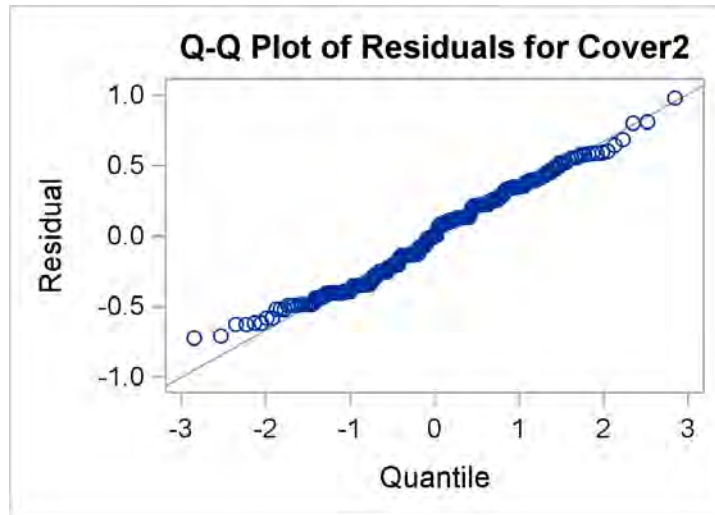
Dependent Variable: Cover2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	8.23918942	0.91546549	7.92	<.0001
Error	270	31.21671160	0.11561745		
Corrected Total	279	39.45590102			

R-Square	Coeff Var	Root MSE	Cover2 Mean
0.208820	83.29344	0.340026	0.408226

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	2.93846825	0.48974471	4.24	0.0004
Depth	2	4.92451496	2.46225748	21.30	<.0001
Quality	1	0.70750757	0.70750757	6.12	0.0140



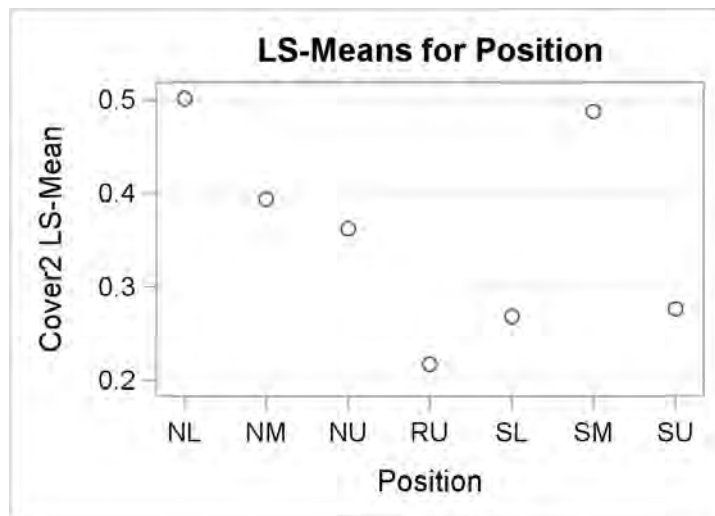


The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Position	Cover2 LSMEAN	LSMEAN Number
NL	0.50218404	1
NM	0.39387371	2
NU	0.36226015	3
RU	0.21730377	4
SL	0.26822836	5
SM	0.48783685	6
SU	0.27641419	7

Least Squares Means for effect Position
Pr > |t| for H0: LSMean(i)=LSMean(j)
Dependent Variable: Cover2

i/j	1	2	3	4	5	6	7
1		0.7882	0.5220	0.0041	0.0369	1.0000	0.0502
2	0.7882		0.9996	0.2372	0.6482	0.8796	0.7173
3	0.5220	0.9996		0.4778	0.8792	0.6488	0.9187
4	0.0041	0.2372	0.4778		0.9941	0.0079	0.9869
5	0.0369	0.6482	0.8792	0.9941		0.0627	1.0000
6	1.0000	0.8796	0.6488	0.0079	0.0627		0.0834
7	0.0502	0.7173	0.9187	0.9869	1.0000	0.0834	

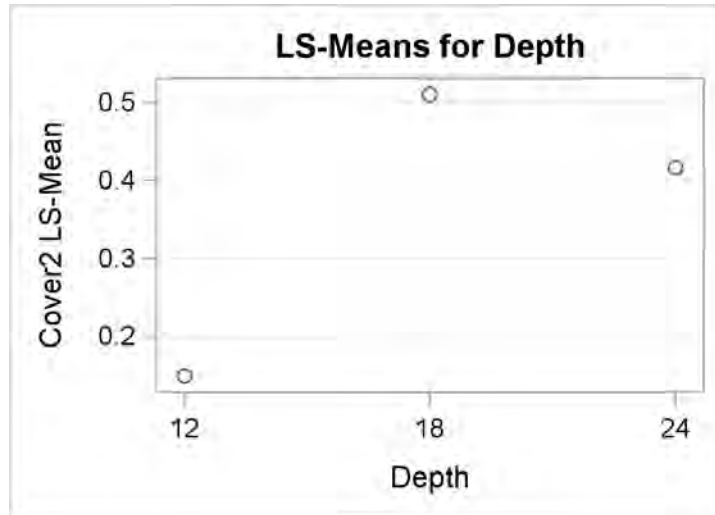


The GLM Procedure
 Least Squares Means
 Adjustment for Multiple Comparisons: Tukey-Kramer

Depth	Cover2 LSMEAN	LSMEAN Number
12	0.14872448	1
18	0.51034935	2
24	0.41582662	3

Least Squares Means for effect Depth
 Pr > |t| for H0: LSMean(i)=LSMean(j)
 Dependent Variable: Cover2

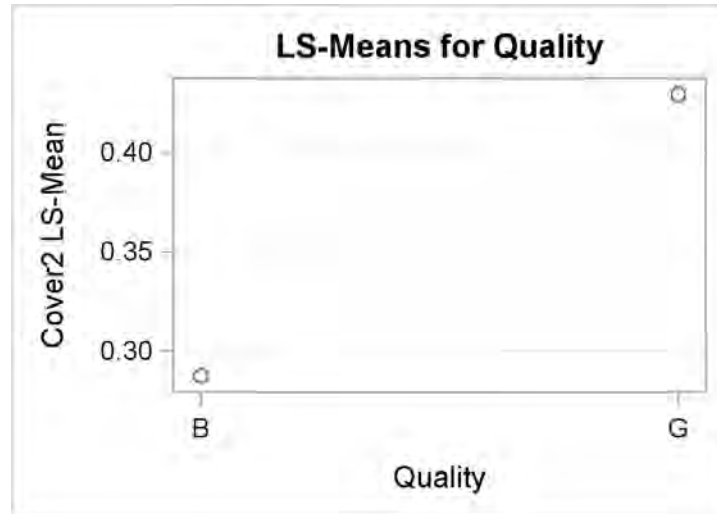
i/j	1	2	3
1		<.0001	<.0001
2	<.0001		0.2288
3	<.0001	0.2288	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

H0:LSMean1=LSMean2

Quality	Cover2 LSMEAN	Pr > |t|
B	0.28721129	0.0140
G	0.42938901	



Species: Lolium multiflorum

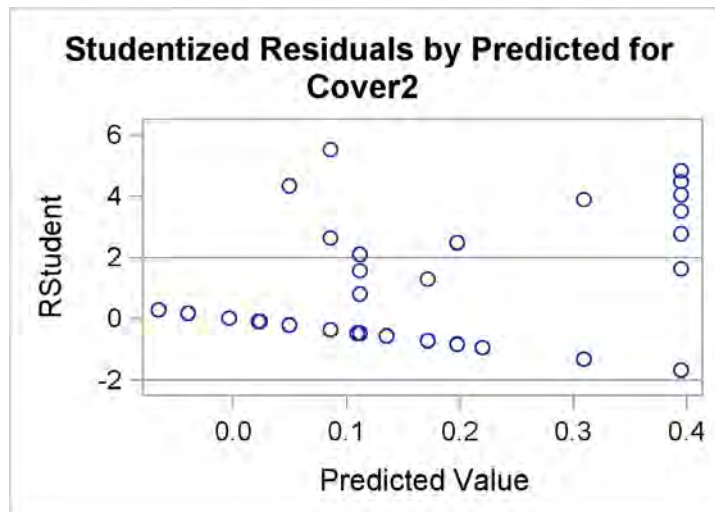
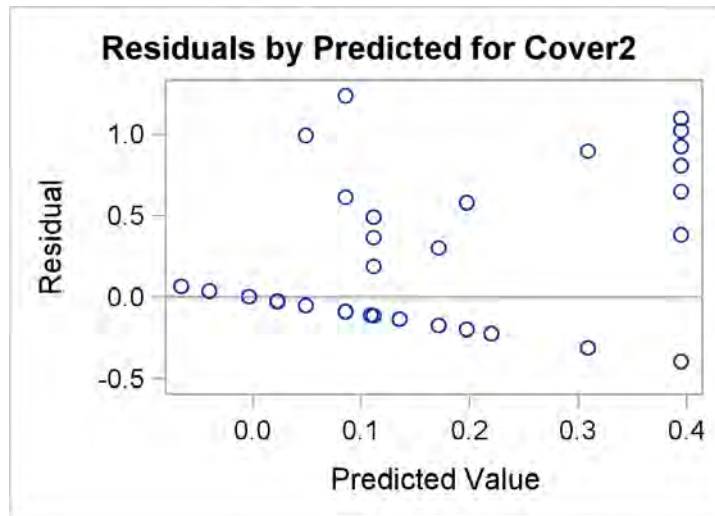
The GLM Procedure

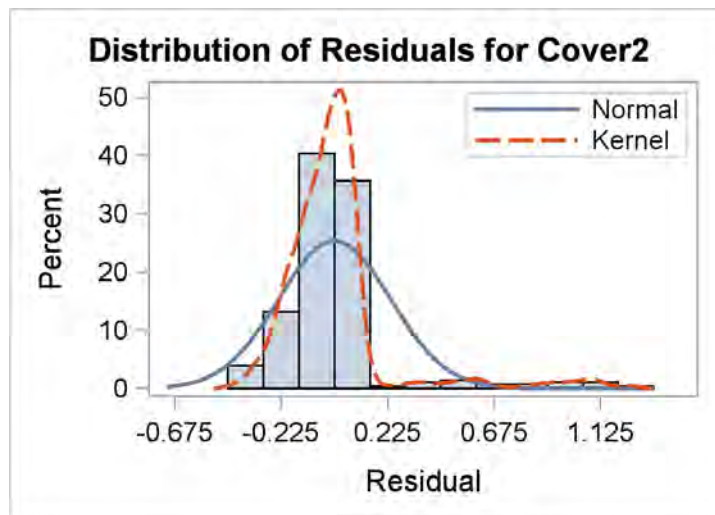
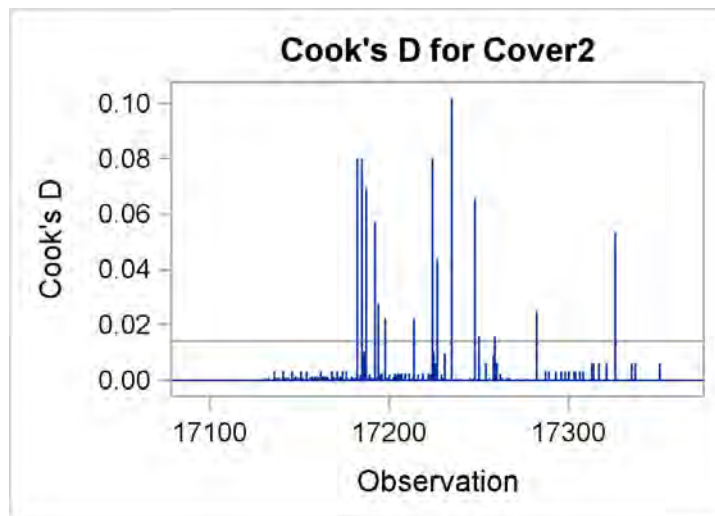
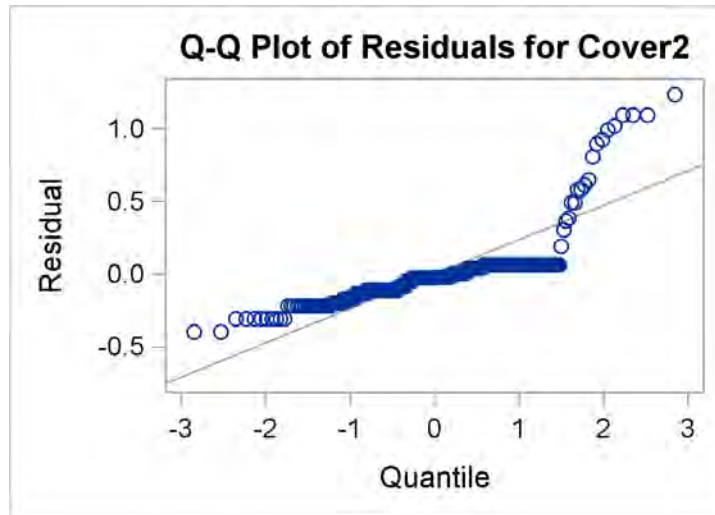
Dependent Variable: Cover2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	4.02629996	0.44736666	7.76	<.0001
Error	270	15.56502817	0.05764825		
Corrected Total	279	19.59132813			

R-Square	Coeff Var	Root MSE	Cover2 Mean
0.205514	363.0551	0.240101	0.066133

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	2.54287856	0.42381309	7.35	<.0001
Depth	2	1.07521685	0.53760842	9.33	0.0001
Quality	1	1.07509135	1.07509135	18.65	<.0001



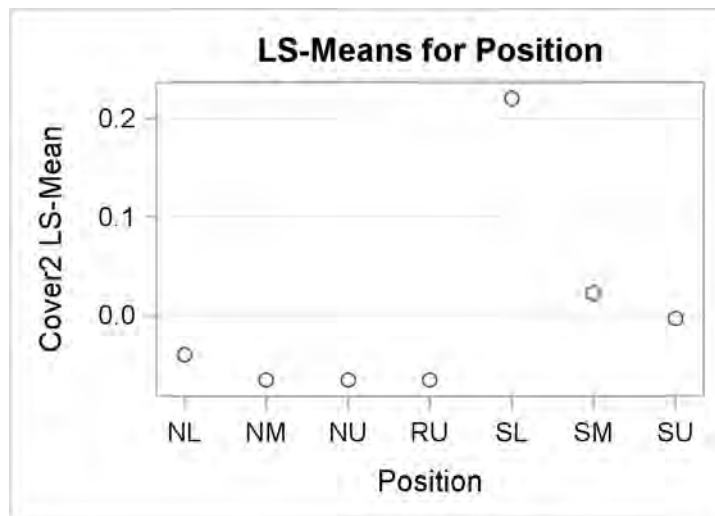


The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Position	Cover2 LSMEAN	LSMEAN Number
NL	-0.03955191	1
NM	-0.06558673	2
NU	-0.06558673	3
RU	-0.06558673	4
SL	0.22038981	5
SM	0.02287761	6
SU	-0.00312897	7

Least Squares Means for effect Position
Pr > |t| for H0: LSMean(i)=LSMean(j)
Dependent Variable: Cover2

i/j	1	2	3	4	5	6	7
1		0.9990	0.9990	0.9990	<.0001	0.9074	0.9937
2	0.9990		1.0000	1.0000	<.0001	0.6514	0.9072
3	0.9990	1.0000		1.0000	<.0001	0.6514	0.9072
4	0.9990	1.0000	1.0000		<.0001	0.6514	0.9072
5	<.0001	<.0001	<.0001	<.0001		0.0052	0.0008
6	0.9074	0.6514	0.6514	0.6514	0.0052		0.9990
7	0.9937	0.9072	0.9072	0.9072	0.0008	0.9990	

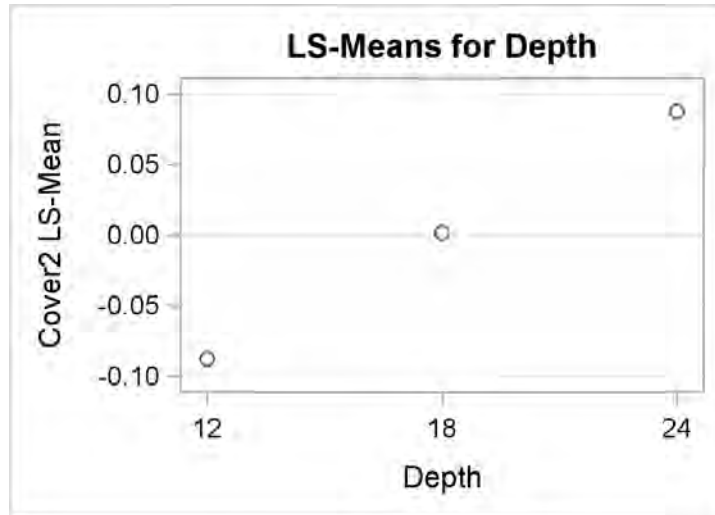


The GLM Procedure
 Least Squares Means
 Adjustment for Multiple Comparisons: Tukey-Kramer

Depth	Cover2 LSMEAN	LSMEAN Number
12	-0.08763118	1
18	0.00163986	2
24	0.08763118	3

Least Squares Means for effect Depth
 Pr > |t| for H0: LSMean(i)=LSMean(j)
 Dependent Variable: Cover2

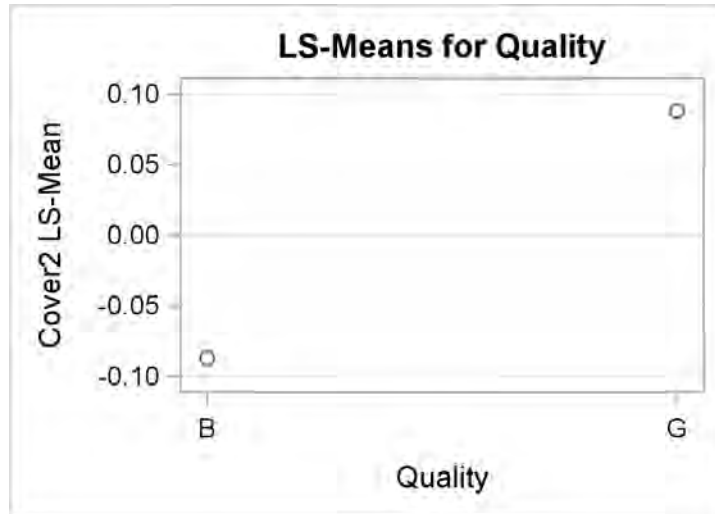
i/j	1	2	3
1		0.0730	<.0001
2	0.0730		0.0879
3	<.0001	0.0879	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

H0:LSMean1=LSMean2

Quality	Cover2 LSMEAN	Pr > |t|
B	-0.08708456	<.0001
G	0.08817780	



Species: Lotus corniculatus

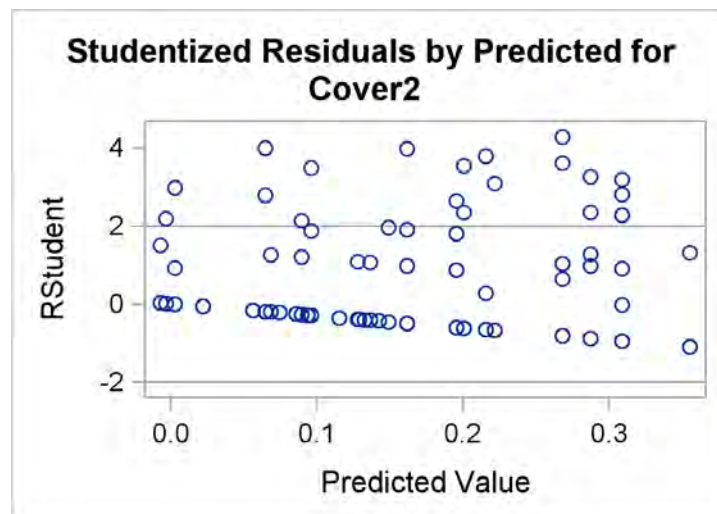
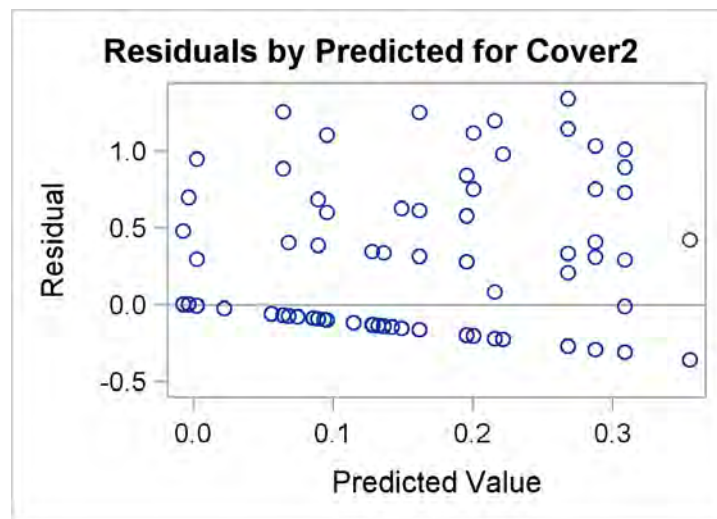
The GLM Procedure

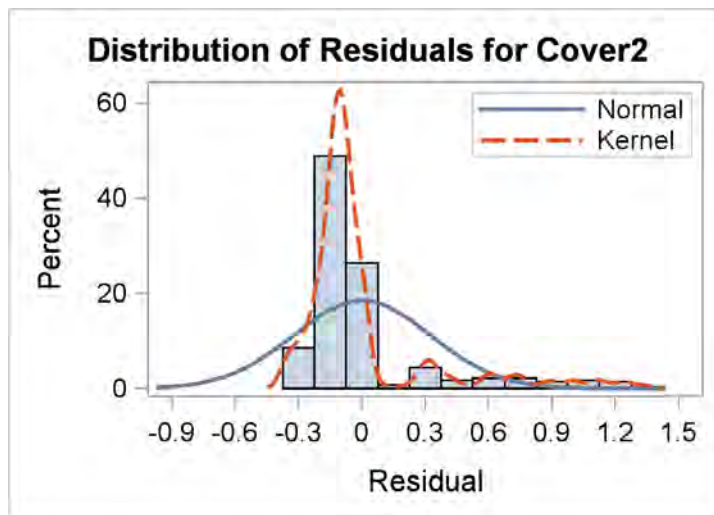
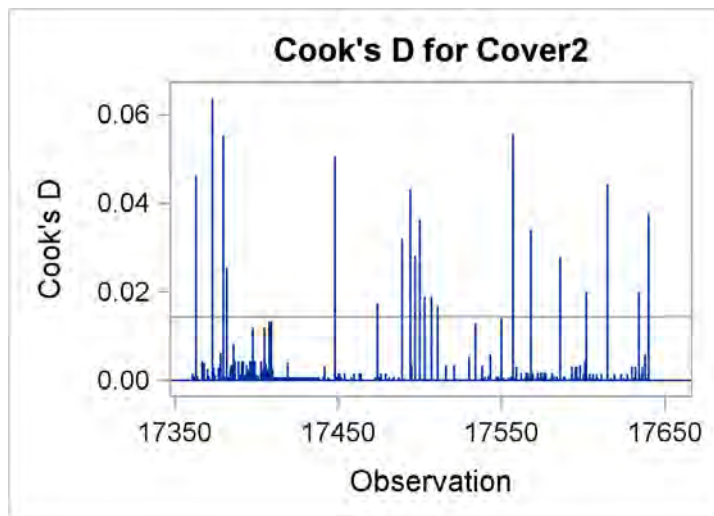
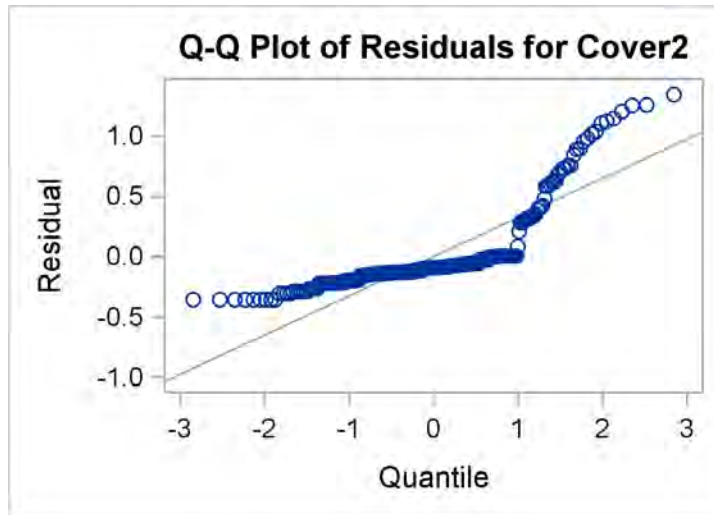
Dependent Variable: Cover2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	2.39696774	0.26632975	2.44	0.0109
Error	270	29.42565582	0.10898391		
Corrected Total	279	31.82262356			

R-Square	Coeff Var	Root MSE	Cover2 Mean
0.075323	243.9521	0.330127	0.135325

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	1.68824358	0.28137393	2.58	0.0189
Depth	2	0.70699945	0.35349973	3.24	0.0405
Quality	1	0.01566772	0.01566772	0.14	0.7049



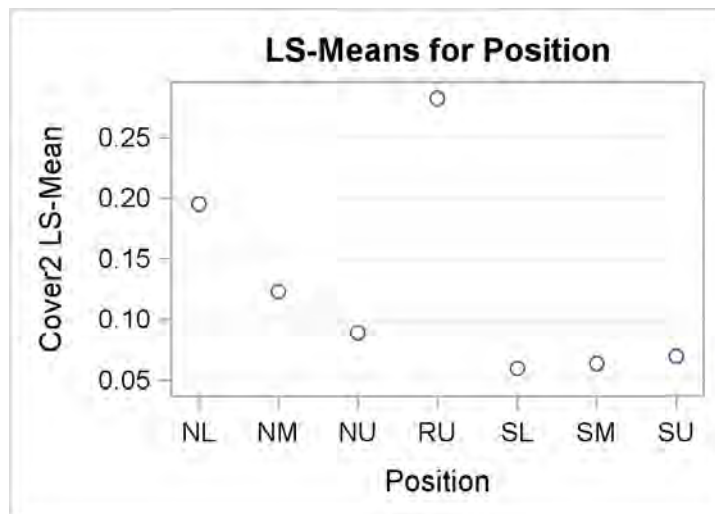


The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Position	Cover2 LSMEAN	LSMEAN Number
NL	0.19559355	1
NM	0.12296233	2
NU	0.08899200	3
RU	0.28262933	4
SL	0.05969362	5
SM	0.06356617	6
SU	0.06981311	7

Least Squares Means for effect Position
Pr > |t| for H0: LSMean(i)=LSMean(j)
Dependent Variable: Cover2

i/j	1	2	3	4	5	6	7
1		0.9572	0.7772	0.9016	0.5216	0.5570	0.6140
2	0.9572		0.9993	0.3193	0.9784	0.9844	0.9913
3	0.7772	0.9993		0.1231	0.9997	0.9999	1.0000
4	0.9016	0.3193	0.1231		0.0435	0.0504	0.0637
5	0.5216	0.9784	0.9997	0.0435		1.0000	1.0000
6	0.5570	0.9844	0.9999	0.0504	1.0000		1.0000
7	0.6140	0.9913	1.0000	0.0637	1.0000	1.0000	

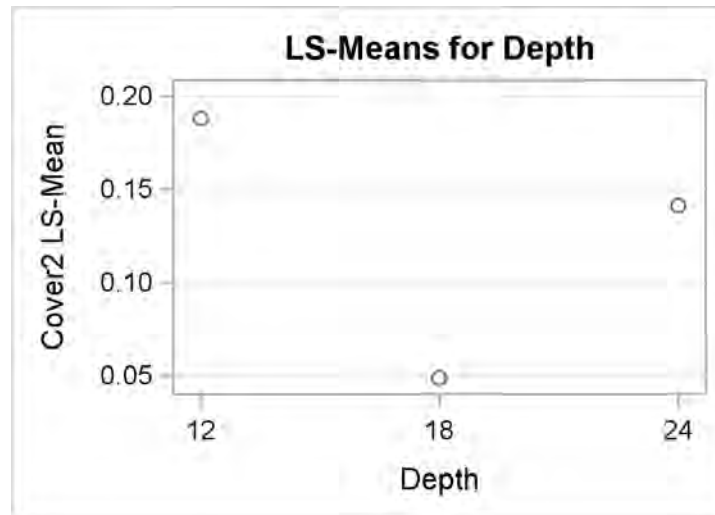


The GLM Procedure
 Least Squares Means
 Adjustment for Multiple Comparisons: Tukey-Kramer

Depth	Cover2 LSMEAN	LSMEAN Number
12	0.18826183	1
18	0.04866924	2
24	0.14160469	3

Least Squares Means for effect Depth
 Pr > |t| for H0: LSMean(i)=LSMean(j)
 Dependent Variable: Cover2

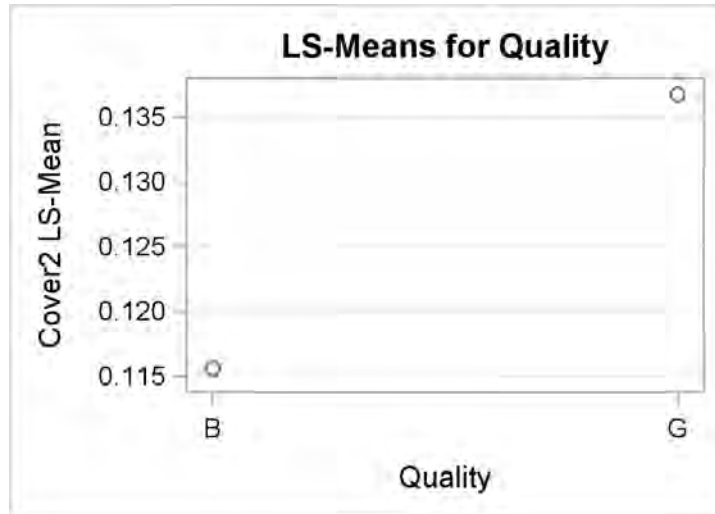
i/j	1	2	3
1		0.0345	0.6809
2	0.0345		0.2204
3	0.6809	0.2204	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

H0:LSMean1=LSMean2

Quality	Cover2 LSMEAN	Pr > |t|
B	0.11559973	0.7049
G	0.13675745	



Species: Lupinus perennis

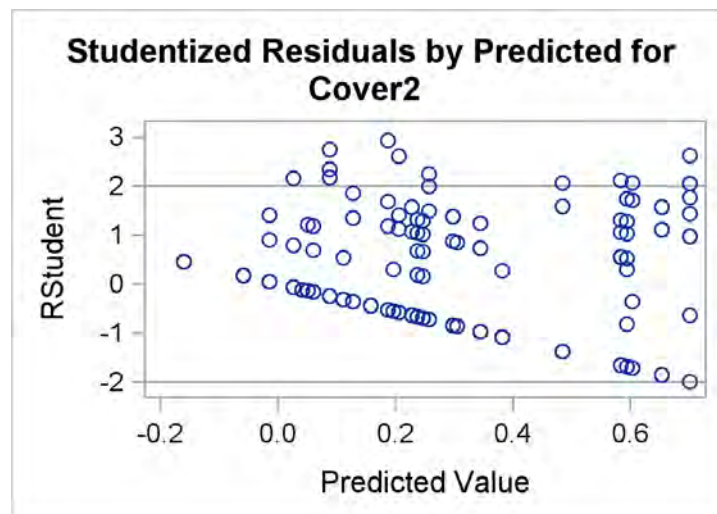
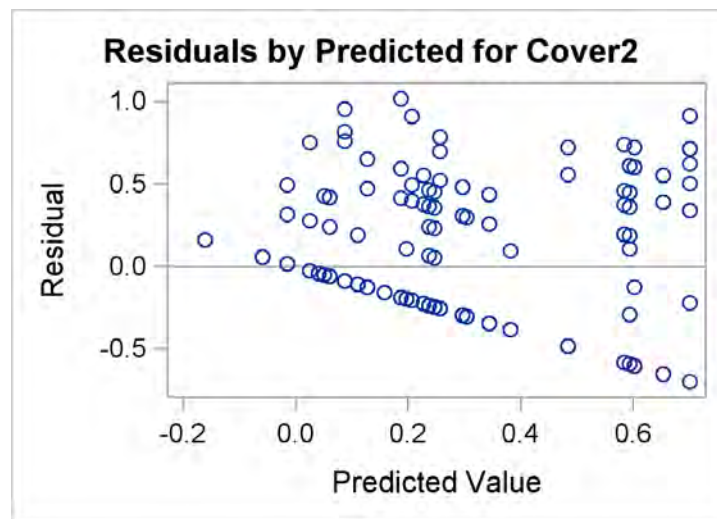
The GLM Procedure

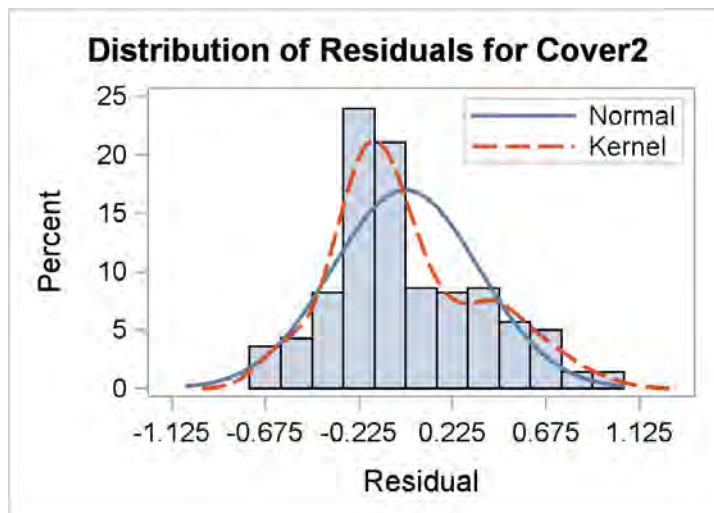
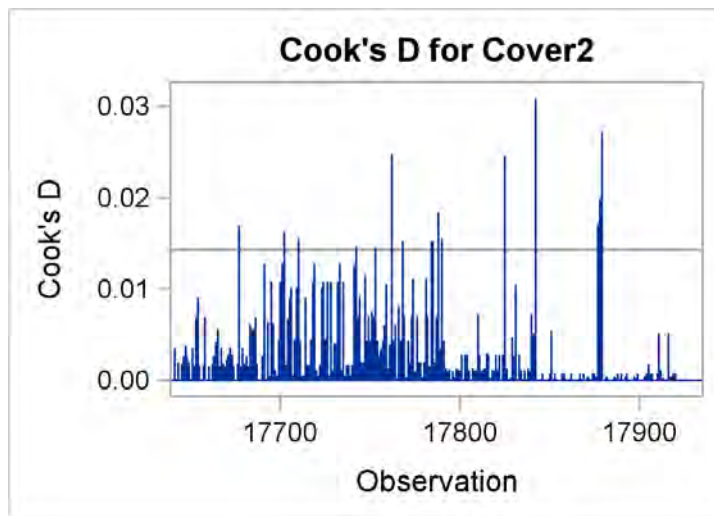
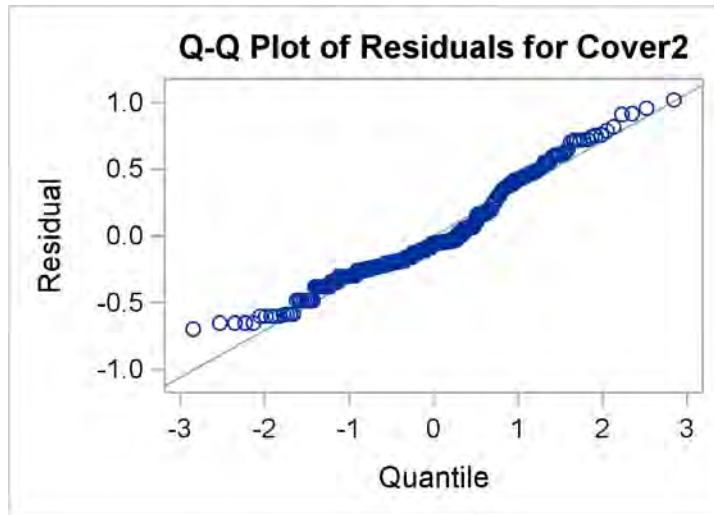
Dependent Variable: Cover2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	13.87174532	1.54130504	11.99	<.0001
Error	270	34.70789583	0.12854776		
Corrected Total	279	48.57964115			

R-Square	Coeff Var	Root MSE	Cover2 Mean
0.285546	144.7430	0.358536	0.247705

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	2.74187743	0.45697957	3.55	0.0021
Depth	2	11.03221534	5.51610767	42.91	<.0001
Quality	1	4.43926011	4.43926011	34.53	<.0001



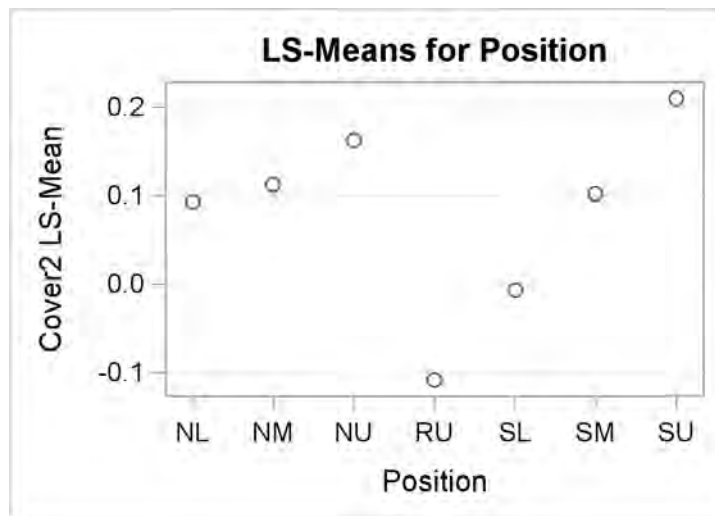


The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Position	Cover2 LSMEAN	LSMEAN Number
NL	0.09258691	1
NM	0.11174005	2
NU	0.16239188	3
RU	-0.10892680	4
SL	-0.00690553	5
SM	0.10220490	6
SU	0.20982645	7

Least Squares Means for effect Position
Pr > |t| for H0: LSMean(i)=LSMean(j)
Dependent Variable: Cover2

i/j	1	2	3	4	5	6	7
1	1.0000	0.9766	0.1585	0.8774	1.0000	0.7668	
2	1.0000	0.9957	0.0896	0.7566	1.0000	0.8846	
3	0.9766	0.9957	0.0142	0.3487	0.9891	0.9970	
4	0.1585	0.0896	0.0142	0.8639	0.1201	0.0017	
5	0.8774	0.7566	0.3487	0.8639	0.8219	0.1013	
6	1.0000	1.0000	0.9891	0.1201	0.8219	0.8313	
7	0.7668	0.8846	0.9970	0.0017	0.1013	0.8313	

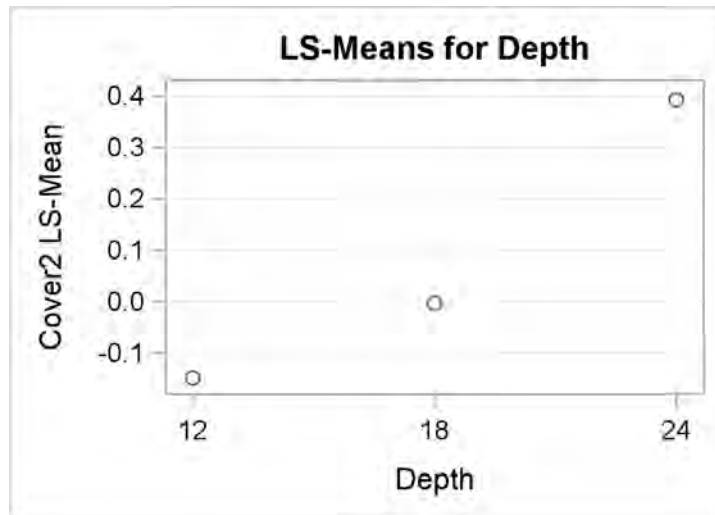


The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Depth	Cover2 LSMEAN	LSMEAN Number
12	-0.14902130	1
18	-0.00315717	2
24	0.39342898	3

Least Squares Means for effect Depth
Pr > |t| for H0: LSMean(i)=LSMean(j)
Dependent Variable: Cover2

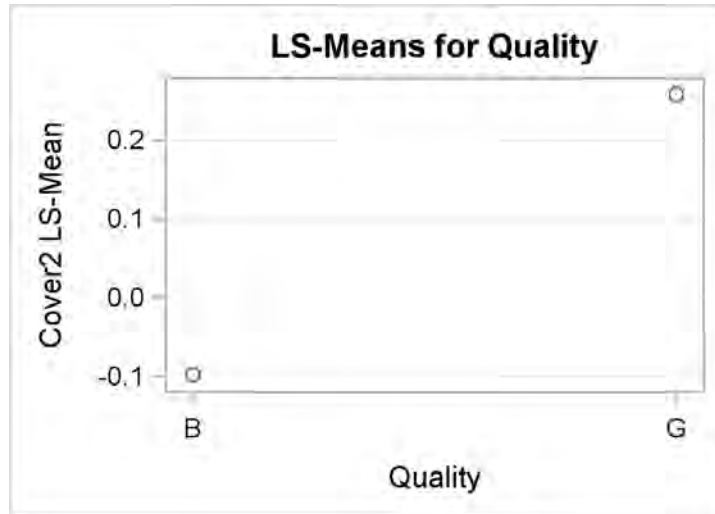
i/j	1	2	3
1		0.0441	<.0001
2	0.0441		<.0001
3	<.0001	<.0001	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

H0:LSMean1=LSMean2

Quality	Cover2 LSMEAN	Pr > |t|
B	-0.09765338	<.0001
G	0.25848705	



Species: *Medicago lupulina*

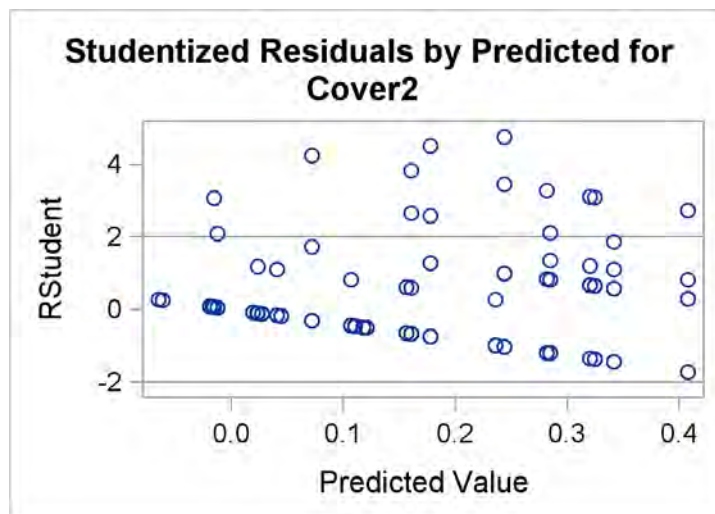
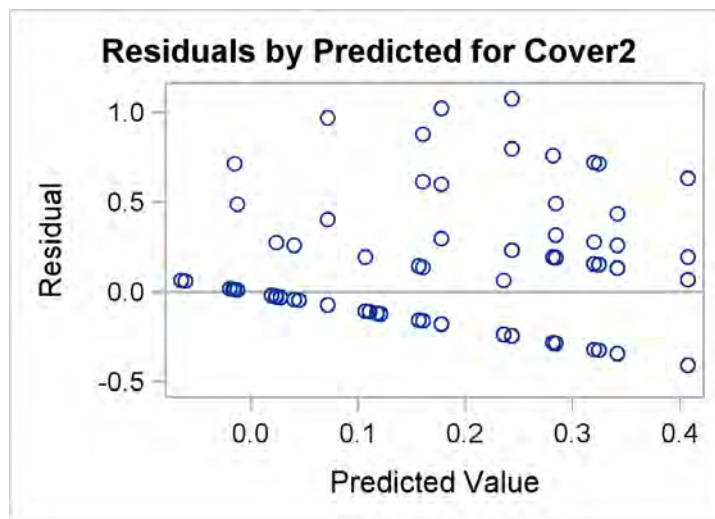
The GLM Procedure

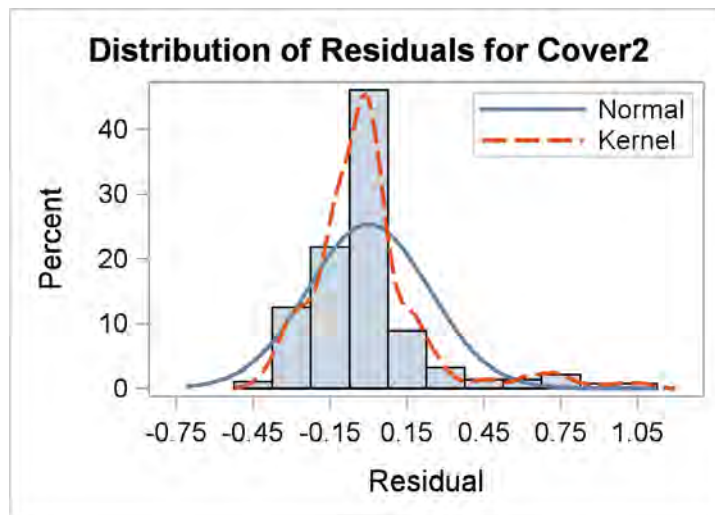
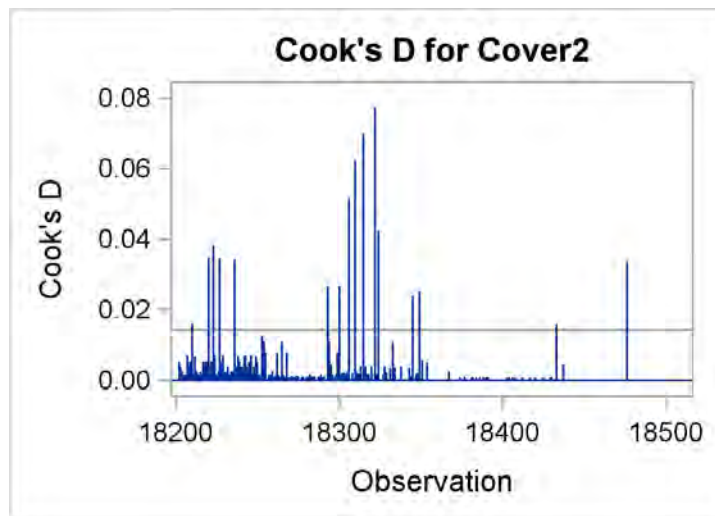
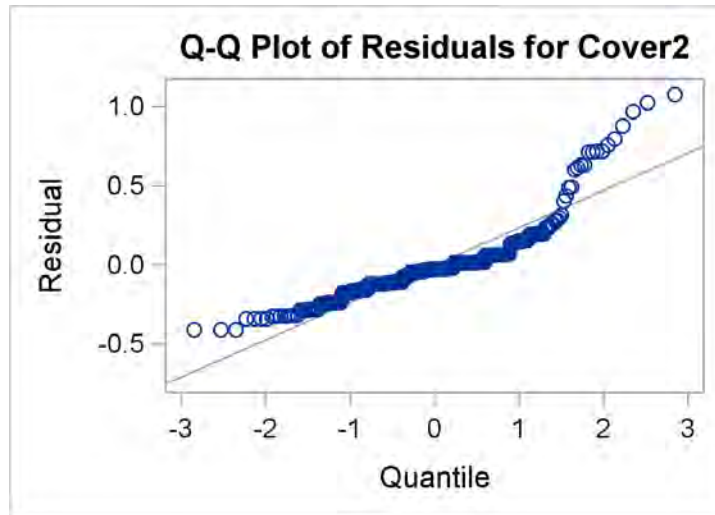
Dependent Variable: Cover2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	4.94467317	0.54940813	9.52	<.0001
Error	270	15.57755854	0.05769466		
Corrected Total	279	20.52223170			

R-Square	Coeff Var	Root MSE	Cover2 Mean
0.240942	194.7195	0.240197	0.123355

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	0.70804643	0.11800774	2.05	0.0600
Depth	2	0.85209927	0.42604964	7.38	0.0008
Quality	1	0.93960972	0.93960972	16.29	<.0001



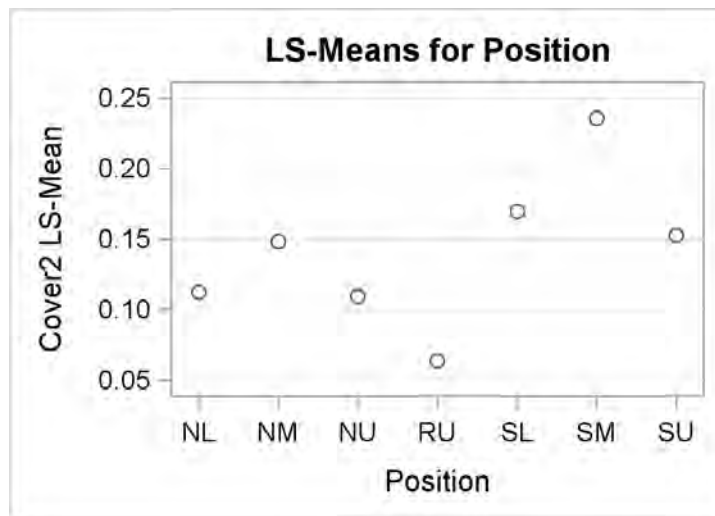


The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Position	Cover2 LSMEAN	LSMEAN Number
NL	0.11259320	1
NM	0.14833252	2
NU	0.10966895	3
RU	0.06393636	4
SL	0.16967573	5
SM	0.23568116	6
SU	0.15273480	7

Least Squares Means for effect Position
Pr > |t| for H0: LSMean(i)=LSMean(j)
Dependent Variable: Cover2

i/j	1	2	3	4	5	6	7
1		0.9943	1.0000	0.9714	0.9383	0.2518	0.9894
2	0.9943		0.9913	0.7008	0.9997	0.6654	1.0000
3	1.0000	0.9913		0.9791	0.9225	0.2262	0.9847
4	0.9714	0.7008	0.9791		0.4371	0.0257	0.6477
5	0.9383	0.9997	0.9225	0.4371		0.8824	0.9999
6	0.2518	0.6654	0.2262	0.0257	0.8824		0.7177
7	0.9894	1.0000	0.9847	0.6477	0.9999	0.7177	

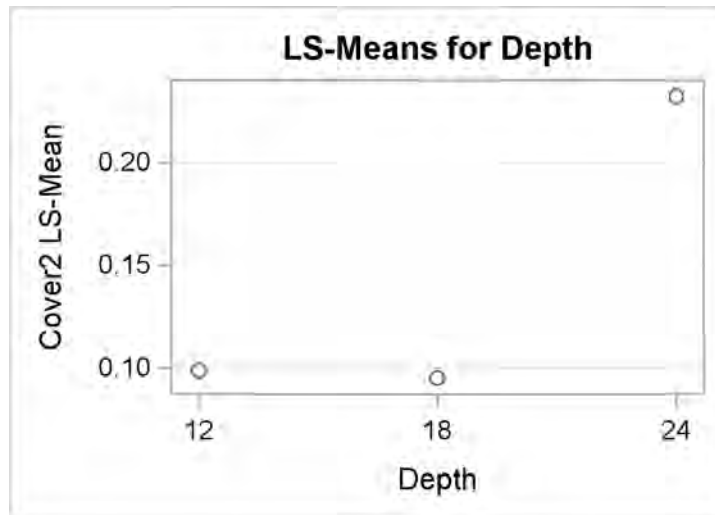


The GLM Procedure
 Least Squares Means
 Adjustment for Multiple Comparisons: Tukey-Kramer

Depth	Cover2 LSMEAN	LSMEAN Number
12	0.09872504	1
18	0.09482502	2
24	0.23185968	3

Least Squares Means for effect Depth
 Pr > |t| for H0: LSMean(i)=LSMean(j)
 Dependent Variable: Cover2

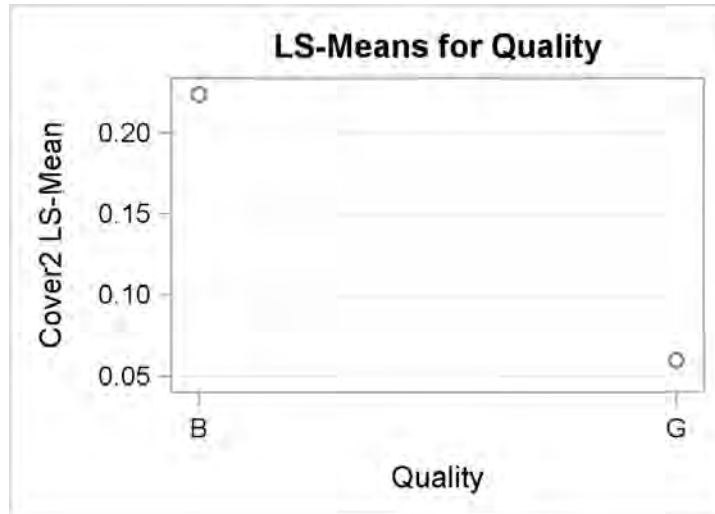
i/j	1	2	3
1		0.9949	0.0034
2	0.9949		0.0024
3	0.0034	0.0024	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

H0:LSMean1=LSMean2

Quality	Cover2 LSMEAN	Pr > |t|
B	0.22372698	<.0001
G	0.05987951	



Species: *Melilotus officinalis*

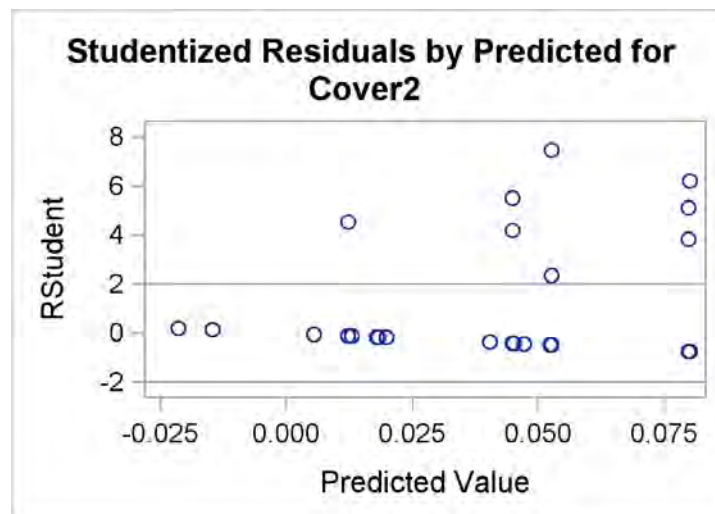
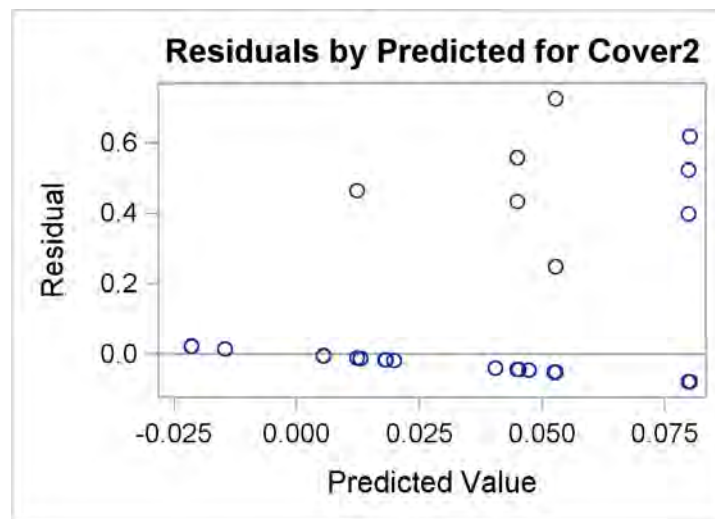
The GLM Procedure

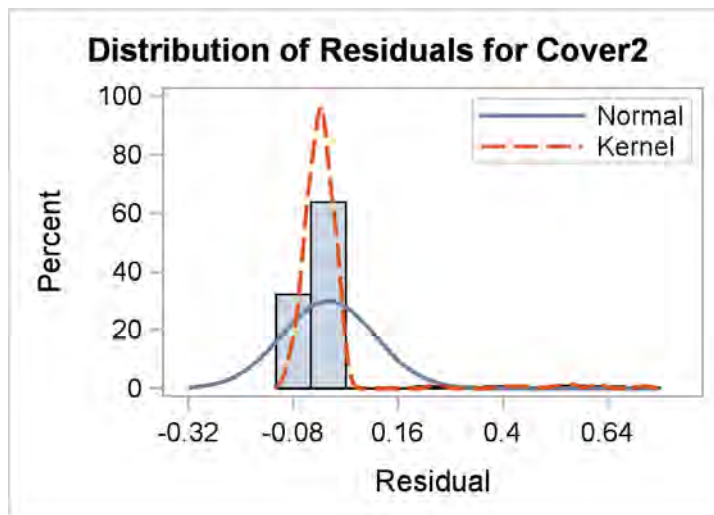
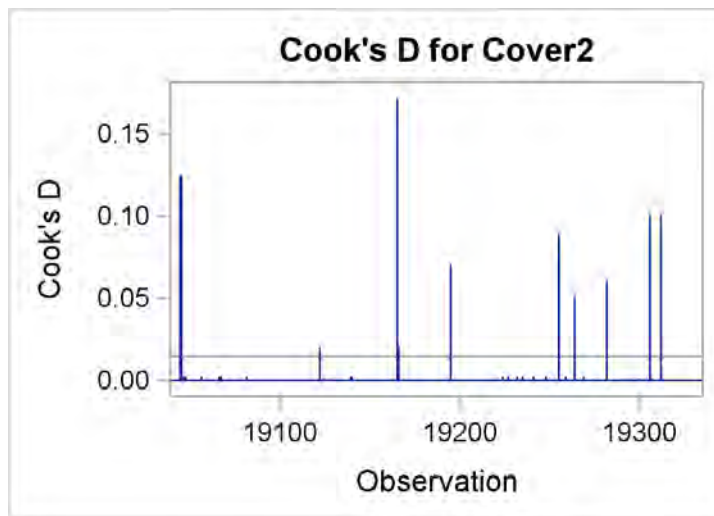
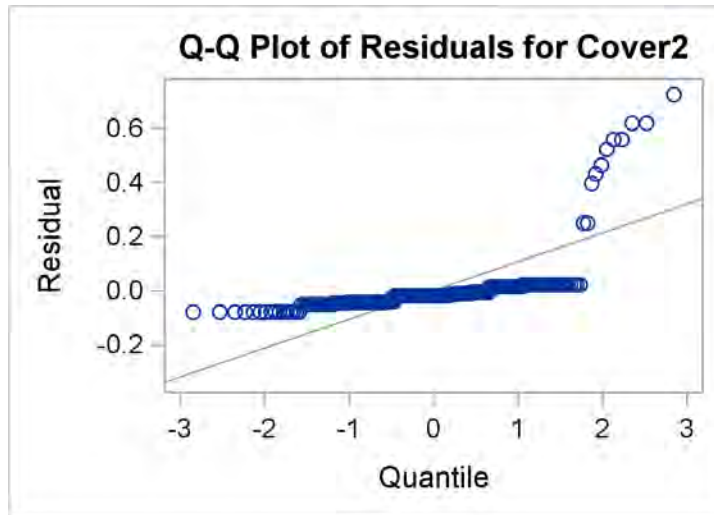
Dependent Variable: Cover2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	0.22313669	0.02479297	2.10	0.0294
Error	270	3.18185675	0.01178465		
Corrected Total	279	3.40499344			

R-Square	Coeff Var	Root MSE	Cover2 Mean
0.065532	505.2783	0.108557	0.021485

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	0.13001448	0.02166908	1.84	0.0917
Depth	2	0.06305004	0.03152502	2.68	0.0707
Quality	1	0.03723903	0.03723903	3.16	0.0766



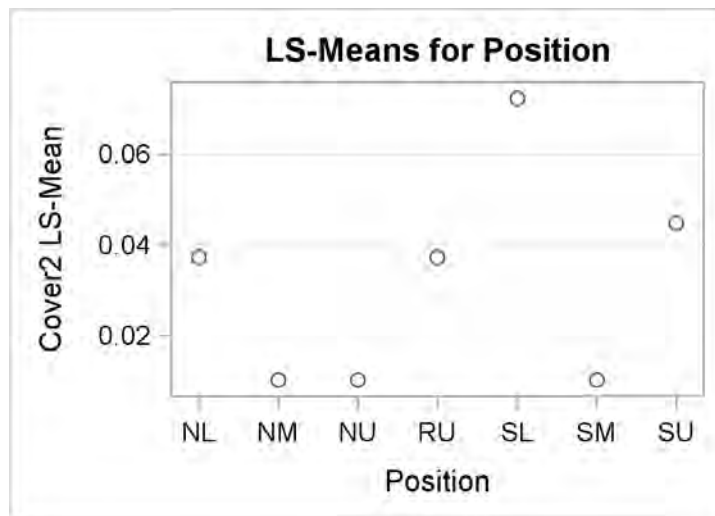


The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Position	Cover2 LSMEAN	LSMEAN Number
NL	0.03730550	1
NM	0.01032597	2
NU	0.01032597	3
RU	0.03730550	4
SL	0.07225400	5
SM	0.01032597	6
SU	0.04483125	7

Least Squares Means for effect Position
Pr > |t| for H0: LSMean(i)=LSMean(j)
Dependent Variable: Cover2

i/j	1	2	3	4	5	6	7
1		0.9243	0.9243	1.0000	0.7797	0.9243	0.9999
2	0.9243		1.0000	0.9243	0.1456	1.0000	0.7899
3	0.9243	1.0000		0.9243	0.1456	1.0000	0.7899
4	1.0000	0.9243	0.9243		0.7797	0.9243	0.9999
5	0.7797	0.1456	0.1456	0.7797		0.1456	0.9185
6	0.9243	1.0000	1.0000	0.9243	0.1456		0.7899
7	0.9999	0.7899	0.7899	0.9999	0.9185	0.7899	

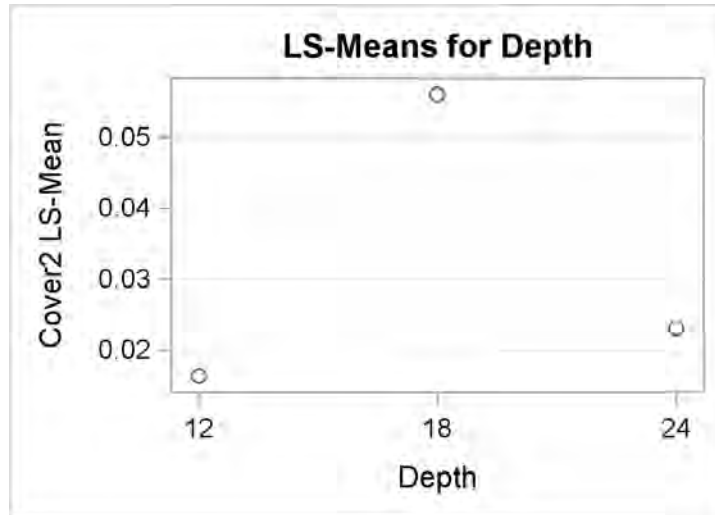


The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Depth	Cover2 LSMEAN	LSMEAN Number
12	0.01630929	1
18	0.05599717	2
24	0.02312531	3

Least Squares Means for effect Depth
Pr > |t| for H0: LSMean(i)=LSMean(j)
Dependent Variable: Cover2

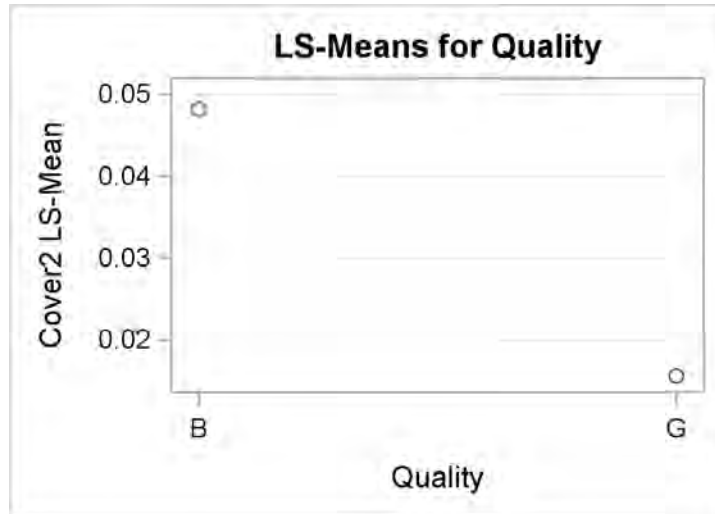
i/j	1	2	3
1		0.0795	0.9268
2	0.0795		0.1744
3	0.9268	0.1744	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

H0:LSMean1=LSMean2

Quality	Cover2 LSMEAN	Pr > |t|
B	0.04811989	0.0766
G	0.01550130	



Species: *Monarda punctata*

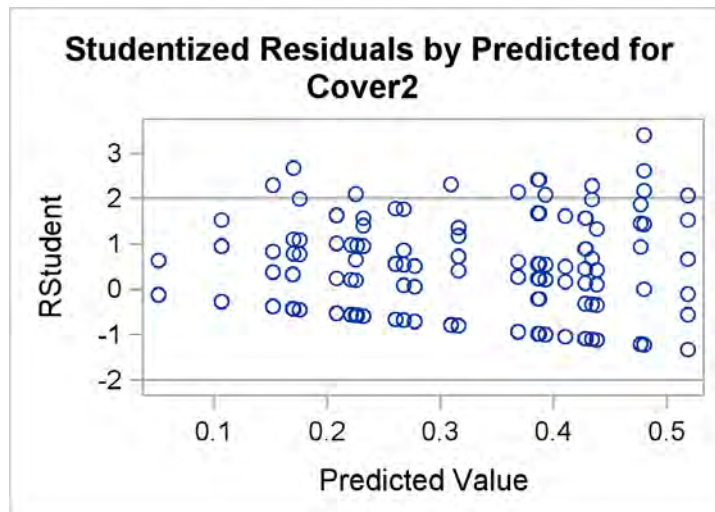
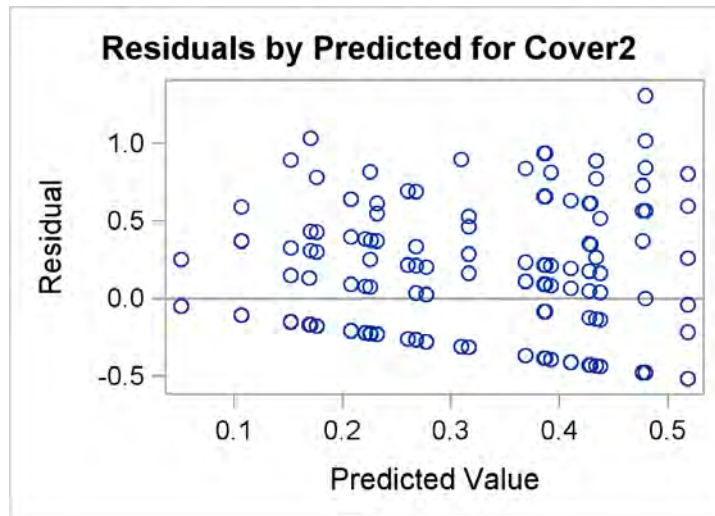
The GLM Procedure

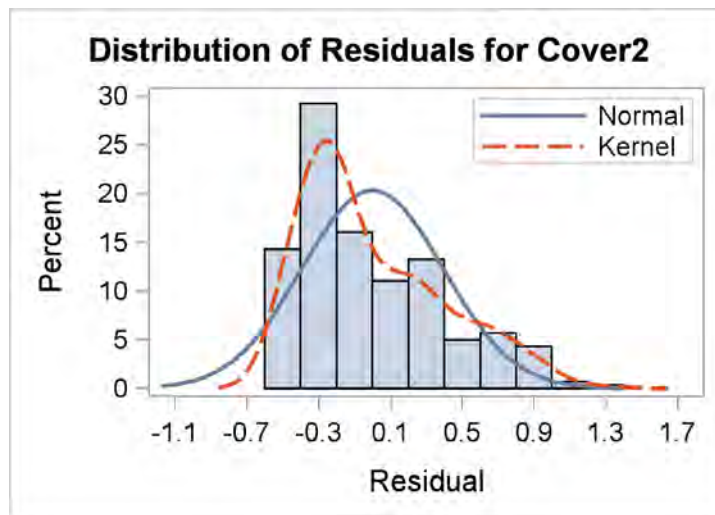
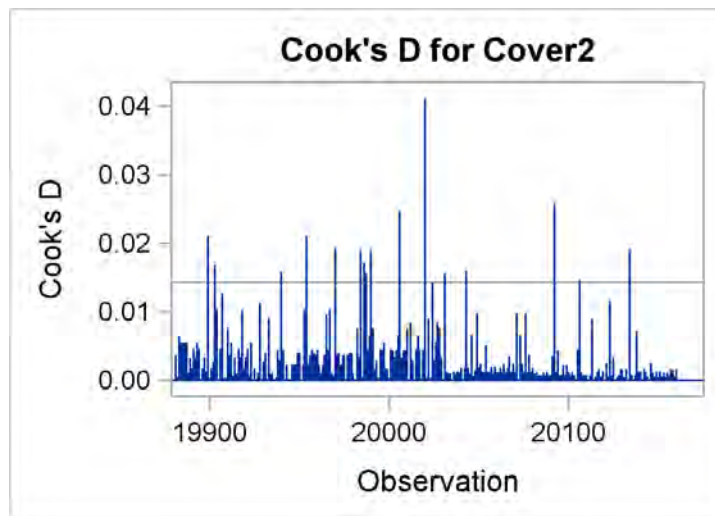
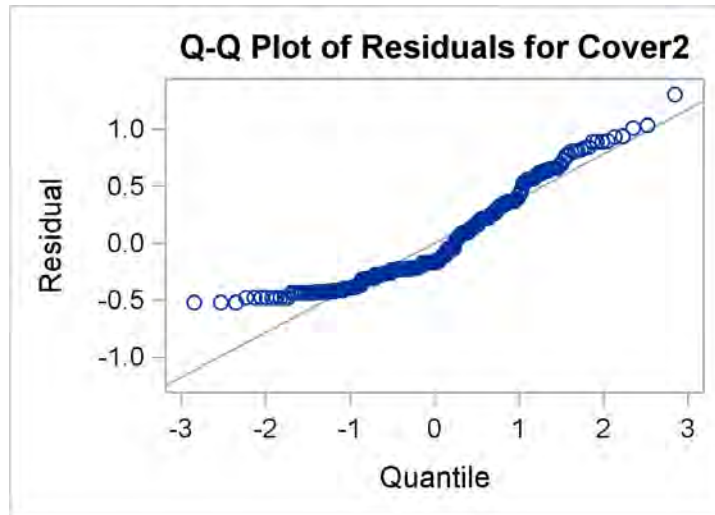
Dependent Variable: Cover2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	4.25093875	0.47232653	2.97	0.0022
Error	270	42.96195645	0.15911836		
Corrected Total	279	47.21289521			

R-Square	Coeff Var	Root MSE	Cover2 Mean
0.090038	131.1210	0.398896	0.304220

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	1.01066543	0.16844424	1.06	0.3878
Depth	2	2.58347901	1.29173950	8.12	0.0004
Quality	1	0.06072664	0.06072664	0.38	0.5372



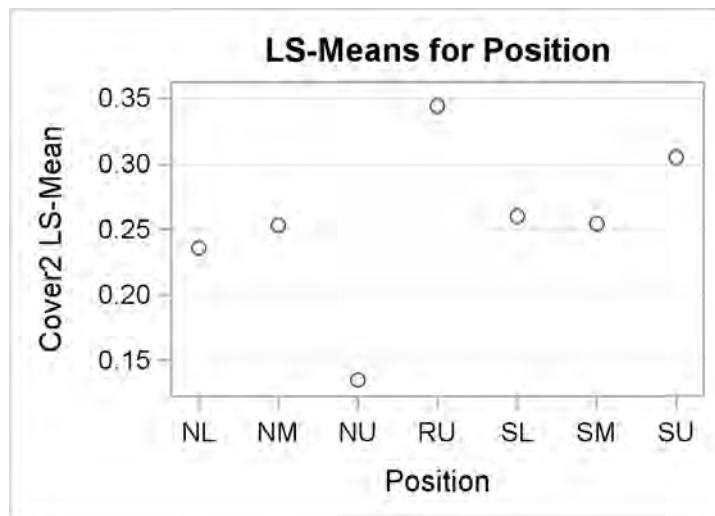


The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Position	Cover2 LSMEAN	LSMEAN Number
NL	0.23606554	1
NM	0.25340602	2
NU	0.13496433	3
RU	0.34417664	4
SL	0.25983150	5
SM	0.25435073	6
SU	0.30522031	7

Least Squares Means for effect Position
Pr > |t| for H0: LSMean(i)=LSMean(j)
Dependent Variable: Cover2

i/j	1	2	3	4	5	6	7
1	1.0000	0.9173	0.8891	1.0000	1.0000	0.9871	
2	1.0000	0.8384	0.9497	1.0000	1.0000	0.9973	
3	0.9173	0.8384	0.2265	0.8016	0.8332	0.4763	
4	0.8891	0.9497	0.2265	0.9647	0.9521	0.9995	
5	1.0000	1.0000	0.8016	0.9647	1.0000	0.9987	
6	1.0000	1.0000	0.8332	0.9521	1.0000	0.9976	
7	0.9871	0.9973	0.4763	0.9995	0.9987	0.9976	

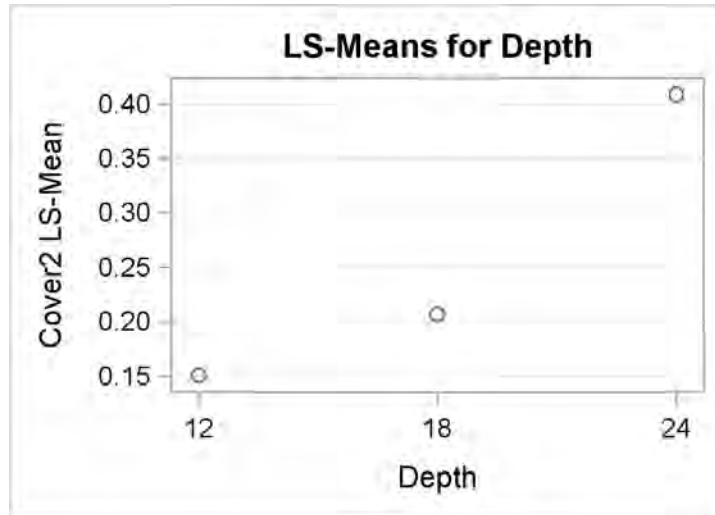


The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Depth	Cover2 LSMEAN	LSMEAN Number
12	0.15073443	1
18	0.20662337	2
24	0.40893438	3

Least Squares Means for effect Depth
Pr > |t| for H0: LSMean(i)=LSMean(j)
Dependent Variable: Cover2

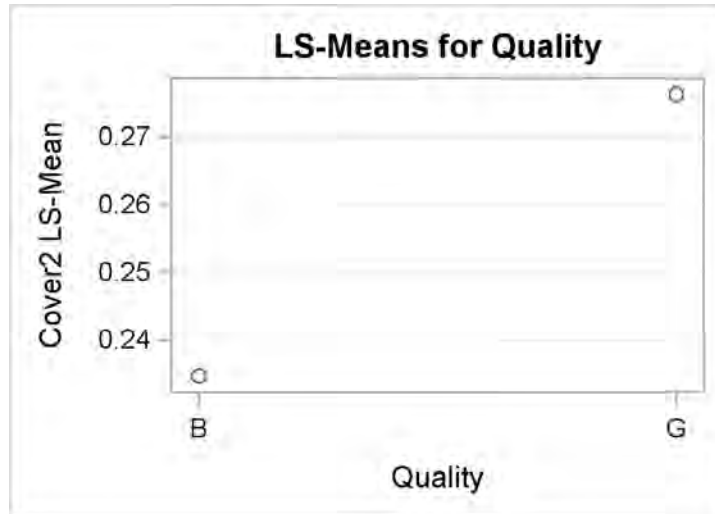
i/j	1	2	3
1		0.6854	0.0005
2	0.6854		0.0083
3	0.0005	0.0083	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

H0:LSMean1=LSMean2

Quality	Cover2 LSMEAN	Pr > |t|
B	0.23460378	0.5372
G	0.27625767	



Species: *Oenothera biennis*

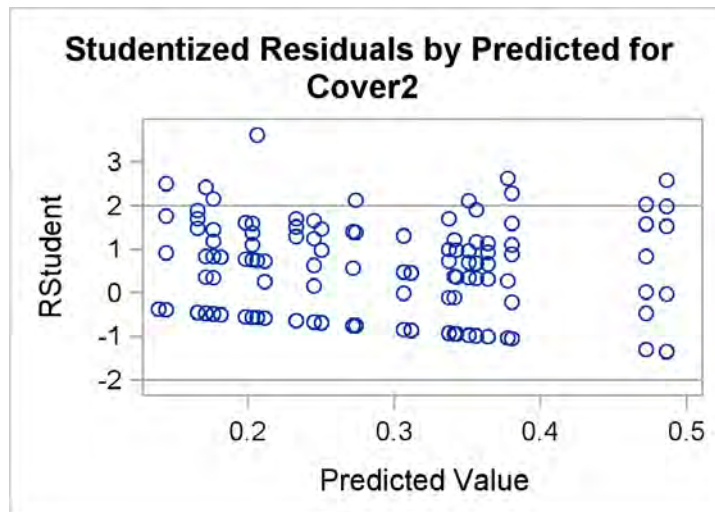
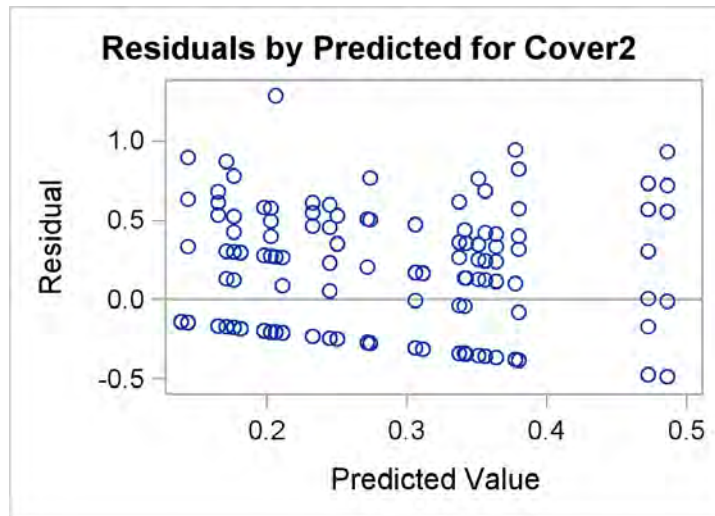
The GLM Procedure

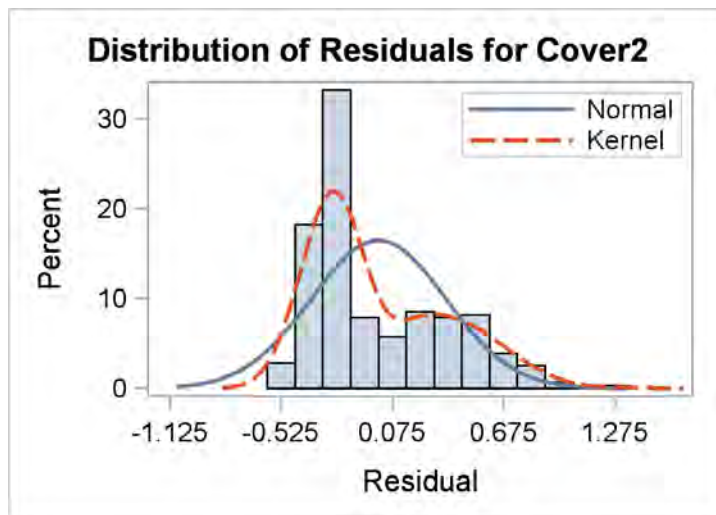
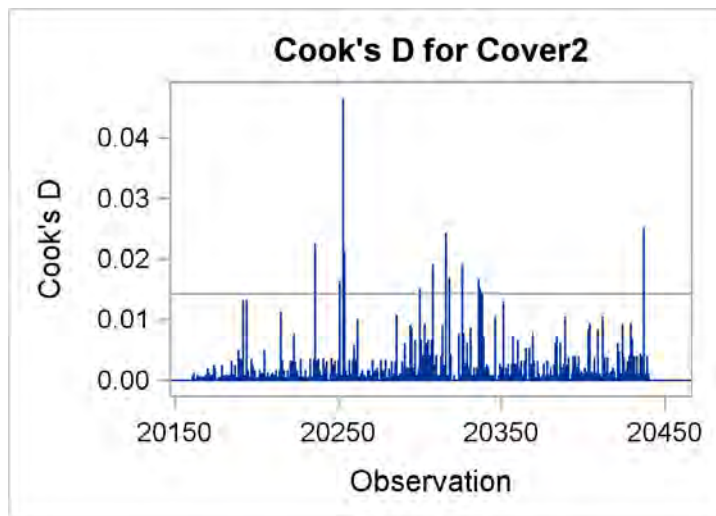
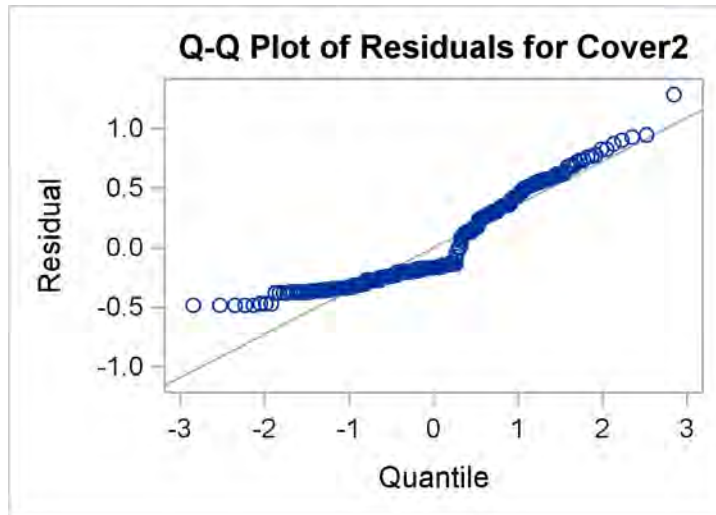
Dependent Variable: Cover2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	2.50636391	0.27848488	2.04	0.0349
Error	270	36.78483251	0.13624012		
Corrected Total	279	39.29119642			

R-Square	Coeff Var	Root MSE	Cover2 Mean
0.063789	134.6838	0.369107	0.274055

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	1.66490068	0.27748345	2.04	0.0611
Depth	2	0.82046149	0.41023074	3.01	0.0509
Quality	1	0.41087553	0.41087553	3.02	0.0836



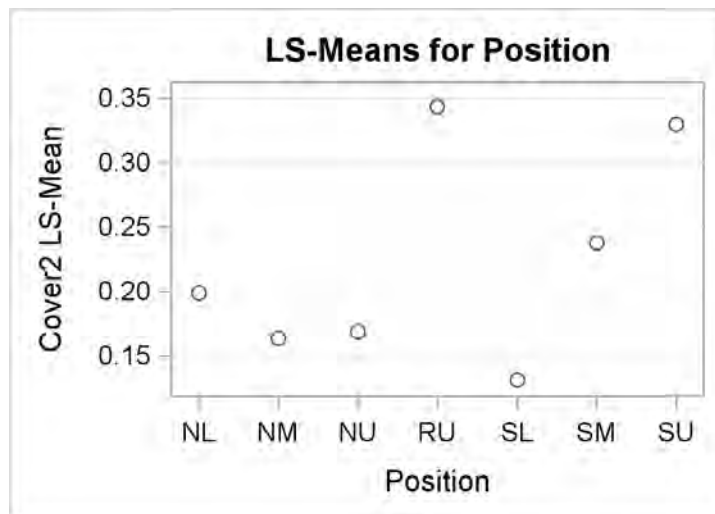


The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Position	Cover2 LSMEAN	LSMEAN Number
NL	0.19867249	1
NM	0.16387306	2
NU	0.16896256	3
RU	0.34366725	4
SL	0.13124067	5
SM	0.23778988	6
SU	0.32995938	7

Least Squares Means for effect Position
Pr > |t| for H0: LSMean(i)=LSMean(j)
Dependent Variable: Cover2

i/j	1	2	3	4	5	6	7
1		0.9996	0.9998	0.5784	0.9831	0.9991	0.6884
2	0.9996		1.0000	0.3107	0.9997	0.9730	0.4093
3	0.9998	1.0000		0.3458	0.9993	0.9812	0.4488
4	0.5784	0.3107	0.3458		0.1382	0.8594	1.0000
5	0.9831	0.9997	0.9993	0.1382		0.8557	0.1993
6	0.9991	0.9730	0.9812	0.8594	0.8557		0.9226
7	0.6884	0.4093	0.4488	1.0000	0.1993	0.9226	

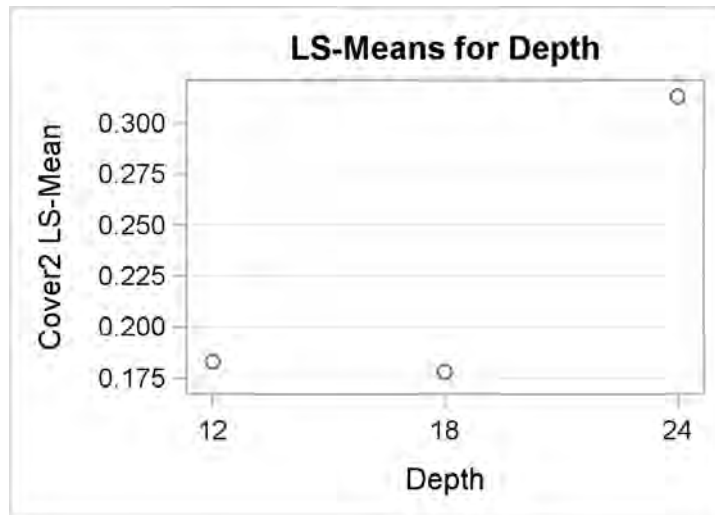


The GLM Procedure
 Least Squares Means
 Adjustment for Multiple Comparisons: Tukey-Kramer

Depth	Cover2 LSMEAN	LSMEAN Number
12	0.18325962	1
18	0.17815466	2
24	0.31322798	3

Least Squares Means for effect Depth
 Pr > |t| for H0: LSMean(i)=LSMean(j)
 Dependent Variable: Cover2

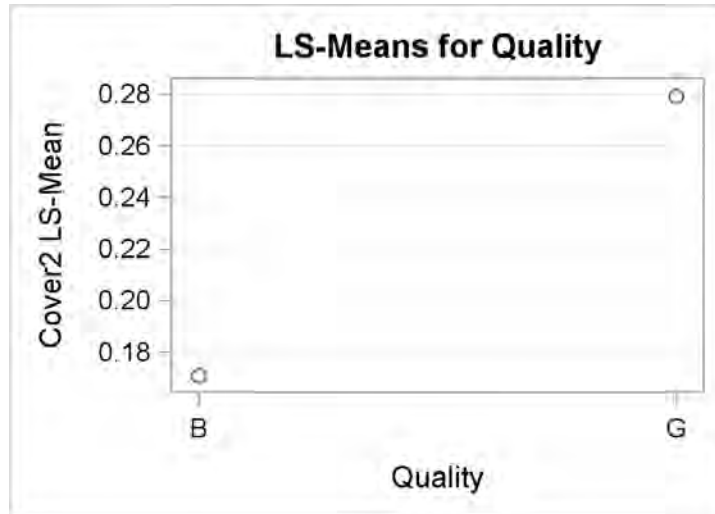
i/j	1	2	3
1		0.9963	0.0952
2	0.9963		0.0792
3	0.0952	0.0792	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

H0:LSMean1=LSMean2

Quality	Cover2 LSMEAN	Pr > |t|
B	0.17070673	0.0836
G	0.27905478	



Species: Populus deltoides

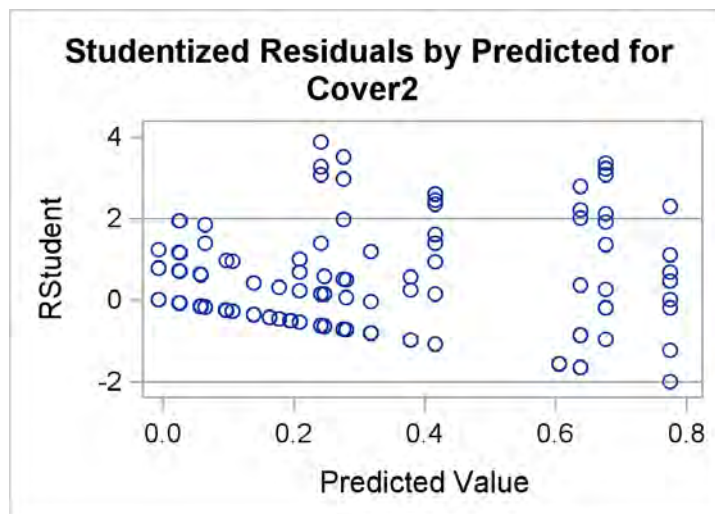
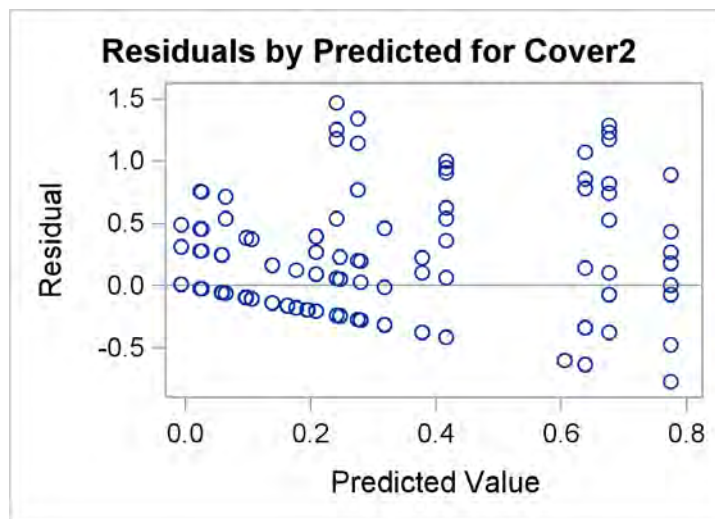
The GLM Procedure

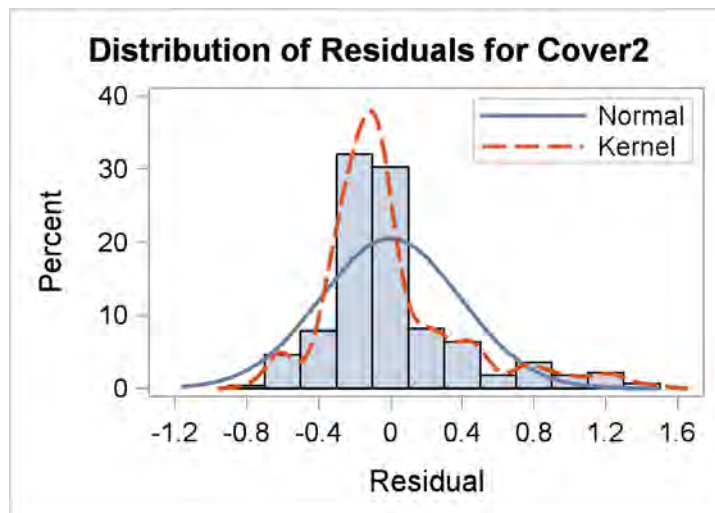
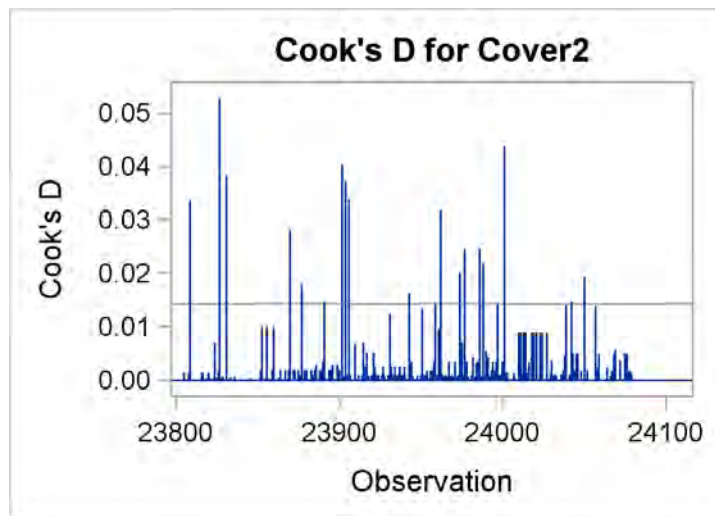
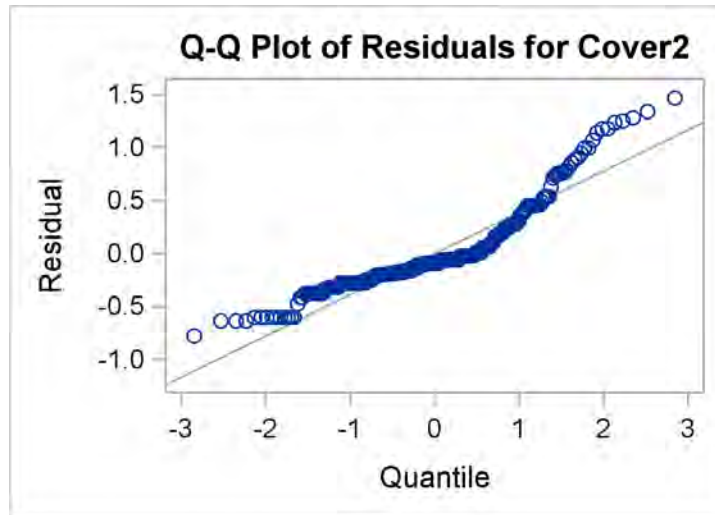
Dependent Variable: Cover2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	12.11255014	1.34583890	8.61	<.0001
Error	270	42.21351357	0.15634635		
Corrected Total	279	54.32606372			

R-Square	Coeff Var	Root MSE	Cover2 Mean
0.222960	163.8797	0.395407	0.241279

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	10.97690588	1.82948431	11.70	<.0001
Depth	2	1.01726017	0.50863008	3.25	0.0402
Quality	1	0.05153304	0.05153304	0.33	0.5664



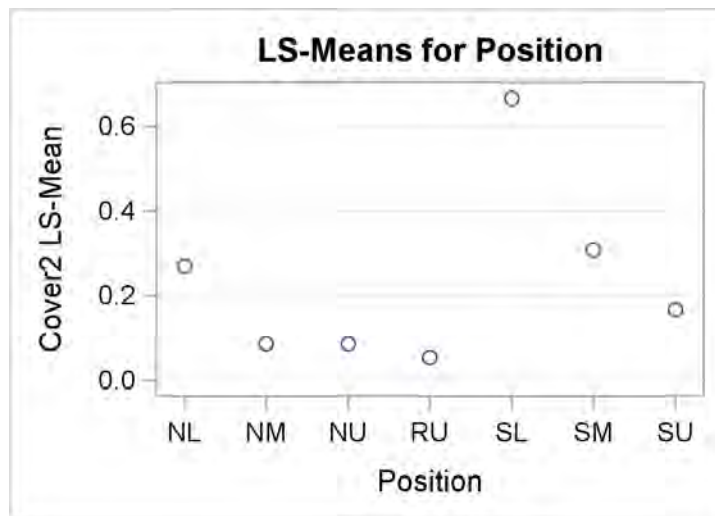


The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Position	Cover2 LSMEAN	LSMEAN Number
NL	0.26991060	1
NM	0.08683122	2
NU	0.08555241	3
RU	0.05417060	4
SL	0.66660670	5
SM	0.30779592	6
SU	0.16688266	7

Least Squares Means for effect Position
Pr > |t| for H0: LSMean(i)=LSMean(j)
Dependent Variable: Cover2

i/j	1	2	3	4	5	6	7
1		0.3732	0.3645	0.1862	0.0002	0.9995	0.9065
2	0.3732		1.0000	0.9998	<.0001	0.1637	0.9715
3	0.3645	1.0000		0.9998	<.0001	0.1585	0.9692
4	0.1862	0.9998	0.9998		<.0001	0.0662	0.8630
5	0.0002	<.0001	<.0001	<.0001		0.0013	<.0001
6	0.9995	0.1637	0.1585	0.0662	0.0013		0.6865
7	0.9065	0.9715	0.9692	0.8630	<.0001	0.6865	

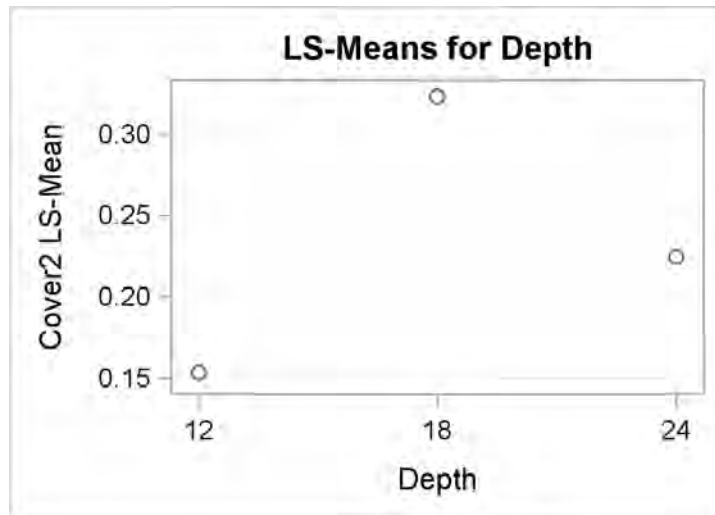


The GLM Procedure
 Least Squares Means
 Adjustment for Multiple Comparisons: Tukey-Kramer

Depth	Cover2 LSMEAN	LSMEAN Number
12	0.15364621	1
18	0.32339704	2
24	0.22484965	3

Least Squares Means for effect Depth
 Pr > |t| for H0: LSMean(i)=LSMean(j)
 Dependent Variable: Cover2

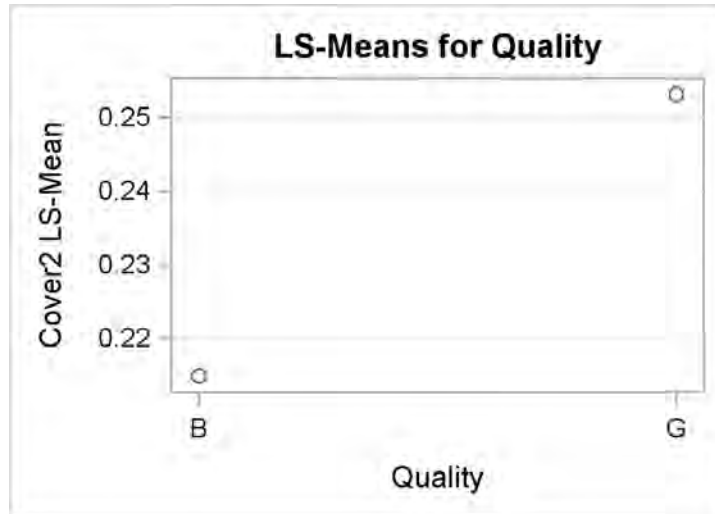
i/j	1	2	3
1		0.0312	0.5364
2	0.0312		0.3048
3	0.5364	0.3048	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

H0:LSMean1=LSMean2

Quality	Cover2 LSMEAN	Pr > |t|
B	0.21477855	0.5664
G	0.25315006	



Species: Rudbeckia hirta

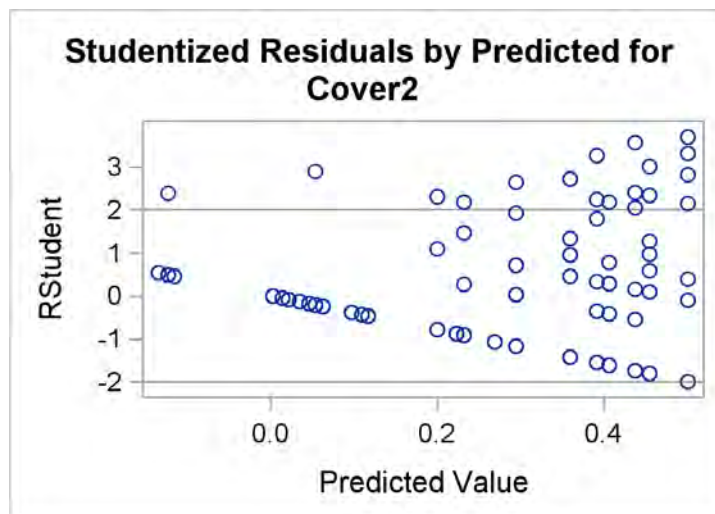
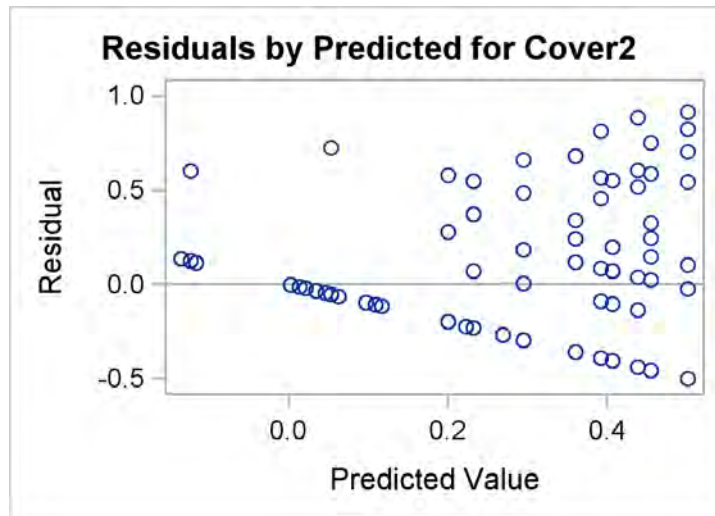
The GLM Procedure

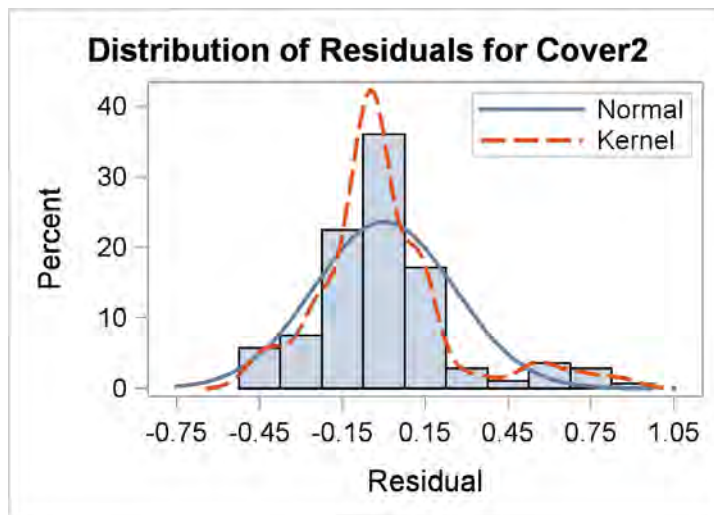
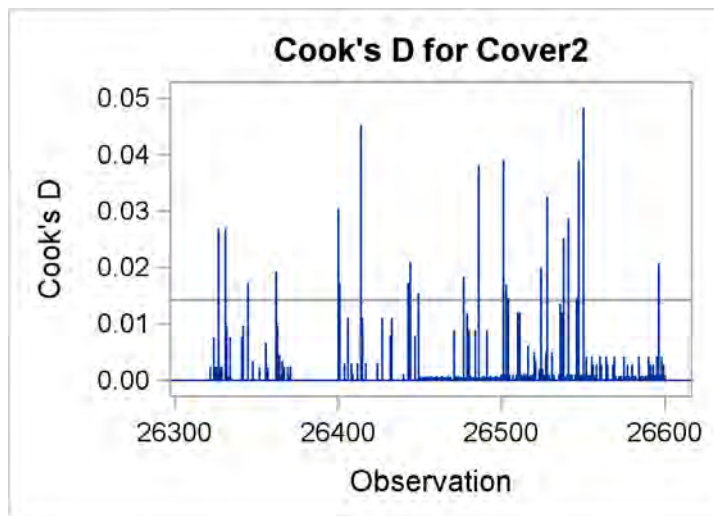
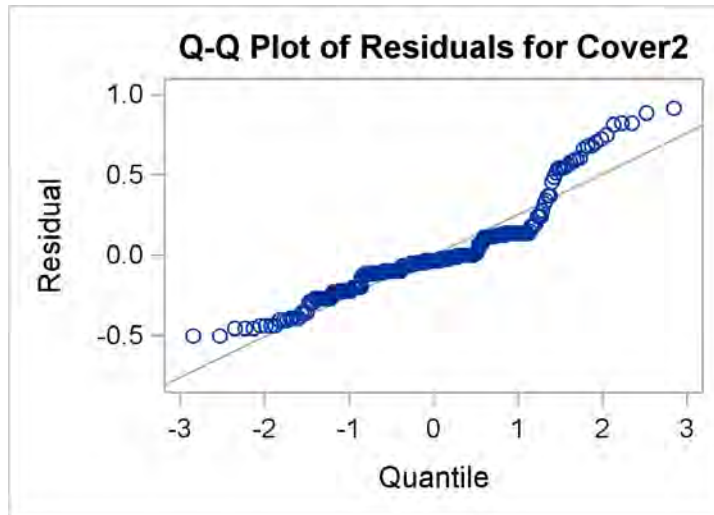
Dependent Variable: Cover2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	9.63170791	1.07018977	16.16	<.0001
Error	270	17.88014314	0.06622275		
Corrected Total	279	27.51185105			

R-Square	Coeff Var	Root MSE	Cover2 Mean
0.350093	181.8989	0.257338	0.141473

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	7.61277117	1.26879519	19.16	<.0001
Depth	2	0.32656991	0.16328496	2.47	0.0869
Quality	1	1.88680346	1.88680346	28.49	<.0001



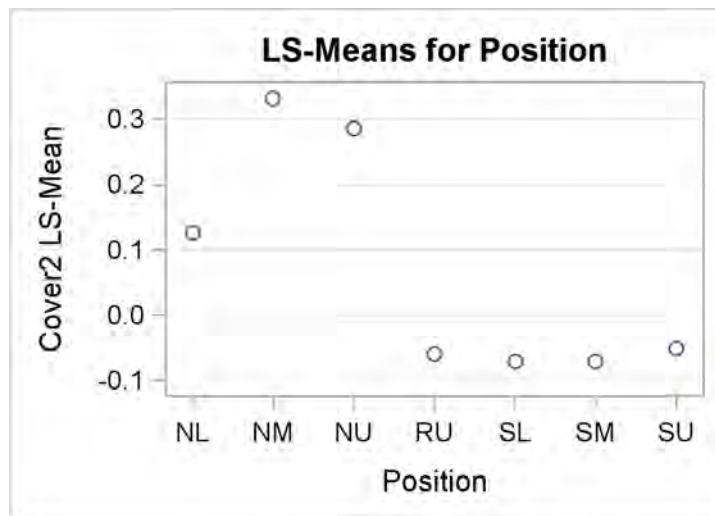


The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Position	Cover2 LSMEAN	LSMEAN Number
NL	0.12645574	1
NM	0.33251993	2
NU	0.28633686	3
RU	-0.05927751	4
SL	-0.07120554	5
SM	-0.07120554	6
SU	-0.05175176	7

Least Squares Means for effect Position
Pr > |t| for H0: LSMean(i)=LSMean(j)
Dependent Variable: Cover2

i/j	1	2	3	4	5	6	7
1		0.0073	0.0838	0.0234	0.0120	0.0120	0.0348
2	0.0073		0.9846	<.0001	<.0001	<.0001	<.0001
3	0.0838	0.9846		<.0001	<.0001	<.0001	<.0001
4	0.0234	<.0001	<.0001		1.0000	1.0000	1.0000
5	0.0120	<.0001	<.0001	1.0000		1.0000	0.9999
6	0.0120	<.0001	<.0001	1.0000	1.0000		0.9999
7	0.0348	<.0001	<.0001	1.0000	0.9999	0.9999	

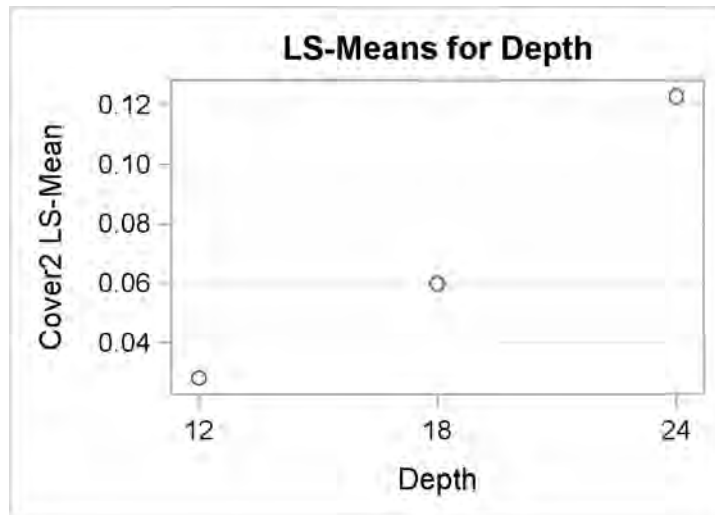


The GLM Procedure
 Least Squares Means
 Adjustment for Multiple Comparisons: Tukey-Kramer

Depth	Cover2 LSMEAN	LSMEAN Number
12	0.02799661	1
18	0.05989853	2
24	0.12290722	3

Least Squares Means for effect Depth
 Pr > |t| for H0: LSMean(i)=LSMean(j)
 Dependent Variable: Cover2

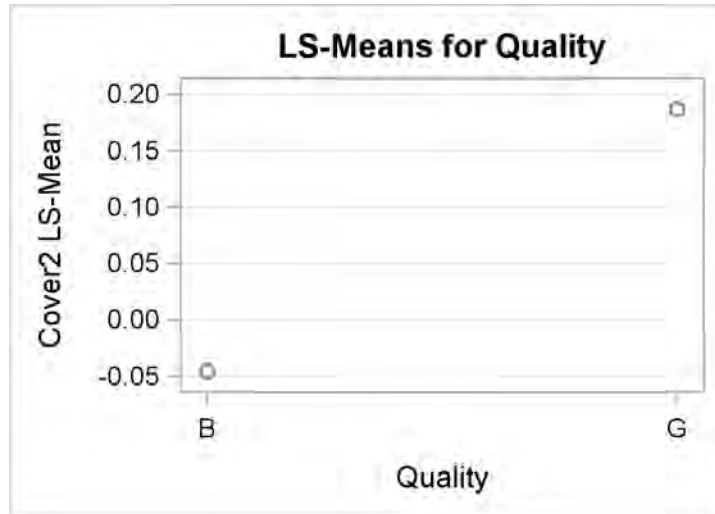
i/j	1	2	3
1		0.7439	0.0761
2	0.7439		0.3176
3	0.0761	0.3176	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

H0:LSMean1=LSMean2

Quality	Cover2 LSMEAN	Pr > |t|
B	-0.04582375	<.0001
G	0.18635866	



Species: *Setaria faberi*

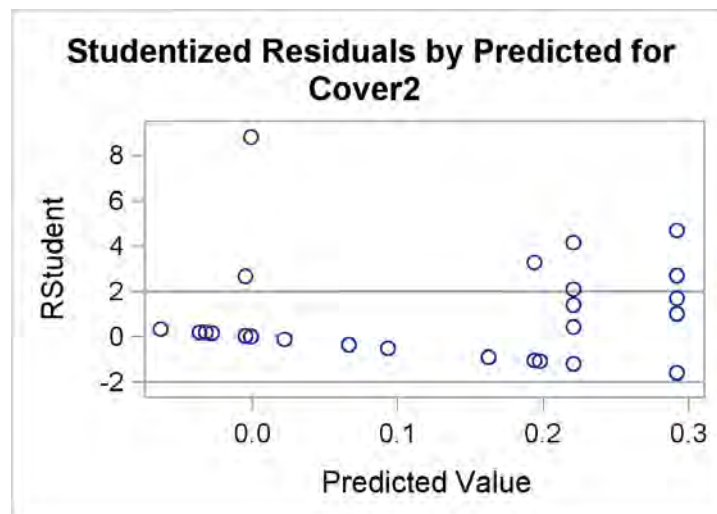
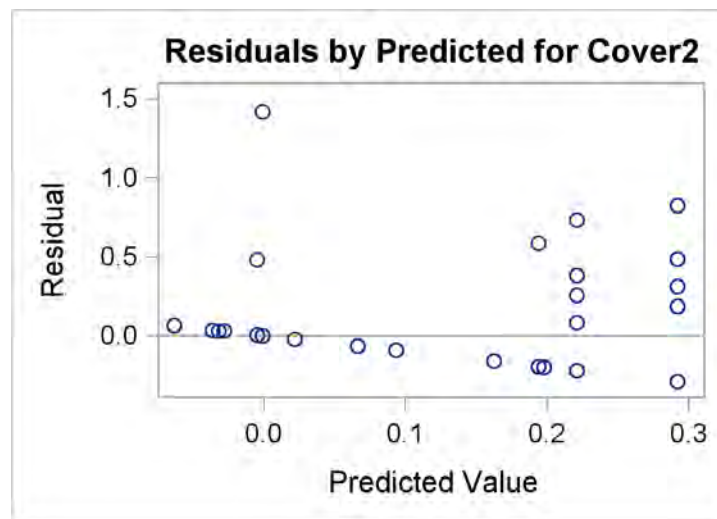
The GLM Procedure

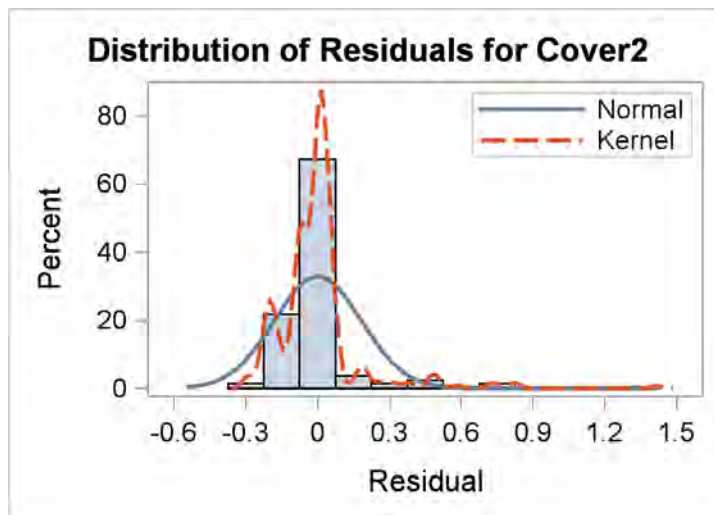
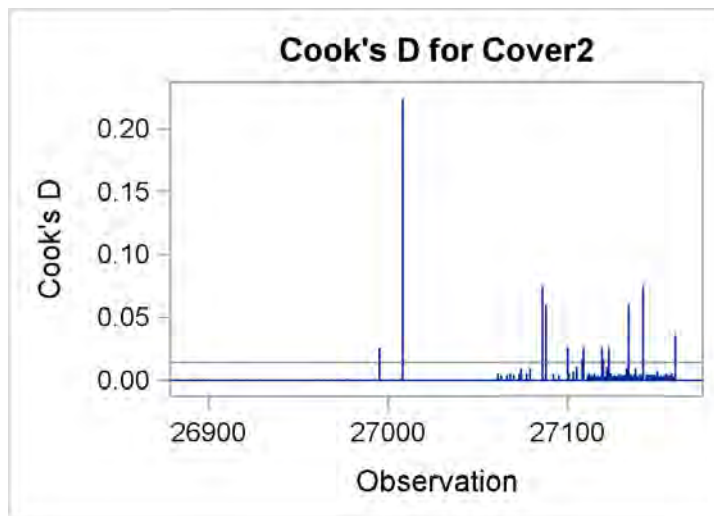
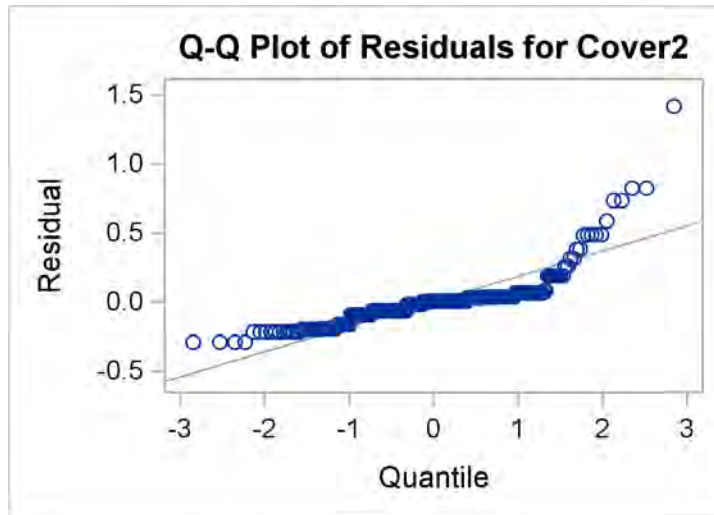
Dependent Variable: Cover2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	3.08731880	0.34303542	10.00	<.0001
Error	270	9.26157360	0.03430212		
Corrected Total	279	12.34889240			

R-Square	Coeff Var	Root MSE	Cover2 Mean
0.250008	292.9728	0.185208	0.063217

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	0.58497409	0.09749568	2.84	0.0106
Depth	2	0.03409545	0.01704772	0.50	0.6089
Quality	1	1.78509367	1.78509367	52.04	<.0001



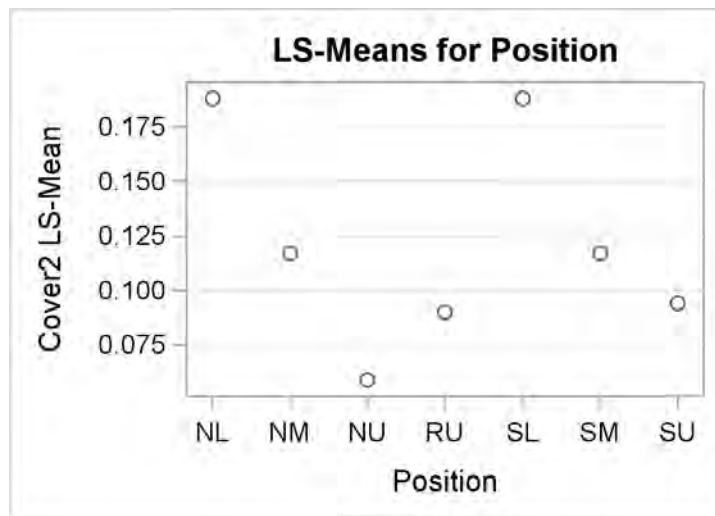


The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Position	Cover2 LSMEAN	LSMEAN Number
NL	0.18823170	1
NM	0.11707327	2
NU	0.05871192	3
RU	0.09009374	4
SL	0.18823170	5
SM	0.11707327	6
SU	0.09408626	7

Least Squares Means for effect Position
Pr > |t| for H0: LSMean(i)=LSMean(j)
Dependent Variable: Cover2

i/j	1	2	3	4	5	6	7
1		0.6044	0.0318	0.2156	1.0000	0.6044	0.2609
2	0.6044		0.7966	0.9949	0.6044	1.0000	0.9979
3	0.0318	0.7966		0.9886	0.0318	0.7966	0.9788
4	0.2156	0.9949	0.9886		0.2156	0.9949	1.0000
5	1.0000	0.6044	0.0318	0.2156		0.6044	0.2609
6	0.6044	1.0000	0.7966	0.9949	0.6044		0.9979
7	0.2609	0.9979	0.9788	1.0000	0.2609	0.9979	

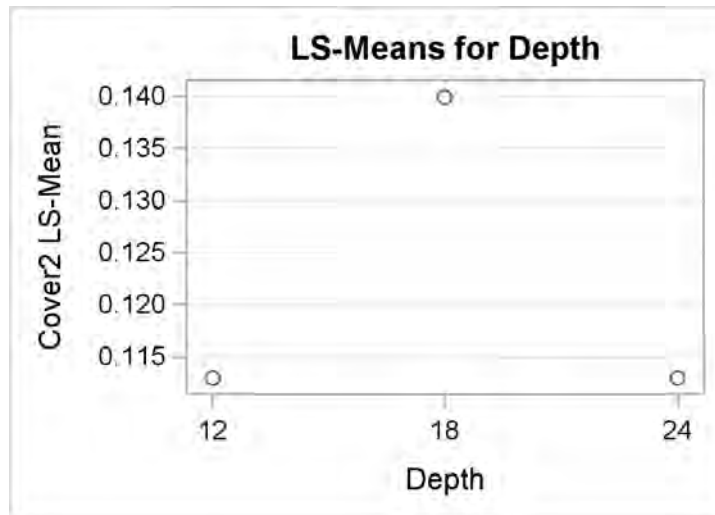


The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Depth	Cover2 LSMEAN	LSMEAN Number
12	0.11291886	1
18	0.13994878	2
24	0.11291886	3

Least Squares Means for effect Depth
Pr > |t| for H0: LSMean(i)=LSMean(j)
Dependent Variable: Cover2

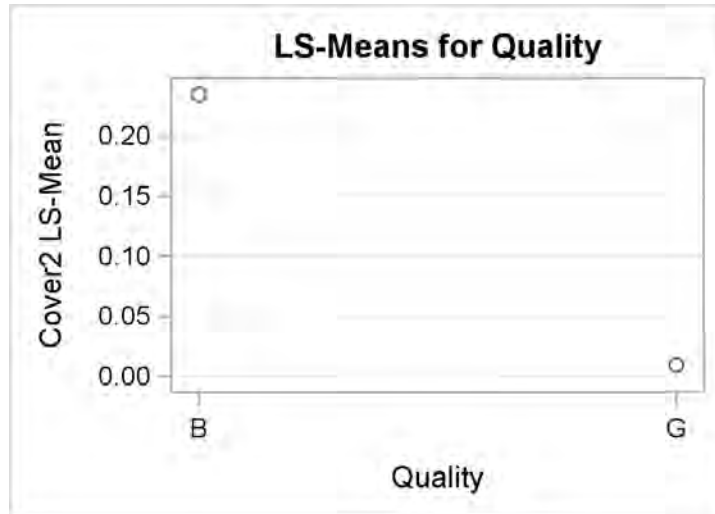
i/j	1	2	3
1		0.6638	1.0000
2	0.6638		0.6638
3	1.0000	0.6638	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

H0:LSMean1=LSMean2

Quality	Cover2 LSMEAN	Pr > |t|
B	0.23484770	<.0001
G	0.00900997	



Species: *Setaria glauca*

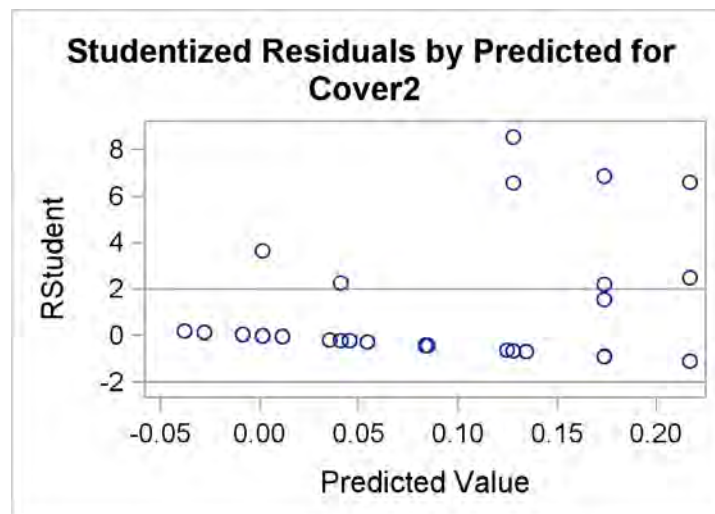
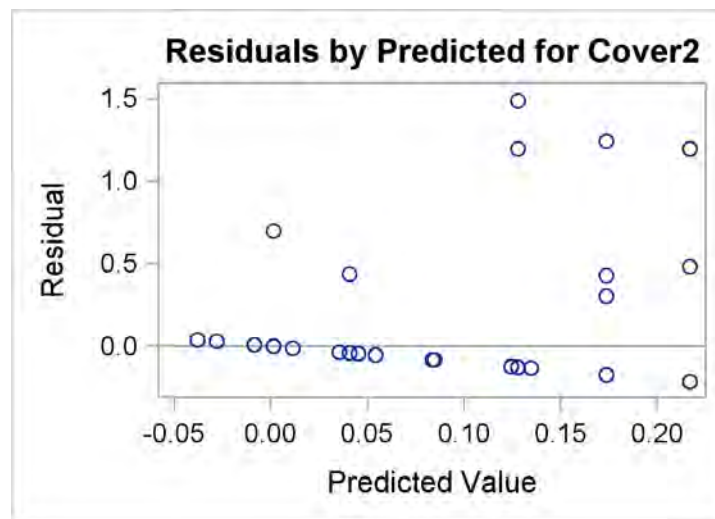
The GLM Procedure

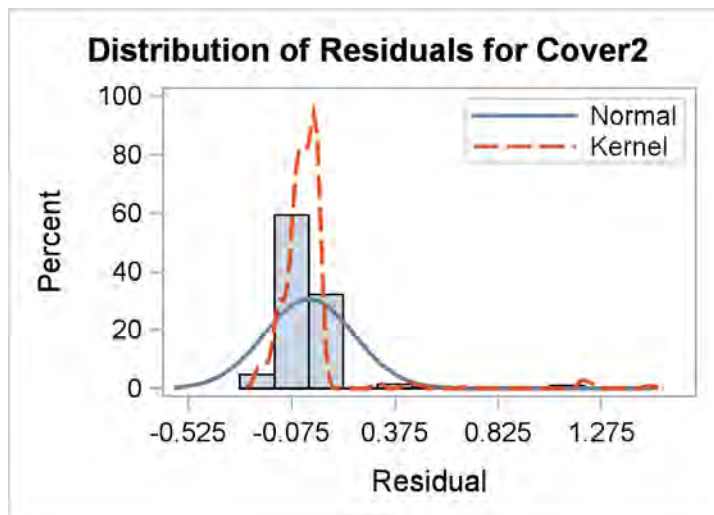
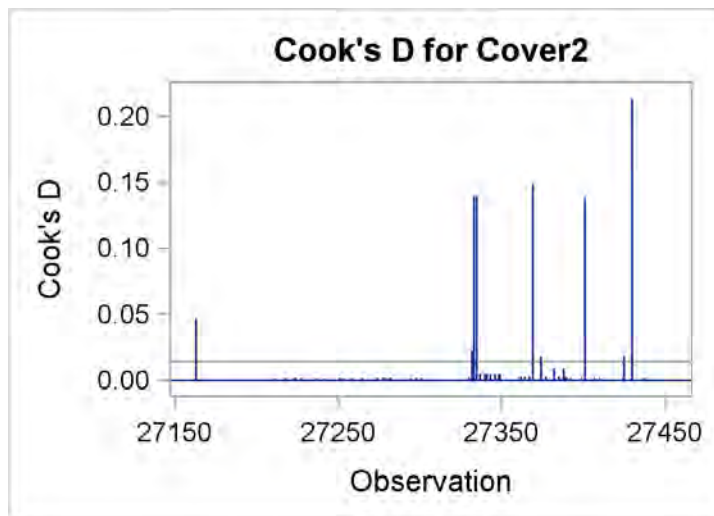
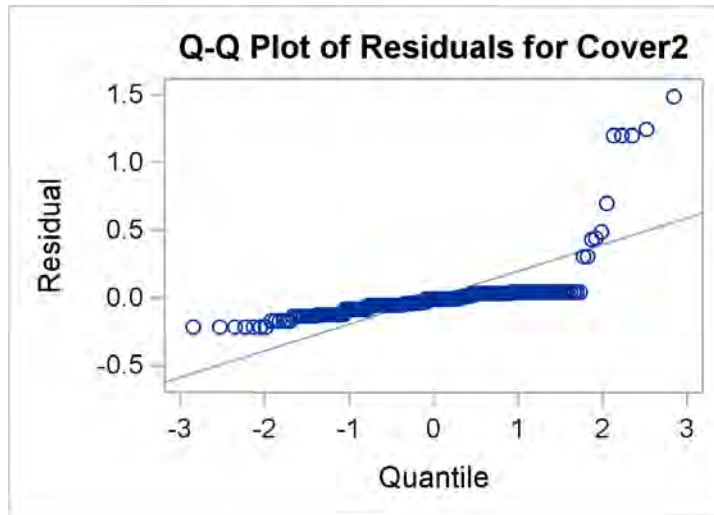
Dependent Variable: Cover2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	1.27571352	0.14174595	3.58	0.0003
Error	270	10.70045853	0.03963133		
Corrected Total	279	11.97617205			

R-Square	Coeff Var	Root MSE	Cover2 Mean
0.106521	525.3023	0.199076	0.037897

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	0.90410768	0.15068461	3.80	0.0012
Depth	2	0.29889086	0.14944543	3.77	0.0243
Quality	1	0.00348971	0.00348971	0.09	0.7669



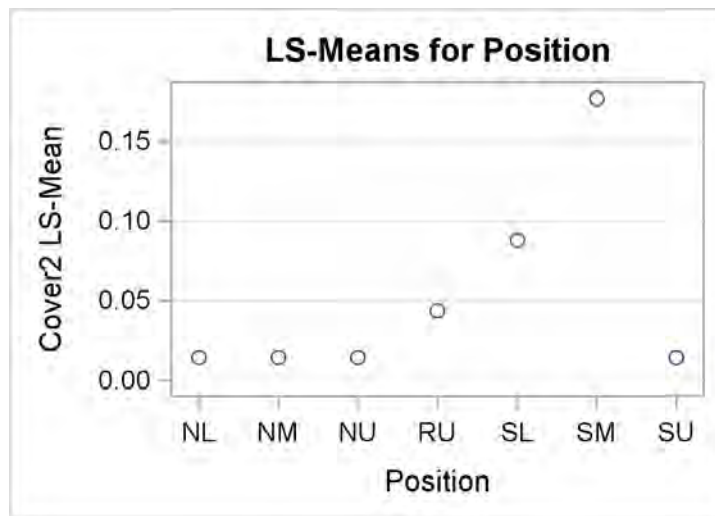


The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Position	Cover2 LSMEAN	LSMEAN Number
NL	0.01429670	1
NM	0.01429670	2
NU	0.01429670	3
RU	0.04369898	4
SL	0.08767178	5
SM	0.17680151	6
SU	0.01429670	7

Least Squares Means for effect Position
Pr > |t| for H0: LSMean(i)=LSMean(j)
Dependent Variable: Cover2

i/j	1	2	3	4	5	6	7
1	1.0000	1.0000	0.9945	0.6510	0.0058	1.0000	
2	1.0000	1.0000	0.9945	0.6510	0.0058	1.0000	
3	1.0000	1.0000	0.9945	0.6510	0.0058	1.0000	
4	0.9945	0.9945	0.9945	0.9563	0.0473	0.9945	
5	0.6510	0.6510	0.6510	0.9563	0.4156	0.6510	
6	0.0058	0.0058	0.0058	0.0473	0.4156	0.0058	
7	1.0000	1.0000	1.0000	0.9945	0.6510	0.0058	

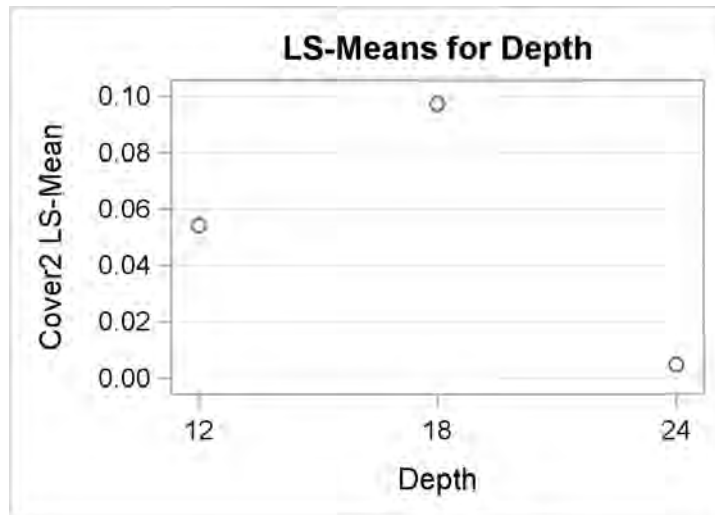


The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Depth	Cover2 LSMEAN	LSMEAN Number
12	0.05425546	1
18	0.09733436	2
24	0.00499264	3

Least Squares Means for effect Depth
Pr > |t| for H0: LSMean(i)=LSMean(j)
Dependent Variable: Cover2

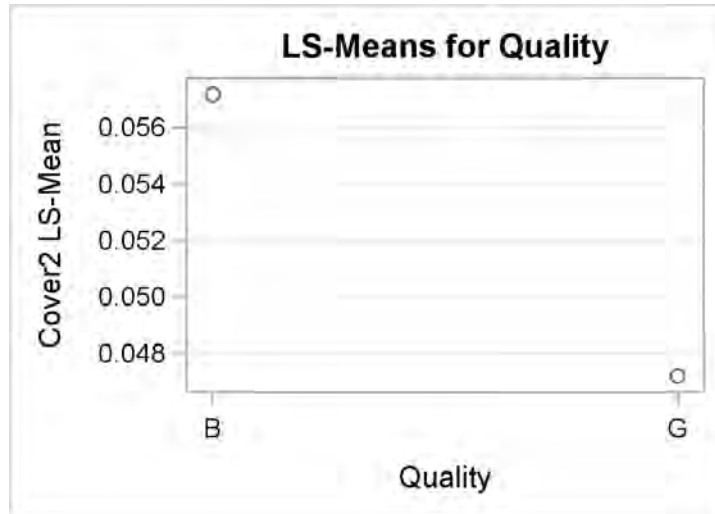
i/j	1	2	3
1		0.4076	0.3100
2	0.4076		0.0177
3	0.3100	0.0177	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

H0:LSMean1=LSMean2

Quality	Cover2 LSMEAN	Pr > |t|
B	0.05718680	0.7669
G	0.04720151	



Species: Sorghastrum nutans

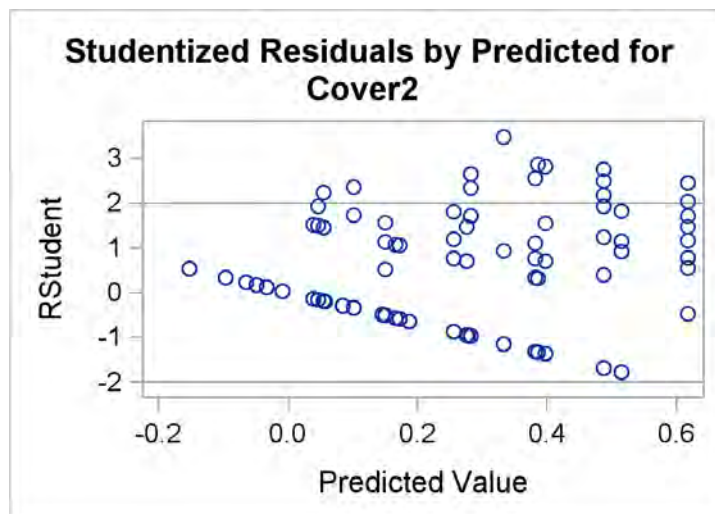
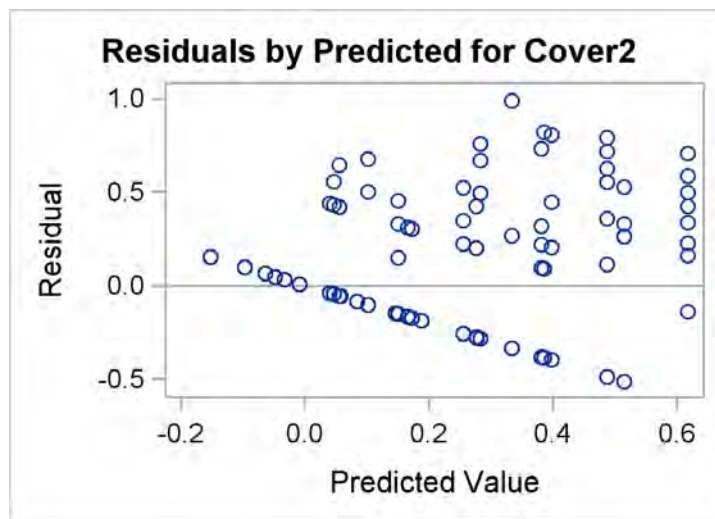
The GLM Procedure

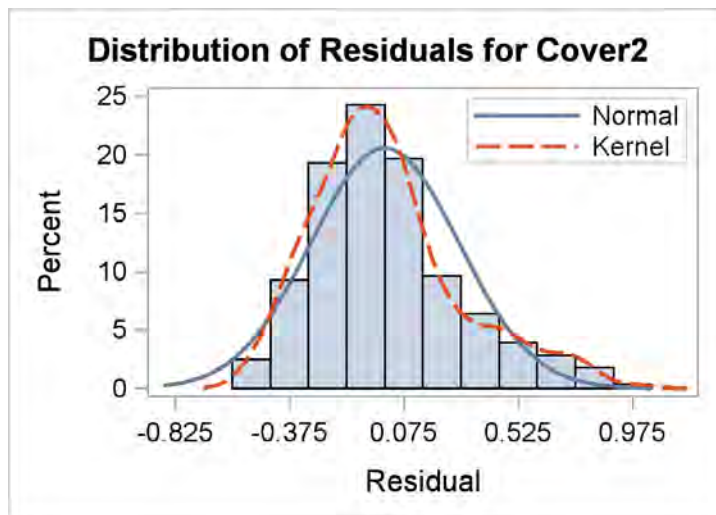
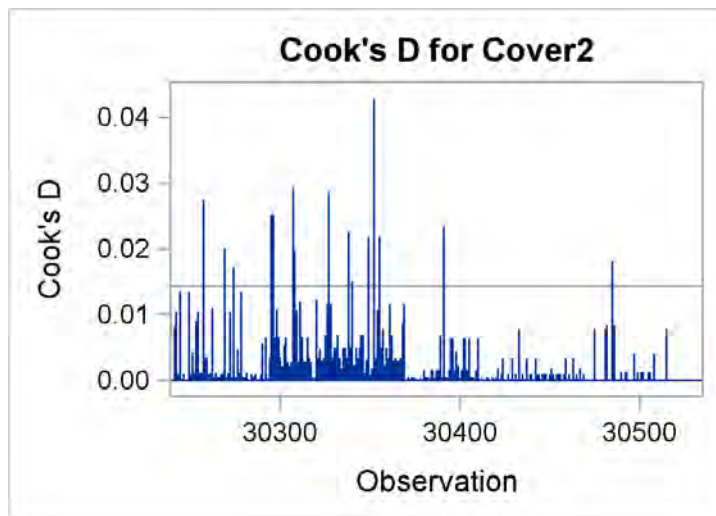
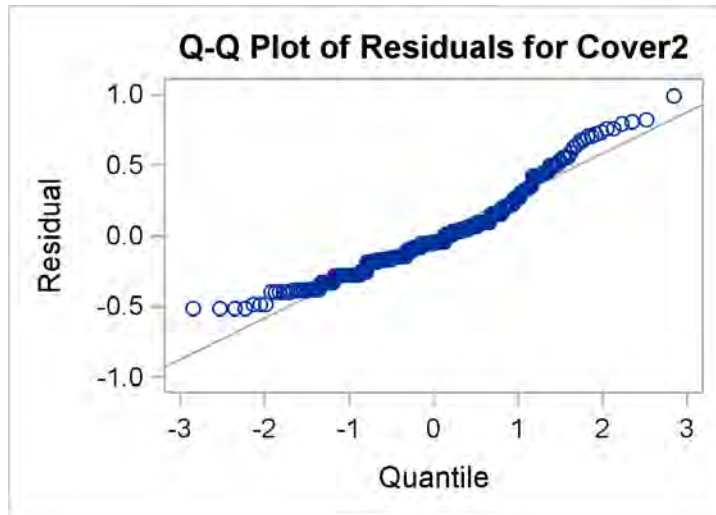
Dependent Variable: Cover2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	10.51716112	1.16857346	13.36	<.0001
Error	270	23.62370313	0.08749520		
Corrected Total	279	34.14086425			

R-Square	Coeff Var	Root MSE	Cover2 Mean
0.308052	165.1558	0.295796	0.179101

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	3.26059793	0.54343299	6.21	<.0001
Depth	2	6.48417278	3.24208639	37.05	<.0001
Quality	1	0.27184602	0.27184602	3.11	0.0791



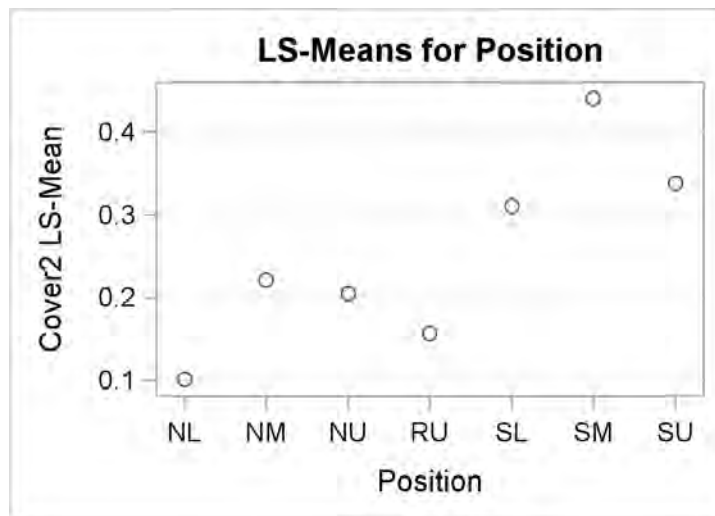


The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Position	Cover2 LSMEAN	LSMEAN Number
NL	0.10136837	1
NM	0.22090866	2
NU	0.20505255	3
RU	0.15700110	4
SL	0.31091919	5
SM	0.44112442	6
SU	0.33805555	7

Least Squares Means for effect Position
Pr > |t| for H0: LSMean(i)=LSMean(j)
Dependent Variable: Cover2

i/j	1	2	3	4	5	6	7
1		0.5443	0.7031	0.9804	0.0281	<.0001	0.0074
2	0.5443		1.0000	0.9608	0.8220	0.0170	0.5687
3	0.7031	1.0000		0.9909	0.6821	0.0076	0.4102
4	0.9804	0.9608	0.9909		0.2349	0.0005	0.0931
5	0.0281	0.8220	0.6821	0.2349		0.4372	0.9996
6	<.0001	0.0170	0.0076	0.0005	0.4372		0.7090
7	0.0074	0.5687	0.4102	0.0931	0.9996	0.7090	

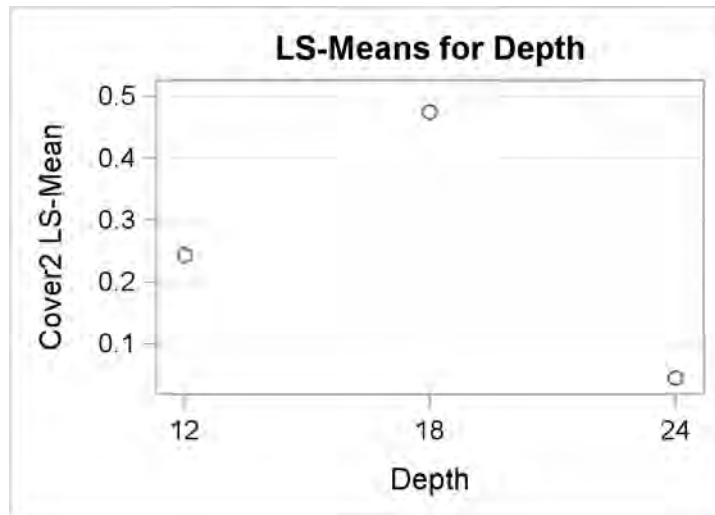


The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Depth	Cover2 LSMEAN	LSMEAN Number
12	0.24235099	1
18	0.47405357	2
24	0.04406538	3

Least Squares Means for effect Depth
Pr > |t| for H0: LSMean(i)=LSMean(j)
Dependent Variable: Cover2

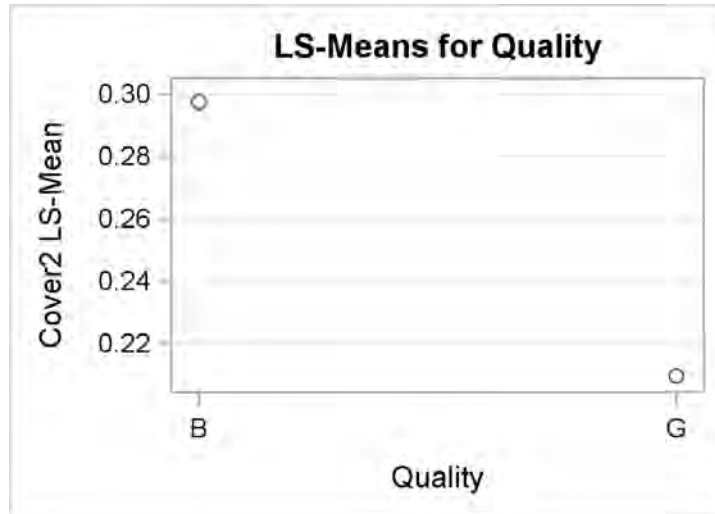
i/j	1	2	3
1		<.0001	0.0003
2	<.0001		<.0001
3	0.0003	<.0001	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

H0:LSMean1=LSMean2

Quality	Cover2 LSMEAN	Pr > |t|
B	0.29755535	0.0791
G	0.20942460	



Species: Taraxacum officinale

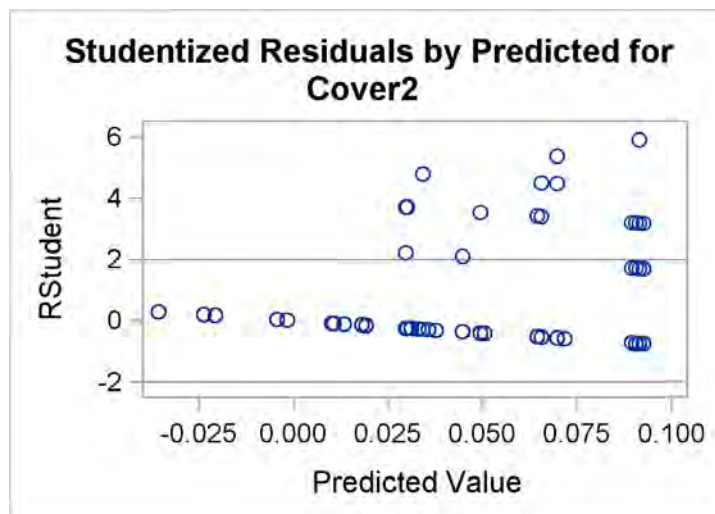
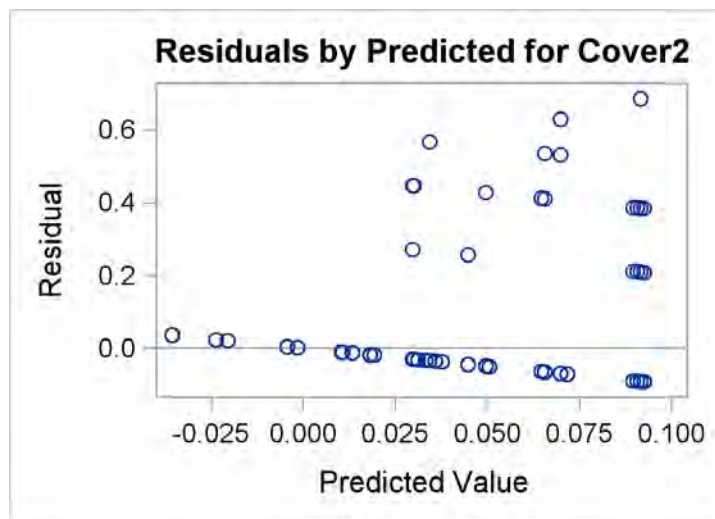
The GLM Procedure

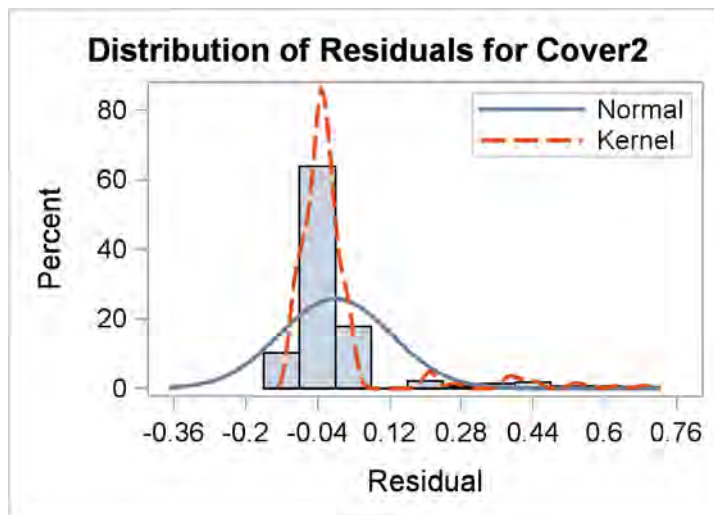
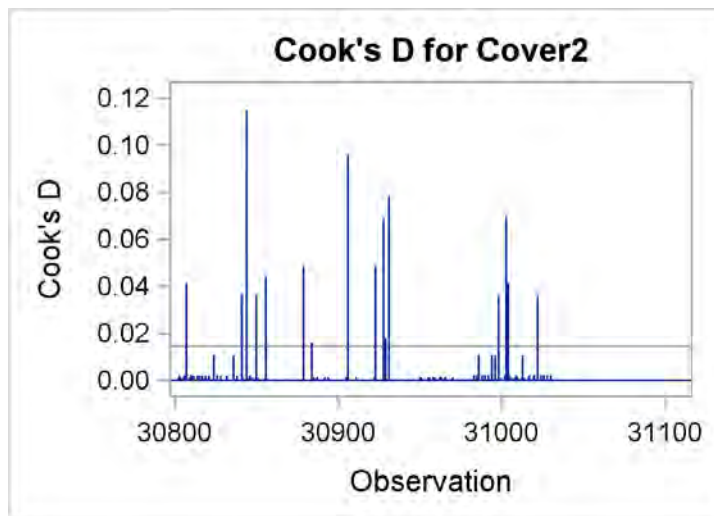
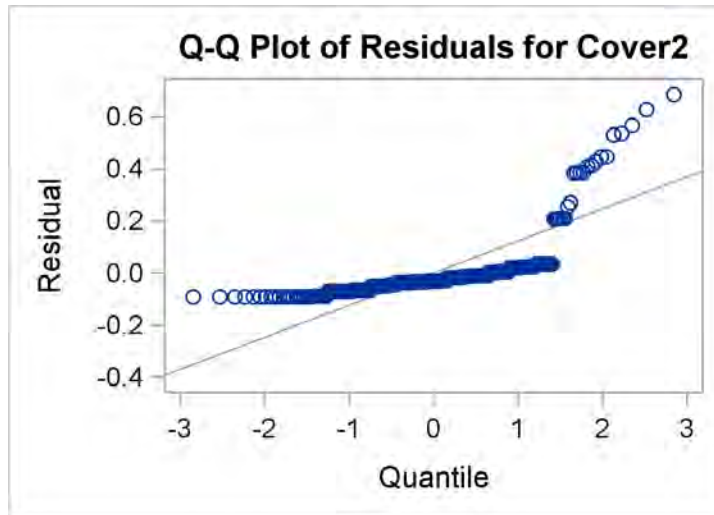
Dependent Variable: Cover2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	0.34197320	0.03799702	2.41	0.0121
Error	270	4.25717129	0.01576730		
Corrected Total	279	4.59914448			

R-Square	Coeff Var	Root MSE	Cover2 Mean
0.074356	352.0960	0.125568	0.035663

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	0.20395706	0.03399284	2.16	0.0476
Depth	2	0.01931036	0.00965518	0.61	0.5428
Quality	1	0.10530398	0.10530398	6.68	0.0103



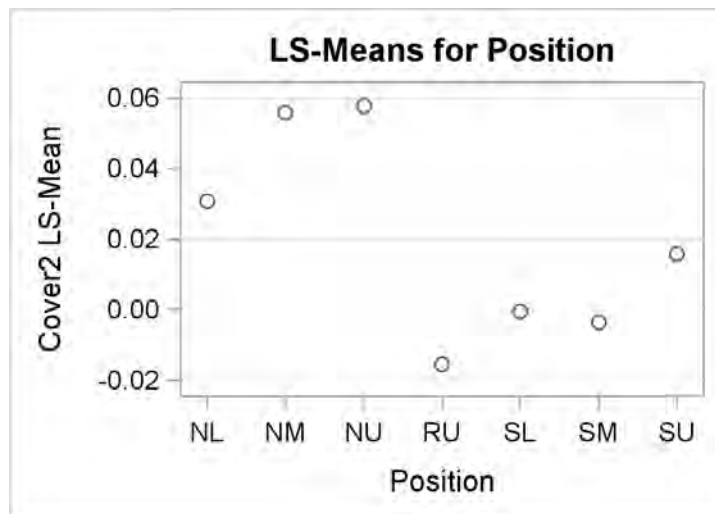


The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Position	Cover2 LSMEAN	LSMEAN Number
NL	0.03089523	1
NM	0.05589523	2
NU	0.05787476	3
RU	-0.01553808	4
SL	-0.00048658	5
SM	-0.00361005	6
SU	0.01584373	7

Least Squares Means for effect Position
Pr > |t| for H0: LSMean(i)=LSMean(j)
Dependent Variable: Cover2

i/j	1	2	3	4	5	6	7
1		0.9738	0.9618	0.6474	0.9223	0.8824	0.9983
2	0.9738		1.0000	0.1480	0.4120	0.3443	0.7871
3	0.9618	1.0000		0.1257	0.3684	0.3045	0.7465
4	0.6474	0.1480	0.1257		0.9983	0.9995	0.9223
5	0.9223	0.4120	0.3684	0.9983		1.0000	0.9973
6	0.8824	0.3443	0.3045	0.9995	1.0000		0.9929
7	0.9983	0.7871	0.7465	0.9223	0.9973	0.9929	

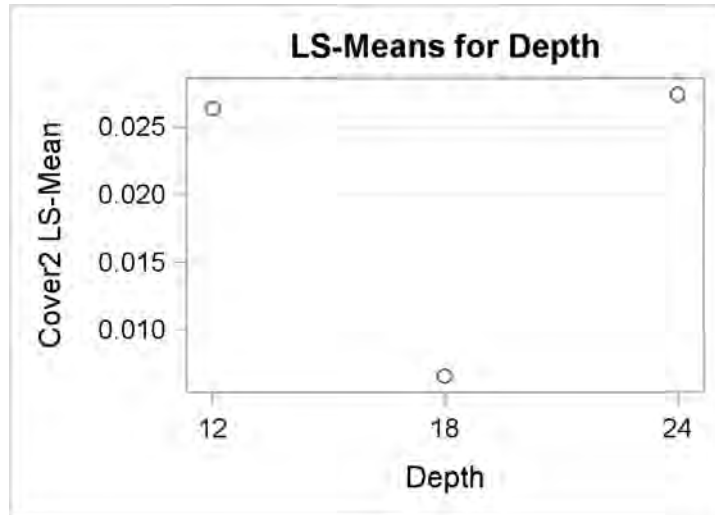


The GLM Procedure
 Least Squares Means
 Adjustment for Multiple Comparisons: Tukey-Kramer

Depth	Cover2 LSMEAN	LSMEAN Number
12	0.02637165	1
18	0.00657728	2
24	0.02742574	3

Least Squares Means for effect Depth
 Pr > |t| for H0: LSMean(i)=LSMean(j)
 Dependent Variable: Cover2

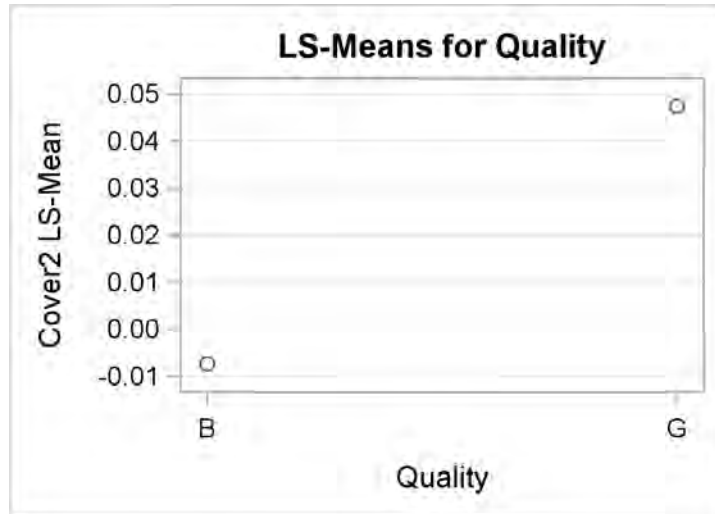
i/j	1	2	3
1		0.6201	0.9986
2	0.6201		0.5887
3	0.9986	0.5887	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

H0:LSMean1=LSMean2

Quality	Cover2 LSMEAN	Pr > |t|
B	-0.00730085	0.0103
G	0.04755063	



Species: Trifolium arvense

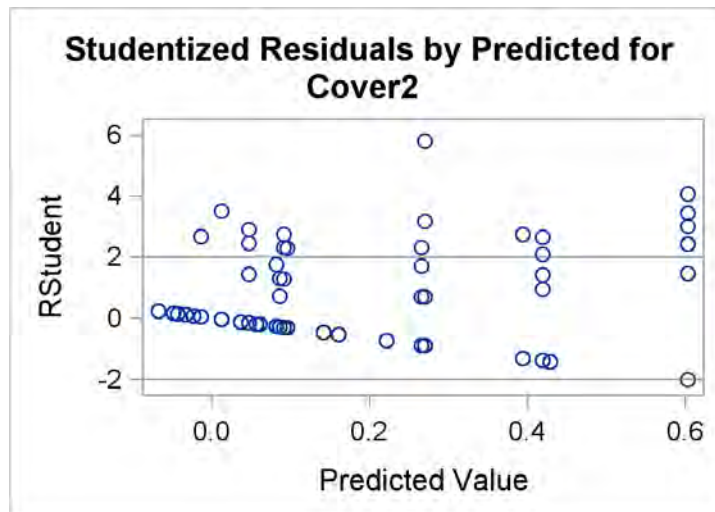
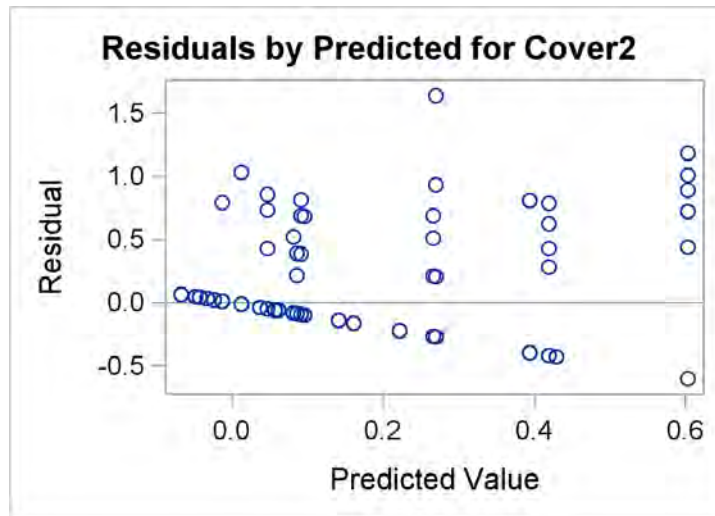
The GLM Procedure

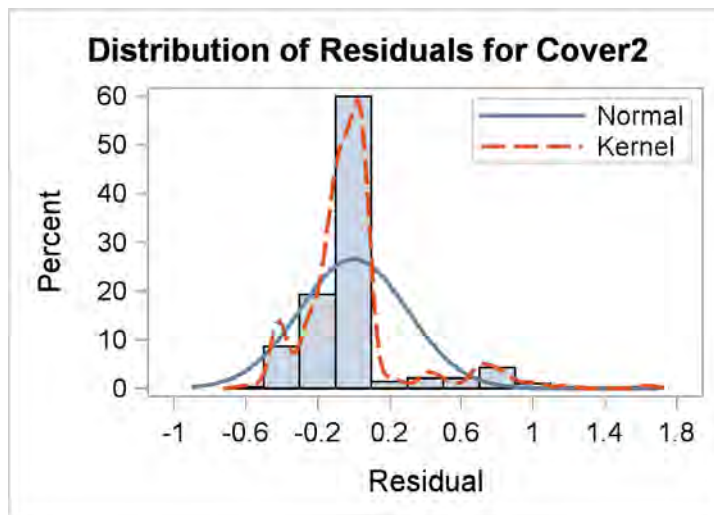
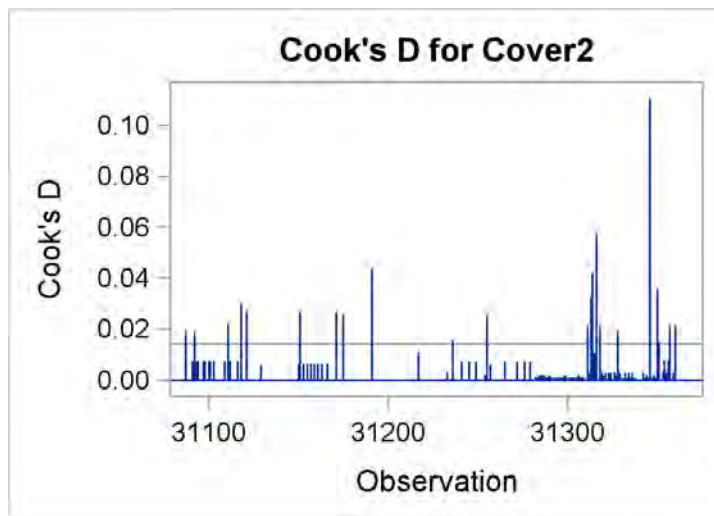
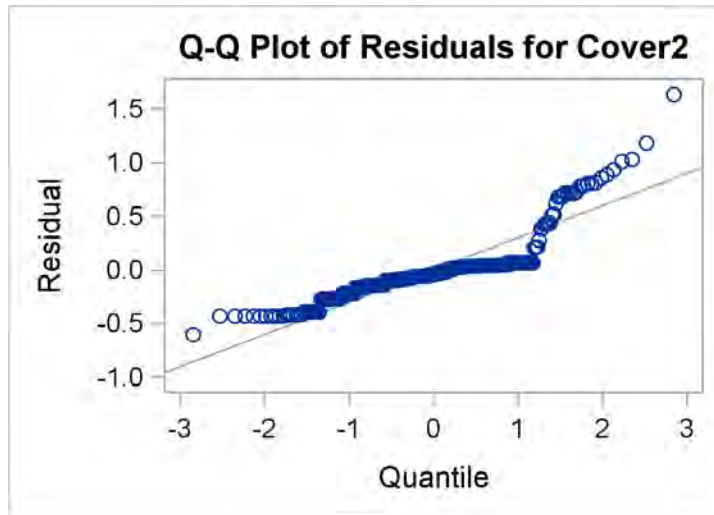
Dependent Variable: Cover2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	8.20401849	0.91155761	9.78	<.0001
Error	270	25.16039212	0.09318664		
Corrected Total	279	33.36441061			

R-Square	Coeff Var	Root MSE	Cover2 Mean
0.245891	262.5706	0.305265	0.116260

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	6.28437910	1.04739652	11.24	<.0001
Depth	2	1.82190525	0.91095263	9.78	<.0001
Quality	1	0.04194888	0.04194888	0.45	0.5028



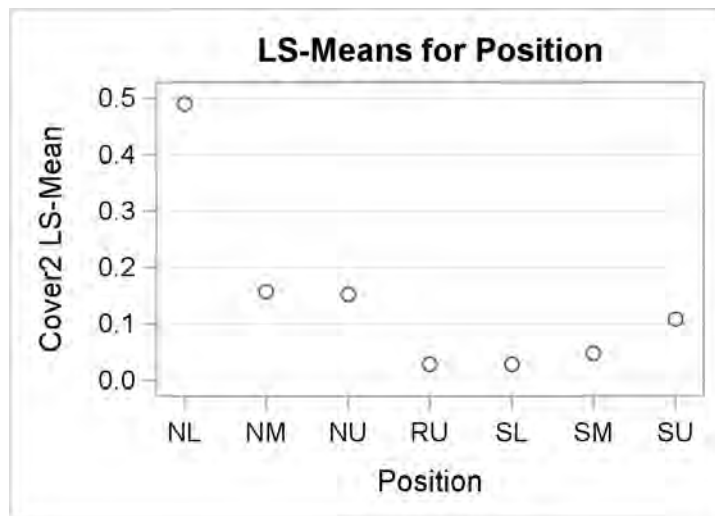


The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Position	Cover2 LSMEAN	LSMEAN Number
NL	0.48957050	1
NM	0.15674726	2
NU	0.15234497	3
RU	0.02809654	4
SL	0.02809654	5
SM	0.04755032	6
SU	0.10809042	7

Least Squares Means for effect Position
Pr > |t| for H0: LSMean(i)=LSMean(j)
Dependent Variable: Cover2

i/j	1	2	3	4	5	6	7
1		<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
2	<.0001		1.0000	0.4922	0.4922	0.6826	0.9918
3	<.0001	1.0000		0.5355	0.5355	0.7233	0.9951
4	<.0001	0.4922	0.5355		1.0000	1.0000	0.9041
5	<.0001	0.4922	0.5355	1.0000		1.0000	0.9041
6	<.0001	0.6826	0.7233	1.0000	1.0000		0.9743
7	<.0001	0.9918	0.9951	0.9041	0.9041	0.9743	

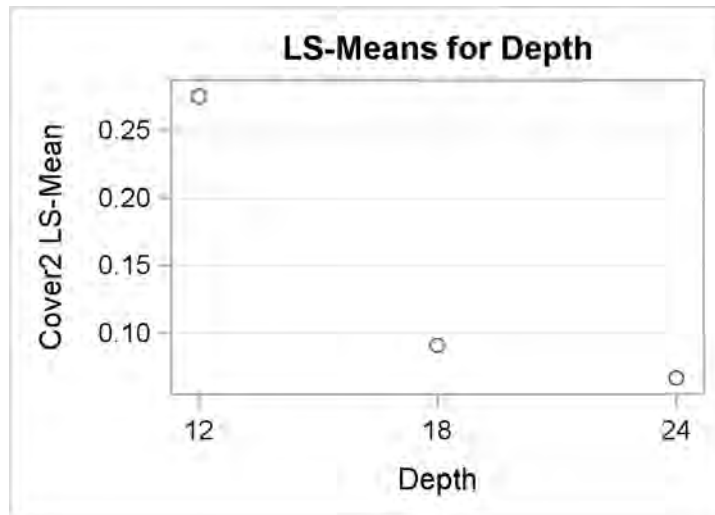


The GLM Procedure
 Least Squares Means
 Adjustment for Multiple Comparisons: Tukey-Kramer

Depth	Cover2 LSMEAN	LSMEAN Number
12	0.27531538	1
18	0.09116413	2
24	0.06659043	3

Least Squares Means for effect Depth
 Pr > |t| for H0: LSMean(i)=LSMean(j)
 Dependent Variable: Cover2

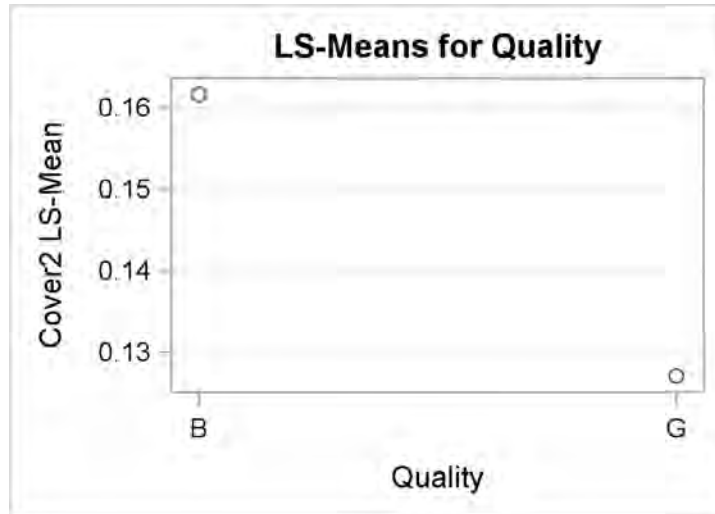
i/j	1	2	3
1		0.0012	0.0002
2	0.0012		0.8826
3	0.0002	0.8826	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

H0:LSMean1=LSMean2

Quality	Cover2 LSMEAN	Pr > |t|
B	0.16166661	0.5028
G	0.12704668	



Species: Trifolium hybridum

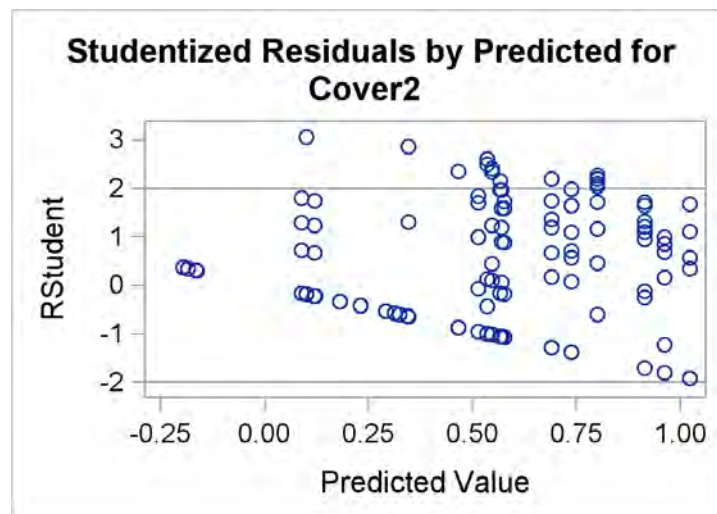
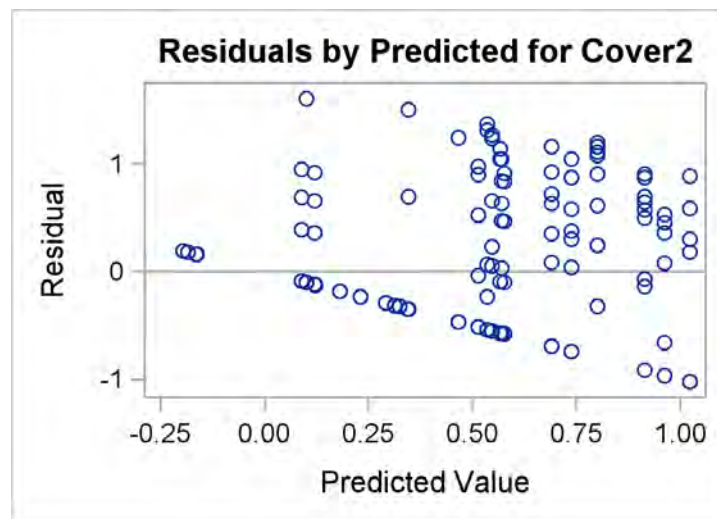
The GLM Procedure

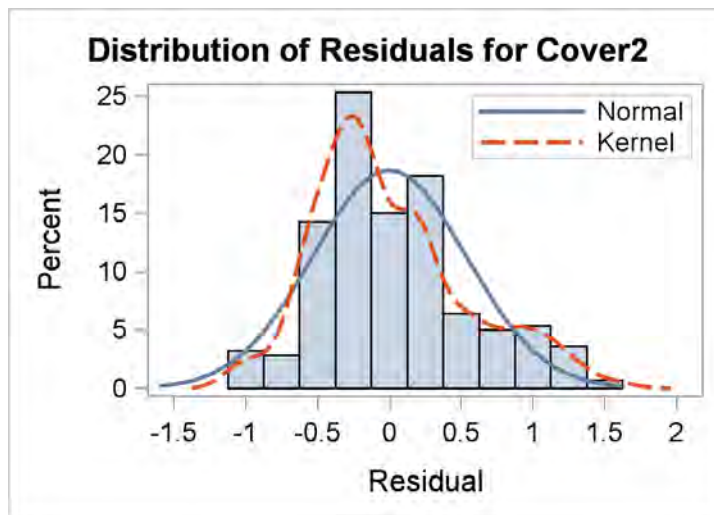
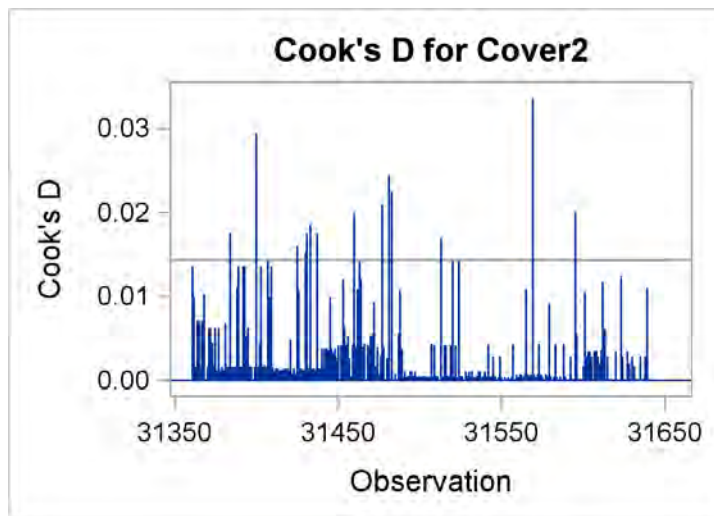
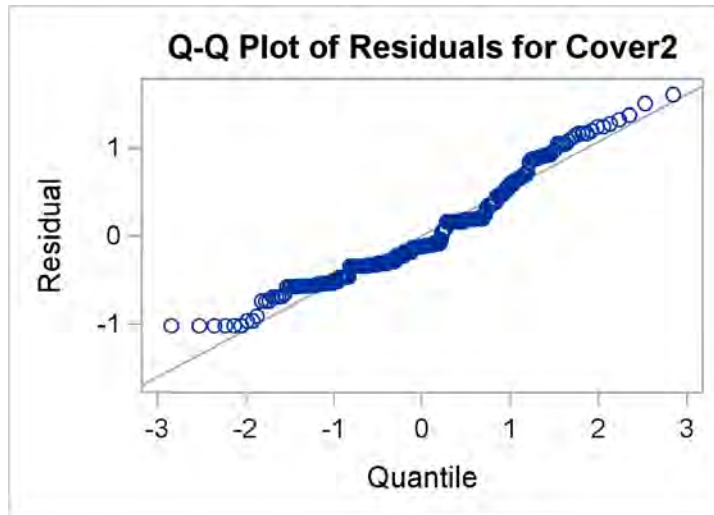
Dependent Variable: Cover2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	32.3772499	3.5974722	12.18	<.0001
Error	270	79.7242590	0.2952750		
Corrected Total	279	112.1015089			

R-Square	Coeff Var	Root MSE	Cover2 Mean
0.288821	142.6746	0.543392	0.380861

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	11.84758679	1.97459780	6.69	<.0001
Depth	2	19.65792407	9.82896204	33.29	<.0001
Quality	1	2.82727748	2.82727748	9.58	0.0022



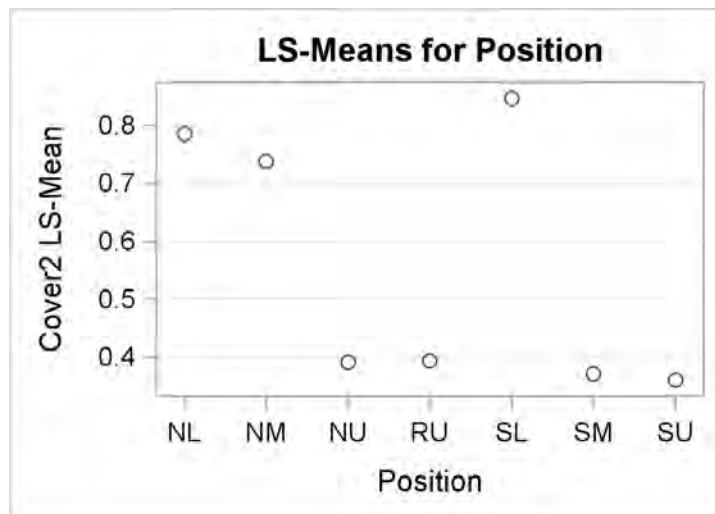


The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Position	Cover2 LSMEAN	LSMEAN Number
NL	0.78572293	1
NM	0.73740459	2
NU	0.39085238	3
RU	0.39352273	4
SL	0.84680612	5
SM	0.37174259	6
SU	0.36023870	7

Least Squares Means for effect Position
Pr > |t| for H0: LSMean(i)=LSMean(j)
Dependent Variable: Cover2

i/j	1	2	3	4	5	6	7
1		0.9997	0.0219	0.0234	0.9988	0.0132	0.0096
2	0.9997		0.0691	0.0733	0.9723	0.0448	0.0340
3	0.0219	0.0691		1.0000	0.0040	1.0000	1.0000
4	0.0234	0.0733	1.0000		0.0043	1.0000	1.0000
5	0.9988	0.9723	0.0040	0.0043		0.0022	0.0015
6	0.0132	0.0448	1.0000	1.0000	0.0022		1.0000
7	0.0096	0.0340	1.0000	1.0000	0.0015	1.0000	

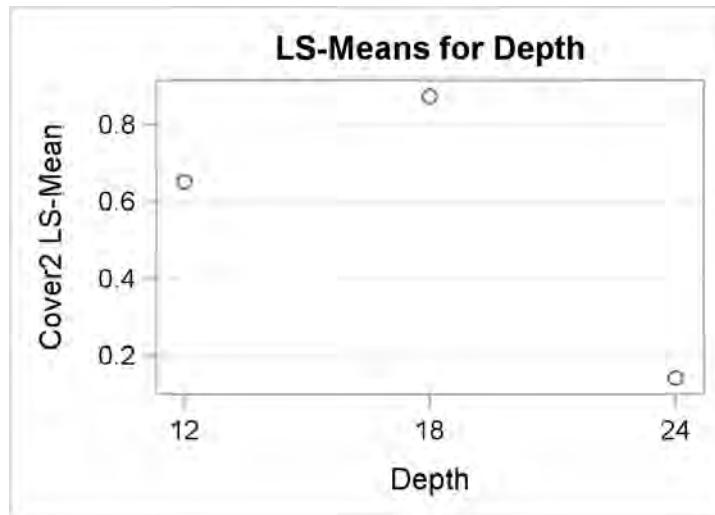


The GLM Procedure
 Least Squares Means
 Adjustment for Multiple Comparisons: Tukey-Kramer

Depth	Cover2 LSMEAN	LSMEAN Number
12	0.65018713	1
18	0.87325720	2
24	0.14210855	3

Least Squares Means for effect Depth
 Pr > |t| for H0: LSMean(i)=LSMean(j)
 Dependent Variable: Cover2

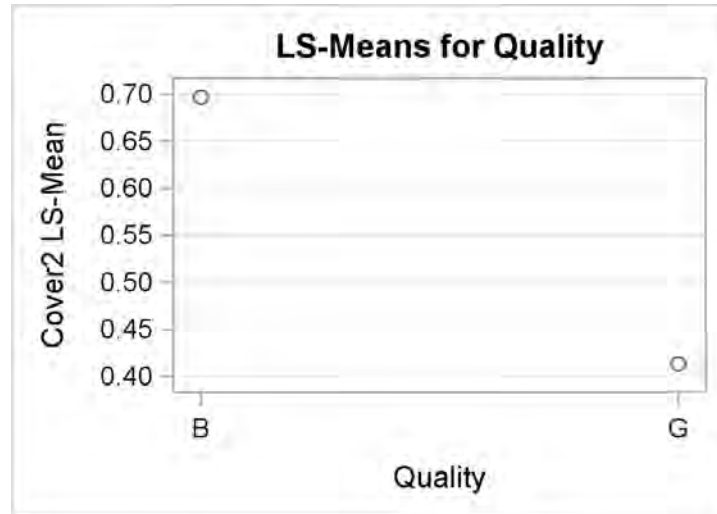
i/j	1	2	3
1		0.0417	<.0001
2	0.0417		<.0001
3	<.0001	<.0001	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

H0:LSMean1=LSMean2

Quality	Cover2 LSMEAN	Pr > |t|
B	0.69729284	0.0022
G	0.41307575	



Species: *Trifolium repens*

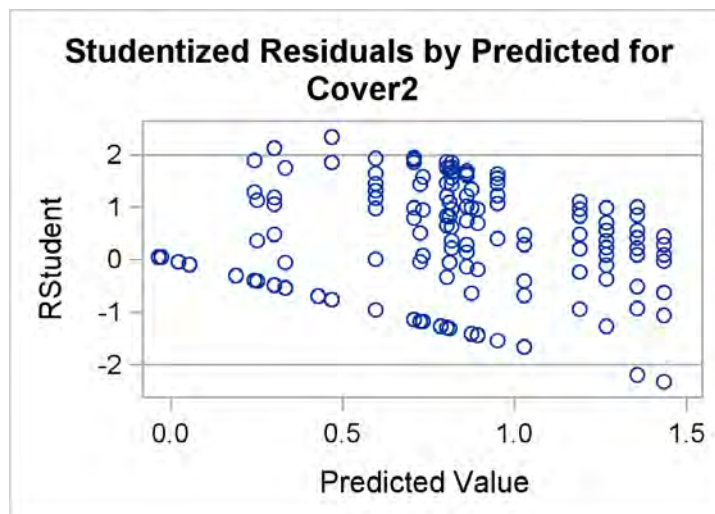
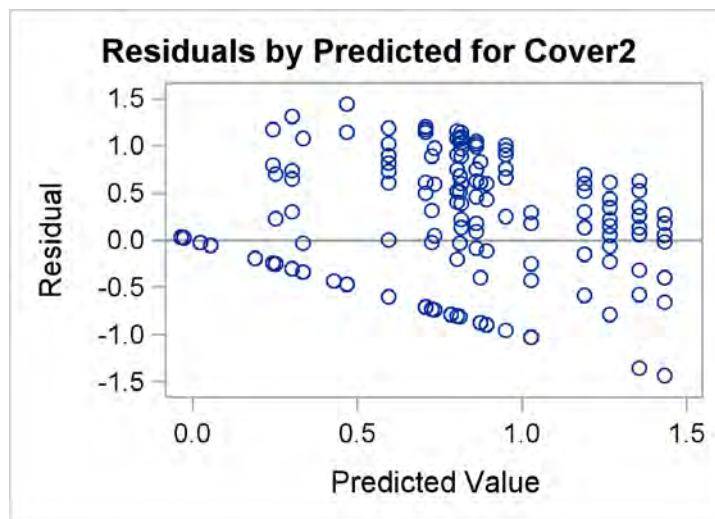
The GLM Procedure

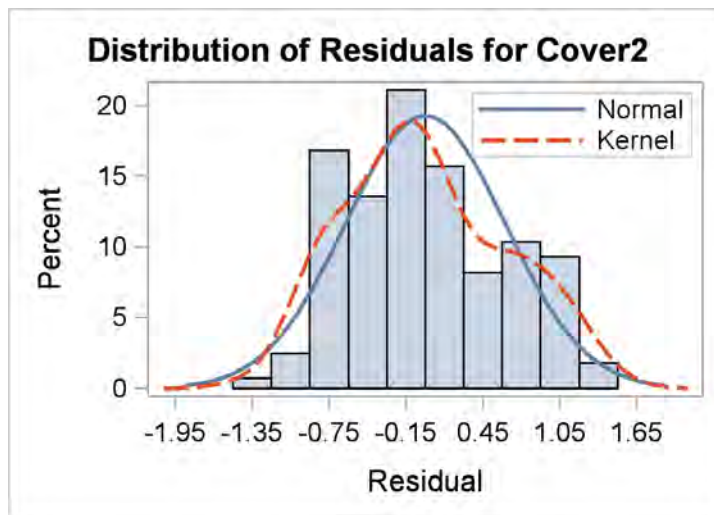
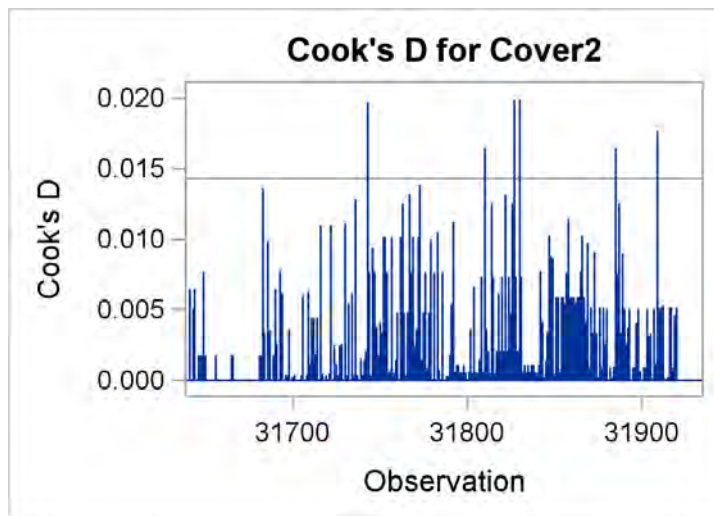
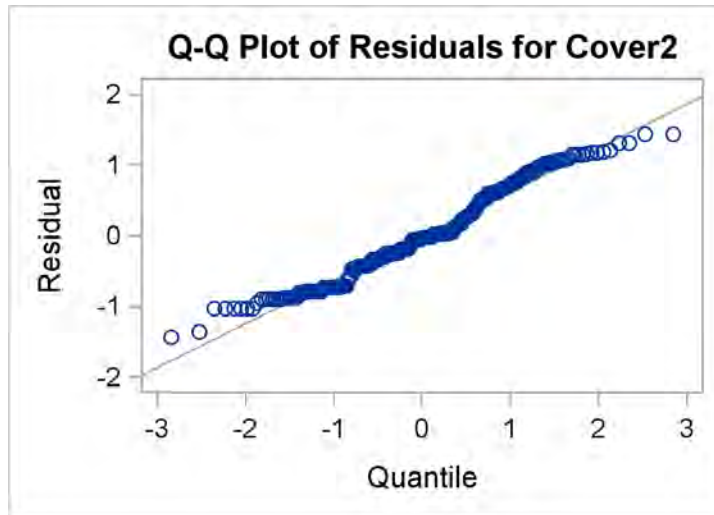
Dependent Variable: Cover2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	48.0212234	5.3356915	13.34	<.0001
Error	270	107.9618801	0.3998588		
Corrected Total	279	155.9831035			

R-Square	Coeff Var	Root MSE	Cover2 Mean
0.307862	98.03936	0.632344	0.644990

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	14.55005984	2.42500997	6.06	<.0001
Depth	2	12.87075219	6.43537610	16.09	<.0001
Quality	1	24.62055588	24.62055588	61.57	<.0001



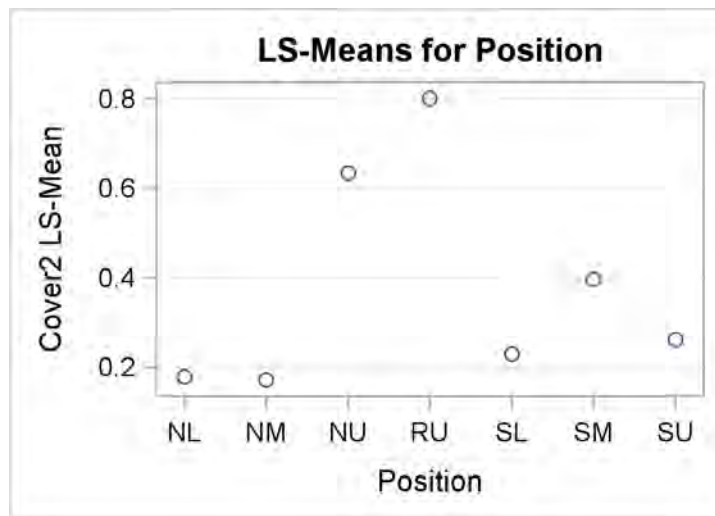


The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Position	Cover2 LSMEAN	LSMEAN Number
NL	0.17913833	1
NM	0.17134085	2
NU	0.63503751	3
RU	0.80202161	4
SL	0.22987848	5
SM	0.39634337	6
SU	0.26187956	7

Least Squares Means for effect Position
Pr > |t| for H0: LSMean(i)=LSMean(j)
Dependent Variable: Cover2

i/j	1	2	3	4	5	6	7
1	1.0000	0.0237	0.0003	0.9998	0.7227	0.9972	
2	1.0000		0.0199	0.0002	0.9996	0.6881	0.9954
3	0.0237	0.0199		0.9009	0.0667	0.6246	0.1185
4	0.0003	0.0002	0.9009		0.0013	0.0661	0.0031
5	0.9998	0.9996	0.0667	0.0013		0.9022	1.0000
6	0.7227	0.6881	0.6246	0.0661	0.9022		0.9637
7	0.9972	0.9954	0.1185	0.0031	1.0000	0.9637	

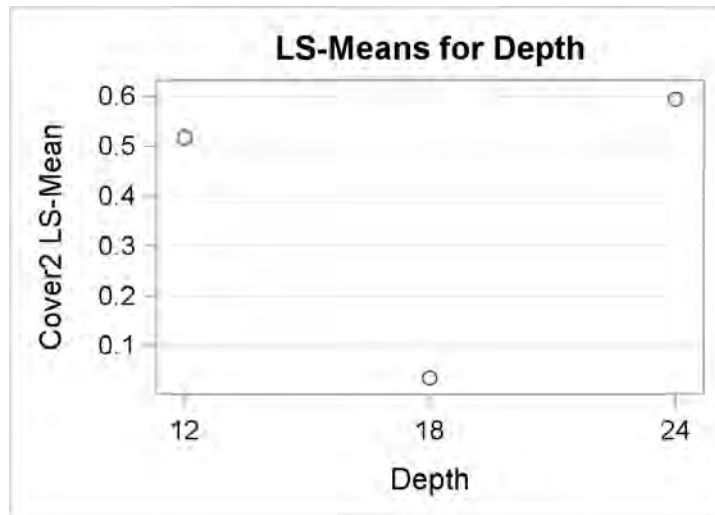


The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Depth	Cover2 LSMEAN	LSMEAN Number
12	0.51717931	1
18	0.03498266	2
24	0.59454076	3

Least Squares Means for effect Depth
Pr > |t| for H0: LSMean(i)=LSMean(j)
Dependent Variable: Cover2

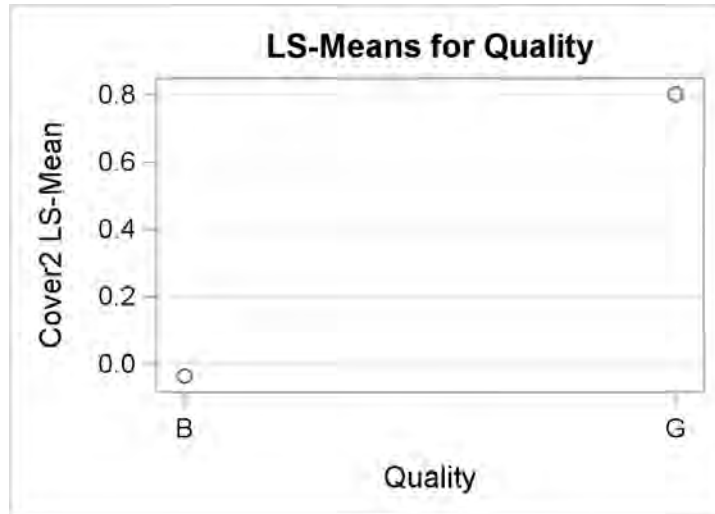
i/j	1	2	3
1		<.0001	0.7496
2	<.0001		<.0001
3	0.7496	<.0001	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

H0:LSMean1=LSMean2

Quality	Cover2 LSMEAN	Pr > |t|
B	-0.03712373	<.0001
G	0.80159222	



Attachment 3. Analysis of Variance (ANOVA) for Frequency

Species: *Agrostis alba*

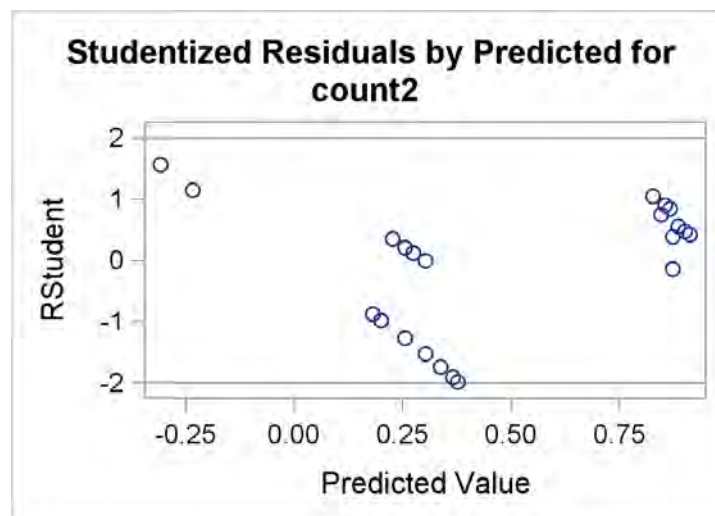
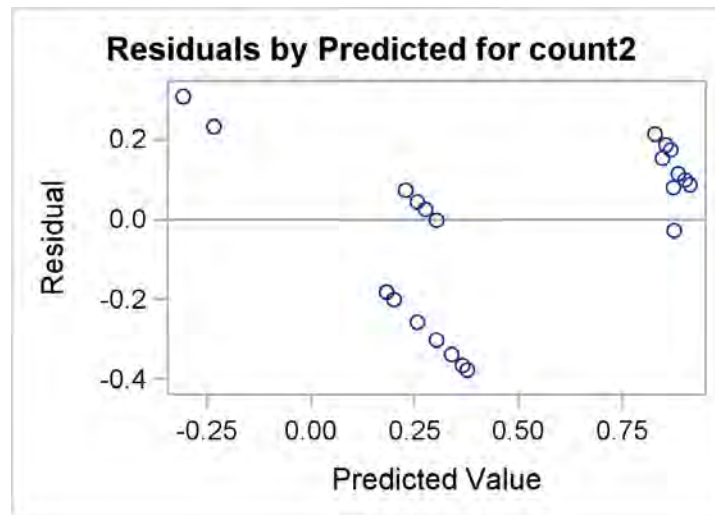
The GLM Procedure

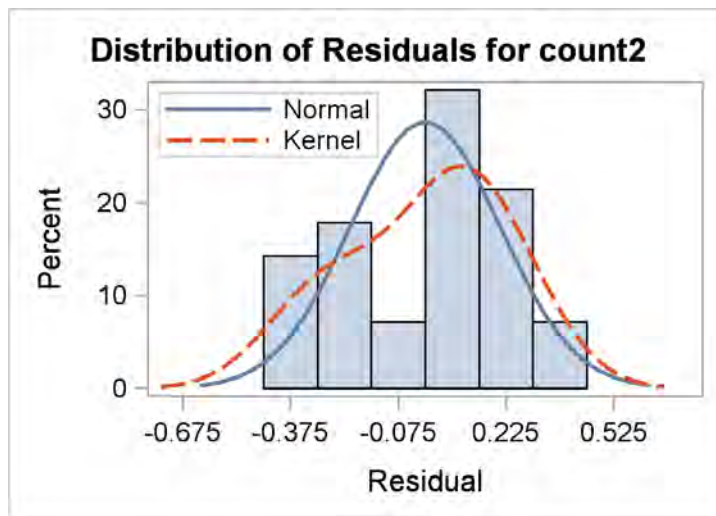
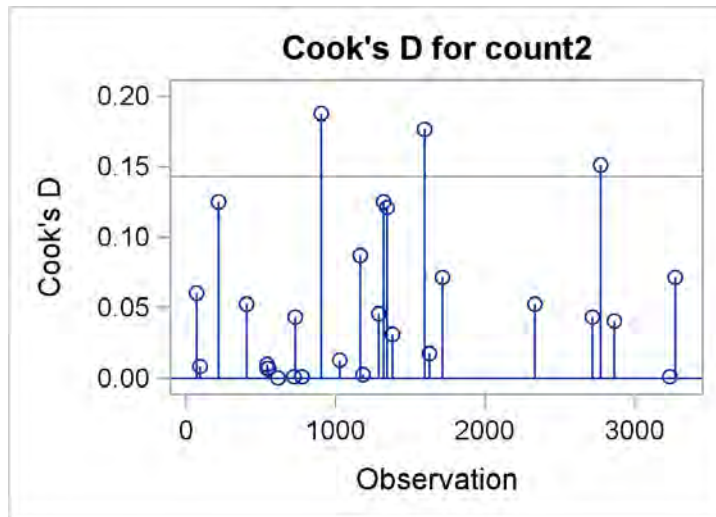
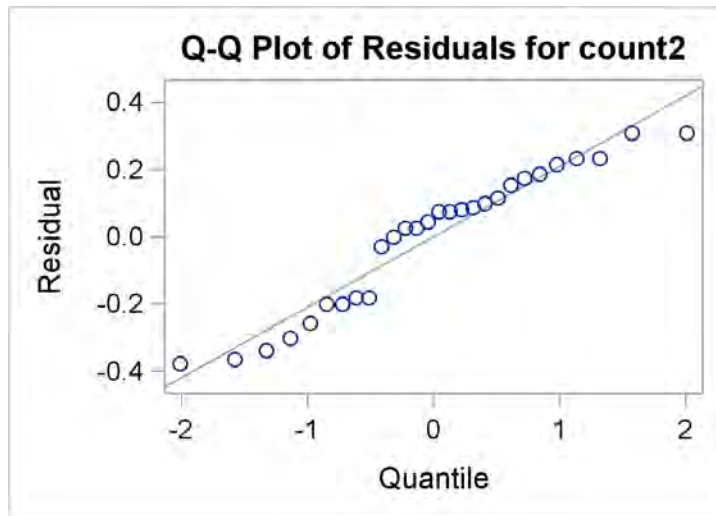
Dependent Variable: count2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	4.13191337	0.45910149	7.01	0.0002
Error	18	1.17840835	0.06546713		
Corrected Total	27	5.31032172			

R-Square	Coeff Var	Root MSE	count2 Mean
0.778091	66.77012	0.255865	0.383204

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	2.75382147	0.45897025	7.01	0.0006
Depth	2	0.00753914	0.00376957	0.06	0.9442
Quality	1	1.00349382	1.00349382	15.33	0.0010

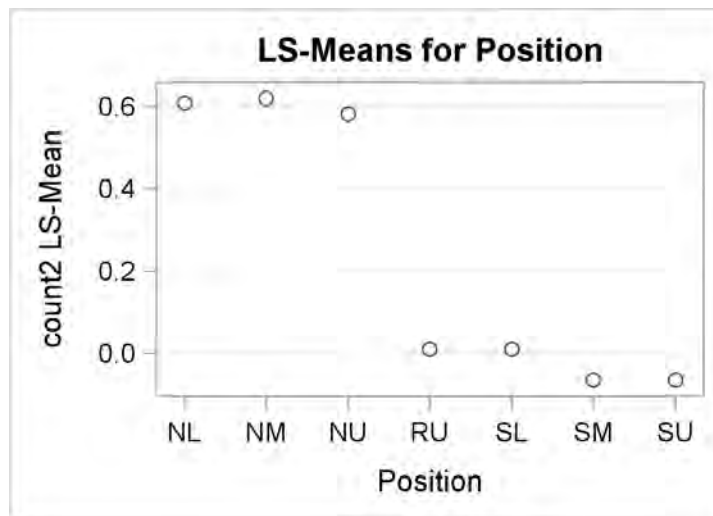




The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Position	count2 LSMEAN	LSMEAN Number
NL	0.60891559	1
NM	0.62035496	2
NU	0.58162947	3
RU	0.01052179	4
SL	0.01052179	5
SM	-0.06473571	6
SU	-0.06473571	7

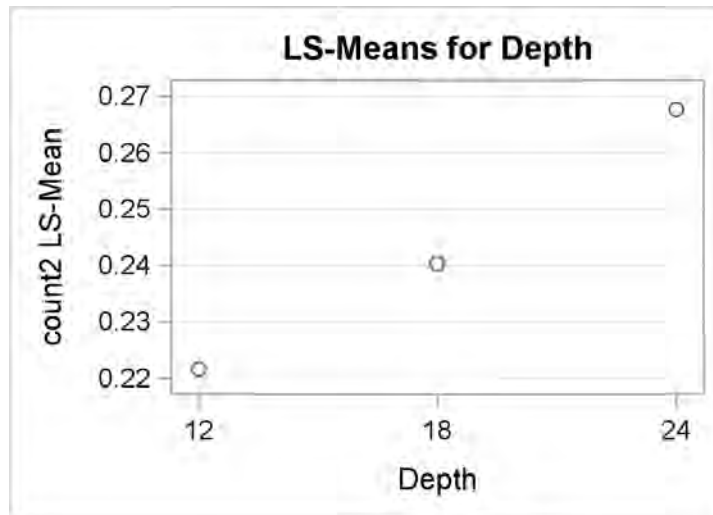
Least Squares Means for effect Position Pr > |t| for H0: LSMean(i)=LSMean(j) Dependent Variable: count2							
i/j	1	2	3	4	5	6	7
1		1.0000	1.0000	0.0497	0.0497	0.0215	0.0215
2	1.0000		1.0000	0.0439	0.0439	0.0189	0.0189
3	1.0000	1.0000		0.0667	0.0667	0.0292	0.0292
4	0.0497	0.0439	0.0667		1.0000	0.9995	0.9995
5	0.0497	0.0439	0.0667	1.0000		0.9995	0.9995
6	0.0215	0.0189	0.0292	0.9995	0.9995		1.0000
7	0.0215	0.0189	0.0292	0.9995	0.9995	1.0000	



The GLM Procedure
 Least Squares Means
 Adjustment for Multiple Comparisons: Tukey-Kramer

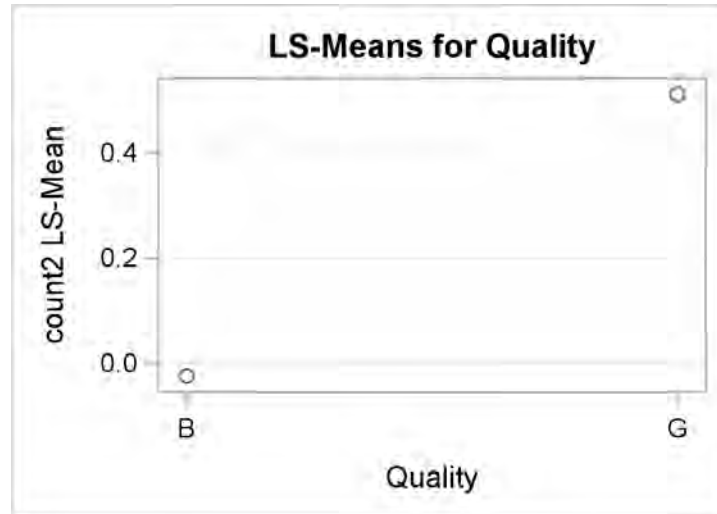
Depth	count2 LSMEAN	LSMEAN Number
12	0.22158772	1
18	0.24031550	2
24	0.26772772	3

Least Squares Means for effect Depth			
Pr > |t| for H0: LSMean(i)=LSMean(j)			
Dependent Variable: count2			
i/j	1	2	3
1		0.9897	0.9394
2	0.9897		0.9781
3	0.9394	0.9781	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Quality	count2 LSMEAN	H0:LSMean1=LSMean2 Pr > |t|
B	-0.02451740	0.0010
G	0.51093803	



Species: *Andropogon gerardii*

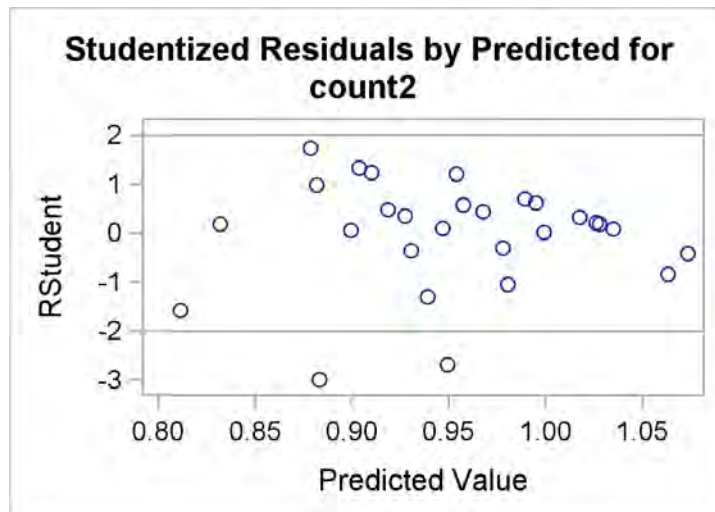
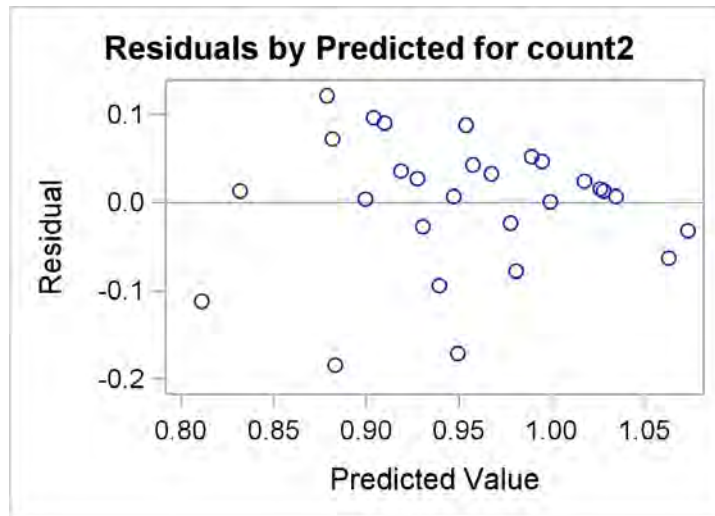
The GLM Procedure

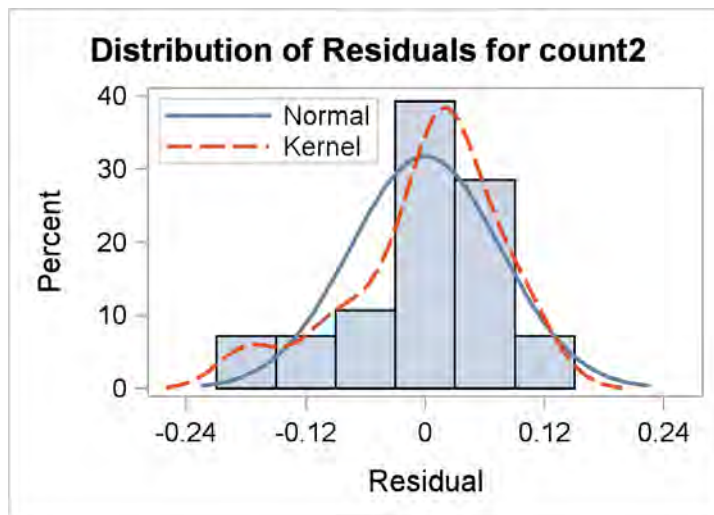
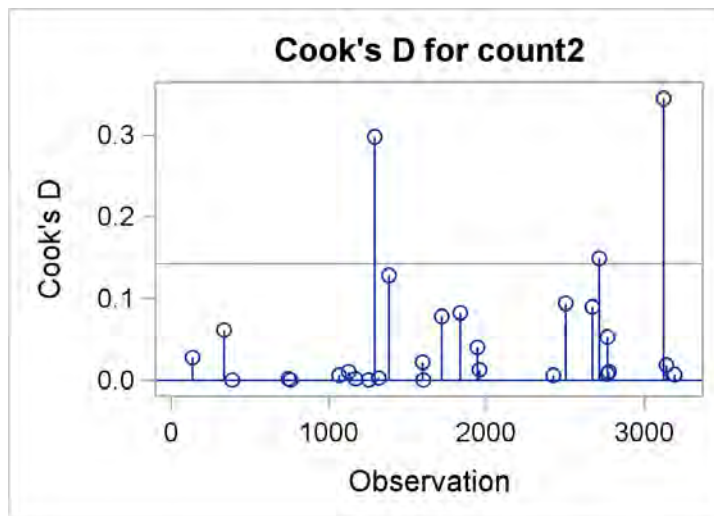
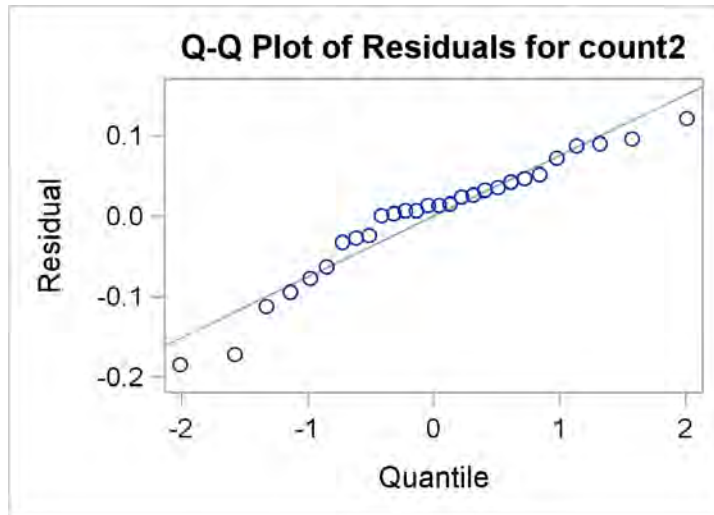
Dependent Variable: count2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	0.11533168	0.01281463	1.51	0.2190
Error	18	0.15303711	0.00850206		
Corrected Total	27	0.26836879			

R-Square	Coeff Var	Root MSE	count2 Mean
0.429751	9.677615	0.092207	0.952783

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	0.05821437	0.00970240	1.14	0.3790
Depth	2	0.03201114	0.01600557	1.88	0.1810
Quality	1	0.04725717	0.04725717	5.56	0.0299

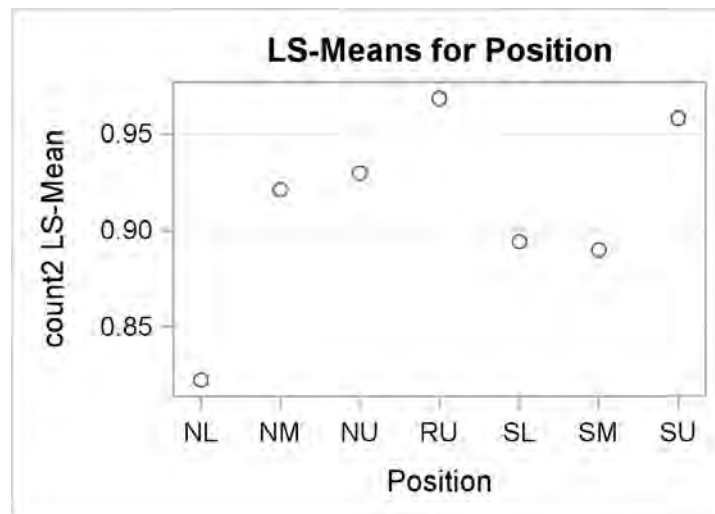




The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Position	count2 LSMEAN	LSMEAN Number
NL	0.82232734	1
NM	0.92108223	2
NU	0.92972055	3
RU	0.96844604	4
SL	0.89427974	5
SM	0.88984755	6
SU	0.95809787	7

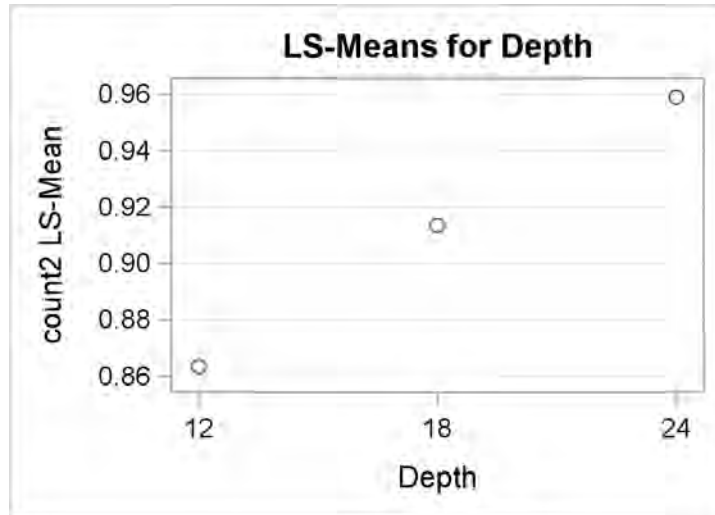
Least Squares Means for effect Position Pr > |t| for H0: LSMean(i)=LSMean(j) Dependent Variable: count2							
i/j	1	2	3	4	5	6	7
1		0.7332	0.6562	0.3227	0.9189	0.9386	0.4023
2	0.7332		1.0000	0.9890	0.9995	0.9988	0.9970
3	0.6562	1.0000		0.9962	0.9977	0.9956	0.9993
4	0.3227	0.9890	0.9962		0.9079	0.8831	1.0000
5	0.9189	0.9995	0.9977	0.9079		1.0000	0.9524
6	0.9386	0.9988	0.9956	0.8831	1.0000		0.9356
7	0.4023	0.9970	0.9993	1.0000	0.9524	0.9356	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

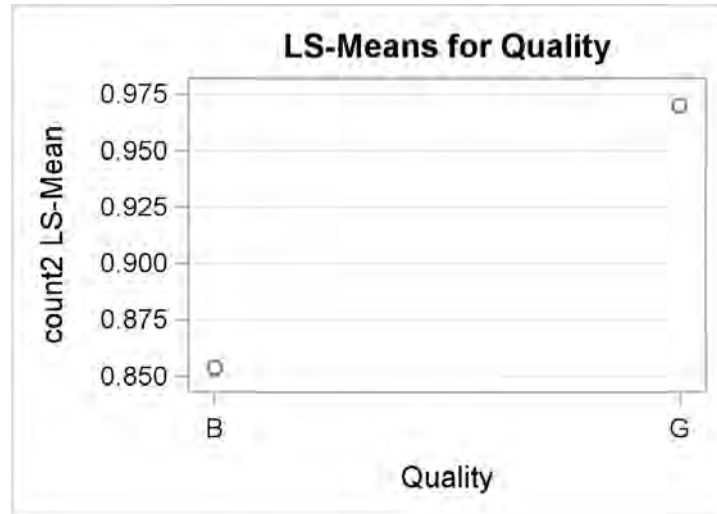
Depth	count2 LSMEAN	LSMEAN Number
12	0.86341778	1
18	0.91348005	2
24	0.95901702	3

Least Squares Means for effect Depth			
Pr > |t| for H0: LSMean(i)=LSMean(j)			
Dependent Variable: count2			
i/j	1	2	3
1		0.5767	0.1564
2	0.5767		0.6326
3	0.1564	0.6326	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Quality	count2 LSMEAN	H0:LSMean1=LSMean2
		Pr > |t|
B	0.85387246	0.0299
G	0.97007078	



Species: *Andropogon scoparius*

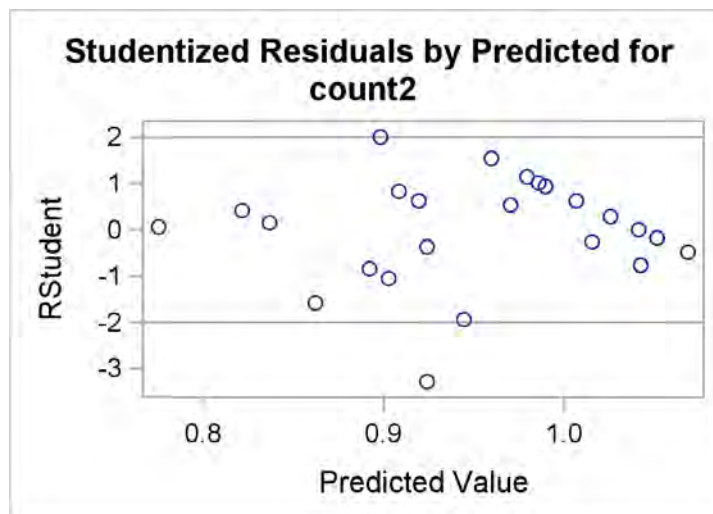
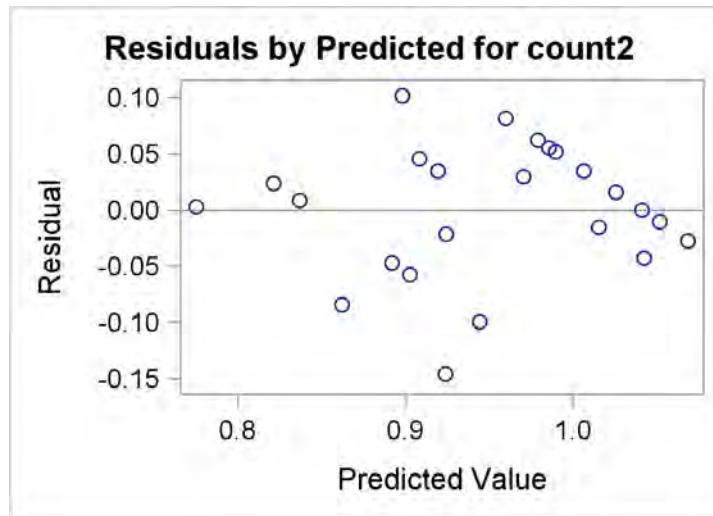
The GLM Procedure

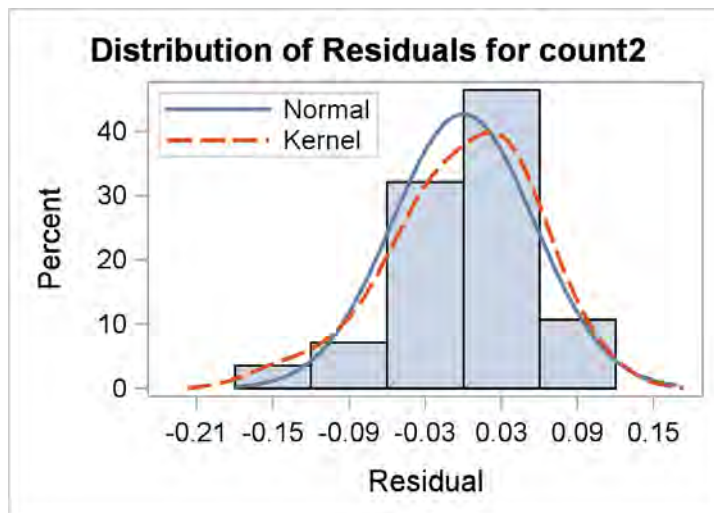
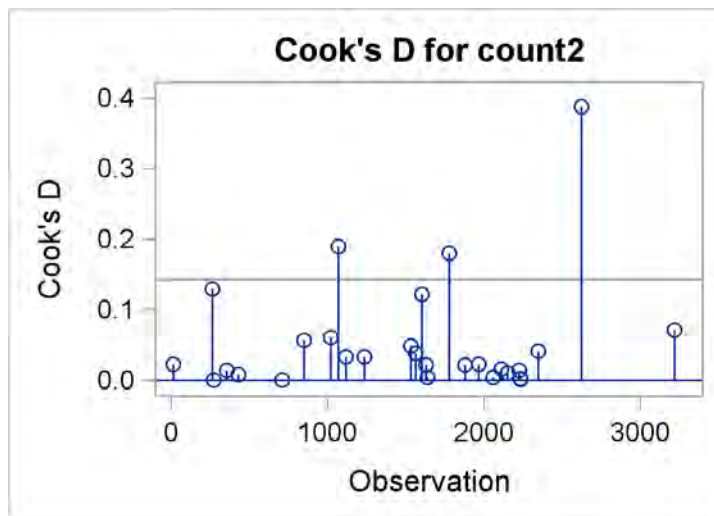
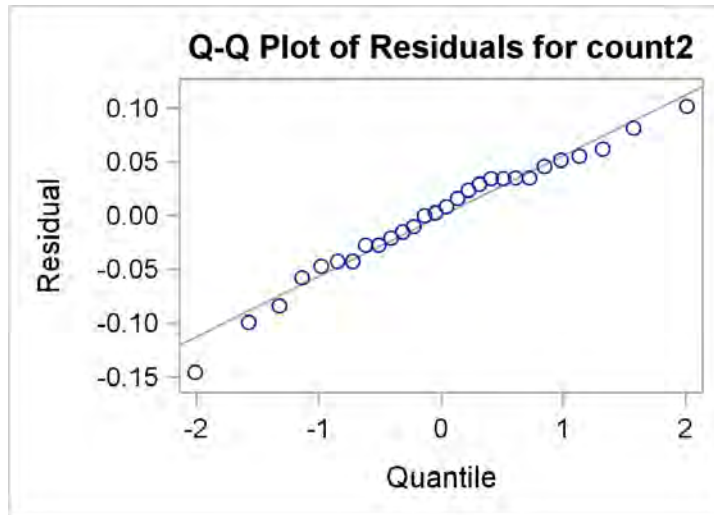
Dependent Variable: count2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	0.16417683	0.01824187	3.87	0.0070
Error	18	0.08490356	0.00471686		
Corrected Total	27	0.24908040			

R-Square	Coeff Var	Root MSE	count2 Mean
0.659132	7.180532	0.068679	0.956467

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	0.07543274	0.01257212	2.67	0.0497
Depth	2	0.08867421	0.04433710	9.40	0.0016
Quality	1	0.01345014	0.01345014	2.85	0.1085

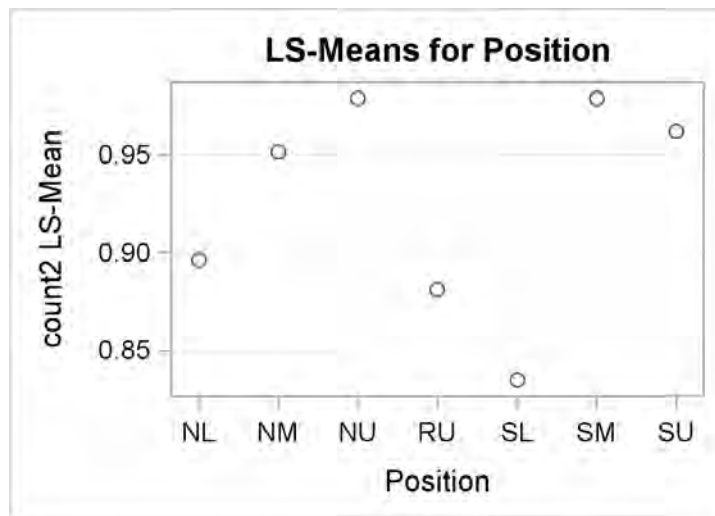




The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Position	count2 LSMEAN	LSMEAN Number
NL	0.89642524	1
NM	0.95188742	2
NU	0.97917354	3
RU	0.88102622	4
SL	0.83476469	5
SM	0.97917354	6
SU	0.96223560	7

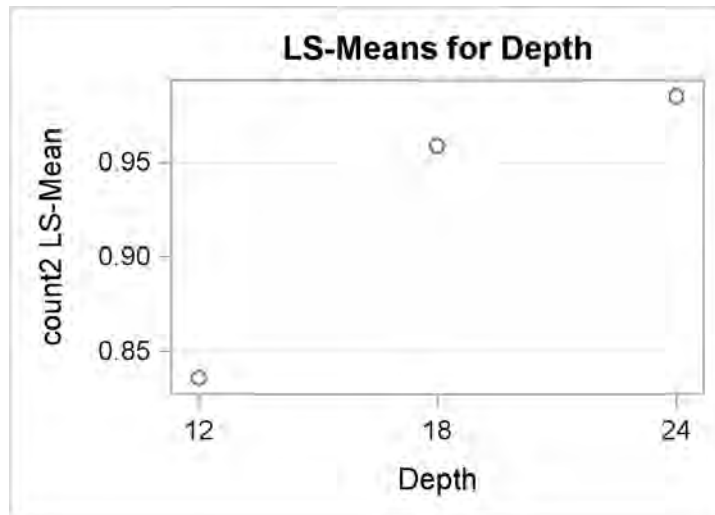
Least Squares Means for effect Position Pr > |t| for H0: LSMean(i)=LSMean(j) Dependent Variable: count2							
i/j	1	2	3	4	5	6	7
1		0.9063	0.6222	0.9999	0.8567	0.6222	0.8174
2	0.9063		0.9972	0.7638	0.2493	0.9972	1.0000
3	0.6222	0.9972		0.4357	0.0943	1.0000	0.9998
4	0.9999	0.7638	0.4357		0.9580	0.4357	0.6412
5	0.8567	0.2493	0.0943	0.9580		0.0943	0.1759
6	0.6222	0.9972	1.0000	0.4357	0.0943		0.9998
7	0.8174	1.0000	0.9998	0.6412	0.1759	0.9998	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

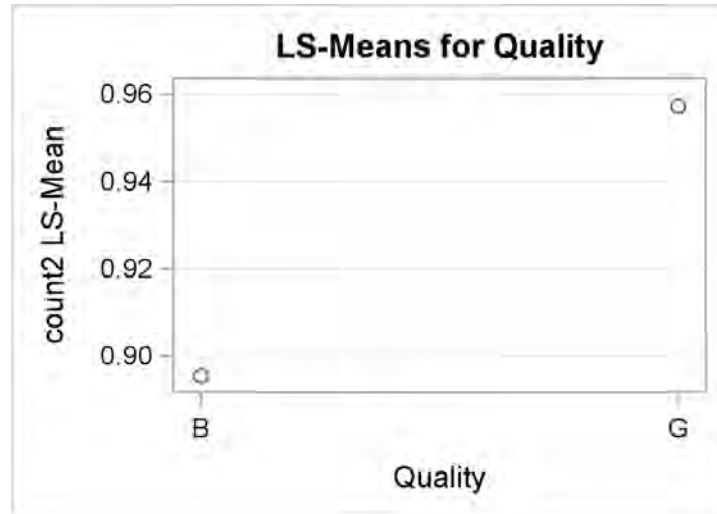
Depth	count2 LSMEAN	LSMEAN Number
12	0.83572280	1
18	0.95870208	2
24	0.98472637	3

Least Squares Means for effect Depth			
Pr > |t| for H0: LSMean(i)=LSMean(j)			
Dependent Variable: count2			
i/j	1	2	3
1		0.0095	0.0020
2	0.0095		0.7614
3	0.0020	0.7614	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Quality	count2 LSMEAN	H0:LSMean1=LSMean2 Pr > |t|
B	0.89538820	0.1085
G	0.95737930	



Species: Desmodium canadense

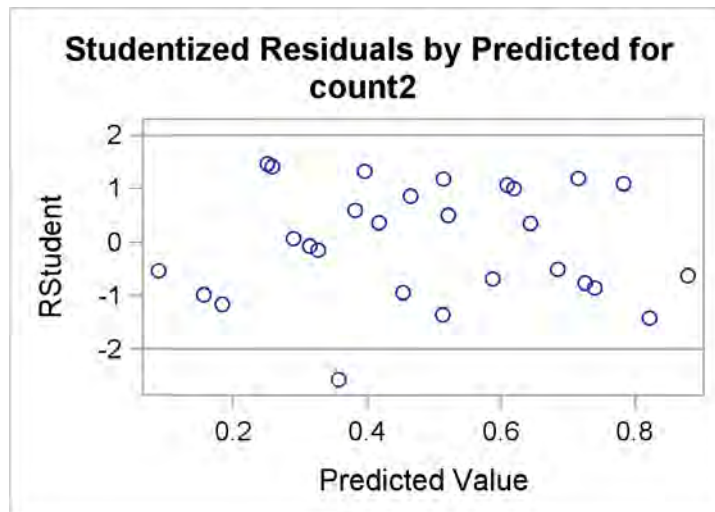
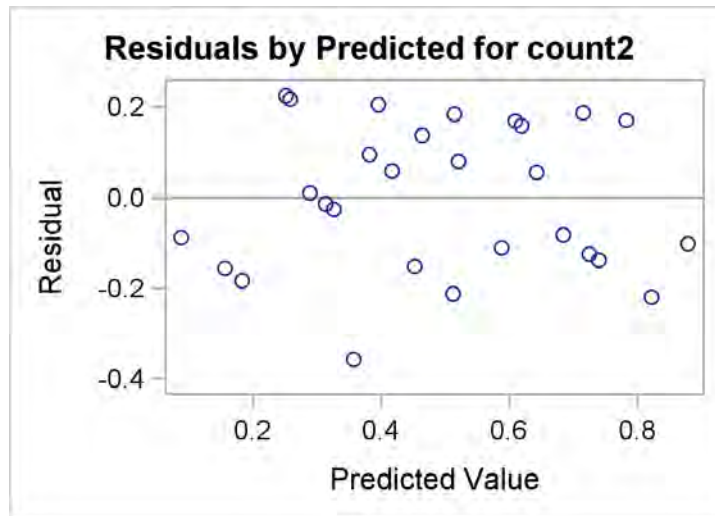
The GLM Procedure

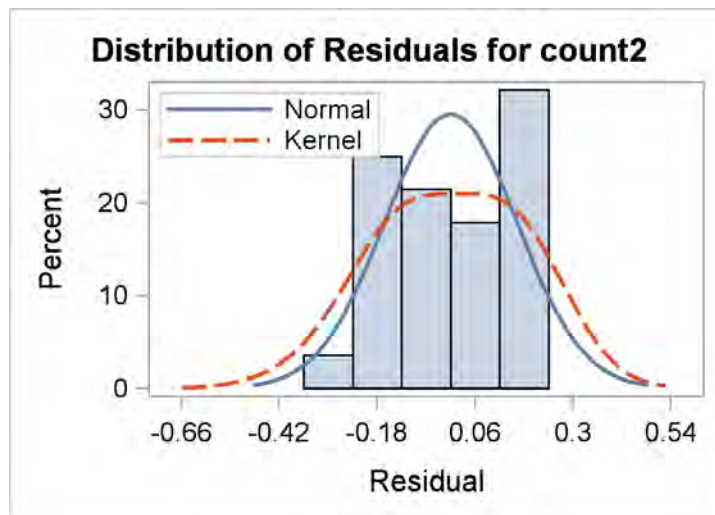
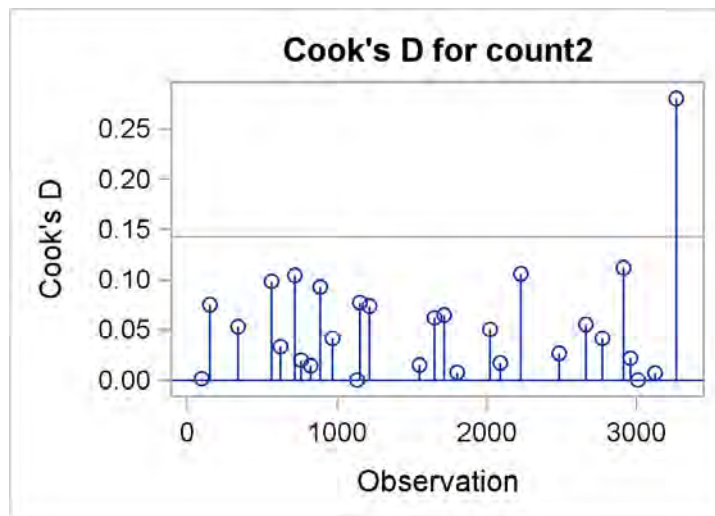
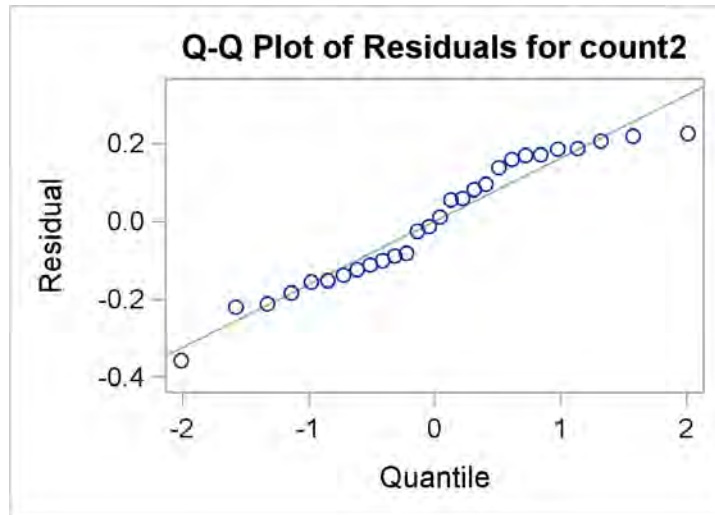
Dependent Variable: count2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	1.24067532	0.13785281	3.50	0.0114
Error	18	0.70957670	0.03942093		
Corrected Total	27	1.95025202			

R-Square	Coeff Var	Root MSE	count2 Mean
0.636162	40.59406	0.198547	0.489104

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	0.36495819	0.06082636	1.54	0.2208
Depth	2	0.69858601	0.34929300	8.86	0.0021
Quality	1	0.23902516	0.23902516	6.06	0.0241

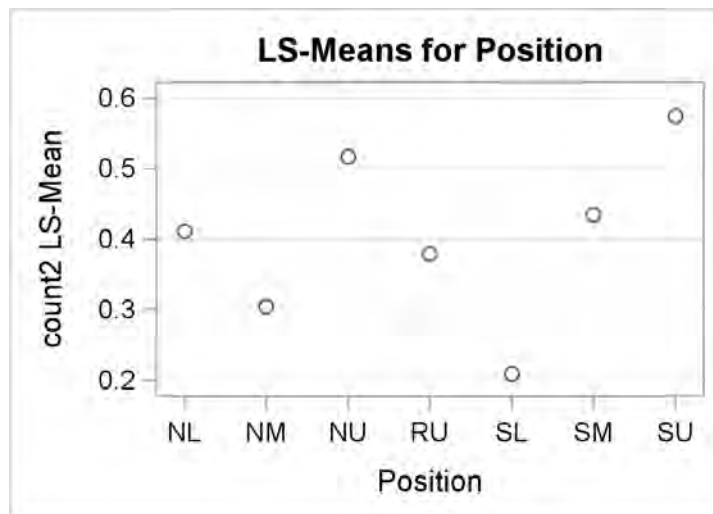




The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Position	count2 LSMEAN	LSMEAN Number
NL	0.41082388	1
NM	0.30433169	2
NU	0.51731606	3
RU	0.37958919	4
SL	0.20927888	5
SM	0.43505138	6
SU	0.57412701	7

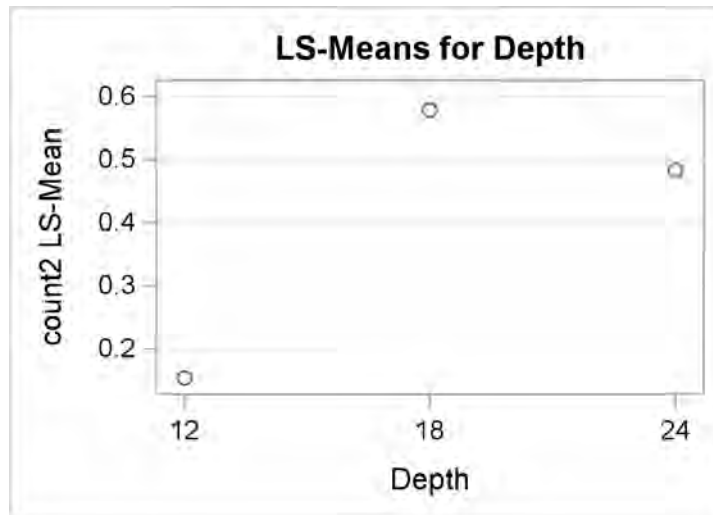
Least Squares Means for effect Position Pr > |t| for H0: LSMean(i)=LSMean(j) Dependent Variable: count2							
i/j	1	2	3	4	5	6	7
1		0.9862	0.9862	1.0000	0.7765	1.0000	0.8989
2	0.9862		0.7319	0.9978	0.9924	0.9623	0.4922
3	0.9862	0.7319		0.9519	0.3452	0.9965	0.9996
4	1.0000	0.9978	0.9519		0.8801	0.9996	0.8023
5	0.7765	0.9924	0.3452	0.8801		0.6793	0.1838
6	1.0000	0.9623	0.9965	0.9996	0.6793		0.9497
7	0.8989	0.4922	0.9996	0.8023	0.1838	0.9497	



The GLM Procedure
 Least Squares Means
 Adjustment for Multiple Comparisons: Tukey-Kramer

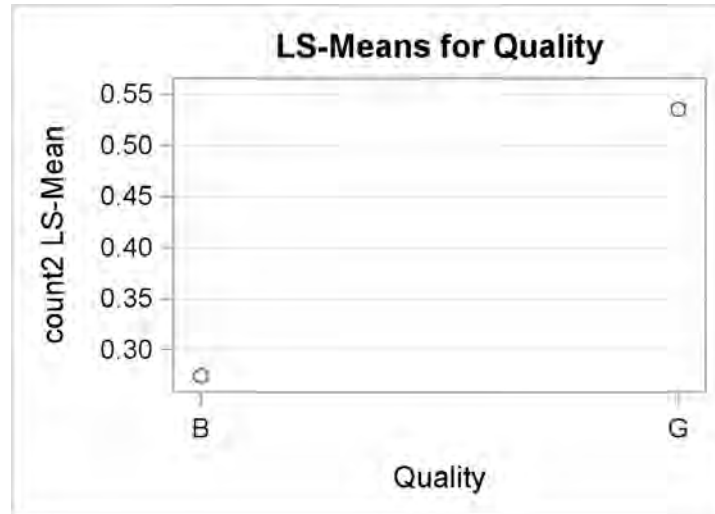
Depth	count2 LSMEAN	LSMEAN Number
12	0.15251705	1
18	0.57855580	2
24	0.48200634	3

Least Squares Means for effect Depth			
Pr > |t| for H0: LSMean(i)=LSMean(j)			
Dependent Variable: count2			
i/j	1	2	3
1		0.0022	0.0160
2	0.0022		0.6413
3	0.0160	0.6413	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Quality	count2 LSMEAN	H0:LSMean1=LSMean2 Pr > |t|
B	0.27369517	0.0241
G	0.53502428	



Species: *Digitaria sanguinalis*

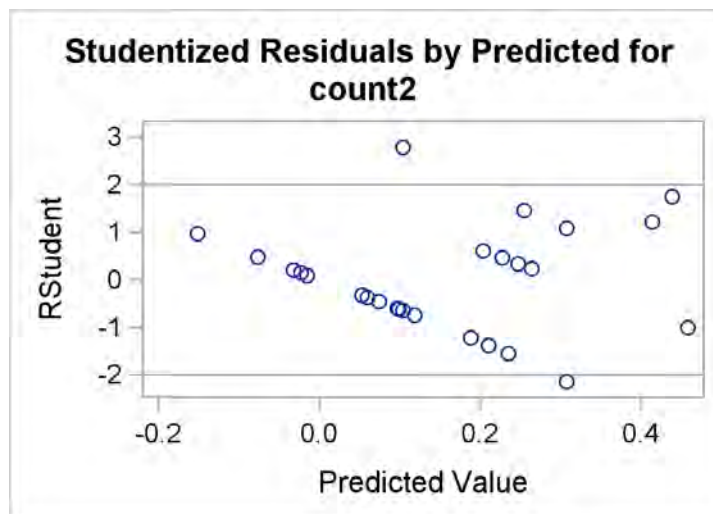
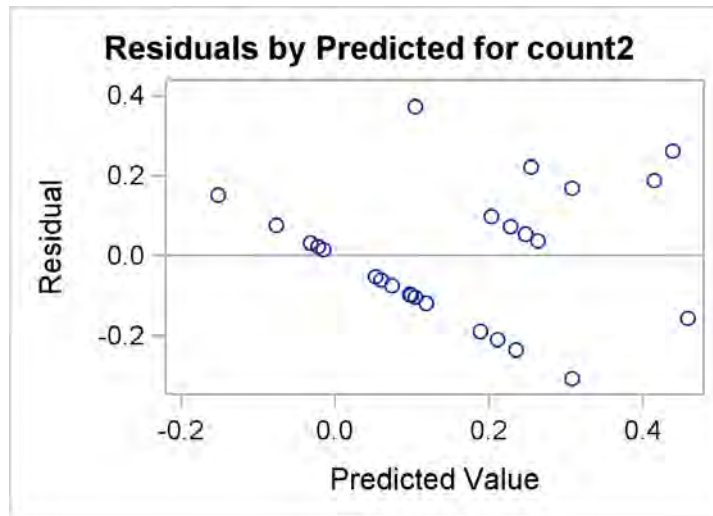
The GLM Procedure

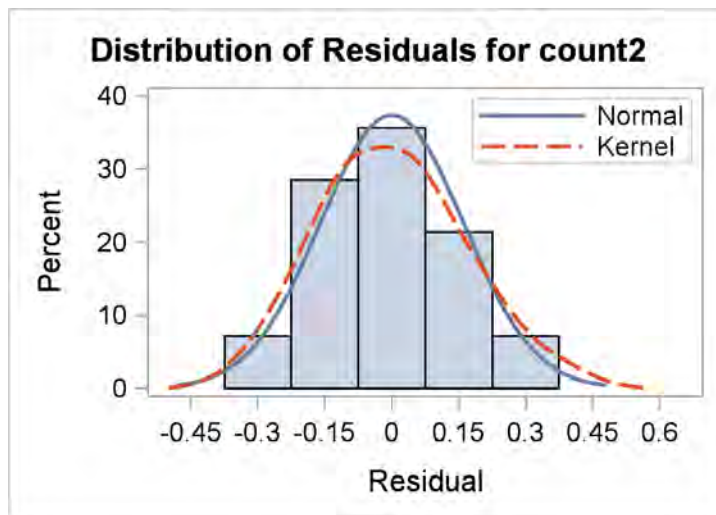
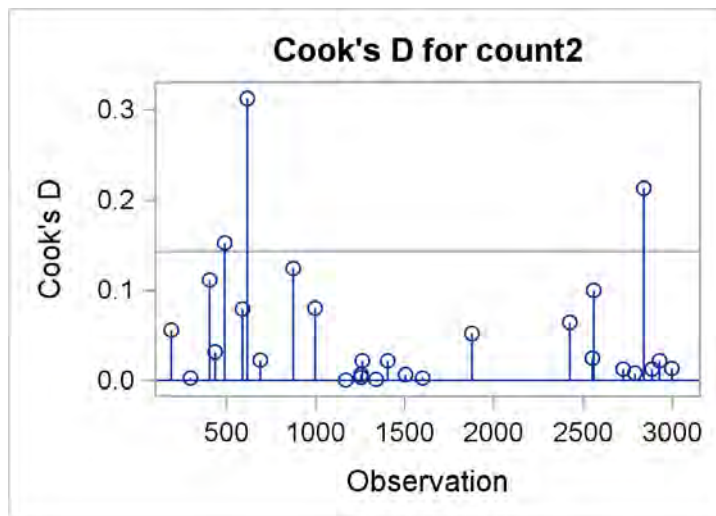
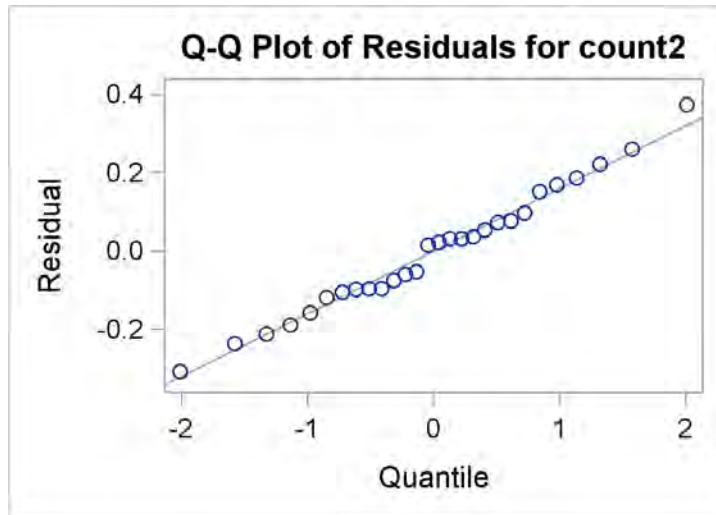
Dependent Variable: count2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	0.65483766	0.07275974	1.90	0.1186
Error	18	0.69091355	0.03838409		
Corrected Total	27	1.34575120			

R-Square	Coeff Var	Root MSE	count2 Mean
0.486596	129.4552	0.195919	0.151341

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	0.24021457	0.04003576	1.04	0.4308
Depth	2	0.41251735	0.20625867	5.37	0.0148
Quality	1	0.06504134	0.06504134	1.69	0.2094

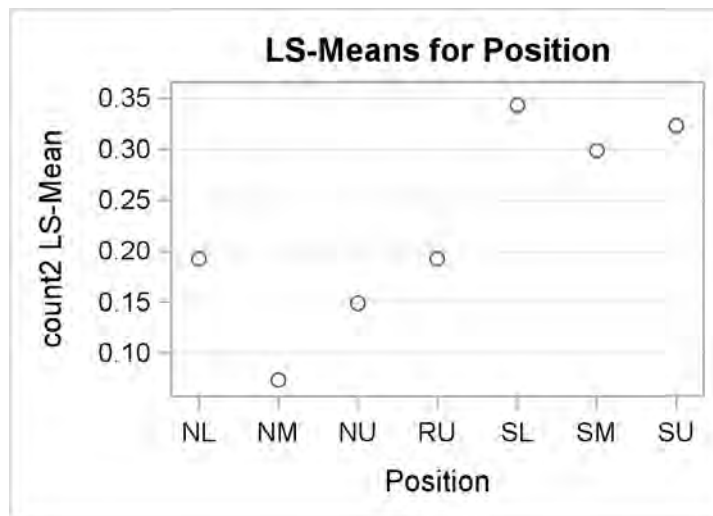




The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Position	count2 LSMEAN	LSMEAN Number
NL	0.19244732	1
NM	0.07316701	2
NU	0.14842451	3
RU	0.19244732	4
SL	0.34296232	5
SM	0.29893951	6
SU	0.32316701	7

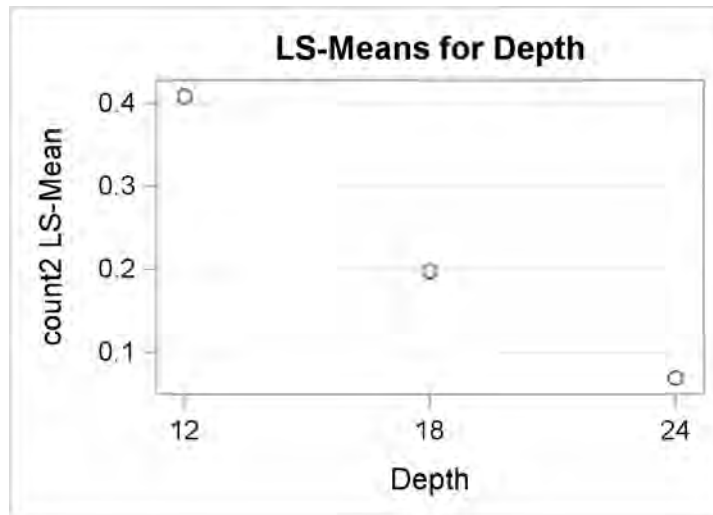
Least Squares Means for effect Position Pr > |t| for H0: LSMean(i)=LSMean(j) Dependent Variable: count2							
i/j	1	2	3	4	5	6	7
1		0.9741	0.9999	1.0000	0.9242	0.9852	0.9598
2	0.9741		0.9977	0.9741	0.4772	0.6665	0.5615
3	0.9999	0.9977		0.9999	0.7928	0.9242	0.8603
4	1.0000	0.9741	0.9999		0.9242	0.9852	0.9598
5	0.9242	0.4772	0.7928	0.9242		0.9999	1.0000
6	0.9852	0.6665	0.9242	0.9852	0.9999		1.0000
7	0.9598	0.5615	0.8603	0.9598	1.0000	1.0000	



The GLM Procedure
 Least Squares Means
 Adjustment for Multiple Comparisons: Tukey-Kramer

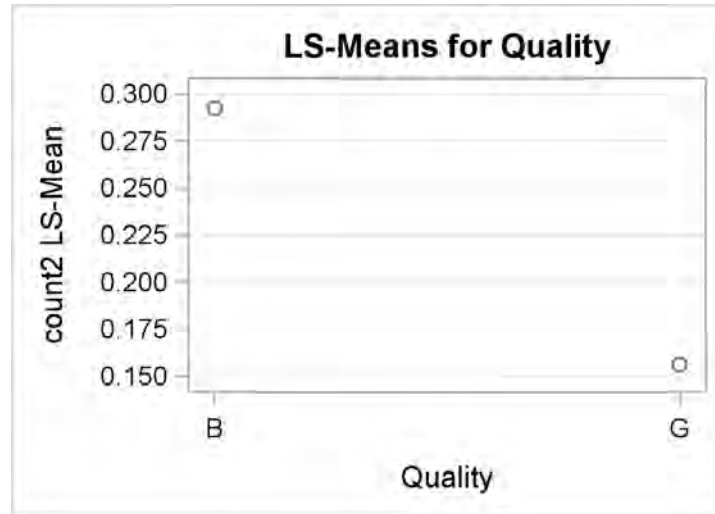
Depth	count2 LSMEAN	LSMEAN Number
12	0.40819036	1
18	0.19717303	2
24	0.06816018	3

Least Squares Means for effect Depth			
Pr > |t| for H0: LSMean(i)=LSMean(j)			
Dependent Variable: count2			
i/j	1	2	3
1		0.1372	0.0118
2	0.1372		0.4504
3	0.0118	0.4504	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Quality	count2 LSMEAN	H0:LSMean1=LSMean2 Pr > |t|
B	0.29266804	0.2094
G	0.15634768	



Species: Echinochloa crusgalli

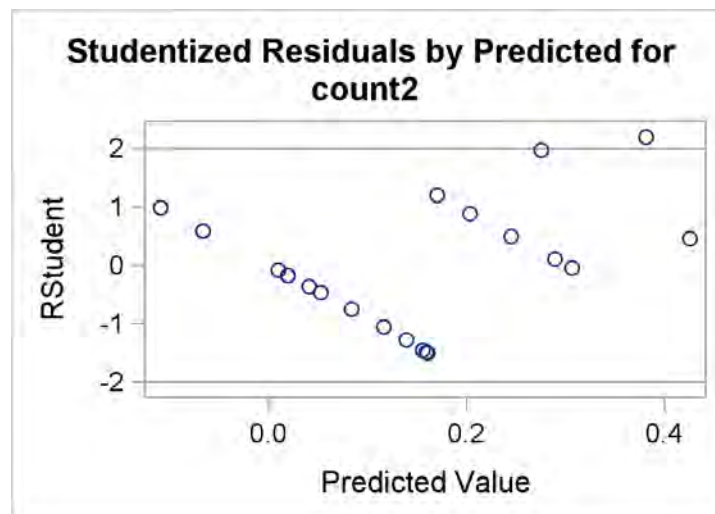
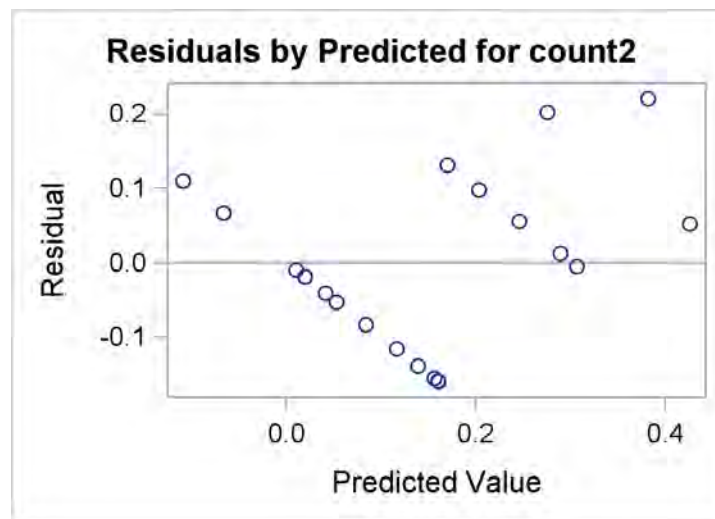
The GLM Procedure

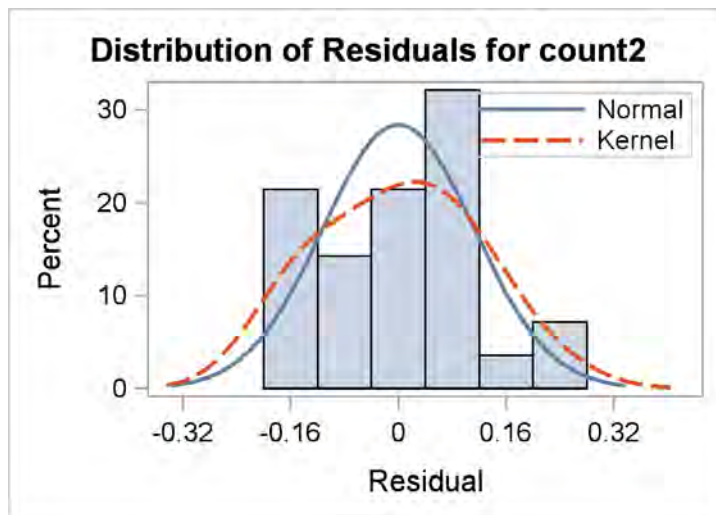
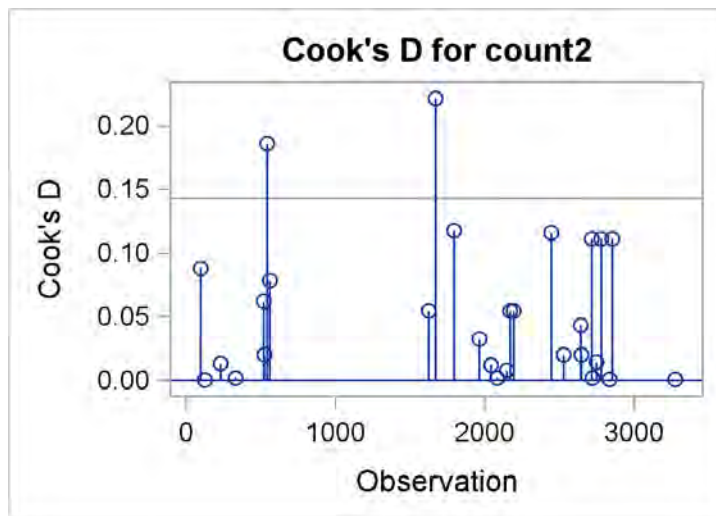
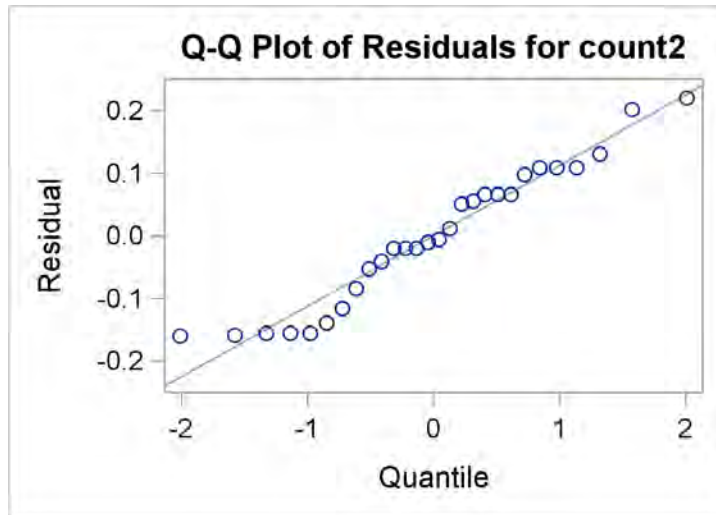
Dependent Variable: count2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	0.59538529	0.06615392	3.49	0.0115
Error	18	0.34074379	0.01893021		
Corrected Total	27	0.93612908			

R-Square	Coeff Var	Root MSE	count2 Mean
0.636008	125.8370	0.137587	0.109338

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	0.30784932	0.05130822	2.71	0.0470
Depth	2	0.28392288	0.14196144	7.50	0.0043
Quality	1	0.05825511	0.05825511	3.08	0.0964

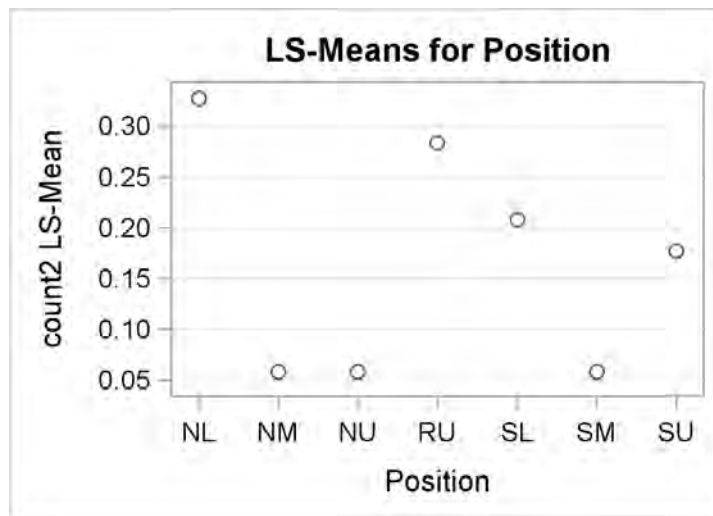




The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Position	count2 LSMEAN	LSMEAN Number
NL	0.32774332	1
NM	0.05794801	2
NU	0.05794801	3
RU	0.28372050	4
SL	0.20846300	5
SM	0.05794801	6
SU	0.17722832	7

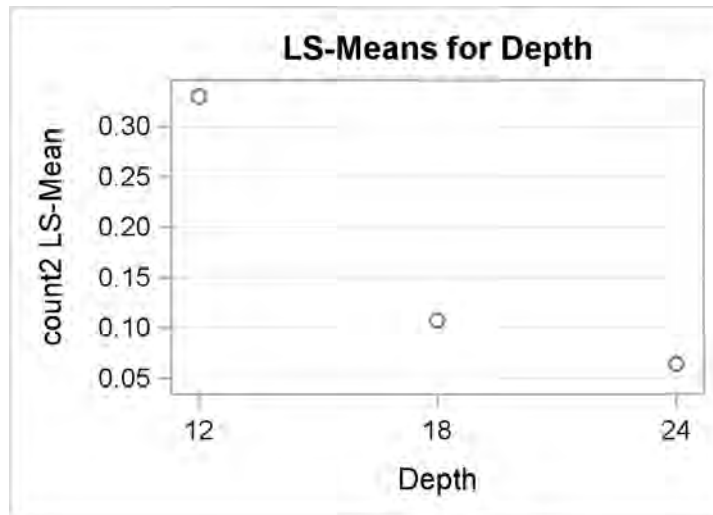
Least Squares Means for effect Position Pr > |t| for H0: LSMean(i)=LSMean(j) Dependent Variable: count2							
i/j	1	2	3	4	5	6	7
1		0.1359	0.1359	0.9992	0.8750	0.1359	0.7148
2	0.1359		1.0000	0.2869	0.7148	1.0000	0.8750
3	0.1359	1.0000		0.2869	0.7148	1.0000	0.8750
4	0.9992	0.2869	0.2869		0.9848	0.2869	0.9217
5	0.8750	0.7148	0.7148	0.9848		0.7148	0.9999
6	0.1359	1.0000	1.0000	0.2869	0.7148		0.8750
7	0.7148	0.8750	0.8750	0.9217	0.9999	0.8750	



The GLM Procedure
 Least Squares Means
 Adjustment for Multiple Comparisons: Tukey-Kramer

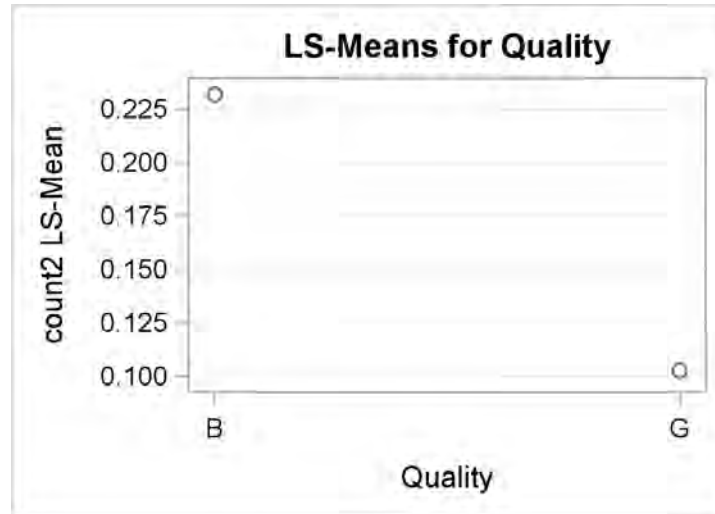
Depth	count2 LSMEAN	LSMEAN Number
12	0.32983964	1
18	0.10751071	2
24	0.06450643	3

Least Squares Means for effect Depth			
Pr > |t| for H0: LSMean(i)=LSMean(j)			
Dependent Variable: count2			
i/j	1	2	3
1		0.0191	0.0054
2	0.0191		0.8299
3	0.0054	0.8299	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Quality	count2 LSMEAN	H0:LSMean1=LSMean2
		Pr > |t|
B	0.23179202	0.0964
G	0.10277917	



Species: Euphorbia maculata

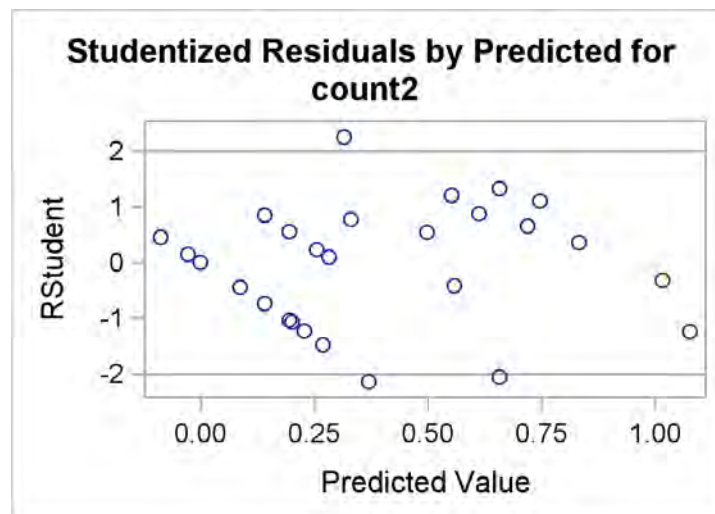
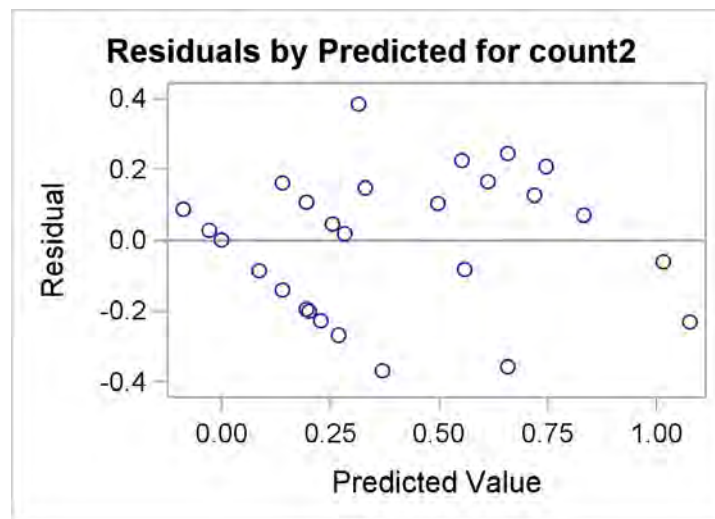
The GLM Procedure

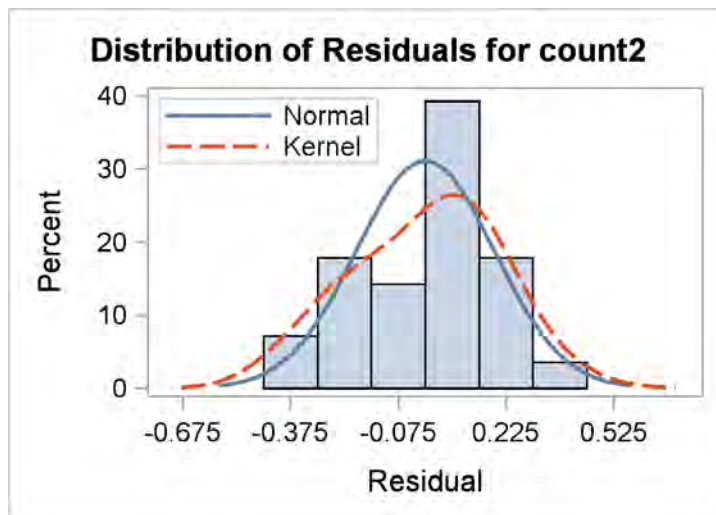
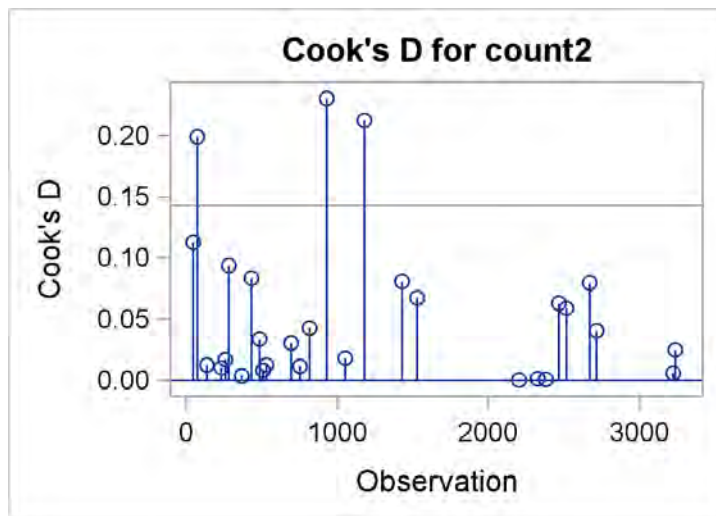
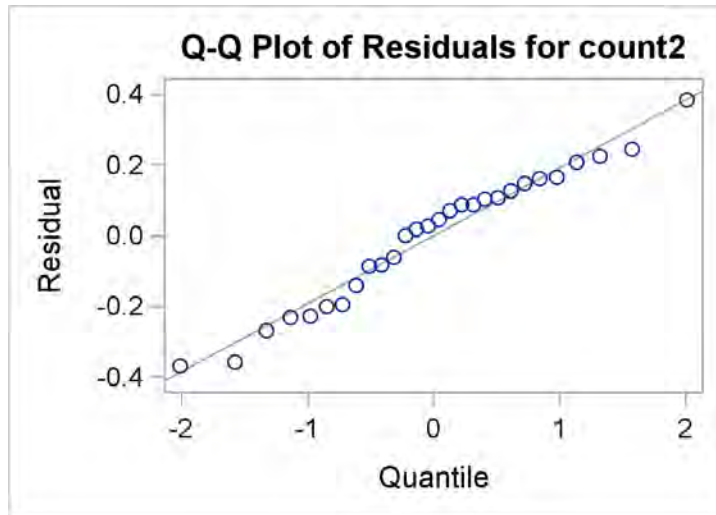
Dependent Variable: count2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	2.74936900	0.30548544	5.52	0.0010
Error	18	0.99632856	0.05535159		
Corrected Total	27	3.74569756			

R-Square	Coeff Var	Root MSE	count2 Mean
0.734007	61.44181	0.235269	0.382914

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	0.68960590	0.11493432	2.08	0.1073
Depth	2	0.31621695	0.15810848	2.86	0.0837
Quality	1	1.95285955	1.95285955	35.28	<.0001

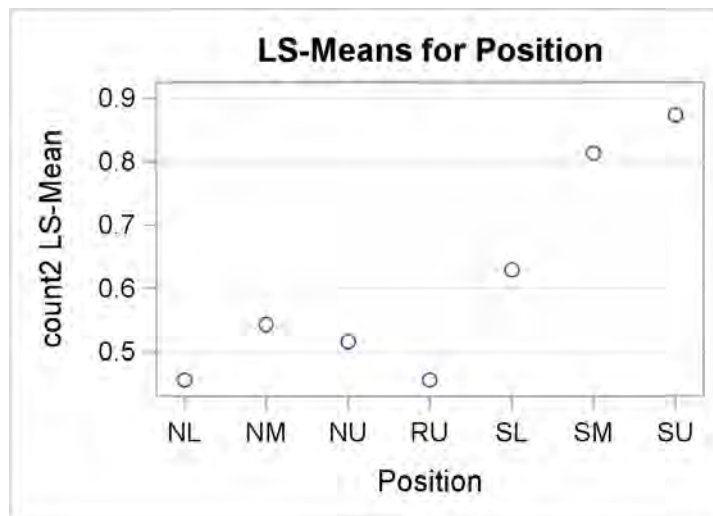




The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Position	count2 LSMEAN	LSMEAN Number
NL	0.45518489	1
NM	0.54323052	2
NU	0.51594440	3
RU	0.45518489	4
SL	0.62992739	5
SM	0.81302583	6
SU	0.87378534	7

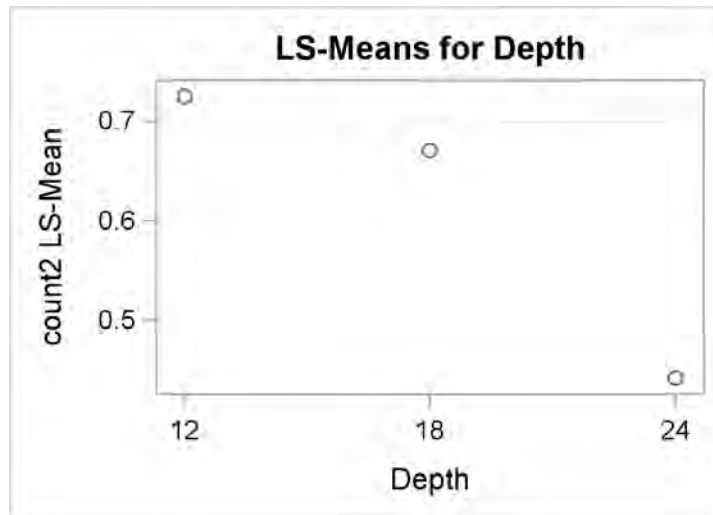
Least Squares Means for effect Position Pr > |t| for H0: LSMean(i)=LSMean(j) Dependent Variable: count2							
i/j	1	2	3	4	5	6	7
1		0.9980	0.9998	1.0000	0.9346	0.3667	0.2108
2	0.9980		1.0000	0.9980	0.9982	0.6713	0.4547
3	0.9998	1.0000		0.9998	0.9919	0.5728	0.3667
4	1.0000	0.9980	0.9998		0.9346	0.3667	0.2108
5	0.9346	0.9982	0.9919	0.9346		0.9199	0.7602
6	0.3667	0.6713	0.5728	0.3667	0.9199		0.9998
7	0.2108	0.4547	0.3667	0.2108	0.7602	0.9998	



The GLM Procedure
 Least Squares Means
 Adjustment for Multiple Comparisons: Tukey-Kramer

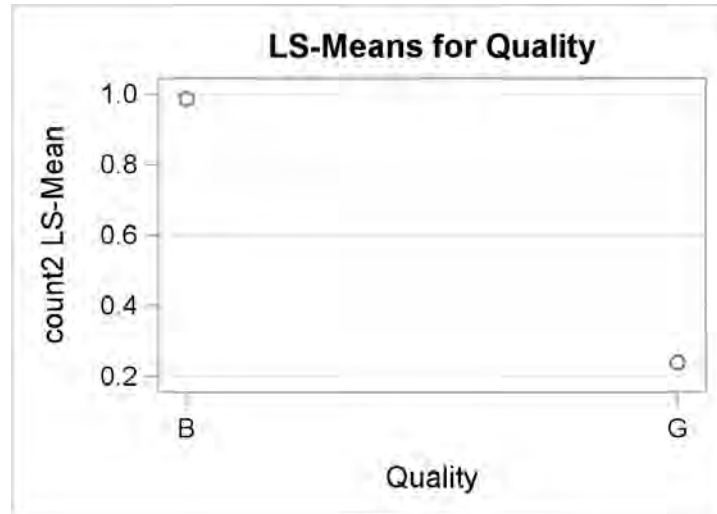
Depth	count2 LSMEAN	LSMEAN Number
12	0.72482534	1
18	0.67050945	2
24	0.44164374	3

Least Squares Means for effect Depth			
Pr > |t| for H0: LSMean(i)=LSMean(j)			
Dependent Variable: count2			
i/j	1	2	3
1		0.9028	0.0893
2	0.9028		0.1914
3	0.0893	0.1914	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Quality	count2 LSMEAN	H0:LSMean1=LSMean2 Pr > |t|
B	0.98580973	<.0001
G	0.23884262	



Species: Festuca rubra

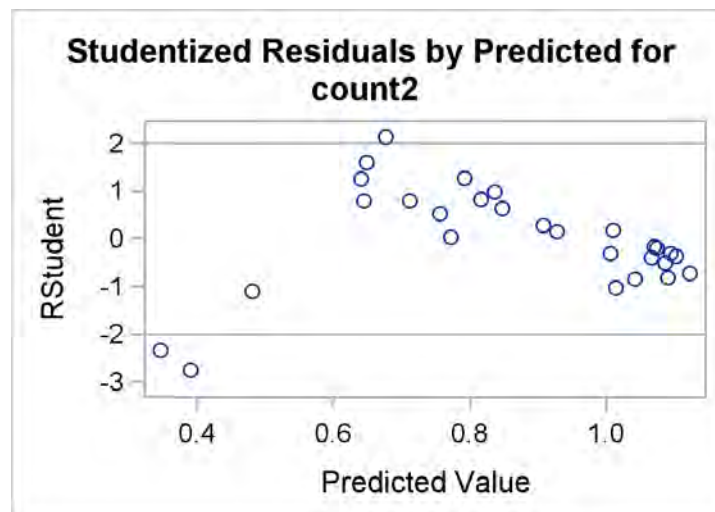
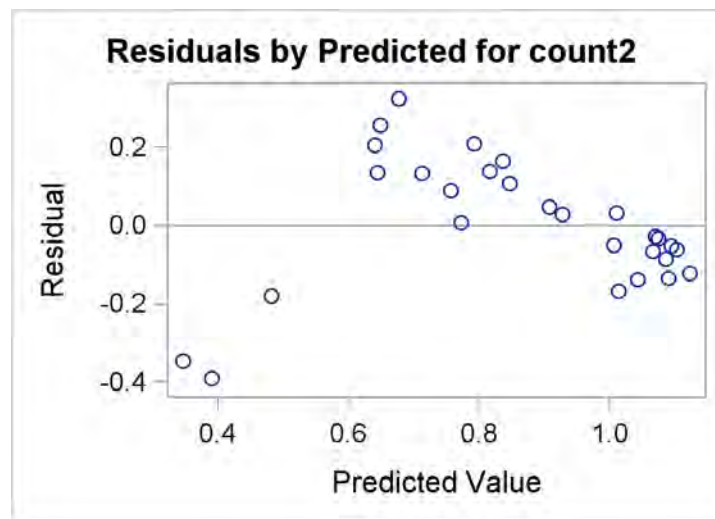
The GLM Procedure

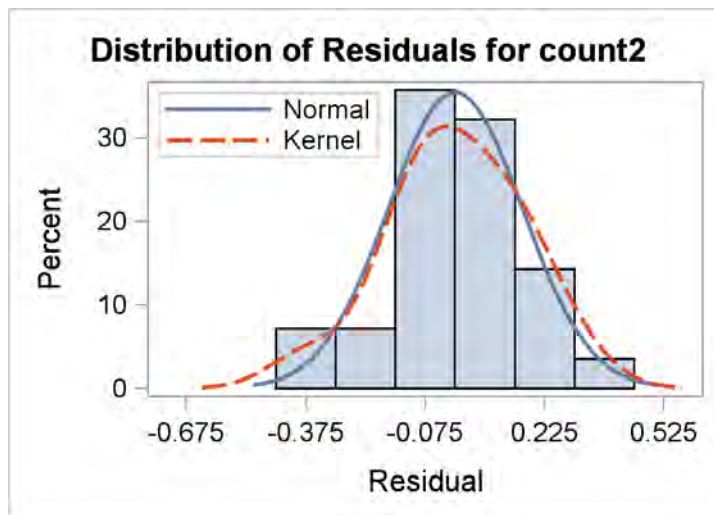
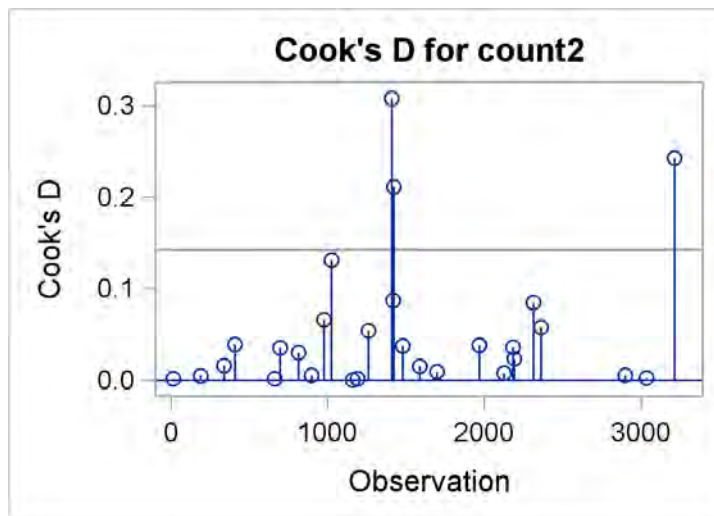
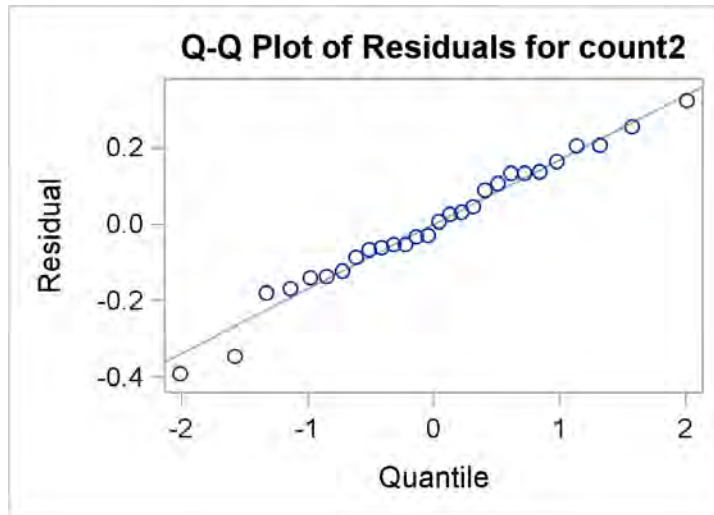
Dependent Variable: count2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	1.37604698	0.15289411	3.58	0.0102
Error	18	0.76862323	0.04270129		
Corrected Total	27	2.14467021			

R-Square	Coeff Var	Root MSE	count2 Mean
0.641612	24.13215	0.206643	0.856297

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	0.45738714	0.07623119	1.79	0.1589
Depth	2	0.74465074	0.37232537	8.72	0.0022
Quality	1	0.00138133	0.00138133	0.03	0.8593



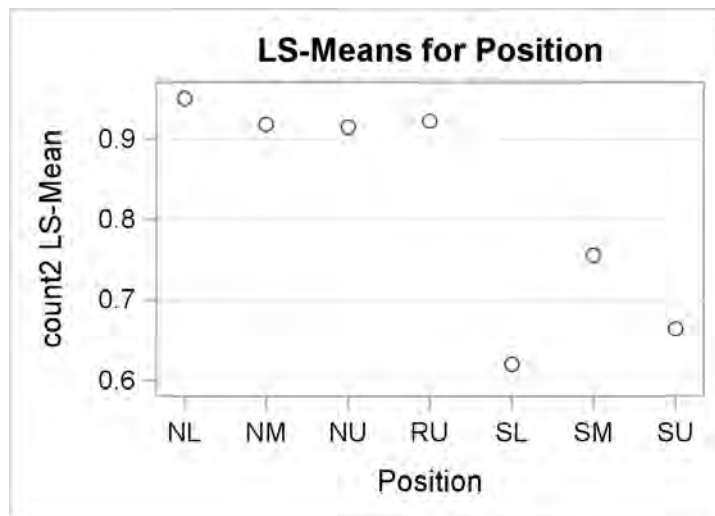


The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Position	count2 LSMEAN	LSMEAN Number
NL	0.95053963	1
NM	0.91821374	2
NU	0.91425410	3
RU	0.92216231	4
SL	0.62023128	5
SM	0.75535834	6
SU	0.66425410	7

Least Squares Means for effect Position
Pr > |t| for H0: LSMean(i)=LSMean(j)
Dependent Variable: count2

i/j	1	2	3	4	5	6	7
1	1.0000	1.0000	1.0000	0.3137	0.8267	0.4705	
2	1.0000	1.0000	1.0000	0.4256	0.9154	0.6016	
3	1.0000	1.0000	1.0000	0.4406	0.9239	0.6179	
4	1.0000	1.0000	1.0000	0.4109	0.9065	0.5853	
5	0.3137	0.4256	0.4406	0.4109	0.9634	0.9999	
6	0.8267	0.9154	0.9239	0.9065	0.9634	0.9951	
7	0.4705	0.6016	0.6179	0.5853	0.9999	0.9951	

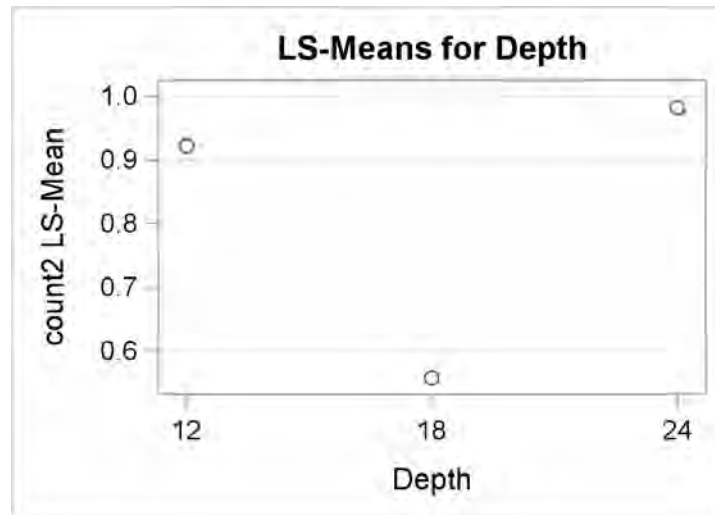


The GLM Procedure
 Least Squares Means
 Adjustment for Multiple Comparisons: Tukey-Kramer

Depth	count2	LSMEAN	LSMEAN	Number
12		0.92254193		1
18		0.55670014		2
24		0.98290657		3

Least Squares Means for effect Depth
 Pr > |t| for H0: LSMean(i)=LSMean(j)
 Dependent Variable: count2

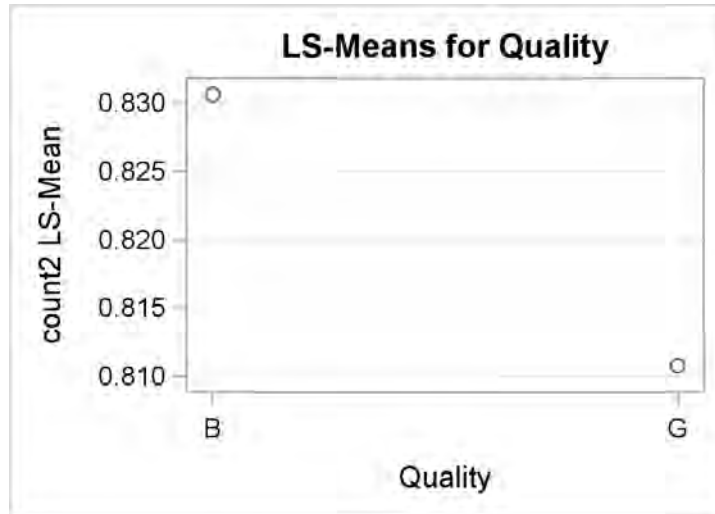
i/j	1	2	3
1		0.0103	0.8495
2	0.0103		0.0031
3	0.8495	0.0031	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

H0:LSMean1=LSMean2

Quality	count2 LSMEAN	Pr > |t|
B	0.83064931	0.8593
G	0.81078311	



Species: Lespedeza capitata

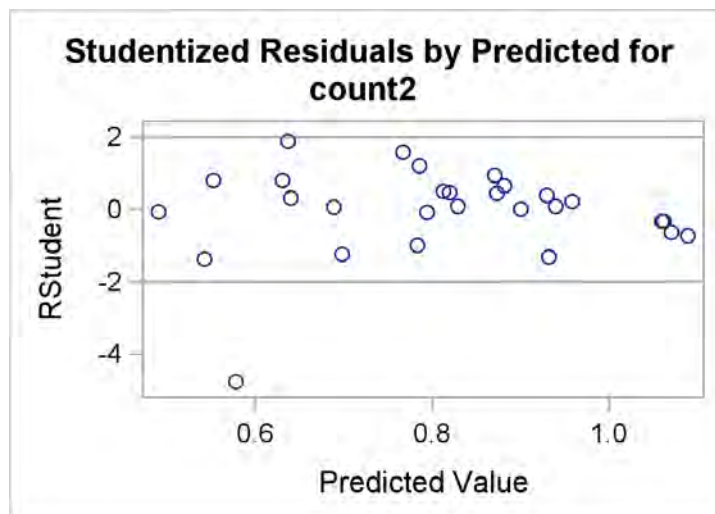
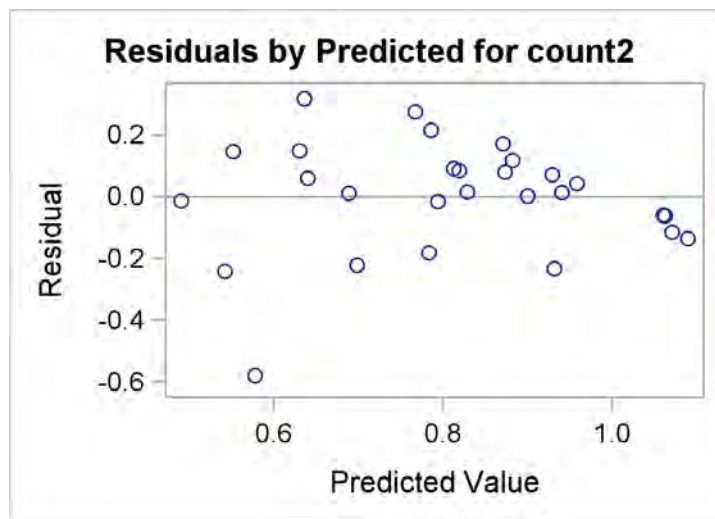
The GLM Procedure

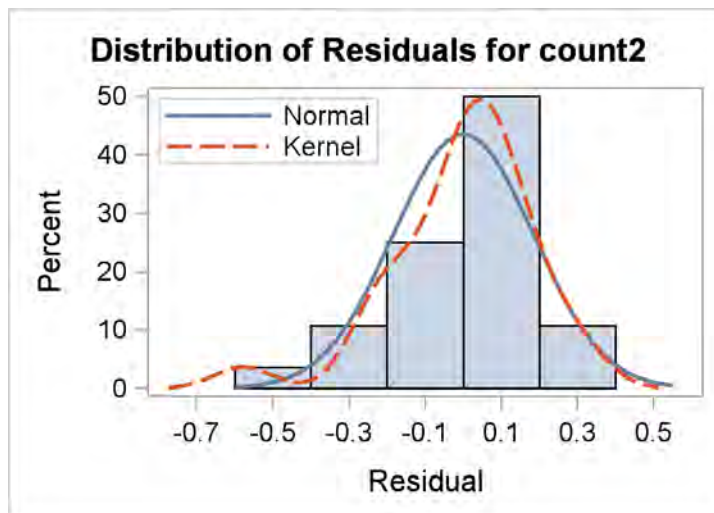
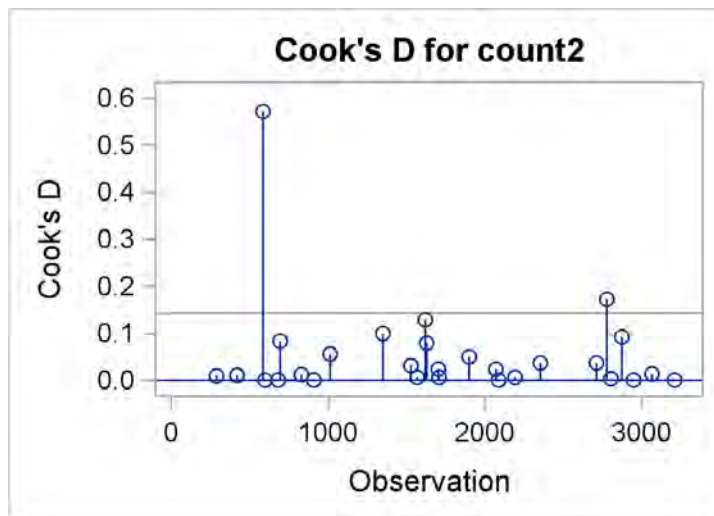
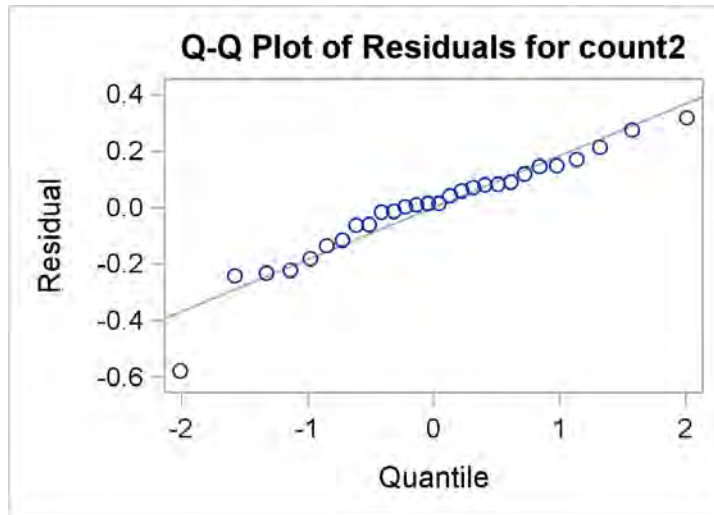
Dependent Variable: count2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	0.77684336	0.08631593	1.71	0.1593
Error	18	0.90930795	0.05051711		
Corrected Total	27	1.68615131			

R-Square	Coeff Var	Root MSE	count2 Mean
0.460720	27.82437	0.224760	0.807781

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	0.49359982	0.08226664	1.63	0.1966
Depth	2	0.28007009	0.14003504	2.77	0.0892
Quality	1	0.01187280	0.01187280	0.24	0.6337



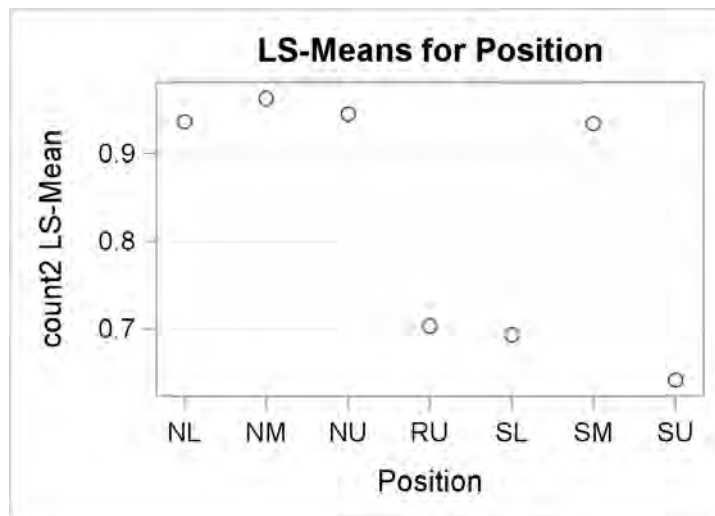


The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Position	count2 LSMEAN	LSMEAN Number
NL	0.93627807	1
NM	0.96308056	2
NU	0.94463401	3
RU	0.70301476	4
SL	0.69328525	5
SM	0.93383811	6
SU	0.64116405	7

Least Squares Means for effect Position
Pr > |t| for H0: LSMean(i)=LSMean(j)
Dependent Variable: count2

i/j	1	2	3	4	5	6	7
1	1.0000	1.0000	0.7592	0.7251	1.0000	0.5303	
2	1.0000	1.0000	0.6626	0.6260	1.0000	0.4332	
3	1.0000	1.0000	0.7300	0.6949	1.0000	0.4993	
4	0.7592	0.6626	0.7300	1.0000	0.7675	0.9996	
5	0.7251	0.6260	0.6949	1.0000	0.7338	0.9999	
6	1.0000	1.0000	1.0000	0.7675	0.7338	1.0000	0.5394
7	0.5303	0.4332	0.4993	0.9996	0.9999	0.5394	1.0000

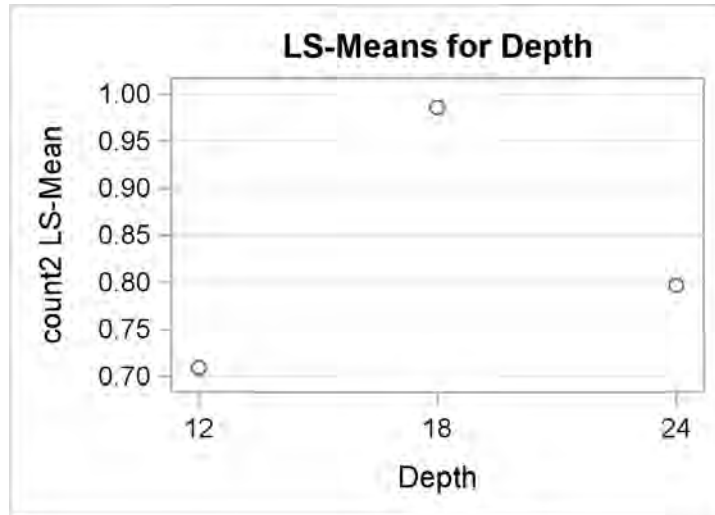


The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Depth	count2	LSMEAN	LSMEAN	Number
12		0.70918177		1
18		0.98598795		2
24		0.79709948		3

Least Squares Means for effect Depth
Pr > |t| for H0: LSMean(i)=LSMean(j)
Dependent Variable: count2

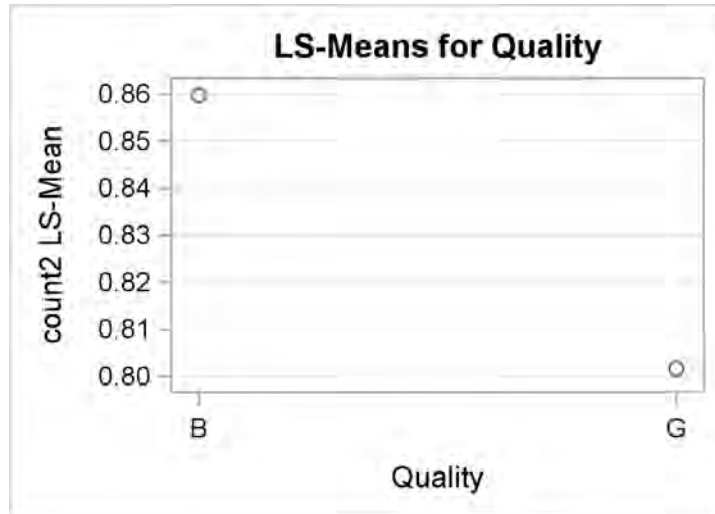
i/j	1	2	3
1		0.0809	0.7481
2	0.0809		0.2827
3	0.7481	0.2827	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

H0:LSMean1=LSMean2

Quality	count2 LSMEAN	Pr > |t|
B	0.85987782	0.6337
G	0.80163498	



Species: Lolium multiflorum

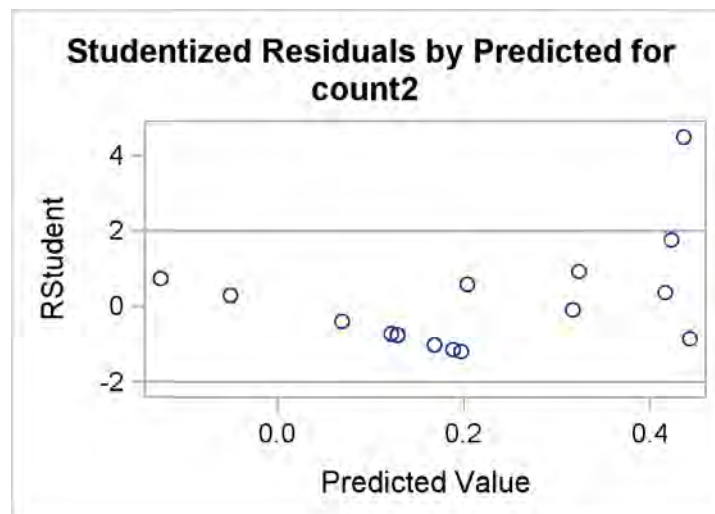
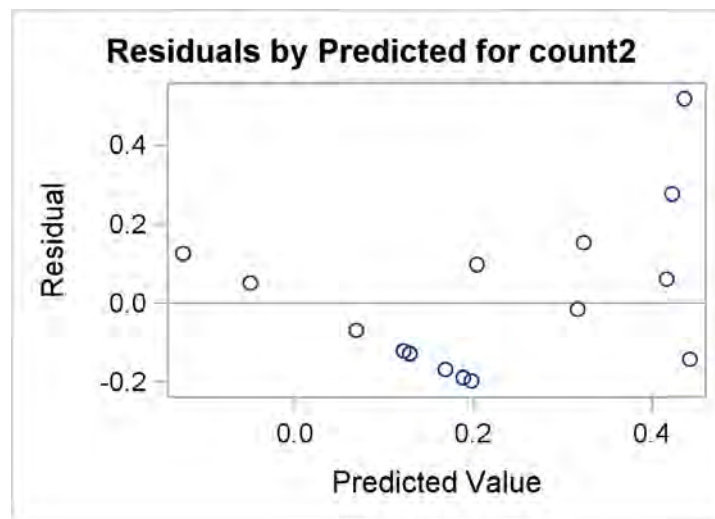
The GLM Procedure

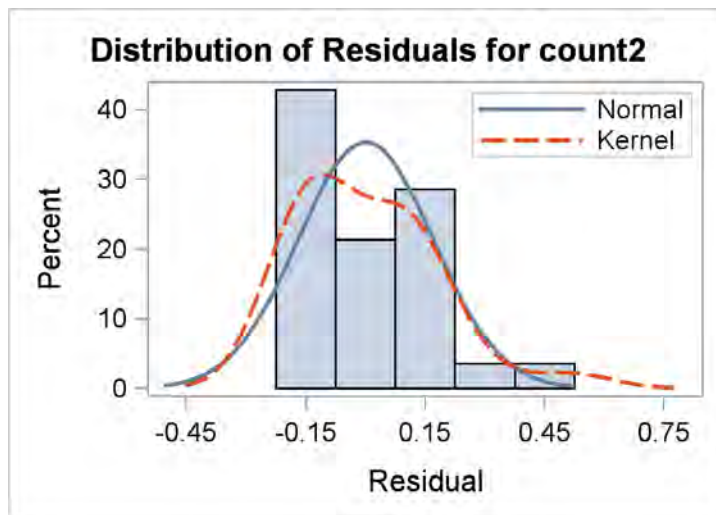
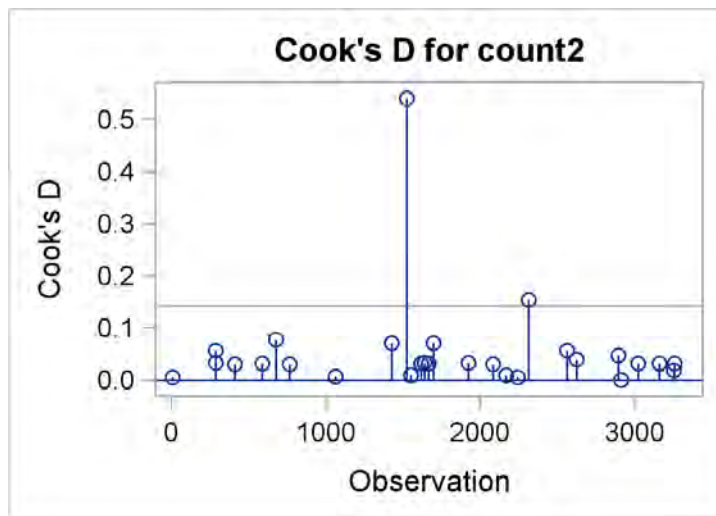
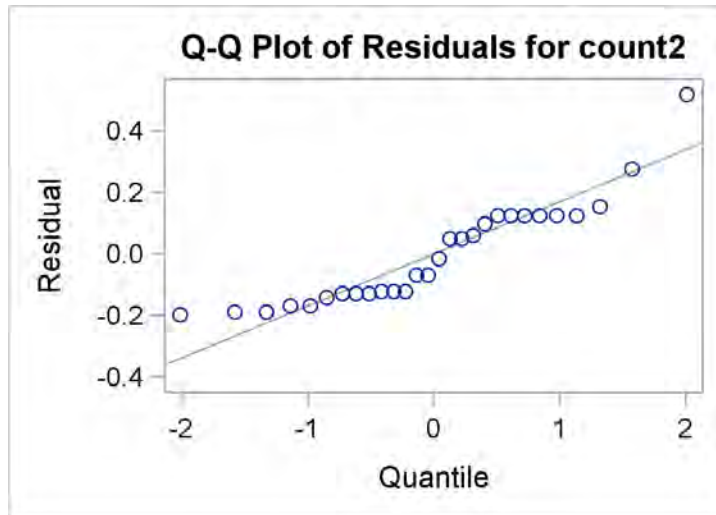
Dependent Variable: count2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	0.91390909	0.10154545	2.37	0.0572
Error	18	0.77223508	0.04290195		
Corrected Total	27	1.68614417			

R-Square Coeff Var Root MSE count2 Mean
0.542011 165.2045 0.207128 0.125377

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	0.47361931	0.07893655	1.84	0.1476
Depth	2	0.29357637	0.14678818	3.42	0.0550
Quality	1	0.21437058	0.21437058	5.00	0.0383



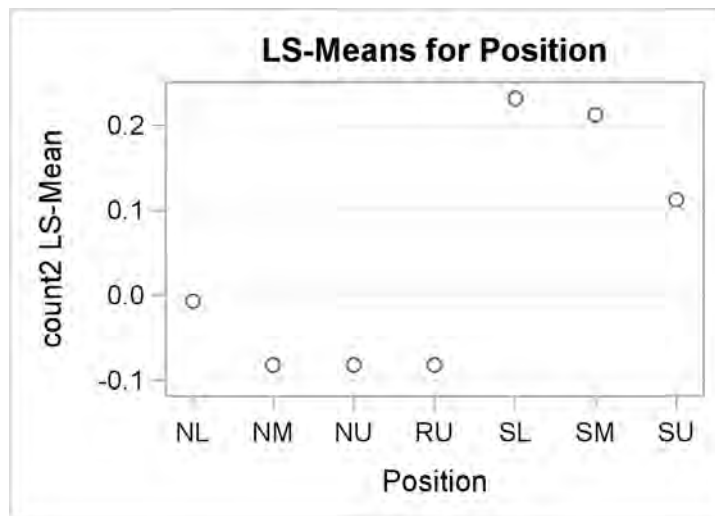


The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Position	count2 LSMEAN	LSMEAN Number
NL	-0.00669271	1
NM	-0.08195021	2
NU	-0.08195021	3
RU	-0.08195021	4
SL	0.23186792	5
SM	0.21207261	6
SU	0.11258760	7

Least Squares Means for effect Position
Pr > |t| for H0: LSMean(i)=LSMean(j)
Dependent Variable: count2

i/j	1	2	3	4	5	6	7
1		0.9983	0.9983	0.9983	0.6671	0.7449	0.9803
2	0.9983		1.0000	1.0000	0.3709	0.4432	0.8303
3	0.9983	1.0000		1.0000	0.3709	0.4432	0.8303
4	0.9983	1.0000	1.0000		0.3709	0.4432	0.8303
5	0.6671	0.3709	0.3709	0.3709		1.0000	0.9803
6	0.7449	0.4432	0.4432	0.4432	1.0000		0.9922
7	0.9803	0.8303	0.8303	0.8303	0.9803	0.9922	

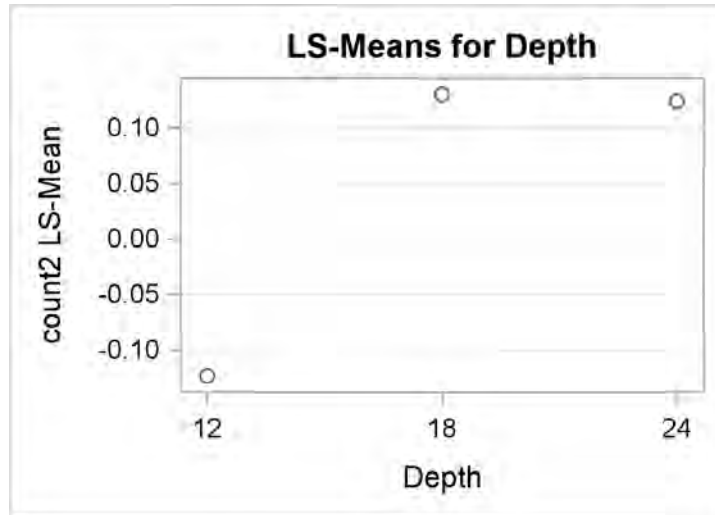


The GLM Procedure
 Least Squares Means
 Adjustment for Multiple Comparisons: Tukey-Kramer

Depth	count2	LSMEAN	LSMEAN	Number
12		-0.12374241		1
18		0.13027920		2
24		0.12374241		3

Least Squares Means for effect Depth
 Pr > |t| for H0: LSMean(i)=LSMean(j)
 Dependent Variable: count2

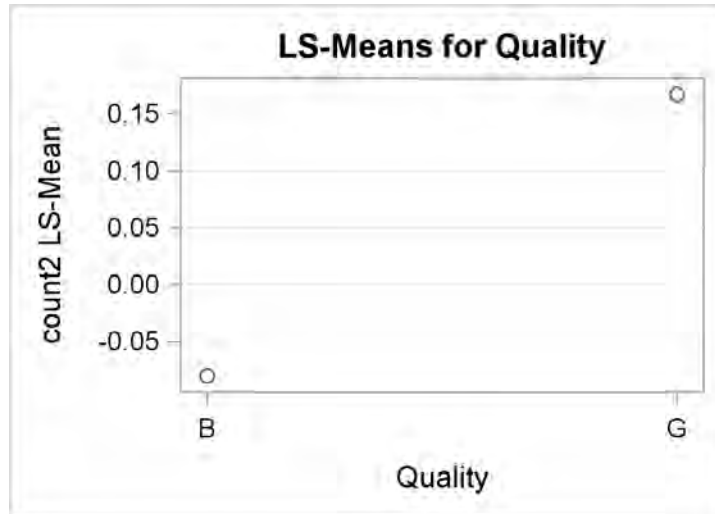
i/j	1	2	3
1		0.0824	0.0920
2	0.0824		0.9981
3	0.0920	0.9981	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

H0:LSMean1=LSMean2

Quality	count2 LSMEAN	Pr > |t|
B	-0.08031601	0.0383
G	0.16716881	



Species: Lotus corniculatus

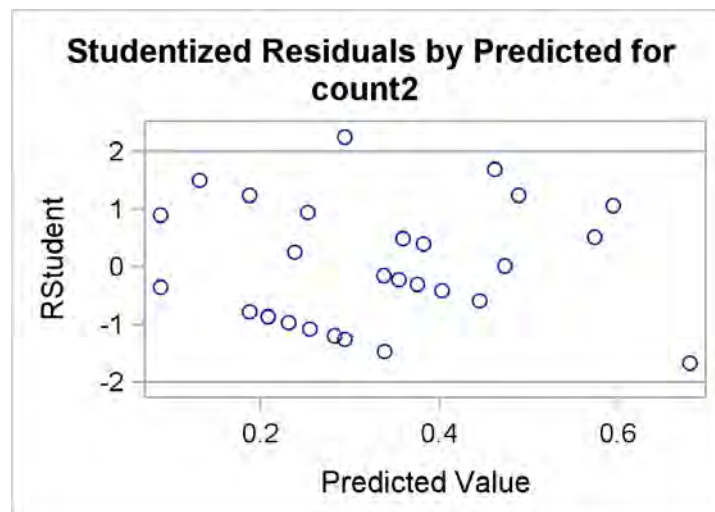
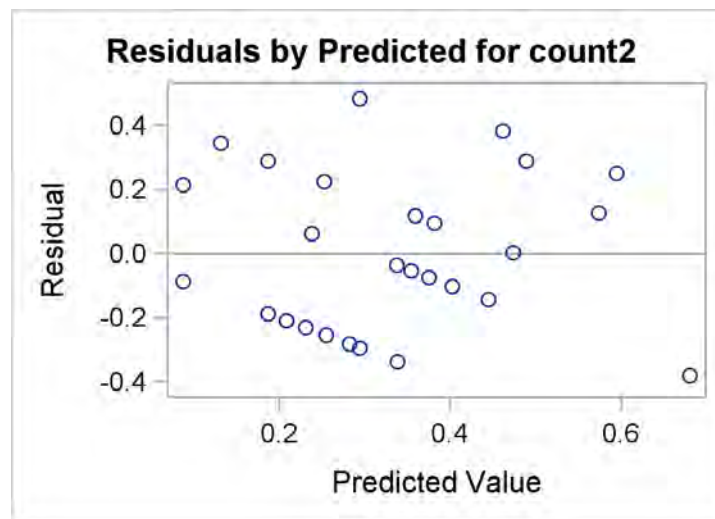
The GLM Procedure

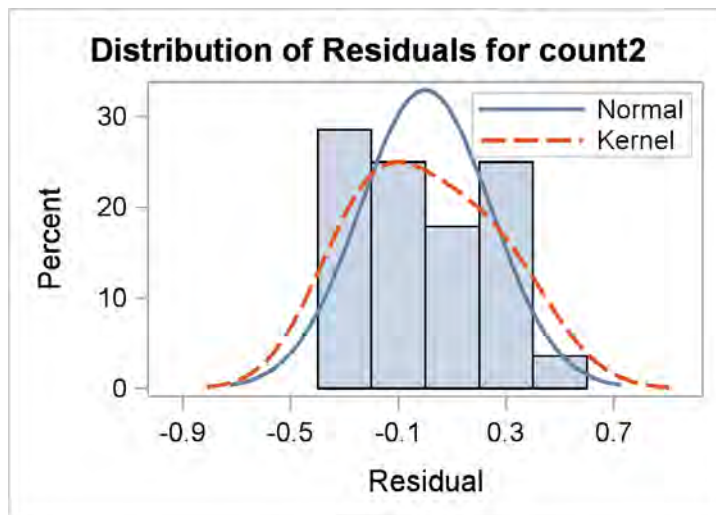
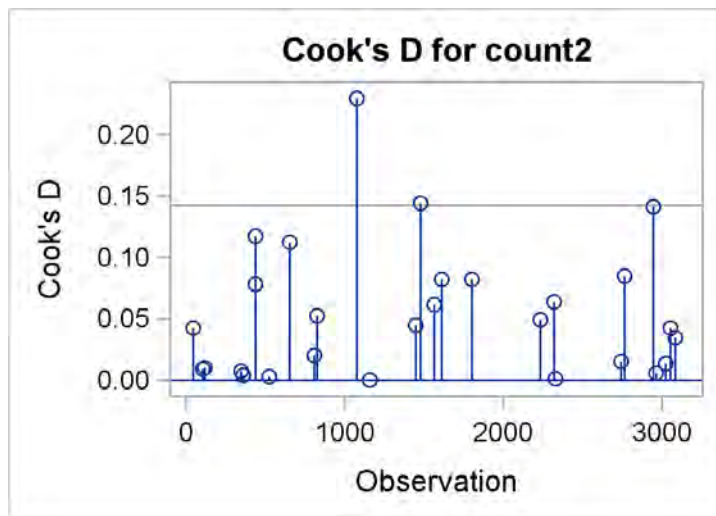
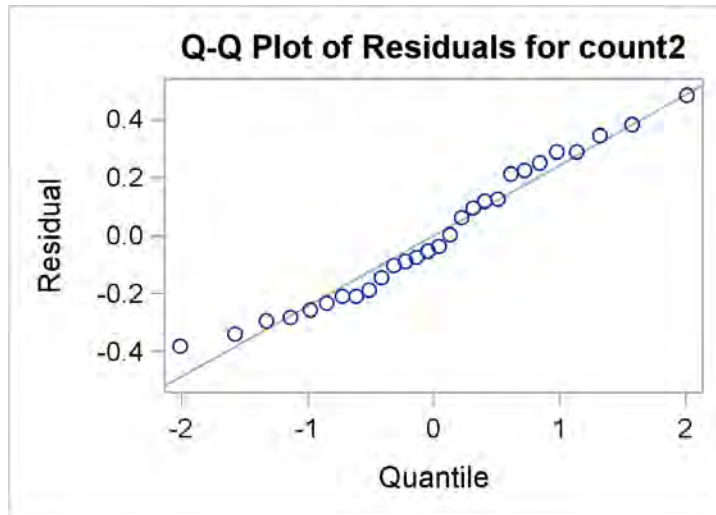
Dependent Variable: count2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	0.60169519	0.06685502	0.76	0.6531
Error	18	1.58343699	0.08796872		
Corrected Total	27	2.18513217			

R-Square	Coeff Var	Root MSE	count2 Mean
0.275359	90.10713	0.296595	0.329158

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	0.45024407	0.07504068	0.85	0.5467
Depth	2	0.15099682	0.07549841	0.86	0.4405
Quality	1	0.00152524	0.00152524	0.02	0.8967



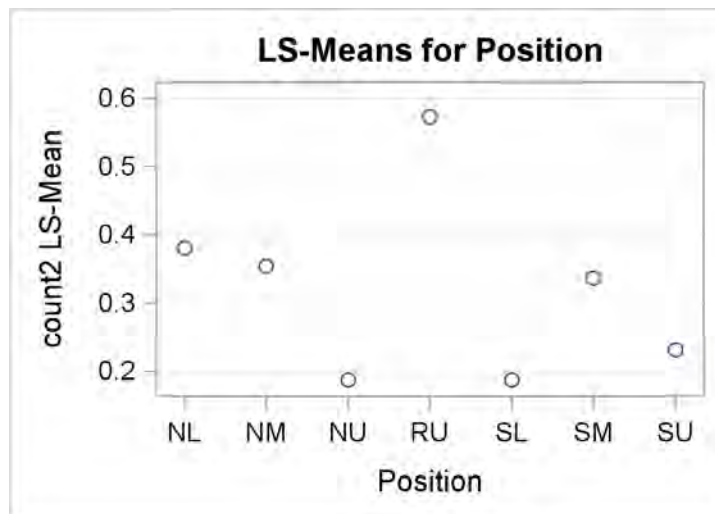


The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Position	count2 LSMEAN	LSMEAN Number
NL	0.38096346	1
NM	0.35367734	2
NU	0.18642564	3
RU	0.57244266	4
SL	0.18642564	5
SM	0.33694064	6
SU	0.23044846	7

Least Squares Means for effect Position
Pr > |t| for H0: LSMean(i)=LSMean(j)
Dependent Variable: count2

i/j	1	2	3	4	5	6	7
1	1.0000	0.9629	0.9656	0.9629	1.0000	0.9896	
2	1.0000		0.9822	0.9366	0.9822	1.0000	0.9964
3	0.9629	0.9822		0.5400	1.0000	0.9896	1.0000
4	0.9656	0.9366	0.5400		0.5400	0.9127	0.6660
5	0.9629	0.9822	1.0000	0.5400		0.9896	1.0000
6	1.0000	1.0000	0.9896	0.9127	0.9896		0.9984
7	0.9896	0.9964	1.0000	0.6660	1.0000	0.9984	

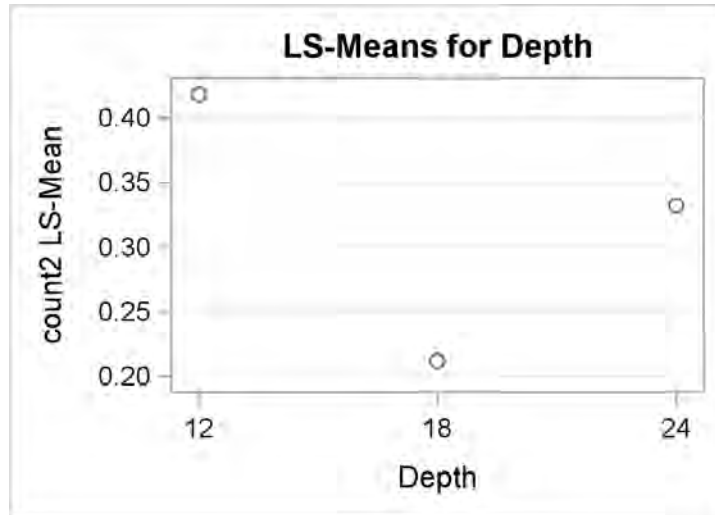


The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Depth	count2	LSMEAN	LSMEAN	Number
12		0.41862807		1
18		0.21189121		2
24		0.33261950		3

Least Squares Means for effect Depth
Pr > |t| for H0: LSMean(i)=LSMean(j)
Dependent Variable: count2

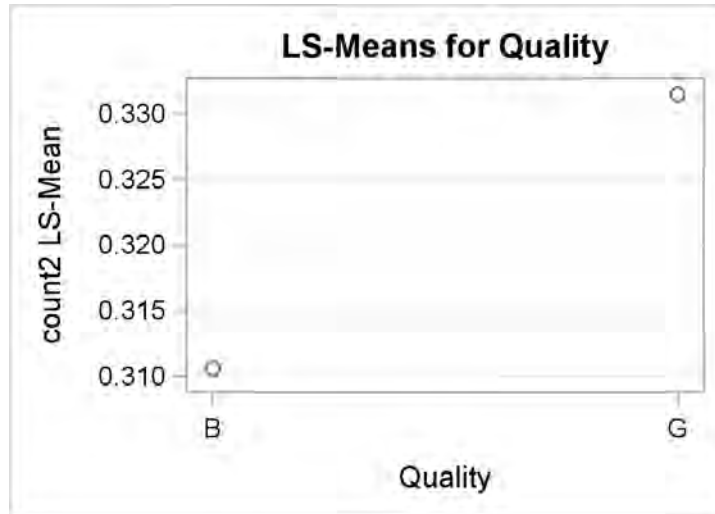
i/j	1	2	3
1		0.4111	0.8515
2	0.4111		0.7307
3	0.8515	0.7307	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

H0:LSMean1=LSMean2

Quality	count2 LSMEAN	Pr > |t|
B	0.31060855	0.8967
G	0.33148398	



Species: *Lupinus perennis*

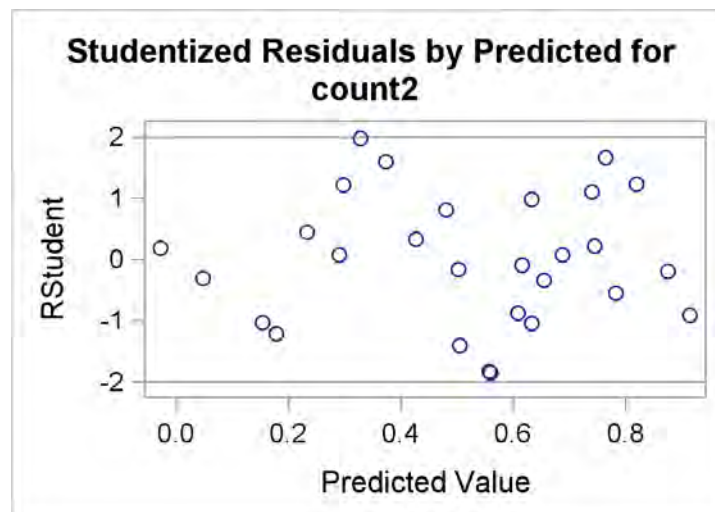
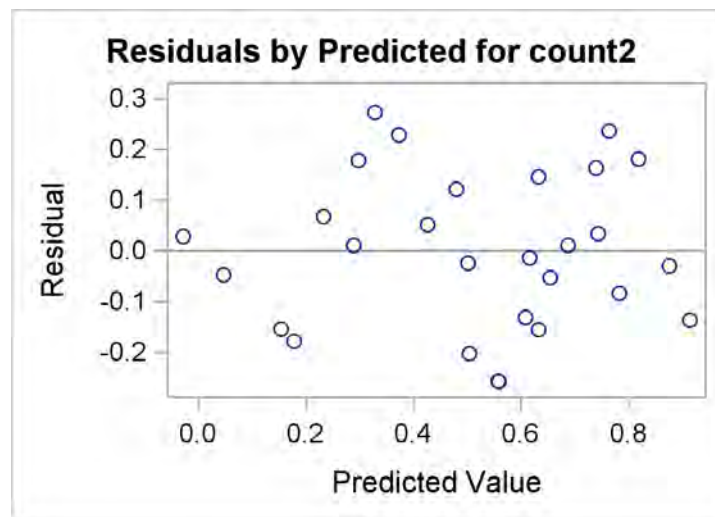
The GLM Procedure

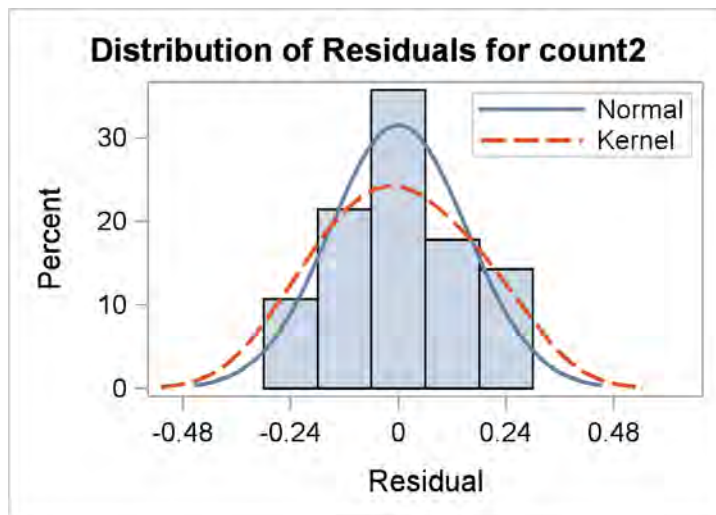
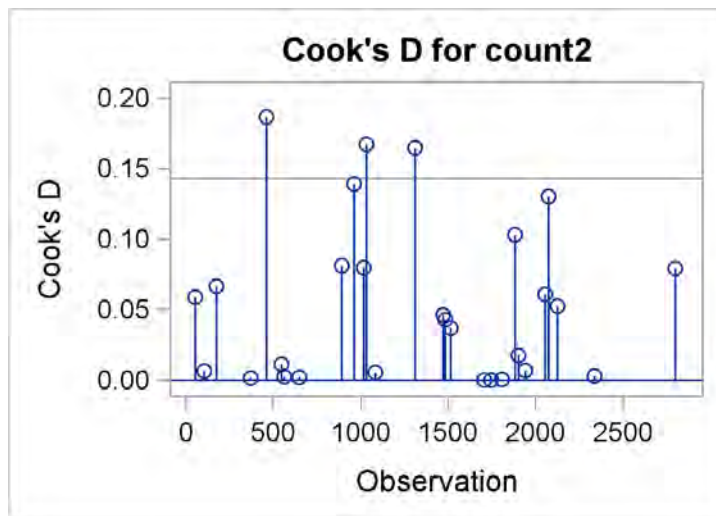
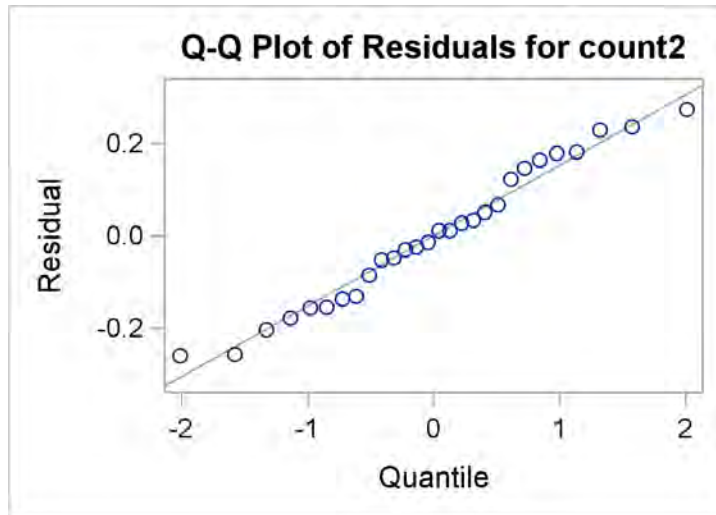
Dependent Variable: count2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	1.71729363	0.19081040	5.51	0.0010
Error	18	0.62300505	0.03461139		
Corrected Total	27	2.34029868			

R-Square	Coeff Var	Root MSE	count2 Mean
0.733793	36.22090	0.186041	0.513630

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	0.39225135	0.06537523	1.89	0.1381
Depth	2	1.20610686	0.60305343	17.42	<.0001
Quality	1	0.06031059	0.06031059	1.74	0.2034



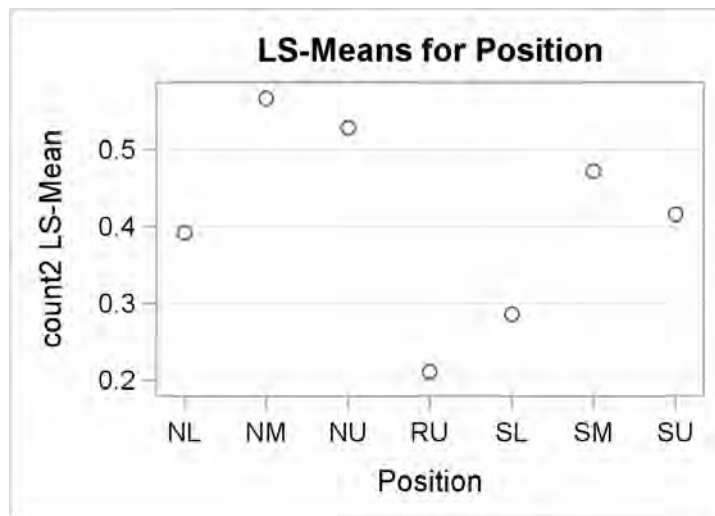


The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Position	count2 LSMEAN	LSMEAN Number
NL	0.39230480	1
NM	0.56704730	2
NU	0.52832181	3
RU	0.21055512	4
SL	0.28581262	5
SM	0.47199449	6
SU	0.41653230	7

Least Squares Means for effect Position
Pr > |t| for H0: LSMean(i)=LSMean(j)
Dependent Variable: count2

i/j	1	2	3	4	5	6	7
1		0.8302	0.9390	0.8043	0.9809	0.9958	1.0000
2	0.8302		0.9999	0.1519	0.3734	0.9893	0.9056
3	0.9390	0.9999		0.2478	0.5383	0.9994	0.9757
4	0.8043	0.1519	0.2478		0.9969	0.4545	0.7040
5	0.9809	0.3734	0.5383	0.9969		0.7871	0.9490
6	0.9958	0.9893	0.9994	0.4545	0.7871		0.9994
7	1.0000	0.9056	0.9757	0.7040	0.9490	0.9994	

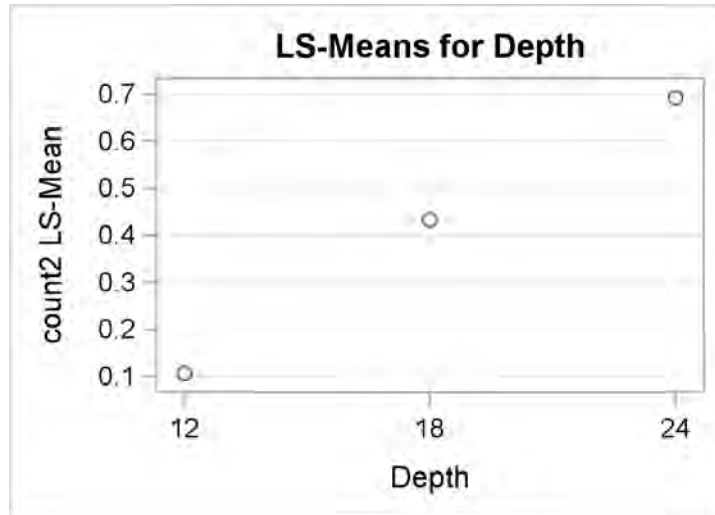


The GLM Procedure
 Least Squares Means
 Adjustment for Multiple Comparisons: Tukey-Kramer

Depth	count2	LSMEAN	LSMEAN	Number
12		0.10638255		1
18		0.43256844		2
24		0.69214977		3

Least Squares Means for effect Depth
 Pr > |t| for H0: LSMean(i)=LSMean(j)
 Dependent Variable: count2

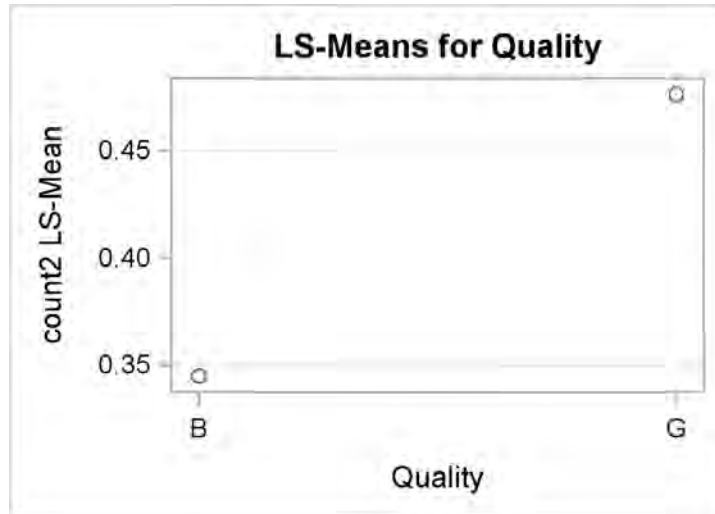
i/j	1	2	3
1		0.0110	<.0001
2	0.0110		0.0445
3	<.0001	0.0445	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

H0:LSMean1=LSMean2

Quality	count2 LSMEAN	Pr > |t|
B	0.34473233	0.2034
G	0.47600151	



Species: *Medicago lupulina*

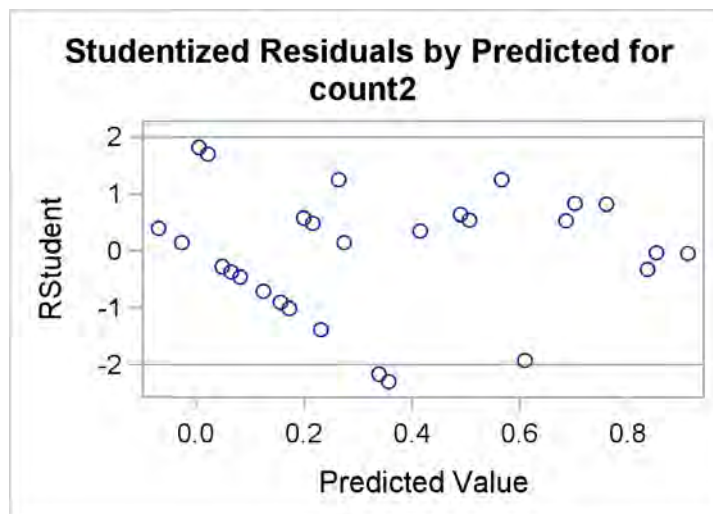
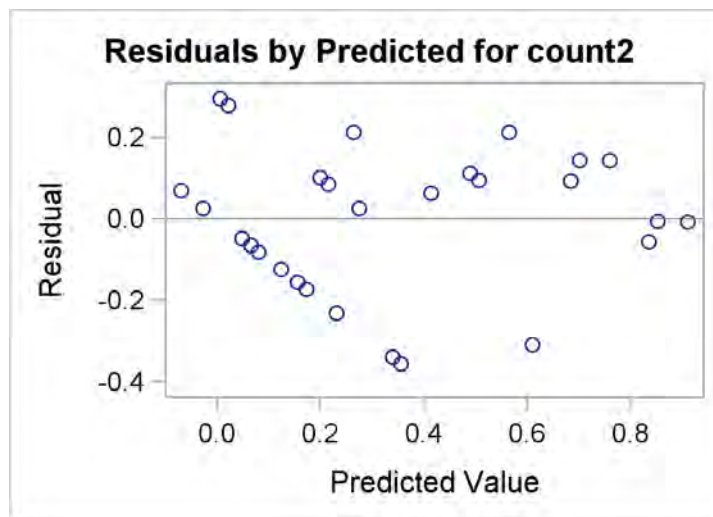
The GLM Procedure

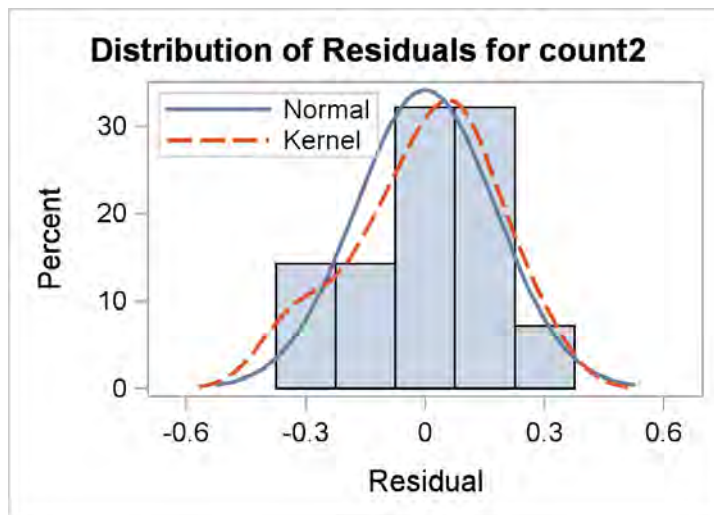
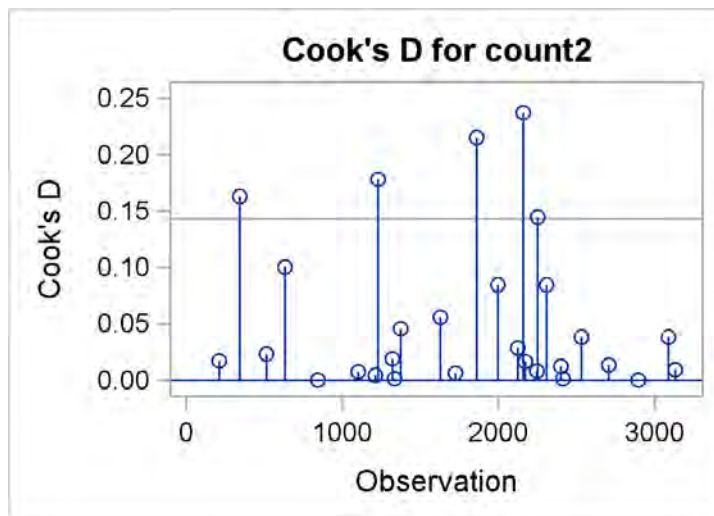
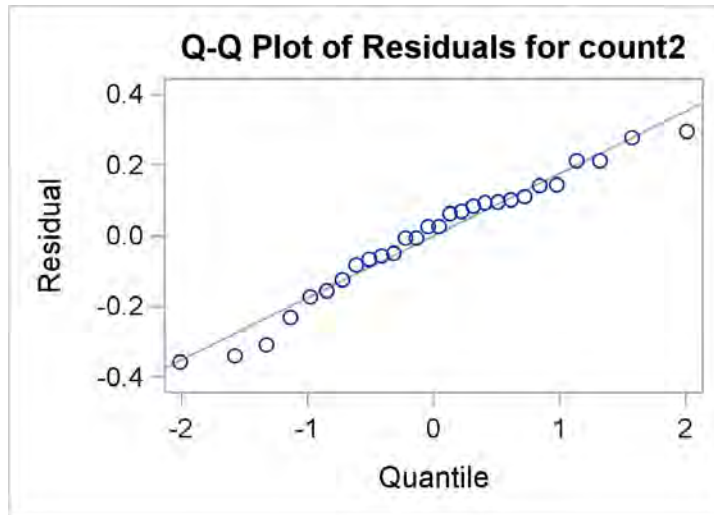
Dependent Variable: count2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	2.34146163	0.26016240	5.63	0.0009
Error	18	0.83181577	0.04621199		
Corrected Total	27	3.17327739			

R-Square	Coeff Var	Root MSE	count2 Mean
0.737869	61.44894	0.214970	0.349835

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	0.27345784	0.04557631	0.99	0.4632
Depth	2	0.46071931	0.23035966	4.98	0.0189
Quality	1	0.41734505	0.41734505	9.03	0.0076





The GLM Procedure

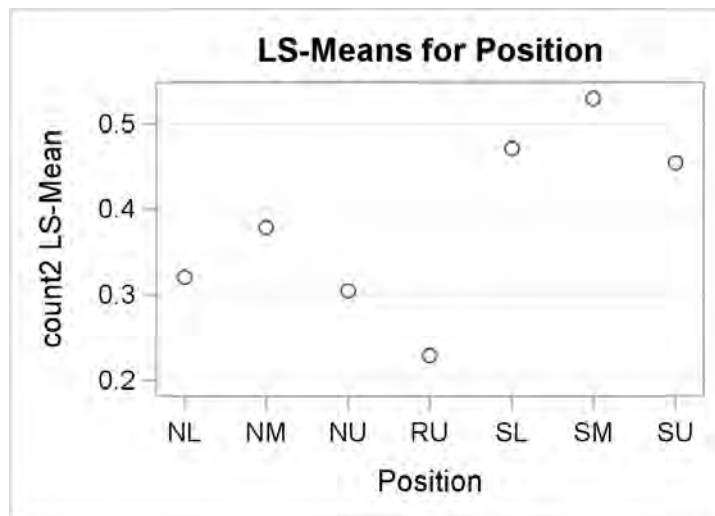
Least Squares Means

Adjustment for Multiple Comparisons: Tukey-Kramer

Position	count2 LSMEAN	LSMEAN Number
NL	0.32086185	1
NM	0.37938265	2
NU	0.30412516	3
RU	0.22886766	4
SL	0.47137685	5
SM	0.52989765	6
SU	0.45464015	7

Least Squares Means for effect Position
 Pr > |t| for H0: LSMean(i)=LSMean(j)
 Dependent Variable: count2

i/j	1	2	3	4	5	6	7
1		0.9997	1.0000	0.9958	0.9498	0.8075	0.9711
2	0.9997		0.9986	0.9498	0.9958	0.9498	0.9986
3	1.0000	0.9986		0.9986	0.9200	0.7496	0.9498
4	0.9958	0.9498	0.9986		0.6868	0.4585	0.7496
5	0.9498	0.9958	0.9200	0.6868		0.9997	1.0000
6	0.8075	0.9498	0.7496	0.4585	0.9997		0.9986
7	0.9711	0.9986	0.9498	0.7496	1.0000	0.9986	

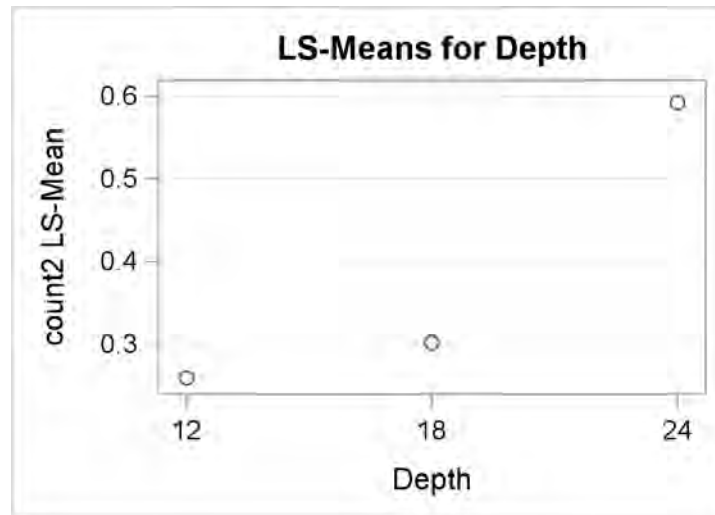


The GLM Procedure
 Least Squares Means
 Adjustment for Multiple Comparisons: Tukey-Kramer

Depth	count2	LSMEAN	LSMEAN	Number
12		0.25866534		1
18		0.30166963		2
24		0.59215874		3

Least Squares Means for effect Depth
 Pr > |t| for H0: LSMean(i)=LSMean(j)
 Dependent Variable: count2

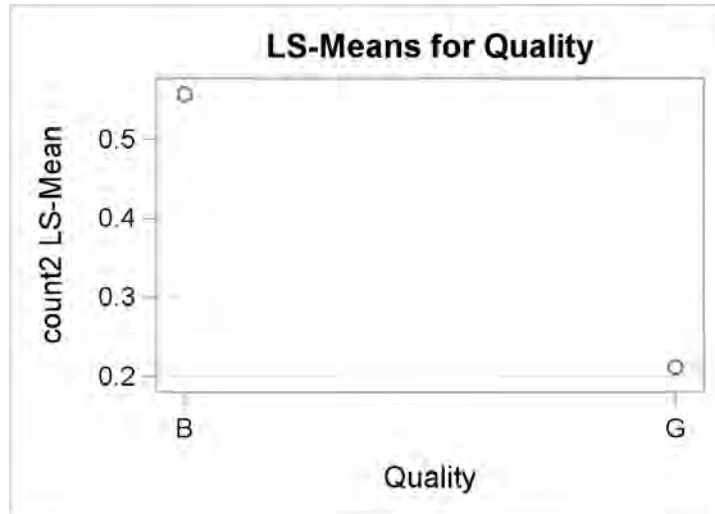
i/j	1	2	3
1		0.9260	0.0245
2	0.9260		0.0524
3	0.0245	0.0524	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

H0:LSMean1=LSMean2

Quality	count2 LSMEAN	Pr > |t|
B	0.55682134	0.0076
G	0.21150780	



Species: Melilotus officinalis

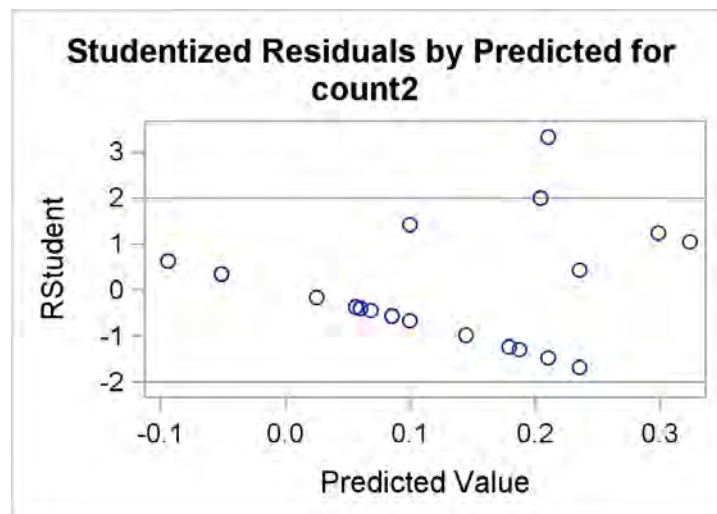
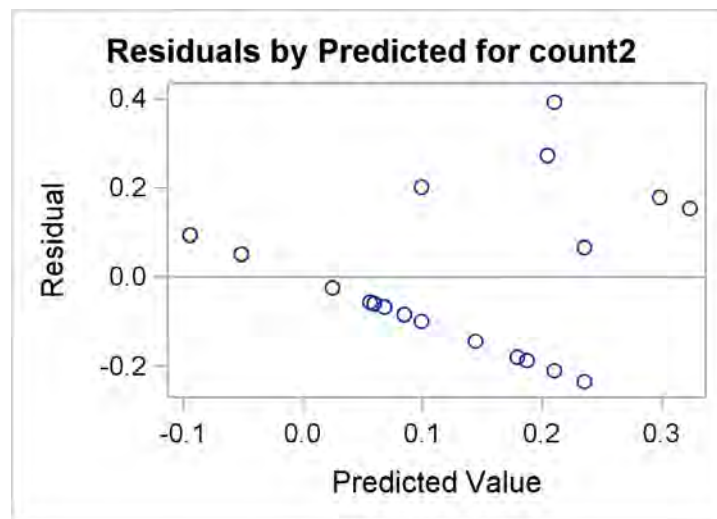
The GLM Procedure

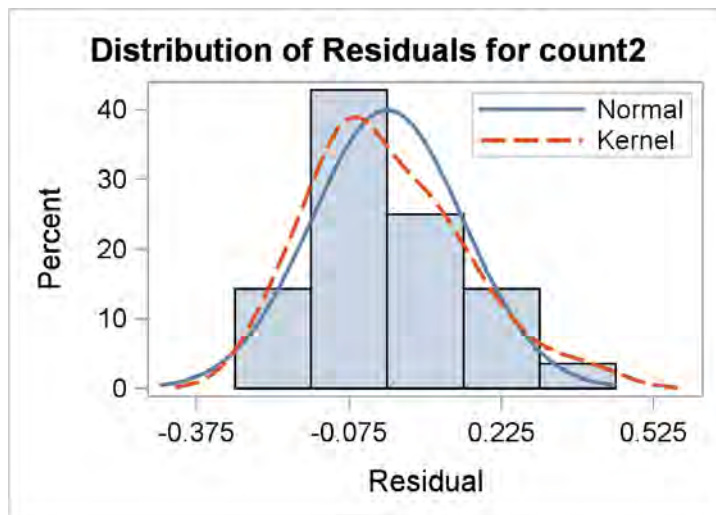
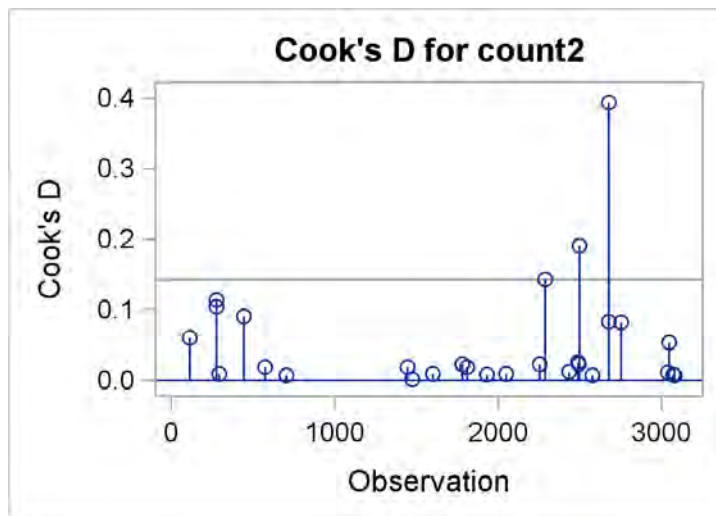
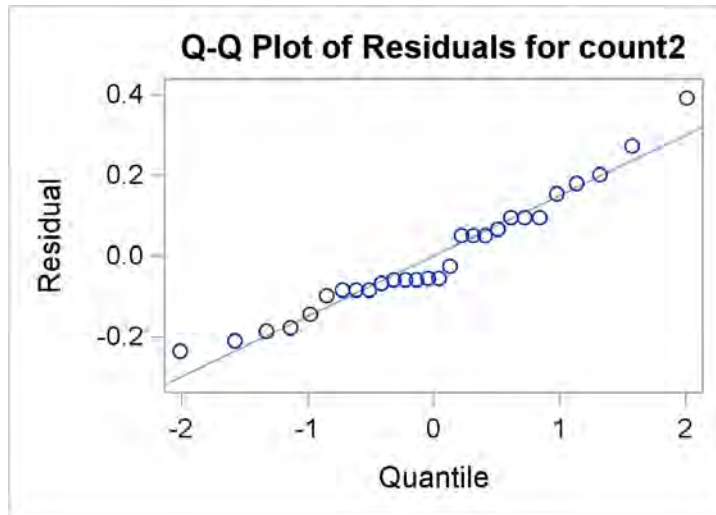
Dependent Variable: count2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	0.37409012	0.04156557	1.24	0.3332
Error	18	0.60449492	0.03358305		
Corrected Total	27	0.97858505			

R-Square	Coeff Var	Root MSE	count2 Mean
0.382277	194.6963	0.183257	0.094124

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	0.21773060	0.03628843	1.08	0.4103
Depth	2	0.08860812	0.04430406	1.32	0.2920
Quality	1	0.06504134	0.06504134	1.94	0.1810



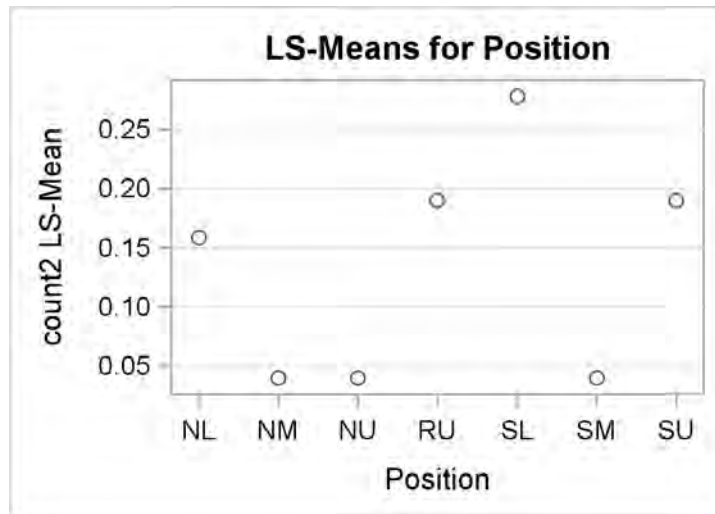


The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Position	count2 LSMEAN	LSMEAN Number
NL	0.15904042	1
NM	0.03976010	2
NU	0.03976010	3
RU	0.19027510	4
SL	0.27832073	5
SM	0.03976010	6
SU	0.19027510	7

Least Squares Means for effect Position
Pr > |t| for H0: LSMean(i)=LSMean(j)
Dependent Variable: count2

i/j	1	2	3	4	5	6	7
1		0.9642	0.9642	1.0000	0.9642	0.9642	1.0000
2	0.9642		1.0000	0.8995	0.5397	1.0000	0.8995
3	0.9642	1.0000		0.8995	0.5397	1.0000	0.8995
4	1.0000	0.8995	0.8995		0.9922	0.8995	1.0000
5	0.9642	0.5397	0.5397	0.9922		0.5397	0.9922
6	0.9642	1.0000	1.0000	0.8995	0.5397		0.8995
7	1.0000	0.8995	0.8995	1.0000	0.9922	0.8995	

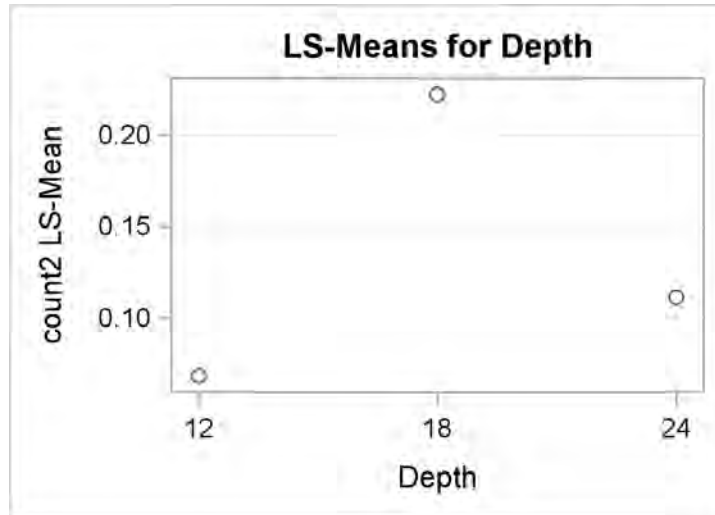


The GLM Procedure
 Least Squares Means
 Adjustment for Multiple Comparisons: Tukey-Kramer

Depth	count2	LSMEAN	LSMEAN	Number
12		0.06816018		1
18		0.22232893		2
24		0.11116446		3

Least Squares Means for effect Depth
 Pr > |t| for H0: LSMean(i)=LSMean(j)
 Dependent Variable: count2

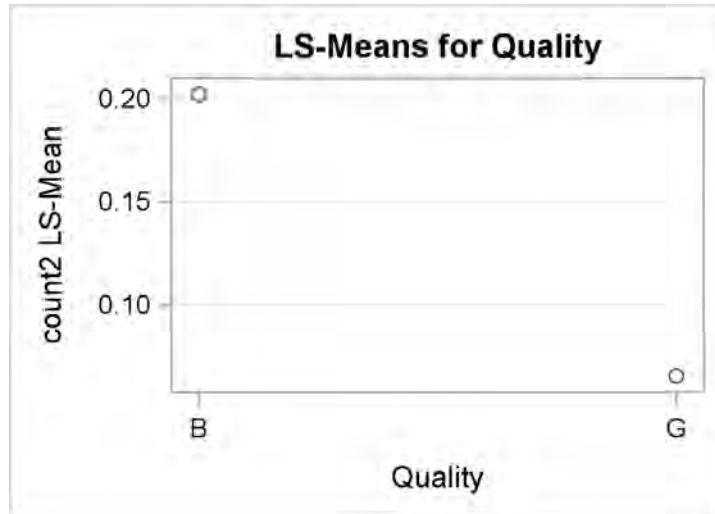
i/j	1	2	3
1		0.2820	0.8998
2	0.2820		0.5058
3	0.8998	0.5058	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

H0:LSMean1=LSMean2

Quality	count2 LSMEAN	Pr > |t|
B	0.20204470	0.1810
G	0.06572434	



Species: *Monarda punctata*

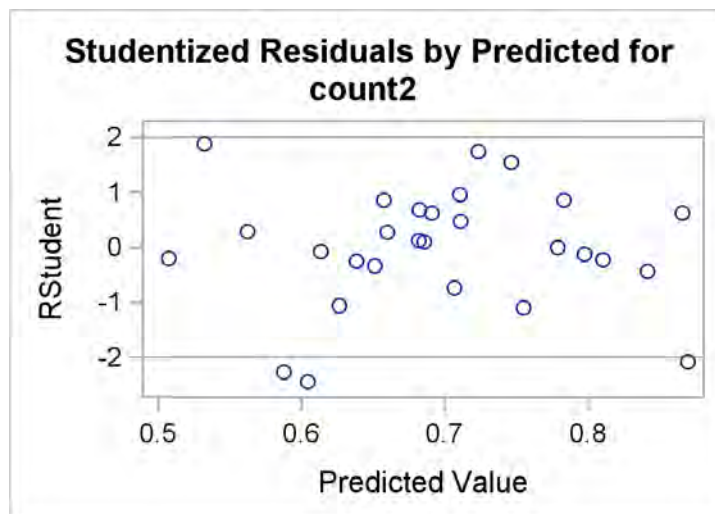
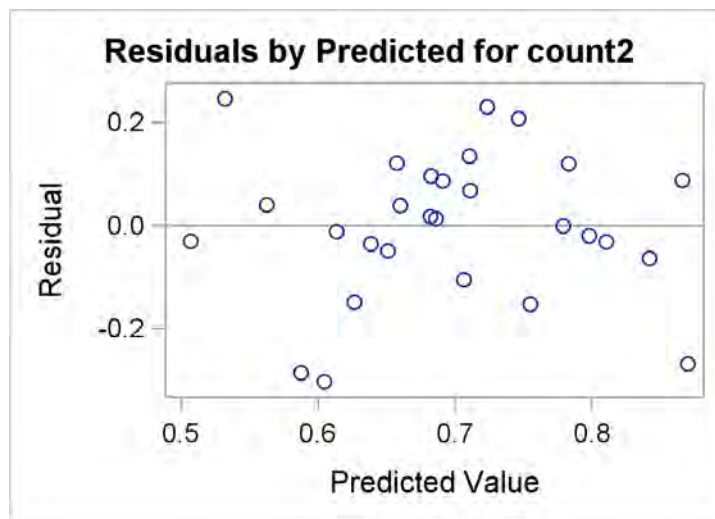
The GLM Procedure

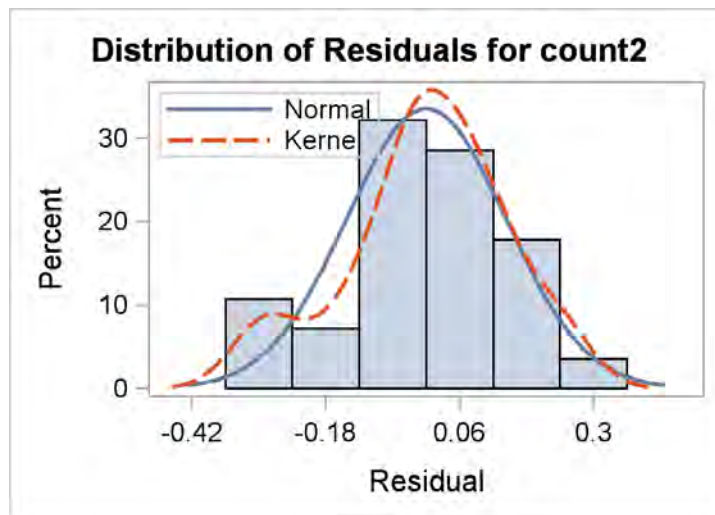
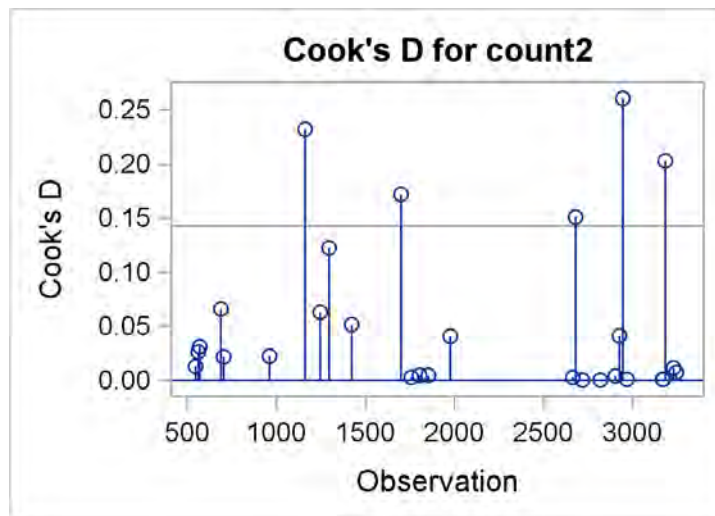
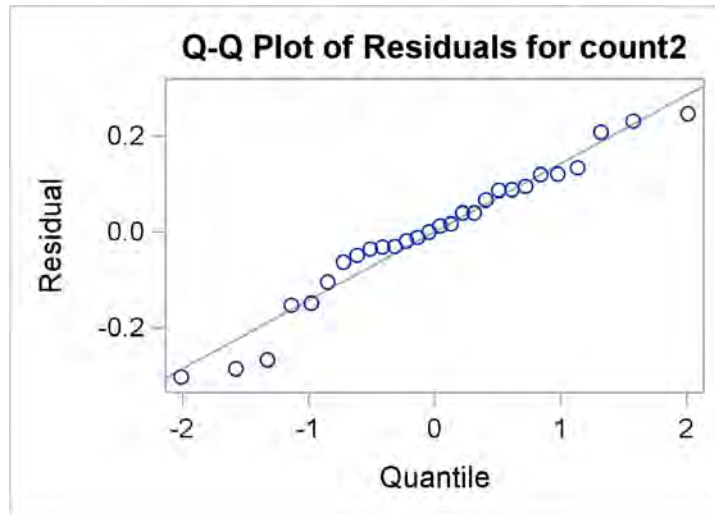
Dependent Variable: count2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	0.24646173	0.02738464	0.90	0.5467
Error	18	0.54907843	0.03050436		
Corrected Total	27	0.79554015			

R-Square Coeff Var Root MSE count2 Mean
0.309804 25.10195 0.174655 0.695782

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	0.10276555	0.01712759	0.56	0.7553
Depth	2	0.03578833	0.01789416	0.59	0.5665
Quality	1	0.02635726	0.02635726	0.86	0.3649



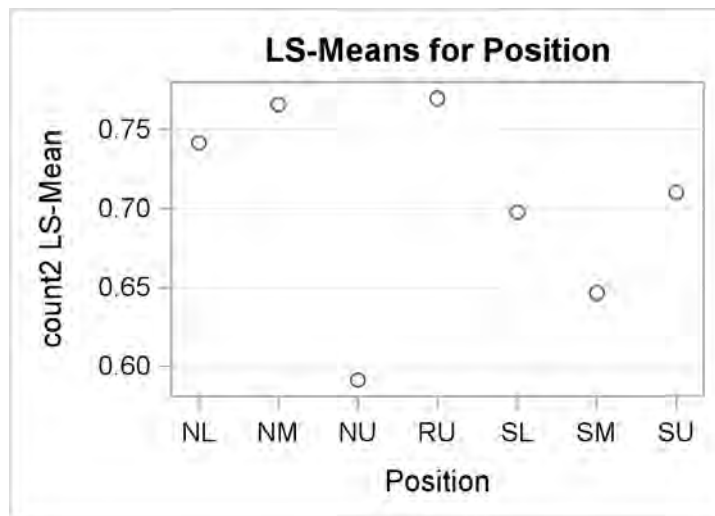


The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Position	count2 LSMEAN	LSMEAN Number
NL	0.74167652	1
NM	0.76590403	2
NU	0.59116153	3
RU	0.76985259	4
SL	0.69765371	5
SM	0.64662371	6
SU	0.71044184	7

Least Squares Means for effect Position
Pr > |t| for H0: LSMean(i)=LSMean(j)
Dependent Variable: count2

i/j	1	2	3	4	5	6	7
1	1.0000	0.8779	1.0000	0.9998	0.9852	1.0000	
2	1.0000	0.7873	1.0000	0.9974	0.9552	0.9992	
3	0.8779	0.7873	0.7704	0.9739	0.9992	0.9552	
4	1.0000	1.0000	0.7704	0.9965	0.9480	0.9988	
5	0.9998	0.9974	0.9739	0.9965	0.9995	1.0000	
6	0.9852	0.9552	0.9992	0.9480	0.9995	0.9982	
7	1.0000	0.9992	0.9552	0.9988	1.0000	0.9982	

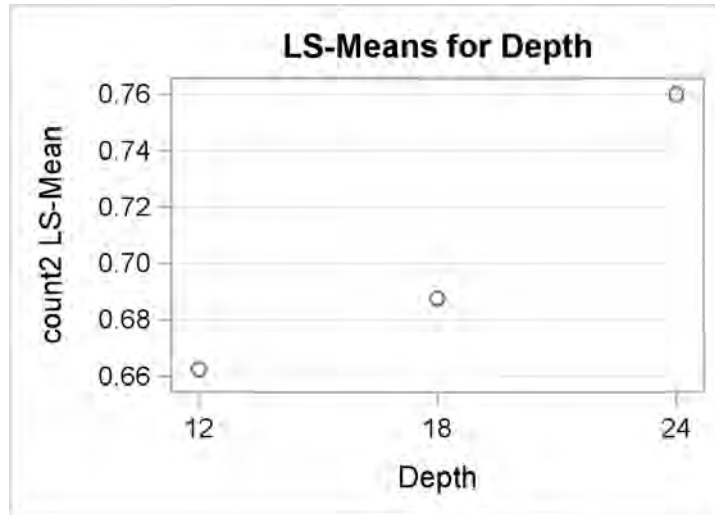


The GLM Procedure
 Least Squares Means
 Adjustment for Multiple Comparisons: Tukey-Kramer

Depth	count2	LSMEAN	LSMEAN	Number
12		0.66259732		1
18		0.68747686		2
24		0.75991750		3

Least Squares Means for effect Depth
 Pr > |t| for H0: LSMean(i)=LSMean(j)
 Dependent Variable: count2

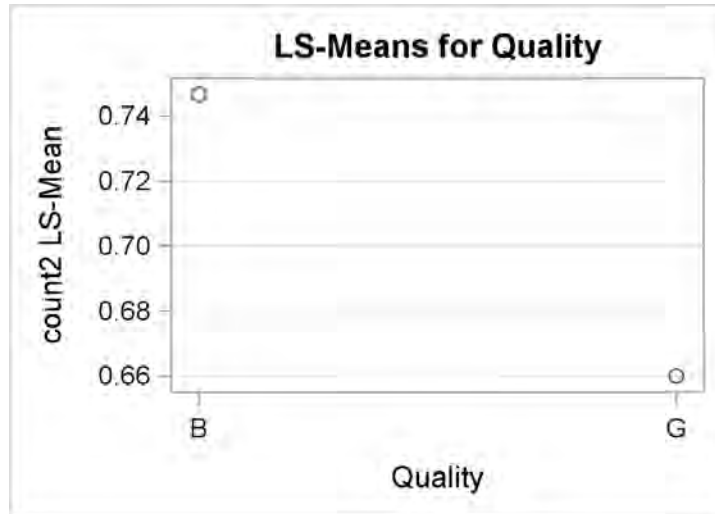
i/j	1	2	3
1		0.9617	0.5606
2	0.9617		0.7221
3	0.5606	0.7221	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

H0:LSMean1=LSMean2

Quality	count2 LSMEAN	Pr > |t|
B	0.74672021	0.3649
G	0.65994092	



Species: *Oenothera biennis*

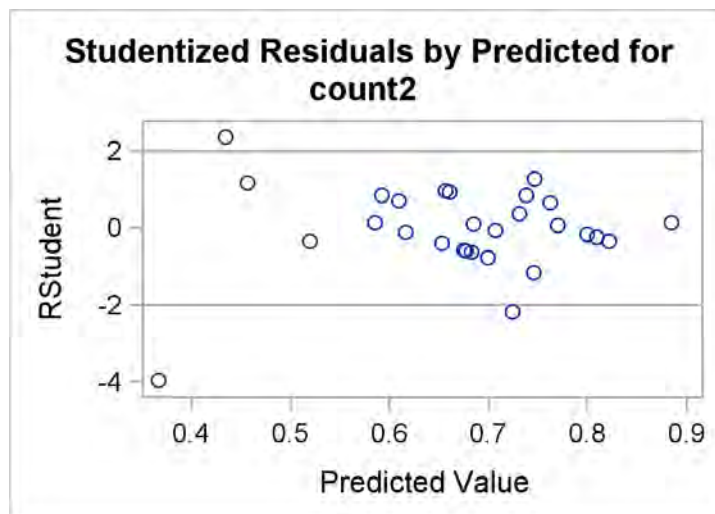
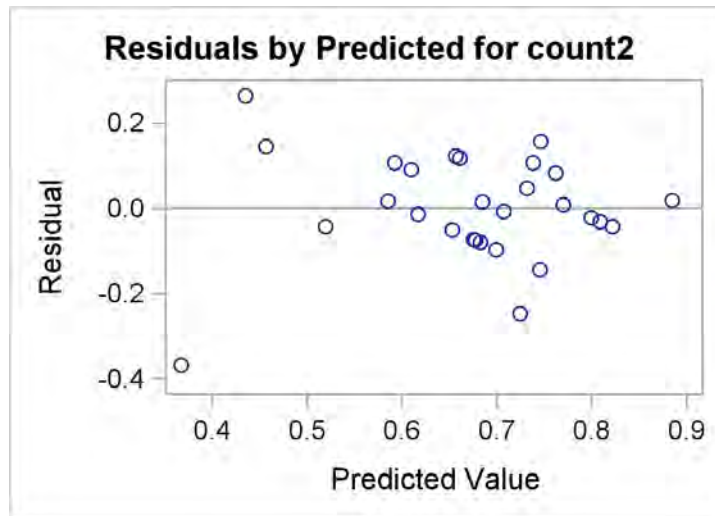
The GLM Procedure

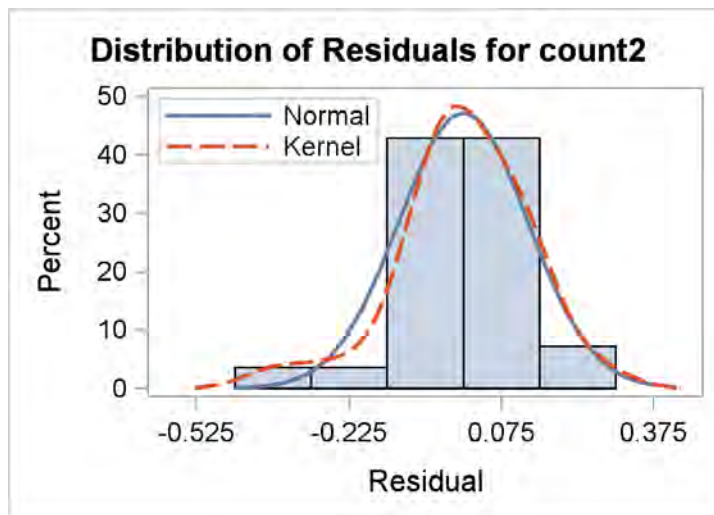
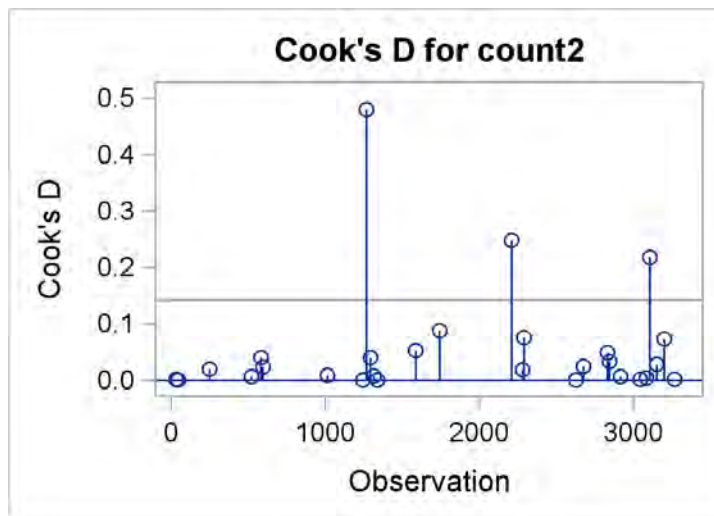
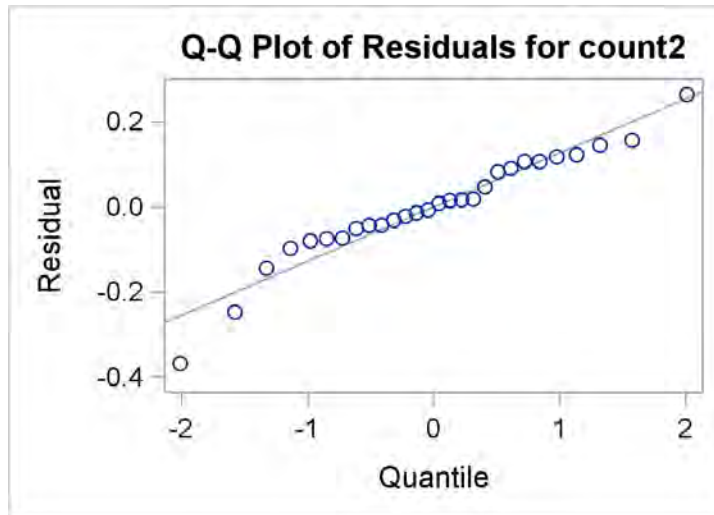
Dependent Variable: count2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	0.38474125	0.04274903	1.76	0.1458
Error	18	0.43606632	0.02422591		
Corrected Total	27	0.82080757			

R-Square	Coeff Var	Root MSE	count2 Mean
0.468735	23.16779	0.155647	0.671824

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	0.30118068	0.05019678	2.07	0.1080
Depth	2	0.08269829	0.04134915	1.71	0.2095
Quality	1	0.02514203	0.02514203	1.04	0.3218



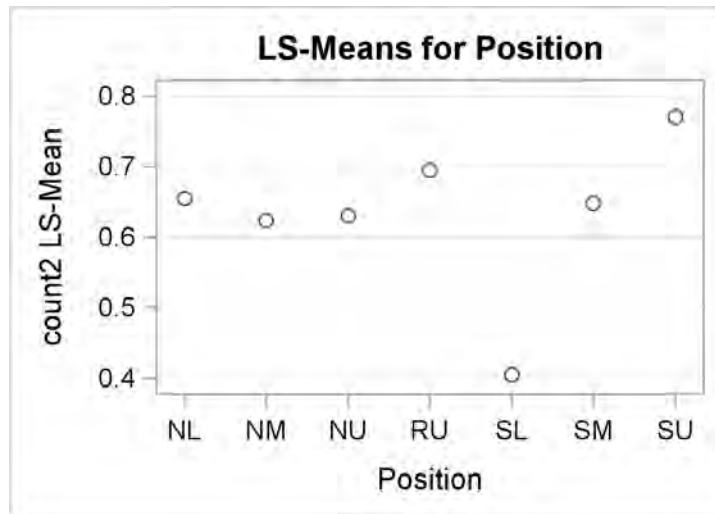


The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Position	count2 LSMEAN	LSMEAN Number
NL	0.65536419	1
NM	0.62364588	2
NU	0.63113669	3
RU	0.69495482	4
SL	0.40536419	5
SM	0.64787339	6
SU	0.77021231	7

Least Squares Means for effect Position
Pr > |t| for H0: LSMean(i)=LSMean(j)
Dependent Variable: count2

i/j	1	2	3	4	5	6	7
1		0.9999	1.0000	0.9998	0.3087	1.0000	0.9365
2	0.9999		1.0000	0.9939	0.4568	1.0000	0.8286
3	1.0000	1.0000		0.9967	0.4190	1.0000	0.8593
4	0.9998	0.9939	0.9967		0.1739	0.9994	0.9919
5	0.3087	0.4568	0.4190	0.1739		0.3407	0.0490
6	1.0000	1.0000	1.0000	0.9994	0.3407		0.9164
7	0.9365	0.8286	0.8593	0.9919	0.0490	0.9164	

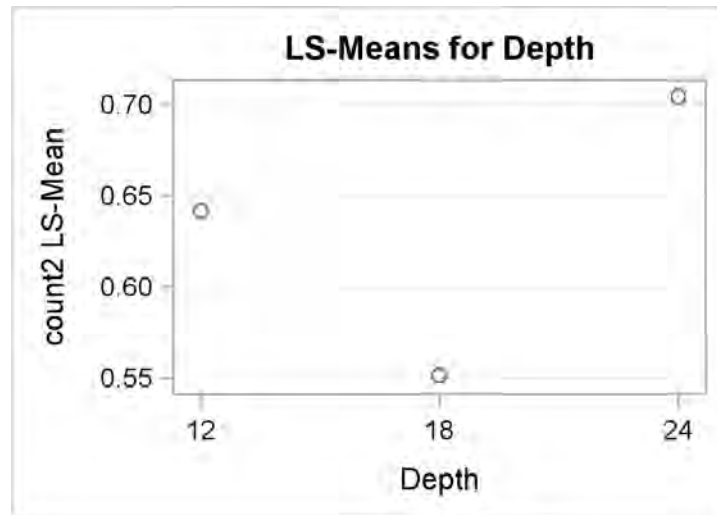


The GLM Procedure
 Least Squares Means
 Adjustment for Multiple Comparisons: Tukey-Kramer

Depth	count2	LSMEAN	LSMEAN	Number
12		0.64168688		1
18		0.55167421		2
24		0.70458954		3

Least Squares Means for effect Depth
 Pr > |t| for H0: LSMean(i)=LSMean(j)
 Dependent Variable: count2

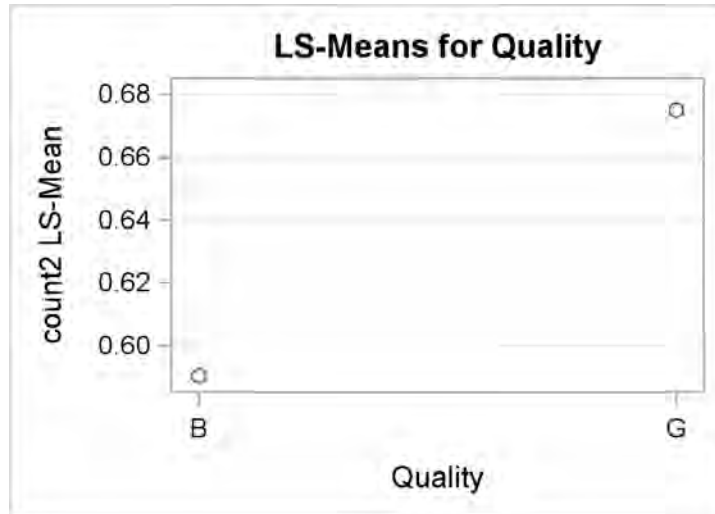
i/j	1	2	3
1		0.5370	0.7339
2	0.5370		0.1858
3	0.7339	0.1858	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

H0:LSMean1=LSMean2

Quality	count2 LSMEAN	Pr > |t|
B	0.59027263	0.3218
G	0.67502779	



Species: Populus deltoides

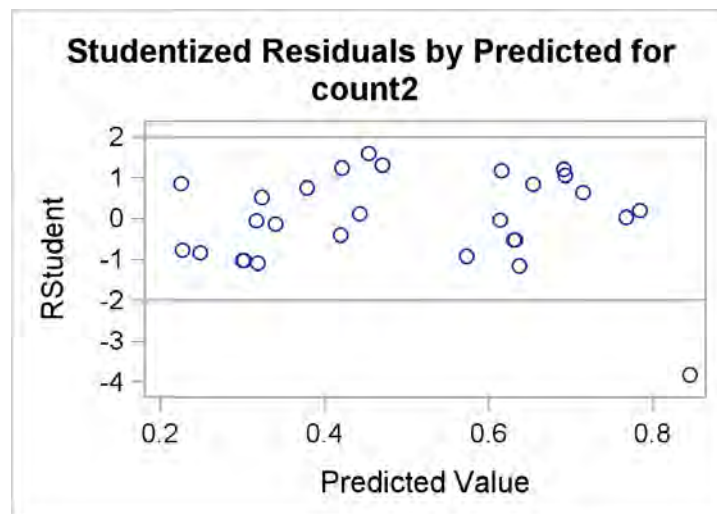
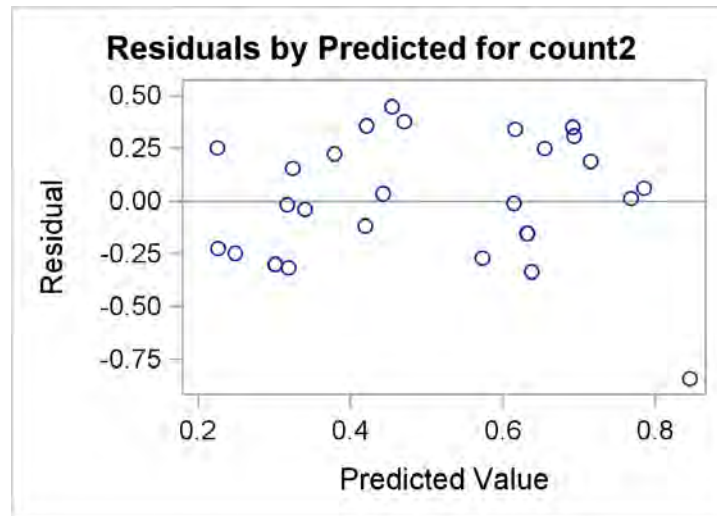
The GLM Procedure

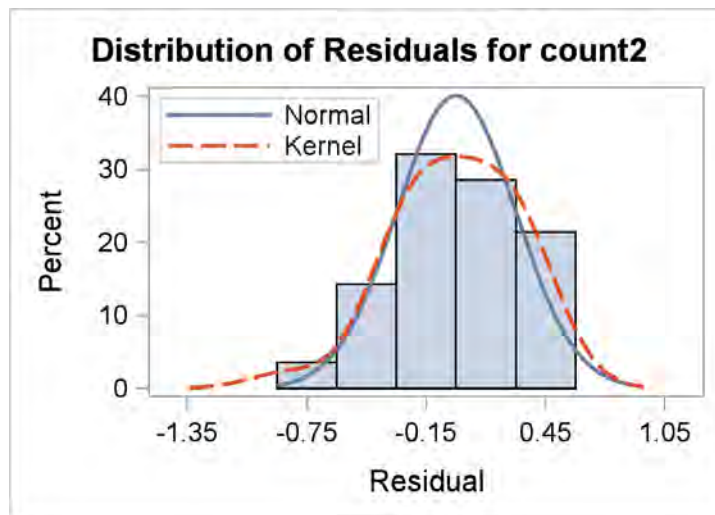
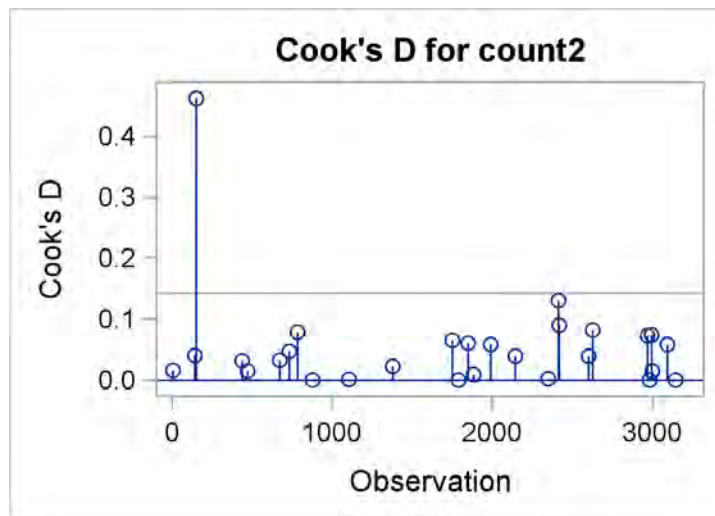
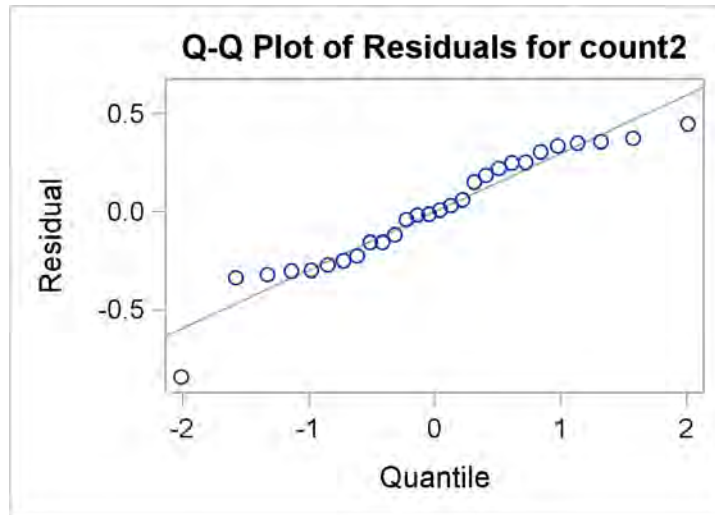
Dependent Variable: count2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	0.95001250	0.10555694	0.79	0.6283
Error	18	2.40111445	0.13339525		
Corrected Total	27	3.35112695			

R-Square	Coeff Var	Root MSE	count2 Mean
0.283490	72.80595	0.365233	0.501653

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	0.83675583	0.13945931	1.05	0.4294
Depth	2	0.10902293	0.05451147	0.41	0.6706
Quality	1	0.00189144	0.00189144	0.01	0.9065





The GLM Procedure

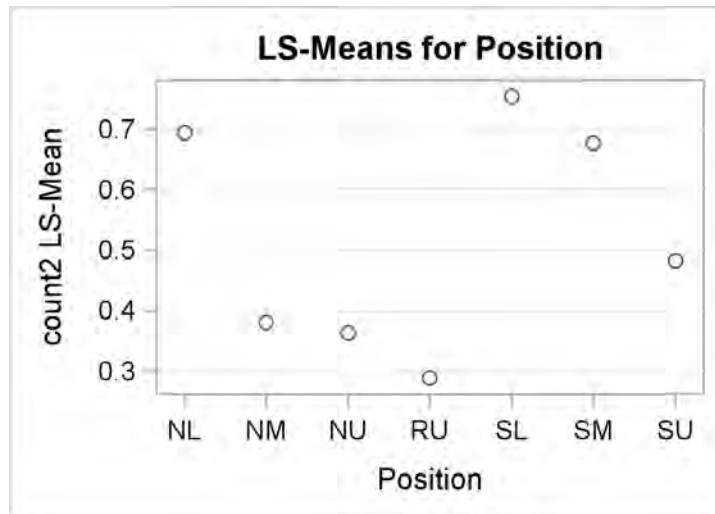
Least Squares Means

Adjustment for Multiple Comparisons: Tukey-Kramer

Position	count2 LSMEAN	LSMEAN Number
NL	0.69433042	1
NM	0.38051229	2
NU	0.36377559	3
RU	0.28851810	4
SL	0.75484345	5
SM	0.67759372	6
SU	0.48305591	7

Least Squares Means for effect Position
 Pr > |t| for H0: LSMean(i)=LSMean(j)
 Dependent Variable: count2

i/j	1	2	3	4	5	6	7
1		0.8793	0.8523	0.7008	1.0000	1.0000	0.9798
2	0.8793		1.0000	0.9998	0.7691	0.9035	0.9996
3	0.8523	1.0000		0.9999	0.7334	0.8793	0.9991
4	0.7008	0.9998	0.9999		0.5609	0.7378	0.9867
5	1.0000	0.7691	0.7334	0.5609		0.9999	0.9340
6	1.0000	0.9035	0.8793	0.7378	0.9999		0.9867
7	0.9798	0.9996	0.9991	0.9867	0.9340	0.9867	

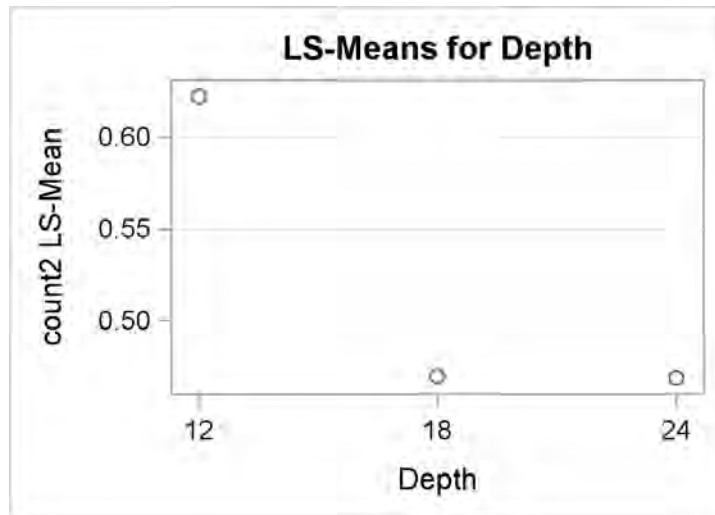


The GLM Procedure
 Least Squares Means
 Adjustment for Multiple Comparisons: Tukey-Kramer

Depth	count2	LSMEAN	LSMEAN	Number
12		0.62227014		1
18		0.47012552		2
24		0.46873126		3

Least Squares Means for effect Depth
 Pr > |t| for H0: LSMean(i)=LSMean(j)
 Dependent Variable: count2

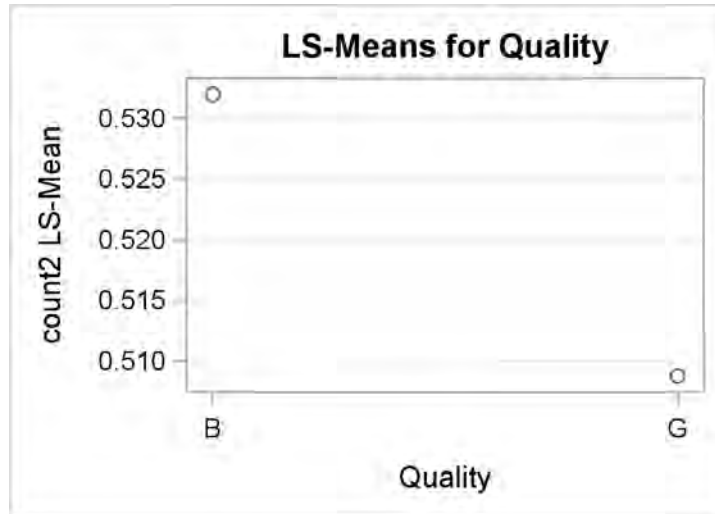
i/j	1	2	3
1		0.7201	0.7159
2	0.7201		1.0000
3	0.7159	1.0000	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

H0:LSMean1=LSMean2

Quality	count2 LSMEAN	Pr > |t|
B	0.53199902	0.9065
G	0.50875226	



Species: Rudbeckia hirta

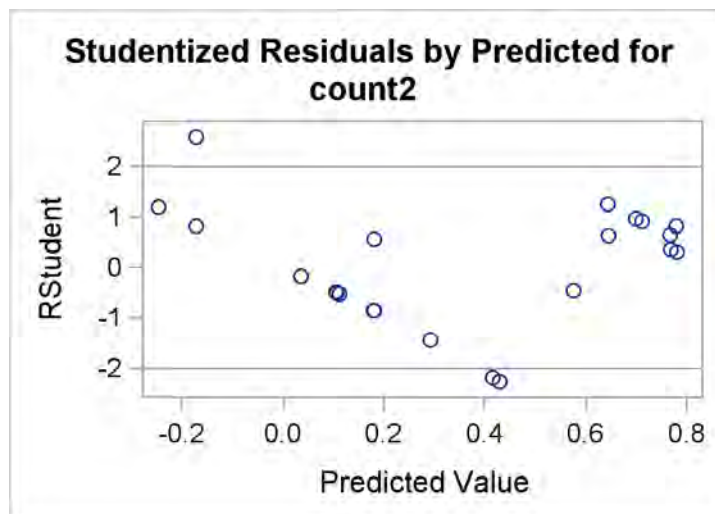
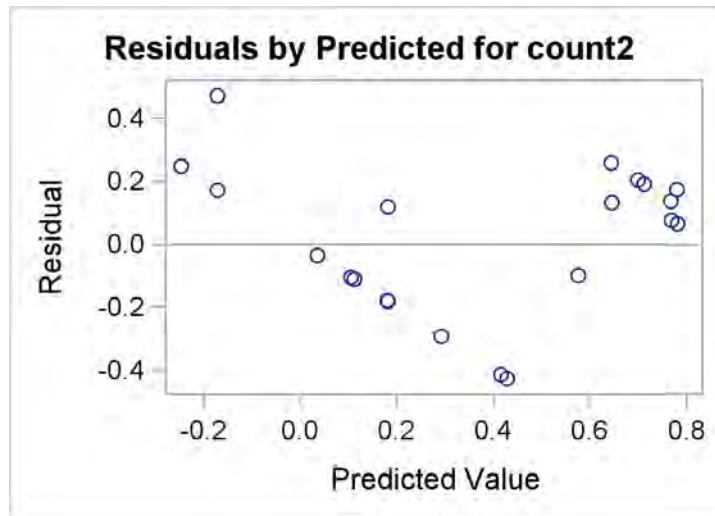
The GLM Procedure

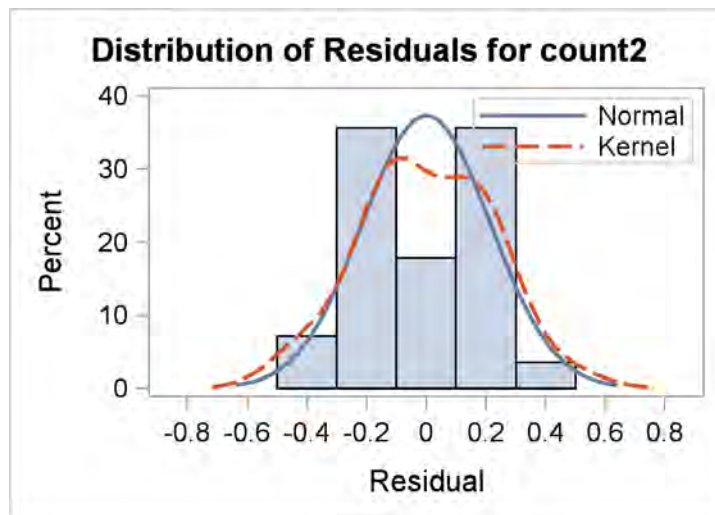
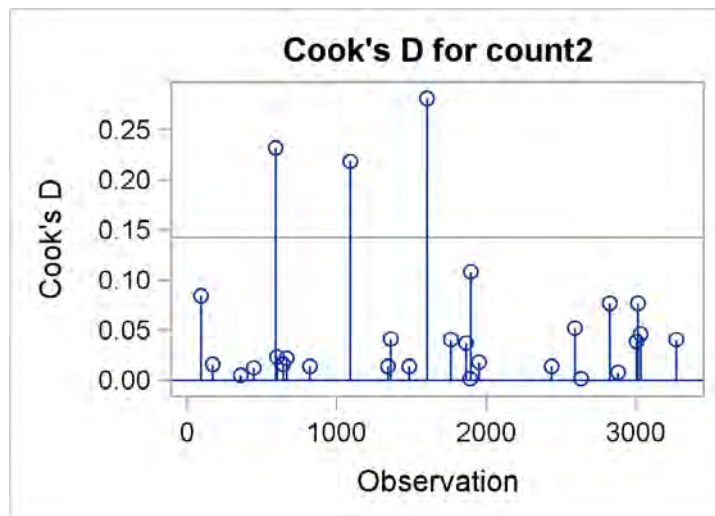
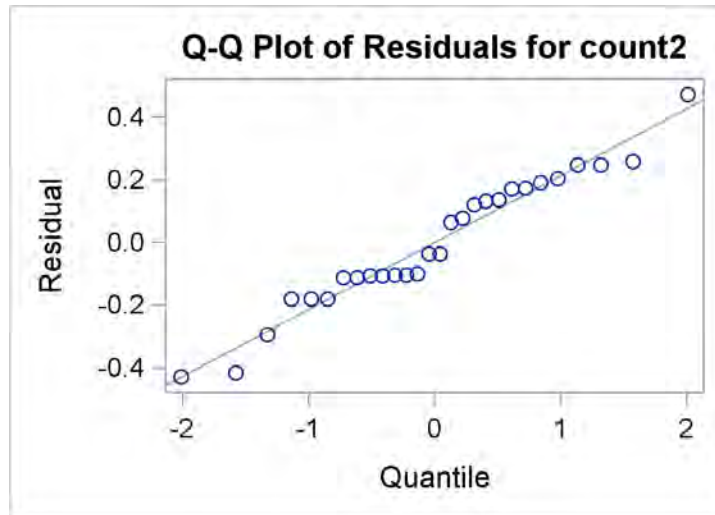
Dependent Variable: count2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	3.03217251	0.33690806	4.92	0.0020
Error	18	1.23207869	0.06844882		
Corrected Total	27	4.26425121			

R-Square	Coeff Var	Root MSE	count2 Mean
0.711068	90.28155	0.261627	0.289790

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	2.44164594	0.40694099	5.95	0.0014
Depth	2	0.02209499	0.01104750	0.16	0.8522
Quality	1	0.43204367	0.43204367	6.31	0.0217



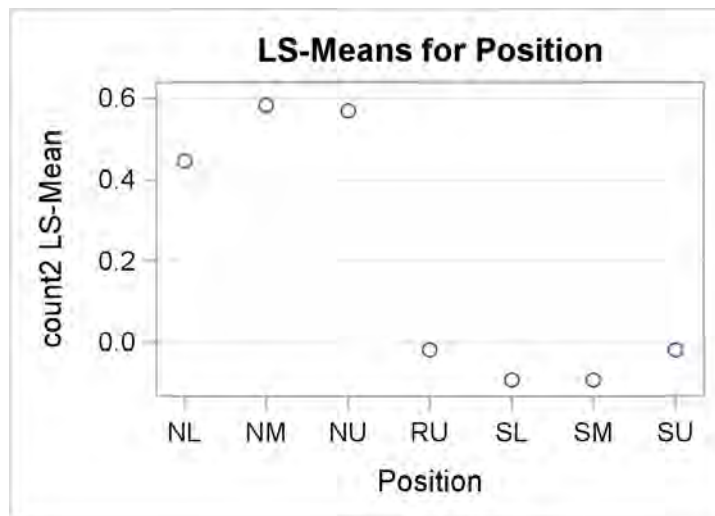


The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Position	count2 LSMEAN	LSMEAN Number
NL	0.44618177	1
NM	0.58219878	2
NU	0.56941065	3
RU	-0.01815136	4
SL	-0.09340886	5
SM	-0.09340886	6
SU	-0.01815136	7

Least Squares Means for effect Position
Pr > |t| for H0: LSMean(i)=LSMean(j)
Dependent Variable: count2

i/j	1	2	3	4	5	6	7
1		0.9883	0.9930	0.2130	0.1048	0.1048	0.2130
2	0.9883		1.0000	0.0562	0.0249	0.0249	0.0562
3	0.9930	1.0000		0.0642	0.0286	0.0286	0.0642
4	0.2130	0.0562	0.0642		0.9995	0.9995	1.0000
5	0.1048	0.0249	0.0286	0.9995		1.0000	0.9995
6	0.1048	0.0249	0.0286	0.9995	1.0000		0.9995
7	0.2130	0.0562	0.0642	1.0000	0.9995	0.9995	

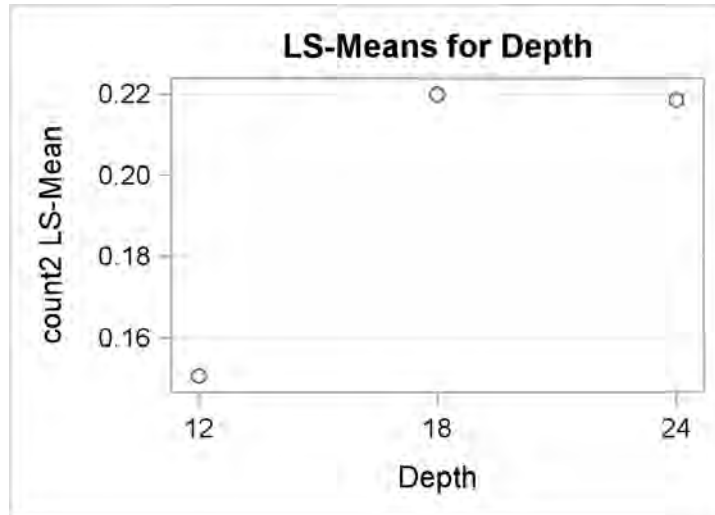


The GLM Procedure
 Least Squares Means
 Adjustment for Multiple Comparisons: Tukey-Kramer

Depth	count2	LSMEAN	LSMEAN	Number
12		0.15051500		1
18		0.21995444		2
24		0.21867518		3

Least Squares Means for effect Depth
 Pr > |t| for H0: LSMean(i)=LSMean(j)
 Dependent Variable: count2

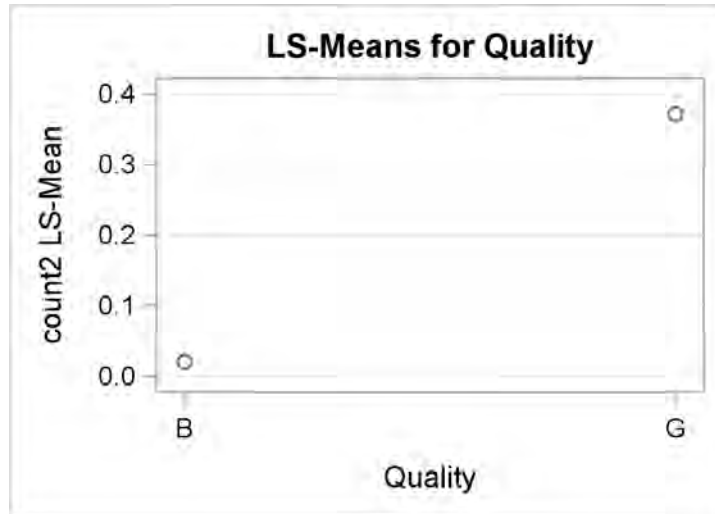
i/j	1	2	3
1		0.8739	0.8781
2	0.8739		1.0000
3	0.8781	1.0000	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

H0:LSMean1=LSMean2

Quality	count2 LSMEAN	Pr > |t|
B	0.02071065	0.0217
G	0.37205243	



Species: *Setaria faberi*

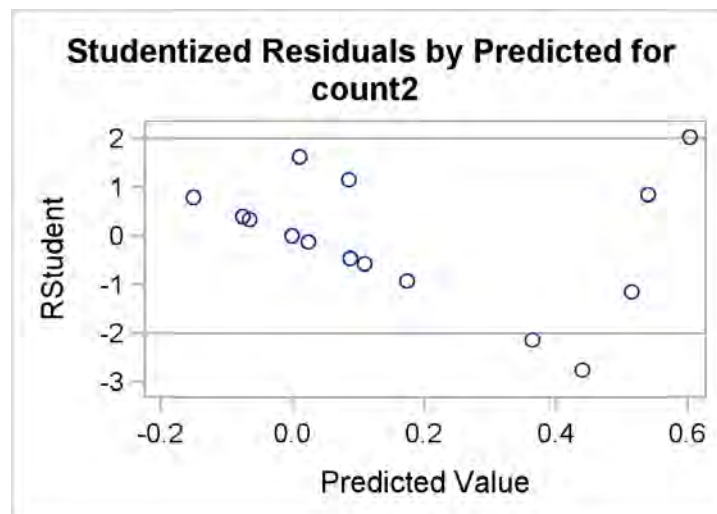
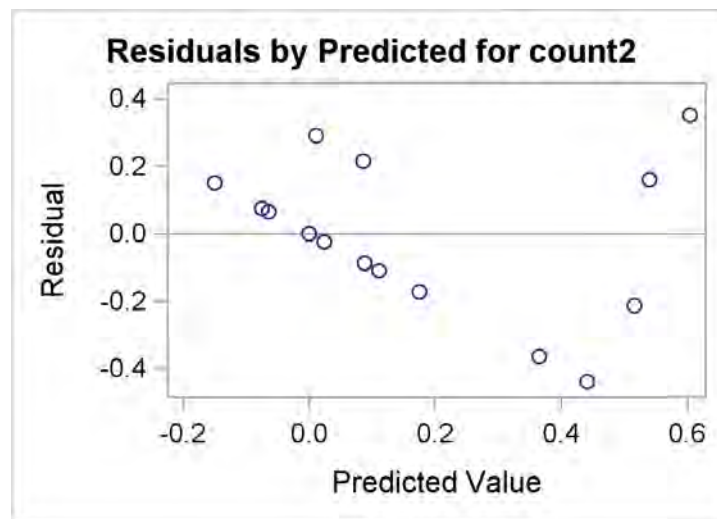
The GLM Procedure

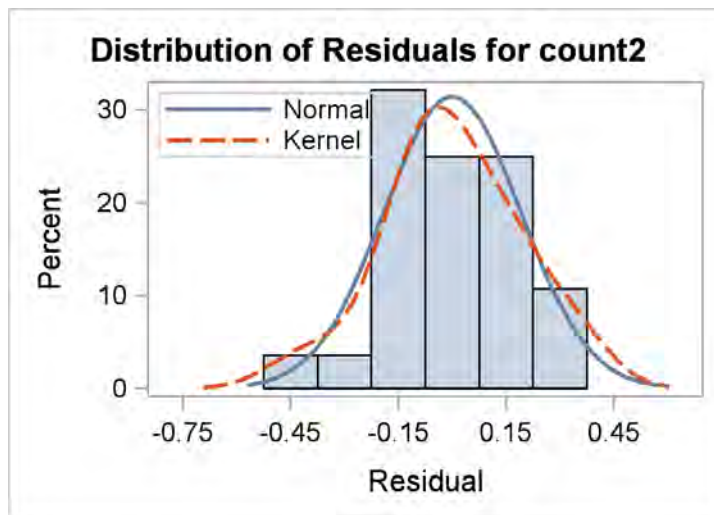
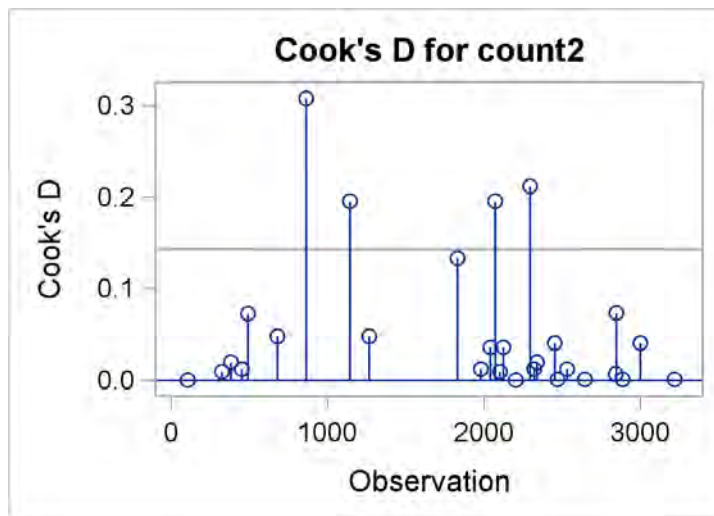
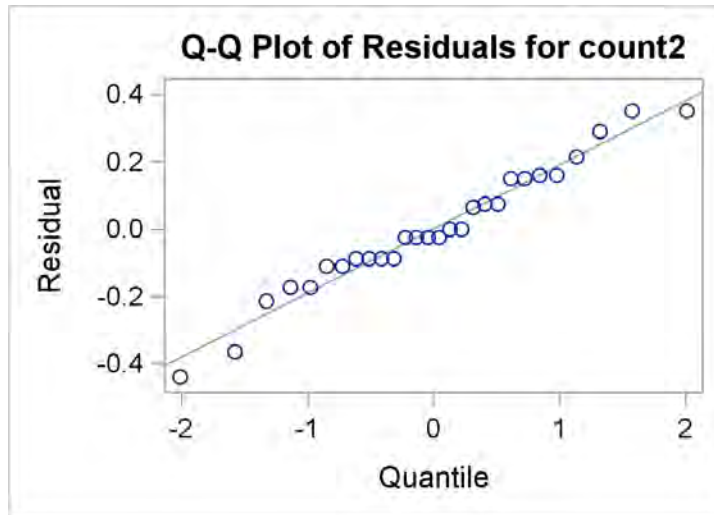
Dependent Variable: count2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	1.45801412	0.16200157	2.98	0.0233
Error	18	0.97926099	0.05440339		
Corrected Total	27	2.43727510			

R-Square	Coeff Var	Root MSE	count2 Mean
0.598215	155.1454	0.233245	0.150340

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	0.17998500	0.02999750	0.55	0.7627
Depth	2	0.03452155	0.01726077	0.32	0.7321
Quality	1	0.92955227	0.92955227	17.09	0.0006



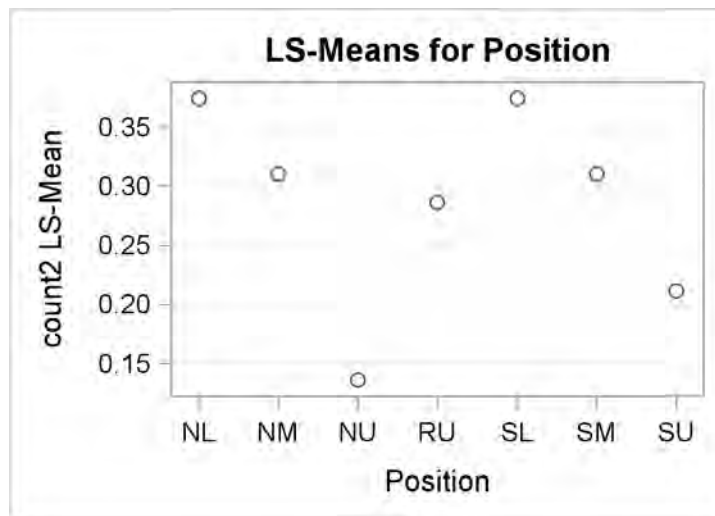


The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Position	count2 LSMEAN	LSMEAN Number
NL	0.37456569	1
NM	0.31074756	2
NU	0.13600506	3
RU	0.28652006	4
SL	0.37456569	5
SM	0.31074756	6
SU	0.21126256	7

Least Squares Means for effect Position
Pr > |t| for H0: LSMean(i)=LSMean(j)
Dependent Variable: count2

i/j	1	2	3	4	5	6	7
1		0.9997	0.7707	0.9979	1.0000	0.9997	0.9498
2	0.9997		0.9321	1.0000	0.9997	1.0000	0.9959
3	0.7707	0.9321		0.9657	0.7707	0.9321	0.9991
4	0.9979	1.0000	0.9657		0.9979	1.0000	0.9991
5	1.0000	0.9997	0.7707	0.9979		0.9997	0.9498
6	0.9997	1.0000	0.9321	1.0000	0.9997		0.9959
7	0.9498	0.9959	0.9991	0.9991	0.9498	0.9959	

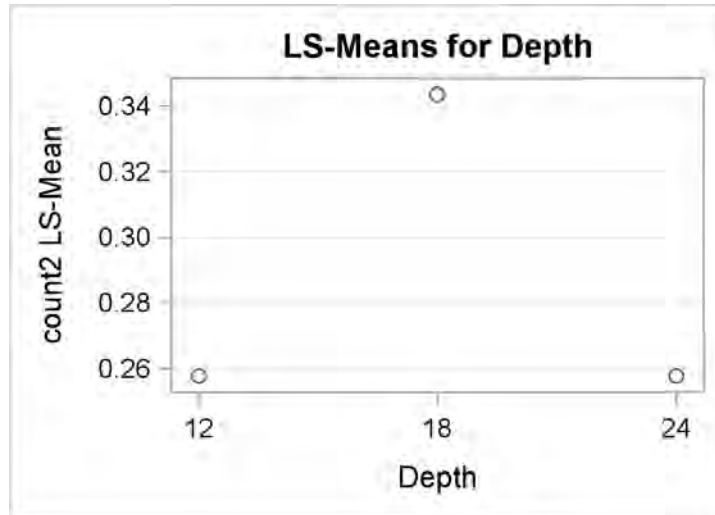


The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Depth	count2	LSMEAN	LSMEAN	Number
12		0.25767536		1
18		0.34368393		2
24		0.25767536		3

Least Squares Means for effect Depth
Pr > |t| for H0: LSMean(i)=LSMean(j)
Dependent Variable: count2

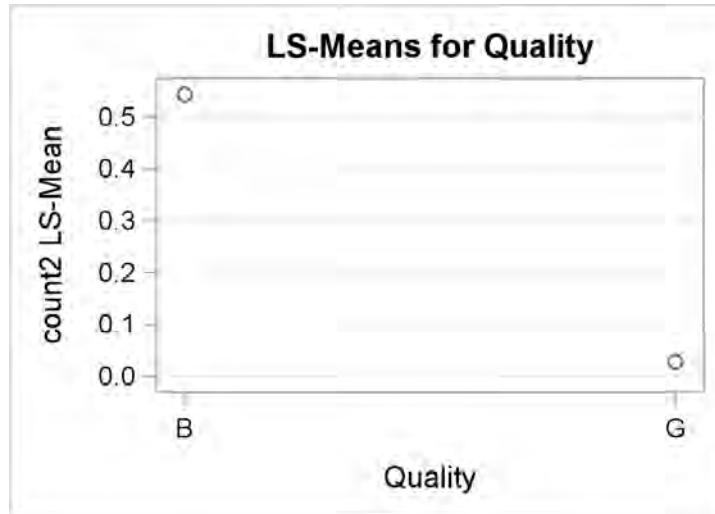
i/j	1	2	3
1		0.7723	1.0000
2	0.7723		0.7723
3	1.0000	0.7723	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

H0:LSMean1=LSMean2

Quality	count2 LSMEAN	Pr > |t|
B	0.54402024	0.0006
G	0.02866952	



Species: *Setaria glauca*

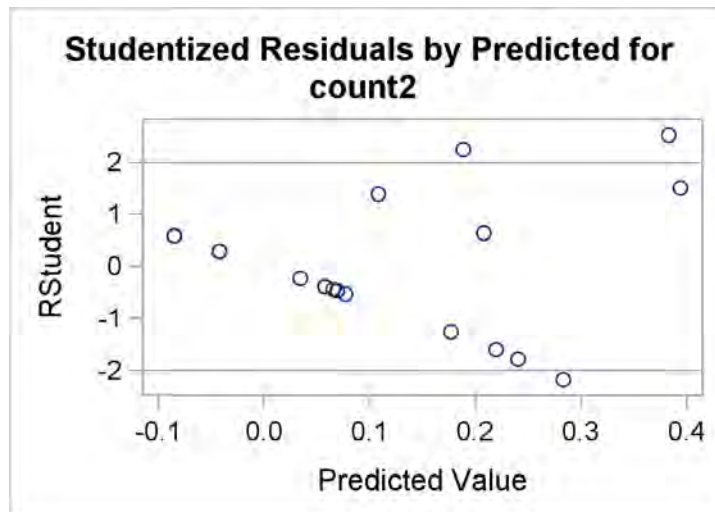
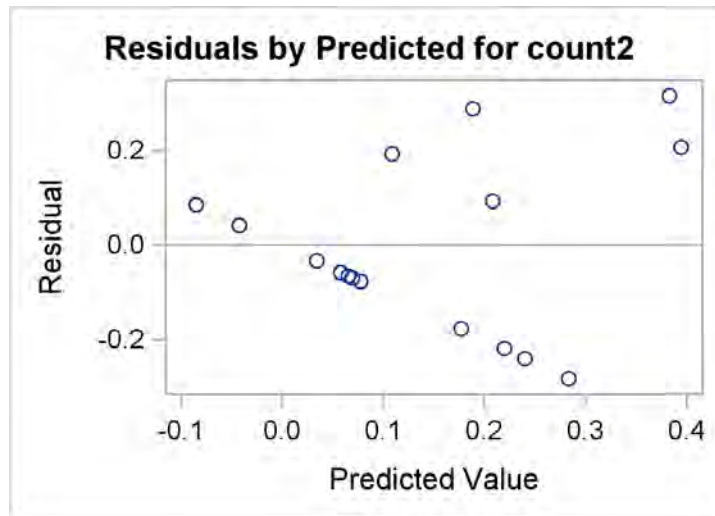
The GLM Procedure

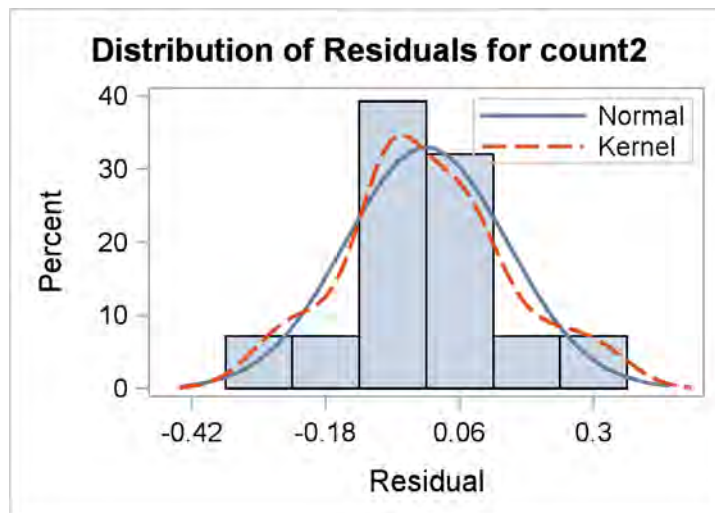
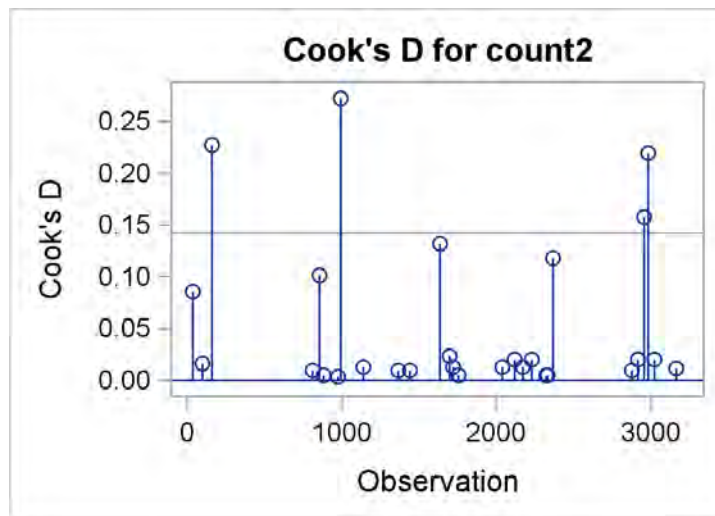
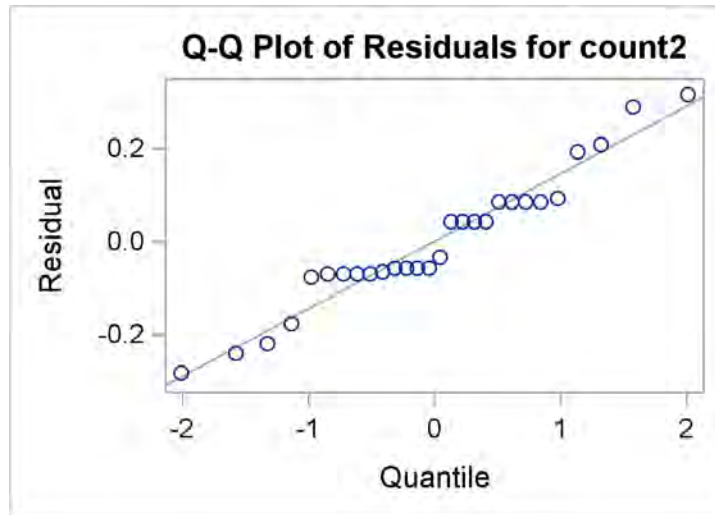
Dependent Variable: count2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	0.48820691	0.05424521	1.71	0.1578
Error	18	0.56937528	0.03163196		
Corrected Total	27	1.05758220			

R-Square	Coeff Var	Root MSE	count2 Mean
0.461626	209.2211	0.177854	0.085008

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	0.36836408	0.06139401	1.94	0.1288
Depth	2	0.10337628	0.05168814	1.63	0.2228
Quality	1	0.00647279	0.00647279	0.20	0.6564



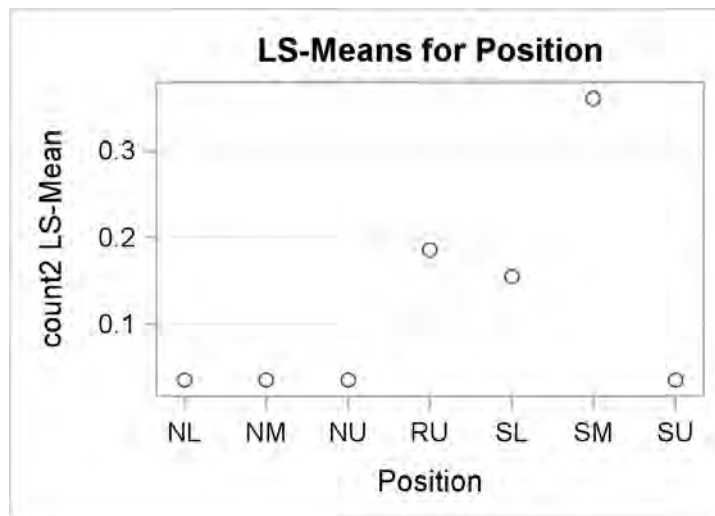


The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Position	count2 LSMEAN	LSMEAN Number
NL	0.03550323	1
NM	0.03550323	2
NU	0.03550323	3
RU	0.18601823	4
SL	0.15478354	5
SM	0.36076073	6
SU	0.03550323	7

Least Squares Means for effect Position
Pr > |t| for H0: LSMean(i)=LSMean(j)
Dependent Variable: count2

i/j	1	2	3	4	5	6	7
1	1.0000	1.0000	0.8865	0.9588	0.1877	1.0000	
2	1.0000	1.0000	0.8865	0.9588	0.1877	1.0000	
3	1.0000	1.0000	0.8865	0.9588	0.1877	1.0000	
4	0.8865	0.8865	0.8865	1.0000	0.8003	0.8865	
5	0.9588	0.9588	0.9588	1.0000	0.6617	0.9588	
6	0.1877	0.1877	0.1877	0.8003	0.6617	0.1877	
7	1.0000	1.0000	1.0000	0.8865	0.9588	0.1877	

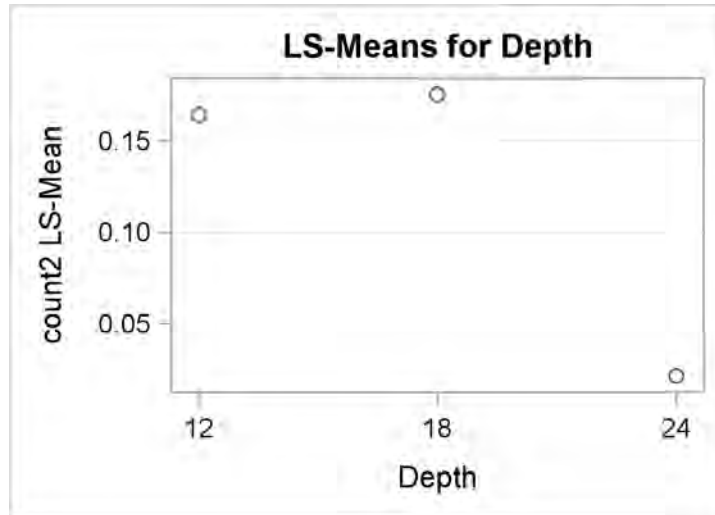


The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Depth	count2	LSMEAN	LSMEAN	Number
12		0.16435929		1
18		0.17567089		2
24		0.02150214		3

Least Squares Means for effect Depth
Pr > |t| for H0: LSMean(i)=LSMean(j)
Dependent Variable: count2

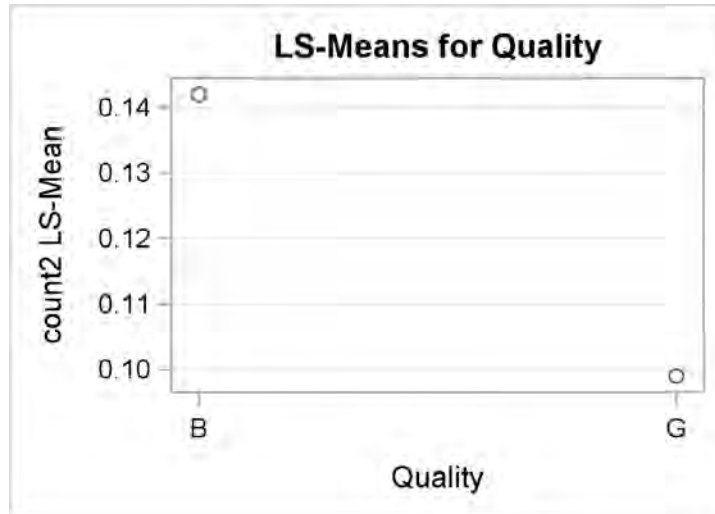
i/j	1	2	3
1		0.9922	0.3131
2	0.9922		0.2624
3	0.3131	0.2624	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

H0:LSMean1=LSMean2

Quality	count2 LSMEAN	Pr > |t|
B	0.14201292	0.6564
G	0.09900863	



Species: Sorghastrum nutans

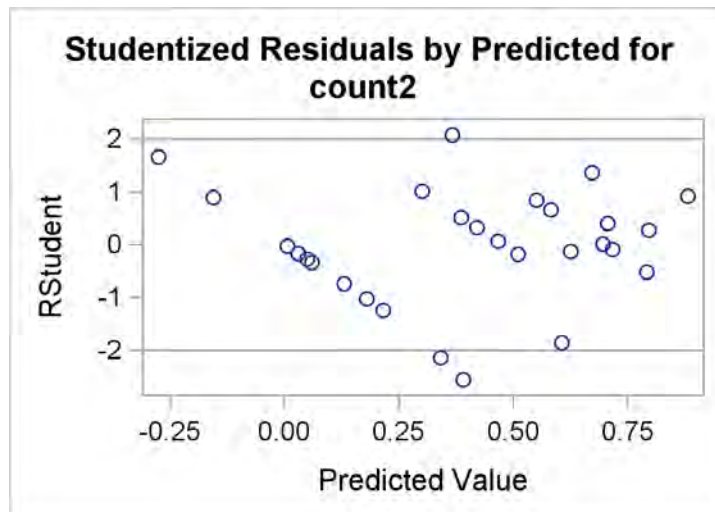
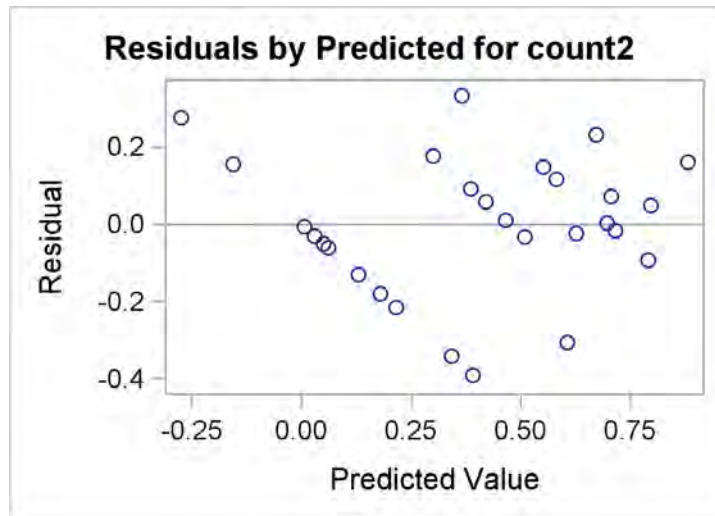
The GLM Procedure

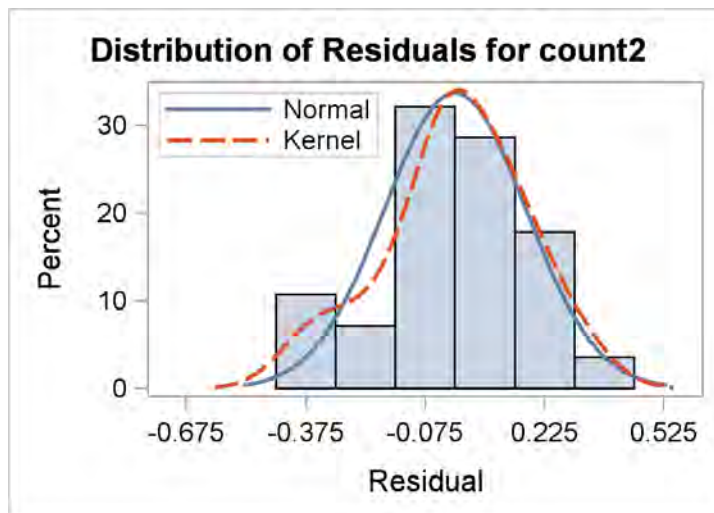
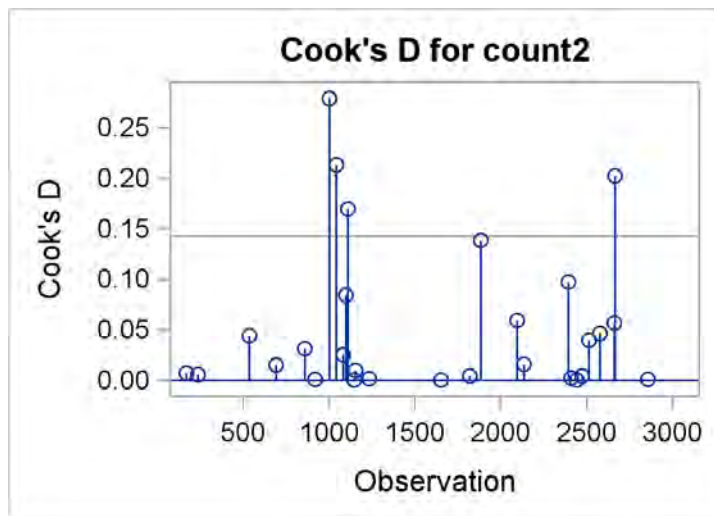
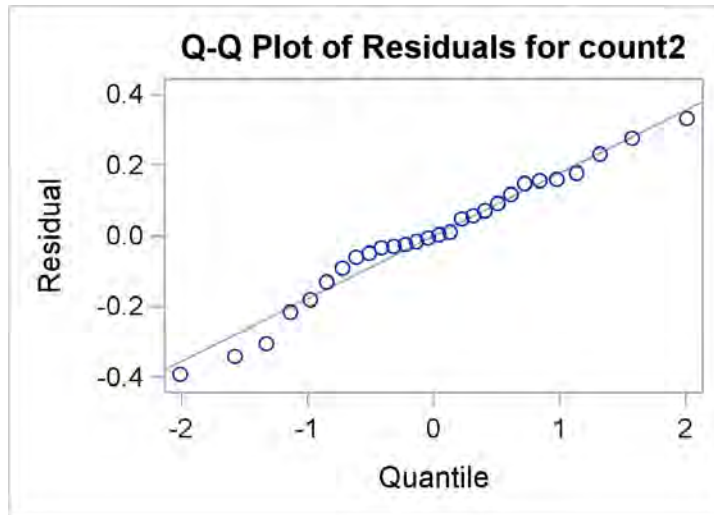
Dependent Variable: count2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	2.52964045	0.28107116	5.94	0.0007
Error	18	0.85181350	0.04732297		
Corrected Total	27	3.38145395			

R-Square	Coeff Var	Root MSE	count2 Mean
0.748093	55.12162	0.217538	0.394652

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	0.66776075	0.11129346	2.35	0.0746
Depth	2	1.82980135	0.91490068	19.33	<.0001
Quality	1	0.39519733	0.39519733	8.35	0.0098



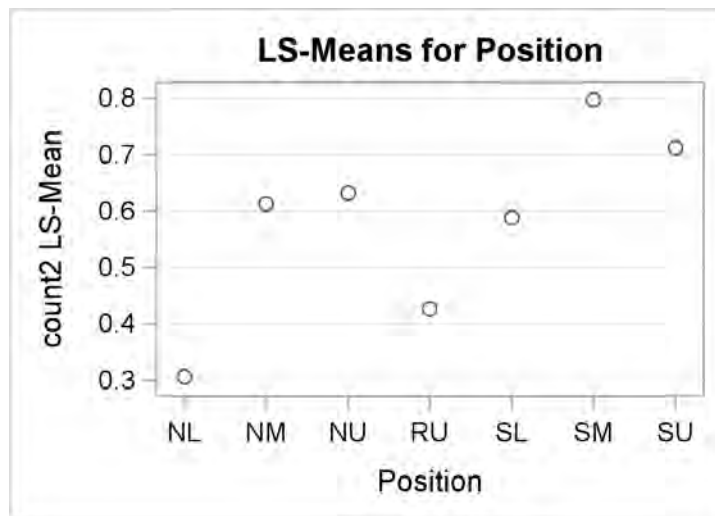


The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Position	count2 LSMEAN	LSMEAN Number
NL	0.30683523	1
NM	0.61229742	2
NU	0.63209273	3
RU	0.42611555	4
SL	0.58806992	5
SM	0.79738809	6
SU	0.71264756	7

Least Squares Means for effect Position
Pr > |t| for H0: LSMean(i)=LSMean(j)
Dependent Variable: count2

i/j	1	2	3	4	5	6	7
1		0.4554	0.3854	0.9846	0.5473	0.0626	0.1719
2	0.4554		1.0000	0.8812	1.0000	0.8840	0.9937
3	0.3854	1.0000		0.8251	0.9999	0.9277	0.9981
4	0.9846	0.8812	0.8251		0.9339	0.2486	0.5268
5	0.5473	1.0000	0.9999	0.9339		0.8146	0.9808
6	0.0626	0.8840	0.9277	0.2486	0.8146		0.9975
7	0.1719	0.9937	0.9981	0.5268	0.9808	0.9975	

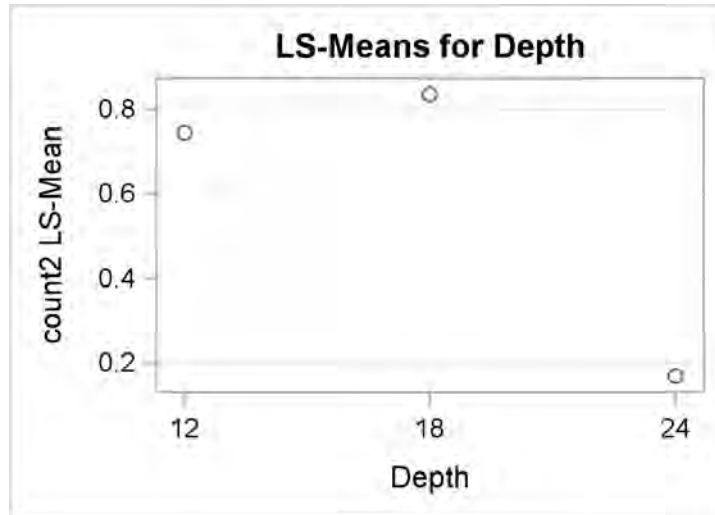


The GLM Procedure
 Least Squares Means
 Adjustment for Multiple Comparisons: Tukey-Kramer

Depth	count2	LSMEAN	LSMEAN	Number
12		0.74421643		1
18		0.83439046		2
24		0.16801304		3

Least Squares Means for effect Depth
 Pr > |t| for H0: LSMean(i)=LSMean(j)
 Dependent Variable: count2

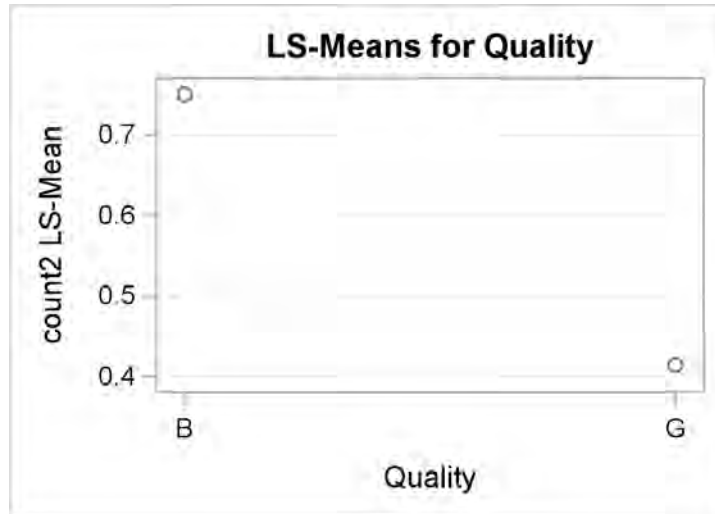
i/j	1	2	3
1		0.7224	0.0003
2	0.7224		<.0001
3	0.0003	<.0001	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

H0:LSMean1=LSMean2

Quality	count2 LSMEAN	Pr > |t|
B	0.75021968	0.0098
G	0.41419361	



Species: Taraxacum officinale

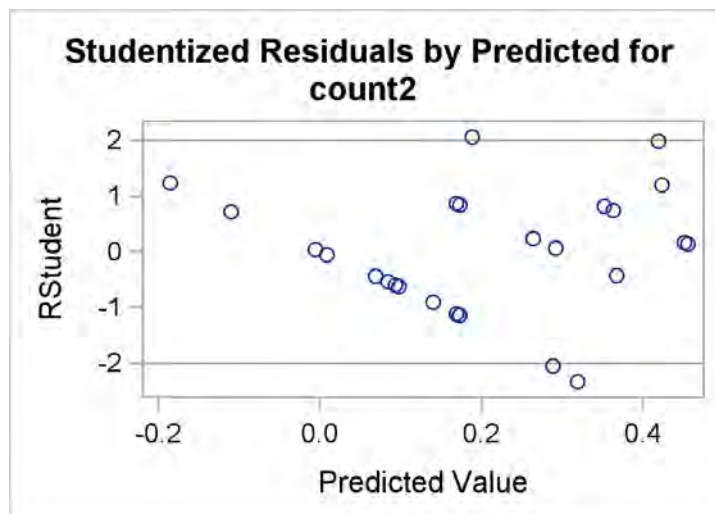
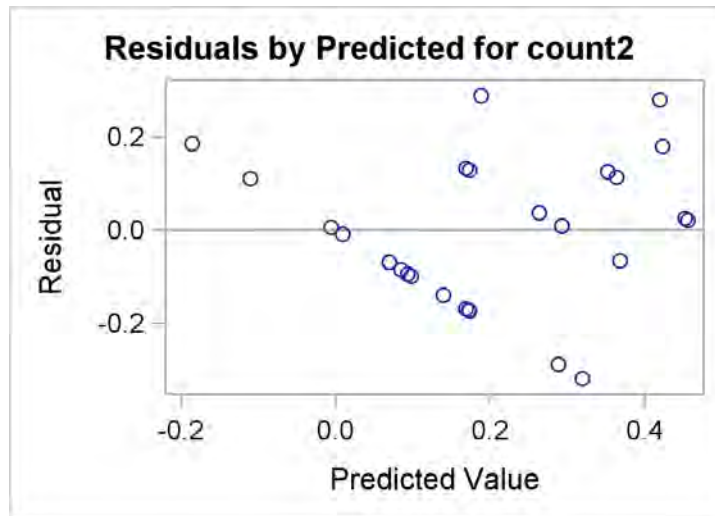
The GLM Procedure

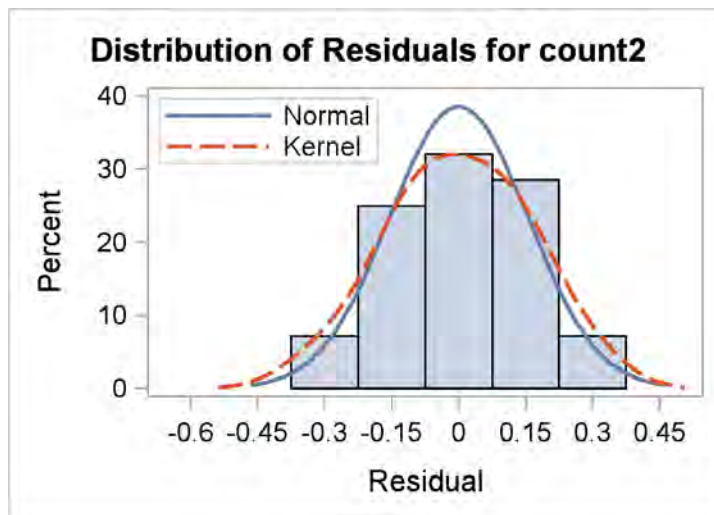
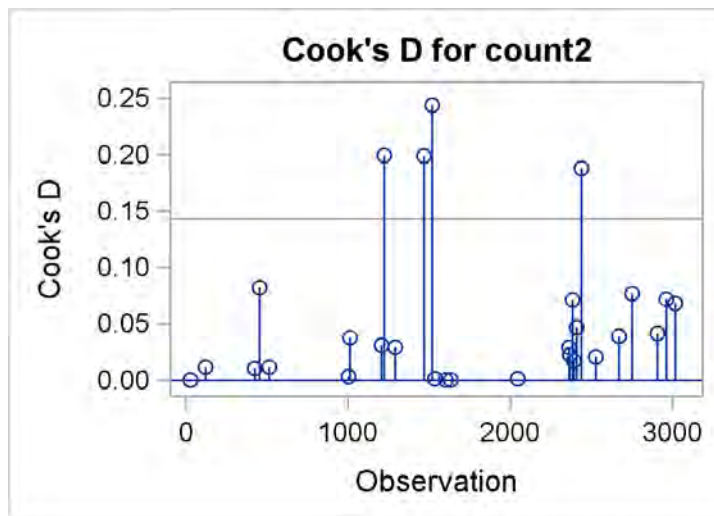
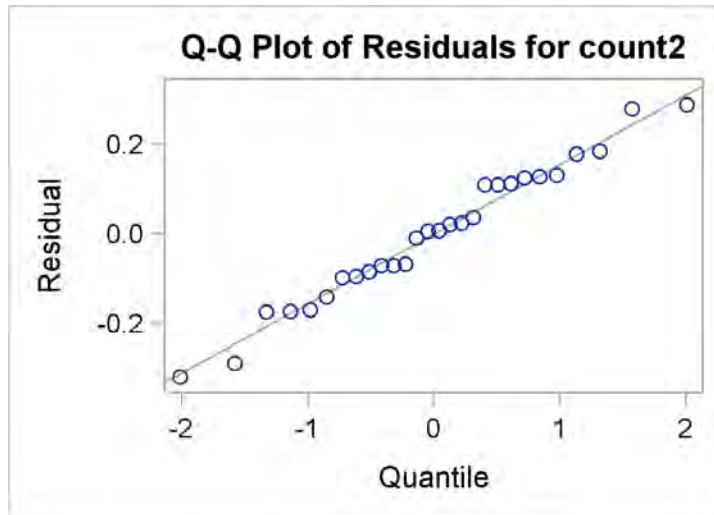
Dependent Variable: count2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	0.82991057	0.09221229	2.55	0.0432
Error	18	0.64977761	0.03609876		
Corrected Total	27	1.47968818			

R-Square	Coeff Var	Root MSE	count2 Mean
0.560869	102.4678	0.189997	0.185421

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	0.46055186	0.07675864	2.13	0.1004
Depth	2	0.04847009	0.02423504	0.67	0.5234
Quality	1	0.27279027	0.27279027	7.56	0.0132



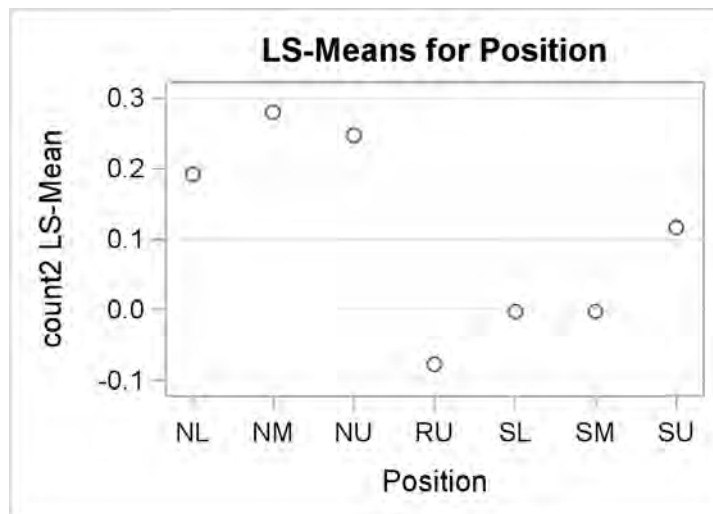


The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Position	count2 LSMEAN	LSMEAN Number
NL	0.19201354	1
NM	0.28005917	2
NU	0.24747573	3
RU	-0.07778177	4
SL	-0.00252427	5
SM	-0.00252427	6
SU	0.11675604	7

Least Squares Means for effect Position
Pr > |t| for H0: LSMean(i)=LSMean(j)
Dependent Variable: count2

i/j	1	2	3	4	5	6	7
1		0.9936	0.9995	0.4428	0.7698	0.7698	0.9972
2	0.9936		1.0000	0.1646	0.3912	0.3912	0.8792
3	0.9995	1.0000		0.2457	0.5279	0.5279	0.9537
4	0.4428	0.1646	0.2457		0.9972	0.9972	0.7698
5	0.7698	0.3912	0.5279	0.9972		1.0000	0.9699
6	0.7698	0.3912	0.5279	0.9972	1.0000		0.9699
7	0.9972	0.8792	0.9537	0.7698	0.9699	0.9699	

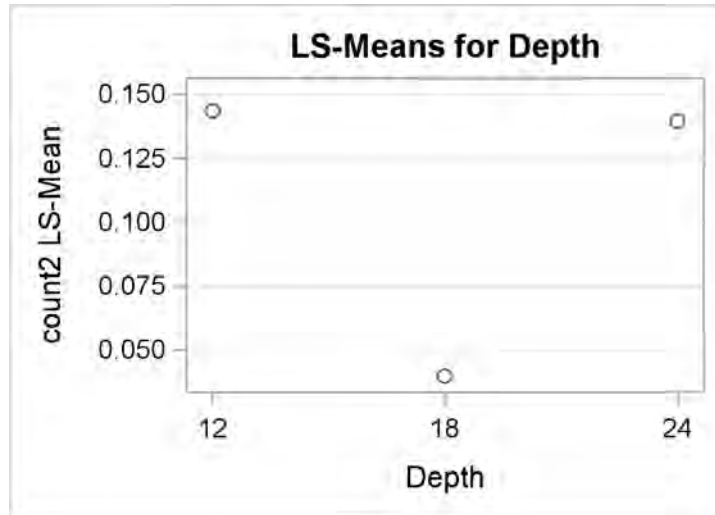


The GLM Procedure
 Least Squares Means
 Adjustment for Multiple Comparisons: Tukey-Kramer

Depth	count2	LSMEAN	LSMEAN	Number
12		0.14359285		1
18		0.03973589		2
24		0.13958875		3

Least Squares Means for effect Depth
 Pr > |t| for H0: LSMean(i)=LSMean(j)
 Dependent Variable: count2

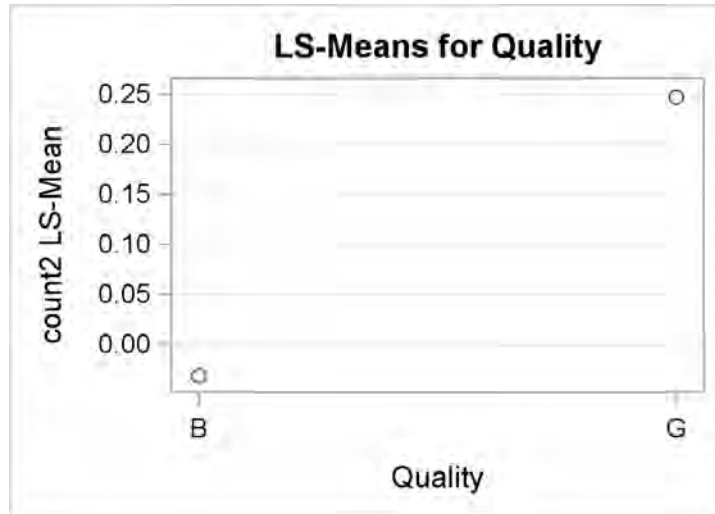
i/j	1	2	3
1		0.5726	0.9991
2	0.5726		0.5965
3	0.9991	0.5965	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

H0:LSMean1=LSMean2

Quality	count2 LSMEAN	Pr > |t|
B	-0.03194958	0.0132
G	0.24722792	



Species: Trifolium arvense

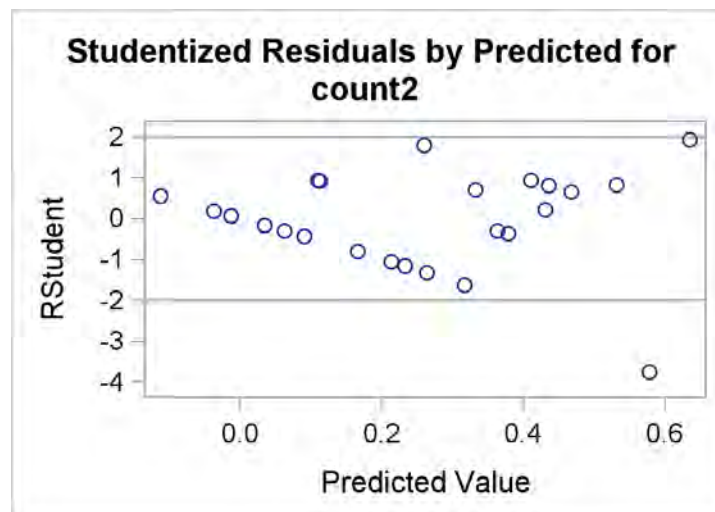
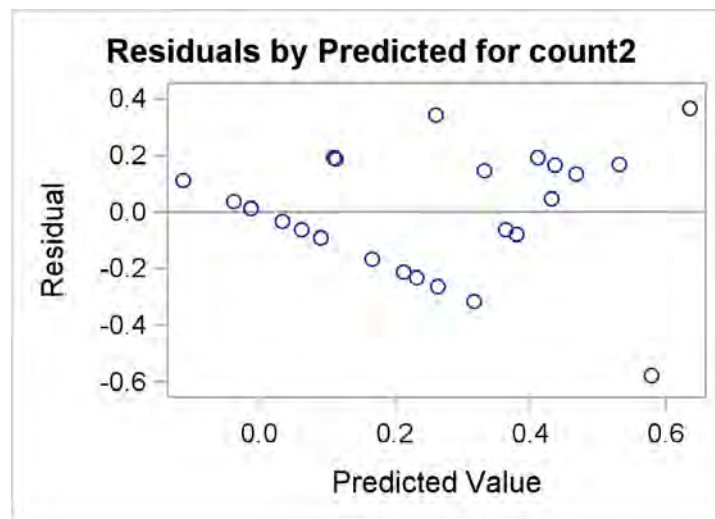
The GLM Procedure

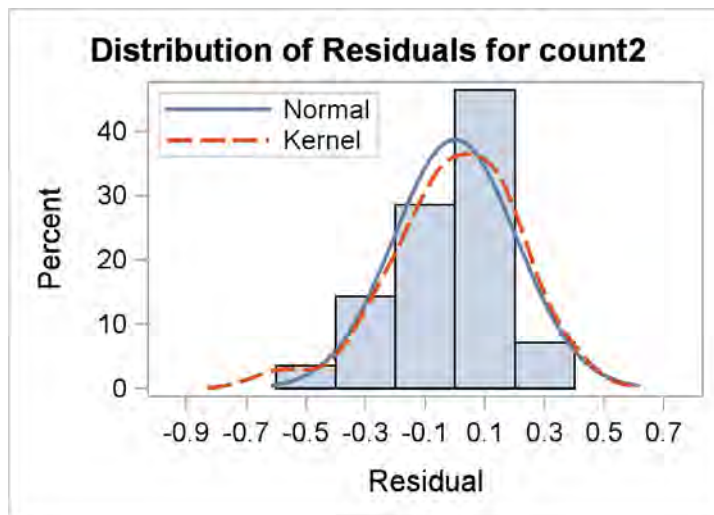
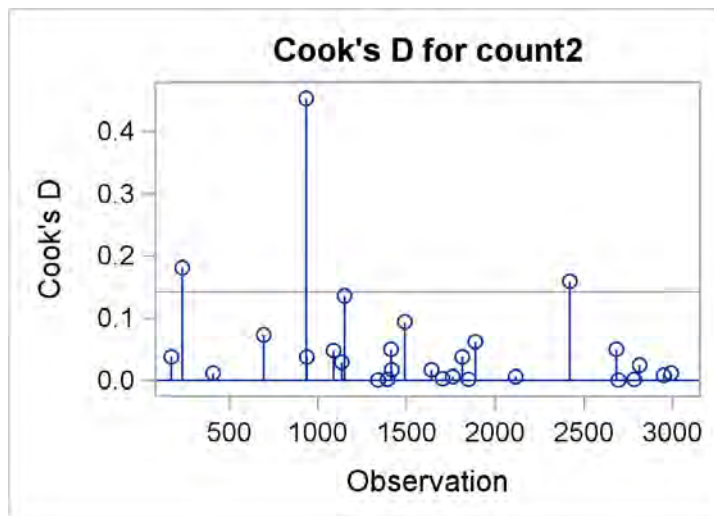
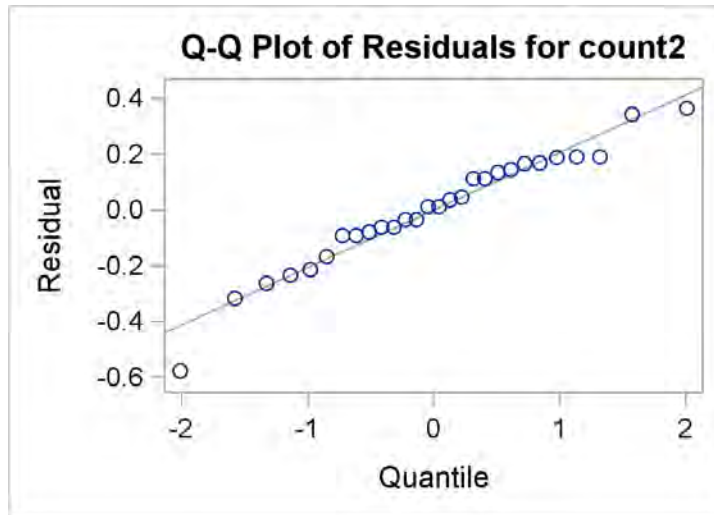
Dependent Variable: count2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	1.20716845	0.13412983	2.10	0.0856
Error	18	1.14701123	0.06372285		
Corrected Total	27	2.35417968			

R-Square	Coeff Var	Root MSE	count2 Mean
0.512777	112.8093	0.252434	0.223770

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	1.05095588	0.17515931	2.75	0.0448
Depth	2	0.14526062	0.07263031	1.14	0.3419
Quality	1	0.07548879	0.07548879	1.18	0.2908





The GLM Procedure

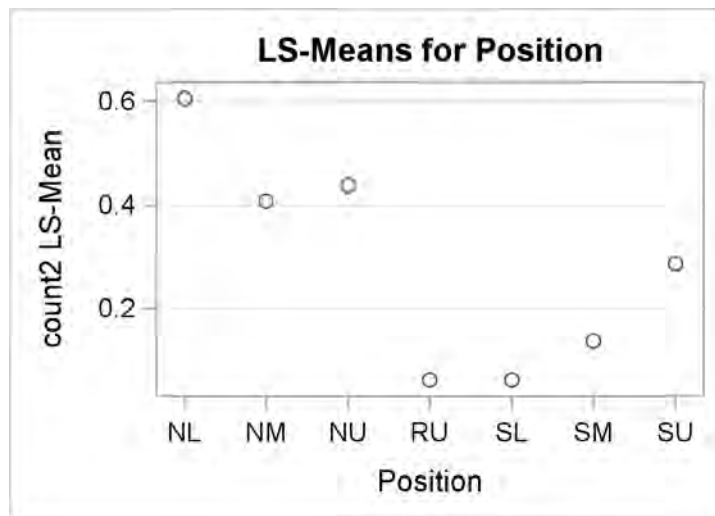
Least Squares Means

Adjustment for Multiple Comparisons: Tukey-Kramer

Position	count2 LSMEAN	LSMEAN Number
NL	0.60603502	1
NM	0.40706501	2
NU	0.43829970	3
RU	0.06201220	4
SL	0.06201220	5
SM	0.13726970	6
SU	0.28778470	7

Least Squares Means for effect Position
 Pr > |t| for H0: LSMean(i)=LSMean(j)
 Dependent Variable: count2

i/j	1	2	3	4	5	6	7
1		0.9154	0.9606	0.0821	0.0821	0.1755	0.5745
2	0.9154		1.0000	0.4856	0.4856	0.7350	0.9929
3	0.9606	1.0000		0.3888	0.3888	0.6326	0.9766
4	0.0821	0.4856	0.3888		1.0000	0.9994	0.8588
5	0.0821	0.4856	0.3888	1.0000		0.9994	0.8588
6	0.1755	0.7350	0.6326	0.9994	0.9994		0.9766
7	0.5745	0.9929	0.9766	0.8588	0.8588	0.9766	

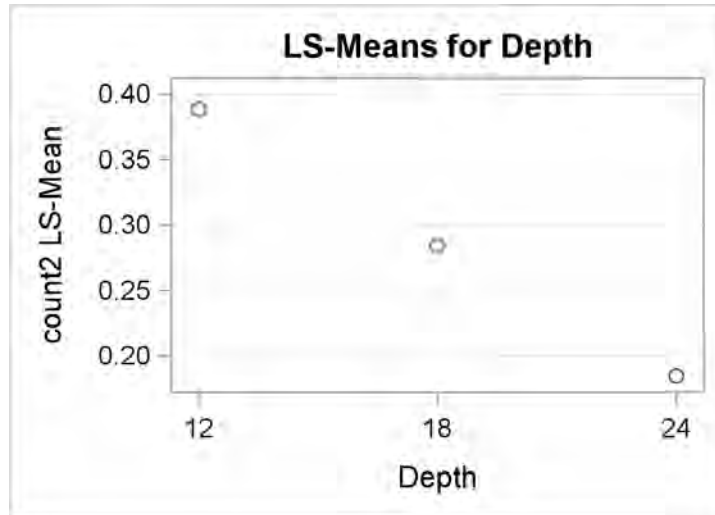


The GLM Procedure
 Least Squares Means
 Adjustment for Multiple Comparisons: Tukey-Kramer

Depth	count2	LSMEAN	LSMEAN	Number
12		0.38830491		1
18		0.28444795		2
24		0.18459509		3

Least Squares Means for effect Depth
 Pr > |t| for H0: LSMean(i)=LSMean(j)
 Dependent Variable: count2

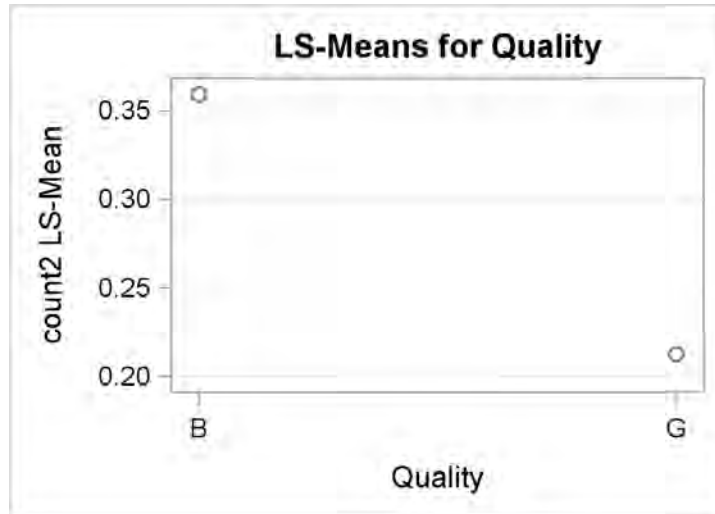
i/j	1	2	3
1		0.7258	0.3100
2	0.7258		0.7433
3	0.3100	0.7433	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

H0:LSMean1=LSMean2

Quality	count2 LSMEAN	Pr > |t|
B	0.35921327	0.2908
G	0.21235202	



Species: Trifolium hybridum

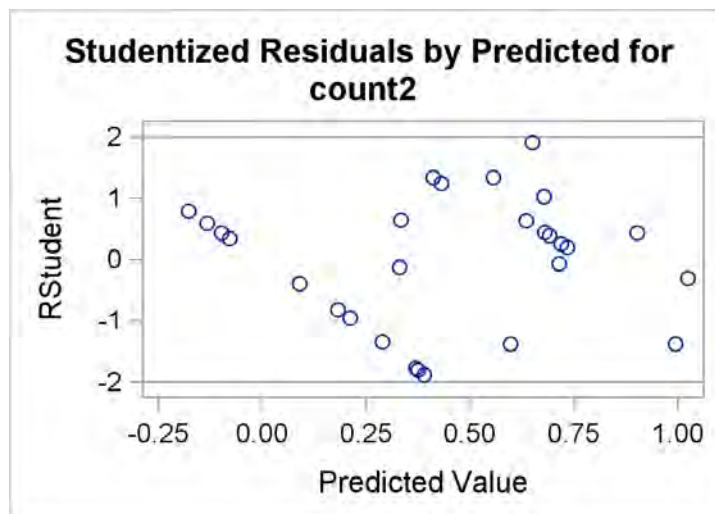
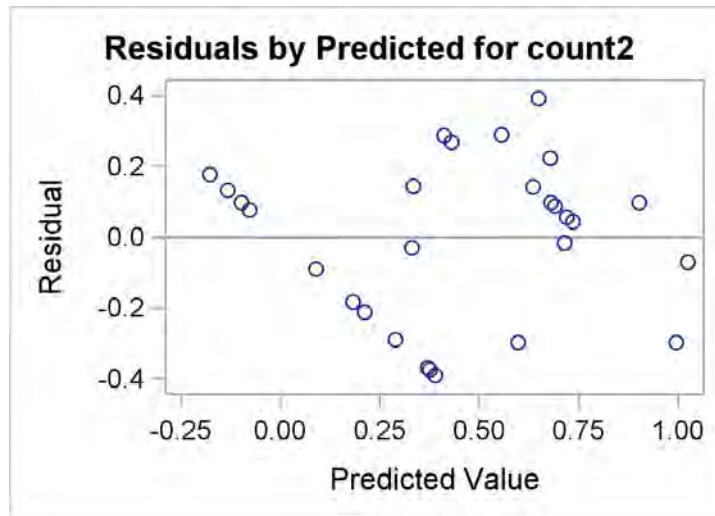
The GLM Procedure

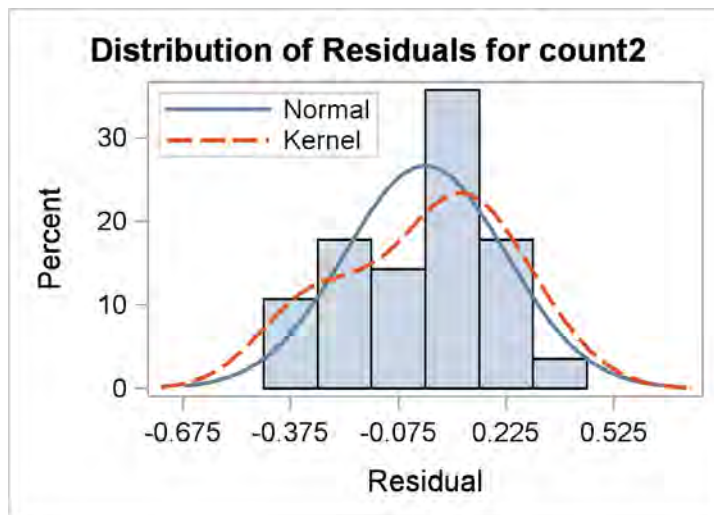
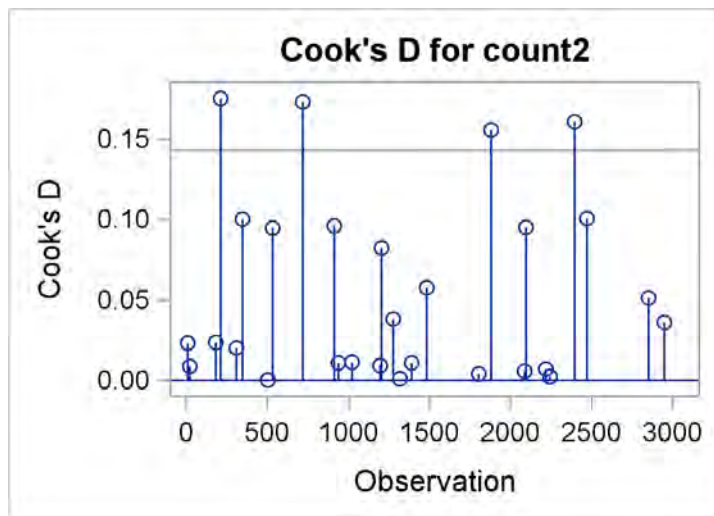
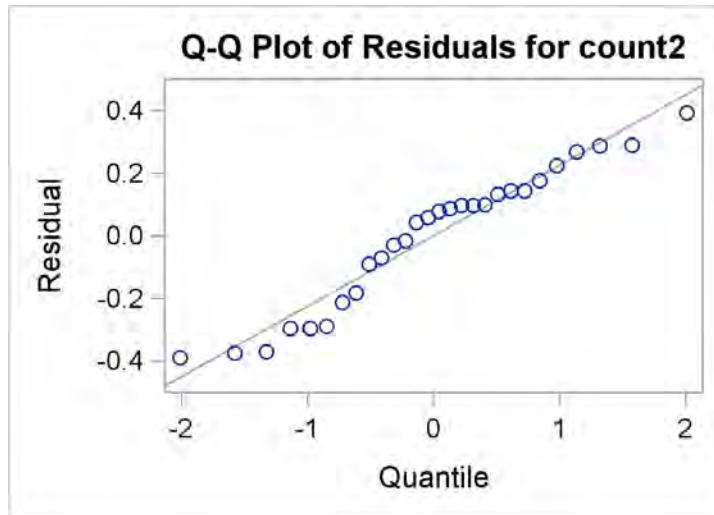
Dependent Variable: count2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	2.96574083	0.32952676	4.36	0.0038
Error	18	1.36084653	0.07560259		
Corrected Total	27	4.32658737			

R-Square	Coeff Var	Root MSE	count2 Mean
0.685469	61.54340	0.274959	0.446773

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	0.60378606	0.10063101	1.33	0.2943
Depth	2	2.32691694	1.16345847	15.39	0.0001
Quality	1	0.90337768	0.90337768	11.95	0.0028





The GLM Procedure

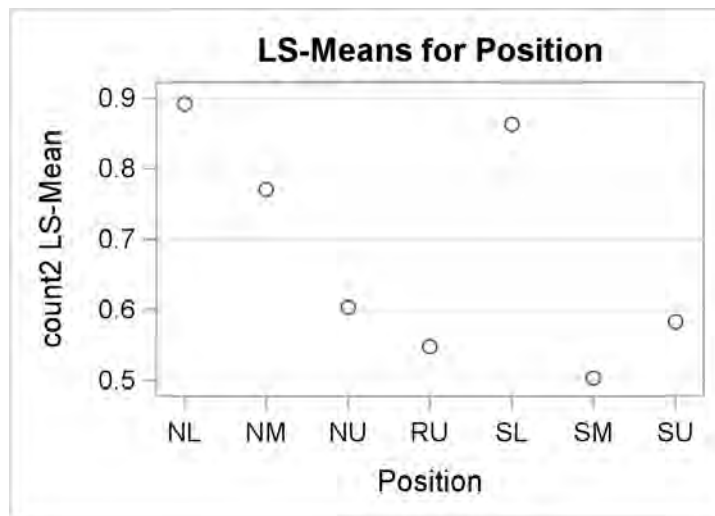
Least Squares Means

Adjustment for Multiple Comparisons: Tukey-Kramer

Position	count2 LSMEAN	LSMEAN Number
NL	0.89246910	1
NM	0.77013017	2
NU	0.60287848	3
RU	0.54741629	4
SL	0.86322665	5
SM	0.50339348	6
SU	0.58308317	7

Least Squares Means for effect Position
Pr > |t| for H0: LSMean(i)=LSMean(j)
Dependent Variable: count2

i/j	1	2	3	4	5	6	7
1		0.9948	0.7473	0.5795	1.0000	0.4468	0.6892
2	0.9948		0.9742	0.9051	0.9988	0.8091	0.9560
3	0.7473	0.9742		0.9999	0.8251	0.9983	1.0000
4	0.5795	0.9051	0.9999		0.6697	1.0000	1.0000
5	1.0000	0.9988	0.8251	0.6697		0.5339	0.7736
6	0.4468	0.8091	0.9983	1.0000	0.5339		0.9995
7	0.6892	0.9560	1.0000	1.0000	0.7736	0.9995	

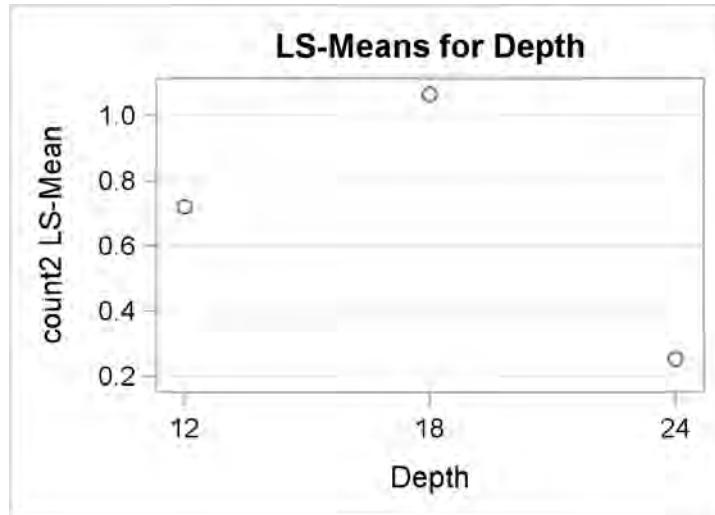


The GLM Procedure
 Least Squares Means
 Adjustment for Multiple Comparisons: Tukey-Kramer

Depth	count2	LSMEAN	LSMEAN	Number
12		0.72069332		1
18		1.06639822		2
24		0.25402161		3

Least Squares Means for effect Depth
 Pr > |t| for H0: LSMean(i)=LSMean(j)
 Dependent Variable: count2

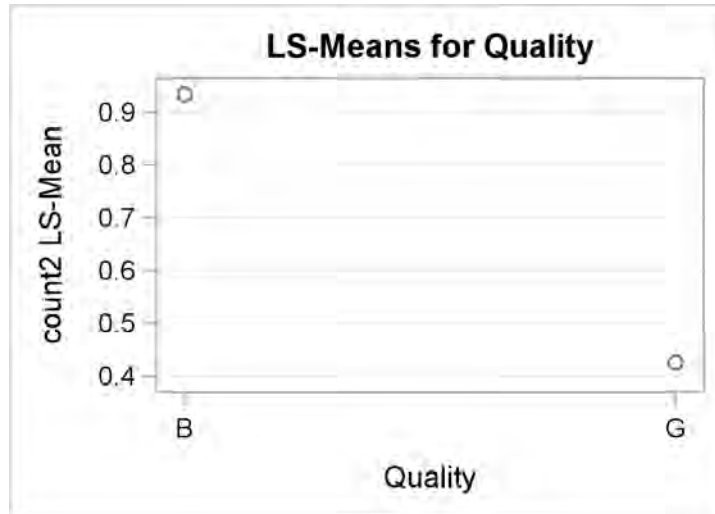
i/j	1	2	3
1		0.0738	0.0138
2	0.0738		<.0001
3	0.0138	<.0001	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

H0:LSMean1=LSMean2

Quality	count2 LSMEAN	Pr > |t|
B	0.93439265	0.0028
G	0.42634944	



Species: *Trifolium repens*

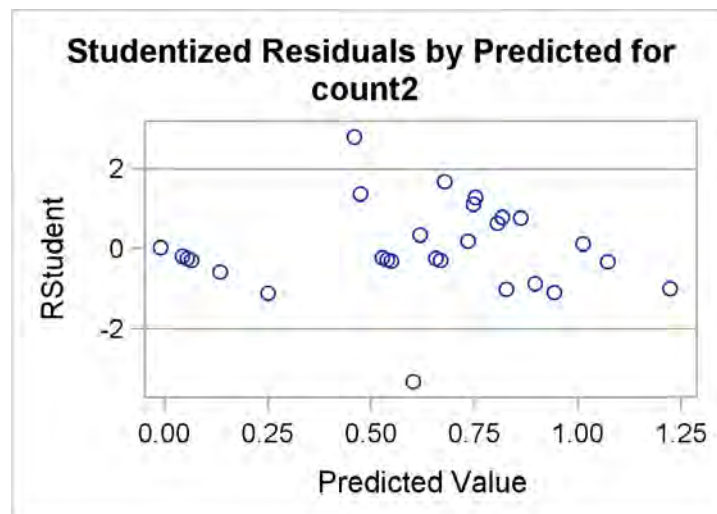
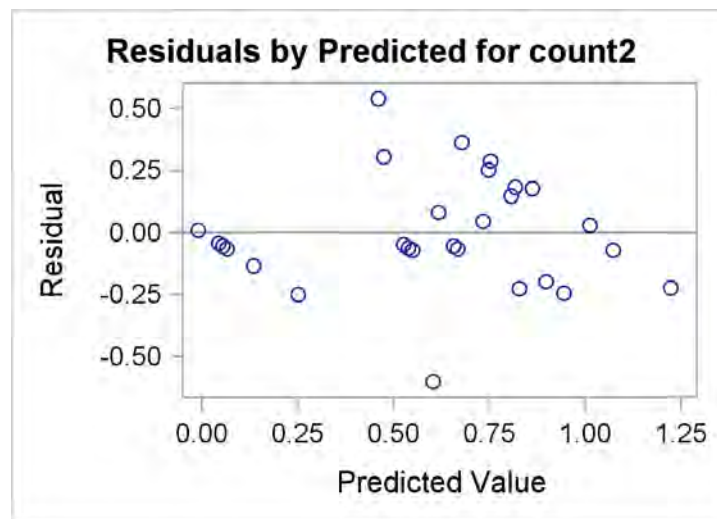
The GLM Procedure

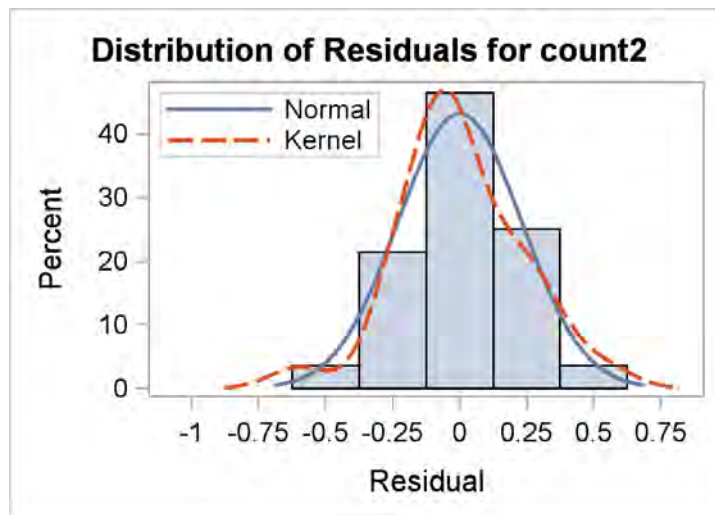
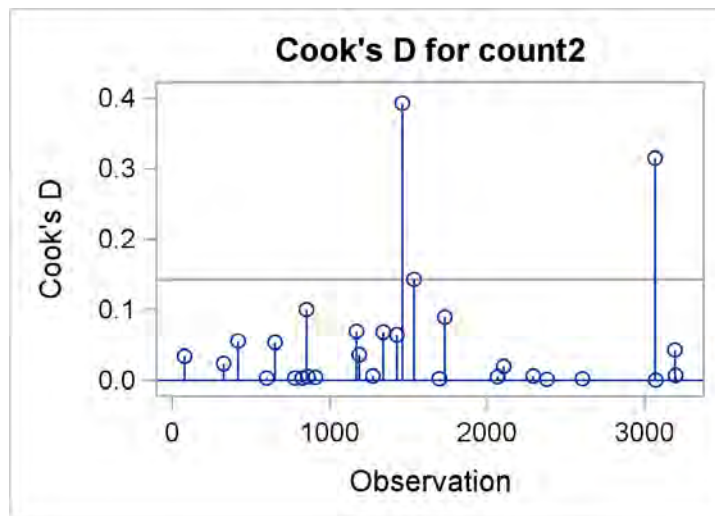
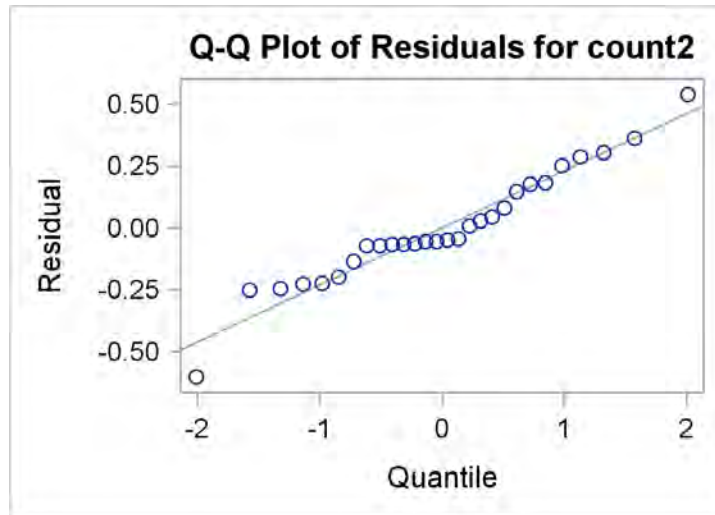
Dependent Variable: count2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	2.92444445	0.32493827	4.07	0.0055
Error	18	1.43694097	0.07983005		
Corrected Total	27	4.36138542			

R-Square	Coeff Var	Root MSE	count2 Mean
0.670531	46.50744	0.282542	0.607520

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	0.63644166	0.10607361	1.33	0.2952
Depth	2	0.27282519	0.13641259	1.71	0.2092
Quality	1	2.03534728	2.03534728	25.50	<.0001



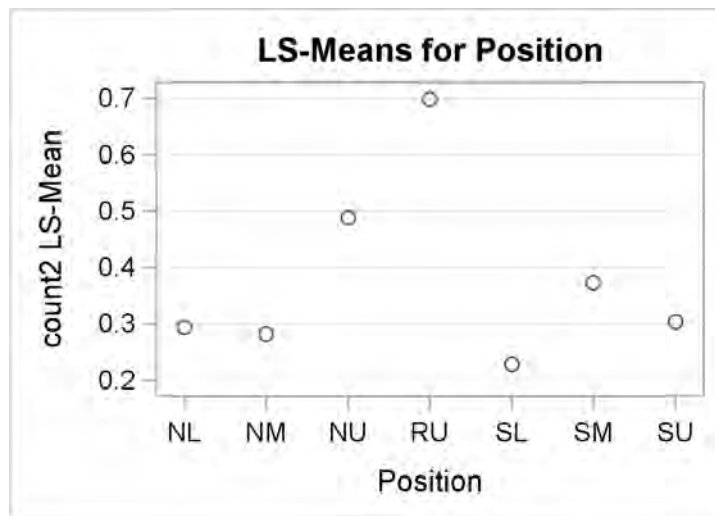


The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Position	count2 LSMEAN	LSMEAN Number
NL	0.29339320	1
NM	0.28195382	2
NU	0.48883204	3
RU	0.69834039	4
SL	0.22848387	5
SM	0.37308289	6
SU	0.30374137	7

Least Squares Means for effect Position
Pr > |t| for H0: LSMean(i)=LSMean(j)
Dependent Variable: count2

i/j	1	2	3	4	5	6	7
1	1.0000	0.9525	0.4325	0.9999	0.9996	1.0000	
2	1.0000	0.9386	0.4014	1.0000	0.9991	1.0000	
3	0.9525	0.9386	0.9351	0.8419	0.9967	0.9631	
4	0.4325	0.4014	0.9351	0.2736	0.6675	0.4615	
5	0.9999	1.0000	0.8419	0.2736	0.9892	0.9997	
6	0.9996	0.9991	0.9967	0.6675	0.9892	0.9998	
7	1.0000	1.0000	0.9631	0.4615	0.9997	0.9998	

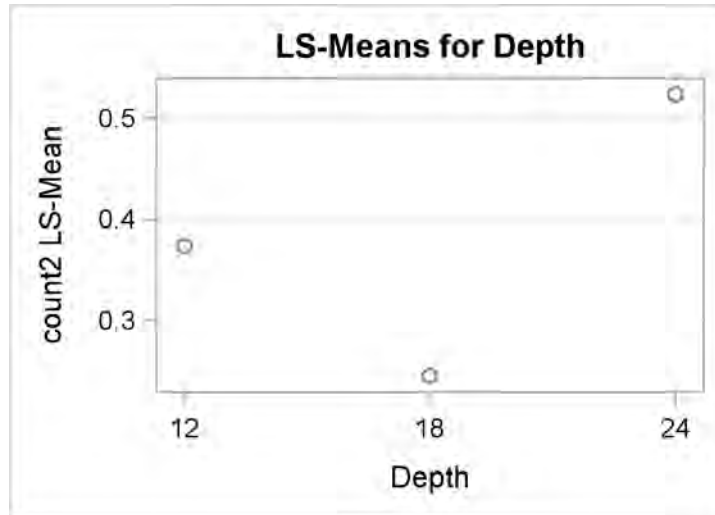


The GLM Procedure
 Least Squares Means
 Adjustment for Multiple Comparisons: Tukey-Kramer

Depth	count2	LSMEAN	LSMEAN	Number
12		0.37398235		1
18		0.24522533		2
24		0.52414699		3

Least Squares Means for effect Depth
 Pr > |t| for H0: LSMean(i)=LSMean(j)
 Dependent Variable: count2

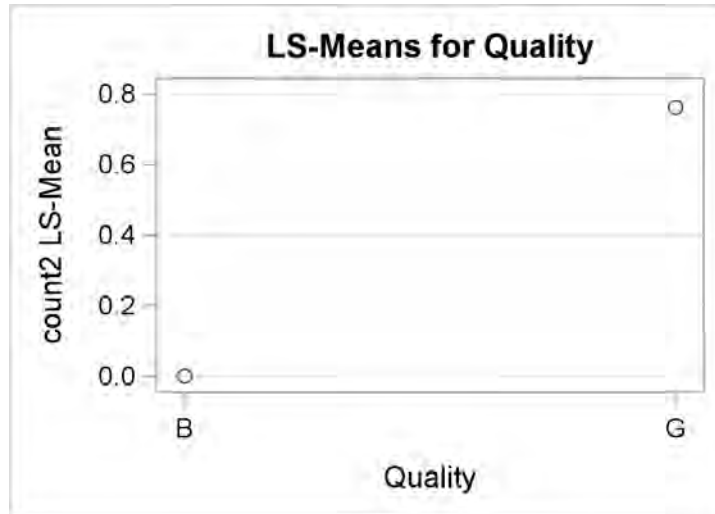
i/j	1	2	3
1		0.6761	0.5897
2	0.6761		0.1831
3	0.5897	0.1831	



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

H0:LSMean1=LSMean2

Quality	count2 LSMEAN	Pr > |t|
B	-0.00017162	<.0001
G	0.76240807	



Attachment 4. Biomass: ANOVA for Natives

The GLM Procedure

Class Level Information		
Class	Levels	Values
Position	7	NL NM NU R- SL SM SU
Depth	3	12 18 24
PH	2	B G

Number of Observations Read	84
Number of Observations Used	84

The GLM Procedure

Dependent Variable: biomass

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	27	0.49721486	0.01841537	2.69	0.0009
Error	56	0.38271589	0.00683421		
Corrected Total	83	0.87993075			

R-Square	Coeff Var	Root MSE	biomass Mean
0.565061	3.386517	0.082669	2.441130

Source	DF	Type I SS	Mean Square	F Value	Pr > F
Position	6	0.16127883	0.02687980	3.93	0.0024
Depth	2	0.08927799	0.04463899	6.53	0.0028
PH	1	0.02253239	0.02253239	3.30	0.0748
Position*Depth	12	0.08564882	0.00713740	1.04	0.4232
Position*PH	6	0.13847683	0.02307947	3.38	0.0065

Source	DF	Type II SS	Mean Square	F Value	Pr > F
Position	6	0.16127883	0.02687980	3.93	0.0024
Depth	2	0.10451672	0.05225836	7.65	0.0012
PH	1	0.02253239	0.02253239	3.30	0.0748
Position*Depth	12	0.13651348	0.01137612	1.66	0.1002
Position*PH	6	0.13847683	0.02307947	3.38	0.0065

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	0.05866850	0.00977808	1.43	0.2193
Depth	2	0.10451672	0.05225836	7.65	0.0012
PH	1	0.02253239	0.02253239	3.30	0.0748
Position*Depth	12	0.13651348	0.01137612	1.66	0.1002
Position*PH	6	0.13847683	0.02307947	3.38	0.0065

*The GLM Procedure**Dependent Variable: biomass*

Contrast	DF	Contrast SS	Mean Square	F Value	Pr > F
compare depth 12 & 18 vs. 24	1	0.01938126	0.01938126	2.84	0.0977
compare postion N vs. S	1	0.00317379	0.00317379	0.46	0.4984
compare postion R vs. others	1	0.00005958	0.00005958	0.01	0.9259

The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

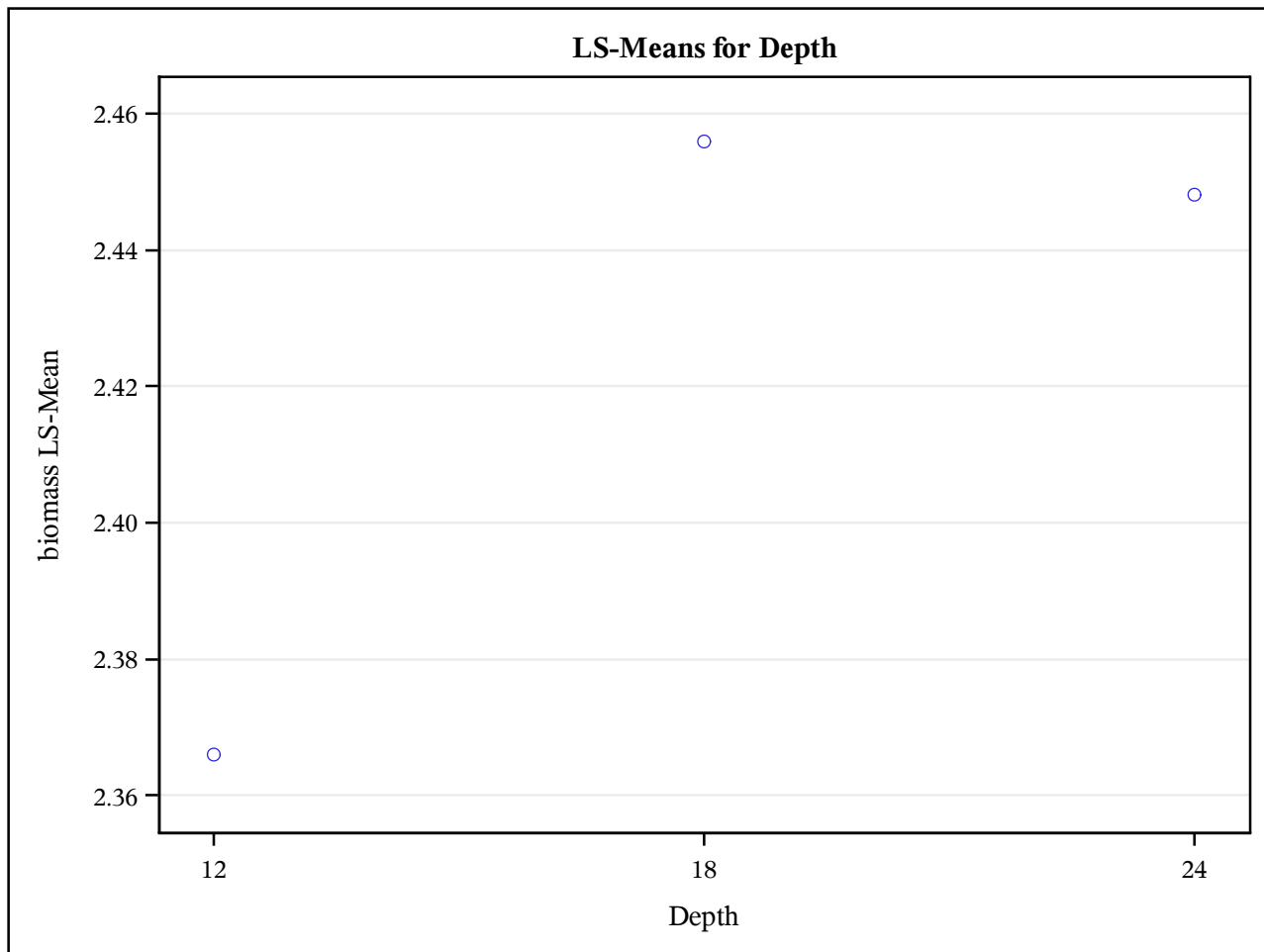
Depth	biomass LSMEAN	LSMEAN Number
12	2.36592291	1
18	2.45596811	2
24	2.44815271	3

Least Squares Means for effect Depth Pr > |t| for H0: LSMean(i)=LSMean(j) Dependent Variable: biomass			
i/j	1	2	3
1		0.0024	0.0059
2	0.0024		0.9496
3	0.0059	0.9496	

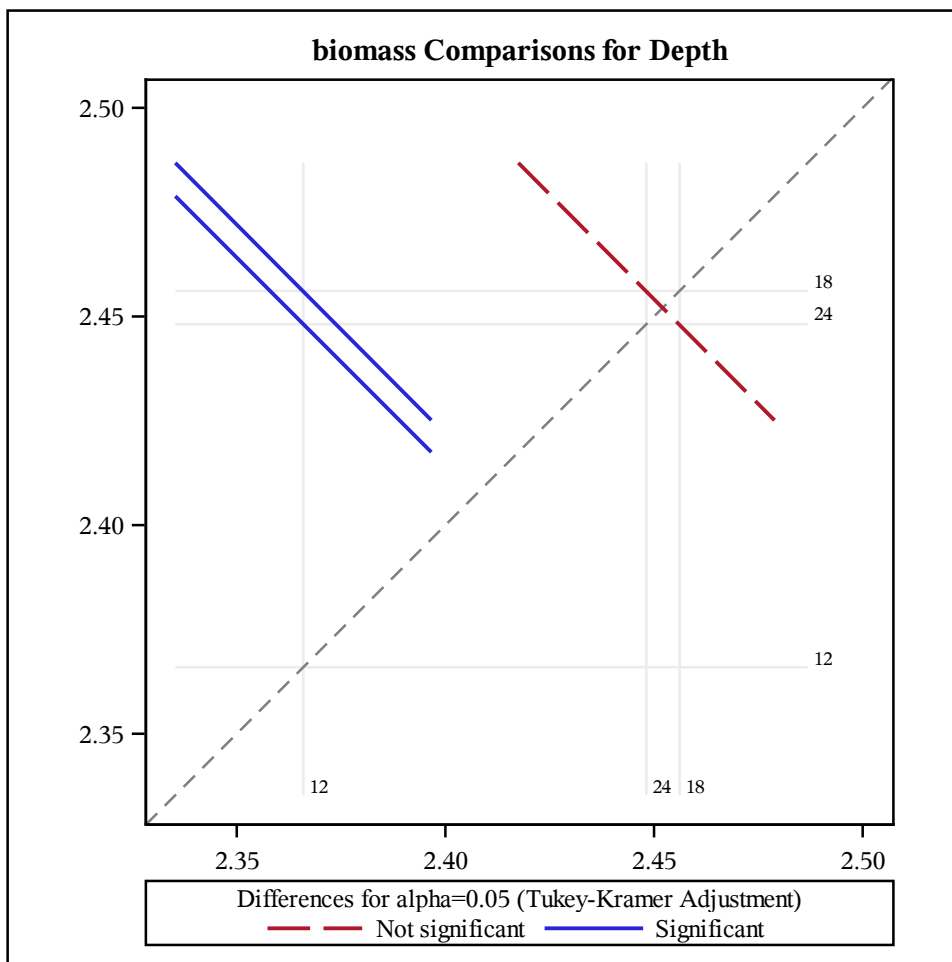
Depth	biomass LSMEAN	95% Confidence Limits	
12	2.365923	2.321663	2.410183
18	2.455968	2.411708	2.500228
24	2.448153	2.422599	2.473706

Least Squares Means for Effect Depth				
i	j	Difference Between Means	Simultaneous 95% Confidence Limits for LSMean(i)-LSMean(j)	
1	2	-0.090045	-0.151466	-0.028624
1	3	-0.082230	-0.143651	-0.020809
2	3	0.007815	-0.053606	0.069237

*The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer*



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Position	PH	biomass LSMEAN	LSMEAN Number
NL	B	2.56864611	1
NL	G	2.44661376	2
NM	B	2.40711614	3
NM	G	2.38521916	4
NU	B	2.40286627	5
NU	G	2.38887999	6
R-	B	2.43430534	7
R-	G	2.40655538	8
SL	B	2.33521710	9
SL	G	2.53550248	10
SM	B	2.35756721	11
SM	G	2.47400925	12
SU	B	2.29558211	13
SU	G	2.48879043	14

Least Squares Means for effect Position*PH Pr > |t| for H0: LSMean(i)=LSMean(j)														
Dependent Variable: biomass														
i/j	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1		0.8632	0.8415	0.2966	0.8164	0.3267	0.9533	0.4921	0.3179	1.0000	0.4780	0.9778	0.1256	0.9950
2	0.8632		1.0000	0.9453	1.0000	0.9655	1.0000	0.9987	0.9240	0.5751	0.9867	1.0000	0.6051	0.9979
3	0.8415	1.0000		1.0000	1.0000	1.0000	1.0000	1.0000	0.9999	0.8166	1.0000	0.9991	0.9898	0.9939
4	0.2966	0.9453	1.0000		1.0000	1.0000	1.0000	1.0000	1.0000	0.0188	1.0000	0.5768	0.9859	0.3298
5	0.8164	1.0000	1.0000	1.0000		1.0000	1.0000	1.0000	0.9999	0.7816	1.0000	0.9984	0.9928	0.9903
6	0.3267	0.9655	1.0000	1.0000	1.0000		1.0000	1.0000	0.9999	0.0246	1.0000	0.6415	0.9803	0.3860
7	0.9533	1.0000	1.0000	1.0000	1.0000	1.0000		1.0000	0.9966	0.9622	0.9998	1.0000	0.9410	0.9999
8	0.4921	0.9987	1.0000	1.0000	1.0000	1.0000	1.0000		0.9983	0.0826	1.0000	0.8957	0.9260	0.6913
9	0.3179	0.9240	0.9999	1.0000	0.9999	0.9999	0.9966	0.9983		0.1814	1.0000	0.7262	1.0000	0.5790
10	1.0000	0.5751	0.8166	0.0188	0.7816	0.0246	0.9622	0.0826	0.1814		0.3423	0.9446	0.0438	0.9944
11	0.4780	0.9867	1.0000	1.0000	1.0000	1.0000	0.9998	1.0000	1.0000	0.3423		0.8979	1.0000	0.7935
12	0.9778	1.0000	0.9991	0.5768	0.9984	0.6415	1.0000	0.8957	0.7262	0.9446	0.8979		0.3381	1.0000

The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Least Squares Means for effect Position*PH Pr > |t| for H0: LSMean(i)=LSMean(j)														
Dependent Variable: biomass														
i/j	1	2	3	4	5	6	7	8	9	10	11	12	13	14
13	0.1256	0.6051	0.9898	0.9859	0.9928	0.9803	0.9410	0.9260	1.0000	0.0438	1.0000	0.3381		0.2250
14	0.9950	0.9979	0.9939	0.3298	0.9903	0.3860	0.9999	0.6913	0.5790	0.9944	0.7935	1.0000	0.2250	

Position	PH	biomass LSMEAN	95% Confidence Limits	
NL	B	2.568646	2.445210	2.692082
NL	G	2.446614	2.391412	2.501816
NM	B	2.407116	2.283680	2.530552
NM	G	2.385219	2.330017	2.440421
NU	B	2.402866	2.279430	2.526302
NU	G	2.388880	2.333678	2.444082
R-	B	2.434305	2.310870	2.557741
R-	G	2.406555	2.351353	2.461758
SL	B	2.335217	2.211781	2.458653
SL	G	2.535502	2.480300	2.590705
SM	B	2.357567	2.234131	2.481003
SM	G	2.474009	2.418807	2.529211
SU	B	2.295582	2.172146	2.419018
SU	G	2.488790	2.433588	2.543993

The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Least Squares Means for Effect Position*PH				
i	j	Difference Between Means	Simultaneous 95% Confidence Limits for LSMean(i)-LSMean(j)	
1	2	0.122032	-0.114543	0.358607
1	3	0.161530	-0.143887	0.466947
1	4	0.183427	-0.053148	0.420002
1	5	0.165780	-0.139637	0.471197
1	6	0.179766	-0.056809	0.416341
1	7	0.134341	-0.171076	0.439758
1	8	0.162091	-0.074484	0.398666
1	9	0.233429	-0.071988	0.538846
1	10	0.033144	-0.203432	0.269719
1	11	0.211079	-0.094338	0.516496
1	12	0.094637	-0.141938	0.331212
1	13	0.273064	-0.032353	0.578481
1	14	0.079856	-0.156719	0.316431
2	3	0.039498	-0.197078	0.276073
2	4	0.061395	-0.075192	0.197981
2	5	0.043747	-0.192828	0.280323
2	6	0.057734	-0.078853	0.194321
2	7	0.012308	-0.224267	0.248884
2	8	0.040058	-0.096528	0.176645
2	9	0.111397	-0.125178	0.347972
2	10	-0.088889	-0.225475	0.047698
2	11	0.089047	-0.147529	0.325622
2	12	-0.027395	-0.163982	0.109191
2	13	0.151032	-0.085544	0.387607
2	14	-0.042177	-0.178763	0.094410
3	4	0.021897	-0.214678	0.258472
3	5	0.004250	-0.301167	0.309667
3	6	0.018236	-0.218339	0.254811
3	7	-0.027189	-0.332606	0.278228

The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

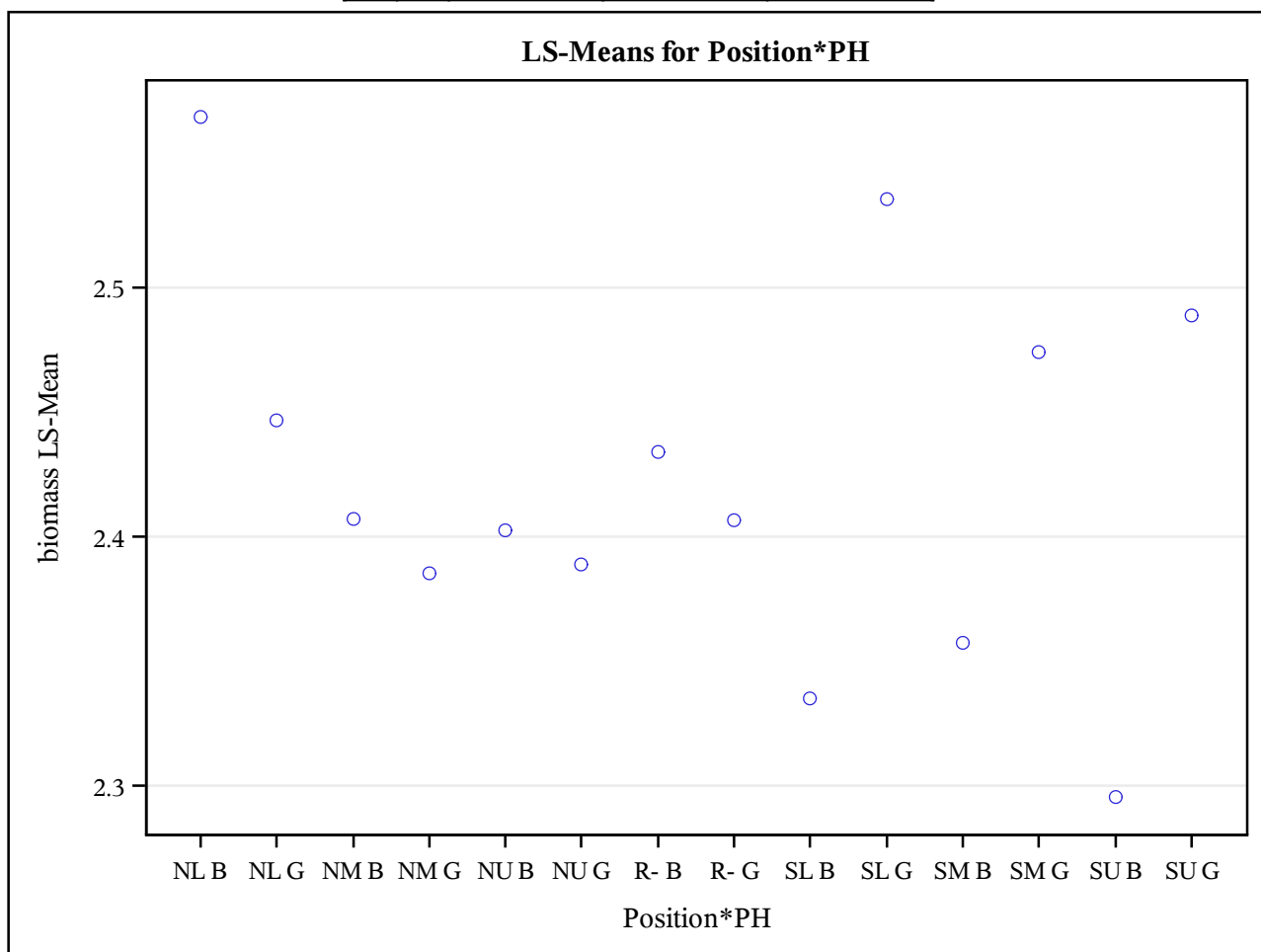
Least Squares Means for Effect Position*PH				
i	j	Difference Between Means	Simultaneous 95% Confidence Limits for LSMean(i)-LSMean(j)	
3	8	0.000561	-0.236014	0.237136
3	9	0.071899	-0.233518	0.377316
3	10	-0.128386	-0.364961	0.108189
3	11	0.049549	-0.255868	0.354966
3	12	-0.066893	-0.303468	0.169682
3	13	0.111534	-0.193883	0.416951
3	14	-0.081674	-0.318249	0.154901
4	5	-0.017647	-0.254222	0.218928
4	6	-0.003661	-0.140248	0.132926
4	7	-0.049086	-0.285661	0.187489
4	8	-0.021336	-0.157923	0.115251
4	9	0.050002	-0.186573	0.286577
4	10	-0.150283	-0.286870	-0.013697
4	11	0.027652	-0.208923	0.264227
4	12	-0.088790	-0.225377	0.047797
4	13	0.089637	-0.146938	0.326212
4	14	-0.103571	-0.240158	0.033015
5	6	0.013986	-0.222589	0.250561
5	7	-0.031439	-0.336856	0.273978
5	8	-0.003689	-0.240264	0.232886
5	9	0.067649	-0.237768	0.373066
5	10	-0.132636	-0.369211	0.103939
5	11	0.045299	-0.260118	0.350716
5	12	-0.071143	-0.307718	0.165432
5	13	0.107284	-0.198133	0.412701
5	14	-0.085924	-0.322499	0.150651
6	7	-0.045425	-0.282001	0.191150
6	8	-0.017675	-0.154262	0.118911
6	9	0.053663	-0.182912	0.290238

The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

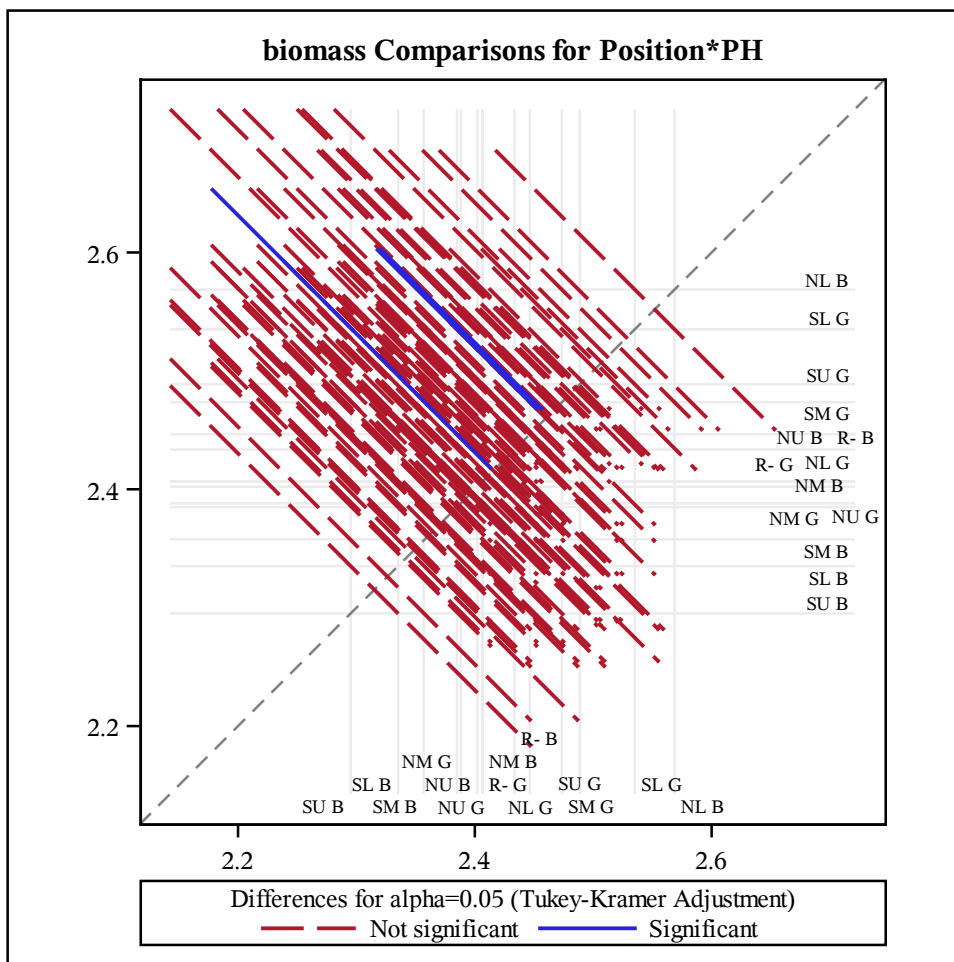
Least Squares Means for Effect Position*PH				
i	j	Difference Between Means	Simultaneous 95% Confidence Limits for LSMean(i)-LSMean(j)	
6	10	-0.146622	-0.283209	-0.010036
6	11	0.031313	-0.205262	0.267888
6	12	-0.085129	-0.221716	0.051457
6	13	0.093298	-0.143277	0.329873
6	14	-0.099910	-0.236497	0.036676
7	8	0.027750	-0.208825	0.264325
7	9	0.099088	-0.206329	0.404505
7	10	-0.101197	-0.337772	0.135378
7	11	0.076738	-0.228679	0.382155
7	12	-0.039704	-0.276279	0.196871
7	13	0.138723	-0.166694	0.444140
7	14	-0.054485	-0.291060	0.182090
8	9	0.071338	-0.165237	0.307913
8	10	-0.128947	-0.265534	0.007640
8	11	0.048988	-0.187587	0.285563
8	12	-0.067454	-0.204041	0.069133
8	13	0.110973	-0.125602	0.347548
8	14	-0.082235	-0.218822	0.054352
9	10	-0.200285	-0.436861	0.036290
9	11	-0.022350	-0.327767	0.283067
9	12	-0.138792	-0.375367	0.097783
9	13	0.039635	-0.265782	0.345052
9	14	-0.153573	-0.390148	0.083002
10	11	0.177935	-0.058640	0.414510
10	12	0.061493	-0.075094	0.198080
10	13	0.239920	0.003345	0.476496
10	14	0.046712	-0.089875	0.183299
11	12	-0.116442	-0.353017	0.120133
11	13	0.061985	-0.243432	0.367402

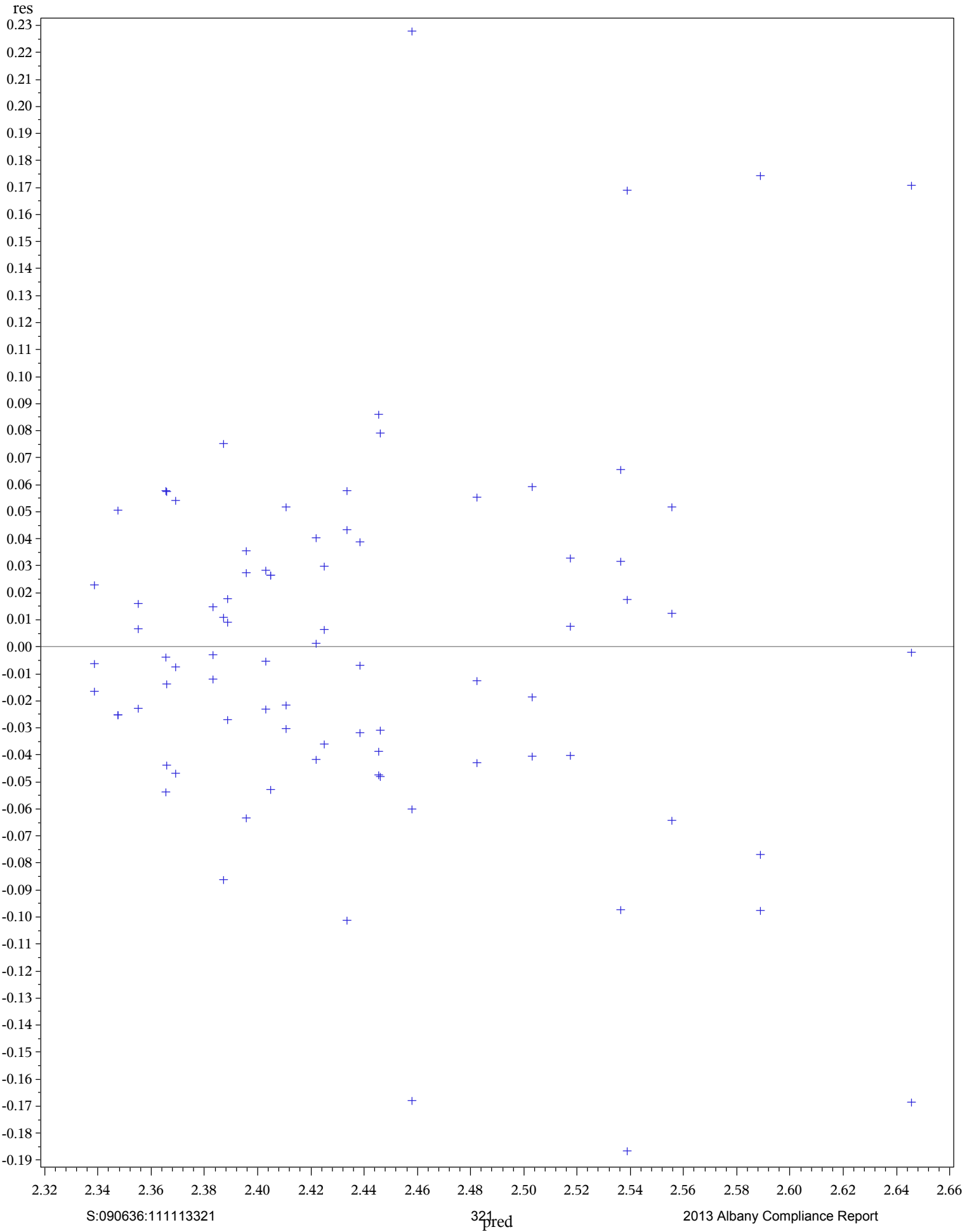
The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

Least Squares Means for Effect Position*PH				
i	j	Difference Between Means	Simultaneous 95% Confidence Limits for LSMean(i)-LSMean(j)	
11	14	-0.131223	-0.367798	0.105352
12	13	0.178427	-0.058148	0.415002
12	14	-0.014781	-0.151368	0.121806
13	14	-0.193208	-0.429783	0.043367



*The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer*

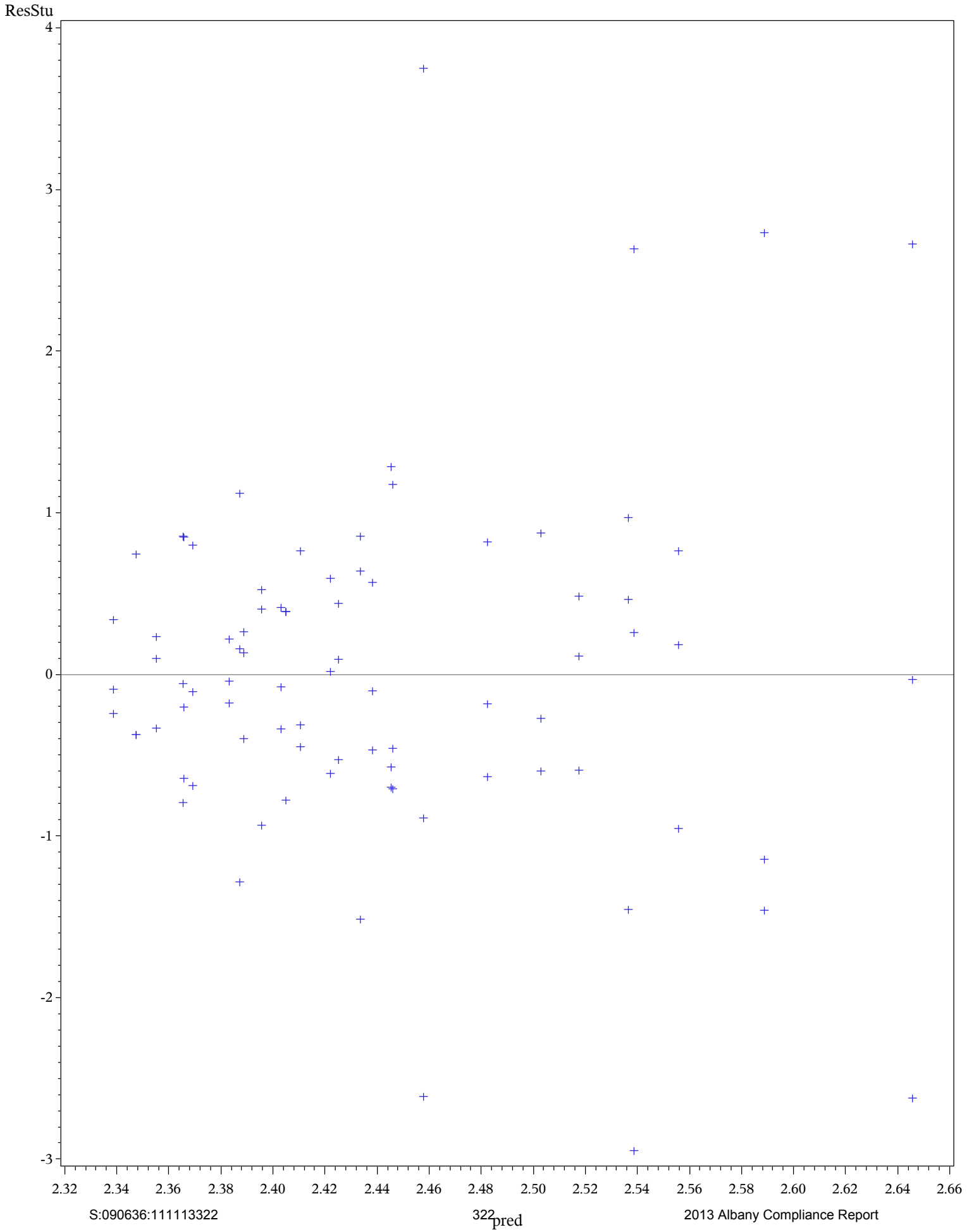




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2013 Albany Compliance Report



Attachment 5. Biomass: ANOVA for Adventives

The GLM Procedure

Class Level Information		
Class	Levels	Values
Position	7	NL NM NU R- SL SM SU
Depth	3	12 18 24
PH	2	B G

Number of Observations Read	84
Number of Observations Used	84

The GLM Procedure

Dependent Variable: biomass

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	27	0.62921043	0.02330409	1.45	0.1214
Error	56	0.90188355	0.01610506		
Corrected Total	83	1.53109398			

R-Square	Coeff Var	Root MSE	biomass Mean
0.410955	5.027292	0.126906	2.524336

Source	DF	Type I SS	Mean Square	F Value	Pr > F
Position	6	0.21774899	0.03629150	2.25	0.0511
Depth	2	0.18953107	0.09476553	5.88	0.0048
PH	1	0.00009310	0.00009310	0.01	0.9397
Position*Depth	12	0.16727971	0.01393998	0.87	0.5852
Position*PH	6	0.05455756	0.00909293	0.56	0.7566

Source	DF	Type II SS	Mean Square	F Value	Pr > F
Position	6	0.21774899	0.03629150	2.25	0.0511
Depth	2	0.14346765	0.07173382	4.45	0.0160
PH	1	0.00009310	0.00009310	0.01	0.9397
Position*Depth	12	0.13813712	0.01151143	0.71	0.7307
Position*PH	6	0.05455756	0.00909293	0.56	0.7566

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Position	6	0.08717275	0.01452879	0.90	0.5000
Depth	2	0.14346765	0.07173382	4.45	0.0160
PH	1	0.00009310	0.00009310	0.01	0.9397
Position*Depth	12	0.13813712	0.01151143	0.71	0.7307
Position*PH	6	0.05455756	0.00909293	0.56	0.7566

The GLM Procedure***Dependent Variable: biomass***

Contrast	DF	Contrast SS	Mean Square	F Value	Pr > F
compare depth 12 & 18 vs. 24	1	0.10274797	0.10274797	6.38	0.0144
compare postion N vs. S	1	0.03935156	0.03935156	2.44	0.1237
compare postion R vs. others	1	0.00168204	0.00168204	0.10	0.7478

The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey

Position	biomass LSMEAN	LSMEAN Number
NL	2.54647992	1
NM	2.57585768	2
NU	2.58717265	3
R-	2.55485962	4
SL	2.57057474	5
SM	2.46314992	6
SU	2.47741331	7

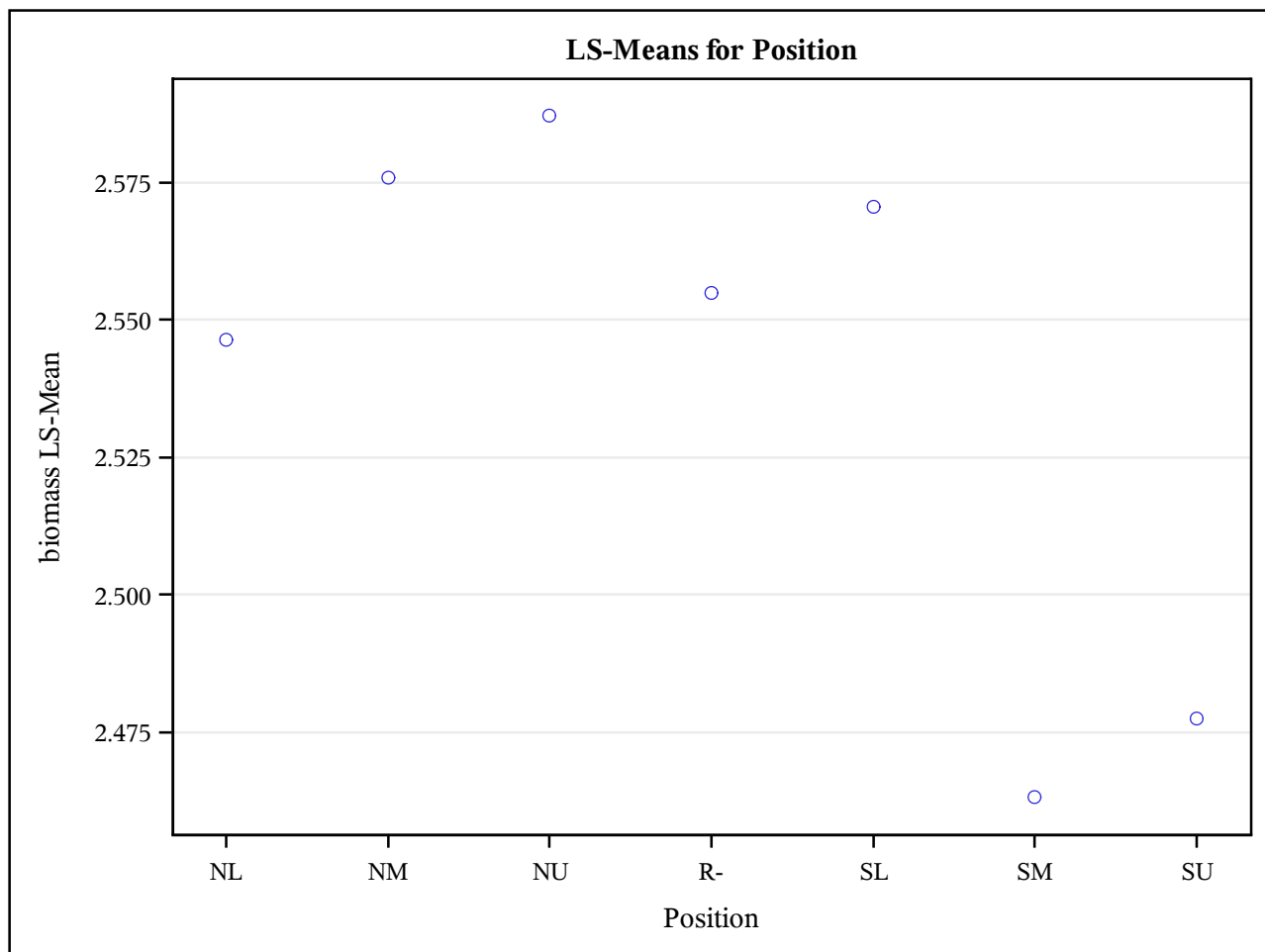
Least Squares Means for effect Position Pr > |t| for H0: LSMean(i)=LSMean(j)							
Dependent Variable: biomass							
i/j	1	2	3	4	5	6	7
1		0.9996	0.9978	1.0000	0.9999	0.9136	0.9637
2	0.9996		1.0000	1.0000	1.0000	0.7208	0.8283
3	0.9978	1.0000		0.9994	1.0000	0.6236	0.7448
4	1.0000	1.0000	0.9994		1.0000	0.8704	0.9378
5	0.9999	1.0000	1.0000	1.0000		0.7631	0.8619
6	0.9136	0.7208	0.6236	0.8704	0.7631		1.0000
7	0.9637	0.8283	0.7448	0.9378	0.8619	1.0000	

Position	biomass LSMEAN	95% Confidence Limits	
NL	2.546480	2.442694	2.650266
NM	2.575858	2.472072	2.679644
NU	2.587173	2.483387	2.690959
R-	2.554860	2.451074	2.658646
SL	2.570575	2.466789	2.674361
SM	2.463150	2.359364	2.566936
SU	2.477413	2.373627	2.581199

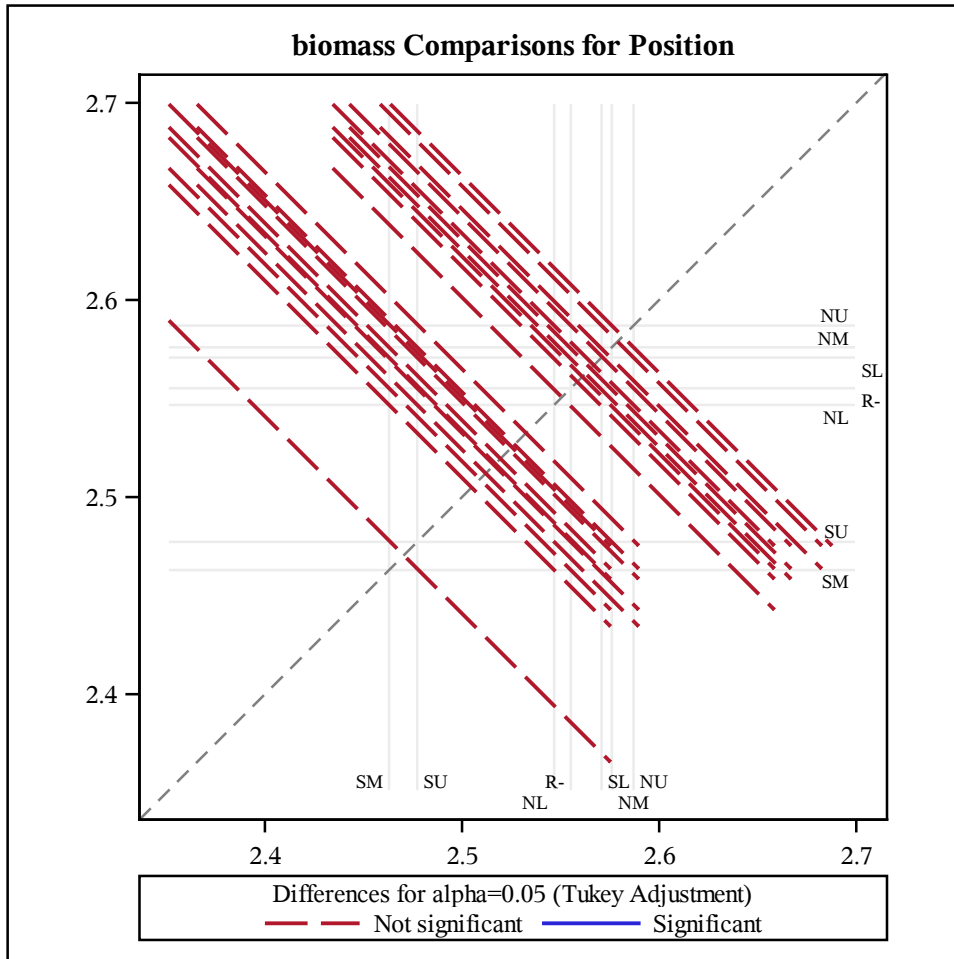
The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey

Least Squares Means for Effect Position				
i	j	Difference Between Means	Simultaneous 95% Confidence Limits for LSMean(i)-LSMean(j)	
1	2	-0.029378	-0.253435	0.194679
1	3	-0.040693	-0.264750	0.183364
1	4	-0.008380	-0.232437	0.215677
1	5	-0.024095	-0.248152	0.199962
1	6	0.083330	-0.140727	0.307387
1	7	0.069067	-0.154990	0.293124
2	3	-0.011315	-0.235372	0.212742
2	4	0.020998	-0.203059	0.245055
2	5	0.005283	-0.218774	0.229340
2	6	0.112708	-0.111349	0.336765
2	7	0.098444	-0.125613	0.322501
3	4	0.032313	-0.191744	0.256370
3	5	0.016598	-0.207459	0.240655
3	6	0.124023	-0.100034	0.348080
3	7	0.109759	-0.114298	0.333816
4	5	-0.015715	-0.239772	0.208342
4	6	0.091710	-0.132347	0.315767
4	7	0.077446	-0.146611	0.301503
5	6	0.107425	-0.116632	0.331482
5	7	0.093161	-0.130896	0.317218
6	7	-0.014263	-0.238320	0.209794

The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer

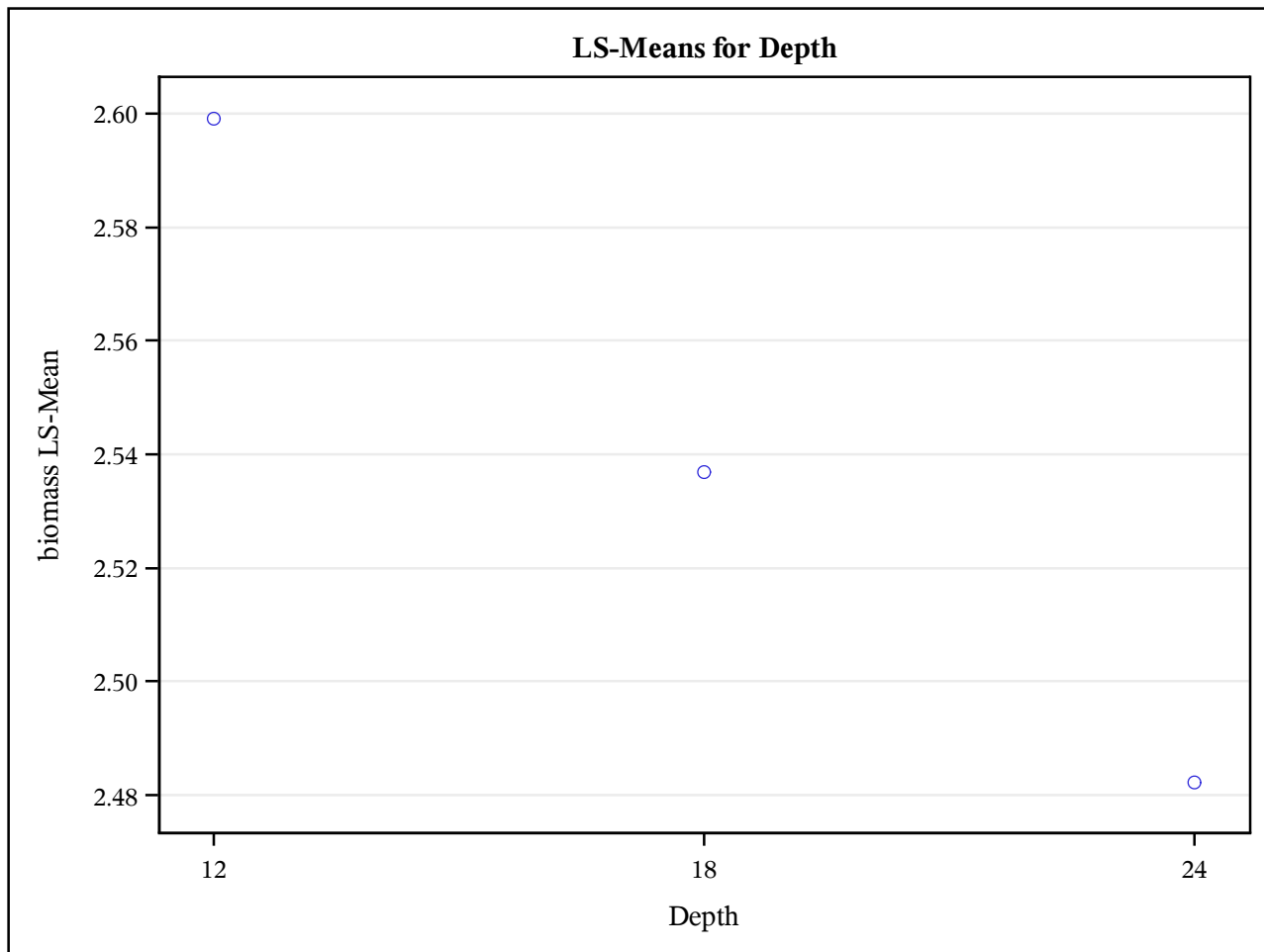
Depth	biomass LSMEAN	LSMEAN Number
12	2.59905158	1
18	2.53677747	2
24	2.48224574	3

Least Squares Means for effect Depth Pr > |t| for H0: LSMean(i)=LSMean(j)			
Dependent Variable: biomass			
i/j	1	2	3
1		0.2583	0.0116
2	0.2583		0.3517
3	0.0116	0.3517	

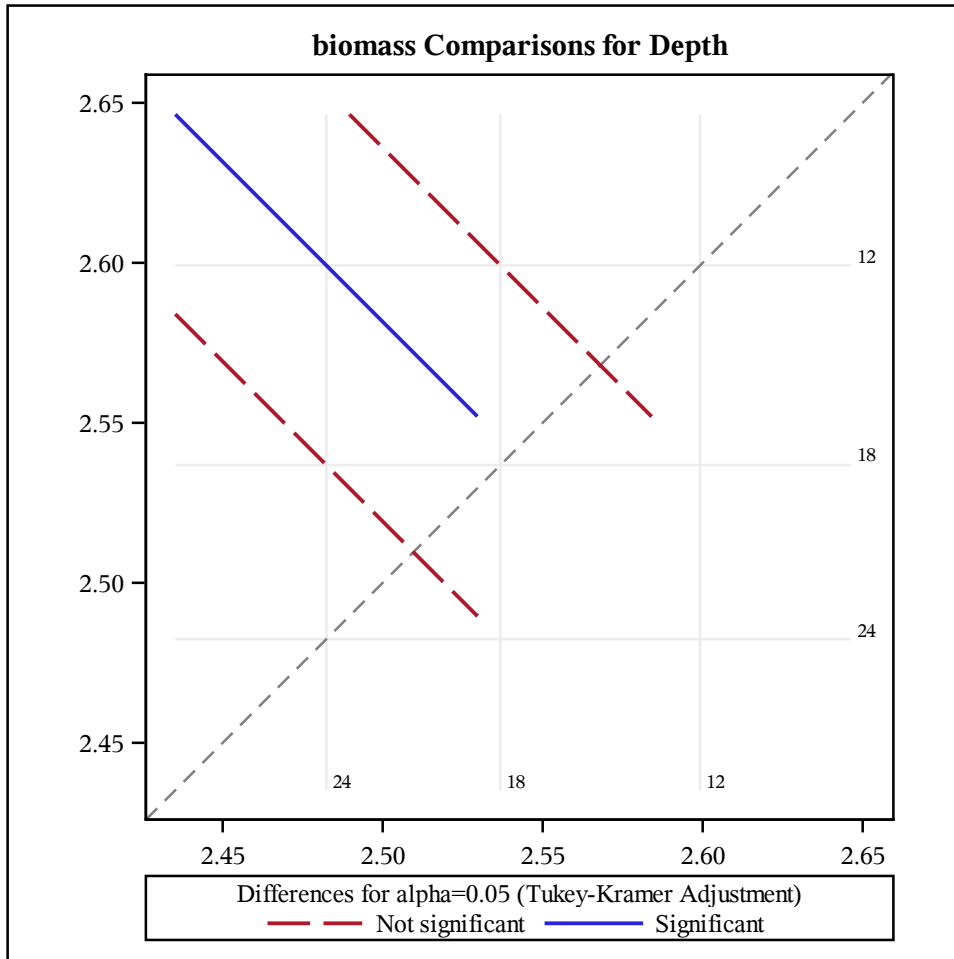
Depth	biomass LSMEAN	95% Confidence Limits	
12	2.599052	2.531108	2.666995
18	2.536777	2.468834	2.604721
24	2.482246	2.443018	2.521473

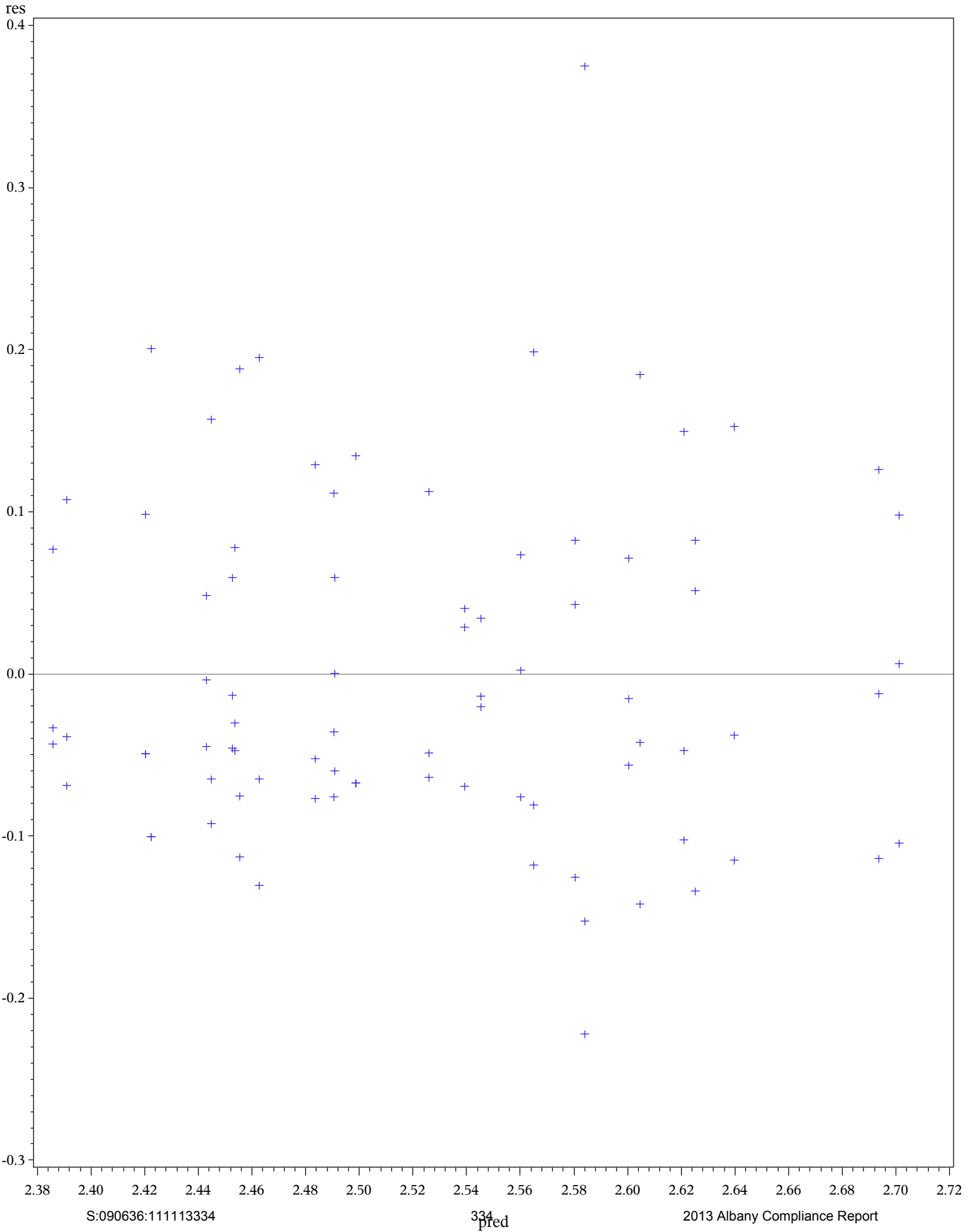
Least Squares Means for Effect Depth				
i	j	Difference Between Means	Simultaneous 95% Confidence Limits for LSMean(i)-LSMean(j)	
1	2	0.062274	-0.032013	0.156562
1	3	0.116806	0.022518	0.211093
2	3	0.054532	-0.039756	0.148819

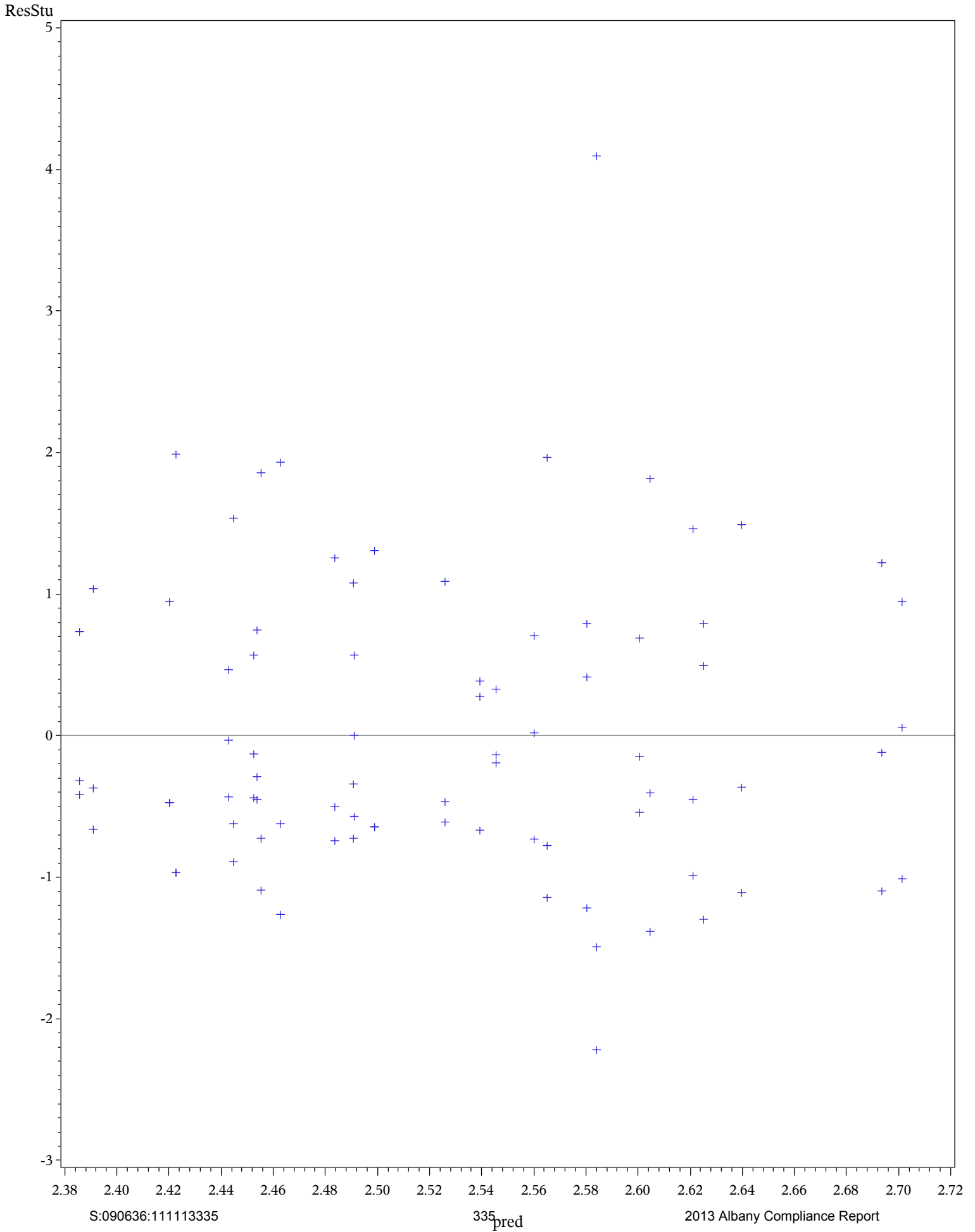
The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer



The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey-Kramer







Attachment 6. Root Depth Summary Analysis

Table 1. Average root width and depth dimensions in subplots.

Plot	Forb (in)		Grass (in)		Plot	Forb (in)		Grass (in)	
N12GU	W	27	W	6	N24BU	W	14	W	13
	D	17.5	D	8		D	14	D	10
N12GM	W	16.5	W	10	N24BM	W	14	W	8
	D	6	D	12		D	12	D	10
N12GL	W	17	W	12	N24BL	W	20	W	15
	D	9.5	D	14		D	10	D	11
AVE	W	20	W	9	AVE	W	16	W	12
AVE	D	11	D	11	AVE	D	12	D	10
AREA		220		99	AREA		192		120
R12G	W	12	W	13.5	R24B	W	17	W	8
	D	12.5	D	11		D	10.5	D	10
AREA		150		149	AREA		179		80
S12GU	W	17	W	8	S24BU	W	14	W	11
	D	12	D	11		D	13	D	9
S12GM	W	18	W	9	S24BM	W	16	W	14
	D	14	D	10		D	13	D	9
S12GL	W	16	W	9	S24BL	W	17	W	15
	D	9	D	10		D	12	D	3
AVE	W	17	W	9	AVE	W	16	W	13
AVE	D	12	D	10	AVE	D	13	D	7
AREA		204		90	AREA		208		91
N18GU	W	14	W	14	N24GU	W	22	W	7
	D	9.5	D	18		D	12	D	11.5
N18GM	W	24	W	10	N24GM	W	24	W	12
	D	12	D	14		D	10	D	12
N18GL	W	17	W	5	N24GL	W	20	W	14
	D	8	D	10.5		D	12	D	10
AVE	W	18	W	10	AVE	W	22	W	11
AVE	D	10	D	14	AVE	D	11	D	11
AREA		180		140	AREA		242		121
R18G	W	15	W	12	R24G	W	15	W	12
	D	8	D	11		D	9	D	10
AREA		120		132	AREA		135		120
S18GU	W	15	W	9	S24GU	W	12	W	12
	D	8	D	9		D	9	D	12
S18GM	W	12	W	7	S24GM	W	16	W	16
	D	9.5	D	9		D	12	D	14.5
S18GL	W	15	W	15	S24GL	W	17	W	12
	D	14	D	10.5		D	15	D	11
AVE	W	14	W	10	AVE	W	15	W	13
AVE	D	11	D	10	AVE	D	12	D	13
AREA		154		100	AREA		180		169

Test Plot Photos—Root Measurements





Photo 9. Grass: S12GU > S12GM > S12GL



Photo 10. Forb: S12GU > S12GM > S12GL



Photo 11. Grass: S18GU > S18GM > S18GL

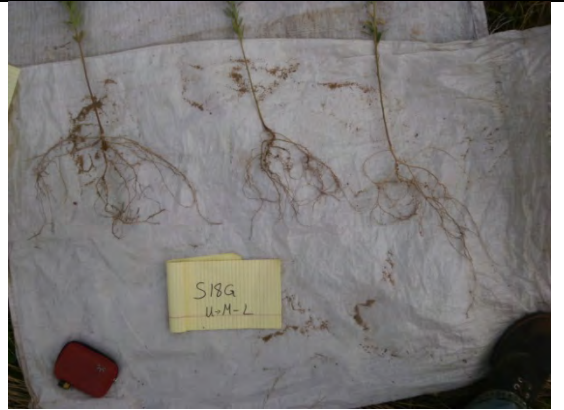


Photo 12. Forb: S18GU > S18GM > S18GL



Photo 13. Grass: S24GU > S24GM > S24GL



Photo 14. Forb: S24GU > S24GM > S24GL



Photo 15. Grass: S24BU > S24BM > S24BL



Photo 16. Forb: S24BU > S24 BM > S24BL



Photo 17. Grass: R24B > R24G > R18G > R12G



Photo 18. Grass: R24B > R24G > R18G > R12G

Attachment 7. Test Plot Monitoring Layout & Sampling Summary

Plot/Subplot ID (sand depth/pH)	Year Established	Sampling Dates	Plot Acreage	Sub-plot Acreage	Number of Quadrats	Photo ID	Restored Community Intercepted
24" – high pH N24BU N24BM N24BL T24B S24BU S24BM S24BL	2012	8/20-22/2012	.592	.066 .080 .055 .158 .080 .077 .076	70 (10 Random in each of 7 zones for a total of 70)	TP-N24B_U TP-N24B_M TP-N24B_L TP-R24B TP-S24B_U TP-S24B_M TP-S24B_L	Test Plot Pitch Pine-Scrub Oak Barrens High pH, 24 inch sand depth
24" – low pH N24GU N24GM N24GL T24G S24GU S24GM S24GL	2012	8/20-22/2012	.610	.072 .083 .072 .153 .079 .076 .075	70 (10 Random in each of 7 zones for a total of 70)	TP-N24G_U TP-N24G_M TP-N24G_L TP-R24G TP-S24G_U TP-S24G_M TP-S24G_L	Test Plot Pitch Pine-Scrub Oak Barrens Low pH, 24 inch sand depth
18" – low pH N18GU N18GM N18GL T18G S18GU S18GM S18GL	2012	8/20-22/2012	.571	.071 .078 .068 .138 .074 .071 .071	70 (10 Random in each of 7 zones for a total of 70)	TP-N18G_U TP-N18G_M TP-N18G_L TP-R18G TP-S18G_U TP-S18G_M TP-S18G_L	Test Plot Pitch Pine-Scrub Oak Barrens Low pH, 18 inch sand depth
12" – low pH N12GU N12GM N12GL T12G S12GU S12GM S12GL	2012	8/20-22/2012	.616	.078 .081 .077 .140 .081 .079 .080	70 (10 Random in each of 7 zones for a total of 70)	TP-N12G_U TP-N12G_M TP-N12G_L TP-R12G TP-S12G_U TP-S12G_M TP-S12G_L	Test Plot Pitch Pine-Scrub Oak Barrens Low pH, 12 inch sand depth
4 plots/28 subplots					280 quadrats	28 photos	

Attachment 8. Test Plot Master Species List & Floristic Analysis

Rapp Road Landfill - Test Plot Data

Total Test Plot Quadrat & Species Search List

Date: August 5, 2013

Samplers: Steven Apfelbaum., Susan Lehnhardt, John Larson

Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
<i>Acalypha rhomboidea</i>	Velvet-leaf	Euphorbiaceae	A-Forb	Nt	FACU			
<i>Acer rubrum</i>	Red maple	Aceraceae	Tree	Nt	FAC			X
<i>Achillea millefolium</i>	Common yarrow	Asteraceae	P-Forb	Ad	FACU			
<i>Agalinis tenuifolia</i>	Gerardia	Scrophulariaceae	P-Forb	Nt	FACW			X
<i>Agropyron repens</i>	Quack grass	Poaceae	P-Grass	Ad				
<i>Agrostis alba</i>	Redtop	Poaceae	P-Grass	Ad	FACW			X
<i>Ambrosia artemisiifolia</i>	Ragweed	Asteraceae	A-Forb	Nt	FACU			
<i>Ambrosia psilostachya</i>	Western ragweed	Asteraceae	P-Forb	Ad	FAC			
<i>Andropogon gerardii</i>	Big bluestem	Poaceae	P-Grass	Nt	FACU			
<i>Andropogon scoparius</i>	Little bluestem	Poaceae	P-Grass	Nt	FACU			X
<i>Artemisia vulgaris</i>	Mugwort	Asteraceae	P-Forb	Ad	UPL			
<i>Asclepias syriaca</i>	Common milkweed	Asclepiadaceae	P-Forb	Nt	UPL		X	
<i>Aster ericoides</i>	White heath aster	Asteraceae	P-Forb	Nt	FACU			
<i>Aster lanceolatus</i>	Old-field aster	Asteraceae	P-Forb	Nt	FACW			
<i>Berteroa incana</i>	Hoary alyssum	Brassicaceae	A-Forb	Ad	UPL			
<i>Bidens frondosa</i>	Beggar-ticks	Asteraceae	A-Forb	Nt	FACW			
<i>Bromus japonicus</i>	Japanese chess	Poaceae	P-Grass	Ad	FACU			
<i>Bromus sp.</i>	Chess	Poaceae	P-Grass	Ad				
<i>Bromus tectorum</i>	Downy chess	Poaceae	P-Grass	Ad	UPL			
<i>Campsis radicans</i>	Trumpet-creeper	Bignoniaceae	Vine	Ad	FAC			
<i>Carex stricta</i>	Tussock sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Cassia fasciculata</i>	Partridge pea	Fabaceae	A-Forb	Nt	FACU	Review List: G5 S3S4		
<i>Celastrus orbiculatus</i>	Oriental bittersweet	Celastraceae	Vine	Ad	UPL			
<i>Cenchrus longispinus</i>	Field sandbur	Poaceae	A-Grass	Nt	UPL			
<i>Centaurea maculosa</i>	Spotted knapweed	Asteraceae	P-Forb	Ad	UPL			
<i>Ceanothus americana</i>	New Jersey tea	Rhamnaceae	Shrub	Nt	UPL		X	
<i>Cerastium vulgatum</i>	Mouse-ear chickweed	Caryophyllaceae	P-Forb	Ad	FACU			
<i>Chenopodium album</i>	Lamb's-quarters	Chenopodiaceae	A-Forb	Ad	FACU			
<i>Chrysanthemum leucanthemum</i>	Ox-eye daisy	Asteraceae	P-Forb	Ad	UPL			X
<i>Cichorium intybus</i>	Chicory	Asteraceae	P-Forb	Ad	FACU			X
<i>Cirsium arvense</i>	Canada thistle	Asteraceae	P-Forb	Ad	FACU			X
<i>Cirsium vulgare</i>	Bull-thistle	Asteraceae	B-Forb	Ad	FACU			
<i>Coryza canadensis</i>	Horseweed	Asteraceae	A-Forb	Nt	FACU			X
<i>Coreopsis lanceolata</i>	Coreopsis	Asteraceae	P-Forb	Ad	FACU			
<i>Coreopsis tinctoria</i>	Golden tickseed	Asteraceae	A-Forb	Ad	FAC			
<i>Coronilla varia</i>	Crown vetch	Fabaceae	P-Forb	Ad	UPL			
<i>Crataegus sp.</i>	Hawthorn	Rosaceae	Tree	Nt				X
<i>Cycloloma atriplicifolium</i>	Winged-pigweed	Chenopodiaceae	A-Forb	Ad	FACU			X
<i>Cyperus esculentus</i>	Yellow nut-grass	Cyperaceae	P-Sedge	Nt	FACW			X
<i>Cyperus houghtonii</i>	Smooth sand sedge	Cyperaceae	P-Sedge	Nt	UPL			
<i>Cyperus sp.</i>	Flat sedge	Cyperaceae	P-Sedge	Nt				X
<i>Cyperus strigosus</i>	Straw-colored flat sedge	Cyperaceae	P-Sedge	Nt	FACW			
<i>Dactylis glomerata</i>	Orchard grass	Poaceae	P-Grass	Ad	FACU			
<i>Daucus carota</i>	Queen-Anne's-lace	Apiaceae	B-Forb	Ad	UPL			

Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
<i>Desmodium canadense</i>	Giant tick clover	Fabaceae	P-Forb	Nt	FAC			
<i>Desmodium paniculatum</i>	Panicled tick trefoil	Fabaceae	P-Forb	Nt	FACU			
<i>Dianthus armeria</i>	Deptford pink	Caryophyllaceae	A-Forb	Ad	UPL			
<i>Digitaria sanguinalis</i>	Tall crabgrass	Poaceae	A-Grass	Ad	FACU			X
<i>Echinochloa crusgalli</i>	Japanese millet	Poaceae	A-Grass	Ad	FAC			
<i>Elymus virginicus</i>	Virginia wild rye	Poaceae	P-Grass	Nt	FACW			
<i>Epilobium coloratum</i>	Purple-leaf willowherb	Onagraceae	P-Forb	Nt	OBL			
<i>Equisetum arvense</i>	Field horsetail	Equisetaceae	Cryptogam	Nt	FAC			X
<i>Eragrostis capillaris</i>	Lace grass	Poaceae	A-Grass	Nt	UPL			X
<i>Eragrostis mexicana</i>	Mexican love grass	Poaceae	A-Grass	Ad	FAC			X
<i>Eragrostis pectinacea</i>	Small love grass	Poaceae	A-Grass	Nt	FAC			
<i>Erechtites hieracifolia</i>	Fireweed	Asteraceae	A-Forb	Nt	FACU			
<i>Erigeron canadensis</i>	Horseweed	Asteraceae	A-Forb	Nt	FAC			
<i>Erigeron strigosus</i>	Daisy-leabane	Asteraceae	A-Forb	Nt	FACU			
<i>Eupatorium perfoliatum</i>	Thoroughwort	Asteraceae	P-Forb	Nt	FACW			
<i>Euphorbia maculata</i>	Spotted Joy-pye weed	Asteraceae	P-Forb	Nt	OBL			X
<i>Festuca elatior</i>	Tall fescue	Poaceae	P-Grass	Ad	FACU			
<i>Festuca rubra</i>	Red fescue	Poaceae	P-Grass	Ad	FACU			
<i>Hypericum perforatum</i>	Common St. John's-wort	Clusiaceae	P-Forb	Ad	UPL			
<i>Hypericum punctatum</i>	St. John's-wort	Clusiaceae	P-Forb	Nt	FAC			
<i>Juncus dudleyi</i>	Dudley's rush	Juncaceae	P-Grass	Nt	FACW			
<i>Juncus effusus</i>	Common rush	Juncaceae	P-Grass	Nt	OBL			
<i>Lactuca canadensis</i>	Wild lettuce	Asteraceae	B-Forb	Nt	FACU			
<i>Lactuca serriola</i>	Prickly lettuce	Asteraceae	B-Forb	Ad	FAC			
<i>Leersia oryzoides</i>	Rice cut grass	Poaceae	P-Grass	Nt	OBL		X	
<i>Lepidium virginicum</i>	Wild peppergrass	Brassicaceae	A-Forb	Nt	FACU			
<i>Lespedeza capitata</i>	Bush-clover	Fabaceae	P-Forb	Nt	FACU		X	
<i>Lobelia inflata</i>	Indian-tobacco	Campanulaceae	B-Forb	Nt	FACU			
<i>Lolium multiflorum</i>	Italian rye grass	Poaceae	A-Grass	Ad	FACU		X	
<i>Lotus corniculatus</i>	Bird's-foot trefoil	Fabaceae	P-Forb	Ad	FACU			
<i>Lupinus perennis</i>	Wild lupine	Fabaceae	P-Forb	Nt	UPL	X	X	
<i>Lychnis alba</i>	White campion	Caryophyllaceae	A-Forb	Ad	UPL			
<i>Lythrum salicaria</i>	Purple loosestrife	Lythraceae	P-Forb	Ad	OBL			
<i>Malus floribunda</i>	Japanese flowering crab apple	Rosaceae	Tree	Ad	UPL			
<i>Medicago lupulina</i>	Black medick	Fabaceae	P-Forb	Ad	FACU			
<i>Medicago sativa</i>	Alfalfa	Fabaceae	P-Forb	Ad	UPL			
<i>Melilotus alba</i>	White sweet clover	Fabaceae	B-Forb	Ad	FACU			
<i>Melilotus officinalis</i>	Yellow melilotus	Fabaceae	B-Forb	Ad	FACU			
<i>Melilotus sp.</i>	Sweet clover	Fabaceae	B-Forb	Ad	FACU			
<i>Monarda fistulosa</i>	Wild bergamot	Lamiaceae	P-Forb	Nt	FACU			
<i>Monarda punctata</i>	Dotted horsemint	Lamiaceae	P-Forb	Nt	UPL	X	X	
<i>Oenothera biennis</i>	Common evening-primrose	Onagraceae	B-Forb	Nt	FACU			
<i>Oxalis europaea</i>	Tall wood-sorrel	Oxalidaceae	A-Forb	Nt	FACU			
<i>Oxalis stricta</i>	Common wood-sorrel	Oxalidaceae	A-Forb	Nt	FACU			
<i>Panicum capillare</i>	Witchgrass	Poaceae	A-Grass	Nt	FAC			
<i>Panicum virgatum</i>	Switchgrass	Poaceae	P-Grass	Nt	FAC			
<i>Penthorum sedoides</i>	Ditch stoncrop	Crassulaceae	P-Forb	Nt	OBL			
<i>Phleum pratense</i>	Timothy	Poaceae	Grass	Ad	FACU			
<i>Phragmites australis</i>	Common reed	Poaceae	P-Grass	Ad	FACW			

Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
<i>Pinus rigida</i>	Pitch pine	Pinaceae	Tree	Nt	FACU			
<i>Plantago lanceolata</i>	Buck horn plantain	Plantaginaceae	P-Forb	Ad	FACU			
<i>Plantago major</i>	Common plantain	Plantaginaceae	P-Forb	Ad	FACU			
<i>Plantago rugelii</i>	Pale plantain	Plantaginaceae	P-Forb	Nt	FAC			
<i>Poa compressa</i>	Canada bluegrass	Poaceae	P-Grass	Ad	FACU			
<i>Poa pratensis</i>	Kentucky bluegrass	Poaceae	P-Grass	Ad	FACU			
<i>Polygonum aviculare</i>	Knotweed	Polygonaceae	A-Forb	Ad	FACU			
<i>Polygonum convolvulus</i>	Black bindweed	Polygonaceae	A-Forb	Ad	FAC			
<i>Polygonum pensylvanicum</i>	Pinkweed	Polygonaceae	A-Forb	Nt	FACW			
<i>Polygonum persicaria</i>	Lady's thumb	Polygonaceae	A-Forb	Ad	FAC			
<i>Populus deltoides</i>	Cottonwood	Salicaceae	Tree	Nt	FAC			
<i>Populus tremuloides</i>	Quaking aspen	Salicaceae	Tree	Nt	FAC			
<i>Potentilla norvegica</i>	Rough cinquefoil	Rosaceae	P-Forb	Nt	FAC			
<i>Potentilla simplex</i>	Common cinquefoil	Rosaceae	P-Forb	Nt	FACU			
<i>Prunus nigra</i>	Canada plum	Rosaceae	Tree	Nt	FACU			
<i>Prunus serotina</i>	Black cherry	Rosaceae	Tree	Nt	FACU			
<i>Rhus radicans</i>	Poison ivy	Anacardiaceae	Vine	Nt	FAC			
<i>Rhus typhina</i>	Staghorn sumac	Anacardiaceae	Tree	Nt	UPL			
<i>Robinia pseudoacacia</i>	Black locust	Fabaceae	Tree	Ad	FACU			
<i>Rosa multiflora</i>	Multiflora rose	Rosaceae	Shrub	Ad	FACU			
<i>Rubus idaeus</i>	Red raspberry	Rosaceae	Shrub	Nt	FACU			
<i>Rudbeckia hirta</i>	Black-eyed Susan	Asteraceae	B-Forb	Nt	FACU			
<i>Rumex crispus</i>	Curly dock	Polygonaceae	P-Forb	Ad	FAC			
<i>Scirpus atrovirens</i>	Dark green bulrush	Cyperaceae	P-Sedge	Nt	OBL			
<i>Secale cereale</i>	Rye	Poaceae	A-Grass	Ad	UPL			
<i>Setaria faberi</i>	Japanese bristle grass	Poaceae	A-Grass	Ad	FACU			
<i>Setaria glauca</i>	Yellow bristle grass	Poaceae	A-Grass	Ad	FAC			
<i>Setaria viridis</i>	Green foxtail	Poaceae	A-Grass	Ad	FAC			
<i>Sisyrinchium campestre</i>	Prairie blue-eyed grass	Iridaceae	P-Forb	Nt	UPL			
<i>Solidago altissima</i>	Tall goldenrod	Asteraceae	P-Forb	Nt	FACU			
<i>Solidago canadensis</i>	Canadian goldenrod	Asteraceae	P-Forb	Nt	FACU			
<i>Solidago gigantea</i>	Late goldenrod	Asteraceae	P-Forb	Nt	FACW			
<i>Solidago graminifolia</i>	Common grass-leaved goldenrod	Asteraceae	P-Forb	Nt	FACW			
<i>Solidago graminifolia nuttallii</i>	Hairy grass-leaved goldenrod	Asteraceae	P-Forb	Nt	FAC			
<i>Solidago juncea</i>	Early goldenrod	Asteraceae	P-Forb	Nt	UPL			
<i>Solidago rugosa</i>	Tall-hairy goldenrod	Asteraceae	P-Forb	Nt	FAC		X	
<i>Sonchus arvensis</i>	Sow thistle	Asteraceae	P-Forb	Ad	FACU			
<i>Sonchus sp.</i>	Thistle	Asteraceae	P-Forb	Ad				
<i>Sorghastrum nutans</i>	Indian grass	Poaceae	P-Grass	Nt	FACU			
<i>Stellaria media</i>	Common chickweed	Caryophyllaceae	A-Forb	Ad	FACU			
<i>Taraxacum officinale</i>	Common dandelion	Asteraceae	P-Forb	Ad	FACU			
<i>Trifolium arvense</i>	Rabbit foot clover	Fabaceae	A-Forb	Ad	UPL			
<i>Trifolium hybridum</i>	Alsike clover	Fabaceae	P-Forb	Ad	FACU			
<i>Trifolium pratense</i>	Red clover	Fabaceae	P-Forb	Ad	FACU			
<i>Trifolium repens</i>	White clover	Fabaceae	P-Forb	Ad	FACU			
<i>Verbascum blattaria</i>	Moth mullein	Scrophulariaceae	B-Forb	Ad	FACU			
<i>Verbascum thapsus</i>	Mullein	Scrophulariaceae	B-Forb	Ad	UPL			

Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
Verbena hastata	Blue vervain	Verbenaceae	P-Forb	Nt	FACW			
Vicia cracca	Cow vetch	Fabaceae	P-Forb	Ad	UPL			
Vicia sativa	Common vetch	Fabaceae	A-Forb	Ad	FACU			
Vitis riparia	Riverbank grape	Vitaceae	Vine	Nt	FAC			
Xanthium strumarium	Cocklebur	Asteraceae	A-Forb	Nt	FAC			

Categories		
Vascular Plant Families	33	
Non-Vascular Plant Families	0	
	No. Species	Percent
Total Species	145	100.0%
Native Species	75	51.7%
Adventive Species	70	48.3%
Unknown Species	0	0.0%
Largest Families Represented		
Aster Family (Asteraceae)	34	23.4%
Grass Family (Poaceae)	30	20.7%
Sedge Family (Cyperaceae)	6	4.1%
Rose Family (Rosaceae)	8	5.5%
Pea Family (Fabaceae)	19	13.1%
Physiognomy		
Perennial Forbs (P-Forb)	53	36.6%
Annual Forbs (A-Forb)	25	17.2%
Biennial Forbs (B-Forbs)	12	8.3%
Forbs	0	0.0%
Perennial Grass (P-Grass)	19	13.1%
Annual Grass (A-Grass)	12	8.3%
Grasses	0	0.0%
Perennial Sedge (P-Sedge)	6	4.1%
Alga	0	0.0%
Cryptogams	1	0.7%
Trees	10	6.9%
Shrubs	3	2.1%
Vines	4	2.8%
Miscellaneous		
Nectar/Larval Food Plants	8	5.5%
Seeded/Planted Species	18	12.4%
Rare Plants	2	1.4%
Wetland Classification		
Upland (UPL)	27	18.6%
Facultative Upland (FACU)	63	43.4%
Faculative (FAC)	28	19.3%
Facultative Wetland (FACW)	14	9.7%
Obligate Wetland (OBL)	8	5.5%
Unknown Species	5	3.4%
Total Hydrophytic Species	50	34.5%

Attachment 9. Test Plot Quadrat Data

Rapp Road Landfill -Test Plot Data

Plot: TP N12GL

Date: August 5, 2013

Samplers: John L. Larson

Nt/Ad	Physiog	Seeded	SPECIES	AVG				STD											
				AF	RF	AC	RC		IV	1	2	3	4	5	6	7	8	9	10
Ad	A-Forb		<i>Trifolium arvense</i>	9	7.26	23.00	22.03	29.29	17.03	20	60	40	30	20	20	20	10	10	
Ad	P-Grass		<i>Agrostis alba</i>	10	8.06	21.00	20.11	28.18	12.20	20	20	20	10	30	15	40	10	5	40
Ad	P-Forb		<i>Trifolium hybridum</i>	7	5.65	18.70	17.91	23.56	21.01	5				40	10	40	60	12	20
Nt	A-Forb		<i>Ambrosia artemisiifolia</i>	9	7.26	4.50	4.31	11.57	4.01	2	10	2	5		10	1	3	2	10
Ad	P-Forb		<i>Lotus corniculatus</i>	5	4.03	7.30	6.99	11.02	13.80	40		3		25	2			3	
Ad	P-Forb		<i>Trifolium repens</i>	3	2.42	7.50	7.18	9.60	16.20			20	50					5	
Nt	P-Forb	X	<i>Lespedeza capitata</i>	9	7.26	1.70	1.63	8.89	0.95	3	2	2	3	1	1	1	2	2	
Nt	P-Grass	X	<i>Andropogon gerardii</i>	6	4.84	2.90	2.78	7.62	3.63	3				8	5		2	10	1
Ad	P-Grass		<i>Festuca rubra</i>	7	5.65	2.10	2.01	7.66	1.85	2		2	2			3	2	5	5
Nt	Cryptogam		<i>Equisetum arvense</i>	6	4.84	2.40	2.30	7.14	2.63	2		4		4			2	4	8
Nt	P-Grass	X	<i>Andropogon scoparius</i>	6	4.84	2.20	2.11	6.95	3.16	2				2		2	5	10	1
Nt	Tree		<i>Populus deltoides</i>	6	4.84	1.20	1.15	5.99	1.23		1	2			3		2	1	3
Nt	P-Forb	X	<i>Monarda punctata</i>	5	4.03	1.60	1.53	5.56	3.06	1	2		2			1		10	
Nt	P-Forb		<i>Solidago altissima</i>	4	3.23	0.80	0.77	3.99	1.14				2			1	2	3	
Nt	B-Forb	X	<i>Oenothera biennis</i>	4	3.23	0.60	0.57	3.80	0.84	1	2		2	1					
Nt	A-Forb		<i>Cassia fasciculata</i>	1	0.81	1.50	1.44	2.24	4.74			15							
Nt	B-Forb	X	<i>Rudbeckia hirta</i>	2	1.61	0.70	0.67	2.28	1.64									2	5
Nt	P-Grass	X	<i>Sorghastrum nutans</i>	2	1.61	0.50	0.48	2.09	1.08				3	2					
Nt	Vine		<i>Vitis riparia</i>	2	1.61	0.50	0.48	2.09	1.08		2		3						
Ad	A-Grass		<i>Echinochloa crusgalli</i>	2	1.61	0.30	0.29	1.90	0.67	1			2						
Nt	P-Forb	X	<i>Monarda fistulosa</i>	2	1.61	0.30	0.29	1.90	0.67		2							1	
Nt	P-Sedge		<i>Cyperus esculentus</i>	1	0.81	0.40	0.38	1.19	1.26					4					
Nt	P-Forb	X	<i>Desmodium canadense</i>	1	0.81	0.30	0.29	1.09	0.95			3							
Ad	P-Forb		<i>Achillea millefolium</i>	1	0.81	0.20	0.19	1.00	0.63					2					
Ad	P-Grass		<i>Agropyron repens</i>	1	0.81	0.20	0.19	1.00	0.63	2									
Ad	P-Forb		<i>Chrysanthemum leucanthemum</i>	1	0.81	0.20	0.19	1.00	0.63			2							
Ad	P-Forb		<i>Cichorium intybus</i>	1	0.81	0.20	0.19	1.00	0.63		2								
Nt	A-Forb		<i>Erigeron canadensis</i>	1	0.81	0.20	0.19	1.00	0.63				2						
Ad	P-Forb		<i>Medicago lupulina</i>	1	0.81	0.20	0.19	1.00	0.63					2					
Nt	A-Forb		<i>Oxalis europaea</i>	1	0.81	0.20	0.19	1.00	0.63										2
Ad	P-Forb		<i>Plantago lanceolata</i>	1	0.81	0.20	0.19	1.00	0.63		2								
Ad	P-Forb		<i>Taraxacum officinale</i>	1	0.81	0.20	0.19	1.00	0.63		2								
Ad	Vine		<i>Celastrus orbiculatus</i>	1	0.81	0.10	0.10	0.90	0.32								1		
Ad	Vine		<i>Celastrus orbiculatus</i>	1	0.81	0.10	0.10	0.90	0.32									1	
Ad	P-Forb		<i>Cirsium arvense</i>	1	0.81	0.10	0.10	0.90	0.32		1								
Ad	A-Forb		<i>Coreopsis tinctoria</i>	1	0.81	0.10	0.10	0.90	0.32				1						
Nt	A-Forb	X	<i>Erechtites hieracifolia</i>	1	0.81	0.10	0.10	0.90	0.32									1	
Ad	P-Forb		<i>Plantago major</i>	1	0.81	0.10	0.10	0.90	0.32	1									
Ad	A-Forb		<i>Vicia sativa</i>	1	0.81	0.10	0.10	0.90	0.32										
				124	100.00	104.40	100.00	200.00											
Non-vegetative ground cover																			
	Soil			10	41.67	8.30	44.86	86.53	3.62										
	Fine litter			10	41.67	9.20	49.73	91.40	6.30	10	10	10	10	10	5	4	5	15	4
	Coarse litter			0	0.00	0.00	0.00	0.00	0.00	20	10	5	5	5	10	10	5	2	20
	Bryophyte			1	4.17	0.40	2.16	6.33	1.26									4	
	Rock			3	12.50	0.60	3.24	15.74	0.97					2	2	2			
				24	100.00	18.50	100.00	200.00											

Rapp Road Landfill - Test Plot Data
 Plot: TP N12GM
 Date: August 5, 2013
 Samplers: John L. Larson

Nt/Ad	Physiogn	Seeded	SPECIES	AVG					STD										
				AF	RF	AC	RC	IV		1	2	3	4	5	6	7	8	9	10
Ad	P-Grass		<i>Agrostis alba</i>	10	7.63	28.00	29.50	37.14	17.51	20	15	50	60	10	10	25	15	40	35
Ad	P-Forb		<i>Trifolium hybridum</i>	6	4.58	17.00	17.91	22.49	23.00	10	5	20	40	70	25				
Ad	A-Forb		<i>Trifolium arvense</i>	3	2.29	9.70	10.22	12.51	25.14	15	80								2
Ad	P-Grass		<i>Festuca rubra</i>	10	7.63	4.50	4.74	12.38	2.68	5	2	4	4	2	5	8	3	2	10
Nt	A-Forb		<i>Ambrosia artemisiifolia</i>	8	6.11	5.90	6.22	12.32	6.08	5	2	1	15		10	10		1	15
Ad	P-Forb		<i>Trifolium repens</i>	3	2.29	5.40	5.69	7.98	12.58							40	10	4	
Nt	P-Grass	X	<i>Andropogon gerardii</i>	7	5.34	2.40	2.53	7.87	2.07	5	2	2	2			5	5		3
Nt	B-Forb	X	<i>Rudbeckia hirta</i>	7	5.34	2.10	2.21	7.56	2.38	2	3	3	2	8			2	1	
Nt	A-Forb		<i>Cassia fasciculata</i>	5	3.82	3.40	3.58	7.40	4.65				1	10	10		10	3	
Ad	P-Forb		<i>Lotus corniculatus</i>	6	4.58	2.60	2.74	7.32	3.24	5		5			2	10		2	2
Nt	P-Forb	X	<i>Lespedeza capitata</i>	7	5.34	1.80	1.90	7.24	1.32	3	3	3	2			2	3		2
Nt	Tree		<i>Populus deltoides</i>	6	4.58	1.40	1.48	6.06	1.58		2			2		5	1	2	2
Nt	P-Grass	X	<i>Andropogon scoparius</i>	6	4.58	1.10	1.16	5.74	0.99	2	2	2				2	2	1	
Ad	P-Forb		<i>Artemisia vulgaris</i>	3	2.29	1.50	1.58	3.87	3.17				2	3	10				
Nt	P-Forb	X	<i>Monarda punctata</i>	4	3.05	0.40	0.42	3.47	0.52	1				1			1		1
Nt	B-Forb	X	<i>Oenothera biennis</i>	3	2.29	0.60	0.63	2.92	1.07	3		1		2					
Nt	A-Forb	X	<i>Coryza canadensis</i>	3	2.29	0.50	0.53	2.82	0.85	1						2			2
Nt	P-Forb	X	<i>Lupinus perennis</i>	3	2.29	0.50	0.53	2.82	0.85	2	2	1							
Nt	A-Forb		<i>Erigeron strigosus</i>	3	2.29	0.30	0.32	2.61	0.48		1							1	1
Nt	Cryptogam		<i>Equisetum arvense</i>	2	1.53	0.70	0.74	2.26	1.64		2	5							
Ad	P-Forb		<i>Chrysanthemum leucanthemum</i>	2	1.53	0.50	0.53	2.05	1.08		2								3
Ad	P-Forb		<i>Achillea millefolium</i>	2	1.53	0.40	0.42	1.95	0.84						2				2
Ad	Vine		<i>Celastrus orbiculatus</i>	2	1.53	0.40	0.42	1.95	0.84							2	2		
Nt	P-Forb		<i>Solidago altissima</i>	2	1.53	0.40	0.42	1.95	0.97		1								3
Nt	P-Forb	X	<i>Monarda fistulosa</i>	2	1.53	0.30	0.32	1.84	0.67	1							2		
Ad	P-Forb		<i>Taraxacum officinale</i>	2	1.53	0.30	0.32	1.84	0.67	2				1					
Nt	A-Forb	X	<i>Erechtites hieracifolia</i>	2	1.53	0.20	0.21	1.74	0.42						1		1		
Ad	P-Forb		<i>Plantago lanceolata</i>	1	0.76	0.60	0.63	1.40	1.90						6				
Nt	P-Forb		<i>Hypericum punctatum</i>	1	0.76	0.30	0.32	1.08	0.95							3			
Nt	P-Grass		<i>Panicum virgatum</i>	1	0.76	0.30	0.32	1.08	0.95					3					
Nt	Vine		<i>Rhus radicans</i>	1	0.76	0.30	0.32	1.08	0.95								3		
Ad	B-Forb		<i>Cirsium vulgare</i>	1	0.76	0.20	0.21	0.97	0.63										2
Nt	P-Grass	X	<i>Sorghastrum nutans</i>	1	0.76	0.20	0.21	0.97	0.63										2
Nt	Vine		<i>Vitis riparia</i>	1	0.76	0.20	0.21	0.97	0.63										2
Ad	P-Forb		<i>Cirsium arvense</i>	1	0.76	0.10	0.11	0.87	0.32	1									
Ad	A-Forb		<i>Coreopsis tinctoria</i>	1	0.76	0.10	0.11	0.87	0.32								1		
Nt	P-Forb		<i>Euphorbia maculata</i>	1	0.76	0.10	0.11	0.87	0.32										1
Ad	P-Forb		<i>Plantago major</i>	1	0.76	0.10	0.11	0.87	0.32						1				
Nt	P-Forb	X	<i>Verbena hastata</i>	1	0.76	0.10	0.11	0.87	0.32										1
				131	100.00	94.90	100.00	200.00											
Non-vegetative ground cover																			
			Soil	10	40.00	9.00	33.96	73.96	6.73	15	8	10	5	2	10	5	5	25	5
			Fine litter	10	40.00	16.50	62.26	102.26	10.55	20	5	10	5	20	25	40	15	10	15
			Coarse litter	0	0.00	0.00	0.00	0.00	0.00										
			Bryophyte	5	20.00	1.00	3.77	23.77	1.05	2		2				2		2	2
			Rock	0	0.00	0.00	0.00	0.00	0.00										
				25	100.00	26.50	100.00	200.00											

Rapp Road Landfill - Test Plot Data

Plot: TP N12GU

Date: August 5, 2013

Samplers: John L. Larson

Nt/Ad	Physiog	Seeded	SPECIES	AVG			10			STD										
				AF	RF	AC	RC	IV	1		2	3	4	5	6	7	8	9	10	
Ad	P-Forb		<i>Trifolium repens</i>	10	8.26	33.80	36.58	44.84	25.41	20	3	30	60	20	50	10	60	75	10	
Ad	P-Grass		<i>Agrostis alba</i>	10	8.26	20.50	22.19	30.45	6.85	10	10	15	25	30	25	20	25	25	20	
Ad	P-Grass		<i>Festuca rubra</i>	8	6.61	5.20	5.63	12.24	3.94	10	12	6	8	4	4	3			5	
Nt	B-Forb	X	<i>Rudbeckia hirta</i>	7	5.79	3.40	3.68	9.46	3.75	2	4	3			10	10		2	3	
Nt	P-Grass	X	<i>Andropogon scoparius</i>	8	6.61	2.10	2.27	8.88	1.79	3	5		2	2	1	2	1		5	
Ad	P-Forb		<i>Lotus corniculatus</i>	5	4.13	3.90	4.22	8.35	7.68	5		2	2	25					5	
Nt	Tree		<i>Populus deltoides</i>	7	5.79	1.40	1.52	7.30	1.51	2	1	2	1		1	5			2	
Nt	A-Forb		<i>Ambrosia artemisiifolia</i>	4	3.31	3.10	3.35	6.66	5.32				1		5	10			15	
Nt	P-Grass	X	<i>Andropogon gerardii</i>	6	4.96	1.40	1.52	6.47	1.26	2	2		2	3				2	3	
Nt	A-Forb		<i>Cassia fasciculata</i>	3	2.48	3.30	3.57	6.05	7.86			25			2				6	
Nt	P-Forb	X	<i>Lespedeza capitata</i>	5	4.13	1.30	1.41	5.54	1.64	5	2		2	2						
Ad	A-Forb		<i>Trifolium arvense</i>	3	2.48	1.50	1.62	4.10	2.80		2		8			5				
Ad	P-Forb		<i>Achillea millefolium</i>	4	3.31	0.60	0.65	3.96	0.84			1	2	2						
Nt	P-Forb	X	<i>Desmodium canadense</i>	3	2.48	0.80	0.87	3.35	1.32	3			2	3						
Ad	P-Forb		<i>Taraxacum officinale</i>	3	2.48	0.80	0.87	3.35	1.62	5	1								2	
Nt	B-Forb	X	<i>Oenothera biennis</i>	3	2.48	0.60	0.65	3.13	0.97				2		2	2				
Nt	P-Grass	X	<i>Sorghastrum nutans</i>	3	2.48	0.60	0.65	3.13	1.07		2			3		1				
Ad	B-Forb		<i>Daucus carota</i>	1	0.83	2.00	2.16	2.99	6.32							20				
Nt	P-Forb	X	<i>Monarda fistulosa</i>	3	2.48	0.40	0.43	2.91	0.70	1		1		2						
Nt	P-Forb		<i>Solidago altissima</i>	2	1.65	0.70	0.76	2.41	1.64	5						2				
Ad	P-Forb		<i>Cichorium intybus</i>	2	1.65	0.50	0.54	2.19	1.08		3								2	
Ad	P-Forb		<i>Artemisia vulgaris</i>	2	1.65	0.40	0.43	2.09	0.84							2			2	
Ad	B-Forb		<i>Cirsium vulgare</i>	2	1.65	0.30	0.32	1.98	0.67	2		1								
Ad	Vine		<i>Celastrus orbiculatus</i>	2	1.65	0.20	0.22	1.87	0.42		1								1	
Nt	P-Forb	X	<i>Monarda punctata</i>	2	1.65	0.20	0.22	1.87	0.42			1		1						
Ad	A-Grass		<i>Digitaria sanguinalis</i>	1	0.83	0.80	0.87	1.69	2.53	8										
Ad	A-Forb		<i>Vicia sativa</i>	1	0.83	0.50	0.54	1.37	1.58	5										
Ad	P-Forb		<i>Medicago lupulina</i>	1	0.83	0.40	0.43	1.26	1.26										4	
Nt	Cryptogam		<i>Equisetum arvense</i>	1	0.83	0.30	0.32	1.15	0.95							3				
Nt	P-Forb	X	<i>Solidago graminifolia</i>	1	0.83	0.30	0.32	1.15	0.95			3								
Nt	A-Forb		<i>Erigeron strigosus</i>	1	0.83	0.20	0.22	1.04	0.63				2							
Ad	P-Forb		<i>Plantago lanceolata</i>	1	0.83	0.20	0.22	1.04	0.63							2				
Ad	P-Forb		<i>Plantago major</i>	1	0.83	0.20	0.22	1.04	0.63							2				
Ad	A-Forb		<i>Coreopsis tinctoria</i>	1	0.83	0.10	0.11	0.93	0.32						1					
Nt	P-Forb		<i>Euphorbia maculata</i>	1	0.83	0.10	0.11	0.93	0.32		1									
Nt	P-Forb	X	<i>Lupinus perennis</i>	1	0.83	0.10	0.11	0.93	0.32		1									
Nt	Tree	X	<i>Pinus rigida</i>	1	0.83	0.10	0.11	0.93	0.32							1				
Nt	Vine		<i>Vitis riparia</i>	1	0.83	0.10	0.11	0.93	0.32										1	
				121	100.00	92.40	100.00	200.00												
Non-vegetative ground cover																				
	Soil			10	38.46	11.20	36.01	74.47	12.42	15	40	25	5	5	2	10	3	5	2	
	Fine litter			9	34.62	17.00	54.66	89.28	19.18	10	10	5	25	5	60	10		5	40	
	Coarse litter			2	7.69	1.30	4.18	11.87	3.20								10		3	
	Bryophyte			3	11.54	1.40	4.50	16.04	3.13		10		2			2				
	Rock			2	7.69	0.20	0.64	8.34	0.42			1				1				
				26	100.00	31.10	100.00	200.00												

Rapp Road Landfill - Test Plot Data
 Plot: TP N18GL
 Date: August 5, 2013
 Samplers: Susan Lehnhardt

Nt/Ad	Physiogn	Seeded	SPECIES	AVG					STD										
				AF	RF	AC	RC	IV		1	2	3	4	5	6	7	8	9	10
Ad	P-Grass		<i>Festuca rubra</i>	9	8.18	26.00	22.81	30.99	20.89	40	40	3	5		2	50	35	35	50
Nt	P-Grass	X	<i>Andropogon scoparius</i>	10	9.09	15.20	13.33	22.42	9.04	12	30	25	6	20	20	10	20	4	5
Ad	P-Forb		<i>Trifolium hybridum</i>	8	7.27	15.60	13.68	20.96	11.75	25	20		25		25	30	20	1	10
Nt	P-Forb	X	<i>Lespedeza capitata</i>	9	8.18	9.10	7.98	16.16	5.90	15	14	6		1	15	5	12	15	8
Nt	A-Forb		<i>Cassia fasciculata</i>	5	4.55	11.60	10.18	14.72	15.69			4	30	40	30			12	
Ad	P-Grass		<i>Agrostis alba</i>	8	7.27	7.30	6.40	13.68	6.07	6	10	20	8		10	8	10	1	
Nt	P-Forb	X	<i>Desmodium canadense</i>	7	6.36	6.30	5.53	11.89	8.49		1	20	15		20	1	3		3
Nt	P-Grass	X	<i>Andropogon gerardii</i>	8	7.27	3.40	2.98	10.26	2.95	2	4	2	4	2		5	10		5
Ad	A-Forb		<i>Trifolium arvense</i>	4	3.64	3.50	3.07	6.71	5.32		6	15				10	4		
Nt	P-Forb	X	<i>Monarda punctata</i>	5	4.55	2.20	1.93	6.48	2.78	6	6			6		1			3
Nt	B-Forb	X	<i>Rudbeckia hirta</i>	5	4.55	1.70	1.49	6.04	2.11	1	3						5	3	5
Nt	B-Forb	X	<i>Oenothera biennis</i>	3	2.73	3.40	2.98	5.71	9.38		2			30			2		
Nt	P-Forb	X	<i>Lupinus perennis</i>	3	2.73	2.30	2.02	4.74	4.79	5		3						15	
Nt	A-Forb		<i>Ambrosia artemisiifolia</i>	3	2.73	0.50	0.44	3.17	0.97	1			3	1					
Nt	A-Forb	X	<i>Conyza canadensis</i>	3	2.73	0.50	0.44	3.17	0.85	2		1		2					
Ad	P-Forb		<i>Trifolium repens</i>	2	1.82	1.00	0.88	2.70	2.54		8	2							
Ad	P-Forb		<i>Cichorium intybus</i>	2	1.82	0.60	0.53	2.34	1.35							4		2	
Nt	Tree		<i>Populus deltoides</i>	2	1.82	0.50	0.44	2.26	1.08						3		2		
Ad	P-Forb		<i>Coreopsis lanceolata</i>	2	1.82	0.40	0.35	2.17	0.97							3		1	
Nt	P-Forb		<i>Solidago canadensis</i>	2	1.82	0.20	0.18	1.99	0.42			1					1		
Nt	A-Grass	X	<i>Lolium multiflorum</i>	1	0.91	1.00	0.88	1.79	3.16					10					
Ad	P-Forb		<i>Coronilla varia</i>	1	0.91	0.80	0.70	1.61	2.53								8		
Nt	B-Forb		<i>Lactuca canadensis</i>	1	0.91	0.20	0.18	1.08	0.63						2				
Ad	A-Grass		<i>Echinochloa crusgalli</i>	1	0.91	0.10	0.09	1.00	0.32			1							
Nt	Cryptogam		<i>Equisetum arvense</i>	1	0.91	0.10	0.09	1.00	0.32						1				
Nt	A-Forb		<i>Erigeron strigosus</i>	1	0.91	0.10	0.09	1.00	0.32						1				
Nt	A-Forb	X	<i>Lobelia inflata</i>	1	0.91	0.10	0.09	1.00	0.32										1
Nt	Tree		<i>Populus tremuloides</i>	1	0.91	0.10	0.09	1.00	0.32										1
Nt	P-Forb	X	<i>Solidago rugosa</i>	1	0.91	0.10	0.09	1.00	0.32										1
Ad	P-Forb		<i>Taraxacum officinale</i>	1	0.91	0.10	0.09	1.00	0.32							1			
				110	100.00	114.00	100.00	200.00											
Non-vegetative ground cover																			
			Soil	7	41.18	7.50	8.24	49.42	8.90	5	10	30				5	5	10	10
			Fine litter	10	58.82	83.50	91.76	150.58	27.19	95	90	70	100	100	10	95	95	90	90
			Coarse litter	0	0.00	0.00	0.00	0.00	0.00										
			Bryophyte	0	0.00	0.00	0.00	0.00	0.00										
			Rock	0	0.00	0.00	0.00	0.00	0.00										
				17	100.00	91.00	100.00	200.00											

Rapp Road Landfill -Test Plot Data
 Plot: TP N18GM
 Date: August 5, 2013
 Samplers: Susan Lehnhardt

Nt/Ad	Physiogn	Seeded	SPECIES	AVG		10		IV	STD										
				AF	RF	AC	RC			1	2	3	4	5	6	7	8	9	10
Ad	P-Forb		<i>Trifolium hybridum</i>	9	8.91	29.60	29.02	37.93	22.05	30		6	35	25	5	30	40	60	65
Ad	P-Grass		<i>Agrostis alba</i>	9	8.91	16.80	16.47	25.38	17.83	10		3	10	25	5	10	60	30	15
Ad	P-Grass		<i>Festuca rubra</i>	5	4.95	13.50	13.24	18.19	14.54	30		30	20	30	25				
Nt	A-Forb		<i>Cassia fasciculata</i>	7	6.93	10.20	10.00	16.93	13.08		6	25	8		25	35		1	2
Nt	P-Grass	X	<i>Andropogon scoparius</i>	9	8.91	5.30	5.20	14.11	4.95	15	10	1	8	6	1	3		1	8
Nt	P-Grass	X	<i>Andropogon gerardii</i>	7	6.93	4.70	4.61	11.54	6.18	10	5	2	4	4	2	20			
Nt	B-Forb	X	<i>Rudbeckia hirta</i>	6	5.94	4.20	4.12	10.06	6.61	2	1			1	10		20		8
Nt	P-Forb	X	<i>Lespedeza capitata</i>	8	7.92	1.50	1.47	9.39	1.18	1	1	4		1	2	2		2	2
Nt	P-Forb	X	<i>Desmodium canadense</i>	5	4.95	2.20	2.16	7.11	3.29	4		5	2	1				10	
Nt	P-Grass	X	<i>Sorghastrum nutans</i>	4	3.96	2.70	2.65	6.61	4.79				3	15			3		6
Ad	P-Forb		<i>Trifolium repens</i>	2	1.98	3.50	3.43	5.41	8.18				25			10			
Nt	P-Forb	X	<i>Lupinus perennis</i>	3	2.97	1.90	1.86	4.83	3.84		3	12			4				
Nt	P-Forb	X	<i>Monarda punctata</i>	3	2.97	1.30	1.27	4.24	3.13	1				2				10	
Nt	B-Forb	X	<i>Oenothera biennis</i>	3	2.97	1.30	1.27	4.24	3.13		10		1					2	
Ad	P-Grass		<i>Phleum pratense</i>	3	2.97	0.50	0.49	3.46	0.85				2		1		2		
Nt	A-Forb		<i>Ambrosia artemisiifolia</i>	3	2.97	0.40	0.39	3.36	0.70	1	2			1					
Ad	P-Forb		<i>Taraxacum officinale</i>	2	1.98	0.70	0.69	2.67	1.49							4			3
Nt	A-Forb		<i>Erigeron strigosus</i>	2	1.98	0.40	0.39	2.37	0.97		1						3		
Ad	A-Forb		<i>Trifolium arvense</i>	2	1.98	0.30	0.29	2.27	0.67		1					2			
Nt	A-Forb	X	<i>Conyza canadensis</i>	2	1.98	0.20	0.20	2.18	0.42		1			1					
Nt	P-Forb	X	<i>Monarda fistulosa</i>	2	1.98	0.20	0.20	2.18	0.42					1			1		
Nt	Tree		<i>Populus tremuloides</i>	1	0.99	0.20	0.20	1.19	0.63							2			
Ad	B-Grass		<i>Agropyron repens</i>	1	0.99	0.10	0.10	1.09	0.32		1								
Ad	P-Forb		<i>Chrysanthemum leucanthemum</i>	1	0.99	0.10	0.10	1.09	0.32										1
Ad	P-Forb		<i>Coreopsis lanceolata</i>	1	0.99	0.10	0.10	1.09	0.32				1						
Ad	A-Forb		<i>Polygonum persicaria</i>	1	0.99	0.10	0.10	1.09	0.32		1								
				101	100.00	102.00	100.00	200.00											
Non-vegetative ground cover																			
			Soil	6	37.50	7.90	7.90	45.40	18.56		3	60	2	3	1	10			
			Fine litter	10	62.50	92.10	92.10	154.60	18.56	97	40	98	97	99	90	100	100	100	100
			Coarse litter	0	0.00	0.00	0.00	0.00	0.00										
			Bryophyte	0	0.00	0.00	0.00	0.00	0.00										
			Rock	0	0.00	0.00	0.00	0.00	0.00										
				16	100.00	100.00	100.00	200.00											

Rapp Road Landfill - Test Plot Data
 Plot: TP N18GU
 Date: August 5, 2013
 Samplers: Susan Lehnhardt

Nt/Ad	Physiog	Seeded	SPECIES	AVG				IV	STD											
				AF	RF	AC	RC			1	2	3	4	5	6	7	8	9	10	
Ad	P-Forb		<i>Trifolium repens</i>	5	4.95	26.00	25.39	30.34	34.62			80	20	15	75			70		
Ad	P-Grass		<i>Agrostis alba</i>	9	8.91	9.60	9.38	18.29	7.47	15	10	10	10	3	2			6	25	15
Ad	P-Forb		<i>Trifolium hybridum</i>	5	4.95	13.40	13.09	18.04	20.85	2	40	40						50	2	
Nt	P-Grass	X	<i>Andropogon gerardii</i>	10	9.90	8.00	7.81	17.71	6.85	8	25	6	10	10	2	5	2	2	2	10
Ad	P-Grass		<i>Festuca rubra</i>	6	5.94	11.30	11.04	16.98	16.28			4		20	40	40	6	3		
Nt	P-Grass	X	<i>Andropogon scoparius</i>	9	8.91	4.80	4.69	13.60	3.58	10	6	1	8	10	4	4	3		2	
Nt	A-Forb		<i>Cassia fasciculata</i>	7	6.93	5.30	5.18	12.11	4.32	8	10	6	4	12	8			5		
Nt	P-Forb	X	<i>Lespedeza capitata</i>	8	7.92	2.50	2.44	10.36	3.10	4		1		1	2	1	1	10	5	
Nt	B-Forb	X	<i>Rudbeckia hirta</i>	6	5.94	3.30	3.22	9.16	4.97		2	15		1		6	8	1		
Nt	P-Forb	X	<i>Desmodium canadense</i>	3	2.97	4.10	4.00	6.97	8.28						4			25	12	
Nt	P-Forb	X	<i>Monarda punctata</i>	5	4.95	1.20	1.17	6.12	1.40		2		4	2		2		2		
Nt	P-Grass	X	<i>Sorghastrum nutans</i>	4	3.96	2.10	2.05	6.01	3.78		2				3	4			12	
Nt	B-Forb	X	<i>Oenothera biennis</i>	4	3.96	1.80	1.76	5.72	2.74		4		4			8	2			
Nt	Tree		<i>Acer rubrum</i>	2	1.98	3.60	3.52	5.50	11.04				1	35						
Nt	P-Forb	X	<i>Lupinus perennis</i>	3	2.97	2.30	2.25	5.22	3.89					8		10	5			
Nt	P-Sedge	X	<i>Cyperus houghtonii</i>	2	1.98	0.70	0.68	2.66	1.89	6						1				
Nt	P-Forb	X	<i>Monarda fistulosa</i>	2	1.98	0.30	0.29	2.27	0.67	2			1							
Nt	A-Forb		<i>Erigeron strigosus</i>	2	1.98	0.20	0.20	2.18	0.42	1								1		
Nt	Tree		<i>Populus tremuloides</i>	2	1.98	0.20	0.20	2.18	0.42				1					1		
Ad	P-Forb		<i>Centaurea maculosa</i>	1	0.99	0.60	0.59	1.58	1.90						6					
Ad	A-Forb		<i>Trifolium arvense</i>	1	0.99	0.30	0.29	1.28	0.95	3										
Nt	P-Forb	X	<i>Asclepias syriaca</i>	1	0.99	0.20	0.20	1.19	0.63										2	
Nt	A-Forb	X	<i>Conyza canadensis</i>	1	0.99	0.20	0.20	1.19	0.63	2										
Nt	P-Forb		<i>Solidago canadensis</i>	1	0.99	0.20	0.20	1.19	0.63									2		
Nt	A-Forb		<i>Ambrosia artemisiifolia</i>	1	0.99	0.10	0.10	1.09	0.32				1							
Nt	A-Forb	X	<i>Lobelia inflata</i>	1	0.99	0.10	0.10	1.09	0.32			1								
				101	100.00	102.40	100.00	200.00												
Non-vegetative ground cover																				
			Soil	7	38.89	17.10	19.00	57.89	20.07	50	30		1	20		15	5	50		
			Fine litter	9	50.00	72.20	80.22	130.22	31.75	50	70	100	99	75	100	85	93	50		
			Coarse litter	0	0.00	0.00	0.00	0.00	0.00											
			Bryophyte	2	11.11	0.70	0.78	11.89	1.64					5			2			
			Rock	0	0.00	0.00	0.00	0.00	0.00											
				18	100.00	90.00	100.00	200.00												

Rapp Road Landfill - Test Plot Data
 Plot: TP N24GL
 Date: August 5, 2013
 Samplers: Steve Apfelbaum

Nt/Ad	Physiog	Seeded	SPECIES	AVG				STD												
				AF	RF	AC	RC		IV	1	2	3	4	5	6	7	8	9	10	
Ad	P-Forb		<i>Trifolium repens</i>	9	7.32	29.00	23.26	30.57	26.65	20	20	75	5	5	75	30	30	30		
Ad	P-Grass		<i>Festuca rubra</i>	10	8.13	24.50	19.65	27.78	7.98	30	20	15	15	20	25	30	30	40	20	
Ad	P-Grass		<i>Agrostis alba</i>	9	7.32	11.80	9.46	16.78	8.64	5	30	20	10		10	8	15	15	5	
Nt	P-Grass	X	<i>Andropogon scoparius</i>	10	8.13	8.90	7.14	15.27	5.69	5	10	2	15	20	2	10	10	5	10	
Nt	P-Grass	X	<i>Andropogon gerardii</i>	8	6.50	9.20	7.38	13.88	7.13		2		15	10	20	15	15	10	5	
Nt	P-Forb	X	<i>Lespedeza capitata</i>	8	6.50	6.40	5.13	11.64	5.70	8	4	2	15	10	2	8	15			
Nt	A-Forb		<i>Cassia fasciculata</i>	6	4.88	8.00	6.42	11.29	10.94	8	35	15	2		10			10		
Nt	P-Forb	X	<i>Lupinus perennis</i>	7	5.69	5.80	4.65	10.34	6.03		8	5	5	5		5	10		20	
Nt	B-Forb	X	<i>Rudbeckia hirta</i>	7	5.69	2.00	1.60	7.29	2.58	8	5	1		1		2	2	1		
Nt	P-Forb	X	<i>Desmodium canadense</i>	5	4.07	3.80	3.05	7.11	7.67	4		2			5		2		25	
Nt	A-Forb	X	<i>Conyza canadensis</i>	7	5.69	1.10	0.88	6.57	0.99	1	1		1	2	2		1	3		
Nt	B-Forb	X	<i>Oenothera biennis</i>	5	4.07	1.50	1.20	5.27	2.01		2		2		5	1	5			
Nt	A-Forb		<i>Ambrosia artemisiifolia</i>	5	4.07	0.80	0.64	4.71	0.92	2		2		2				1		
Ad	P-Forb		<i>Coreopsis lanceolata</i>	4	3.25	1.80	1.44	4.70	2.78	5			8			2		3		
Ad	A-Forb		<i>Trifolium arvense</i>	2	1.63	3.00	2.41	4.03	6.32								15		15	
Nt	P-Forb	X	<i>Monarda punctata</i>	3	2.44	1.50	1.20	3.64	3.17	10	2								3	
Nt	P-Grass		<i>Panicum virgatum</i>	3	2.44	0.50	0.40	2.84	0.85			2	2						1	
Ad	P-Forb		<i>Centaurea maculosa</i>	2	1.63	1.20	0.96	2.59	3.16				10			2				
Ad	P-Forb		<i>Taraxacum officinale</i>	2	1.63	0.50	0.40	2.03	1.08								2	3		
Ad	P-Forb		<i>Lotus corniculatus</i>	1	0.81	1.50	1.20	2.02	4.74							15				
Nt	Tree		<i>Populus deltoides</i>	2	1.63	0.40	0.32	1.95	0.84			2		2						
Ad	P-Forb		<i>Coronilla varia</i>	2	1.63	0.30	0.24	1.87	0.67					2					1	
Nt	A-Forb		<i>Oxalis stricta</i>	2	1.63	0.20	0.16	1.79	0.42	1	1									
Ad	P-Forb		<i>Chrysanthemum leucanthemum</i>	1	0.81	0.30	0.24	1.05	0.95							3				
Nt	P-Forb	X	<i>Solidago gigantea</i>	1	0.81	0.30	0.24	1.05	0.95							3				
Ad	P-Forb		<i>Artemisia vulgaris</i>	1	0.81	0.20	0.16	0.97	0.63						2					
Nt	P-Forb		<i>Solidago canadensis</i>	1	0.81	0.20	0.16	0.97	0.63			2								
				123	100.00	124.70	100.00	200.00												
Non-vegetative ground cover																				
			Soil	8	44.44	27.00	28.42	72.87	26.37			10	60	50	10	30	25	10	75	
			Fine litter	10	55.56	68.00	71.58	127.13	27.51	100	100	40	40	50	90	70	75	90	25	
			Coarse litter	0	0.00	0.00	0.00	0.00	0.00											
			Bryophyte	0	0.00	0.00	0.00	0.00	0.00											
			Rock	0	0.00	0.00	0.00	0.00	0.00											
				18	100.00	95.00	100.00	200.00												

Rapp Road Landfill - Test Plot Data
 Plot: TP N24GM
 Date: August 5, 2013
 Samplers: Steve Apfelbaum

		AVG							10										
Nt/A	Physiog	Seede	SPECIES							1	2	3	4	5	6	7	8	9	10
d	d	d	AF	RF	AC	RC	IV	STD											
Ad	P-Grass		<i>Festuca rubra</i>	10	10.10	31.50	25.08	35.18	11.56	25	30	30	50	40	10	40	40	30	20
Ad	P-Forb		<i>Trifolium repens</i>	8	8.08	30.80	24.52	32.60	31.62	3		50	20	15	90		35	75	20
Nt	P-Grass	X	<i>Andropogon gerardii</i>	10	10.10	10.80	8.60	18.70	3.29	8	10	10	5	15	10	15	10	10	15
Ad	P-Grass		<i>Agrostis alba</i>	9	9.09	12.00	9.55	18.65	8.56		10	5	20	10	15	5	10	30	15
Nt	P-Grass	X	<i>Andropogon scoparius</i>	10	10.10	9.00	7.17	17.27	8.10	10	15	5	5	5	5	5	5	5	30
Nt	B-Forb	X	<i>Rudbeckia hirta</i>	8	8.08	9.70	7.72	15.80	9.58	2		10	20	25	20		2	15	3
Nt	P-Forb	X	<i>Lupinus perennis</i>	5	5.05	6.70	5.33	10.38	8.37		15	15	2				20		15
Nt	P-Forb	X	<i>Lespedeza capitata</i>	7	7.07	4.10	3.26	10.34	4.86	5	10	3	3	3			15	2	
Nt	B-Forb	X	<i>Oenothera biennis</i>	6	6.06	1.70	1.35	7.41	1.95	1	2	2				5	5		2
Nt	P-Forb	X	<i>Monarda punctata</i>	5	5.05	2.10	1.67	6.72	3.25	2	5	1				10		3	
Nt	A-Forb		<i>Cassia fasciculata</i>	3	3.03	2.70	2.15	5.18	5.33				2	15		10			
Nt	P-Forb	X	<i>Monarda fistulosa</i>	3	3.03	1.20	0.96	3.99	3.12							10		1	1
Ad	P-Forb		<i>Coreopsis lanceolata</i>	2	2.02	1.00	0.80	2.82	2.11				5	5					
Ad	P-Forb		<i>Cichorium intybus</i>	2	2.02	0.40	0.32	2.34	0.84							2			2
Ad	P-Forb		<i>Taraxacum officinale</i>	2	2.02	0.30	0.24	2.26	0.67		1							2	
Nt	A-Forb		<i>Ambrosia artemisiifolia</i>	2	2.02	0.20	0.16	2.18	0.42	1				1					
Ad	P-Forb		<i>Medicago lupulina</i>	2	2.02	0.20	0.16	2.18	0.42	1									1
Ad	P-Forb		<i>Lotus corniculatus</i>	1	1.01	0.50	0.40	1.41	1.58	5									
Nt	A-Forb	X	<i>Conyza canadensis</i>	1	1.01	0.20	0.16	1.17	0.63							2			
Nt	P-Forb	X	<i>Desmodium canadense</i>	1	1.01	0.20	0.16	1.17	0.63										2
Nt	Tree		<i>Populus deltoides</i>	1	1.01	0.20	0.16	1.17	0.63										2
Ad	P-Forb		<i>Hypericum perforatum</i>	1	1.01	0.10	0.08	1.09	0.32										1
			99	100.00	125.60	100.00	200.00												
Non-vegetative ground cover																			
	Soil		10	50.00	15.50	15.50	65.50	11.41		25	25	10	5	15	5	5	10	15	40
	Fine litter		10	50.00	84.50	84.50	134.50	11.41		75	75	90	95	85	95	95	90	85	60
	Coarse litter		0	0.00	0.00	0.00	0.00	0.00											
	Bryophyte		0	0.00	0.00	0.00	0.00	0.00											
	Rock		0	0.00	0.00	0.00	0.00	0.00											
			20	100.00	100.00	100.00	200.00												

Rapp Road Landfill - Test Plot Data
 Plot: TP N24GU
 Date: August 5, 2013
 Samplers: Steve Apfelbaum

Nt/Ad	Physiog	Seeded	SPECIES	AVG					STD										
				AF	RF	AC	RC	IV		1	2	3	4	5	6	7	8	9	10
Ad	P-Grass		<i>Festuca rubra</i>	9	8.65	49.00	34.00	42.66	27.67	60		80	60	40	80	20	40	30	80
Ad	P-Forb		<i>Trifolium repens</i>	10	9.62	30.70	21.30	30.92	21.48	40	10	30	50	40	2	20	15	25	75
Nt	A-Forb		<i>Cassia fasciculata</i>	8	7.69	17.40	12.07	19.77	23.76	2		2	25	15	15	20	15	80	
Nt	P-Grass	X	<i>Andropogon gerardii</i>	10	9.62	9.50	6.59	16.21	3.69	10	15	5	10	10	10	15	10	5	5
Nt	P-Grass	X	<i>Andropogon scoparius</i>	10	9.62	8.90	6.18	15.79	11.50	5	40	2	2	5	5	5	15	5	5
Nt	P-Forb	X	<i>Lespedeza capitata</i>	9	8.65	3.10	2.15	10.81	2.77	3	5	2	3	3	2		10	2	1
Nt	P-Forb	X	<i>Lupinus perennis</i>	6	5.77	7.00	4.86	10.63	6.32			10		10	10	15	10	15	
Ad	P-Grass		<i>Agrostis alba</i>	6	5.77	6.30	4.37	10.14	7.87	10			1	2	15			15	20
Nt	B-Forb	X	<i>Rudbeckia hirta</i>	7	6.73	4.10	2.85	9.58	4.89		2	15	10	4	5	3			2
Ad	P-Forb		<i>Coreopsis lanceolata</i>	4	3.85	2.70	1.87	5.72	4.74				4		3	15	5		
Ad	P-Forb		<i>Taraxacum officinale</i>	4	3.85	0.50	0.35	4.19	0.71		1				2	1	1		
Nt	B-Forb	X	<i>Oenothera biennis</i>	3	2.88	0.60	0.42	3.30	0.97	2				2				2	
Nt	A-Forb		<i>Ambrosia artemisiifolia</i>	3	2.88	0.30	0.21	3.09	0.48			1		1	1				
Nt	P-Forb	X	<i>Desmodium canadense</i>	3	2.88	0.30	0.21	3.09	0.48	1			1						1
Ad	P-Forb		<i>Artemisia vulgaris</i>	2	1.92	0.30	0.21	2.13	0.67							1	2		
Nt	A-Forb	X	<i>Coryza canadensis</i>	2	1.92	0.30	0.21	2.13	0.67		2				1				
Nt	P-Forb	X	<i>Monarda punctata</i>	1	0.96	1.50	1.04	2.00	4.74		15								
Ad	Vine		<i>Celastrus orbiculatus</i>	1	0.96	0.40	0.28	1.24	1.26								4		
Ad	P-Forb		<i>Plantago lanceolata</i>	1	0.96	0.40	0.28	1.24	1.26									4	
Nt	P-Shrub		<i>Ceanothus americana</i>	1	0.96	0.20	0.14	1.10	0.63		2								
Ad	P-Forb		<i>Cichorium intybus</i>	1	0.96	0.20	0.14	1.10	0.63									2	
Nt	P-Forb	X	<i>Monarda fistulosa</i>	1	0.96	0.20	0.14	1.10	0.63		2								
Ad	P-Forb		<i>Achillea millefolium</i>	1	0.96	0.10	0.07	1.03	0.32								1		
Nt	Vine		<i>Vitis riparia</i>	1	0.96	0.10	0.07	1.03	0.32								1		
				104	100.00	144.10	100.00	200.00											
Non-vegetative ground cover																			
			Soil	10	50.00	15.00	15.00	65.00	9.13	25	30	5	15	15	10	25	15	5	5
			Fine litter	10	50.00	85.00	85.00	135.00	9.13	75	70	95	85	85	90	75	85	95	95
			Coarse litter	0	0.00	0.00	0.00	0.00	0.00										
			Bryophyte	0	0.00	0.00	0.00	0.00	0.00										
			Rock	0	0.00	0.00	0.00	0.00	0.00										
				20	100.00	100.00	100.00	200.00											

Rapp Road Landfill - Test Plot Data
 Plot: TP N24BL
 Date: August 6, 2013
 Samplers: Steve Apfelbaum

Nt/Ad	Physiog	Seeded	SPECIES	AVG															
				AF	RF	AC	RC	IV	STD	1	2	3	4	5	6	7	8	9	10
Ad	P-Grass		<i>Festuca rubra</i>	9	7.69	41.00	29.14	36.83	21.19	35	30	40	30	30	60	50	75		60
Ad	B-Forb		<i>Trifolium repens</i>	7	5.98	24.70	17.56	23.54	24.78	2	20		50		25	70	40	40	
Nt	P-Grass	X	<i>Andropogon gerardii</i>	10	8.55	13.00	9.24	17.79	6.75	5	5	15	25	15	20	15	15	5	10
Nt	P-Grass	X	<i>Andropogon scoparius</i>	9	7.69	7.80	5.54	13.24	8.64	10		10	5	30	10	5	5	1	2
Nt	B-Forb	X	<i>Rudbeckia hirta</i>	9	7.69	7.30	5.19	12.88	5.72	15	8		2	5	5	5	15	3	15
Nt	A-Forb		<i>Cassia fasciculata</i>	8	6.84	6.50	4.62	11.46	6.15		20		2	3	5	5	10	10	10
Nt	P-Forb	X	<i>Lespedeza capitata</i>	8	6.84	3.60	2.56	9.40	3.72	3	3	10	10		5	3		1	1
Nt	P-Grass		<i>Panicum virgatum</i>	4	3.42	5.90	4.19	7.61	9.39				10		4			20	25
Nt	P-Forb	X	<i>Lupinus perennis</i>	5	4.27	3.90	2.77	7.05	7.64	25				3	3	5	3		
Ad	P-Forb		<i>Medicago lupulina</i>	4	3.42	3.80	2.70	6.12	5.67	3	10		10		15				
Nt	P-Forb	X	<i>Desmodium canadense</i>	4	3.42	3.30	2.35	5.76	4.47	10	10				5		8		
Nt	A-Forb		<i>Ambrosia artemisiifolia</i>	5	4.27	1.90	1.35	5.62	3.25	1		10		2		1			5
Ad	P-Forb		<i>Coreopsis lanceolata</i>	5	4.27	1.80	1.28	5.55	2.20	4		5				5	1	3	
Ad	A-Forb		<i>Trifolium arvense</i>	3	2.56	3.50	2.49	5.05	7.84					5		25	5		
Nt	P-Forb	X	<i>Monarda punctata</i>	5	4.27	1.00	0.71	4.98	1.15	2	2	1	3				2		
Ad	P-Grass		<i>Agrostis alba</i>	3	2.56	2.50	1.78	4.34	4.25		10	10						5	
Nt	A-Forb	X	<i>Coryza canadensis</i>	4	3.42	0.60	0.43	3.85	0.84			2		2	1	1			
Ad	P-Forb		<i>Centaurea maculosa</i>	2	1.71	2.00	1.42	3.13	4.83		5			15					
Ad	P-Forb		<i>Lotus corniculatus</i>	2	1.71	1.50	1.07	2.78	3.37		10		5						
Nt	B-Forb	X	<i>Oenothera biennis</i>	2	1.71	1.20	0.85	2.56	3.16	2			10						
Nt	A-Grass	X	<i>Lolium multiflorum</i>	1	0.85	2.00	1.42	2.28	6.32									20	
Ad	P-Forb		<i>Taraxacum officinale</i>	2	1.71	0.50	0.36	2.06	1.08				2			3			
Nt	Tree		<i>Populus deltoides</i>	2	1.71	0.30	0.21	1.92	0.67				2					1	
Nt	P-Forb	X	<i>Monarda fistulosa</i>	1	0.85	0.40	0.28	1.14	1.26					4					
Ad	P-Forb		<i>Artemisia vulgaris</i>	1	0.85	0.30	0.21	1.07	0.95					3					
Ad	P-Forb		<i>Achillea millefolium</i>	1	0.85	0.20	0.14	1.00	0.63									2	
Nt	P-Forb		<i>Euphorbia maculata</i>	1	0.85	0.20	0.14	1.00	0.63		2								
				117	100.00	140.70	100.00	200.00											
Non-vegetative ground cover																			
	Soil			10	50.00	25.50	25.50	75.50	13.43	50	20	20	30	40	30	20	10	5	30
	Fine litter			10	50.00	74.50	74.50	124.50	13.43	50	80	80	70	60	70	80	90	95	70
	Coarse litter			0	0.00	0.00	0.00	0.00	0.00										
	Bryophyte			0	0.00	0.00	0.00	0.00	0.00										
	Rock			0	0.00	0.00	0.00	0.00	0.00										
				20	100.00	100.00	100.00	200.00											

Rapp Road Landfill - Test Plot Data
 Plot: TP N24BM
 Date: August 6, 2013
 Samplers: Steve Apfelbaum

Nt/Ad	Physiog	Seeded	SPECIES	AVG			10	STD											
				AF	RF	AC	RC		IV	1	2	3	4	5	6	7	8	9	10
Ad	P-Grass		<i>Festuca rubra</i>	10	8.62	50.00	40.06	48.68	20.14	30	40	50	30	75	25	60	80	70	40
Nt	P-Grass	X	<i>Andropogon gerardii</i>	10	8.62	11.50	9.21	17.84	7.72	2	15	15	1	15	2	10	15	15	25
Ad	P-Forb		<i>Trifolium repens</i>	6	5.17	11.20	8.97	14.15	12.91	10	2	15		25		30		30	
Nt	P-Grass	X	<i>Andropogon scoparius</i>	10	8.62	6.30	5.05	13.67	5.14	5	15	5	3	10	3	2	2	3	15
Ad	P-Forb		<i>Coreopsis lanceolata</i>	8	6.90	6.30	5.05	11.94	5.58	5	3	8	15	2		10	5	15	
Nt	P-Forb	X	<i>Lespedeza capitata</i>	10	8.62	2.30	1.84	10.46	1.34	2	4	4	1	1	4	2	1	1	3
Ad	P-Forb		<i>Medicago lupulina</i>	7	6.03	5.20	4.17	10.20	6.84		2	3	5		2	20		5	15
Nt	A-Forb		<i>Cassia fasciculata</i>	5	4.31	5.80	4.65	8.96	7.80	5			3		20	15	15		
Nt	P-Forb	X	<i>Lupinus perennis</i>	6	5.17	3.70	2.96	8.14	4.85	3	15		5		5	1			8
Nt	B-Forb	X	<i>Rudbeckia hirta</i>	6	5.17	2.90	2.32	7.50	4.56		2	2		5		2	15		3
Ad	P-Forb		<i>Centaurea maculosa</i>	3	2.59	5.00	4.01	6.59	9.72					10	30			10	
Nt	A-Forb		<i>Ambrosia artemisiifolia</i>	4	3.45	3.90	3.13	6.57	9.29				30	3	2				4
Nt	P-Forb	X	<i>Desmodium canadense</i>	4	3.45	2.20	1.76	5.21	4.76		15	1		5				1	
Ad	P-Grass		<i>Agrostis alba</i>	3	2.59	2.20	1.76	4.35	4.78							2	5	15	
Nt	B-Forb	X	<i>Oenothera biennis</i>	4	3.45	1.10	0.88	4.33	1.52	2							2	3	4
Nt	P-Forb	X	<i>Monarda punctata</i>	4	3.45	0.90	0.72	4.17	1.45		1	3						1	4
Ad	B-Forb		<i>Melilotus officinalis</i>	3	2.59	1.20	0.96	3.55	2.10			5		5				2	
Ad	P-Forb		<i>Lotus corniculatus</i>	3	2.59	0.80	0.64	3.23	1.40		2			2			4		
Ad	A-Forb		<i>Trifolium arvense</i>	3	2.59	0.80	0.64	3.23	1.32	3			3					2	
Ad	P-Forb		<i>Artemisia vulgaris</i>	2	1.72	0.60	0.48	2.20	1.35	4	2								
Nt	P-Forb	X	<i>Solidago gigantea</i>	1	0.86	0.40	0.32	1.18	1.26								4		
Nt	A-Forb	X	<i>Conyza canadensis</i>	1	0.86	0.20	0.16	1.02	0.63	2									
Ad	P-Forb		<i>Achillea millefolium</i>	1	0.86	0.10	0.08	0.94	0.32			1							
Ad	P-Forb		<i>Chrysanthemum leucanthemum</i>	1	0.86	0.10	0.08	0.94	0.32								1		
Nt	P-Grass		<i>Panicum virgatum</i>	1	0.86	0.10	0.08	0.94	0.32				1						
				116	100.00	124.80	100.00	200.00											
Non-vegetative ground cover																			
	Soil			10	50.00	42.50	42.50	92.50	24.64	60	50	50	70	20	80	20	10	15	50
	Fine litter			10	50.00	57.50	57.50	107.50	24.64	40	50	50	30	80	20	80	90	85	50
	Coarse litter			0	0.00	0.00	0.00	0.00	0.00										
	Bryophyte			0	0.00	0.00	0.00	0.00	0.00										
	Rock			0	0.00	0.00	0.00	0.00	0.00										
				20	100.00	100.00	100.00	200.00											

Rapp Road Landfill - Test Plot Data
 Plot: TP N24BU
 Date: August 6, 2013
 Samplers: Steve Apfelbaum

Nt/Ad	Physiog	Seeded	SPECIES	AVG					STD											
				AF	RF	AC	RC	IV		1	2	3	4	5	6	7	8	9	10	
Ad	P-Grass		<i>Festuca rubra</i>	10	9.09	41.50	36.24	45.34	7.47	40	50	30	30	50	40	40	40	50	45	
Ad	P-Forb		<i>Trifolium repens</i>	7	6.36	18.50	16.16	22.52	13.95	25	30	15		20	35	30			30	
Ad	P-Forb		<i>Medicago lupulina</i>	10	9.09	10.50	9.17	18.26	8.24	3	2	10	10	5	5	10	10	25	25	
Nt	P-Grass	X	<i>Andropogon gerardii</i>	9	8.18	5.10	4.45	12.64	3.70	2		10	5	10	5	3	2	4	10	
Nt	P-Grass	X	<i>Andropogon scoparius</i>	9	8.18	4.60	4.02	12.20	3.17	10		5	5	4	3	3	10	3	3	
Nt	P-Forb	X	<i>Lespedeza capitata</i>	9	8.18	3.30	2.88	11.06	2.75	8	3	1	3	4	2		3	8	1	
Ad	P-Forb		<i>Coreopsis lanceolata</i>	7	6.36	4.80	4.19	10.56	4.76	3		5	5	15		5	5	10		
Nt	B-Forb	X	<i>Rudbeckia hirta</i>	4	3.64	5.30	4.63	8.27	12.47			8		4	1			40		
Nt	A-Forb		<i>Ambrosia artemisiifolia</i>	6	5.45	2.80	2.45	7.90	4.59	1	15		2			3	5	2		
Nt	P-Forb	X	<i>Lupinus perennis</i>	5	4.55	3.00	2.62	7.17	3.77		8		5	5			10	2		
Nt	A-Forb		<i>Cassia fasciculata</i>	4	3.64	3.20	2.79	6.43	5.25		10		15		4	3				
Nt	P-Forb	X	<i>Desmodium canadense</i>	4	3.64	1.60	1.40	5.03	3.13	2	10	3		1						
Ad	P-Forb		<i>Artemisia vulgaris</i>	4	3.64	1.00	0.87	4.51	1.63				2			5	2		1	
Nt	P-Grass		<i>Panicum virgatum</i>	3	2.73	1.90	1.66	4.39	3.78	1	10		8							
Ad	P-Forb		<i>Centaurea maculosa</i>	2	1.82	2.00	1.75	3.56	4.22					10		10				
Ad	A-Forb		<i>Trifolium arvense</i>	1	0.91	2.00	1.75	2.66	6.32					20						
Ad	P-Grass		<i>Agrostis alba</i>	2	1.82	0.50	0.44	2.25	1.08		2		3							
Ad	P-Forb		<i>Coronilla varia</i>	2	1.82	0.50	0.44	2.25	1.08	2							3			
Nt	P-Forb	X	<i>Monarda punctata</i>	2	1.82	0.40	0.35	2.17	0.97					3					1	
Nt	B-Forb	X	<i>Oenothera biennis</i>	2	1.82	0.40	0.35	2.17	0.84			2					2			
Ad	P-Forb		<i>Lotus corniculatus</i>	1	0.91	0.30	0.26	1.17	0.95									3		
Ad	P-Forb		<i>Taraxacum officinale</i>	1	0.91	0.30	0.26	1.17	0.95						3					
Ad	A-Forb		<i>Berteroa incana</i>	1	0.91	0.20	0.17	1.08	0.63										2	
Nt	A-Grass		<i>Cenchrus longispinus</i>	1	0.91	0.20	0.17	1.08	0.63							2				
Ad	P-Forb		<i>Cichorium intybus</i>	1	0.91	0.20	0.17	1.08	0.63								2			
Ad	B-Forb		<i>Mellilotus officinalis</i>	1	0.91	0.20	0.17	1.08	0.63								2			
Nt	A-Forb	X	<i>Conyza canadensis</i>	1	0.91	0.10	0.09	1.00	0.32						1					
Ad	B-Forb		<i>Verbascum thapsus</i>	1	0.91	0.10	0.09	1.00	0.32	1										
				110	100.00	114.50	100.00	200.00												
Non-vegetative ground cover																				
Soil				10	50.00	46.00	46.00	96.00	8.43	50	30	60	50	40	40	40	40	50	50	50
Fine litter				10	50.00	54.00	54.00	104.00	8.43	50	70	40	50	60	60	60	60	50	50	50
Coarse litter				0	0.00	0.00	0.00	0.00	0.00											
Rock				0	0.00	0.00	0.00	0.00	0.00											
Bryophyte				0	0.00	0.00	0.00	0.00	0.00											
				20	100.00	100.00	100.00	200.00												

Rapp Road Landfill - Test Plot Data
 Plot: TP R12G
 Date: August 5, 2013
 Samplers: John Larson

Nt/Ad	Physiog	Seeded	SPECIES	AVG				STD											
				AF	RF	AC	RC		IV	1	2	3	4	5	6	7	8	9	10
Ad	P-Forb		<i>Trifolium repens</i>	9	10.34	35.50	37.41	47.75	30.59		50	30	5	25	40	10	25	95	75
Nt	P-Grass	X	<i>Andropogon gerardii</i>	8	9.20	9.60	10.12	19.31	14.96	2	50	3	5		10	15	3		8
Ad	P-Grass		<i>Festuca rubra</i>	6	6.90	7.20	7.59	14.48	15.29	5		2	5	8	2		50		
Nt	B-Forb	X	<i>Oenothera biennis</i>	7	8.05	3.60	3.79	11.84	3.75	3	2	3		3	10	10			5
Ad	P-Forb		<i>Trifolium hybridum</i>	2	2.30	8.00	8.43	10.73	22.01	70			10						
Ad	P-Grass		<i>Poa pratensis</i>	2	2.30	7.50	7.90	10.20	19.04	15		60							
Nt	P-Grass	X	<i>Andropogon scoparius</i>	6	6.90	2.70	2.85	9.74	2.79		4		8	5	5	2			3
Ad	A-Grass		<i>Digitaria sanguinalis</i>	2	2.30	6.50	6.85	9.15	14.15						25	40			
Nt	A-Forb		<i>Ambrosia artemisiifolia</i>	5	5.75	1.50	1.58	7.33	1.78	2	5	3		2	3				
Nt	P-Forb	X	<i>Monarda punctata</i>	4	4.60	1.40	1.48	6.07	2.50			2			2	8			2
Ad	A-Grass		<i>Echinochloa crusgalli</i>	3	3.45	2.00	2.11	5.56	3.50			5				5	10		
Nt	P-Forb	X	<i>Lespedeza capitata</i>	4	4.60	0.90	0.95	5.55	1.20				2	3		2			2
Nt	A-Forb		<i>Erigeron canadensis</i>	3	3.45	0.60	0.63	4.08	1.07		2		3	1					
Nt	P-Forb	X	<i>Monarda fistulosa</i>	3	3.45	0.50	0.53	3.98	0.85	1		2							2
Nt	Tree		<i>Populus deltoides</i>	3	3.45	0.40	0.42	3.87	0.70		2		1			1			
Nt	P-Forb		<i>Desmodium canadense</i>	2	2.30	1.20	1.26	3.56	3.16	2			10						
Nt	P-Grass	X	<i>Sorghastrum nutans</i>	2	2.30	0.80	0.84	3.14	1.75						5				3
Ad	P-Grass		<i>Bromus sp.</i>	2	2.30	0.60	0.63	2.93	1.58		5			1					
Nt	P-Sedge		<i>Cyperus esculentus</i>	1	1.15	1.00	1.05	2.20	3.16								10		
Nt	P-Forb		<i>Euphorbia maculata</i>	1	1.15	0.50	0.53	1.68	1.58							5			
Ad	P-Forb		<i>Lotus corniculatus</i>	1	1.15	0.50	0.53	1.68	1.58		5								
Ad	A-Forb		<i>Vicia sativa</i>	1	1.15	0.50	0.53	1.68	1.58								5		
Ad	P-Forb		<i>Plantago major</i>	1	1.15	0.30	0.32	1.47	0.95		3								
Ad	P-Grass		<i>Agrostis alba</i>	1	1.15	0.20	0.21	1.36	0.63					2					
Nt	A-Forb	X	<i>Bidens frondosa</i>	1	1.15	0.20	0.21	1.36	0.63	2									
Ad	P-Grass		<i>Festuca elatior</i>	1	1.15	0.20	0.21	1.36	0.63					2					
Nt	P-Forb	X	<i>Lupinus perennis</i>	1	1.15	0.20	0.21	1.36	0.63					2					
Ad	B-Forb		<i>Mellilotus sp.</i>	1	1.15	0.20	0.21	1.36	0.63					2					
Ad	A-Forb		<i>Polygonum convolvulus</i>	1	1.15	0.20	0.21	1.36	0.63					2					
Ad	A-Grass		<i>Setaria glauca</i>	1	1.15	0.20	0.21	1.36	0.63					2					
Ad	P-Forb		<i>Artemisia vulgaris</i>	1	1.15	0.10	0.11	1.25	0.32		1								
Ad	Vine		<i>Celastrus orbiculatus</i>	1	1.15	0.10	0.11	1.25	0.32					1					
				87	100.00	94.90	100.00	200.00											
Non-vegetative ground cover																			
			Soil	6	33.33	7.30	25.98	59.31	13.78		2		40	25	2	2			2
			Fine litter	10	55.56	20.40	72.60	128.15	19.71	2	40	10	10	2	20	5	15	40	60
			Coarse litter	0	0.00	0.00	0.00	0.00	0.00										
			Bryophyte	0	0.00	0.00	0.00	0.00	0.00										
			Rock	2	11.11	0.40	1.42	12.53	0.84				2		2				
				18	100.00	28.10	100.00	200.00											

Rapp Road Landfill -Test Plot Data
 Plot: TP R18G
 Date: August 5, 2013
 Samplers: Susan Lehnhardt

Nt/Ad	Physiog	Seeded	SPECIES	AVG					STD										
				AF	RF	AC	RC	IV		1	2	3	4	5	6	7	8	9	10
Ad	P-Grass		<i>Festuca rubra</i>	7	8.05	24.10	25.42	33.47	25.28	70	30	50		50	25		10	6	
Nt	P-Grass	X	<i>Andropogon gerardii</i>	10	11.49	13.40	14.14	25.63	11.27	6	3	5	2	25	15	10	8	25	35
Ad	P-Forb		<i>Trifolium repens</i>	4	4.60	11.20	11.81	16.41	18.41						30		2	50	30
Ad	P-Forb		<i>Trifolium hybridum</i>	5	5.75	9.30	9.81	15.56	13.72	3	10	25		40		15			
Nt	P-Grass	X	<i>Andropogon scoparius</i>	6	6.90	7.10	7.49	14.39	9.65					3	15	30	10	3	10
Nt	P-Forb	X	<i>Lespedeza capitata</i>	6	6.90	3.40	3.59	10.48	3.69					2	8	3	5	6	10
Ad	P-Grass		<i>Festuca elatior</i>	4	4.60	5.40	5.70	10.29	9.86			15	30			5		4	
Nt	P-Forb	X	<i>Monarda punctata</i>	6	6.90	2.50	2.64	9.53	2.51		6			3	3	5		2	6
Nt	B-Forb	X	<i>Oenothera biennis</i>	5	5.75	2.50	2.64	8.38	3.75				2	4	4		3	12	
Nt	P-Forb	X	<i>Desmodium canadense</i>	3	3.45	4.10	4.32	7.77	8.39					1				20	20
Nt	A-Forb	X	<i>Coryza canadensis</i>	5	5.75	0.70	0.74	6.49	0.95		1			3		1		1	1
Nt	A-Forb		<i>Ambrosia artemisiifolia</i>	4	4.60	1.20	1.27	5.86	1.99		2	6			1				3
Ad	P-Forb		<i>Lotus corniculatus</i>	2	2.30	2.60	2.74	5.04	7.88				25			1			
Nt	P-Grass	X	<i>Sorghastrum nutans</i>	2	2.30	2.30	2.43	4.73	6.29			20	3						
Nt	P-Forb	X	<i>Monarda fistulosa</i>	3	3.45	0.40	0.42	3.87	0.70				1				1		
Nt	Tree		<i>Populus tremuloides</i>	3	3.45	0.30	0.32	3.76	0.48	1					1				1
Ad	P-Grass		<i>Phleum pratense</i>	2	2.30	1.00	1.05	3.35	2.54					8					2
Nt	P-Forb	X	<i>Lupinus perennis</i>	2	2.30	0.30	0.32	2.62	0.67							1	2		
Ad	P-Grass		<i>Dactylis glomerata</i>	1	1.15	0.80	0.84	1.99	2.53				8						
Ad	P-Grass		<i>Agropyron repens</i>	1	1.15	0.60	0.63	1.78	1.90				6						
Nt	P-Forb		<i>Euphorbia maculata</i>	1	1.15	0.50	0.53	1.68	1.58								5		
Ad	B-Forb		<i>Cirsium vulgare</i>	1	1.15	0.30	0.32	1.47	0.95		3								
Ad	P-Forb		<i>Medicago sativa</i>	1	1.15	0.30	0.32	1.47	0.95					3					
Ad	P-Grass		<i>Agrostis alba</i>	1	1.15	0.20	0.21	1.36	0.63									2	
Ad	A-Grass		<i>Setaria faberi</i>	1	1.15	0.20	0.21	1.36	0.63		2								
Nt	A-Forb		<i>Erigeron strigosus</i>	1	1.15	0.10	0.11	1.25	0.32								1		
				87	100.00	94.80	100.00	200.00											
Non-vegetative ground cover																			
	Soil			8	42.11	9.90	9.90	52.01	10.56					2	15	30	25	10	10
	Fine litter			10	52.63	89.60	89.60	142.23	10.42	98	90	100	100	98	85	70	75	90	90
	Coarse litter			0	0.00	0.00	0.00	0.00	0.00										
	Bryophyte			1	5.26	0.50	0.50	5.76	1.58		5								
	Rock			0	0.00	0.00	0.00	0.00	0.00										
				19	100.00	100.00	100.00	200.00											

Rapp Road Landfill - Test Plot Data
 Plot: TP R24G
 Date: August 6, 2013
 Samplers: Steve Apfelbaum

Nt/Ad	Physiog	Seeded	SPECIES	AVG			IV	STD											
				AF	RF	AC			10 RC	1	2	3	4	5	6	7	8	9	10
Ad	P-Grass		<i>Festuca rubra</i>	10	11.63	44.00	34.08	45.71	25.14	60	50	70	50	90	25	10	40	15	30
Ad	B-Forb		<i>Trifolium repens</i>	9	10.47	23.00	17.82	28.28	18.74	30	50	40	50	10	10	10	5		25
Nt	P-Grass	X	<i>Andropogon gerardii</i>	10	11.63	13.50	10.46	22.08	6.69	5	15	10	10	15	10	30	15	10	15
Nt	P-Grass	X	<i>Andropogon scoparius</i>	9	10.47	13.50	10.46	20.92	9.44	15	30	15	10		5	25	5	20	10
Nt	P-Forb	X	<i>Monarda punctata</i>	7	8.14	6.50	5.03	13.17	8.00	1		5			12	2	5	20	20
Ad	P-Forb		<i>Lotus corniculatus</i>	6	6.98	5.90	4.57	11.55	7.36	3		10		15	20	10	1		
Nt	B-Forb		<i>Oenothera biennis</i>	5	5.81	6.20	4.80	10.62	8.63				2		10	25		10	15
Nt	A-Forb		<i>Ambrosia artemisiifolia</i>	6	6.98	3.80	2.94	9.92	6.00	2	3	1	15	15	2				
Nt	A-Forb	X	<i>Coryza canadensis</i>	6	6.98	2.40	1.86	8.84	4.53	1	2	2	2		15	2			
Nt	P-Forb	X	<i>Lespedeza capitata</i>	4	4.65	2.90	2.25	6.90	6.23						2	2		20	5
Ad	P-Forb		<i>Artemisia vulgaris</i>	2	2.33	1.20	0.93	3.26	3.16			2		10					
Ad	P-Forb		<i>Medicago lupulina</i>	2	2.33	1.20	0.93	3.26	3.16				2	10					
Nt	P-Forb	X	<i>Desmodium canadense</i>	2	2.33	1.00	0.77	3.10	2.11									5	5
Nt	A-Grass		<i>Cenchrus longispinus</i>	2	2.33	0.80	0.62	2.95	1.75			3					5		
Nt	Tree		<i>Populus deltoides</i>	2	2.33	0.80	0.62	2.95	1.75		3		5						
Ad	P-Forb		<i>Coronilla varia</i>	1	1.16	1.50	1.16	2.32	4.74				15						
Nt	P-Forb	X	<i>Monarda fistulosa</i>	1	1.16	0.50	0.39	1.55	1.58					5					
Nt	P-Forb	X	<i>Lupinus perennis</i>	1	1.16	0.20	0.15	1.32	0.63							2			
Ad	B-Forb		<i>Melilotus officinalis</i>	1	1.16	0.20	0.15	1.32	0.63							2			
				86	100.00	129.10	100.00	200.00											
Non-vegetative ground cover																			
	Soil			9	47.37	35.00	35.00	82.37	17.64										
	Fine litter			10	52.63	65.00	65.00	117.63	17.64	20	30	25	25		50	50	50	50	50
	Coarse litter			0	0.00	0.00	0.00	0.00	0.00	80	70	75	75	100	50	50	50	50	50
	Bryophyte			0	0.00	0.00	0.00	0.00	0.00										
	Rock			0	0.00	0.00	0.00	0.00	0.00										
				19	100.00	100.00	100.00	200.00											

Rapp Road Landfill - Test Plot Data
 Plot: TP R24B
 Date: August 6, 2013
 Samplers: Susan Lehnhardt & Steve Apfelbaum

Nt/Ad	Physiog	Seeded	SPECIES	AVG					STD										
				AF	RF	AC	RC	IV		1	2	3	4	5	6	7	8	9	10
Ad	P-Grass		<i>Festuca rubra</i>	10	11.36	26.00	24.62	35.98	20.68	15	8	15	10	12	40	40	25	20	75
Ad	P-Forb		<i>Trifolium repens</i>	9	10.23	24.30	23.01	33.24	17.33	30	25	20	25	25	15	40		60	3
Nt	P-Grass	X	<i>Andropogon gerardii</i>	9	10.23	9.70	9.19	19.41	14.80	3	3	6	4	3	15	3		50	10
Nt	A-Forb		<i>Ambrosia artemisiifolia</i>	7	7.95	10.40	9.85	17.80	12.38		1	5	30	20	3	30		15	
Nt	P-Grass	X	<i>Andropogon scoparius</i>	8	9.09	6.40	6.06	15.15	4.70	10	2	10	10	2	10	10		10	
Nt	A-Forb	X	<i>Conyza canadensis</i>	7	7.95	6.10	5.78	13.73	6.85		20	4	10	15	2			5	5
Nt	A-Grass		<i>Cenchrus longispinus</i>	3	3.41	6.00	5.68	9.09	10.49							15	30	15	
Ad	P-Forb		<i>Lotus corniculatus</i>	4	4.55	3.70	3.50	8.05	6.57	3				20	4		10		
Nt	P-Forb	X	<i>Monarda punctata</i>	3	3.41	3.10	2.94	6.34	5.43	6			10	15					
Nt	B-Forb	X	<i>Oenothera biennis</i>	2	2.27	2.20	2.08	4.36	6.29				2		20				
Ad	P-Grass		<i>Festuca elatior</i>	2	2.27	0.60	0.57	2.84	1.58			5							1
Nt	P-Forb	X	<i>Lupinus perennis</i>	2	2.27	0.60	0.57	2.84	1.58		5		1						
Nt	P-Sedge	X	<i>Cyperus houghtonii</i>	2	2.27	0.50	0.47	2.75	1.27				1	4					
Nt	P-Forb	X	<i>Lespedeza capitata</i>	2	2.27	0.40	0.38	2.65	0.97	1					3				
Nt	P-Forb	X	<i>Monarda fistulosa</i>	2	2.27	0.40	0.38	2.65	0.97	1					3				
Ad	P-Forb		<i>Coreopsis lanceolata</i>	1	1.14	1.50	1.42	2.56	4.74							15			
Ad	P-Forb		<i>Artemisia vulgaris</i>	1	1.14	0.50	0.47	1.61	1.58							5			
Ad	A-Grass		<i>Setaria faberi</i>	1	1.14	0.50	0.47	1.61	1.58					5					
Nt	P-Forb		<i>Euphorbia maculata</i>	1	1.14	0.40	0.38	1.52	1.26					4					
Ad	A-Grass		<i>Setaria glauca</i>	1	1.14	0.40	0.38	1.52	1.26			4							
Ad	A-Forb		<i>Cycloloma atriplicifolium</i>	1	1.14	0.30	0.28	1.42	0.95								3		
Ad	A-Grass		<i>Echinochloa crusgalli</i>	1	1.14	0.30	0.28	1.42	0.95										3
Ad	B-Forb		<i>Melilotus officinalis</i>	1	1.14	0.30	0.28	1.42	0.95								3		
Nt	P-Forb	X	<i>Desmodium canadense</i>	1	1.14	0.20	0.19	1.33	0.63			2							
Nt	B-Forb	X	<i>Rudbeckia hirta</i>	1	1.14	0.20	0.19	1.33	0.63							2			
Nt	A-Forb		<i>Cassia fasciculata</i>	1	1.14	0.10	0.09	1.23	0.32								1		
Ad	Vine		<i>Celastrus orbiculatus</i>	1	1.14	0.10	0.09	1.23	0.32										1
Ad	P-Forb		<i>Cerastium vulgatum</i>	1	1.14	0.10	0.09	1.23	0.32				1						
Nt	Cryptogam		<i>Equisetum arvense</i>	1	1.14	0.10	0.09	1.23	0.32		1								
Nt	A-Forb		<i>Erigeron strigosus</i>	1	1.14	0.10	0.09	1.23	0.32					1					
Ad	P-Forb		<i>Medicago lupulina</i>	1	1.14	0.10	0.09	1.23	0.32				1						
				88	100.00	105.60	100.00	200.00											
Non-vegetative ground cover																			
	Soil			10	43.48	24.00	24.00	67.48	19.55	15	40	5	20	25	30	20	70	10	5
	Fine litter			10	43.48	74.50	74.50	117.98	19.78	80	55	95	75	75	70	80	30	90	95
	Coarse litter			0	0.00	0.00	0.00	0.00	0.00										
	Bryophyte			3	13.04	1.50	1.50	14.54	2.42	5	5		5						
	Rock			0	0.00	0.00	0.00	0.00	0.00										
				23	100.00	100.00	100.00	200.00											

Rapp Road Landfill - Test Plot Data
 Plot: TP S12GL
 Date: August 6, 2013
 Samplers: John Larson

Nt/Ad	Physiog	Seeded	SPECIES	AVG				STD											
				AF	RF	AC	RC		IV	1	2	3	4	5	6	7	8	9	10
Ad	P-Forb		<i>Trifolium hybridum</i>	10	15.38	53.00	53.86	69.25	38.11	90	2	98	90	75	50	10	10	25	80
Ad	P-Grass		<i>Festuca rubra</i>	6	9.23	19.60	19.92	29.15	28.79				2		2	50	75	55	12
Nt	P-Grass	X	<i>Andropogon gerardii</i>	9	13.85	6.40	6.50	20.35	4.06		8	2	8	3	10	12	10	8	3
Nt	A-Forb		<i>Erigeron strigosus</i>	5	7.69	6.10	6.20	13.89	9.13					20	25	8	3	5	
Nt	A-Forb		<i>Erigeron canadensis</i>	6	9.23	2.20	2.24	11.47	3.05	2			2		10	2		4	2
Nt	P-Grass	X	<i>Andropogon scoparius</i>	5	7.69	1.70	1.73	9.42	1.95		3			3		5	4	2	
Nt	P-Grass	X	<i>Sorghastrum nutans</i>	4	6.15	1.20	1.22	7.37	1.75				5				3	2	2
Nt	B-Forb	X	<i>Oenothera biennis</i>	3	4.62	1.70	1.73	6.34	3.33		10				5	2			
Nt	P-Forb	X	<i>Monarda punctata</i>	3	4.62	1.30	1.32	5.94	2.58		8					3	2		
Ad	P-Grass		<i>Festuca elatior</i>	2	3.08	0.40	0.41	3.48	0.84									2	2
Ad	B-Forb		<i>Melilotus sp.</i>	2	3.08	0.40	0.41	3.48	0.84		2				2				
Ad	A-Grass		<i>Echinochloa crusgalli</i>	1	1.54	1.50	1.52	3.06	4.74		15								
Ad	Tree		<i>Robinia pseudoacacia</i>	1	1.54	1.00	1.02	2.55	3.16		10								
Ad	P-Forb		<i>Artemisia vulgaris</i>	1	1.54	0.40	0.41	1.94	1.26										4
Nt	P-Forb	X	<i>Asclepias syriaca</i>	1	1.54	0.30	0.30	1.84	0.95					3					
Nt	A-Forb		<i>Polygonum pensylvanicum</i>	1	1.54	0.30	0.30	1.84	0.95		3								
Ad	P-Forb		<i>Cirsium arvense</i>	1	1.54	0.20	0.20	1.74	0.63						2				
Ad	A-Grass		<i>Digitaria sanguinalis</i>	1	1.54	0.20	0.20	1.74	0.63		2								
Nt	P-Forb	X	<i>Lespedeza capitata</i>	1	1.54	0.20	0.20	1.74	0.63		2								
Ad	P-Grass		<i>Phleum pratense</i>	1	1.54	0.20	0.20	1.74	0.63	2									
Nt	P-Forb	X	<i>Monarda fistulosa</i>	1	1.54	0.10	0.10	1.64	0.32					1					
				65	100.00	98.40	100.00	200.00											
Non-vegetative ground cover																			
Soil				6	35.29	5.00	24.51	59.80	12.34		40			2	2	2	2	2	
Fine litter				10	58.82	15.20	74.51	133.33	8.78	25	5	25	10	20	20	10	10	25	2
Coarse litter				0	0.00	0.00	0.00	0.00	0.00										
Bryophyte				0	0.00	0.00	0.00	0.00	0.00										
Rock				1	5.88	0.20	0.98	6.86	0.63									2	
				17	100.00	20.40	100.00	200.00											

Rapp Road Landfill - Test Plot Data
 Plot: TP S12GM
 Date: August 5, 2013
 Samplers: John Larson

Nt/Ad	Physiog	Seeded	SPECIES	AVG					STD										
				AF	RF	AC	RC	IV		1	2	3	4	5	6	7	8	9	10
Ad	P-Forb		<i>Trifolium repens</i>	9	9.47	50.50	53.90	63.37	28.33	90	70	50	50	15		80	40	70	40
Ad	P-Grass		<i>Festuca rubra</i>	8	8.42	9.90	10.57	18.99	18.53		2	2	5		2	20	60	3	5
Nt	P-Grass	X	<i>Andropogon gerardii</i>	7	7.37	4.60	4.91	12.28	4.09	3	10	8	10	7	6		2		
Nt	P-Grass	X	<i>Andropogon scoparius</i>	8	8.42	3.10	3.31	11.73	3.03	4	2	10	2	5	2			5	1
Nt	A-Forb		<i>Erigeron canadensis</i>	6	6.32	4.50	4.80	11.12	5.17		10	5	5	8	2			15	
Ad	A-Grass		<i>Setaria glauca</i>	4	4.21	3.20	3.42	7.63	7.74			2		3	25				2
Nt	P-Forb		<i>Euphorbia maculata</i>	5	5.26	2.00	2.13	7.40	3.13		10			2	4			2	2
Ad	P-Forb		<i>Cirsium arvense</i>	4	4.21	2.30	2.45	6.67	4.64				15				2	3	3
Nt	P-Grass	X	<i>Sorghastrum nutans</i>	4	4.21	2.10	2.24	6.45	4.63	2			15				2		2
Nt	Tree		<i>Populus deltoides</i>	5	5.26	0.60	0.64	5.90	0.70		1	1		2	1				1
Nt	P-Forb	X	<i>Monarda punctata</i>	3	3.16	2.00	2.13	5.29	4.69		3		2		15				
Ad	A-Grass		<i>Digitaria sanguinalis</i>	3	3.16	1.50	1.60	4.76	3.17	3		10							2
Nt	B-Forb	X	<i>Oenothera biennis</i>	3	3.16	1.10	1.17	4.33	1.85		3			5					3
Ad	B-Forb		<i>Cirsium vulgare</i>	3	3.16	0.80	0.85	4.01	1.62		1			5	2				
Nt	P-Sedge		<i>Cyperus esculentus</i>	3	3.16	0.70	0.75	3.90	1.57					5					1
Nt	P-Forb	X	<i>Lespedeza capitata</i>	3	3.16	0.70	0.75	3.90	1.16		2		3						2
Nt	P-Forb	X	<i>Monarda fistulosa</i>	3	3.16	0.70	0.75	3.90	1.16		2						2		3
Nt	A-Forb		<i>Erigeron strigosus</i>	2	2.11	1.10	1.17	3.28	2.60	3			8						
Ad	A-Grass		<i>Eragrostis mexicana</i>	1	1.05	0.30	0.32	1.37	0.95			3							
Nt	P-Sedge	X	<i>Cyperus houghtonii</i>	1	1.05	0.20	0.21	1.27	0.63			2							
Nt	P-Forb	X	<i>Desmodium canadense</i>	1	1.05	0.20	0.21	1.27	0.63				2						
Ad	P-Forb		<i>Lotus corniculatus</i>	1	1.05	0.20	0.21	1.27	0.63						2				
Nt	P-Forb	X	<i>Lupinus perennis</i>	1	1.05	0.20	0.21	1.27	0.63						2				
Nt	A-Forb		<i>Oxalis europaea</i>	1	1.05	0.20	0.21	1.27	0.63					2					
Ad	P-Forb		<i>Plantago major</i>	1	1.05	0.20	0.21	1.27	0.63					2					
Nt	A-Forb		<i>Polygonum pensylvanicum</i>	1	1.05	0.20	0.21	1.27	0.63			2							
Ad	A-Forb		<i>Stellaria meadia</i>	1	1.05	0.20	0.21	1.27	0.63		2								
Ad	P-Forb		<i>Taraxacum officinale</i>	1	1.05	0.20	0.21	1.27	0.63	2									
Ad	Vine		<i>Celastrus orbiculatus</i>	1	1.05	0.10	0.11	1.16	0.32						1				
Nt	B-Forb		<i>Lactuca canadensis</i>	1	1.05	0.10	0.11	1.16	0.32					1					
				95	100.00	93.70	100.00	200.00											
Non-vegetative ground cover																			
			Soil	8	40.00	17.50	60.55	100.55	20.28	2	30	40	3	60	15			5	20
			Fine litter	10	50.00	10.90	37.72	87.72	7.03	2	20	5	20	10	20	10	10	2	10
			Coarse litter	0	0.00	0.00	0.00	0.00	0.00										
			Bryophyte	1	5.00	0.20	0.69	5.69	0.63					2					
			Rock	1	5.00	0.30	1.04	6.04	0.95			3							
				20	100.00	28.90	100.00	200.00											

Rapp Road Landfill - Test Plot Data
 Plot: TP S12GU
 Date: August 5, 2013
 Samplers: John Larson

Nt/Ad	Physiogn	Seeded	SPECIES	AVG			10		STD										
				AF	RF	AC	RC	IV		1	2	3	4	5	6	7	8	9	10
Ad	P-Forb		<i>Trifolium repens</i>	10	11.24	47.80	52.70	63.94	30.85	60	90	70	25	80	15	70	50	10	8
Ad	P-Grass		<i>Festuca rubra</i>	6	6.74	12.20	13.45	20.19	16.58	2					12	25	8	25	50
Nt	P-Grass	X	<i>Andropogon gerardii</i>	9	10.11	3.80	4.19	14.30	2.20	2	3	4	8	5	2	4	5	5	
Ad	A-Grass		<i>Digitaria sanguinalis</i>	4	4.49	8.10	8.93	13.42	15.97				1		15			50	15
Nt	P-Grass	X	<i>Sorghastrum nutans</i>	5	5.62	3.80	4.19	9.81	4.34			5	10	5	10		8		
Nt	P-Forb		<i>Euphorbia maculata</i>	5	5.62	3.50	3.86	9.48	4.95			15	5	2	5				8
Nt	P-Grass	X	<i>Andropogon scoparius</i>	6	6.74	1.60	1.76	8.51	1.65	3			2	2	4	1	4		
Nt	B-Forb	X	<i>Oenothera biennis</i>	5	5.62	1.40	1.54	7.16	1.65	2		4		2	2		4		
Ad	P-Forb		<i>Cirsium arvense</i>	4	4.49	0.60	0.66	5.16	0.84		1	2			1		2		
Nt	P-Forb	X	<i>Monarda fistulosa</i>	3	3.37	0.80	0.88	4.25	1.40			2	4						
Nt	A-Forb		<i>Erigeron canadensis</i>	3	3.37	0.70	0.77	4.14	1.25	3								1	3
Ad	P-Grass		<i>Festuca elatior</i>	3	3.37	0.70	0.77	4.14	1.16						2			3	2
Ad	A-Grass		<i>Echinochloa crusgalli</i>	2	2.25	0.70	0.77	3.02	1.64					5				2	
Nt	P-Forb	X	<i>Monarda punctata</i>	2	2.25	0.40	0.44	2.69	0.97			1			3				
Ad	P-Forb		<i>Plantago major</i>	2	2.25	0.40	0.44	2.69	0.84	2							2		
Nt	P-Forb	X	<i>Solidago juncea</i>	2	2.25	0.40	0.44	2.69	0.84				2			2			
Ad	A-Forb		<i>Stellaria media</i>	2	2.25	0.40	0.44	2.69	0.84				2		2				
Nt	Vine		<i>Vitis riparia</i>	2	2.25	0.40	0.44	2.69	0.84								2		2
Nt	P-Forb	X	<i>Lespedeza capitata</i>	2	2.25	0.30	0.33	2.58	0.67				1				2		
Nt	A-Forb		<i>Erigeron strigosus</i>	1	1.12	0.50	0.55	1.67	1.58					5					
Nt	Cryptogam		<i>Equisetum arvense</i>	1	1.12	0.30	0.33	1.45	0.95					3					
Ad	Vine		<i>Celastrus orbiculatus</i>	1	1.12	0.20	0.22	1.34	0.63	2									
Nt	P-Forb	X	<i>Desmodium canadense</i>	1	1.12	0.20	0.22	1.34	0.63								2		
Nt	A-Forb	X	<i>Erechtites hieracifolia</i>	1	1.12	0.20	0.22	1.34	0.63	2									
Nt	A-Forb		<i>Oxalis europaea</i>	1	1.12	0.20	0.22	1.34	0.63								2		
Nt	Tree		<i>Populus deltoides</i>	1	1.12	0.20	0.22	1.34	0.63				2						
Nt	Tree		<i>Rhus typhina</i>	1	1.12	0.20	0.22	1.34	0.63	2									
Nt	P-Forb	X	<i>Solidago gigantea</i>	1	1.12	0.20	0.22	1.34	0.63					2					
Ad	P-Forb		<i>Sonchus sp.</i>	1	1.12	0.20	0.22	1.34	0.63					2					
Ad	P-Forb		<i>Taraxacum officinale</i>	1	1.12	0.20	0.22	1.34	0.63				2						
Nt	P-Forb	X	<i>Asclepias syriaca</i>	1	1.12	0.10	0.11	1.23	0.32	1									
				89	100.00	90.70	100.00	200.00											
Non-vegetative ground cover																			
	Soil			5	31.25	6.30	18.31	49.56	11.80	4			35		20		2	2	
	Fine litter			10	62.50	28.00	81.40	143.90	13.98	25	10	50	15	20	20	25	25	40	50
	Coarse litter			0	0.00	0.00	0.00	0.00	0.00										
	Bryophyte			1	6.25	0.10	0.29	6.54	0.32	1									
	Rock			0	0.00	0.00	0.00	0.00	0.00										
				16	100.00	34.40	100.00	200.00											

Rapp Road Landfill - Test Plot Data
 Plot: TP S18GL
 Date: August 6, 2013
 Samplers: Susan Lehnhardt

Nt/Ad	Physiog	Seeded	SPECIES	AF	RF	AC	RC	IV	STD	1	2	3	4	5	6	7	8	9	10		
Ad	P-Forb		<i>Trifolium hybridum</i>	4	3.33	15.50	16.33	19.67	26.29	15				40			20	80			
Nt	Tree		<i>Populus deltoides</i>	9	7.50	10.40	10.96	18.46	12.92	1	15	10	8	45	8	8	4		5		
Nt	P-Grass	X	<i>Andropogon gerardii</i>	10	8.33	7.30	7.69	16.03	3.83	10	10	10	3	15	7	5	4	5	4		
Nt	P-Grass	X	<i>Andropogon scoparius</i>	9	7.50	7.90	8.32	15.82	7.42	5	2	3	12		12	25	8	2	10		
Ad	P-Forb		<i>Trifolium repens</i>	5	4.17	10.10	10.64	14.81	16.17	40	8	3	10				40				
Nt	P-Grass	X	<i>Sorghastrum nutans</i>	7	5.83	7.40	7.80	13.63	6.59	15	10	12	3		6		18	10			
Nt	P-Forb	X	<i>Desmodium canadense</i>	4	3.33	6.20	6.53	9.87	10.88		28	25		5		4					
Nt	P-Forb	X	<i>Lespedeza capitata</i>	7	5.83	3.30	3.48	9.31	2.54		3	3	6		4	6	6	5			
Nt	A-Forb	X	<i>Conyza canadensis</i>	7	5.83	2.10	2.21	8.05	2.02	1	2	4			2	4	2		6		
Ad	A-Grass		<i>Setaria glauca</i>	2	1.67	6.00	6.32	7.99	13.50		20	40									
Nt	P-Forb	X	<i>Lupinus perennis</i>	3	2.50	2.30	2.42	4.92	3.83				10		7				6		
Nt	P-Forb	X	<i>Monarda fistulosa</i>	4	3.33	1.10	1.16	4.49	1.60	4		1		3					3		
Nt	P-Forb	X	<i>Monarda punctata</i>	3	2.50	1.40	1.48	3.98	2.37				6				5	3			
Nt	P-Forb		<i>Euphorbia maculata</i>	4	3.33	0.60	0.63	3.97	0.84							1			2		
Nt	Tree		<i>Crataegus sp.</i>	4	3.33	0.50	0.53	3.86	0.71		2	1		1					1		
Ad	P-Grass		<i>Phleum pratense</i>	3	2.50	0.60	0.63	3.13	1.07			2			1				3		
Nt	P-Sedge	X	<i>Scirpus atrovirens</i>	1	0.83	2.00	2.11	2.94	6.32					20							
Nt	Cryptogam		<i>Equisetum arvense</i>	2	1.67	1.10	1.16	2.83	3.14						1			10			
Ad	B-Forb		<i>Melilotus officinalis</i>	2	1.67	0.80	0.84	2.51	1.69						4				4		
Nt	A-Grass	X	<i>Lolium multiflorum</i>	1	0.83	1.50	1.58	2.41	4.74									15			
Ad	P-Forb		<i>Artemisia vulgaris</i>	2	1.67	0.70	0.74	2.40	1.89				1		6						
Nt	A-Forb		<i>Polygonum pensylvanicum</i>	2	1.67	0.30	0.32	1.98	0.67					1					2		
Ad	A-Grass		<i>Digitaria sanguinalis</i>	1	0.83	1.00	1.05	1.89	3.16										10		
Nt	A-Forb	X	<i>Erechtites hieracifolia</i>	2	1.67	0.20	0.21	1.88	0.42	1									1		
Ad	B-Forb		<i>Daucus carota</i>	1	0.83	0.80	0.84	1.68	2.53			8									
Ad	P-Grass		<i>Festuca elatior</i>	1	0.83	0.80	0.84	1.68	2.53						8						
Nt	P-Forb		<i>Aster lanceolatum</i>	1	0.83	0.40	0.42	1.25	1.26									4			
Ad	P-Forb		<i>Chrysanthemum leucanthemum</i>	1	0.83	0.30	0.32	1.15	0.95										3		
Nt	P-Forb	X	<i>Solidago graminifolia nuttallii</i>	1	0.83	0.30	0.32	1.15	0.95						3						
Nt	A-Forb	X	<i>Bidens frondosa</i>	1	0.83	0.20	0.21	1.04	0.63	2											
Nt	P-Sedge		<i>Cyperus esculentus</i>	1	0.83	0.20	0.21	1.04	0.63		2										
Ad	P-Forb		<i>Lotus corniculatus</i>	1	0.83	0.20	0.21	1.04	0.63								2				
Nt	Tree		<i>Acer rubrum</i>	1	0.83	0.10	0.11	0.94	0.32			1									
Ad	P-Grass		<i>Agrostis alba</i>	1	0.83	0.10	0.11	0.94	0.32						1						
Nt	A-Forb		<i>Ambrosia artemisiifolia</i>	1	0.83	0.10	0.11	0.94	0.32								1				
Nt	P-Forb	X	<i>Aster ericoides</i>	1	0.83	0.10	0.11	0.94	0.32			1									
Ad	P-Forb		<i>Cirsium arvense</i>	1	0.83	0.10	0.11	0.94	0.32	1											
Ad	B-Forb		<i>Cirsium vulgare</i>	1	0.83	0.10	0.11	0.94	0.32			1									
Nt	P-Sedge	X	<i>Cyperus houghtonii</i>	1	0.83	0.10	0.11	0.94	0.32			1									
Nt	P-Forb	X	<i>Epilobium coloratum</i>	1	0.83	0.10	0.11	0.94	0.32			1									
Nt	A-Forb		<i>Erigeron strigosus</i>	1	0.83	0.10	0.11	0.94	0.32			1									
Ad	A-Forb		<i>Lychnis alba</i>	1	0.83	0.10	0.11	0.94	0.32				1								
Ad	P-Forb		<i>Medicago lupulina</i>	1	0.83	0.10	0.11	0.94	0.32				1								
Nt	A-Forb		<i>Oxalis europaea</i>	1	0.83	0.10	0.11	0.94	0.32				1								
Nt	P-Forb		<i>Solidago canadensis</i>	1	0.83	0.10	0.11	0.94	0.32			1									
Nt	P-Forb	X	<i>Solidago rugosa</i>	1	0.83	0.10	0.11	0.94	0.32		1										
				120	100.00	94.90	100.00	200.00													
Non-vegetative ground cover																					
Soil				8	33.33	26.20	25.94	59.27	27.06	2	15	10	45		50	70	10		60		
Fine litter				10	41.67	67.50	66.83	108.50	26.38	95	70	70	40	100	50	30	80	100	40		
Coarse litter				0	0.00	0.00	0.00	0.00	0.00												
Bryophyte				6	25.00	7.30	7.23	32.23	7.65	3	15	20	15		10		10				
Rock				0	0.00	0.00	0.00	0.00	0.00												
				24	100.00	101.00	100.00	200.00													

Rapp Road Landfill - Test Plot Data
 Plot: TP S18GM
 Date: August 6, 2013
 Samplers: Susan Lehnhardt

Nt/Ad	Physiogn	Seeded	SPECIES	AVG				STD	10									
				AF	RF	AC	RC		IV	1	2	3	4	5	6	7	8	9
Ad	P-Forb		<i>Trifolium repens</i>	4	3.48	24.00	22.35	25.82	33.73	80		80	40					40
Nt	P-Grass	X	<i>Sorghastrum nutans</i>	10	8.70	10.40	9.68	18.38	6.26	6	10	20	12	2	20	5	8	6
Ad	P-Forb		<i>Trifolium hybridum</i>	5	4.35	14.80	13.78	18.13	25.59		65	5		15				3
Nt	Tree		<i>Populus deltoides</i>	8	6.96	11.70	10.89	17.85	10.32		22	25	5		2	10	25	8
Nt	P-Grass	X	<i>Andropogon gerardii</i>	9	7.83	9.90	9.22	17.04	5.84	18	5	15	10		10	5	8	18
Nt	P-Grass	X	<i>Andropogon scoparius</i>	9	7.83	7.80	7.26	15.09	4.29		4	5	8	12	10	15	6	8
Nt	P-Forb	X	<i>Lespedeza capitata</i>	9	7.83	4.60	4.28	12.11	3.84	1	1	1	8		10	6	10	5
Ad	A-Grass		<i>Setaria glauca</i>	3	2.61	5.40	5.03	7.64	10.41								25	25
Nt	A-Forb	X	<i>Coryza canadensis</i>	6	5.22	1.50	1.40	6.61	1.78	1		1	5	4		2		2
Nt	A-Forb		<i>Ambrosia artemisiifolia</i>	4	3.48	1.40	1.30	4.78	1.96						5	2	4	
Nt	B-Forb	X	<i>Oenothera biennis</i>	4	3.48	1.30	1.21	4.69	2.11			1	2				6	
Nt	P-Forb	X	<i>Desmodium canadense</i>	3	2.61	2.20	2.05	4.66	4.73			15					3	
Ad	P-Forb		<i>Medicago sativa</i>	2	1.74	3.00	2.79	4.53	7.89		5		25					
Nt	A-Grass	X	<i>Lolium multiflorum</i>	4	3.48	0.90	0.84	4.32	1.29			3	1	3	2			
Ad	P-Grass		<i>Phleum pratense</i>	3	2.61	1.60	1.49	4.10	2.95			2		8	6			
Nt	P-Forb	X	<i>Monarda fistulosa</i>	4	3.48	0.50	0.47	3.94	0.71	2	1					1	1	
Nt	P-Forb		<i>Solidago canadensis</i>	3	2.61	1.40	1.30	3.91	2.80		1						8	5
Nt	P-Forb		<i>Euphorbia maculata</i>	3	2.61	0.30	0.28	2.89	0.48			1				1	1	
Nt	A-Forb	X	<i>Bidens frondosa</i>	2	1.74	0.30	0.28	2.02	0.67									1
Nt	A-Forb		<i>Oxalis europaea</i>	2	1.74	0.30	0.28	2.02	0.67								2	1
Ad	A-Grass		<i>Digitaria sanguinalis</i>	1	0.87	0.80	0.74	1.61	2.53		8							
Nt	P-Grass		<i>Panicum virgatum</i>	1	0.87	0.60	0.56	1.43	1.90			6						
Ad	P-Grass		<i>Festuca elatior</i>	1	0.87	0.40	0.37	1.24	1.26							4		
Ad	P-Forb		<i>Lotus corniculatus</i>	1	0.87	0.40	0.37	1.24	1.26			4						
Nt	P-Sedge	X	<i>Cyperus houghtonii</i>	1	0.87	0.30	0.28	1.15	0.95					3				
Nt	P-Forb	X	<i>Monarda punctata</i>	1	0.87	0.30	0.28	1.15	0.95								3	
Nt	P-Forb	X	<i>Epilobium coloratum</i>	1	0.87	0.20	0.19	1.06	0.63									
Ad	P-Forb		<i>Artemisia vulgaris</i>	1	0.87	0.10	0.09	0.96	0.32		1							
Ad	P-Forb		<i>Cerastium vulgatum</i>	1	0.87	0.10	0.09	0.96	0.32						1			
Ad	B-Forb		<i>Cirsium vulgare</i>	1	0.87	0.10	0.09	0.96	0.32					1				
Nt	Tree		<i>Crataegus sp.</i>	1	0.87	0.10	0.09	0.96	0.32									1
Nt	A-Forb		<i>Erigeron strigosus</i>	1	0.87	0.10	0.09	0.96	0.32									1
Ad	P-Grass		<i>Festuca rubra</i>	1	0.87	0.10	0.09	0.96	0.32							1		
Ad	B-Forb		<i>Lactuca serriola</i>	1	0.87	0.10	0.09	0.96	0.32	1								
Nt	P-Forb	X	<i>Lupinus perennis</i>	1	0.87	0.10	0.09	0.96	0.32								1	
Ad	P-Forb		<i>Medicago lupulina</i>	1	0.87	0.10	0.09	0.96	0.32						1			
Nt	P-Forb	X	<i>Solidago rugosa</i>	1	0.87	0.10	0.09	0.96	0.32	1								
Nt	P-Forb	X	<i>Verbena hastata</i>	1	0.87	0.10	0.09	0.96	0.32								1	
				115	100.00	107.40	100.00	200.00										
			Non-vegetative ground cover															
			Soil	9	34.62	9.30	10.32	44.94	8.74	1	1	1	10	20	20	15	20	5
			Fine litter	9	34.62	73.80	81.91	116.52	28.55	99	95	99	85	75	70	70	70	75
			Coarse litter	1	3.85	0.20	0.22	4.07	0.63					2				
			Rock	0	0.00	0.00	0.00	0.00	0.00									
			Bryophyte	7	26.92	6.80	7.55	34.47	6.83									
				26	100.00	90.10	100.00	200.00			4		5	4	10	15	10	20

Rapp Road Landfill - Test Plot Data
 Plot: TP S18GU
 Date: August 5, 2013
 Samplers: Susan Lehnhardt

Nt/Ad	Physiogn	Seeded	SPECIES	AVG						10									
				AF	RF	AC	RC	IV	STD	1	2	3	4	5	6	7	8	9	10
Nt	P-Grass	X	<i>Andropogon gerardii</i>	10	7.69	17.00	16.62	24.31	5.37	5	15	20	15	25	15	15	20	20	20
Ad	P-Forb		<i>Trifolium hybridum</i>	4	3.08	15.40	15.05	18.13	31.51						3	1	70	80	
Nt	P-Grass	X	<i>Andropogon scoparius</i>	10	7.69	10.60	10.36	18.05	11.85	40	5	4	20	15	8	5	2	5	2
Nt	P-Forb	X	<i>Lespedeza capitata</i>	10	7.69	5.90	5.77	13.46	2.92	6	5	10	4	5	5	11	8	2	3
Nt	Tree		<i>Populus deltoides</i>	5	3.85	8.70	8.50	12.35	13.63	25	10				40	2	10		
Ad	P-Forb		<i>Desmodium canadense</i>	5	3.85	7.60	7.43	11.28	9.71		20	20				15	20		1
Nt	A-Forb	X	<i>Coryza canadensis</i>	9	6.92	2.30	2.25	9.17	1.77	1	2	3		6	1	3	1	2	4
Nt	P-Grass	X	<i>Sorghastrum nutans</i>	6	4.62	3.60	3.52	8.13	3.44			5	6	10		5	5	5	
Ad	P-Grass		<i>Phleum pratense</i>	6	4.62	3.20	3.13	7.74	3.22	5		8	8		5			3	3
Nt	B-Forb	X	<i>Oenothera biennis</i>	5	3.85	2.00	1.96	5.80	2.71		4	1		4		8			3
Nt	Tree		<i>Populus tremuloides</i>	3	2.31	2.30	2.25	4.56	6.25			20	2	1					
Ad	P-Forb		<i>Trifolium repens</i>	2	1.54	2.60	2.54	4.08	7.88	1				25					
Nt	A-Grass	X	<i>Lolium multiflorum</i>	2	1.54	2.40	2.35	3.88	6.31				20		4				
Nt	P-Forb	X	<i>Monarda fistulosa</i>	4	3.08	0.70	0.68	3.76	1.06							2	1	3	1
Nt	P-Forb		<i>Solidago canadensis</i>	3	2.31	1.00	0.98	3.29	1.76				3	2	5				
Ad	A-Grass		<i>Setaria faberi</i>	1	0.77	2.50	2.44	3.21	7.91						25				
Ad	B-Forb		<i>Melilotus officinalis</i>	3	2.31	0.70	0.68	2.99	1.57					1		1	5		
Ad	A-Grass		<i>Digitaria sanguinalis</i>	1	0.77	2.00	1.96	2.72	6.32							20			
Nt	P-Forb	X	<i>Monarda punctata</i>	3	2.31	0.40	0.39	2.70	0.70				1	2				1	
Nt	A-Forb	X	<i>Erechtites hieracifolia</i>	3	2.31	0.30	0.29	2.60	0.48				1				1	1	
Ad	B-Forb		<i>Daucus carota</i>	2	1.54	0.90	0.88	2.42	2.51		1					8			
Ad	P-Forb		<i>Lotus corniculatus</i>	2	1.54	0.90	0.88	2.42	2.51				1		8				
Nt	Cryptogam		<i>Equisetum arvense</i>	2	1.54	0.60	0.59	2.12	1.35	4					2				
Nt	P-Forb		<i>Potentilla simplex</i>	1	0.77	1.20	1.17	1.94	3.79		12								
Nt	P-Forb		<i>Euphorbia maculata</i>	2	1.54	0.40	0.39	1.93	0.97				3					1	
Nt	A-Forb		<i>Oxalis stricta</i>	2	1.54	0.30	0.29	1.83	0.67		2	1							
Nt	P-Forb	X	<i>Solidago rugosa</i>	2	1.54	0.30	0.29	1.83	0.67						2	1			
Ad	P-Forb		<i>Taraxacum officinale</i>	2	1.54	0.30	0.29	1.83	0.67						1			2	
Nt	P-Grass	X	<i>Juncus dudleyi</i>	1	0.77	1.00	0.98	1.75	3.16						10				
Ad	P-Forb		<i>Plantago major</i>	1	0.77	1.00	0.98	1.75	3.16				10						
Nt	A-Forb		<i>Erigeron strigosus</i>	2	1.54	0.20	0.20	1.73	0.42					1		1			
Ad	P-Forb		<i>Medicago sativa</i>	1	0.77	0.80	0.78	1.55	2.53						8				
Nt	B-Forb	X	<i>Rudbeckia hirta</i>	1	0.77	0.50	0.49	1.26	1.58							5			
Ad	P-Forb		<i>Centaurea maculosa</i>	1	0.77	0.40	0.39	1.16	1.26								4		
Ad	P-Grass		<i>Festuca elatior</i>	1	0.77	0.40	0.39	1.16	1.26					4					
Nt	P-Forb	X	<i>Lupinus perennis</i>	1	0.77	0.30	0.29	1.06	0.95		3								
Nt	A-Forb		<i>Acalypha rhomboidea</i>	1	0.77	0.20	0.20	0.96	0.63										
Nt	P-Forb	X	<i>Asclepias syriaca</i>	1	0.77	0.20	0.20	0.96	0.63									2	
Nt	A-Forb	X	<i>Bidens frondosa</i>	1	0.77	0.20	0.20	0.96	0.63							2			
Nt	P-Sedge		<i>Cyperus esculentus</i>	1	0.77	0.20	0.20	0.96	0.63				2						
Nt	P-Forb	X	<i>Solidago juncea</i>	1	0.77	0.20	0.20	0.96	0.63				2						
Nt	A-Forb		<i>Ambrosia artemisiifolia</i>	1	0.77	0.10	0.10	0.87	0.32				1						
Ad	P-Grass		<i>Artemisia vulgaris</i>	1	0.77	0.10	0.10	0.87	0.32				1						
Ad	P-Forb		<i>Cirsium arvense</i>	1	0.77	0.10	0.10	0.87	0.32					1					
Ad	P-Forb		<i>Cirsium vulgare</i>	1	0.77	0.10	0.10	0.87	0.32		1								
Ad	P-Forb		<i>Coronilla varia</i>	1	0.77	0.10	0.10	0.87	0.32				1						
Ad	P-Forb		<i>Medicago lupulina</i>	1	0.77	0.10	0.10	0.87	0.32				1						
				130	100.00	102.30	100.00	200.00											
Non-vegetative ground cover																			
Soil				10	34.48	24.30	24.92	59.41	28.10	10	30	15	20	25	10	25	3	5	100
Fine litter				9	31.03	67.50	69.23	100.27	26.06	80	60	75	70	70	90	70	65	95	
Coarse litter				0	0.00	0.00	0.00	0.00	0.00										

Rock	3	10.34	0.70	0.72	11.06	1.57
Bryophyte	7	24.14	5.00	5.13	29.27	4.08
	29	100.00	97.50	100.00	200.00	

1	5		1						
10	5	10	10	5		5	5		

Rapp Road Landfill - Test Plot Data
 Plot: TP S24GL
 Date: August 6, 2013
 Samplers: Steve Apfelbaum

Nt/Ad	Physiog	Seeded	SPECIES	AVG				STD											
				AF	RF	AC	RC		IV	1	2	3	4	5	6	7	8	9	10
Ad	P-Forb		<i>Trifolium repens</i>	10	9.01	34.80	22.72	31.72	29.82	30	70	10	20	40	10	5	80	8	75
Nt	Tree		<i>Populus deltoides</i>	10	9.01	32.20	21.02	30.03	34.68	3	15	70	80	90	25	5	3	1	30
Nt	A-Grass	X	<i>Lolium multiflorum</i>	8	7.21	16.50	10.77	17.98	12.26	10	20	25	30	30	5		15		30
Nt	P-Grass	X	<i>Andropogon gerardii</i>	9	8.11	11.90	7.77	15.88	8.66	20	10	15	10		4	5	30	15	10
Nt	P-Grass	X	<i>Andropogon scoparius</i>	7	6.31	9.10	5.94	12.25	15.67	10	2				2	50	2	20	5
Nt	P-Forb	X	<i>Monarda punctata</i>	5	4.50	6.00	3.92	8.42	8.71	20		1			4		15	20	
Ad	P-Grass		<i>Festuca rubra</i>	5	4.50	5.00	3.26	7.77	7.36		15			2	10	3			20
Nt	A-Forb	X	<i>Coryza canadensis</i>	7	6.31	2.20	1.44	7.74	1.87	5	2	2			3	3	2	5	
Nt	P-Forb	X	<i>Lespedeza capitata</i>	5	4.50	4.30	2.81	7.31	5.31	15	5					8	5	10	
Nt	P-Forb	X	<i>Lupinus perennis</i>	3	2.70	3.30	2.15	4.86	5.58	8	15							10	
Nt	A-Forb		<i>Ambrosia artemisiifolia</i>	4	3.60	1.40	0.91	4.52	2.55			2			3	1	8		
Nt	Cryptogam		<i>Equisetum arvense</i>	1	0.90	5.00	3.26	4.16	15.81			50							
Ad	P-Forb		<i>Medicago lupulina</i>	3	2.70	2.20	1.44	4.14	4.78						2	15			5
Nt	P-Forb	X	<i>Epilobium coloratum</i>	3	2.70	1.20	0.78	3.49	2.10			5	5	2					
Ad	P-Grass		<i>Phleum pratense</i>	2	1.80	2.50	1.63	3.43	5.40					10	15				
Nt	P-Forb		<i>Solidago canadensis</i>	2	1.80	2.00	1.31	3.11	4.83			15							5
Ad	P-Forb		<i>Artemisia vulgaris</i>	2	1.80	1.50	0.98	2.78	3.37			5			10				
Nt	P-Grass	X	<i>Juncus dudleyi</i>	2	1.80	1.50	0.98	2.78	3.37			10							5
Nt	B-Forb	X	<i>Oenothera biennis</i>	2	1.80	1.50	0.98	2.78	3.37						5	10			
Nt	P-Forb	X	<i>Desmodium canadense</i>	2	1.80	0.80	0.52	2.32	1.75			3							5
Ad	A-Grass		<i>Setaria viridis</i>	1	0.90	2.00	1.31	2.21	6.32					20					
Ad	B-Grass		<i>Agropyron repens</i>	1	0.90	1.00	0.65	1.55	3.16					10					
Nt	A-Forb	X	<i>Bidens frondosa</i>	1	0.90	1.00	0.65	1.55	3.16				10						
Ad	P-Grass		<i>Agrostis alba</i>	1	0.90	0.50	0.33	1.23	1.58				5						
Ad	B-Forb		<i>Cirsium vulgare</i>	1	0.90	0.50	0.33	1.23	1.58							5			
Nt	P-Sedge		<i>Cyperus strigosus</i>	1	0.90	0.50	0.33	1.23	1.58			5							
Nt	P-Forb	X	<i>Eupatorium perfoliatum</i>	1	0.90	0.30	0.20	1.10	0.95					3					
Ad	P-Forb		<i>Plantago lanceolata</i>	1	0.90	0.30	0.20	1.10	0.95										3
Nt	Shrub		<i>Rubus idaeus</i>	1	0.90	0.30	0.20	1.10	0.95						3				
Ad	P-Forb		<i>Taraxacum officinale</i>	1	0.90	0.30	0.20	1.10	0.95					3					
Nt	P-Forb	X	<i>Verbena hastata</i>	1	0.90	0.30	0.20	1.10	0.95					3					
Nt	P-Forb	X	<i>Monarda fistulosa</i>	1	0.90	0.20	0.13	1.03	0.63						2				
Nt	P-Forb		<i>Potentilla norvegica</i>	1	0.90	0.20	0.13	1.03	0.63										2
Nt	Tree		<i>Prunus nigra</i>	1	0.90	0.20	0.13	1.03	0.63										2
Ad	B-Forb		<i>Verbascum thapsus</i>	1	0.90	0.20	0.13	1.03	0.63						2				
Nt	Vine		<i>Vitis riparia</i>	1	0.90	0.20	0.13	1.03	0.63				2						
Ad	B-Forb		<i>Daucus carota</i>	1	0.90	0.10	0.07	0.97	0.32			1							
Nt	P-Grass	X	<i>Leersia oryzoides</i>	1	0.90	0.10	0.07	0.97	0.32							1			
Nt	A-Forb		<i>Polygonum pensylvanicum</i>	1	0.90	0.10	0.07	0.97	0.32							1			
				111	100.00	153.20	100.00	200.00											
Non-vegetative ground cover																			
			Soil	6	37.50	12.50	12.50	50.00	15.86	20					10	40	10	40	5
			Fine litter	10	62.50	87.50	87.50	150.00	15.86	80	100	100	100	100	90	60	90	60	95
			Coarse litter	0	0.00	0.00	0.00	0.00	0.00										
			Bryophyte	0	0.00	0.00	0.00	0.00	0.00										
			Rock	0	0.00	0.00	0.00	0.00	0.00										
				16	100.00	100.00	100.00	200.00											

Rapp Road Landfill - Test Plot Data
 Plot: TP S24GM
 Date: August 6, 2013
 Samplers: Steve Apfelbaum

Nt/Ad	Physiog	Seeded	SPECIES	AVG			IV	STD												
				AF	RF	AC			RC	1	2	3	4	5	6	7	8	9	10	
Nt	P-Grass	X	<i>Andropogon scoparius</i>	10	8.77	19.00	20.39	29.16	7.75	15	30	30	25	10	25	10	15	15	15	
Nt	P-Grass	X	<i>Andropogon gerardii</i>	10	8.77	8.90	9.55	18.32	8.44	10	5	5	30	2	10	5	5	2	15	
Nt	P-Forb	X	<i>Lespedeza capitata</i>	10	8.77	8.70	9.33	18.11	7.66	4	2	15	25	1	4	3	15	10	8	
Nt	P-Forb	X	<i>Lupinus perennis</i>	8	7.02	6.40	6.87	13.88	5.76	15	4	5	15	4	10		10	1		
Nt	P-Forb	X	<i>Desmodium canadense</i>	4	3.51	9.50	10.19	13.70	15.89				15			15	50	15		
Nt	A-Forb		<i>Ambrosia artemisiifolia</i>	9	7.89	4.20	4.51	12.40	5.35	1	1	2	1	10	1	15	10		1	
Ad	P-Grass		<i>Festuca rubra</i>	8	7.02	4.90	5.26	12.28	4.63	15	5	5	5		2		10	2	5	
Nt	B-Forb	X	<i>Oenothera biennis</i>	6	5.26	4.80	5.15	10.41	6.01	4	15	1	5			15		8		
Ad	P-Forb		<i>Medicago lupulina</i>	5	4.39	3.60	3.86	8.25	6.52	2		2	2		10	20				
Ad	P-Forb		<i>Trifolium repens</i>	4	3.51	4.30	4.61	8.12	7.26	20			15			5			3	
Nt	A-Forb	X	<i>Conyza canadensis</i>	6	5.26	2.30	2.47	7.73	3.13		5	2	2	10				2	2	
Nt	P-Forb	X	<i>Monarda punctata</i>	4	3.51	2.50	2.68	6.19	3.54	5	10		5						5	
Ad	P-Forb		<i>Centaurea maculosa</i>	1	0.88	4.00	4.29	5.17	12.65								40			
Nt	Tree		<i>Populus deltoides</i>	3	2.63	1.10	1.18	3.81	2.08						1		5	5		
Nt	A-Forb		<i>Lepidium virginicum</i>	3	2.63	0.40	0.43	3.06	0.70		2	1		1						
Nt	A-Grass	X	<i>Lolium multiflorum</i>	2	1.75	1.00	1.07	2.83	2.11			5						5		
Ad	P-Forb		<i>Lotus corniculatus</i>	2	1.75	0.70	0.75	2.51	1.64	2					5					
Ad	P-Forb		<i>Medicago sativa</i>	1	0.88	1.50	1.61	2.49	4.74										15	
Ad	B-Forb		<i>Verbascum thapsus</i>	2	1.75	0.50	0.54	2.29	1.08		3		2							
Ad	Vine		<i>Celastrus orbiculatus</i>	2	1.75	0.30	0.32	2.08	0.67	2				1						
Nt	P-Sedge	X	<i>Cyperus houghtonii</i>	2	1.75	0.20	0.21	1.97	0.42									1	1	
Ad	P-Grass		<i>Agrostis alba</i>	1	0.88	1.00	1.07	1.95	3.16							10				
Ad	P-Forb		<i>Artemisia vulgaris</i>	1	0.88	1.00	1.07	1.95	3.16						10					
Nt	A-Forb		<i>Oxalis stricta</i>	1	0.88	0.50	0.54	1.41	1.58		5									
Ad	Vine		<i>Campsis radicans</i>	1	0.88	0.40	0.43	1.31	1.26		4									
Nt	P-Grass		<i>Panicum virgatum</i>	1	0.88	0.30	0.32	1.20	0.95			3								
Nt	A-Grass		<i>Cenchrus longispinus</i>	1	0.88	0.20	0.21	1.09	0.63		2									
Nt	A-Forb		<i>Erigeron strigosus</i>	1	0.88	0.20	0.21	1.09	0.63									2		
Ad	P-Grass		<i>Phleum pratense</i>	1	0.88	0.20	0.21	1.09	0.63			2								
Nt	Vine		<i>Rhus radicans</i>	1	0.88	0.20	0.21	1.09	0.63										2	
Nt	P-Forb		<i>Solidago canadensis</i>	1	0.88	0.20	0.21	1.09	0.63						2					
Ad	A-Forb		<i>Chenopodium album</i>	1	0.88	0.10	0.11	0.98	0.32				1							
Ad	A-Forb		<i>Dianthus armeria</i>	1	0.88	0.10	0.11	0.98	0.32									1		
				114	100.00	93.20	100.00	200.00												
Non-vegetative ground cover																				
Soil				10	50.00	61.00	61.00	111.00	17.92	70	70	70	50	90	40	40	40	40	80	60
Fine litter				10	50.00	39.00	39.00	89.00	17.92	30	30	30	50	10	60	60	60	60	20	40
Coarse litter				0	0.00	0.00	0.00	0.00	0.00											
Bryophyte				0	0.00	0.00	0.00	0.00	0.00											
Rock				0	0.00	0.00	0.00	0.00	0.00											
				20	100.00	100.00	100.00	200.00												

Rapp Road Landfill - Test Plot Data
 Plot: TP S24GU
 Date: August 6, 2013
 Samplers: Steve Apfelbaum

Nt/Ad	Physiog	Seeded	SPECIES	AVG					STD										
				AF	RF	AC	RC	IV		1	2	3	4	5	6	7	8	9	10
Nt	P-Grass	X	<i>Andropogon scoparius</i>	10	11.36	16.50	14.07	25.43	9.73	10	10	15	30	15	30	30	10	10	5
Nt	P-Forb	X	<i>Lupinus perennis</i>	9	10.23	17.20	14.66	24.89	12.23	2	25	25	40	10	15	20		10	25
Nt	P-Forb	X	<i>Desmodium canadense</i>	8	9.09	18.50	15.77	24.86	15.64		40	10	40	10	30	5		20	30
Nt	P-Forb	X	<i>Monarda punctata</i>	8	9.09	15.20	12.96	22.05	18.24		60	10	30		10	20	10	2	10
Nt	P-Grass	X	<i>Andropogon gerardii</i>	9	10.23	11.20	9.55	19.78	6.23		15	10	15	15	10	20	2	15	10
Ad	P-Grass		<i>Festuca rubra</i>	8	9.09	6.70	5.71	14.80	6.82	20	10	15	5	10	2			3	2
Nt	B-Forb	X	<i>Oenothera biennis</i>	7	7.95	5.80	4.94	12.90	6.18		2	10	5		15	10		15	1
Ad	P-Forb		<i>Trifolium repens</i>	3	3.41	5.50	4.69	8.10	10.66			5		30			20		
Nt	A-Forb		<i>Ambrosia artemisiifolia</i>	4	4.55	4.00	3.41	7.96	6.15					15		5		15	5
Ad	P-Forb		<i>Coronilla varia</i>	1	1.14	7.50	6.39	7.53	23.72								75		
Nt	A-Forb	X	<i>Conyza canadensis</i>	5	5.68	0.80	0.68	6.36	0.92	2		1	1		2	2			
Ad	P-Forb		<i>Medicago lupulina</i>	3	3.41	1.60	1.36	4.77	3.34	1					10			5	
Ad	P-Forb		<i>Lotus corniculatus</i>	2	2.27	1.90	1.62	3.89	4.77						15				4
Nt	P-Forb		<i>Euphorbia maculata</i>	2	2.27	1.50	1.28	3.55	3.37	10								5	
Ad	Vine		<i>Celastrus orbiculatus</i>	2	2.27	0.50	0.43	2.70	1.08		2			3					
Ad	P-Forb		<i>Centaurea maculosa</i>	1	1.14	1.00	0.85	1.99	3.16			10							
Ad	A-Forb		<i>Trifolium arvense</i>	1	1.14	1.00	0.85	1.99	3.16					10					
Ad	P-Grass		<i>Agrostis alba</i>	1	1.14	0.20	0.17	1.31	0.63				2						
Ad	P-Forb		<i>Artemisia vulgaris</i>	1	1.14	0.20	0.17	1.31	0.63						2				
Nt	A-Grass	X	<i>Lolium multiflorum</i>	1	1.14	0.20	0.17	1.31	0.63										2
Ad	B-Forb		<i>Verbascum thapsus</i>	1	1.14	0.20	0.17	1.31	0.63				2						
Nt	Tree		<i>Populus deltoides</i>	1	1.14	0.10	0.09	1.22	0.32	1									
				88	100.00	117.30	100.00	200.00											
Non-vegetative ground cover																			
			Soil	10	50.00	45.00	45.00	95.00	16.67	50	40	50	50	20	60	50	30	25	75
			Fine litter	10	50.00	55.00	55.00	105.00	16.67	50	60	50	50	80	40	50	70	75	25
			Coarse litter	0	0.00	0.00	0.00	0.00	0.00										
			Bryophyte	0	0.00	0.00	0.00	0.00	0.00										
			Rock	0	0.00	0.00	0.00	0.00	0.00										
				20	100.00	100.00	100.00	200.00											

Rapp Road Landfill - Test Plot Data
 Plot: TP S24BL
 Date: August 6, 2013
 Samplers: John Larson

Nt/Ad	Physiog	Seeded	SPECIES	AVG					10										
				AF	RF	AC	RC	IV	STD	1	2	3	4	5	6	7	8	9	10
Ad	P-Forb		<i>Vicia cracca</i>	10	8.20	20.60	23.28	31.47	28.51	3	2	40	10	40	4	90	5	2	10
Nt	Tree		<i>Populus deltoides</i>	7	5.74	11.30	12.77	18.51	17.56	1	30	50	5				1	1	25
Nt	A-Forb		<i>Ambrosia artemisiifolia</i>	8	6.56	9.70	10.96	17.52	13.00	20	5		4	2	3		3	40	20
Ad	P-Grass		<i>Festuca rubra</i>	9	7.38	8.10	9.15	16.53	4.20	8	10	10	15	8		5	11	4	10
Ad	P-Forb		<i>Trifolium hybridum</i>	5	4.10	7.70	8.70	12.80	11.24		30		2	10	10				25
Ad	A-Grass		<i>Setaria faberi</i>	8	6.56	3.30	3.73	10.29	3.50	2	12			2	2	2	5	3	5
Nt	A-Forb		<i>Erigeron canadensis</i>	9	7.38	2.10	2.37	9.75	1.29	2	2	1	2		2	2	2	3	5
Nt	P-Grass	X	<i>Andropogon scoparius</i>	5	4.10	2.80	3.16	7.26	3.79	8				10	6		2	2	
Nt	P-Forb		<i>Euphorbia maculata</i>	7	5.74	1.30	1.47	7.21	1.25	4	2		2		1	2	1	1	
Nt	P-Forb	X	<i>Monarda punctata</i>	5	4.10	2.40	2.71	6.81	4.58				2	2	15	2	3		
Ad	P-Forb		<i>Medicago lupulina</i>	6	4.92	1.60	1.81	6.73	1.65	2	2		2				2	3	5
Nt	B-Forb	X	<i>Oenothera biennis</i>	4	3.28	2.00	2.26	5.54	2.62		4			6	5		5		
Ad	P-Forb		<i>Lotus corniculatus</i>	2	1.64	2.80	3.16	4.80	6.55				20					8	
Nt	P-Forb	X	<i>Lespedeza capitata</i>	4	3.28	1.20	1.36	4.63	1.93	2				2	2		6		
Nt	P-Grass	X	<i>Andropogon gerardii</i>	4	3.28	0.70	0.79	4.07	0.95	2				2	2	1			
Ad	P-Forb		<i>Artemisia vulgaris</i>	2	1.64	1.50	1.69	3.33	3.37		5	10							
Ad	P-Grass		<i>Festuca elatior</i>	3	2.46	0.60	0.68	3.14	0.97	2							2	2	
Ad	B-Forb		<i>Daucus carota</i>	2	1.64	1.00	1.13	2.77	2.11	5		5							
Nt	P-Forb	X	<i>Lupinus perennis</i>	2	1.64	0.80	0.90	2.54	1.75					3			5		
Ad	P-Forb		<i>Centaurea maculosa</i>	1	0.82	1.50	1.69	2.51	4.74				15						
Ad	B-Forb		<i>Melilotus officinalis</i>	2	1.64	0.50	0.56	2.20	1.08	3								2	
Nt	P-Sedge	X	<i>Cyperus houghtonii</i>	2	1.64	0.40	0.45	2.09	0.84	2			2						
Ad	A-Grass		<i>Digitaria sanguinalis</i>	2	1.64	0.30	0.34	1.98	0.67								2	1	
Ad	A-Grass		<i>Echinochloa crusgalli</i>	1	0.82	1.00	1.13	1.95	3.16				10						
Ad	P-Forb		<i>Ambrosia psilostachya</i>	1	0.82	0.80	0.90	1.72	2.53								8		
Ad	P-Grass		<i>Poa pratensis</i>	1	0.82	0.50	0.56	1.38	1.58		5								
Ad	A-Forb		<i>Stellaria meadia</i>	1	0.82	0.50	0.56	1.38	1.58	5									
Ad	Vine		<i>Celastrus orbiculatus</i>	1	0.82	0.20	0.23	1.05	0.63		2								
Ad	P-Forb		<i>Cirsium arvense</i>	1	0.82	0.20	0.23	1.05	0.63			2							
Nt	P-Sedge		<i>Cyperus esculentus</i>	1	0.82	0.20	0.23	1.05	0.63		2								
Ad	P-Grass		<i>Phleum pratense</i>	1	0.82	0.20	0.23	1.05	0.63									2	
Ad	P-Grass		<i>Poa compressa</i>	1	0.82	0.20	0.23	1.05	0.63		2								
Ad	P-Forb		<i>Sonchus arvensis</i>	1	0.82	0.20	0.23	1.05	0.63							2			
Nt	A-Forb	X	<i>Bidens frondosa</i>	1	0.82	0.10	0.11	0.93	0.32			1							
Nt	A-Grass		<i>Cenchrus longispinus</i>	1	0.82	0.10	0.11	0.93	0.32									1	
Nt	A-Grass		<i>Eragrostis capillaris</i>	1	0.82	0.10	0.11	0.93	0.32				1						
				122	100.00	88.50	100.00	200.00											
Non-vegetative ground cover																			
Soil				10	35.71	27.10	67.75	103.46	21.84	50	2	2	20	25	60	20	50	40	2
Fine litter				10	35.71	6.90	17.25	52.96	4.18	2	5	5	2	5	10	10	15	10	5
Coarse litter				1	3.57	0.10	0.25	3.82	0.32	1									
Bryophyte				1	3.57	5.00	12.50	16.07	15.81		50								
Rock				6	21.43	0.90	2.25	23.68	0.99	1			1	2	1		1	3	
				28	100.00	40.00	100.00	200.00											

Rapp Road Landfill -Test Plot Data
 Plot: TP S24BM
 Date: August 6, 2013
 Samplers: John Larson

Nt/Ad	Physiog	Seeded	SPECIES	AVG		10		STD	1	2	3	4	5	6	7	8	9	10	
				AF	RF	AC	RC												IV
Ad	P-Forb		<i>Vicia cracca</i>	5	3.91	16.80	24.35	28.25	24.97	70	25	3		20			50		
Ad	P-Grass		<i>Festuca rubra</i>	8	6.25	7.10	10.29	16.54	8.62	2		5		2	25	9	20	5	3
Nt	P-Forb	X	<i>Monarda punctata</i>	8	6.25	5.10	7.39	13.64	6.38	10		10	20	2	3		2	3	1
Nt	P-Grass	X	<i>Andropogon scoparius</i>	10	7.81	3.90	5.65	13.46	1.97	3	5	8	6	2	4	3	4	2	2
Nt	P-Forb	X	<i>Lespedeza capitata</i>	9	7.03	2.50	3.62	10.65	1.27	3	2	3	3	5	3	2		2	2
Nt	A-Forb		<i>Ambrosia artemisiifolia</i>	7	5.47	3.50	5.07	10.54	3.54	2	4	5	8		5	10			1
Nt	P-Grass	X	<i>Andropogon gerardii</i>	9	7.03	2.10	3.04	10.07	1.52	1	1	3	2	4	5	1	2	2	
Nt	P-Forb		<i>Euphorbia maculata</i>	8	6.25	2.60	3.77	10.02	2.88	1		4		10	2	2	2	3	2
Ad	P-Forb		<i>Medicago lupulina</i>	7	5.47	3.10	4.49	9.96	3.78	2	10	10	2	2	2	3			
Ad	P-Grass		<i>Festuca elatior</i>	6	4.69	3.20	4.64	9.33	3.52			3			2	8	3	8	8
Nt	A-Forb		<i>Erigeron canadensis</i>	8	6.25	2.10	3.04	9.29	1.60	4	3	2	2		5	2		1	2
Ad	P-Forb		<i>Trifolium hybridum</i>	1	0.78	5.00	7.25	8.03	15.81						50				
Nt	A-Grass		<i>Eragrostis capillaris</i>	5	3.91	1.10	1.59	5.50	1.20		2	3	2	2					2
Ad	A-Grass		<i>Setaria faberi</i>	4	3.13	1.40	2.03	5.15	2.55	1	8			3					2
Nt	P-Forb	X	<i>Lupinus perennis</i>	4	3.13	1.00	1.45	4.57	1.49				2	1	3				4
Nt	P-Grass	X	<i>Sorghastrum nutans</i>	4	3.13	1.00	1.45	4.57	1.41				4	2	2				2
Nt	B-Forb	X	<i>Oenothera biennis</i>	3	2.34	1.20	1.74	4.08	2.10				5		2				5
Ad	P-Forb		<i>Centaurea maculosa</i>	1	0.78	1.50	2.17	2.96	4.74	15									
Nt	P-Forb	X	<i>Desmodium canadense</i>	2	1.56	0.80	1.16	2.72	1.75				3	5					
Ad	B-Forb		<i>Daucus carota</i>	2	1.56	0.70	1.01	2.58	1.49					3				4	
Ad	P-Grass		<i>Phleum pratense</i>	2	1.56	0.50	0.72	2.29	1.08							2			3
Nt	A-Forb		<i>Xanthium strumarium</i>	2	1.56	0.30	0.43	2.00	0.67		1			2					
Nt	A-Forb		<i>Polygonum pensylvanicum</i>	2	1.56	0.20	0.29	1.85	0.42		1								1
Ad	A-Forb		<i>Trifolium arvense</i>	1	0.78	0.50	0.72	1.51	1.58					5					
Ad	B-Forb		<i>Melilotus alba</i>	1	0.78	0.40	0.58	1.36	1.26			4							
Ad	P-Forb		<i>Ambrosia psilostachya</i>	1	0.78	0.30	0.43	1.22	0.95						3				
Nt	A-Grass		<i>Cenchrus longispinus</i>	1	0.78	0.20	0.29	1.07	0.63		2								
Ad	P-Forb		<i>Lotus corniculatus</i>	1	0.78	0.20	0.29	1.07	0.63					2					
Ad	P-Grass		<i>Poa pratensis</i>	1	0.78	0.20	0.29	1.07	0.63				2						
Ad	A-Forb		<i>Chenopodium album</i>	1	0.78	0.10	0.14	0.93	0.32	1									
Nt	P-Sedge		<i>Cyperus esculentus</i>	1	0.78	0.10	0.14	0.93	0.32			1							
Ad	A-Forb		<i>Lychnis alba</i>	1	0.78	0.10	0.14	0.93	0.32			1							
Nt	Tree		<i>Populus deltoides</i>	1	0.78	0.10	0.14	0.93	0.32						1				
Ad	P-Forb		<i>Sonchus arvensis</i>	1	0.78	0.10	0.14	0.93	0.32									1	
				128	100.00	69.00	100.00	200.00											
Non-vegetative ground cover																			
	Soil			10	32.26	32.00	71.27	103.53	16.36	15	40	60	30	30	5	50	20	30	40
	Fine litter			10	32.26	10.90	24.28	56.53	9.40	2	10	5	5	10	10	10	2	30	25
	Coarse litter			2	6.45	0.30	0.67	7.12	0.67			1	2						
	Bryophyte			0	0.00	0.00	0.00	0.00	0.00										
	Rock			9	29.03	1.70	3.79	32.82	0.67	2	2	2	2	2		2	1	2	2
				31	100.00	44.90	100.00	200.00											

Rapp Road Landfill - Test Plot Data
 Plot: TP S24BU
 Date: August 6, 2013
 Samplers: John Larson

Nt/Ad	Physiog	Seeded	SPECIES	AVG					STD	10									
				AF	RF	AC	RC	IV		1	2	3	4	5	6	7	8	9	10
Ad	A-Grass		<i>Festuca rubra</i>	9	8.18	7.30	15.08	23.26	7.41	3	2		5	4	10	10	25	12	2
Nt	P-Grass	X	<i>Andropogon scoparius</i>	10	9.09	4.30	8.88	17.98	2.75	2	2	8	2	4	5	2	2	8	8
Ad	P-Forb		<i>Vicia cracca</i>	3	2.73	6.60	13.64	16.36	18.81			2	60		4				
Ad	P-Forb		<i>Ambrosia psilostachya</i>	4	3.64	4.40	9.09	12.73	8.14	10	25							1	8
Nt	P-Forb	X	<i>Lespedeza capitata</i>	8	7.27	2.00	4.13	11.40	1.41		2	3	2	2	2	2		5	2
Nt	P-Grass	X	<i>Andropogon gerardii</i>	8	7.27	1.90	3.93	11.20	1.20		2	2	2	4	2	3	2		2
Ad	A-Grass		<i>Festuca elatior</i>	7	6.36	1.60	3.31	9.67	1.51	1		2	2	2	5	2			2
Nt	P-Forb		<i>Desmodium canadense</i>	3	2.73	3.20	6.61	9.34	7.83			5		2		25			
Nt	P-Forb	X	<i>Lupinus perennis</i>	5	4.55	2.10	4.34	8.88	2.33			3	5	5	3	5			
Ad	P-Forb		<i>Medicago lupulina</i>	5	4.55	1.80	3.72	8.26	3.05	10	2	2	2		2				
Nt	P-Forb	X	<i>Monarda punctata</i>	5	4.55	1.70	3.51	8.06	2.54		3			8	2			3	1
Nt	B-Forb	X	<i>Oenothera biennis</i>	5	4.55	1.60	3.31	7.85	1.90	4		5	2	3	2				
Ad	P-Forb		<i>Trifolium hybridum</i>	4	3.64	1.90	3.93	7.56	3.28	2							5	10	2
Nt	P-Forb		<i>Euphorbia maculata</i>	6	5.45	0.90	1.86	7.31	0.99			3	1	1	2	1			1
Ad	A-Grass		<i>Setaria viridis</i>	4	3.64	1.40	2.89	6.53	2.07	2	5	2							5
Ad	A-Forb		<i>Trifolium arvense</i>	3	2.73	1.40	2.89	5.62	2.55				5					2	7
Nt	A-Forb		<i>Erigeron canadensis</i>	4	3.64	0.90	1.86	5.50	1.20		2	2				2		3	
Nt	A-Forb		<i>Ambrosia artemisiifolia</i>	3	2.73	0.90	1.86	4.59	1.66			2		5			2		
Nt	A-Grass		<i>Eragrostis capillaris</i>	3	2.73	0.60	1.24	3.97	0.97			2						2	2
Ad	A-Forb		<i>Vicia sativa</i>	3	2.73	0.60	1.24	3.97	0.97						2	2		2	
Nt	P-Grass	X	<i>Sorghastrum nutans</i>	2	1.82	0.40	0.83	2.64	0.84	2						2			
Nt	Tree		<i>Populus deltoides</i>	2	1.82	0.20	0.41	2.23	0.42	1			1						
Ad	A-Forb		<i>Cycloloma atriplicifolium</i>	1	0.91	0.20	0.41	1.32	0.63										2
Ad	B-Forb		<i>Melilotus alba</i>	1	0.91	0.20	0.41	1.32	0.63					2					
Ad	A-Forb		<i>Stellaria meadia</i>	1	0.91	0.20	0.41	1.32	0.63					2					
Nt	P-Forb	X	<i>Monarda fistulosa</i>	1	0.91	0.10	0.21	1.12	0.32						1				
				110	100.00	48.40	100.00	200.00											
Non-vegetative ground cover																			
	Soil			10	35.71	43.00	66.26	101.97	22.75	60	60	50	15	25	20	10	70	60	60
	Fine litter			10	35.71	20.40	31.43	67.15	22.35	2	10	15	10	40	40	70	2	10	5
	Coarse litter			0	0.00	0.00	0.00	0.00	0.00										
	Bryophyte			0	0.00	0.00	0.00	0.00	0.00										
	Rock			8	28.57	1.50	2.31	30.88	1.18	2	2	2	2		1		4	1	1
				28	100.00	64.90	100.00	200.00											

Attachment 10. Species Search Data

Rapp Road Landfill - Test Plot Data
 Plot: TP N12GL
 Date: August 5, 2013
 Samplers: Steven Apfelbaum

Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
<i>Achillea millefolium</i>	Common yarrow	Asteraceae	P-Forb	Ad	FACU			
<i>Agrostis alba</i>	Redtop	Poaceae	P-Grass	Ad	FACW			
<i>Ambrosia artemisiifolia</i>	Ragweed	Asteraceae	A-Forb	Nt	FACU			
<i>Andropogon scoparius</i>	Little bluestem	Poaceae	P-Grass	Nt	FACU			X
<i>Artemisia vulgaris</i>	Mugwort	Asteraceae	P-Forb	Ad	UPL			
<i>Asclepias syriaca</i>	Common milkweed	Asclepiadaceae	P-Forb	Nt	UPL		X	X
<i>Cassia fasciculata</i>	Partridge pea	Fabaceae	A-Forb	Nt	FACU	Review List: G5 S3S4		
<i>Chrysanthemum leucanthemum</i>	Ox-eye daisy	Asteraceae	P-Forb	Ad	UPL			
<i>Cichorium intybus</i>	Chicory	Asteraceae	P-Forb	Ad	FACU			
<i>Cirsium vulgare</i>	Bull-thistle	Asteraceae	B-Forb	Ad	FACU			
<i>Conyza canadensis</i>	Horseweed	Asteraceae	A-Forb	Nt	FACU			X
<i>Coreopsis lanceolata</i>	Coreopsis	Asteraceae	P-Forb	Ad	FACU			
<i>Coreopsis tinctoria</i>	Golden tickseed	Asteraceae	A-Forb	Ad	FAC			
<i>Cyperus esculentus</i>	Yellow nut-grass	Cyperaceae	P-Sedge	Nt	FACW			
<i>Daucus carota</i>	Queen-Anne's-lace	Apiaceae	B-Forb	Ad	UPL			
<i>Desmodium canadense</i>	Giant tick clover	Fabaceae	P-Forb	Nt	FAC			X
<i>Echinochloa crusgalli</i>	Japanese millet	Poaceae	A-Grass	Ad	FAC			
<i>Equisetum arvense</i>	Field horsetail	Equisetaceae	Cryptogam	Nt	FAC			
<i>Erechtites hieracifolia</i>	Fireweed	Asteraceae	A-Forb	Nt	FACU			X
<i>Euphorbia maculata</i>	Spotted Joy-pye weed	Asteraceae	P-Forb	Nt	OBL			
<i>Festuca rubra</i>	Red fescue	Poaceae	P-Grass	Ad	FACU			
<i>Hypericum perforatum</i>	Common St. John's-wort	Clusiaceae	P-Forb	Ad	UPL			
<i>Lespedeza capitata</i>	Bush-clover	Fabaceae	P-Forb	Nt	FACU		X	X
<i>Lotus corniculatus</i>	Bird's-foot trefoil	Fabaceae	P-Forb	Ad	FACU			
<i>Lupinus perennis</i>	Wild lupine	Fabaceae	P-Forb	Nt	UPL		X	X
<i>Monarda fistulosa</i>	Wild bergamot	Lamiaceae	P-Forb	Nt	FACU			X
<i>Monarda punctata</i>	Dotted horsemint	Lamiaceae	P-Forb	Nt	UPL		X	X
<i>Oenothera biennis</i>	Common evening-primrose	Onagraceae	B-Forb	Nt	FACU			X
<i>Panicum capillare</i>	Witchgrass	Poaceae	A-Grass	Nt	FAC			X
<i>Phleum pratense</i>	Timothy	Poaceae	Grass	Ad	FACU			
<i>Plantago major</i>	Common plantain	Plantaginaceae	P-Forb	Ad	FACU			
<i>Populus deltoides</i>	Cottonwood	Salicaceae	Tree	Nt	FAC			
<i>Prunus serotina</i>	Black cherry	Rosaceae	Tree	Nt	FACU			
<i>Robinia pseudoacacia</i>	Black locust	Fabaceae	Tree	Ad	FACU			
<i>Rudbeckia hirta</i>	Black-eyed Susan	Asteraceae	B-Forb	Nt	FACU			X
<i>Rumex crispus</i>	Curly dock	Polygonaceae	P-Forb	Ad	FAC			
<i>Solidago canadensis</i>	Canadian goldenrod	Asteraceae	P-Forb	Nt	FACU			
<i>Solidago gigantea</i>	Late goldenrod	Asteraceae	P-Forb	Nt	FACW			X
<i>Sorghastrum nutans</i>	Indian grass	Poaceae	P-Grass	Nt	FACU			X
<i>Taraxacum officinale</i>	Common dandelion	Asteraceae	P-Forb	Ad	FACU			
<i>Trifolium arvense</i>	Rabbit foot clover	Fabaceae	A-Forb	Ad	UPL			
<i>Trifolium hybridum</i>	Alsike clover	Fabaceae	P-Forb	Ad	FACU			
<i>Verbena hastata</i>	Blue vervain	Verbenaceae	P-Forb	Nt	FACW			X
<i>Xanthium strumarium</i>	Cocklebur	Asteraceae	A-Forb	Nt	FAC			

Categories		
Vascular Plant Families	15	
Non-Vascular Plant Families	0	
	No. Species	Percent
Total Species	44	100.0%
Native Species	24	54.5%
Adventive Species	20	45.5%
Unknown Species	0	0.0%
Largest Families Represented		
Aster Family (Asteraceae)	16	36.4%
Grass Family (Poaceae)	7	15.9%
Pea Family (Fabaceae)	8	18.2%
Physiognomy		
Perennial Forbs (P-Forb)	21	47.7%
Annual Forbs (A-Forb)	7	15.9%
Biennial Forbs (B-Forbs)	4	9.1%
Forbs	0	0.0%
Perennial Grass (P-Grass)	4	9.1%
Annual Grass (A-Grass)	2	4.5%
Grasses	1	2.3%
Perennial Sedge (P-Sedge)	1	2.3%
Alga	0	0.0%
Cryptogams	1	2.3%
Trees	3	6.8%
Shrubs	0	0.0%
Vines	0	0.0%
Miscellaneous		
Nectar/Larval Food Plants	4	9.1%
Seeded/Planted Species	15	34.1%
Rare Plants	1	2.3%
Wetland Classification		
Upland (UPL)	8	18.2%
Facultative Upland (FACU)	23	52.3%
Faculative (FAC)	8	18.2%
Facultative Wetland (FACW)	4	9.1%
Obligate Wetland (OBL)	1	2.3%
Unknown Species	0	0.0%
Total Hydrophytic Species	13	29.5%

Rapp Road Landfill - Test Plot Data
 Plot: TP N12GL
 Date: August 5, 2013
 Samplers: Steven Apfelbaum

Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
<i>Achillea millefolium</i>	Common yarrow	Asteraceae	P-Forb	Ad	FACU			
<i>Agrostis alba</i>	Redtop	Poaceae	P-Grass	Ad	FACW			
<i>Ambrosia artemisiifolia</i>	Ragweed	Asteraceae	A-Forb	Nt	FACU			
<i>Andropogon gerardii</i>	Big bluestem	Poaceae	P-Grass	Nt	FACU			X
<i>Andropogon scoparius</i>	Little bluestem	Poaceae	P-Grass	Nt	FACU			X
<i>Artemisia vulgaris</i>	Mugwort	Asteraceae	P-Forb	Ad	UPL			
<i>Cassia fasciculata</i>	Partridge pea	Fabaceae	A-Forb	Nt	FACU	Review List: G5 S3S4		
<i>Celastrus orbiculatus</i>	Oriental bittersweet	Celastraceae	Vine	Ad	UPL			
<i>Chrysanthemum leucanthemum</i>	Ox-eye daisy	Asteraceae	P-Forb	Ad	UPL			
<i>Gichorium intybus</i>	Chicory	Asteraceae	P-Forb	Ad	FACU			
<i>Conyza canadensis</i>	Horseweed	Asteraceae	A-Forb	Nt	FACU			X
<i>Coreopsis lanceolata</i>	Coreopsis	Asteraceae	P-Forb	Ad	FACU			
<i>Coreopsis tinctoria</i>	Golden tickseed	Asteraceae	A-Forb	Ad	FAC			
<i>Desmodium canadense</i>	Giant tick clover	Fabaceae	P-Forb	Nt	FAC			X
<i>Echinochloa crusgalli</i>	Japanese millet	Poaceae	A-Grass	Ad	FAC			
<i>Festuca rubra</i>	Red fescue	Poaceae	P-Grass	Ad	FACU			
<i>Hypericum perforatum</i>	Common St. John's-wort	Clusiaceae	P-Forb	Ad	UPL			
<i>Lotus corniculatus</i>	Bird's-foot trefoil	Fabaceae	P-Forb	Ad	FACU			
<i>Lupinus perennis</i>	Wild lupine	Fabaceae	P-Forb	Nt	UPL		X	X
<i>Medicago sativa</i>	Alfalfa	Fabaceae	P-Forb	Ad	UPL			
<i>Monarda fistulosa</i>	Wild bergamot	Lamiaceae	P-Forb	Nt	FACU			X
<i>Monarda punctata</i>	Dotted horsemint	Lamiaceae	P-Forb	Nt	UPL		X	X
<i>Oenothera biennis</i>	Common evening-primrose	Onagraceae	B-Forb	Nt	FACU			X
<i>Polygonum pensylvanicum</i>	Pinkweed	Polygonaceae	A-Forb	Nt	FACW			
<i>Populus deltoides</i>	Cottonwood	Salicaceae	Tree	Nt	FAC			
<i>Robinia pseudoacacia</i>	Black locust	Fabaceae	Tree	Ad	FACU			
<i>Rudbeckia hirta</i>	Black-eyed Susan	Asteraceae	B-Forb	Nt	FACU			X
<i>Setaria faberi</i>	Japanese bristle grass	Poaceae	A-Grass	Ad	FACU			
<i>Taraxacum officinale</i>	Common dandelion	Asteraceae	P-Forb	Ad	FACU			
<i>Trifolium arvense</i>	Rabbit foot clover	Fabaceae	A-Forb	Ad	UPL			
<i>Trifolium hybridum</i>	Alsike clover	Fabaceae	P-Forb	Ad	FACU			
<i>Trifolium repens</i>	White clover	Fabaceae	P-Forb	Ad	FACU			
<i>Vicia cracca</i>	Cow vetch	Fabaceae	P-Forb	Ad	UPL			
<i>Vitis riparia</i>	Riverbank grape	Vitaceae	Vine	Nt	FAC			

Categories		
Vascular Plant Families	10	
Non-Vascular Plant Families	0	
	No. Species	Percent
Total Species	34	100.0%
Native Species	14	41.2%
Adventive Species	20	58.8%
Unknown Species	0	0.0%
Largest Families Represented		
Aster Family (Asteraceae)	10	29.4%
Grass Family (Poaceae)	6	17.6%
Pea Family (Fabaceae)	10	29.4%
Physiognomy		
Perennial Forbs (P-Forb)	16	47.1%
Annual Forbs (A-Forb)	6	17.6%
Biennial Forbs (B-Forbs)	2	5.9%
Forbs	0	0.0%
Perennial Grass (P-Grass)	4	11.8%
Annual Grass (A-Grass)	2	5.9%
Grasses	0	0.0%
Perennial Sedge (P-Sedge)	0	0.0%
Alga	0	0.0%
Cryptogams	0	0.0%
Trees	2	5.9%
Shrubs	0	0.0%
Vines	2	5.9%
Miscellaneous		
Nectar/Larval Food Plants	2	5.9%
Seeded/Planted Species	9	26.5%
Rare Plants	1	2.9%
Wetland Classification		
Upland (UPL)	9	26.5%
Facultative Upland (FACU)	18	52.9%
Facultative (FAC)	5	14.7%
Facultative Wetland (FACW)	2	5.9%
Obligate Wetland (OBL)	0	0.0%
Unknown Species	0	0.0%
Total Hydrophytic Species	7	20.6%

Rapp Road Landfill - Test Plot Data
 Plot: TP N12GL
 Date: August 5, 2013
 Samplers: Steven Apfelbaum

Scientific Name	Common Name	Family Classification	Physiognomy	Native/Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
<i>Achillea millefolium</i>	Common yarrow	Asteraceae	P-Forb	Ad	FACU			
<i>Agrostis alba</i>	Redtop	Poaceae	P-Grass	Ad	FACW			
<i>Ambrosia artemisiifolia</i>	Ragweed	Asteraceae	A-Forb	Nt	FACU			
<i>Andropogon gerardii</i>	Big bluestem	Poaceae	P-Grass	Nt	FACU			X
<i>Artemisia vulgaris</i>	Mugwort	Asteraceae	P-Forb	Ad	UPL			
<i>Aster ericoides</i>	White heath aster	Asteraceae	P-Forb	Nt	FACU			X
<i>Cassia fasciculata</i>	Partridge pea	Fabaceae	A-Forb	Nt	FACU	Review List: G5 S3S4		
<i>Centaurea maculosa</i>	Spotted knapweed	Asteraceae	P-Forb	Ad	UPL			
<i>Chrysanthemum leucanthemum</i>	Ox-eye daisy	Asteraceae	P-Forb	Ad	UPL			
<i>Cichorium intybus</i>	Chicory	Asteraceae	P-Forb	Ad	FACU			
<i>Conyza canadensis</i>	Horseweed	Asteraceae	A-Forb	Nt	FACU			X
<i>Coreopsis lanceolata</i>	Coreopsis	Asteraceae	P-Forb	Ad	FACU			
<i>Coronilla varia</i>	Crown vetch	Fabaceae	P-Forb	Ad	UPL			
<i>Desmodium canadense</i>	Giant tick clover	Fabaceae	P-Forb	Nt	FAC			X
<i>Festuca rubra</i>	Red fescue	Poaceae	P-Grass	Ad	FACU			
<i>Lespedeza capitata</i>	Bush-clover	Fabaceae	P-Forb	Nt	FACU		X	X
<i>Lotus corniculatus</i>	Bird's-foot trefoil	Fabaceae	P-Forb	Ad	FACU			
<i>Lupinus perennis</i>	Wild lupine	Fabaceae	P-Forb	Nt	UPL		X	X
<i>Medicago lupulina</i>	Black medick	Fabaceae	P-Forb	Ad	FACU			
<i>Medicago sativa</i>	Alfalfa	Fabaceae	P-Forb	Ad	UPL			
<i>Monarda fistulosa</i>	Wild bergamot	Lamiaceae	P-Forb	Nt	FACU			X
<i>Monarda punctata</i>	Dotted horsemint	Lamiaceae	P-Forb	Nt	UPL		X	X
<i>Oenothera biennis</i>	Common evening-primrose	Onagraceae	B-Forb	Nt	FACU			X
<i>Panicum virgatum</i>	Switchgrass	Poaceae	P-Grass	Nt	FAC			
<i>Populus deltoides</i>	Cottonwood	Salicaceae	Tree	Nt	FAC			
<i>Solidago canadensis</i>	Canadian goldenrod	Asteraceae	P-Forb	Nt	FACU			
<i>Solidago gigantea</i>	Late goldenrod	Asteraceae	P-Forb	Nt	FACW			X
<i>Sorghastrum nutans</i>	Indian grass	Poaceae	P-Grass	Nt	FACU			X
<i>Taraxacum officinale</i>	Common dandelion	Asteraceae	P-Forb	Ad	FACU			
<i>Trifolium arvense</i>	Rabbit foot clover	Fabaceae	A-Forb	Ad	UPL			
<i>Trifolium hybridum</i>	Alsike clover	Fabaceae	P-Forb	Ad	FACU			

Categories		
Vascular Plant Families	6	
Non-Vascular Plant Families	0	
	No. Species	Percent
Total Species	31	100.0%
Native Species	16	51.6%
Adventive Species	15	48.4%
Unknown Species	0	0.0%
Largest Families Represented		
Aster Family (Asteraceae)	12	38.7%
Grass Family (Poaceae)	5	16.1%
Pea Family (Fabaceae)	10	32.3%
Physiognomy		
Perennial Forbs (P-Forb)	20	64.5%
Annual Forbs (A-Forb)	4	12.9%
Biennial Forbs (B-Forbs)	1	3.2%
Forbs	0	0.0%
Perennial Grass (P-Grass)	5	16.1%
Annual Grass (A-Grass)	0	0.0%
Grasses	0	0.0%
Perennial Sedge (P-Sedge)	0	0.0%
Alga	0	0.0%
Cryptogams	0	0.0%
Trees	1	3.2%
Shrubs	0	0.0%
Vines	0	0.0%
Miscellaneous		
Nectar/Larval Food Plants	3	9.7%
Seeded/Planted Species	11	35.5%
Rare Plants	1	3.2%
Wetland Classification		
Upland (UPL)	8	25.8%
Facultative Upland (FACU)	18	58.1%
Facultative (FAC)	3	9.7%
Facultative Wetland (FACW)	2	6.5%
Obligate Wetland (OBL)	0	0.0%
Unknown Species	0	0.0%
Total Hydrophytic Species	5	16.1%

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Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
<i>Ambrosia artemisiifolia</i>	Ragweed	Asteraceae	A-Forb	Nt	FACU			
<i>Andropogon gerardii</i>	Big bluestem	Poaceae	P-Grass	Nt	FACU			X
<i>Andropogon scoparius</i>	Little bluestem	Poaceae	P-Grass	Nt	FACU			X
<i>Asclepias syriaca</i>	Common milkweed	Asclepiadaceae	P-Forb	Nt	UPL		X	X
<i>Cassia fasciculata</i>	Partridge pea	Fabaceae	A-Forb	Nt	FACU	Review List: G5 S3S4		
<i>Cenchrus longispinus</i>	Field sandbur	Poaceae	A-Grass	Nt	UPL			
<i>Centaurea maculosa</i>	Spotted knapweed	Asteraceae	P-Forb	Ad	UPL			
<i>Cichorium intybus</i>	Chicory	Asteraceae	P-Forb	Ad	FACU			
<i>Coryza canadensis</i>	Horseweed	Asteraceae	A-Forb	Nt	FACU			X
<i>Coreopsis lanceolata</i>	Coreopsis	Asteraceae	P-Forb	Ad	FACU			
<i>Coronilla varia</i>	Crown vetch	Fabaceae	P-Forb	Ad	UPL			
<i>Desmodium canadense</i>	Giant tick clover	Fabaceae	P-Forb	Nt	FAC			X
<i>Euphorbia maculata</i>	Spotted Joy-pye weed	Asteraceae	P-Forb	Nt	OBL			
<i>Festuca rubra</i>	Red fescue	Poaceae	P-Grass	Ad	FACU			
<i>Lespedeza capitata</i>	Bush-clover	Fabaceae	P-Forb	Nt	FACU		X	X
<i>Lotus corniculatus</i>	Bird's-foot trefoil	Fabaceae	P-Forb	Ad	FACU			
<i>Lupinus perennis</i>	Wild lupine	Fabaceae	P-Forb	Nt	UPL		X	X
<i>Medicago lupulina</i>	Black medick	Fabaceae	P-Forb	Ad	FACU			
<i>Melilotus alba</i>	White sweet-clover	Fabaceae	B-Forb	Ad	FACU			
<i>Monarda fistulosa</i>	Wild bergamot	Lamiaceae	P-Forb	Nt	FACU			X
<i>Monarda punctata</i>	Dotted horsemint	Lamiaceae	P-Forb	Nt	UPL		X	X
<i>Oenothera biennis</i>	Common evening-primrose	Onagraceae	B-Forb	Nt	FACU			X
<i>Panicum virgatum</i>	Switchgrass	Poaceae	P-Grass	Nt	FAC			
<i>Populus deltoides</i>	Cottonwood	Salicaceae	Tree	Nt	FAC			
<i>Robinia pseudoacacia</i>	Black locust	Fabaceae	Tree	Ad	FACU			
<i>Rudbeckia hirta</i>	Black-eyed Susan	Asteraceae	B-Forb	Nt	FACU			X
<i>Taraxacum officinale</i>	Common dandelion	Asteraceae	P-Forb	Ad	FACU			
<i>Trifolium arvense</i>	Rabbit foot clover	Fabaceae	A-Forb	Ad	UPL			
<i>Trifolium hybridum</i>	Alsike clover	Fabaceae	P-Forb	Ad	FACU			
<i>Trifolium pratense</i>	Red clover	Fabaceae	P-Forb	Ad	FACU			
<i>Vicia cracca</i>	Cow vetch	Fabaceae	P-Forb	Ad	UPL			
<i>Vitis riparia</i>	Riverbank grape	Vitaceae	Vine	Nt	FAC			

Categories		
Vascular Plant Families	8	
Non-Vascular Plant Families	0	
	No. Species	Percent
Total Species	32	100.0%
Native Species	18	56.3%
Adventive Species	14	43.8%
Unknown Species	0	0.0%
Largest Families Represented		
Aster Family (Asteraceae)	8	25.0%
Grass Family (Poaceae)	5	15.6%
Pea Family (Fabaceae)	13	40.6%
Physiognomy		
Perennial Forbs (P-Forb)	17	53.1%
Annual Forbs (A-Forb)	4	12.5%
Biennial Forbs (B-Forbs)	3	9.4%
Forbs	0	0.0%
Perennial Grass (P-Grass)	4	12.5%
Annual Grass (A-Grass)	1	3.1%
Grasses	0	0.0%
Perennial Sedge (P-Sedge)	0	0.0%
Alga	0	0.0%
Cryptogams	0	0.0%
Trees	2	6.3%
Shrubs	0	0.0%
Vines	1	3.1%
Miscellaneous		
Nectar/Larval Food Plants	4	12.5%
Seeded/Planted Species	11	34.4%
Rare Plants	1	3.1%
Wetland Classification		
Upland (UPL)	8	25.0%
Facultative Upland (FACU)	19	59.4%
Facultative (FAC)	4	12.5%
Facultative Wetland (FACW)	0	0.0%
Obligate Wetland (OBL)	1	3.1%
Unknown Species	0	0.0%
Total Hydrophytic Species	5	15.6%

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Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
Agrostis alba	Redtop	Poaceae	P-Grass	Ad	FACW			
Ambrosia artemisiifolia	Ragweed	Asteraceae	A-Forb	Nt	FACU			
Andropogon gerardii	Big bluestem	Poaceae	P-Grass	Nt	FACU			X
Andropogon scoparius	Little bluestem	Poaceae	P-Grass	Nt	FACU			X
Artemisia vulgaris	Mugwort	Asteraceae	P-Forb	Ad	UPL			
Asclepias syriaca	Common milkweed	Asclepiadaceae	P-Forb	Nt	UPL		X	X
Berteroa incana	Hoary alyssum	Brassicaceae	A-Forb	Ad	UPL			
Bidens frondosa	Beggar-ticks	Asteraceae	A-Forb	Nt	FACW			X
Bromus japonicus	Japanese chess	Poaceae	P-Grass	Ad	FACU			
Centaurea maculosa	Spotted knapweed	Asteraceae	P-Forb	Ad	UPL			
Cirsium arvense	Canada thistle	Asteraceae	P-Forb	Ad	FACU			
Cirsium vulgare	Bull-thistle	Asteraceae	B-Forb	Ad	FACU			
Conyza canadensis	Horseweed	Asteraceae	A-Forb	Nt	FACU			X
Coronilla varia	Crown vetch	Fabaceae	P-Forb	Ad	UPL			
Daucus carota	Queen-Anne's-lace	Apiaceae	B-Forb	Ad	UPL			
Desmodium canadense	Giant tick clover	Fabaceae	P-Forb	Nt	FAC			X
Echinochloa crusgalli	Japanese millet	Poaceae	A-Grass	Ad	FAC			
Erigeron strigosus	Daisy-fleabane	Asteraceae	A-Forb	Nt	FACU			
Euphorbia maculata	Spotted Joy-pye weed	Asteraceae	P-Forb	Nt	OBL			
Festuca rubra	Red fescue	Poaceae	P-Grass	Ad	FACU			
Lespedeza capitata	Bush-clover	Fabaceae	P-Forb	Nt	FACU		X	X
Lolium multiflorum	Indian-tobacco	Campanulaceae	B-Forb	Ad	FACU			X
Lotus corniculatus	Bird's-foot trefoil	Fabaceae	P-Forb	Ad	FACU			
Medicago sativa	Alfalfa	Fabaceae	P-Forb	Ad	UPL			
Melilotus officinalis	Yellow melilotus	Fabaceae	B-Forb	Ad	FACU			
Monarda fistulosa	Wild bergamot	Lamiaceae	P-Forb	Nt	FACU			X
Monarda punctata	Dotted horsemint	Lamiaceae	P-Forb	Nt	UPL		X	X
Oenothera biennis	Common evening-primrose	Onagraceae	B-Forb	Nt	FACU			X
Panicum virgatum	Switchgrass	Poaceae	P-Grass	Nt	FAC			
Phleum pratense	Timothy	Poaceae	Grass	Ad	FACU			
Plantago rugelii	Pale plantain	Plantaginaceae	P-Forb	Nt	FAC			
Polygonum pensylvanicum	Pinkweed	Polygonaceae	A-Forb	Nt	FACW			
Populus deltoides	Cottonwood	Salicaceae	Tree	Nt	FAC			
Rumex crispus	Curly dock	Polygonaceae	P-Forb	Ad	FAC			
Setaria faberi	Japanese bristle grass	Poaceae	A-Grass	Ad	FACU			
Solidago canadensis	Canadian goldenrod	Asteraceae	P-Forb	Nt	FACU			
Trifolium arvense	Rabbit foot clover	Fabaceae	A-Forb	Ad	UPL			
Trifolium hybridum	Alsike clover	Fabaceae	P-Forb	Ad	FACU			
Trifolium repens	White clover	Fabaceae	P-Forb	Ad	FACU			

Categories		
Vascular Plant Families	12	
Non-Vascular Plant Families	0	
	No. Species	Percent
Total Species	39	100.0%
Native Species	18	46.2%
Adventive Species	21	53.8%
Unknown Species	0	0.0%
Largest Families Represented		
Aster Family (Asteraceae)	10	25.6%
Grass Family (Poaceae)	9	23.1%
Pea Family (Fabaceae)	9	23.1%
Physiognomy		
Perennial Forbs (P-Forb)	17	43.6%
Annual Forbs (A-Forb)	7	17.9%
Biennial Forbs (B-Forbs)	5	12.8%
Forbs	0	0.0%
Perennial Grass (P-Grass)	6	15.4%
Annual Grass (A-Grass)	2	5.1%
Grasses	1	2.6%
Perennial Sedge (P-Sedge)	0	0.0%
Alga	0	0.0%
Cryptogams	0	0.0%
Trees	1	2.6%
Shrubs	0	0.0%
Vines	0	0.0%
Miscellaneous		
Nectar/Larval Food Plants	3	7.7%
Seeded/Planted Species	11	28.2%
Rare Plants	0	0.0%
Wetland Classification		
Upland (UPL)	9	23.1%
Facultative Upland (FACU)	20	51.3%
Facultative (FAC)	6	15.4%
Facultative Wetland (FACW)	3	7.7%
Obligate Wetland (OBL)	1	2.6%
Unknown Species	0	0.0%
Total Hydrophytic Species	10	25.6%

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Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
Agrostis alba	Redtop	Poaceae	P-Grass	Ad	FACW			
Ambrosia artemisiifolia	Ragweed	Asteraceae	A-Forb	Nt	FACU			
Andropogon gerardii	Big bluestem	Poaceae	P-Grass	Nt	FACU			X
Asclepias syriaca	Common milkweed	Asclepiadaceae	P-Forb	Nt	UPL		X	X
Bidens frondosa	Beggar-ticks	Asteraceae	A-Forb	Nt	FACW			X
Bromus japonicus	Japanese chess	Poaceae	P-Grass	Ad	FACU			
Centaurea maculosa	Spotted knapweed	Asteraceae	P-Forb	Ad	UPL			
Cirsium vulgare	Bull-thistle	Asteraceae	B-Forb	Ad	FACU			
Conyza canadensis	Horseweed	Asteraceae	A-Forb	Nt	FACU			X
Cyperus strigosus	Straw-colored flat sedge	Cyperaceae	P-Sedge	Nt	FACW			
Daucus carota	Queen-Anne's-lace	Apiaceae	B-Forb	Ad	UPL			
Desmodium canadense	Giant tick clover	Fabaceae	P-Forb	Nt	FAC			X
Desmodium paniculatum	Panicled tick trefoil	Fabaceae	P-Forb	Nt	FACU			
Erechtites hieracifolia	Fireweed	Asteraceae	A-Forb	Nt	FACU			X
Erigeron strigosus	Daisy-fleabane	Asteraceae	A-Forb	Nt	FACU			
Festuca rubra	Red fescue	Poaceae	P-Grass	Ad	FACU			
Hypericum perforatum	Common St. John's-wort	Clusiaceae	P-Forb	Ad	UPL			
Juncus dudleyi	Dudley's rush	Juncaceae	P-Grass	Nt	FACW			X
Lespedeza capitata	Bush-clover	Fabaceae	P-Forb	Nt	FACU		X	X
Lobelia inflata	Indian-tobacco	Campanulaceae	B-Forb	Nt	FACU			X
Lotus corniculatus	Bird's-foot trefoil	Fabaceae	P-Forb	Ad	FACU			
Lupinus perennis	Wild lupine	Fabaceae	P-Forb	Nt	UPL		X	X
Medicago sativa	Alfalfa	Fabaceae	P-Forb	Ad	UPL			
Melilotus alba	White sweet-clover	Fabaceae	B-Forb	Ad	FACU			
Monarda fistulosa	Wild bergamot	Lamiaceae	P-Forb	Nt	FACU			X
Monarda punctata	Dotted horsemint	Lamiaceae	P-Forb	Nt	UPL		X	X
Oenothera biennis	Common evening-primrose	Onagraceae	B-Forb	Nt	FACU			X
Panicum virgatum	Switchgrass	Poaceae	P-Grass	Nt	FAC			
Phleum pratense	Timothy	Poaceae	Grass	Ad	FACU			
Plantago major	Common plantain	Plantaginaceae	P-Forb	Ad	FACU			
Polygonum aviculare	Knotweed	Polygonaceae	A-Forb	Ad	FACU			
Polygonum pensylvanicum	Pinkweed	Polygonaceae	A-Forb	Nt	FACW			
Populus deltoides	Cottonwood	Salicaceae	Tree	Nt	FAC			
Rumex crispus	Curly dock	Polygonaceae	P-Forb	Ad	FAC			
Solidago altissima	Tall goldenrod	Asteraceae	P-Forb	Nt	FACU			
Solidago canadensis	Canadian goldenrod	Asteraceae	P-Forb	Nt	FACU			
Solidago gigantea	Late goldenrod	Asteraceae	P-Forb	Nt	FACW			X
Sorghastrum nutans	Indian grass	Poaceae	P-Grass	Nt	FACU			X
Trifolium hybridum	Alsike clover	Fabaceae	P-Forb	Ad	FACU			
Trifolium pratense	Red clover	Fabaceae	P-Forb	Ad	FACU			
Verbascum thapsus	Mullein	Scrophulariaceae	B-Forb	Ad	UPL			

Categories		
Vascular Plant Families	15	
Non-Vascular Plant Families	0	
	No. Species	Percent
Total Species	41	100.0%
Native Species	24	58.5%
Adventive Species	17	41.5%
Unknown Species	0	0.0%
Largest Families Represented		
Aster Family (Asteraceae)	10	24.4%
Grass Family (Poaceae)	7	17.1%
Pea Family (Fabaceae)	9	22.0%
Physiognomy		
Perennial Forbs (P-Forb)	18	43.9%
Annual Forbs (A-Forb)	7	17.1%
Biennial Forbs (B-Forbs)	6	14.6%
Forbs	0	0.0%
Perennial Grass (P-Grass)	7	17.1%
Annual Grass (A-Grass)	0	0.0%
Grasses	1	2.4%
Perennial Sedge (P-Sedge)	1	2.4%
Alga	0	0.0%
Cryptogams	0	0.0%
Trees	1	2.4%
Shrubs	0	0.0%
Vines	0	0.0%
Miscellaneous		
Nectar/Larval Food Plants	4	9.8%
Seeded/Planted Species	15	36.6%
Rare Plants	0	0.0%
Wetland Classification		
Upland (UPL)	8	19.5%
Facultative Upland (FACU)	23	56.1%
Facultative (FAC)	4	9.8%
Facultative Wetland (FACW)	6	14.6%
Obligate Wetland (OBL)	0	0.0%
Unknown Species	0	0.0%
Total Hydrophytic Species	10	24.4%

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Scientific Name	Common Name	Family Classification	Physiognomy	Native/Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
<i>Ambrosia artemisiifolia</i>	Ragweed	Asteraceae	A-Forb	Nt	FACU			
<i>Andropogon gerardii</i>	Big bluestem	Poaceae	P-Grass	Nt	FACU			X
<i>Andropogon scoparius</i>	Little bluestem	Poaceae	P-Grass	Nt	FACU			X
<i>Artemisia vulgaris</i>	Mugwort	Asteraceae	P-Forb	Ad	UPL			
<i>Asclepias syriaca</i>	Common milkweed	Asclepiadaceae	P-Forb	Nt	UPL		X	X
<i>Bromus japonicus</i>	Japanese chess	Poaceae	P-Grass	Ad	FACU			
<i>Bromus tectorum</i>	Downy chess	Poaceae	P-Grass	Ad	UPL			
<i>Cenchrus longispinus</i>	Field sandbur	Poaceae	A-Grass	Nt	UPL			
<i>Centaurea maculosa</i>	Spotted knapweed	Asteraceae	P-Forb	Ad	UPL			
<i>Conyza canadensis</i>	Horseweed	Asteraceae	A-Forb	Nt	FACU			X
<i>Coronilla varia</i>	Crown vetch	Fabaceae	P-Forb	Ad	UPL			
<i>Cycloloma atriplicifolium</i>	Winged-pigweed	Chenopodiaceae	A-Forb	Ad	FACU			
<i>Daucus carota</i>	Queen-Anne's-lace	Apiaceae	B-Forb	Ad	UPL			
<i>Desmodium canadense</i>	Giant tick clover	Fabaceae	P-Forb	Nt	FAC			X
<i>Echinochloa crusgalli</i>	Japanese millet	Poaceae	A-Grass	Ad	FAC			
<i>Elymus virginicus</i>	Virginia wild rye	Poaceae	P-Grass	Nt	FACW			X
<i>Erigeron strigosus</i>	Daisy-fleabane	Asteraceae	A-Forb	Nt	FACU			
<i>Euphorbia maculata</i>	Spotted Joy-pye weed	Asteraceae	P-Forb	Nt	OBL			
<i>Festuca rubra</i>	Red fescue	Poaceae	P-Grass	Ad	FACU			
<i>Lespedeza capitata</i>	Bush-clover	Fabaceae	P-Forb	Nt	FACU		X	X
<i>Lotus corniculatus</i>	Bird's-foot trefoil	Fabaceae	P-Forb	Ad	FACU			
<i>Lupinus perennis</i>	Wild lupine	Fabaceae	P-Forb	Nt	UPL		X	X
<i>Medicago lupulina</i>	Black medick	Fabaceae	P-Forb	Ad	FACU			
<i>Medicago sativa</i>	Alfalfa	Fabaceae	P-Forb	Ad	UPL			
<i>Melilotus officinalis</i>	Yellow melilotus	Fabaceae	B-Forb	Ad	FACU			
<i>Monarda fistulosa</i>	Wild bergamot	Lamiaceae	P-Forb	Nt	FACU			X
<i>Monarda punctata</i>	Dotted horsemint	Lamiaceae	P-Forb	Nt	UPL		X	X
<i>Oenothera biennis</i>	Common evening-primrose	Onagraceae	B-Forb	Nt	FACU			X
<i>Panicum virgatum</i>	Switchgrass	Poaceae	P-Grass	Nt	FAC			
<i>Phleum pratense</i>	Timothy	Poaceae	Grass	Ad	FACU			
<i>Plantago rugelii</i>	Pale plantain	Plantaginaceae	P-Forb	Nt	FAC			
<i>Polygonum pensylvanicum</i>	Pinkweed	Polygonaceae	A-Forb	Nt	FACW			
<i>Populus deltoides</i>	Cottonwood	Salicaceae	Tree	Nt	FAC			
<i>Rudbeckia hirta</i>	Black-eyed Susan	Asteraceae	B-Forb	Nt	FACU			X
<i>Secale cereale</i>	Rye	Poaceae	A-Grass	Ad	UPL			
<i>Setaria faberi</i>	Japanese bristle grass	Poaceae	A-Grass	Ad	FACU			
<i>Solidago canadensis</i>	Canadian goldenrod	Asteraceae	P-Forb	Nt	FACU			
<i>Trifolium repens</i>	White clover	Fabaceae	P-Forb	Ad	FACU			
<i>Verbascum thapsus</i>	Mullein	Scrophulariaceae	B-Forb	Ad	UPL			
<i>Vitis riparia</i>	Riverbank grape	Vitaceae	Vine	Nt	FAC			

Categories		
Vascular Plant Families	13	
Non-Vascular Plant Families	0	
	No. Species	Percent
Total Species	40	100.0%
Native Species	22	55.0%
Adventive Species	18	45.0%
Unknown Species	0	0.0%
Largest Families Represented		
Aster Family (Asteraceae)	8	20.0%
Grass Family (Poaceae)	12	30.0%
Pea Family (Fabaceae)	9	22.5%
Physiognomy		
Perennial Forbs (P-Forb)	16	40.0%
Annual Forbs (A-Forb)	5	12.5%
Biennial Forbs (B-Forbs)	5	12.5%
Forbs	0	0.0%
Perennial Grass (P-Grass)	7	17.5%
Annual Grass (A-Grass)	4	10.0%
Grasses	1	2.5%
Perennial Sedge (P-Sedge)	0	0.0%
Alga	0	0.0%
Cryptogams	0	0.0%
Trees	1	2.5%
Shrubs	0	0.0%
Vines	1	2.5%
Miscellaneous		
Nectar/Larval Food Plants	4	10.0%
Seeded/Planted Species	12	30.0%
Rare Plants	0	0.0%
Wetland Classification		
Upland (UPL)	12	30.0%
Facultative Upland (FACU)	19	47.5%
Facultative (FAC)	6	15.0%
Facultative Wetland (FACW)	2	5.0%
Obligate Wetland (OBL)	1	2.5%
Unknown Species	0	0.0%
Total Hydrophytic Species	9	22.5%

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Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
<i>Ambrosia artemisiifolia</i>	Ragweed	Asteraceae	A-Forb	Nt	FACU			
<i>Andropogon gerardii</i>	Big bluestem	Poaceae	P-Grass	Nt	FACU			X
<i>Andropogon scoparius</i>	Little bluestem	Poaceae	P-Grass	Nt	FACU			X
<i>Artemisia vulgaris</i>	Mugwort	Asteraceae	P-Forb	Ad	UPL			
<i>Berteroa incana</i>	Hoary alyssum	Brassicaceae	A-Forb	Ad	UPL			
<i>Celastrus orbiculatus</i>	Oriental bittersweet	Celastraceae	Vine	Ad	UPL			
<i>Cenchrus longispinus</i>	Field sandbur	Poaceae	A-Grass	Nt	UPL			
<i>Conyza canadensis</i>	Horseweed	Asteraceae	A-Forb	Nt	FACU			X
<i>Coreopsis lanceolata</i>	Coreopsis	Asteraceae	P-Forb	Ad	FACU			
<i>Cyperus strigosus</i>	Straw-colored flat sedge	Cyperaceae	P-Sedge	Nt	FACW			
<i>Dactylis glomerata</i>	Orchard grass	Poaceae	P-Grass	Ad	FACU			
<i>Desmodium canadense</i>	Giant tick clover	Fabaceae	P-Forb	Nt	FAC			X
<i>Dianthus armeria</i>	Deptford pink	Caryophyllaceae	A-Forb	Ad	UPL			
<i>Echinochloa crusgalli</i>	Japanese millet	Poaceae	A-Grass	Ad	FAC			
<i>Equisetum arvense</i>	Field horsetail	Equisetaceae	Cryptogam	Nt	FAC			
<i>Euphorbia maculata</i>	Spotted Joy-pye weed	Asteraceae	P-Forb	Nt	OBL			
<i>Festuca rubra</i>	Red fescue	Poaceae	P-Grass	Ad	FACU			
<i>Lespedeza capitata</i>	Bush-clover	Fabaceae	P-Forb	Nt	FACU		X	X
<i>Lotus corniculatus</i>	Bird's-foot trefoil	Fabaceae	P-Forb	Ad	FACU			
<i>Lupinus perennis</i>	Wild lupine	Fabaceae	P-Forb	Nt	UPL		X	X
<i>Medicago sativa</i>	Alfalfa	Fabaceae	P-Forb	Ad	UPL			
<i>Melilotus alba</i>	White sweet-clover	Fabaceae	B-Forb	Ad	FACU			
<i>Monarda punctata</i>	Dotted horsemint	Lamiaceae	P-Forb	Nt	UPL		X	X
<i>Oenothera biennis</i>	Common evening-primrose	Onagraceae	B-Forb	Nt	FACU			X
<i>Panicum virgatum</i>	Switchgrass	Poaceae	P-Grass	Nt	FAC			
<i>Phleum pratense</i>	Timothy	Poaceae	Grass	Ad	FACU			
<i>Polygonum pensylvanicum</i>	Pinkweed	Polygonaceae	A-Forb	Nt	FACW			
<i>Setaria faberi</i>	Japanese bristle grass	Poaceae	A-Grass	Ad	FACU			
<i>Stellaria media</i>	Common chickweed	Caryophyllaceae	A-Forb	Ad	FACU			
<i>Taraxacum officinale</i>	Common dandelion	Asteraceae	P-Forb	Ad	FACU			
<i>Trifolium hybridum</i>	Alsike clover	Fabaceae	P-Forb	Ad	FACU			
<i>Trifolium pratense</i>	Red clover	Fabaceae	P-Forb	Ad	FACU			

Categories		
Vascular Plant Families	11	
Non-Vascular Plant Families	0	
	No. Species	Percent
Total Species	32	100.0%
Native Species	15	46.9%
Adventive Species	17	53.1%
Unknown Species	0	0.0%
Largest Families Represented		
Aster Family (Asteraceae)	6	18.8%
Grass Family (Poaceae)	9	28.1%
Pea Family (Fabaceae)	8	25.0%
Physiognomy		
Perennial Forbs (P-Forb)	12	37.5%
Annual Forbs (A-Forb)	6	18.8%
Biennial Forbs (B-Forbs)	2	6.3%
Forbs	0	0.0%
Perennial Grass (P-Grass)	5	15.6%
Annual Grass (A-Grass)	3	9.4%
Grasses	1	3.1%
Perennial Sedge (P-Sedge)	1	3.1%
Alga	0	0.0%
Cryptogams	1	3.1%
Trees	0	0.0%
Shrubs	0	0.0%
Vines	1	3.1%
Miscellaneous		
Nectar/Larval Food Plants	3	9.4%
Seeded/Planted Species	8	25.0%
Rare Plants	0	0.0%
Wetland Classification		
Upland (UPL)	8	25.0%
Facultative Upland (FACU)	17	53.1%
Facultative (FAC)	4	12.5%
Facultative Wetland (FACW)	2	6.3%
Obligate Wetland (OBL)	1	3.1%
Unknown Species	0	0.0%
Total Hydrophytic Species	7	21.9%

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Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
<i>Ambrosia artemisiifolia</i>	Ragweed	Asteraceae	A-Forb	Nt	FACU			
<i>Andropogon gerardii</i>	Big bluestem	Poaceae	P-Grass	Nt	FACU			X
<i>Andropogon scoparius</i>	Little bluestem	Poaceae	P-Grass	Nt	FACU			X
<i>Asclepias syriaca</i>	Common milkweed	Asclepiadaceae	P-Forb	Nt	UPL		X	X
<i>Bidens frondosa</i>	Beggar-ticks	Asteraceae	A-Forb	Nt	FACW			X
<i>Centaurea maculosa</i>	Spotted knapweed	Asteraceae	P-Forb	Ad	UPL			
<i>Chenopodium album</i>	Lamb's-quarters	Chenopodiaceae	A-Forb	Ad	FACU			
<i>Cirsium arvense</i>	Canada thistle	Asteraceae	P-Forb	Ad	FACU			
<i>Cirsium vulgare</i>	Bull-thistle	Asteraceae	B-Forb	Ad	FACU			
<i>Conyza canadensis</i>	Horseweed	Asteraceae	A-Forb	Nt	FACU			X
<i>Coreopsis tinctoria</i>	Golden tickseed	Asteraceae	A-Forb	Ad	FAC			
<i>Desmodium canadense</i>	Giant tick clover	Fabaceae	P-Forb	Nt	FAC			X
<i>Digitaria sanguinalis</i>	Tall crabgrass	Poaceae	A-Grass	Ad	FACU			
<i>Echinochloa crusgalli</i>	Japanese millet	Poaceae	A-Grass	Ad	FAC			
<i>Eragrostis pectinacea</i>	Small love grass	Poaceae	A-Grass	Nt	FAC			
<i>Erechtites hieracifolia</i>	Fireweed	Asteraceae	A-Forb	Nt	FACU			X
<i>Erigeron strigosus</i>	Daisy-fleabane	Asteraceae	A-Forb	Nt	FACU			
<i>Euphorbia maculata</i>	Spotted Joy-pye weed	Asteraceae	P-Forb	Nt	OBL			
<i>Lespedeza capitata</i>	Bush-clover	Fabaceae	P-Forb	Nt	FACU		X	X
<i>Lolium multiflorum</i>	Italian rye grass	Poaceae	A-Grass	Ad	FACU			X
<i>Lotus corniculatus</i>	Bird's-foot trefoil	Fabaceae	P-Forb	Ad	FACU			
<i>Lupinus perennis</i>	Wild lupine	Fabaceae	P-Forb	Nt	UPL		X	X
<i>Medicago sativa</i>	Alfalfa	Fabaceae	P-Forb	Ad	UPL			
<i>Monarda fistulosa</i>	Wild bergamot	Lamiaceae	P-Forb	Nt	FACU			X
<i>Oenothera biennis</i>	Common evening-primrose	Onagraceae	B-Forb	Nt	FACU			X
<i>Panicum virgatum</i>	Switchgrass	Poaceae	P-Grass	Nt	FAC			
<i>Phleum pratense</i>	Timothy	Poaceae	Grass	Ad	FACU			
<i>Phragmites australis</i>	Common reed	Poaceae	P-Grass	Ad	FACW			
<i>Plantago major</i>	Common plantain	Plantaginaceae	P-Forb	Ad	FACU			
<i>Polygonum pensylvanicum</i>	Pinkweed	Polygonaceae	A-Forb	Nt	FACW			
<i>Robinia pseudoacacia</i>	Black locust	Fabaceae	Tree	Ad	FACU			
<i>Rudbeckia hirta</i>	Black-eyed Susan	Asteraceae	B-Forb	Nt	FACU			X
<i>Setaria faberi</i>	Japanese bristle grass	Poaceae	A-Grass	Ad	FACU			
<i>Sisyrinchium campestre</i>	Prairie blue-eyed grass	Iridaceae	P-Forb	Nt	UPL			
<i>Solidago juncea</i>	Early goldenrod	Asteraceae	P-Forb	Nt	UPL			X
<i>Sorghastrum nutans</i>	Indian grass	Poaceae	P-Grass	Nt	FACU			X
<i>Trifolium arvense</i>	Rabbit foot clover	Fabaceae	A-Forb	Ad	UPL			
<i>Trifolium hybridum</i>	Alsike clover	Fabaceae	P-Forb	Ad	FACU			
<i>Trifolium repens</i>	White clover	Fabaceae	P-Forb	Ad	FACU			
<i>Verbascum blattaria</i>	Moth mullein	Scrophulariaceae	B-Forb	Ad	FACU			
<i>Verbascum thapsus</i>	Mullein	Scrophulariaceae	B-Forb	Ad	UPL			
<i>Xanthium strumarium</i>	Cocklebur	Asteraceae	A-Forb	Nt	FAC			

Categories		
Vascular Plant Families	11	
Non-Vascular Plant Families	0	
	No. Species	Percent
Total Species	42	100.0%
Native Species	22	52.4%
Adventive Species	20	47.6%
Unknown Species	0	0.0%
Largest Families Represented		
Aster Family (Asteraceae)	13	31.0%
Grass Family (Poaceae)	11	26.2%
Pea Family (Fabaceae)	9	21.4%
Physiognomy		
Perennial Forbs (P-Forb)	15	35.7%
Annual Forbs (A-Forb)	10	23.8%
Biennial Forbs (B-Forbs)	5	11.9%
Forbs	0	0.0%
Perennial Grass (P-Grass)	5	11.9%
Annual Grass (A-Grass)	5	11.9%
Grasses	1	2.4%
Perennial Sedge (P-Sedge)	0	0.0%
Alga	0	0.0%
Cryptogams	0	0.0%
Trees	1	2.4%
Shrubs	0	0.0%
Vines	0	0.0%
Miscellaneous		
Nectar/Larval Food Plants	3	7.1%
Seeded/Planted Species	15	35.7%
Rare Plants	0	0.0%
Wetland Classification		
Upland (UPL)	8	19.0%
Facultative Upland (FACU)	24	57.1%
Facultative (FAC)	6	14.3%
Facultative Wetland (FACW)	3	7.1%
Obligate Wetland (OBL)	1	2.4%
Unknown Species	0	0.0%
Total Hydrophytic Species	10	23.8%

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Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
Agalinis tenuifolia	Gerardia	Scrophulariaceae	P-Forb	Nt	FACW			X
Agrostis alba	Redtop	Poaceae	P-Grass	Ad	FACW			
Ambrosia artemisiifolia	Ragweed	Asteraceae	A-Forb	Nt	FACU			
Andropogon gerardii	Big bluestem	Poaceae	P-Grass	Nt	FACU			X
Andropogon scoparius	Little bluestem	Poaceae	P-Grass	Nt	FACU			X
Artemisia vulgaris	Mugwort	Asteraceae	P-Forb	Ad	UPL			
Asclepias syriaca	Common milkweed	Asclepiadaceae	P-Forb	Nt	UPL		X	X
Bidens frondosa	Beggar-ticks	Asteraceae	A-Forb	Nt	FACW			X
Carex stricta	Tussock sedge	Cyperaceae	P-Sedge	Nt	OBL			X
Celastrus orbiculatus	Oriental bittersweet	Celastraceae	Vine	Ad	UPL			
Centaurea maculosa	Spotted knapweed	Asteraceae	P-Forb	Ad	UPL			
Cirsium vulgare	Bull-thistle	Asteraceae	B-Forb	Ad	FACU			
Conyza canadensis	Horseweed	Asteraceae	A-Forb	Nt	FACU			X
Coronilla varia	Crown vetch	Fabaceae	P-Forb	Ad	UPL			
Cyperus sp.	Flat sedge	Cyperaceae	P-Sedge	Nt				
Cyperus strigosus	Straw-colored flat sedge	Cyperaceae	P-Sedge	Nt	FACW			
Daucus carota	Queen-Anne's-lace	Apiaceae	B-Forb	Ad	UPL			
Desmodium canadense	Giant tick clover	Fabaceae	P-Forb	Nt	FAC			X
Epilobium coloratum	Purple-leaf willowherb	Onagraceae	P-Forb	Nt	OBL			X
Equisetum arvense	Field horsetail	Equisetaceae	Cryptogam	Nt	FAC			
Euphorbia maculata	Spotted Joy-pye weed	Asteraceae	P-Forb	Nt	OBL			
Festuca rubra	Red fescue	Poaceae	P-Grass	Ad	FACU			
Hypericum perforatum	Common St. John's-wort	Clusiaceae	P-Forb	Ad	UPL			
Juncus effusus	Common rush	Juncaceae	P-Grass	Nt	OBL			X
Lespedeza capitata	Bush-clover	Fabaceae	P-Forb	Nt	FACU		X	X
Lolium multiflorum	Italian rye grass	Poaceae	A-Grass	Ad	FACU			X
Lotus corniculatus	Bird's-foot trefoil	Fabaceae	P-Forb	Ad	FACU			
Lupinus perennis	Wild lupine	Fabaceae	P-Forb	Nt	UPL		X	X
Medicago lupulina	Black medick	Fabaceae	P-Forb	Ad	FACU			
Medicago sativa	Alfalfa	Fabaceae	P-Forb	Ad	UPL			
Monarda fistulosa	Wild bergamot	Lamiaceae	P-Forb	Nt	FACU			X
Monarda punctata	Dotted horsemint	Lamiaceae	P-Forb	Nt	UPL		X	X
Oxalis stricta	Common wood-sorrel	Oxalidaceae	A-Forb	Nt	FACU			
Panicum virgatum	Switchgrass	Poaceae	P-Grass	Nt	FAC			
Penthorum sedoides	Ditch-stonecrop	Crassulaceae	P-Forb	Nt	OBL			X
Phleum pratense	Timothy	Poaceae	Grass	Ad	FACU			
Populus deltoides	Cottonwood	Salicaceae	Tree	Nt	FAC			
Rhus typhina	Staghorn sumac	Anacardiaceae	Tree	Nt	UPL			
Rudbeckia hirta	Black-eyed Susan	Asteraceae	B-Forb	Nt	FACU			X
Rumex crispus	Curly dock	Polygonaceae	P-Forb	Ad	FAC			
Scirpus atrovirens	Dark green bulrush	Cyperaceae	P-Sedge	Nt	OBL			X
Setaria faberi	Japanese bristle grass	Poaceae	A-Grass	Ad	FACU			
Solidago altissima	Tall goldenrod	Asteraceae	P-Forb	Nt	FACU			
Solidago canadensis	Canadian goldenrod	Asteraceae	P-Forb	Nt	FACU			
Solidago graminifolia	Common grass-leaved goldenrod	Asteraceae	P-Forb	Nt	FACW			X
Solidago rugosa	Tall-hairy goldenrod	Asteraceae	P-Forb	Nt	FAC			X
Stellaria media	Common chickweed	Caryophyllaceae	A-Forb	Ad	FACU			
Trifolium hybridum	Alsike clover	Fabaceae	P-Forb	Ad	FACU			

Categories		
Vascular Plant Families	19	
Non-Vascular Plant Families	0	
	No. Species	Percent
Total Species	48	100.0%
Native Species	30	62.5%
Adventive Species	18	37.5%
Unknown Species	0	0.0%
Largest Families Represented		
Aster Family (Asteraceae)	12	25.0%
Grass Family (Poaceae)	8	16.7%
Pea Family (Fabaceae)	8	16.7%
Physiognomy		
Perennial Forbs (P-Forb)	23	47.9%
Annual Forbs (A-Forb)	5	10.4%
Biennial Forbs (B-Forbs)	3	6.3%
Forbs	0	0.0%
Perennial Grass (P-Grass)	6	12.5%
Annual Grass (A-Grass)	2	4.2%
Grasses	1	2.1%
Perennial Sedge (P-Sedge)	4	8.3%
Alga	0	0.0%
Cryptogams	1	2.1%
Trees	2	4.2%
Shrubs	0	0.0%
Vines	1	2.1%
Miscellaneous		
Nectar/Larval Food Plants	4	8.3%
Seeded/Planted Species	20	41.7%
Rare Plants	0	0.0%
Wetland Classification		
Upland (UPL)	11	22.9%
Facultative Upland (FACU)	19	39.6%
Facultative (FAC)	6	12.5%
Facultative Wetland (FACW)	5	10.4%
Obligate Wetland (OBL)	6	12.5%
Unknown Species	1	2.1%
Total Hydrophytic Species	17	35.4%

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Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
Agrostis alba	Redtop	Poaceae	P-Grass	Ad	FACW			
Ambrosia artemisiifolia	Ragweed	Asteraceae	A-Forb	Nt	FACU			
Andropogon gerardii	Big bluestem	Poaceae	P-Grass	Nt	FACU			X
Andropogon scoparius	Little bluestem	Poaceae	P-Grass	Nt	FACU			X
Artemisia vulgaris	Mugwort	Asteraceae	P-Forb	Ad	UPL			
Campsis radicans	Trumpet-creeper	Bignoniaceae	Vine	Ad	FAC			
Celastrus orbiculatus	Oriental bittersweet	Celastraceae	Vine	Ad	UPL			
Centaurea maculosa	Spotted knapweed	Asteraceae	P-Forb	Ad	UPL			
Coryza canadensis	Horseweed	Asteraceae	A-Forb	Nt	FACU			X
Coronilla varia	Crown vetch	Fabaceae	P-Forb	Ad	UPL			
Cyperus esculentus	Yellow nut-grass	Cyperaceae	P-Sedge	Nt	FACW			
Daucus carota	Queen-Anne's-lace	Apiaceae	B-Forb	Ad	UPL			
Desmodium canadense	Giant tick clover	Fabaceae	P-Forb	Nt	FAC			X
Epilobium coloratum	Purple-leaf willowherb	Onagraceae	P-Forb	Nt	OBL			X
Euphorbia maculata	Spotted Joy-pye weed	Asteraceae	P-Forb	Nt	OBL			
Festuca rubra	Red fescue	Poaceae	P-Grass	Ad	FACU			
Hypericum perforatum	Common St. John's-wort	Clusiaceae	P-Forb	Ad	UPL			
Juncus dudleyi	Dudley's rush	Juncaceae	P-Grass	Nt	FACW			X
Lespedeza capitata	Bush-clover	Fabaceae	P-Forb	Nt	FACU		X	X
Lolium multiflorum	Italian rye grass	Poaceae	A-Grass	Ad	FACU			X
Lotus corniculatus	Bird's-foot trefoil	Fabaceae	P-Forb	Ad	FACU			
Lupinus perennis	Wild lupine	Fabaceae	P-Forb	Nt	UPL		X	X
Lychnis alba	White campion	Caryophyllaceae	A-Forb	Ad	UPL			
Lythrum salicaria	Purple loosestrife	Lythraceae	P-Forb	Ad	OBL			
Malus floribunda	Japanese flowering crab apple	Rosaceae	Tree	Ad	UPL			
Medicago lupulina	Black medick	Fabaceae	P-Forb	Ad	FACU			
Monarda fistulosa	Wild bergamot	Lamiaceae	P-Forb	Nt	FACU			X
Oenothera biennis	Common evening-primrose	Onagraceae	B-Forb	Nt	FACU			X
Oxalis stricta	Common wood-sorrel	Oxalidaceae	A-Forb	Nt	FACU			
Phleum pratense	Timothy	Poaceae	Grass	Ad	FACU			
Phragmites australis	Common reed	Poaceae	P-Grass	Ad	FACW			
Plantago lanceolata	Buck horn plantain	Plantaginaceae	P-Forb	Ad	FACU			
Polygonum pensylvanicum	Pinkweed	Polygonaceae	A-Forb	Nt	FACW			
Populus deltoides	Cottonwood	Salicaceae	Tree	Nt	FAC			
Robinia pseudoacacia	Black locust	Fabaceae	Tree	Ad	FACU			
Rosa multiflora	Multiflora rose	Rosaceae	Shrub	Ad	FACU			
Rumex crispus	Curly dock	Polygonaceae	P-Forb	Ad	FAC			
Secale cereale	Rye	Poaceae	A-Grass	Ad	UPL			
Solidago altissima	Tall goldenrod	Asteraceae	P-Forb	Nt	FACU			
Solidago gigantea	Late goldenrod	Asteraceae	P-Forb	Nt	FACW			X
Solidago graminifolia	Common grass-leaved goldenrod	Asteraceae	P-Forb	Nt	FACW			X
Sorghastrum nutans	Indian grass	Poaceae	P-Grass	Nt	FACU			X
Trifolium arvense	Rabbit foot clover	Fabaceae	A-Forb	Ad	UPL			
Trifolium hybridum	Alsike clover	Fabaceae	P-Forb	Ad	FACU			
Trifolium repens	Red clover	Fabaceae	P-Forb	Ad	FACU			
Verbascum thapsus	Mullein	Scrophulariaceae	B-Forb	Ad	UPL			
Vitis riparia	Riverbank grape	Vitaceae	Vine	Nt	FAC			

Categories		
Vascular Plant Families	20	
Non-Vascular Plant Families	0	
	No. Species	Percent
Total Species	47	100.0%
Native Species	21	44.7%
Adventive Species	26	55.3%
Unknown Species	0	0.0%
Largest Families Represented		
Aster Family (Asteraceae)	8	17.0%
Grass Family (Poaceae)	9	19.1%
Pea Family (Fabaceae)	10	21.3%
Physiognomy		
Perennial Forbs (P-Forb)	20	42.6%
Annual Forbs (A-Forb)	6	12.8%
Biennial Forbs (B-Forbs)	3	6.4%
Forbs	0	0.0%
Perennial Grass (P-Grass)	7	14.9%
Annual Grass (A-Grass)	2	4.3%
Grasses	1	2.1%
Perennial Sedge (P-Sedge)	1	2.1%
Alga	0	0.0%
Cryptogams	0	0.0%
Trees	3	6.4%
Shrubs	1	2.1%
Vines	3	6.4%
Miscellaneous		
Nectar/Larval Food Plants	2	4.3%
Seeded/Planted Species	14	29.8%
Rare Plants	0	0.0%
Wetland Classification		
Upland (UPL)	12	25.5%
Facultative Upland (FACU)	20	42.6%
Facultative (FAC)	5	10.6%
Facultative Wetland (FACW)	7	14.9%
Obligate Wetland (OBL)	3	6.4%
Unknown Species	0	0.0%
Total Hydrophytic Species	15	31.9%

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Scientific Name	Common Name	Family Classification	Physiognomy	Native/Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
<i>Ambrosia artemisiifolia</i>	Ragweed	Asteraceae	A-Forb	Nt	FACU			
<i>Andropogon gerardii</i>	Big bluestem	Poaceae	P-Grass	Nt	FACU			X
<i>Andropogon scoparius</i>	Little bluestem	Poaceae	P-Grass	Nt	FACU			X
<i>Artemisia vulgaris</i>	Mugwort	Asteraceae	P-Forb	Ad	UPL			
<i>Asclepias syriaca</i>	Common milkweed	Asclepiadaceae	P-Forb	Nt	UPL		X	X
<i>Celastrus orbiculatus</i>	Oriental bittersweet	Celastraceae	Vine	Ad	UPL			
<i>Centaurea maculosa</i>	Spotted knapweed	Asteraceae	P-Forb	Ad	UPL			
<i>Cirsium vulgare</i>	Bull-thistle	Asteraceae	B-Forb	Ad	FACU			
<i>Conyza canadensis</i>	Horseweed	Asteraceae	A-Forb	Nt	FACU			X
<i>Coronilla varia</i>	Crown vetch	Fabaceae	P-Forb	Ad	UPL			
<i>Daucus carota</i>	Queen-Anne's-lace	Apiaceae	B-Forb	Ad	UPL			
<i>Desmodium canadense</i>	Giant tick clover	Fabaceae	P-Forb	Nt	FAC			X
<i>Euphorbia maculata</i>	Spotted Joy-pye weed	Asteraceae	P-Forb	Nt	OBL			
<i>Festuca elatior</i>	Tall fescue	Poaceae	P-Grass	Ad	FACU			
<i>Lepidium virginicum</i>	Wild peppergrass	Brassicaceae	A-Forb	Nt	FACU			
<i>Lespedeza capitata</i>	Bush-clover	Fabaceae	P-Forb	Nt	FACU		X	X
<i>Lolium multiflorum</i>	Italian rye grass	Poaceae	A-Grass	Ad	FACU			X
<i>Lotus corniculatus</i>	Bird's-foot trefoil	Fabaceae	P-Forb	Ad	FACU			
<i>Lupinus perennis</i>	Wild lupine	Fabaceae	P-Forb	Nt	UPL		X	X
<i>Medicago lupulina</i>	Black medick	Fabaceae	P-Forb	Ad	FACU			
<i>Medicago sativa</i>	Alfalfa	Fabaceae	P-Forb	Ad	UPL			
<i>Melilotus officinalis</i>	Yellow melilotus	Fabaceae	B-Forb	Ad	FACU			
<i>Monarda fistulosa</i>	Wild bergamot	Lamiaceae	P-Forb	Nt	FACU			X
<i>Monarda punctata</i>	Dotted horsemint	Lamiaceae	P-Forb	Nt	UPL		X	X
<i>Oenothera biennis</i>	Common evening-primrose	Onagraceae	B-Forb	Nt	FACU			X
<i>Panicum virgatum</i>	Switchgrass	Poaceae	P-Grass	Nt	FAC			
<i>Plantago lanceolata</i>	Buck horn plantain	Plantaginaceae	P-Forb	Ad	FACU			
<i>Polygonum pensylvanicum</i>	Pinkweed	Polygonaceae	A-Forb	Nt	FACW			
<i>Populus deltoides</i>	Cottonwood	Salicaceae	Tree	Nt	FAC			
<i>Taraxacum officinale</i>	Common dandelion	Asteraceae	P-Forb	Ad	FACU			
<i>Trifolium hybridum</i>	Alsike clover	Fabaceae	P-Forb	Ad	FACU			
<i>Trifolium pratense</i>	Red clover	Fabaceae	P-Forb	Ad	FACU			
<i>Trifolium repens</i>	White clover	Fabaceae	P-Forb	Ad	FACU			
<i>Vitis riparia</i>	Riverbank grape	Vitaceae	Vine	Nt	FAC			
<i>Xanthium strumarium</i>	Cocklebur	Asteraceae	A-Forb	Nt	FAC			

Categories		
Vascular Plant Families	13	
Non-Vascular Plant Families	0	
	No. Species	Percent
Total Species	35	100.0%
Native Species	18	51.4%
Adventive Species	17	48.6%
Unknown Species	0	0.0%
Largest Families Represented		
Aster Family (Asteraceae)	8	22.9%
Grass Family (Poaceae)	5	14.3%
Pea Family (Fabaceae)	11	31.4%
Physiognomy		
Perennial Forbs (P-Forb)	18	51.4%
Annual Forbs (A-Forb)	5	14.3%
Biennial Forbs (B-Forbs)	4	11.4%
Forbs	0	0.0%
Perennial Grass (P-Grass)	4	11.4%
Annual Grass (A-Grass)	1	2.9%
Grasses	0	0.0%
Perennial Sedge (P-Sedge)	0	0.0%
Alga	0	0.0%
Cryptogams	0	0.0%
Trees	1	2.9%
Shrubs	0	0.0%
Vines	2	5.7%
Miscellaneous		
Nectar/Larval Food Plants	4	11.4%
Seeded/Planted Species	11	31.4%
Rare Plants	0	0.0%
Wetland Classification		
Upland (UPL)	9	25.7%
Facultative Upland (FACU)	19	54.3%
Faculative (FAC)	5	14.3%
Facultative Wetland (FACW)	1	2.9%
Obligate Wetland (OBL)	1	2.9%
Unknown Species	0	0.0%
Total Hydrophytic Species	7	20.0%

Attachment 11. Test Plot Photos



Test Plot N12GL



Test Plot N12GM



Test Plot N12GU



Test Plot R12G



Test Plot S12GL



Test Plot S12GM



Test Plot S12GU



Test Plot N18GL



Test Plot N18GM



Test Plot N18GU



Test Plot R18G



Test Plot S18GU



Test Plot S18GM



Test Plot S18GL



Test Plot N24GL



Test Plot N24GM



Test Plot N24GU



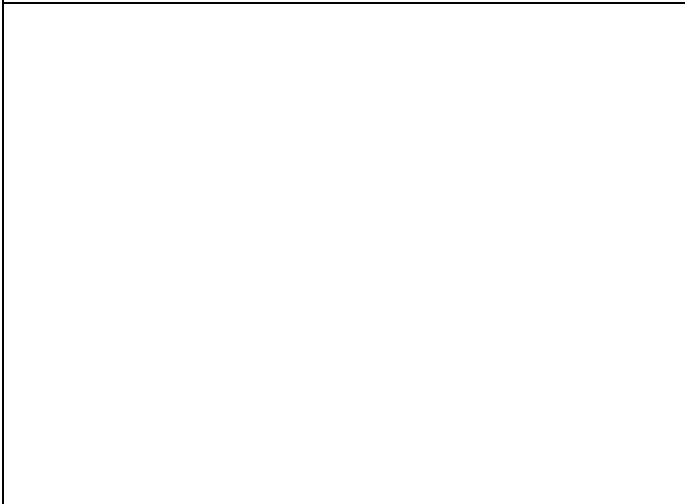
Test Plot R24G



Test Plot S24GU



Test Plot S24GM



Test Plot S24GL



Test Plot N24BL



Test Plot N24BM



Test Plot N24BU



Test Plot R24B



Test Plot S24BU



Test Plot S24BM



Test Plot S24BL

Attachment F. Vernal Pond and Wetland Modifications
Compliance Report
Albany Rapp Road Landfill
Ecosystem Mitigation, Restoration & Enhancement Plan
City of Albany, New York

Introduction

Modifications of vernal pond and forested wetland areas were necessary to bring these areas into compliance (Figure 1). The vernal pond was designed and initially constructed to intercept groundwater at an elevation that would provide saturated conditions during drier times of the year with only small areas of ponding water to remain. However, due to extreme weather conditions and continued groundwater monitoring it was determined that constructed elevations were too low and it was necessary to raise the bottom of the vernal pond from elevation 296 feet up to an elevation of approximately 302.5-303 feet. Similar conditions were being observed in two wetland areas located in the western portion of Phase 2 that are to reflect a forested wetland. The elevation of water within these areas is dictated by groundwater and outlet elevations of each wetland which is higher than the current wetland elevation by approximately 2 to 2.5 feet. Therefore, the establishment of a forested wetland within these areas is not possible.

The area behind the pump station is also designated in the permit requirements to become a forested wetland. However, the constructed elevations were above the extrapolated groundwater contours of the site and did not meet hydrologic conditions necessary to support a forested wetland community.

Grading and planting plans were developed for each of the wetland modification areas. See figures 2-4. Attachment 1 provides photos of the activities of each of these areas to achieve the desired conditions.

Work Activity

Vernal Pond

Modifications to the Vernal Pond began on April 2nd with dewatering of the pond into adjacent upland areas (Photo 1). Once water elevations were reduced to minimum levels, CHA biologists seined the pond to identify and remove any frogs or turtles that may be harmed by construction activities. No turtles were located during this survey; however tadpoles, insect larvae, and some water beetles were removed and transferred to the bio filter located south of the vernal pond. On April 11th, the City began placing sand into the vernal pond area (Photo 3). Once a base layer of sand was placed, grade stakes were placed to ensure proper grades were met. As the compost was placed, the depressions were staked and shaped (Photo 4). Elevations were continually monitored by the City using a level transit to ensure specified grades were met (Photo 5). Root wads were placed and the area was completed on April 17th (Photo 6). Water elevations returned approximately 3 days after completion. On May 28th the first treatment of seeding and sphagnum moss was placed

over the vernal pond. Due to water elevations, the second treatment of sphagnum has been delayed until 2014.

Wetland Modifications

Construction of mounds to raise elevations to support trees began on April 17th. Mounds were constructed in the approximate shapes and configurations as indicated on the plans. Elevations of each mound were verified by the City using a level transit. The northern modified forested wetland area consisted of 39 mounds. A total of 64 trees and 33 shrubs were planted on the mounds with at least one tree being planted on every mound. The southern modified forested wetland area consisted of 20 mounds. Thirty-three trees and 11 shrubs were planted within this wetland area as indicated on the plans. Trees and shrubs were installed by the City and according to the Wetland Tree Planting Detail indicated on Figure 3. All plantings were completed by April 29, 2013. Both areas were seeded with native vegetation and cover crop on June 17th, 2013. Photos 7 – 11 show construction activities and vegetation growth on each of these areas.

In July it was observed that the vegetation on the mounds was dominated by barnyard grass (*Echinochloa sp.*). Discussions resulted in the initial agreement that the grass should be controlled by cutting. The City deployed staff to cut the grass using weed trimmers on August 2nd. After detailed site investigations, it was later determined that the effort to remove the barnyard grass was not commensurate with the benefit. This species is an annual and has been used as a cover crop for wetland restoration projects. Additionally, there was concern that the recently planted trees and shrubs could be damaged by the cutting effort. As a result, the cutting activities were ceased after the grass had been cut on only a few mounds.

Pump Station Grading

In order to bring this area into compliance and achieve forested wetland conditions the area was cut from an elevation of 302 feet to 300 feet which gradually slopes to 298 feet towards the stream. Initial concerns over the flooding of the pump station have been alleviated by flattening the area and the gradual sloping towards the stream and away from the pump station. Grading activities began on April 13th and were completed on April 22nd. Elevations were continually checked during grading activities to ensure the indicated grades were met. Prior to the planting of trees and shrubs, CHA engineers and scientists reviewed and approved the final grades. On May 8th trees and shrubs were planted and on June 19th the application of native and cover crop seed was completed. Photos 12-14 show grading, planting and conditions of this area as of August 19, 2013.

Attachment 1. Photographs



Photo 1. Pumping water from Vernal Pond.



Photo 2. Final water drawdown for seining activities and to begin the placement of sand.



Photo 3. Placing sand in the vernal pond.



Photo 4. Placing compost and constructing pool areas.



Photo 5. Checking grades of vernal pool.



Photo 6. Vernal pool complete before water filled the pool.



Photo 7. Construction of mounds in the north modified forested wetland area.



Photo 8. Trees and shrubs plantings on mounds in the north modified forested wetland.



Photo 9. Vegetated North Modified Forested Wetland Area.



Photo 10. Construction of the mounds located in the south modified forested wetland area.



Photo 11. Vegetated South Modified Forested Wetland Area.



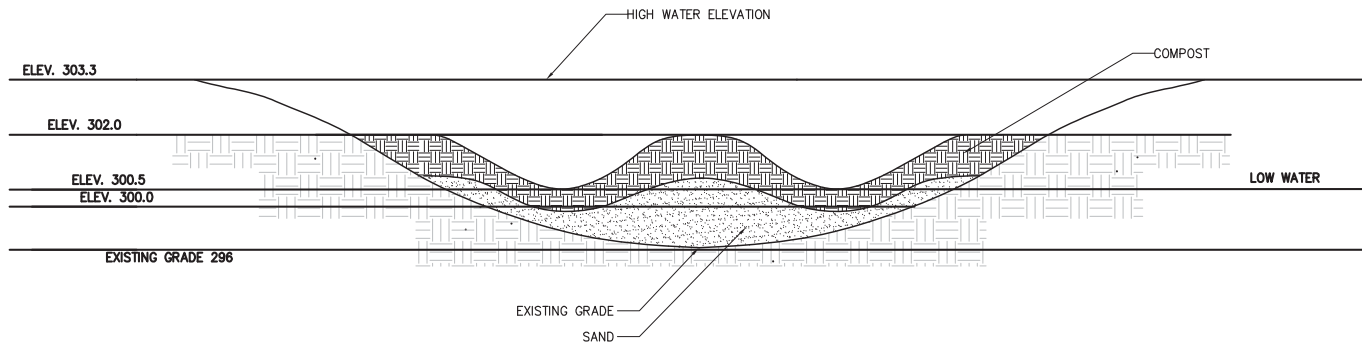
Photo 12. Stripping topsoil from area behind pump house.



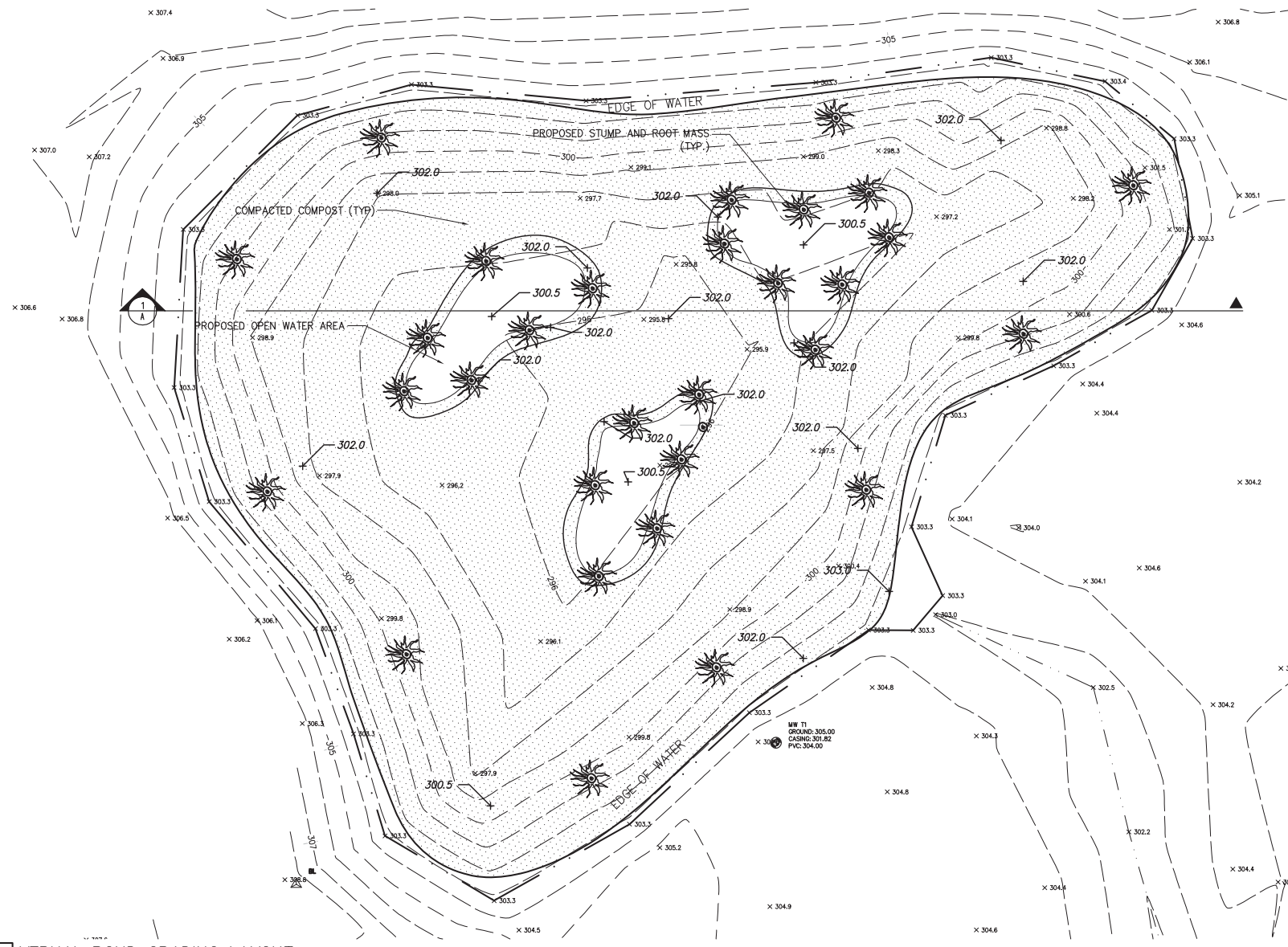
Photo 13. Planting trees and shrubs behind pump house.



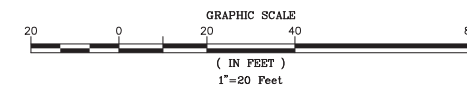
Photo 14. Conditions of area behind pump house on August 19, 2013.



B VERNAL POND SECTION
NOT TO SCALE



A VERNAL POND GRADING LAYOUT
1" = 20' +/-



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1	ISSUED FOR BID	MEH NJS	08/13/10
2	PUMP STATION GRADING, WETLAND BOUND DET	NJS NJS	10/20/12
3	VERNAL POND AND WETLAND MODIFICATIONS	NJS NJS	11/20/12
4	VERNAL POND AND WETLAND MODIFICATIONS	NJS NJS	11/27/12



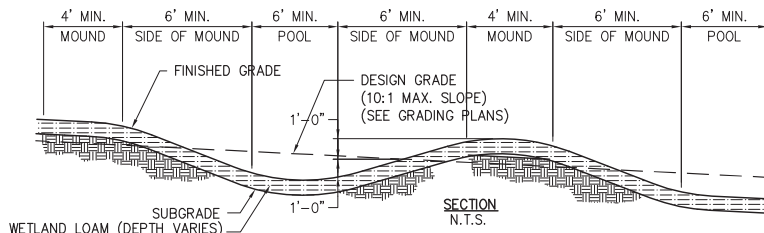
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CHA
 Civil & Environmental
 110 West 42nd St. 10th Floor New York, NY 10018
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 www.cha-engineers.com

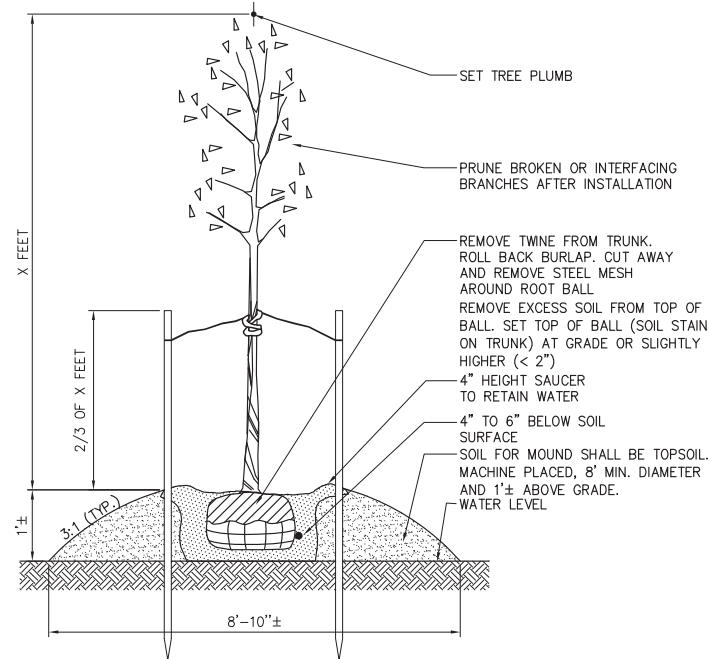
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ALBANY RAPP ROAD LANDFILL
 RESTORATION
 VERNAL POND GRADING
 MODIFICATIONS
 Issue Date: 8/13/10 Project No.: 21661 Scale: AS NOTED

FIG 2



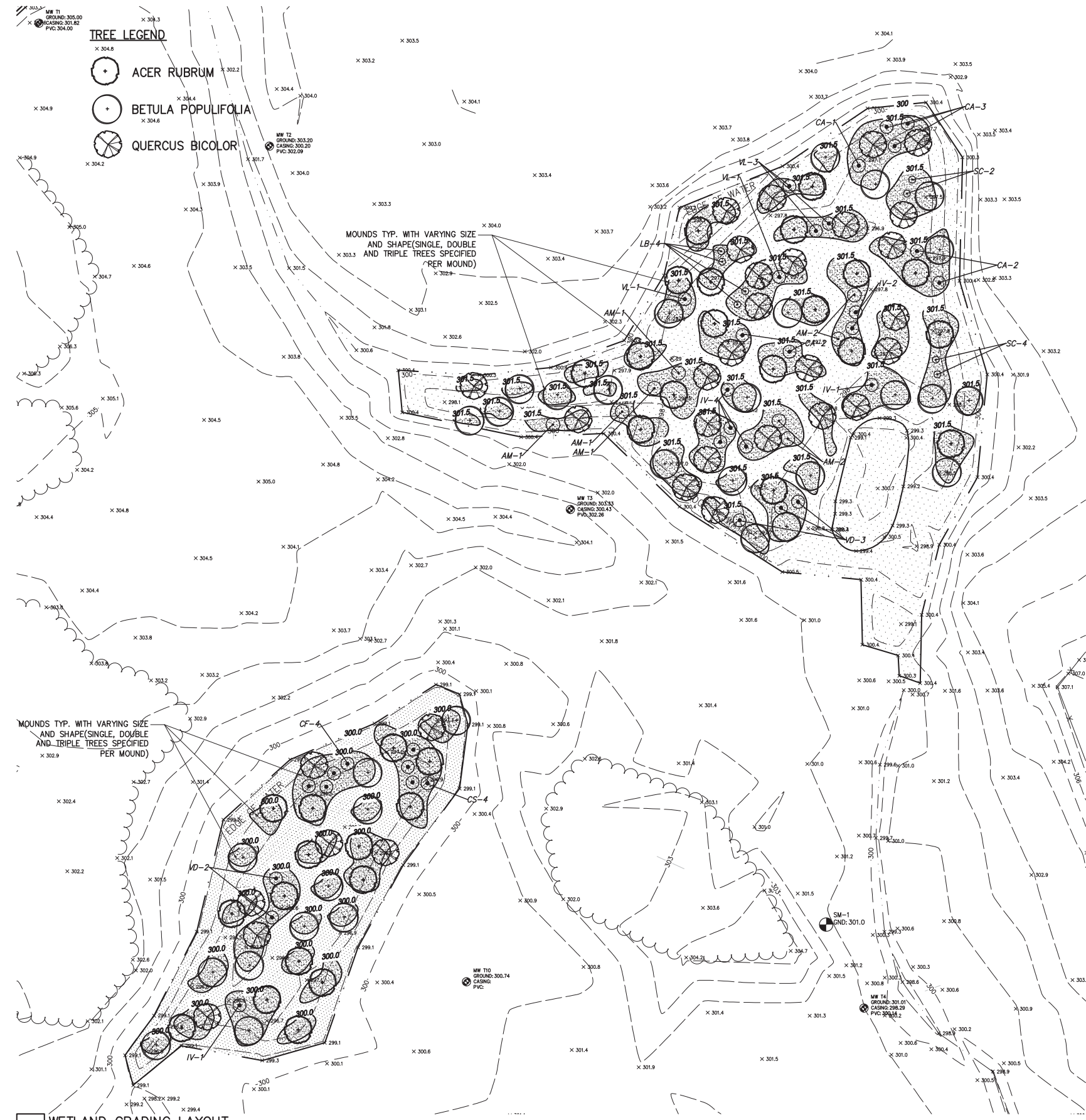
A MOUND AND POOL DETAIL
SCALE: N.T.S.



B WETLAND TREE PLANTING DETAIL - MOUNDS
SCALE: N.T.S.

WETLAND MOUND PLANTING SCHEDULE			
TREES			
SCIENTIFIC NAME	COMMON NAME	3 GAL. CONTAINER	
ACER RUBRUM	RED MAPLE	32	
BETULA POPULIFOLIA	GRAY BIRCH	32	
QUERCUS BICOLOR	SWAMP WHITE OAK	33	
	TOTAL	97	
SHRUBS			
KEY	SCIENTIFIC NAME	COMMON NAME	3 GAL. CONTAINER
AM	AMELANCHIER SPP.	SERVICEBERRY SPP	8
CA	CORNUS AMOMUM	SILKY DOGWOOD	8
CF	CORNUS FOEMINA	GRAY DOGWOOD	4
CS	CORNUS SERICEA	RED-OSIER DOGWOOD	4
IV	LLEX VERTICILLATA	COMMON WINTERBERRY	8
LB	LINDERA BENZOIN	SPICEBUSH	4
SC	SAMBUCUS CANADENSIS	BLACK ELDERBERRY	4
VD	VIBURNUM DENTATUM	SOUTHERN ARROWWOOD	5
VL	VIBURNUM LENTAGO	SHEEP BERRY	5
	TOTAL	50	

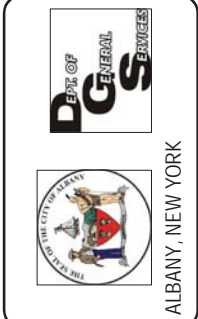
C WETLAND TREE AND SHRUB PLANTING SCHEDULE
SCALE: N.T.S.



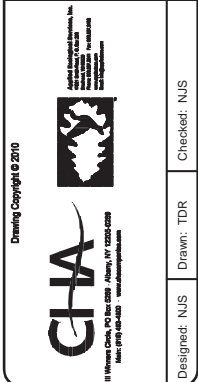
D WETLAND GRADING LAYOUT
1" = 30' +/-

- NOTES:
- CONTAINERIZED PLANTS AND SHRUBS WILL HAVE GENETIC ORIGIN FROM WITHIN 300 MILES OF THE PROJECT SITE.
 - TREES SHALL BE PLACED ON THE MOUNDS IN THE QUANTITIES NOTED ON THE PLANS.
 - SHRUBS SHALL BE PLACED ON THE MOUNDS BASED ON AVAILABLE SPACE AS DETERMINED IN THE FIELD.
 - SHRUBS SHALL NOT BE PLANTED ON MOUNDS WITH ONLY 1 TREE.
 - SEED MIX SHALL BE THE SAME AS WHAT WAS PREVIOUSLY PROVIDED FOR THIS AREA AND AT THE SAME RATE.
 - TREES SHALL BE PLANTED AT A RATE OF 75 STEMS/AC AND SHRUBS SHALL BE PLANTED AT 36 SHRUBS/AC

No.	Submittal / Revision	App'd By	Date
1	ISSUED FOR BID	MEH NJS	08/13/10
2	PUMP STATION GRADING, WETLAND MOUND DET	NJS NJS	10/20/12
3	VERNAL POND AND WETLAND MODIFICATIONS	NJS NJS	11/20/12
4	VERNAL POND AND WETLAND MODIFICATIONS	NJS NJS	11/27/12



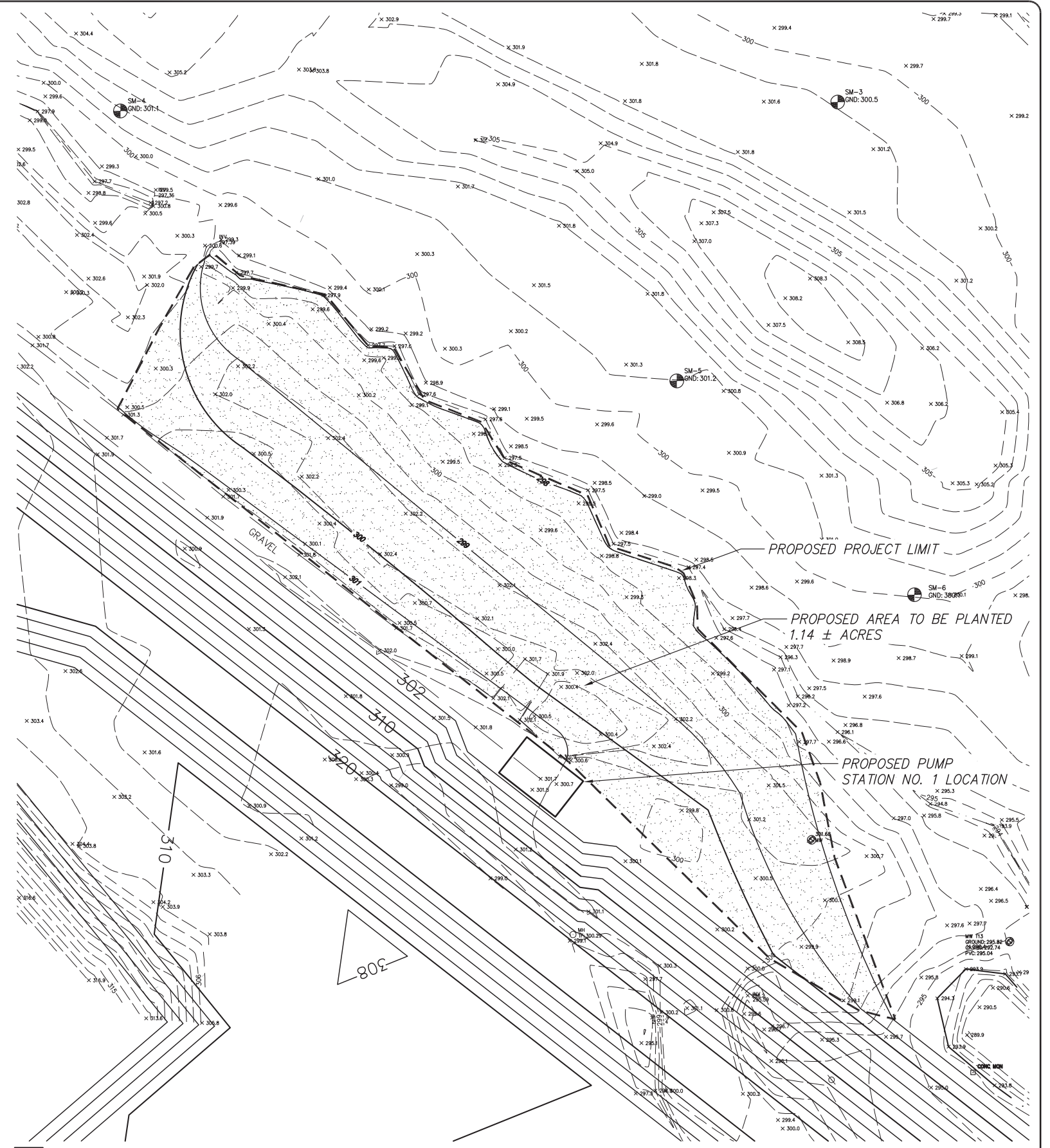
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Issue Date: 01/31/10
Project No.: 21661
Scale: AS NOTED

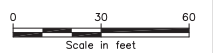
PLANTING SCHEDULE		
TREES		
SCIENTIFIC NAME	COMMON NAME	3 GAL. CONTAINER
ACER RUBRUM	RED MAPLE	29
BETULA POPULIFOLIA	GRAY BIRCH	29
QUERCUS BICOLOR	SWAMP WHITE OAK	29
	TOTAL	87
SHRUBS		
SCIENTIFIC NAME	COMMON NAME	3 GAL. CONTAINER
AMELANCHIER SPP.	SERVICEBERRY SPP	6
CORNUS AMOMUM	SILKY DOGWOOD	6
CORNUS FOEMINA	GRAY DOGWOOD	7
CORNUS SERICEA	RED-OSIER DOGWOOD	6
LLEX VERTICILLATA	COMMON WINTERBERRY	7
LINDERA BENZOIN	SPICEBUSH	6
SAMBUCUS CANADENSIS	BLACK ELDERBERRY	6
VIBURNUM DENTATUM	SOUTHERN ARROWWOOD	7
VIBURNUM LENTAGO	SHEEP BERRY	6
	TOTAL	57

- NOTES:
1. CONTAINERIZED PLANTS AND SHRUBS WILL HAVE GENETIC ORIGIN FROM WITHIN 300 MILES OF THE PROJECT SITE.
 2. TREES SHALL BE PLACED WITHIN THE AREA SHOWN ON THE PLAN IN ODD NUMBER GROUPINGS.
 3. SHRUBS SHALL BE PLACED WITHIN THE AREA SHOWN BASED ON AVAILABLE SPACE AS DETERMINED IN THE FIELD.
 4. SEED MIX SHALL BE THE SAME AS WHAT WAS PREVIOUSLY PROVIDED FOR THIS AREA AND AT THE SAME RATE.
 5. TREES SHALL BE PLANTED AT A RATE OF 75 STEMS/AC AND SHRUBS SHALL BE PLANTED AT 50 SHRUBS/AC



A PUMP STATION LANDSCAPING PLAN
1" = 30' +/-

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No.	Revised / Revision	App'd By	Date
1	ISSUED FOR BID	MEH NJS	08/13/10
2	PUMP STATION GRADING, WETLAND WOUND DET	NJS NJS	10/02/12
3	VERNAL POND AND WETLAND MODIFICATIONS	NJS NJS	11/02/12
4	VERNAL POND AND WETLAND MODIFICATIONS	NJS NJS	11/27/12



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ALBANY RAPP ROAD LANDFILL RESTORATION
PUMP STATION LANDSCAPE PLAN

Project No.: 21661
Scale: AS NOTED
Issue Date: 8/13/10

FIG 5

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**Attachment G. Phase III Enhancement
Compliance Report
Albany Rapp Road Landfill
Ecosystem Mitigation, Restoration & Enhancement Plan
City of Albany, New York**

Introduction

The goal of the Phase III Enhancement Plan is to restore upland areas to PPSOB and DPSF, establish the early successional habitat critical for the continued conservation of the federally listed Karner Blue Butterfly (*Lycæides melissa samuelis*), and restore ecological connectivity to Preserve lands east and west of the project site. Phase III Enhancement areas were divided into management units covering 58.7 acres of varying upland community types and an additional 29.6 acres of wetland (see attached A.1 Phase III Work Plan Context Map and A.2 Phase III Work Plan Clearing Map)

Phase III activities began during the fall of 2012 and continued throughout 2013. All upland enhancement areas have been thinned or cleared and seeded with a cover mix to stabilize soils. Wetland areas are scheduled to be treated during the fall of 2013. Vegetation composition that has sprouted due to seed or root stock in the soil has been reviewed and a plan for final seeding and planting with natives will be determined through 2016.

Work Activity

Upland Enhancement Thinning and Clearing

Tree thinning and clearing activities halted on December 20, 2012 due severe winter weather conditions and staff availability. At the time of winter shut down, areas still in need of additional work included U-1, U-2, U-5, U-7, U-9, and U-11. Photographs of habitat conditions prior to and after enhancement activities are provided for each area in Attachment 1.

In February 2013 work was resumed in area U-1 where trees were cut, stockpiled, chipped and removed from the area. Due to conditions it was not feasible to treat the remaining stumps to reduce sprouting. Conversations between AES and CHA resulted in the agreement to cut the stumps higher than specified so that if needed in the spring the stumps could be cut lower and treated with herbicide or foliar treatments could be conducted later in the season. Area U-1 was identified for selective tree thinning only. Thinning areas in Area U-1 was determined complete in March when all slash was removed and any ruts or disturbed soils were returned to previous conditions. Photos 1 - 3 show habitat conditions in this area from initiation of the thinning to completion. Native seed mix (PPSOB Mix) will be applied in 2014 and shrubs will be planted in 2015.

Tree cutting in area U-2 was initiated on February 12, 2013. Asplund Tree Service removed all trees within the power line right-of-way. Due to the amount of soil to be stripped and the contours of the area in relationship to the powerline, a second stockpile area was determined to be necessary. Stripping of topsoil began near the end of March on the eastern portion from where it narrows at the property boundary to Rapp Road. This area was seeded with cover crop and erosion blankets

installed on the slopes on April 15-16, 2013. Photos 4 – 6 shows habitat conditions before during and after the thinning and topsoil removal within this area. The steep slopes between areas U-1 and U-2 were graded on August 26, 2013 by cutting the top back 10-15 feet back as directed by AES to reduce the steepness. This activity only occurred on the western portion of the slope since trees remaining on the south slope did not allow for the slope to be cut back. Photos 7 and 8 show before and after conditions of this slope. At the time of this report, the soil stockpiles remain within the eastern portions of area U-2. These piles will be removed, native seed mix (PPSOB Mix) will be applied in 2014 and trees and shrubs will be planted in 2015.

Felling of trees in areas U-5 and U-7 was completed near the end of 2012; therefore enhancement activities conducted in 2013 consisted of the grubbing and removal of stumps, cleanup of slash and remaining trunks, returning the area to previous grades, and application of seed and mulch. These activities were completed on the northern portion of U-7 on May 31st and on the remaining areas on August 28th. Photos 9-12 show habitat conditions of U-5 and U-7 before and after the tree thinning. Native seed mix (PPSOB and Mesic Meadow Mix) will be applied in 2014 and shrubs will be planted in 2015.

All trees that were to be removed from area U-9 were cut during 2012. Stumps remained into 2013 for use in the Vernal Pool. Clean-up activities resumed on May 13th. The majority of the area within U-9 was seeded on May 31st. The entire area was not seeded because of the presence of a turkey nesting within a pile of debris and discussions concerning leaving the road for future access. Photos 13 & 14 show habitat conditions before and after the enhancement activities. The status of the road is still in question, however the remaining debris was cleaned up and the remaining area was seeded with cover crop on August 28th. The area is slated for application of native seed (PPSOB, Mesic Meadow and Vernal Pond Mix) in 2014 and planting of shrubs in 2015.

Additional tree thinning was conducted in an area located north-east of the nursery. AES flagged trees and shrubs that were to be protected. The remaining tree cutting of this area as well as the cedar in area U-11 was conducted on April 30, 2013 to comply with the breeding bird restrictions.

At the end of tree removal in U-13 and prior to the application of cover crop in 2012, the area was not returned to previous conditions (Photo 15). Soil disturbance was evident where root balls were removed and equipment left ruts in the soil. This area was regraded to return the area to previous tree thinning conditions (Photo 16) on May 10th and cover crop was reapplied on May 31st. Additional areas have recently been identified where saplings need to be either cut or treated. This activity is scheduled to occur during the fall of 2013.

Wetland Enhancement Thinning

The thinning of undesirable tree species within the Phase III Wetland Enhancement areas did not occur as anticipated during the spring of 2013 and has been postponed until late fall/early winter of 2013. Along with the drill and fill activities there is a small stand of cottonwoods that are located close to the power line. These trees will be felled during the fall of 2013 and left in place rather than drilled and filled in order to prevent the trees falling towards the power line.

Wetland enhancement seeding has also been postponed until the thinning is completed and is scheduled to occur during the spring of 2014.

Deviations from Work Plan

The Phase III work did not significantly deviate from the work plan. Seeding of the Phase III Enhancement Areas has been postponed until spring 2014 in order to implement invasive species control prior to applying native seed.

Attachment 1. Photographs



Photo 1. Area U-1 prior to tree clearing.



Photo 2. Clean-up activities in area U-1.



Photo 3. Spring vegetation sprouting in area U-1.



Photo 4. Area U-2 prior to tree clearing.



Photo 5. Stripping and stockpiling topsoil in area U-2.



Photo 6. Spring vegetation in Area U-2.



Photo 7. Slope between Area U-1 and U-2 before re-contouring.



Photo 8. Softening of slope between U-1 and U-2.



Photo 9. Area U-5 prior to tree thinning.



Photo 10. Areas U-5 in foreground and U-7 in background cleaned up, graded to previous contours and ready for seeding.



Photo 11. Area U-7 prior to tree thinning.



Photo 12. Northern portion of area U-7 after east area was mulched in August.



Photo 13. Area U-9 prior to tree thinning.



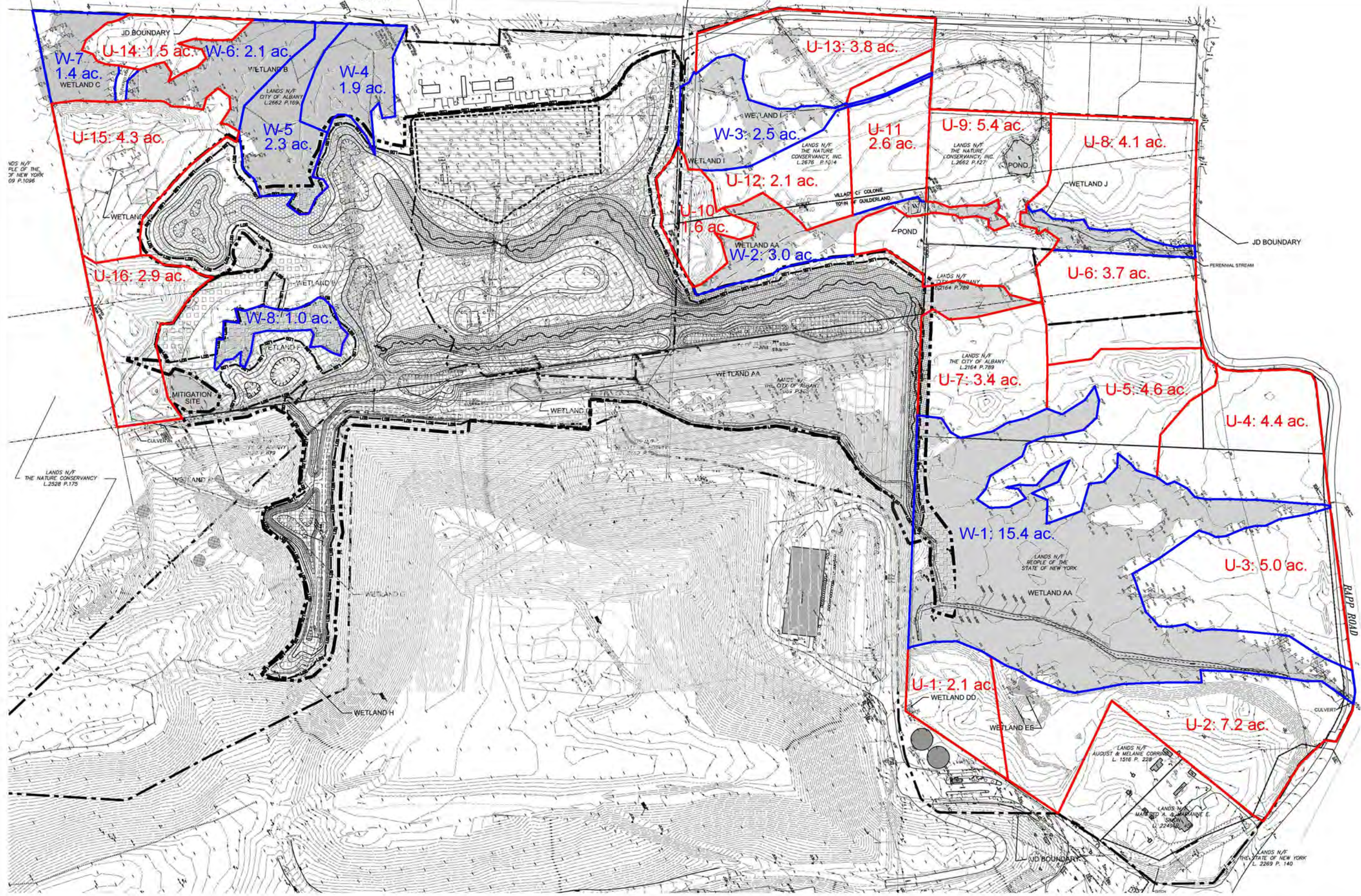
Photo 14. Area U-9 after tree thinning and returning to previous grades.



Photo 15. Area U-13 prior to grading to previous conditions.



Photo 16. Area U-13 after grading.



Albany Rapp Road Landfill
 Albany, New York
 City of Albany, Dept. of General Services
 One Connors Blvd.
 Albany, New York

Phase III Work Plan
 Context Map

AES Proj #	09036
Designed By	WCC
Drawn By	WCC
Checked By	EMK
File	Phase III Work Plan.dwg
Date	01/05/2012
Coordinate System	NAD



Applied Ecological Services, Inc.
 17561 Smith Road, P.O. Box 256
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 Phone: (908) 897-8641 Fax: (908) 897-6480
 www.aecservices.com
 Email: info@aecservices.com

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Phase III Project Areas

- Upland Units
- Wetland Units

LEGEND

- Project Limit Line
- Seeding Zone Boundary
- 80.0 AC
- Existing 2' Contours
- Proposed 2' Contours
- Restored Stream
- Existing Stream

Upland Grassland Communities

- Dry Prairie/Sand Flat
- 3.66 AC
- Dune
- 1.33 AC

Upland Forest Communities

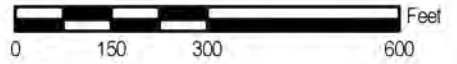
- Pitch Pine-Scrub Oak Barrens
- 4.85 AC
- Nursery Area
- 3.77 AC

Wetland Communities

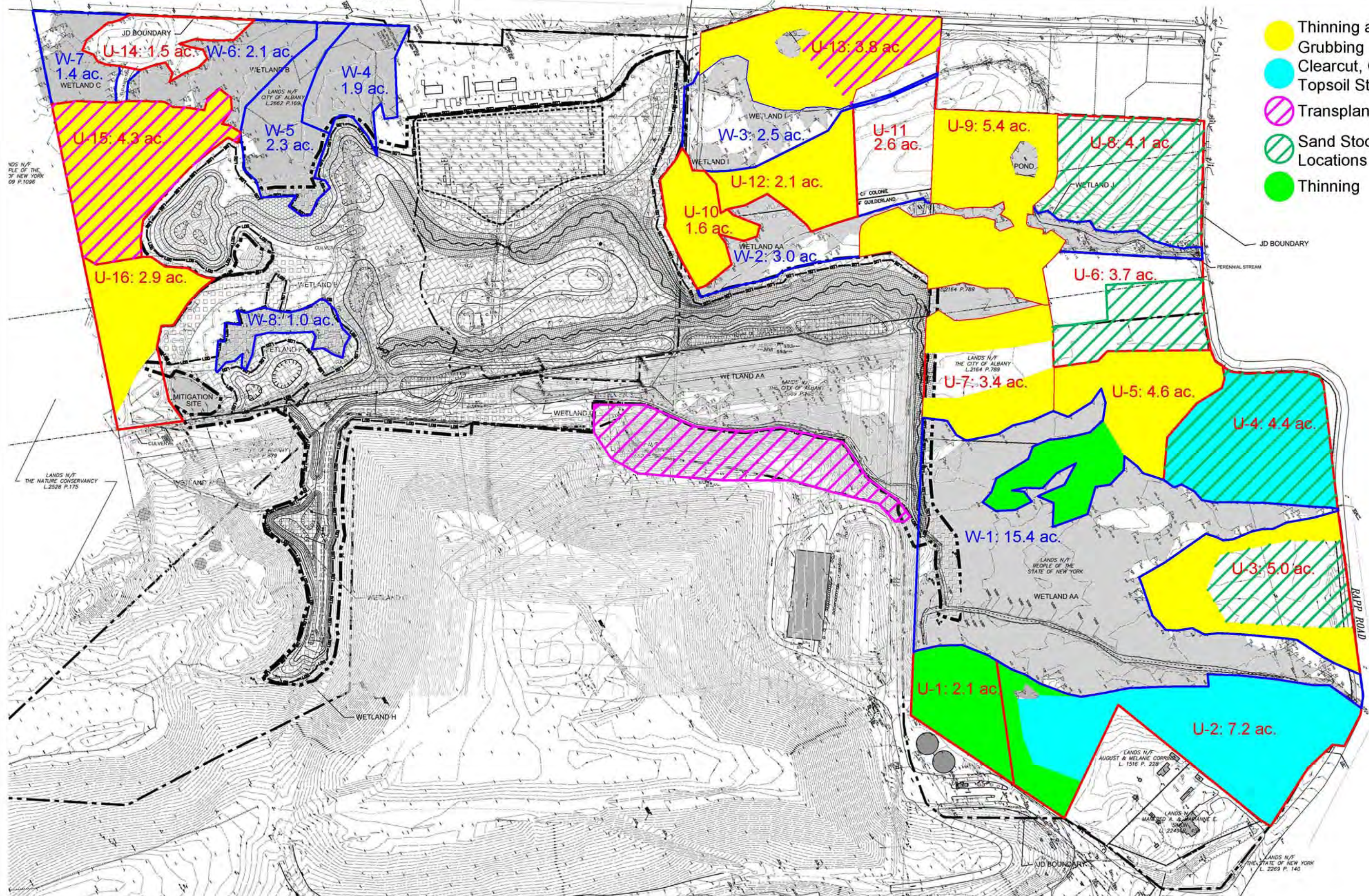
- Buffer Wetland
- 1.42 AC
- Pine Barrens Vernal Pond
- 1.12 AC
- Sedge Meadow
- 0.63 AC
- Forested Wetland (Red Maple Hardwood Swamp)
- 13.17 AC

Wetland Enhancement Communities

- Forested Wetland Enhancement (Red Maple Hardwood Swamp)
- 3.05 AC
- Forested Riparian Wetland (Red Maple Hardwood Swamp)
- 6.50 AC



Scale 1" = 300'
 To Scale When Printed at 11 x 17"



- Thinning and Grubbing
- Clearcut, Grub, and Topsoil Strip
- Transplant Material
- Sand Stockpile Locations
- Thinning

Albany Rapp Road Landfill
 Albany, New York
 City of Albany, Dept. of General Services
 One Connors Blvd.
 Albany, New York

Phase III Work Plan
 Clearing Map

AES Proj #	09030
Designed By	WCC
Drawn By	WCC
Checked By	EMK
File	Phase III Work Plan.dwg
Date	01-06-2012
Coordinate System	NAD



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Phase III Project Areas

- Upland Units
- Wetland Units

LEGEND

- Project Limit Line
- Seeding Zone Boundary
- 80.0 AC
- Existing 2' Contours
- Proposed 2' Contours

- Existing 2' Contours
- Restored Stream
- Existing Stream

- Upland Grassland Communities**
- Dry Prairie/Sand Flat
3.66 AC
 - Dune
1.30 AC

- Upland Forest Communities**
- Pitch Pine-Scrub Oak Barrens
4.85 AC
 - Nursery Area
3.77 AC

- Wetland Communities**
- Emergent Wetland
1.42 AC
 - Pine Barrens Vernal Pond
1.12 AC

- Sedge Meadow
0.63 AC
- Forested Wetland (Red Maple Hardwood Swamp)
13.17 AC

- Forested Wetland Enhancement (Red Maple Hardwood Swamp)
3.05 AC
- Forested Riparian Wetland (Red Maple Hardwood Swamp)
6.50 AC



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**Attachment H. Invasive Plant Management
Compliance Report
Albany Rapp Road Landfill
Ecosystem Mitigation, Restoration & Enhancement Plan
City of Albany, New York**

Introduction

Phase I, Phase II and Phase III restoration activities include the implementation of the Integrated Pest and Invasive Species Management Plan for the Albany Rapp Road Landfill Ecosystem Mitigation, Restoration & Enhancement Project (AES June 2009). Several high priority species have been identified that pose the greatest risk to the long term success of the restoration plan. Implementation of invasive species management was initiated in 2010. Control activities in 2013 followed the schedule below.

Planning Month	2013												Area Controlled	IPM Plan	Construction Specifications	
	1	2	3	4	5	6	7	8	9	10	11	12				
Calendar Month	J	F	M	A	M	J	J	A	S	O	N	D				
Task 9. Invasive Plant Management														Page #	Section #	
1. Common reed (<i>Phragmites australis</i>)								x	x	x				All Phases	94	31 13 14
2. Oriental bittersweet (<i>Celastrus orbiculatus</i>)	x	x	x	x	x	x	x	x	x	x	x	x		All Phases	77 – 80	31 13 14
3. Sweet clover (<i>Melilotus</i> spp)					x	x	x	x	x	x				All Phases	95 – 96	31 13 13
4. Canada thistle (<i>Cirsium arvense</i>)						x	x	x	x					All Phases	85 – 87	31 13 13
5. Purple loosestrife (<i>Lythrum salicaria</i>)						x	x	x	x					Phase II	88 – 89	31 13 13
6. Garlic mustard (<i>Alliaria petiolata</i>)	x	x	x	x	x	x	x	x	x	x	x	x		All Phases	72 – 74	31 13 14
7. Spotted knapweed (<i>Centaurea maculosa</i>)	x	x	x	x	x	x	x	x	x	x	x	x		All Phases	80 – 83	31 13 14
8. Woody control	x	x	x	x	x	x	x	x	x	x	x	x		All Phases	112 – 115	31 13 13

Herbicide applications were conducted by New York State commercial applicators John Price and Nathan Carlton as well as restoration technicians Mathew Shawl, Samantha Knowlden, and Sean Vollenweider.

Work Activity

A. Woody Invasives

The primary effort to remove woody invasive species throughout the Phase I-III areas (with the exception of Oriental Bittersweet) was completed in 2011. Maintenance applications in the form of spot treatment for regrowth, root suckers, and new germinants were initiated in 2012. Treatment of woody invasives began in September and will continue through December 2013. Methods of treatment consisted of cut stem/stump application, foliar application, basal barking and hand

pulling. Herbicide methods for cut stump utilized Triclopyr at rates between 20-100% or Glyphosate at a rate of 50-100% based on species targeted. Foliar applications of 1-3% Triclopyr were also used to control dense mats of Oriental Bittersweet (*Celastrus orbiculatus*) and Black Locust during the growing season.

1. **Maintenance**

Constraints on timing of treatments due to prolonged wet weather conditions impeded foliar application of woody re-sprouts in much of the Phase III restoration area. Black locust was foliar treated in U2 with 3% Triclopyr on October 1st, 3rd, and 10th. As a result, woody control moved to a cut stump and basal barking strategy with 20% Triclopyr beginning October 22nd and will continue until all areas have been treated for trees too small to drill and fill. Drill and fill will be conducted in December to treat *Populus* and other non desirable tree species on the entire landfill project.

2. **Oriental Bittersweet**

Oriental Bittersweet (*Celastrus orbiculatus*) control was conducted in the period beginning June 6th and will end by December 31st. Methods included foliar application of 3% Triclopyr with backpack sprayers and cut stump treatment with 20% Triclopyr. Treatment has occurred in W1, W2, and U9. Treatment was primarily focused on seedlings and smaller vines bordering the Phase II restoration area to maintain the buffer around disturbed units. The greatest density of Oriental Bittersweet was encountered in W1, W2, U5, and U7, as well as along the corridor between I90 and the landfill. Continued efforts will be required in 2014 to bring these populations fully under control.

3. **Populus spp.**

Upland populations of adult *Populus* spp. (*P. tremuloides*, *P. deltoides*, and *P. grandidentata*) were controlled as a result of Phase III construction activities during September and October 2012. Trees in sensitive areas in which the stumps could not be removed were stump-treated with 20% Triclopyr concentrate after cutting and removal of the crown was performed by City staff. Trees accessible to construction equipment were cut and grubbed. It is anticipated that drill-and-fill treatment of *Populus* spp. will be completed in December 2013.

B. Herbaceous Invasives

• **Garlic Mustard**

Control of Garlic Mustard (*Alliaria petiolata*) was conducted in the forested wetland areas of the Phase II restoration, and all areas of the Phase III enhancement from May 1st through June 6th, 2013. Methods included foliar application of 2% aquatic glyphosate (Rodeo) and standard use glyphosate with backpack sprayers. The largest populations of Garlic Mustard were encountered in W1, W2, and W3 the greatest amount of time was devoted to control in those areas. Control efforts will be ongoing, as disturbance from construction activities will continue to support reestablishment.

• **Spotted Knapweed**

Control of Spotted Knapweed (*Centaurea maculosa*) was conducted from May 21st through June 24th, 2013. Treatment was focused on all non-forested upland habitats within Phase II and Phase III limits. Methods included foliar application of 2-3% glyphosate with backpack sprayers. Spotted Knapweed has re-colonized much of the Phase II uplands and construction in Phase III has led to more light penetration and caused more seedlings to

sprout this fall. The largest increase has been in U15, U11, and U12, and will require continued efforts in 2014 in order to bring this species under control.

- **Phragmites**

Phragmites control occurred during the period from September 11th to October 24th. Control was conducted in three main areas: the GAL, the Phase II restoration, and the APB vernal pond. Treatment on the GAL was performed with a high pressure spray gun using a 1-2% solution of glyphosate and imazamox. Populations along the I90 corridor in the wooded area and along the road of the GAL were effectively treated this way; however, the northern and southern slopes were mowed by landfill staff in late summer and Phragmites stems had not grown to sufficient size by the end of the growing season for effective treatment to occur in 2013. 2012 treatments proved to be very effective, with stand reductions of up to 70% on the south slope.

Phase II construction activities in 2011 disturbed and relocated several Phragmites populations. As a result, some of these populations expanded from their marginal status in 2011, most notably in an area south of W8. New populations have also shown up in patches across all of phase II. These populations were hand wicked or backpack-sprayed with a 1-2% solution of glyphosate and imazamox depending on their relative densities. Effectiveness of these treatments cannot be fully measured until spring 2014, however, these populations do not compare either in size or density to those which existed before 2010 treatments.

The APB vernal pond was hand wicked on October 17th with a .75 solution of glyphosate and imazamox. Stand density has been reduced approximately 95% from 2010 levels, with only a handful of stems encountered during treatment. The population will be monitored once annually and any remaining stems hand wicked.

- **Canada Thistle**

Canada Thistle (*Cirsium arvense*) was primarily treated in open-canopy portions of W4, W5, W8, and the Phase II stream corridors between June 19th and June 22nd. A fall treatment was conducted between September 17th and 18th. Treatment was performed with backpack sprayers, using a 2% glyphosate solution. Stand reduction was limited from 2012 treatments, however adjacent disturbance from Phase II construction has caused some outward expansion of these populations into the restoration area that can be attributed to soil movement. There are also several stands on the landfill that have been supplying seed to cause expansion into the Phase II area. Continued effort will be required in 2014 to fully control this species.

- **Purple Loosestrife**

Control of Purple Loosestrife (*Lythrum salicaria*) was conducted from July 17th to September 5th using backpacks with a 3% Triclopyr solution. The treatments of 2012 showed very good control but because of the amount of seed in the seed bank these populations will thrive for the next several years. The heaviest infestation is around the pond area west of W8 and all stream corridors. There are also populations under the power line next to fox run road, around all biofilters, all ponds and the stream next to the horse barn. 2014 treatment should continue to focus on all Phase II wetlands, ponds and the entire length of the streams. The drill and fill activity this winter will result in more light penetration to the ground in forested

wetland areas, requiring those areas to be monitored to assess the response of purple loosestrife

- **Sweet Clover**

Treatment occurred from June 25th to July 11th and consisted of a 3% glyphosate solution delivered with backpack sprayers. Treatment occurred across all of phase II, but the largest populations were in the upland open sand areas around the nursery, along the land fill access road on the west side of the site, and on both stock piles next to the horse barn. The wetlands were substantially less dense than 2012 probably due to prevention of seed production and competition from native plants that are now present. All second year plants that were treated in 2012 did not produce seed. It will be important to continue to control the species until the seed bank is exhausted.

- **Black Bindweed**

Black Bindweed (*Polygonum convolvulus*) is an annual vine that covers vegetation robbing it of sunlight. The seed can persist in the soil for 3 to 5 years. In 2013, sufficient populations were present for control. Control was conducted from July 21st to August 21st. Populations have shown up in all areas of the phase III restoration, W8, and W5, with the largest populations in U10, W8, and W5. Control should be continued with chemical treatment, hand pulling and mowing before the seed is ripe.

The following species were spot treated throughout the project in July and August of 2011 with 2-5% Glyphosate (Rodeo or Cornerstone Plus) or 2-3% Triclopyr (Garlon 3A).

- | | |
|----------------------|------------------------------|
| • Reed Canary Grass | <i>Phalaris arundinacea</i> |
| • Cow Vetch | <i>Vicia cracca</i> |
| • Crown Vetch | <i>Coronilla varia</i> |
| • Birds Foot Trefoil | <i>Lotus corniculatus</i> |
| • Soapwort | <i>Saponaria officinalis</i> |
| • Deptford Pink | <i>Dianthus armeria</i> |
| • Black Bindweed | <i>Polygonum convolvulus</i> |
| • Switchgrass | <i>Panicum virgatum</i> |
| • Japanese Hops | <i>Humulus japonicas</i> |
| • Swallowwort | <i>Cynanchum louiseae</i> |
| • Russian Thistle | <i>Salsola kali</i> |

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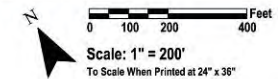


LEGEND

- Project Limit Line
- Wetland Boundary
- Existing 2' Contours
- Existing 10' Contours

Targeted Invasive Plant Species

- Garlic Mustard & Oriental Bittersweet
- Common Reed Grass
- Knapweed
- Buckthorn & Other Woody Species



Invasive species control and removal of the chicken wire fencing to be conducted pending USACE approval

Albany Rapp Road Landfill
 Albany, New York
City of Albany, Dept. of General Services
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**2010 Work Plan
 Invasive Species
 Control Plan**

REVISES	No.	Date	By
Description:			
No.	Date	By	
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No.	Date	By	
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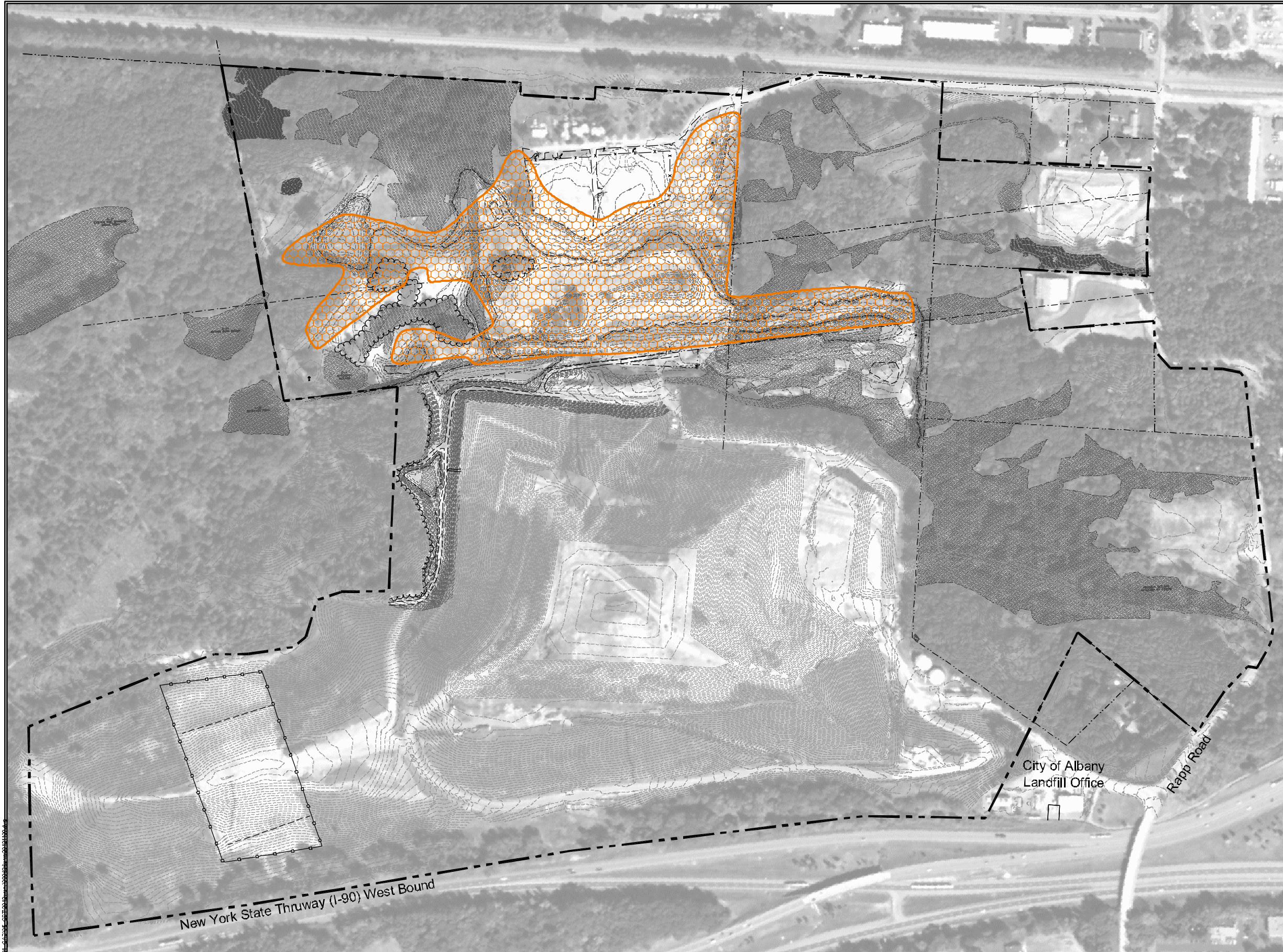


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LEGEND

-  Project Limit Line
-  Wetland Boundary
-  Existing Contours
-  As-Built Contours

Targeted Invasive Plant Species

-  Canada Thistle
-  Garlic Mustard
-  Knapweed
-  Oriental Bittersweet
-  Phragmites
-  Purple Loosestrife
-  Sweet Clover

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Invasive Plant Management

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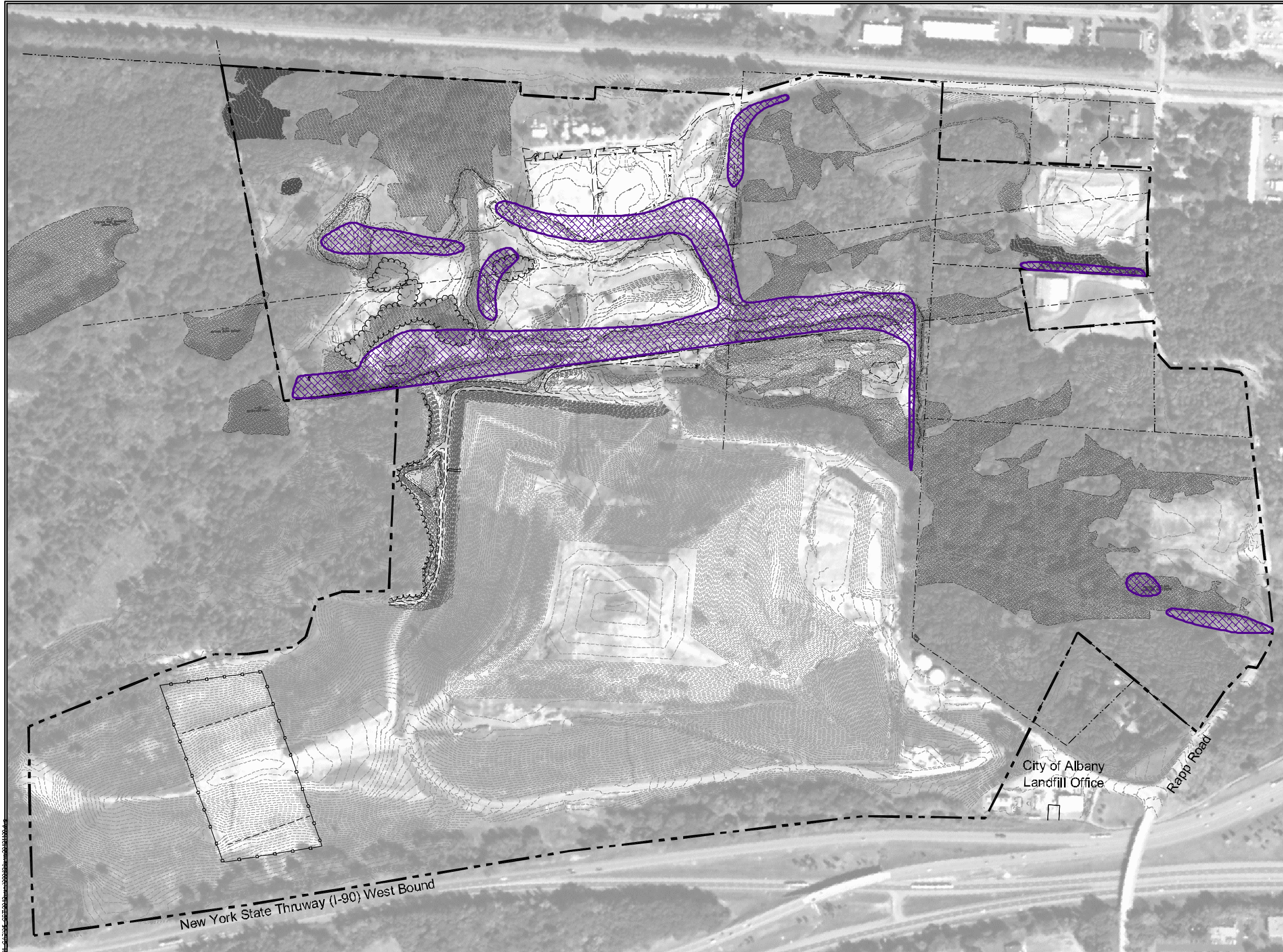
New York State Thruway (I-90) West Bound

City of Albany
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 Rapp Road







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LEGEND

-  Project Limit Line
-  Wetland Boundary
-  Existing Contours
-  As-Built Contours

Targeted Invasive Plant Species

-  Canada Thistle
-  Garlic Mustard
-  Knapweed
-  Oriental Bittersweet
-  Phragmites
-  Purple Loosestrife
-  Sweet Clover

New York State Thruway (I-90) West Bound

City of Albany
Landfill Office

Rapp Road

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
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-  Wetland Boundary
-  Existing Contours
-  As-Built Contours

Targeted Invasive Plant Species

-  Canada Thistle
-  Garlic Mustard
-  Knapweed
-  Oriental Bittersweet
-  Phragmites
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LEGEND

-  Project Limit Line
-  Wetland Boundary
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Targeted Invasive Plant Species

-  Canada Thistle
-  Garlic Mustard
-  Knapweed
-  Oriental Bittersweet
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-  Purple Loosestrife
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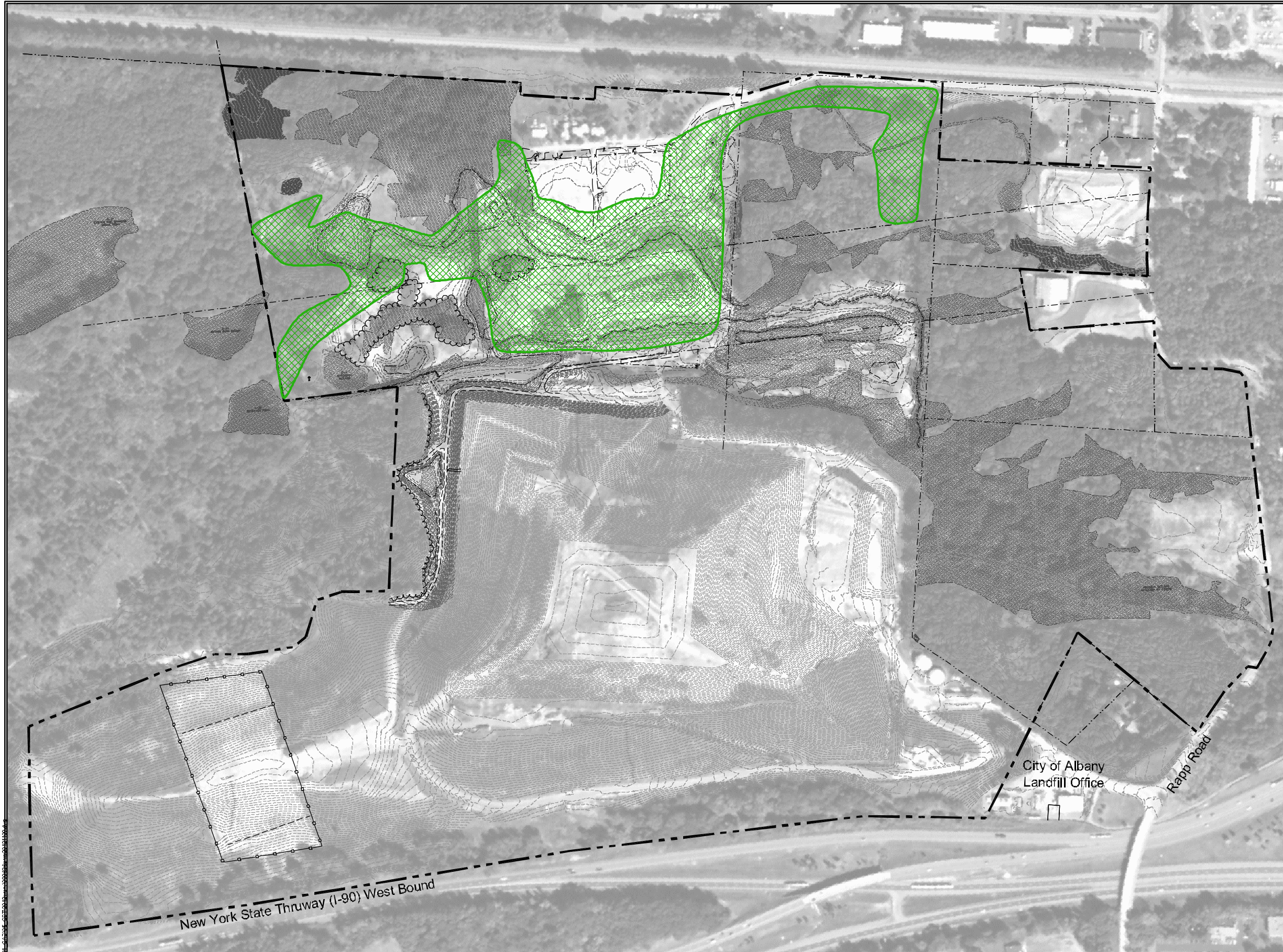
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


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LEGEND

-  Project Limit Line
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Targeted Invasive Plant Species

-  Canada Thistle
-  Garlic Mustard
-  Knapweed
-  Oriental Bittersweet
-  Phragmites
-  Purple Loosestrife
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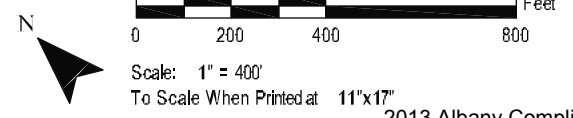
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Invasive Plant Management

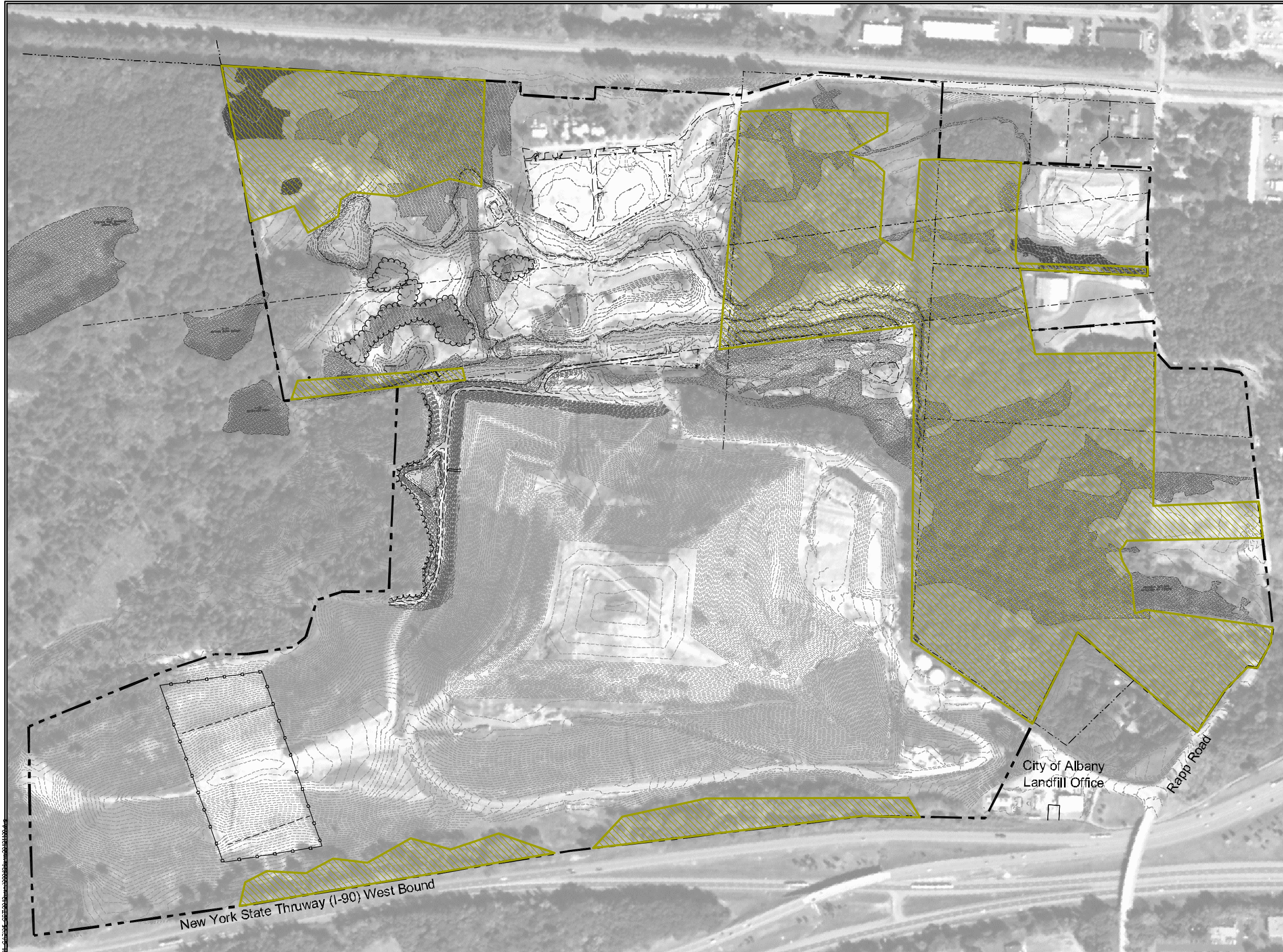
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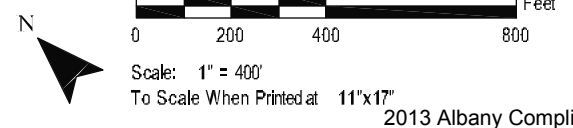
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
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Attachment I. Soil & Hydrologic Monitoring
Albany Rapp Road Landfill
Ecosystem Mitigation, Restoration & Enhancement Plan
City of Albany, New York

The approved hydrologic monitoring plan for the Albany Rapp Road project is located in the “Monitoring Plan and Performance Criteria” found in Appendix 3 of the permitted restoration plan. Phase I and Phase II restoration grading was completed in 2011 with vegetative establishment beginning in 2011 and continuing throughout 2012 and 2013. Minimal grading as needed to control erosion occurred in 2012. Hydrologic monitoring preparation activity for the Phase II restoration area started in the November of 2011 with placement of well cases for sixteen Telog soil water level instruments. A gravimetric analysis of four soil core samples was finalized in January of 2012 to estimate how much saturated capillary rise above the water table occurs in the sand on the site.

In spring 2012, continuously-recording hydrologic monitoring instruments were deployed to initiate data capture of groundwater levels and soil moisture conditions on the completed Phase II restoration area at the Albany Rapp Road Landfill, according to the approved permit. This monitoring has continued annually throughout the compliance reporting period to evaluate the overall project effectiveness in restoring wetland habitat.

The instruments deployed include 16 Telog soil water level recording units fitted into shallow well cases, and 12 Decagon EC-5 Soil Moisture sensors, two of which were installed at each of six locations at depths of six and twelve inches below the ground surface, along with a temperature sensor at 4-inch depth (see Attachment I-1 Hydrology Monitoring Sites map for the location of each unit or array). Soil samples were taken during installation in 2012 to determine sand porosity at 6” and 12” for calibration of the soil moisture sensors. Both the Telog and soil moisture sensors are continuously-recording instruments and data are downloaded monthly during the wetland monitoring period. Additional monitoring conducted in 2012 included the use of soil moisture probes to qualitatively measure soil moisture content. These instruments were determined to be vulnerable to abrasion damage in the site’s sandy soils, and thus at risk of producing less than reliable data. As a result, the use of the probes was discontinued at the end of the 2012 monitoring season. Six existing piezometers, installed during the design and permitting phases of the project, were also monitored periodically in 2012 and 2013 to provide additional ground water measurements just southeast of the stream restoration.

In April of 2013 hydrologic monitoring data collection from the Telogs and soil moisture meters began and continued until October 15th.

Hydrology Report 2013

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HYDROLOGY REPORT 2013

1.0 Introduction

The Albany Pine Bush Phase II restoration consists of approximately 40 acres of land in Colonie, New York. The hydrology report provides hydrological results from April 1 through October 15, 2013. This is the second annual status summary evaluating wetland restoration areas

2.0 Hydrology Performance

2.1 Growing Season & Consecutive Days

Beginning and ending dates of the growing season are required to evaluate certain wetland indicators, such as visual observations of flooding, ponding, and shallow water tables. Growing season dates are needed when recorded hydrologic data, such as water table monitoring data, is analyzed to determine if wetland hydrology is present. The determination of sufficient wetland hydrology is dependent on the start and the end of the growing season and the length (number of days) of that growing season. For purposes of this project, April 1 and October 15 are used as the beginning and end dates of the growing season. Hydrology conditions within the growing season are used for determining whether sufficient hydrology is present to support wetlands.

The Phase II restoration area grading was completed in late 2011, and planting of wetland species was limited. Planting of wetland species began in earnest in the spring of 2012. By the end of 2013 the planted wetland species will have completed two full growing seasons. An evaluation of wetland vegetation success has occurred with the completion of the 2012 Phase II and Phase III vegetation monitoring effort, which was repeated in mid-summer 2013.

Based on the April 1 and October 15 dates, the regional wetland growing season extends over a period of 198 days. The Regional Supplement to the Corps of Engineers Wetland Delineation Manual: North central and Northeast Region, (2012) provides “a technical standard for monitoring sites which requires 14 or more consecutive days [between 5% and 12.5% of the growing season] of flooding, ponding, and/or a water table 12 inches or less below the soil surface during the growing season” to indicate sufficient hydrology is present for wetland establishment. Wetland hydrology, hydrophytic vegetation, and hydric soils are the three conditions that must be present to determine the existence of a wetland. Additional indicators listed in Table 1 are required to indicate sufficient hydrology is present for wetland establishment, if the 14 consecutive day period is not met.

2.2 Primary Hydrology Indicators

Inundation and soil saturation within 12 inches from the surface for 14 consecutive days or greater during the 2013 growing season are two of the primary hydrology indicators (Table 1) required by the U.S. Army Corps of Engineers (2012). Achieving one primary indicator in this Table provides a positive wetland hydrology indicator.

If inundation or saturation is less than 14 consecutive days, one other primary or two secondary hydrological indicators would be required to achieve wetland hydrology. Additional primary

indicators that provide evidence of extended periods of standing water and saturation are water marks, drift deposits, drainage patterns, oxidized rhizospheres along living roots, hydrogen sulfide odor, presence of reduced iron, recent iron reduction in tilled soils, thin mulch surface, sediment deposits, algal mat or crust, iron deposits, inundation visible on aerial photography, sparsely vegetated concave surface, water stained leaves, aquatic fauna, and marl deposits. Observation of any one of the primary criteria is a positive indicator of wetland hydrology (Table 1).

2.3 Secondary Hydrology Indicators

Some wetland hydrological indicators are defined as secondary, as they do not always occur alone in wetlands (Table 1). Thus, at least two secondary wetland hydrology indicators were required to provide a positive indicator of wetland hydrology. Secondary hydrological indicators include water-stained leaves, local soil survey data, FAC neutral test, surface soil cracks, drainage patterns, moss trim lines, dry season water table, crayfish burrows, saturation visible on aerial photography, stunted or stressed plants, geomorphic position, shallow aquitard, and micro-topographic relief. These observations are typically used when no primary hydrology indicator has been readily observed and the vegetation is dominated by hydrophytes.

Table 1. Wetland Hydrology Indicators for the North Central and Northeast Region (USACE 2008 and 2012)

Indicator	Category	
	Primary	Secondary
Observation of Surface Water or Saturated Soils		
A. Surface water	X	
B. High water table	X	
C. Saturation	X	
Evidence of Recent Inundation		
D. Water marks	X	
E. Sediment deposits	X	
F. Algal mat or crust	X	
G. Iron deposits	X	
H. Inundation visible on aerial imagery	X	
I. Sparsely vegetated concave surface	X	
J. Water-stained leaves	X	
K. Aquatic fauna	X	
L. Marl deposits	X	
M. Surface soil cracks		X
O. Drainage patterns		X
P. Moss trim lines		X
Evidence of Current or Recent Soil Saturation		
Q. Hydrogen sulfide odor	X	
R. Oxidized rhizospheres along living roots	X	
S. Presence of reduced iron	X	
T. Recent iron reduction in tilled soils	X	
U. Thin muck surface	X	
V. Dry-season water table		X
W. Crayfish burrows		X
X. Saturation visible on aerial imagery		X
Evidence from Other Site Conditions or Data		
Y. Stunted or stressed plants		X
Z. Geomorphic position		X
AA. Shallow aquitard		X
BB. Micro-topographic relief		X
CC. FAC neutral test		X

3.0 Methods

3.1 Hydrology Equipment

The monitoring of the primary hydrological indicators of saturation and inundation are two effective measurement means for determining sufficient hydrology to support wetlands. For the Albany Phase II restoration, a number of instrumentation devices and methods to measure site hydrology have been installed and are described below.

3.1.1 Telogs

In 2012, sixteen 2" diameter x 48" deep PVC wells were installed (Attachment I-1) and each fitted with a Telog water level recorder consisting of an electronic data logger and a pressure sensitive transducer to provide constant water level monitoring. Each Telog was protected by a steel shaft and capped to prevent rainfall entry and padlocked for security. Sixteen Telog locations were surveyed and mapped (Attachment I-1). During the spring 2013 site visit, each shallow ground water monitoring well housing a Telog unit was checked for damage or displacement by frost heave, and each Telog unit was inspected and tested for proper functioning. Winter data was downloaded and units were recalibrated as necessary. Telogs were downloaded monthly from April through mid-October, 2013. Telog data was used to produce the hydrographs in Attachment I-3 depicting daily average water levels, above or below the ground surface, during the monitoring period from April 1 through mid-October, 2013.

In soil, capillary action causes water to raise in the soil pores to form the capillary fringe above the free standing water table. The capillary zone is comprised of saturated soil. The height of capillary rise is dependent on the soil texture. The soils at Albany are fine sand and a study was initiated in 2012 to collect core samples from four locations to estimate the average capillary rise. The capillary rise analysis is discussed in Attachment I-8. The average capillary rise was determined to be 16 inches with a standard deviation of ± 5 inches. Since the Telog unit measures the free standing water in the well, soil saturation within 12 inches of the soil would be reflected by a water level reading of 28 inches below the surface.

3.1.2 Soil Moisture Meters

Unlike the Telog units which are left in place and operational through the winter months, the soil moisture meters are removed for cleaning and storage at the close of the hydro monitoring season to prevent freeze-thaw damage to the units. In April 2013, two Decagon EC-5 soil moisture volumetric water content sensors and one temperature sensor were re-installed at each of the six locations shown on Attachment I-1, generally in the transitional zone between wetland and upland settings. As previously, moisture sensors were placed at depths of 6 and 12 inches to measure the soil moisture volumetric water content at those depths within the rooting zone. Because temperature can influence soil moisture, particularly within 4 inches of the soil surface, a temperature sensor was also re-installed to monitor potential temperature effects. The moisture sensors are placed at depths that exceed four inches to minimize or avoid temperature effects on soil moisture results. The moisture meter data for each of the two soil depths was used to produce a soil saturation graph for each unit. A reading of 0.300 is considered the point of saturation on the graph. Either the 6" or 12" depth can be used as the indicator of soil saturation. Previous reports

(see Attachment I-9 in the 2012 Compliance Report) discuss the results of porosity analyses adjacent to each sensor, which are used to calibrate the sensors.

3.1.3 Soil Moisture Probes

Additional monitoring conducted in 2012 included the use of soil moisture probes to qualitatively measure soil moisture content. These instruments were determined to be vulnerable to abrasion damage in the site's sandy soils, and thus at risk of producing less than reliable data. As a result, the use of the probes was discontinued at the end of the 2012 monitoring season.

3.1.4 Existing Piezometers

Six existing piezometers located along the original baseline transects E-1 and E-2 east of the landfill (shown on Attachment I-1) had ground water elevation measured monthly from April through June, and again in August and October. This monitoring provided additional ground water measurements just southeast of the stream restoration.

4.0 Results

4.1 Precipitation

The establishment of wetlands is contingent on annual precipitation events and ground water. Previous experience found that initially, annual precipitation events will be more important for establishing the necessary hydrology. The precipitation recorded for March through October 15th 2013 at the Albany Airport is shown on Attachment I-2.

Extreme and atypical precipitation patterns have characterized the growing and non-growing season conditions since the establishment of wetlands on the Albany site. As reported in last year's compliance report, the 2012 growing season started at a significant deficit in precipitation during the previous six months, and continued with almost no rainfall until the third week in April. In fact, below normal precipitation occurred in most months through the growing season with the exception of May and September, which were wetter than normal. Nevertheless, all but 4 of the 16 Telogs during the 2012 growing season recorded hydrological conditions meeting the 14 day minimum.

In 2013, the season started with below normal rainfall, but picked up beginning in May and continuing through July with record rainfall amounts, resulting in an overall increase in precipitation of 8.67 inches in 2013 compared to 2012. In addition, antecedent precipitation was not as severely deficient going into the 2013 growing season, as had been the case in 2012.

4.2 Telog Data

The Telog data are shown in Attachment I-3. In 2013, 13 of the 16 Telogs had soil saturation levels in excess of the 14 consecutive days of water levels within the required soil depth during the growing season (Table 2), compared to 12 performing Telogs the previous season which was a year of extreme drought. Telog T-1 came into performance in 2013, an abnormally wet year. Telogs T-3, T-11, and T-14 continue to fail to meet the fourteen consecutive day standard. At these non-performing locations, as demonstrated in the charts in Attachment I-3, water and moisture levels

responded rapidly to precipitation, but remained within one foot or near the surface for only a few days, draining quickly once precipitation ceased. An examination of the position of these three Telogs shows that they are likely influenced by local drainage effects.

- T-3 is located at the edge of an upland sand prairie peninsula which transitions into the forested wetland community and sedge meadow. Vegetation in the vicinity of T-3 is represented in part by transects DS-1 and the north end of P2-2. The Telog is located near the top of the short slope where vegetation data (see transect DS-1 data for quadrats 5 and 6 in the Ecological Monitoring section of the Compliance Report) suggests upland and wetland vegetation transition rather abruptly from dry prairie to vegetation dominated by hydrophytic species. The elevation of T-3 relative to the position of the vegetation quadrats indicates, however, that the Telog is in a location that should be supporting hydrophytic species. Differences between ground water and depth to saturated conditions between T-3 and nearby T-2 suggest that local drainage conditions may be contributing to the anomalous readings at T-3. For example, the difference in ground elevation between T-3 (303.33') and T-2 (303.20') is only 1.6 inches, yet the difference of depth to saturated conditions is on average 1.5 feet (based on 2012 April data). T-1, on the other hand, which is aligned with T-2 and T-3 on the hydrological gradient, is set at ground elevation 305.00'. Between T-1 and T-2 is a drop in ground elevation of 1.8 feet in conjunction with a 1.0 foot drop in depth to saturated soil elevation, while between T-2 and T-3 is a drop in ground elevation of only 1.6 inches, but a drop in depth to saturated soil elevation of 1.57 feet.
- T-11 is located off of the west end of the large central dune and near the east end of transect P2-3. Vegetation in this forested wetland area appears to be slightly better drained and currently dominated by several FAC species and a few weedier FACU species.
- Telog 14 is located on the narrow berm separating the southern stream from the eastern biofilter pond. The edge of the berm, where the Telog is located, is likely being effectively drained by the adjacent biofilter basin.

4.3 Soil Moisture Meter Data

The Soil Moisture Meter data are shown in Attachment I-4. In 2013, three of the units (SM-1, 3, and 4) significantly exceeded the 14 consecutive day standard at either the 12 inch or 6 inch depths (Table 3). Unit SM-2 just exceeded the 14 day standard by two days. Units SM-5 and 6 failed to meet the 14 day standard by a week. Relative to SM-4 (positioned at a ground elevation of 301.1'), SM-5 positioned at 301.2' and SM-6 at 300.1', although down the hydrological gradient, have significantly different results, suggesting influence by local drainage effects as with the non-performing telogs discussed above. SM-5 and SM-6 are in locations that did not receive the top dressing of organic hydric soils excavated from the landfill expansion area, and as a result have not developed the denser ground cover vegetation that quickly established in those areas that did receive this treatment, such as the area where SM-4 is located. Examination of the graphed data for SM-4 suggests the influence the condition of the vegetation has on its ability to hold moisture in the upper part of the rooting zone, long after the sandy soils have dewatered at the 12-inch depth.

4.4 Existing Piezometer Data

Ground water level measurements in the six existing piezometers are shown in Attachment I-5. The levels agree well with measurements in the nearby Telogs 15 and 16.

Table 2. Consecutive Days of Saturation and Inundation for Achieving Hydrology Standards for the 16 Telog Units

Telog Number	2013 Dates Water Levels At or Above 12” of Soil Surface	Consecutive days April 1-October 15, 2013
1	6/28 – 7/14	17**
2	4/1 – 10/15	198**
3	6/10 – 6/15	6
4	5/18 – 10/15	151**
5	6/6 – 7/20	45**
6	6/6 – 7/19	44**
7	4/1 – 10/15	198**
8	4/1 – 10/15	198**
9	4/1 – 10/15	198**
10	4/1 – 10/15	198**
11	6/10 – 6/14	5
12	6/6 – 7/18	43**
13	4/1 – 10/15	198**
14	6/28	1
15	4/1 – 8/23	145**
16	4/1 – 10/15	198**

** Indicates primary hydrology standard of inundation or saturation for minimum 14 consecutive days has been achieved.

Table 3. Consecutive Days of Saturation and Inundation for Achieving Hydrology Standards for the Six Soil Moisture Meter Units

Soil Moisture Meter Number	2013 Dates Water Levels At or Above 12” of Soil Surface **	Consecutive Days April 10-October 15, 2013
1	4/10 – 10/15	189***
2	5/21 – 6/5	16***
3	4/10 – 10/15	189***
4	4/12 – 10/15	187***
5	6/11 – 6/18	8
6	6/11 – 6/16	6

** Saturation data based on either the 6 inch or 12 inch depth soil smart sensor.

*** Primary hydrology standard of 14 consecutive days or greater has been achieved.

5.0 Discussion and Conclusions

The 2013 monitoring effort of hydrological performance of the Phase II restoration represents the second full growing season of the project following construction. Hydrological monitoring will continue to be evaluated annually by the monitoring program. Long-term hydrology monitoring is required to evaluate the overall project effectiveness in restoring wetland habitat.

Rainfall patterns during 2013 demonstrated higher precipitation levels and prolonged wet season conditions compared to the growing season of 2012, which was plagued by high temperatures and drought. As a result, first-year vegetation establishment impacted by the drought experienced accelerated growth during 2013. Some transitional areas in the forested wetland zone continue to recover from the slow start.

In 2013, as a result of the wet year, thirteen of the sixteen Telogs located within Phase II restored wetland zones, as well as the six baseline piezometers located in the existing forested wetlands, in most cases far exceeded the 14 consecutive days of saturation and/or inundation for achievement of the required one primary indicator. Four of the six soil moisture meters located adjacent to the boundary between upland and wetland areas likewise exceeded the 14 consecutive days of saturation and/or inundation. The results show a significant improvement from the 2012 growing season.

While the majority of the wetland areas have achieved the necessary hydrology to sustain restored wetland vegetation, some hydrological transitional areas of the site (represented by Telog 11 and Moisture Meters 5 and 6) will require close monitoring and possible amendments to accelerate the establishment of slowly developing hydrophytic vegetation. Such areas include forested wetland communities that did not receive a top dressing of salvageable organic hydric soils from the landfill expansion area, a material that was in limited supply. Areas that did receive this top dressing quickly established hydrophytic vegetation due to the existing soil seedbank contained in the material, which augmented the native seeding and enhancement planting that occurred throughout the restoration area, as well as the added moisture holding capacity of the organic soil.

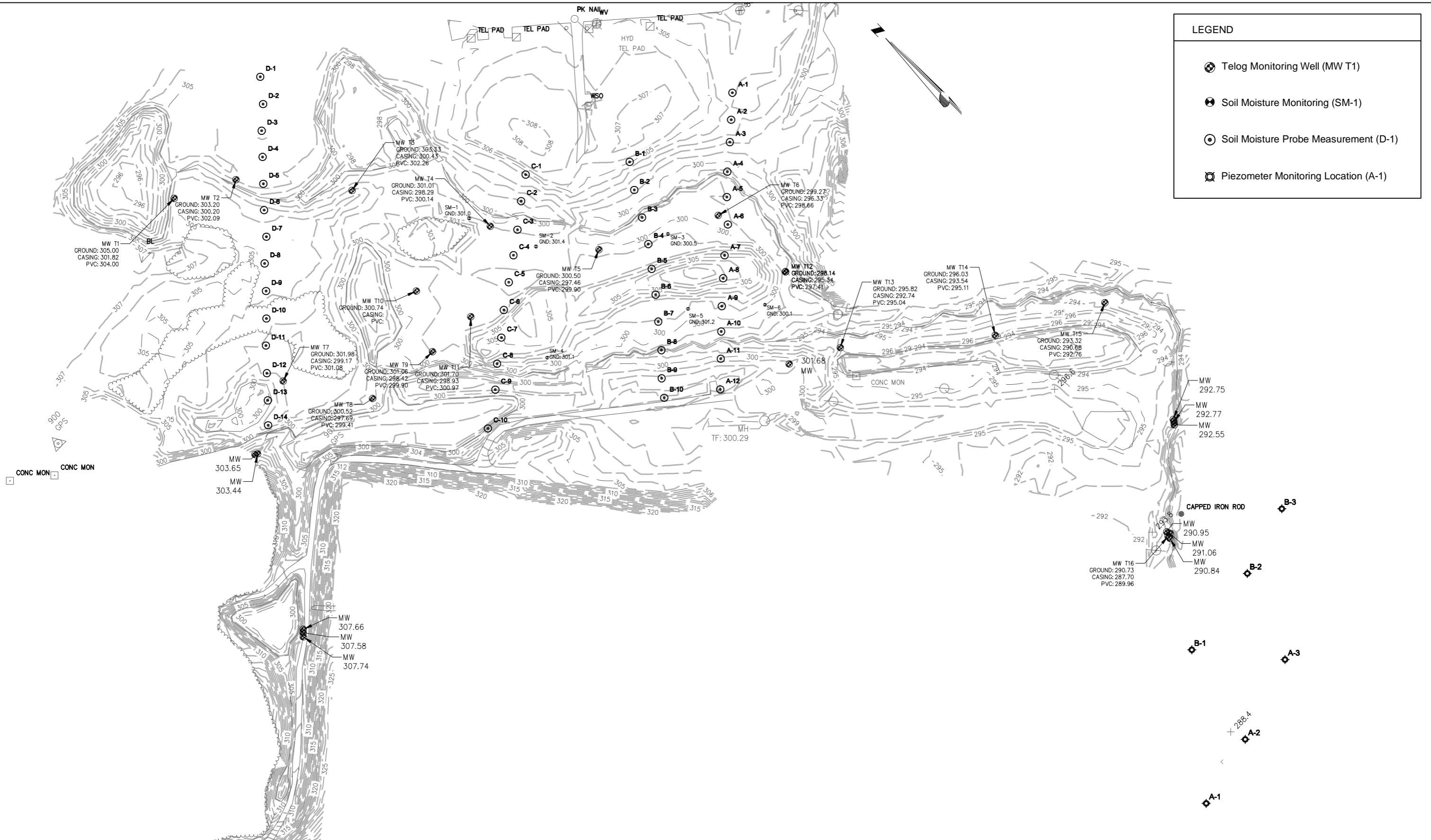
6.0 Planned Hydrological Activities for 2014

- Continue hydrological monitoring of Telogs and soil moisture meters throughout 2014.
- Consider remedial action strategies for transitional areas where hydrology is underperforming to accelerate hydrophytic vegetation establishment.

Reference

U.S. Army Corps of Engineers. 2012. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region. Version 2.0. Environmental Laboratory ERDC/EL TR-12-1.

Attachment I-1.
Figure 01: Hydrology Monitoring Map
Soil & Hydrologic Monitoring
Albany Rapp Road Landfill



LEGEND	
	Telog Monitoring Well (MW T1)
	Soil Moisture Monitoring (SM-1)
	Soil Moisture Probe Measurement (D-1)
	Piezometer Monitoring Location (A-1)

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 Applied Ecological Services, Inc. 17021 Smith Road, P. O. Box 256 Brookfield, NY 13320 Phone: 518.857.8641 Fax: 518.857.8468 www.appliedeco.com Email: info@appliedeco.com	 ALBANY, NEW YORK	 DEPT. OF GENERAL SERVICES	Drawing Copyright © 2012 III Winners Circle, PO Box 5269 · Albany, NY 12205-0269 Main: (518) 453-4500 · www.chacompanies.com	HYDROLOGY MONITORING MAP RAPP ROAD LANDFILL RESTORATION PLAN	PROJECT NO. 21661 DATE: 11/07/12 FIGURE 01 2013 Albany Compliance Report
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Attachment I-2.
Albany New York Airport – Rainfall 2013
Soil & Hydrologic Monitoring
Albany Rapp Road Landfill

Albany New York Airport - Rainfall 2013 (Inches)

Day	March	April	May	June	July	Aug	Sep	Oct
1	0.02	0.03	0	0	0.59	0.02	0.01	0
2	0.01	0.03	0	0.12	T	0	0.6	0
3	0.03	T	0	T	0	0	0	0
4	T	0	0	0	T	T	0	0.7
5	T	T	0	0	0.13	0	T	0.02
6	T	T	0	0.6	T	0	0	0.18
7	0.19	0.01	0	0.74	0.94	0	T	0.94
8	0.5	T	0.17	0.21	1.4	0.01	T	0
9	0	0.09	0	0	T	0.76	0	0
10	0	0.7	T	0.81	0.85	0	0.45	0
11	0	0.06	0.7	0.93	T	0	0.41	0
12	0.81	0.49	T	0	0	0	1.03	T
13	T	0.01	0	1.55	T	1.21	1.39	0
14	T	0.01	0	0.08	0	T	T	0
15	0.01	0	0.08	0	0	0	0	T
16	T	0.22	0	T	0	0	0.23	
17	0	0	0	0.36	0	0	0	
18	0.25	0	0	T	0	0	0	
19	0.5	0.61	0.09	0	T	0	0	
20	T	0.13	0	0	0.01	0	0	
21	0	0	1.31	0	0	0	0.56	
22	T	0	1.15	0	0.09	0.16	0.13	
23	T	0	0.18	0	0.92	0	0	
24	0	0.05	1.07	0.19	T	0	0	
25	0	T	0.75	0.58	0	T	0	
26	T	T	0.04	T	0	0.19	0	
27	T	0	0	0.17	0	0.06	0	
28	T	0	0.01	1.77	0.46	0	0	
29	0	0.03	1.1	T	0	0	0	
30	0	T	0	0.57	0	0	0	
31	0.17		0		0	0.29		

*T = Trace

Sum =	2.49	2.47	6.65	8.68	5.39	2.70	4.81	1.84
Departure from Normal	-0.72	-0.70	3.04	4.89	1.27	-0.76	1.51	Not complete

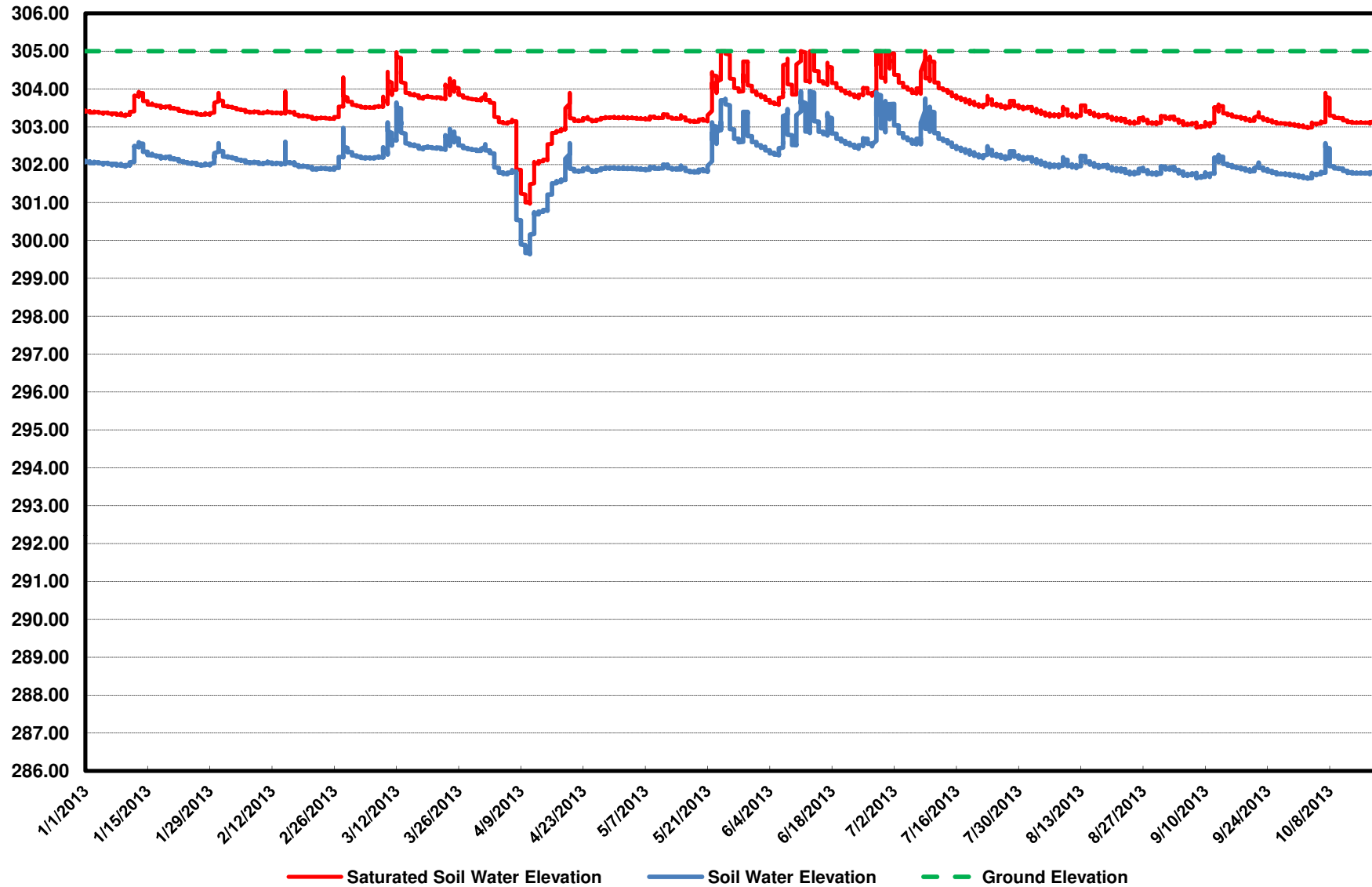
Summary

Total Precipitation March 1 to October 15, 2013	35.03	Inches
Departure from Normal Precipitation (3/1 to 10/15)	8.53	Inches

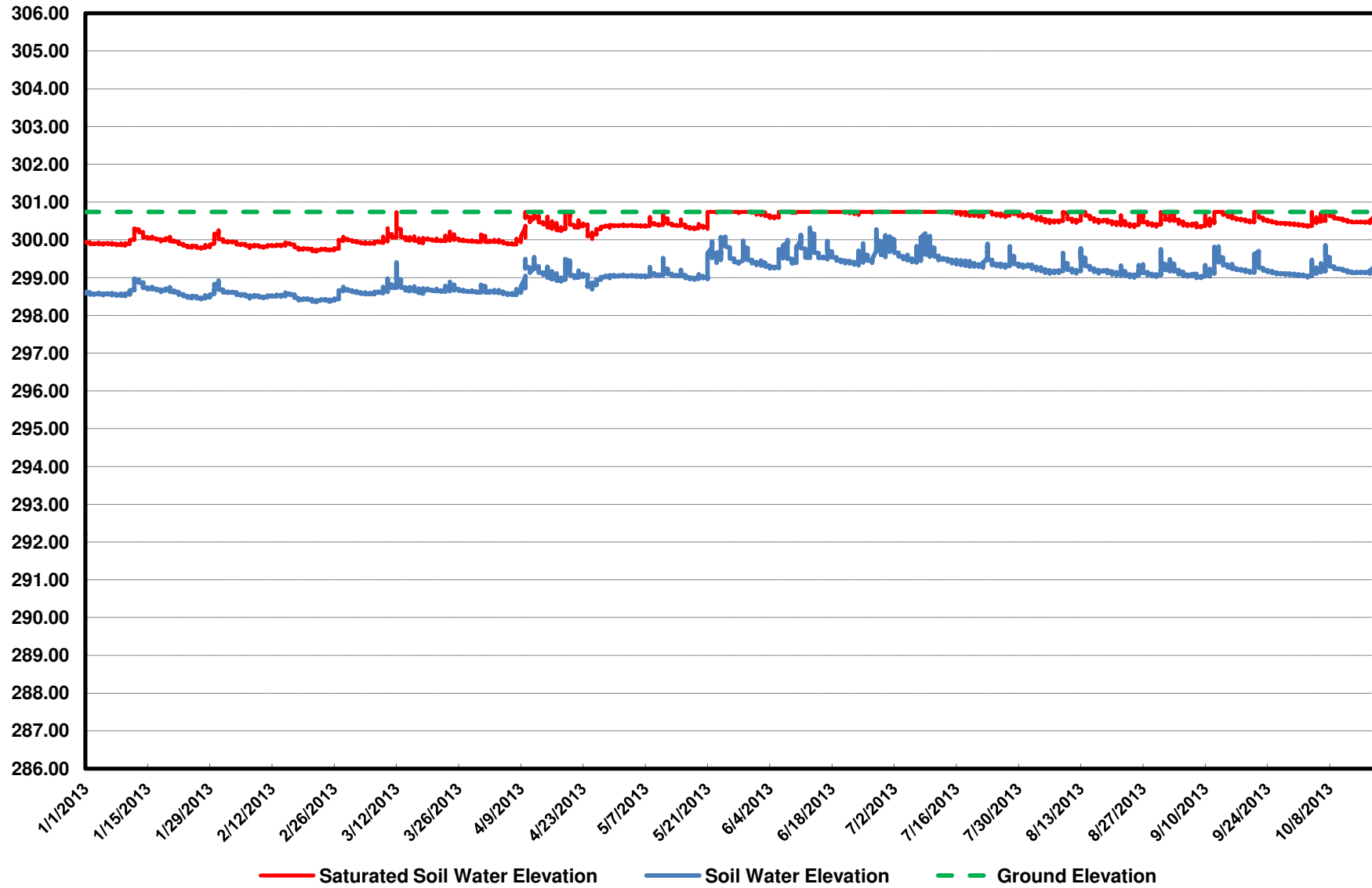
Source: National Weather Service www.nws.noaa.gov/climate/local_data.php?wfo=aly

Attachment I-3.
Telog Groundwater Monitoring Data 2013
Soil & Hydrologic Monitoring
Albany Rapp Road Landfill

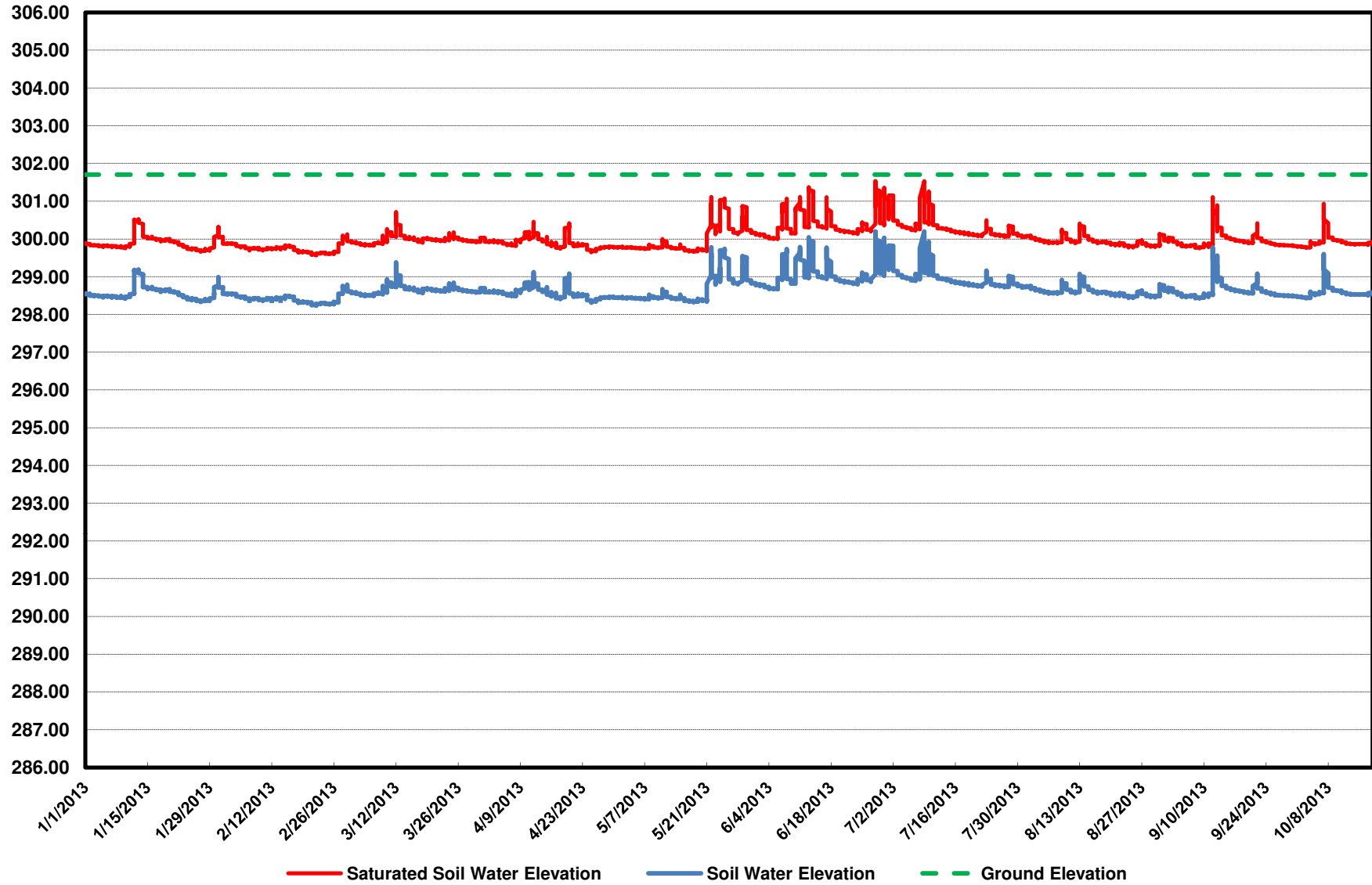
ALBANY TELOG #1 -- GROUND SURFACE AND SOIL WATER ELEVATIONS (FEET)



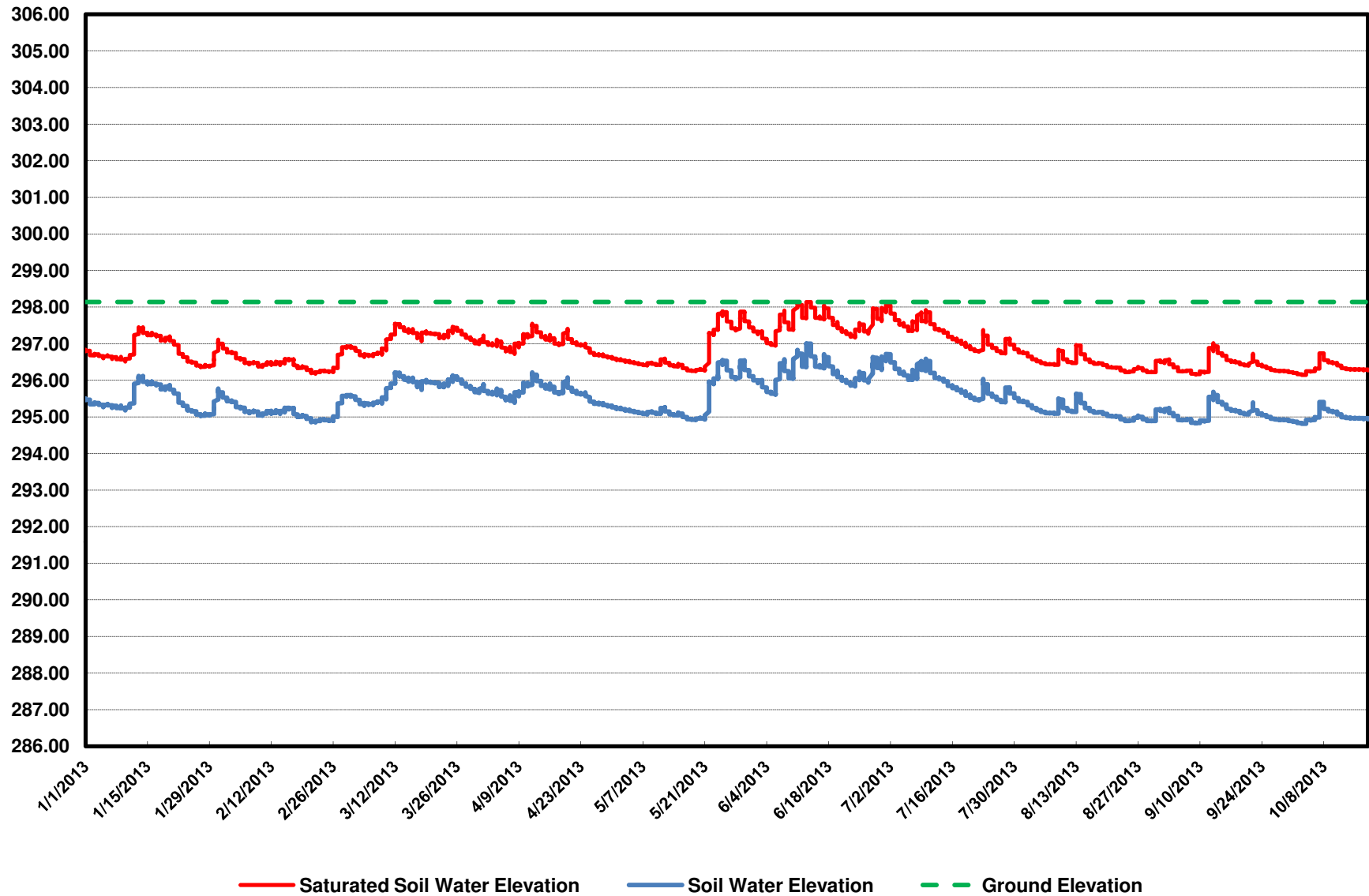
ALBANY TELOG #10 -- GROUND SURFACE AND SOIL WATER ELEVATIONS (FEET)



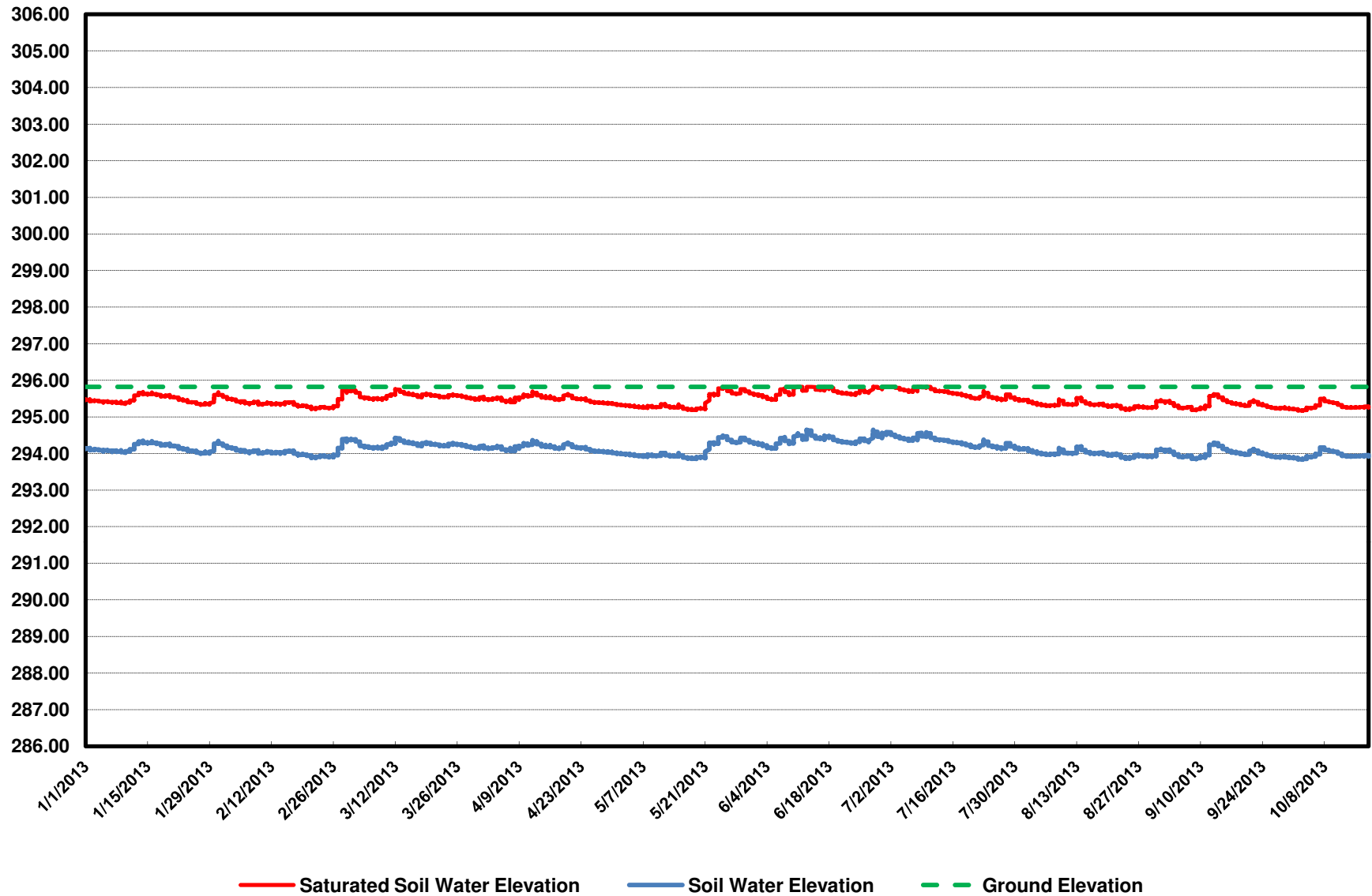
ALBANY TELOG #11 -- GROUND SURFACE AND SOIL WATER ELEVATIONS (FEET)



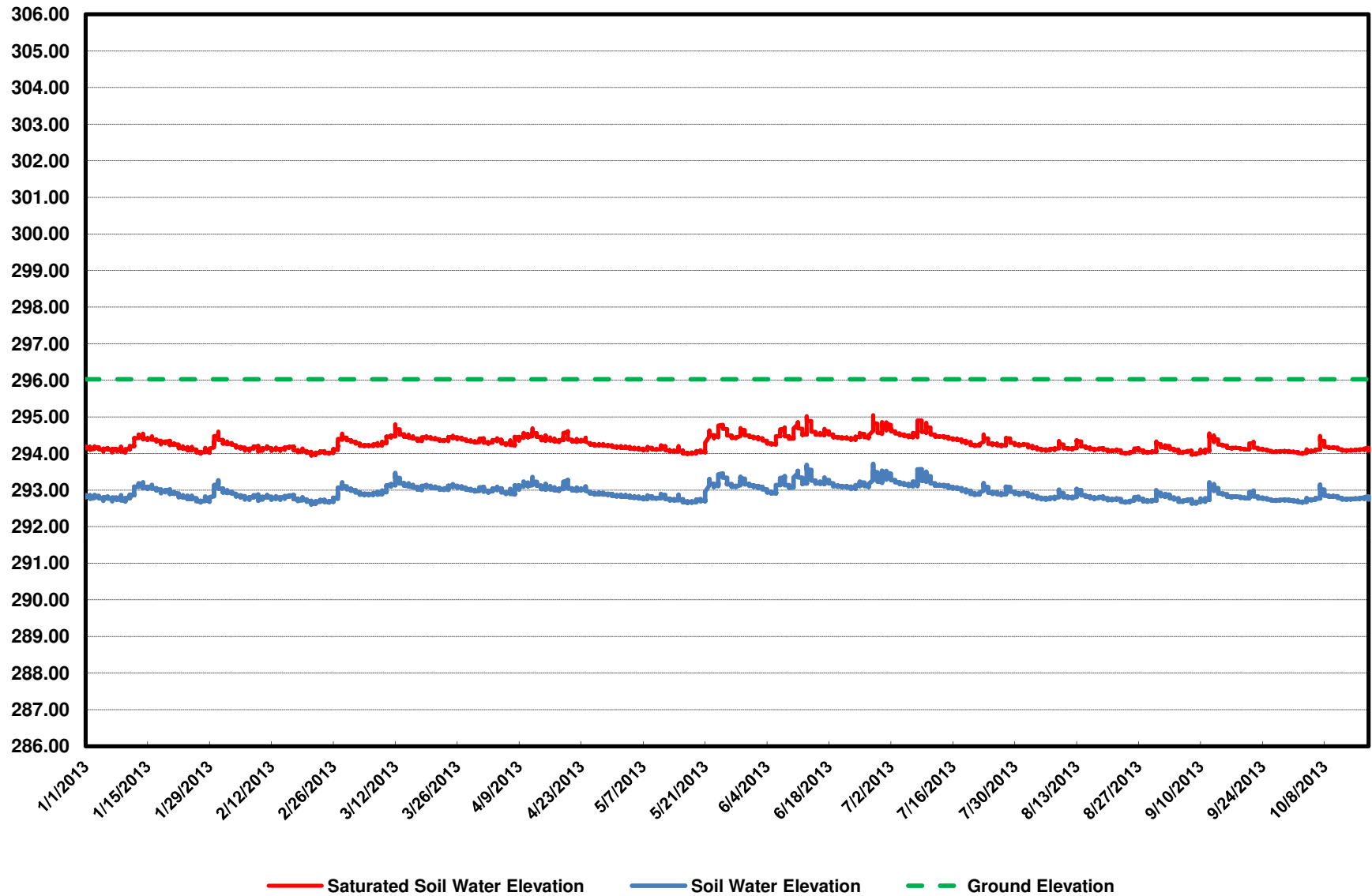
ALBANY TELOG #12 -- GROUND SURFACE AND SOIL WATER ELEVATIONS (FEET)



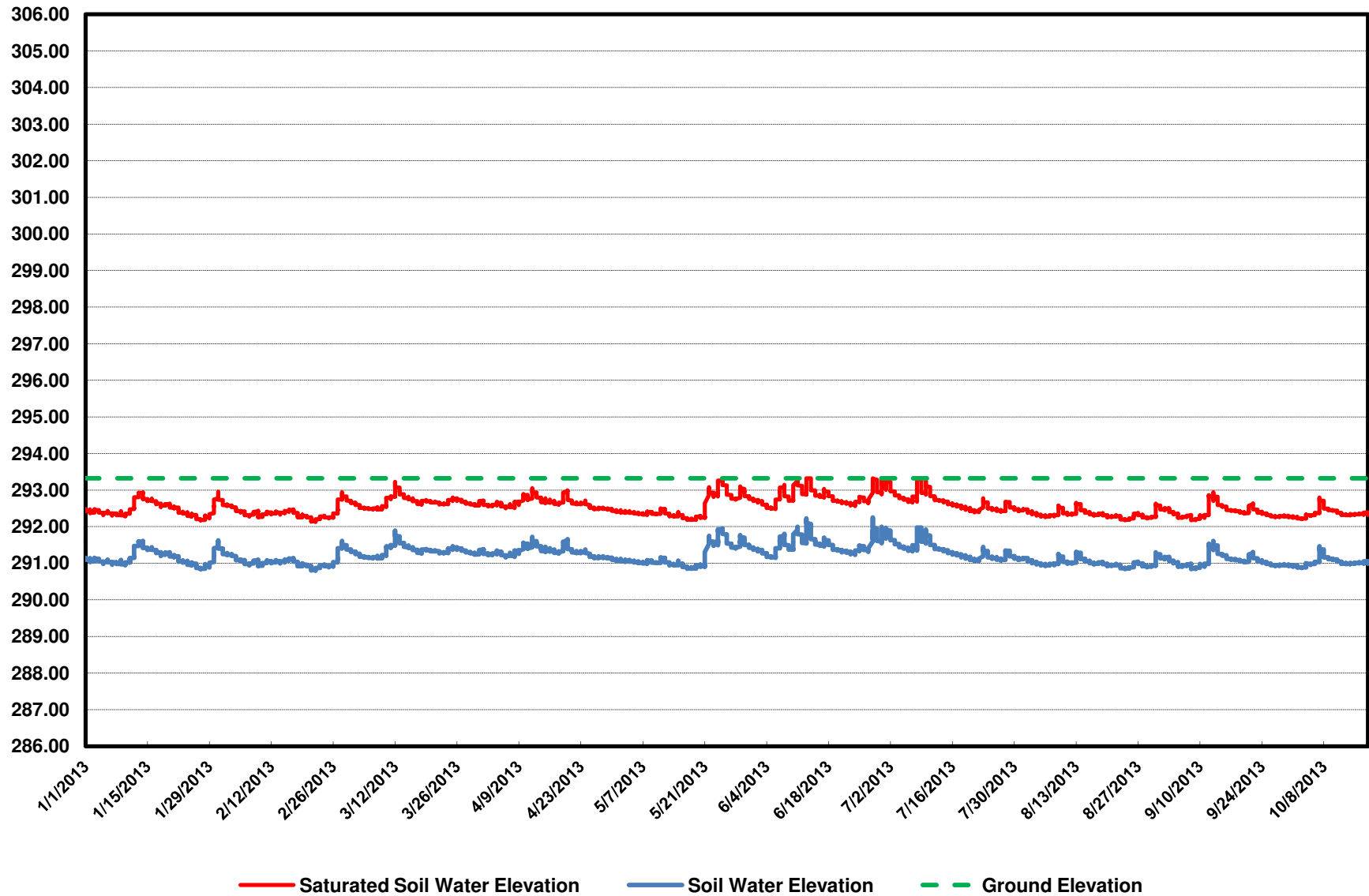
ALBANY TELOG #13 -- GROUND SURFACE AND SOIL WATER ELEVATIONS (FEET)



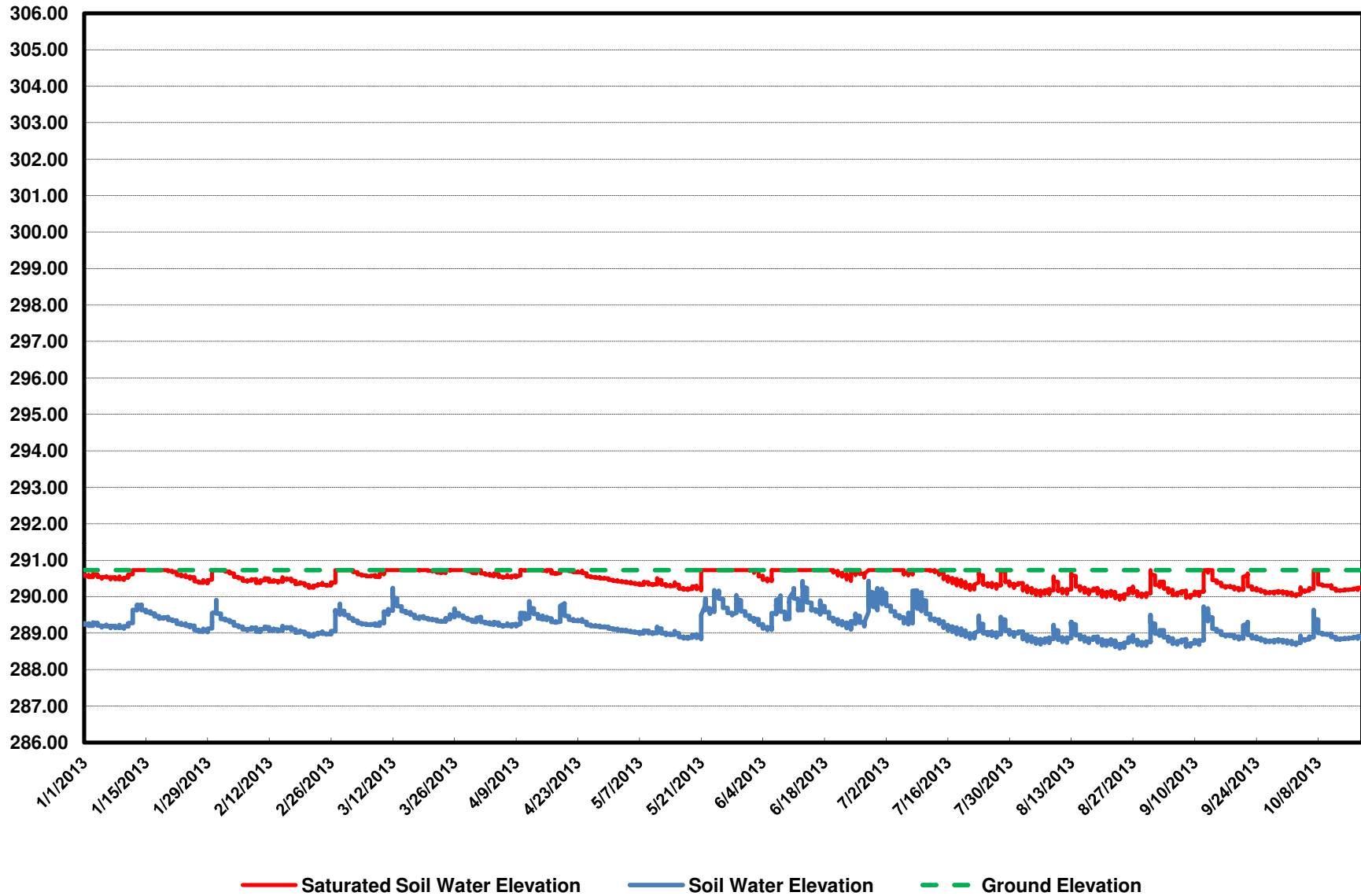
ALBANY TELOG #14 -- GROUND SURFACE AND SOIL WATER ELEVATIONS (FEET)



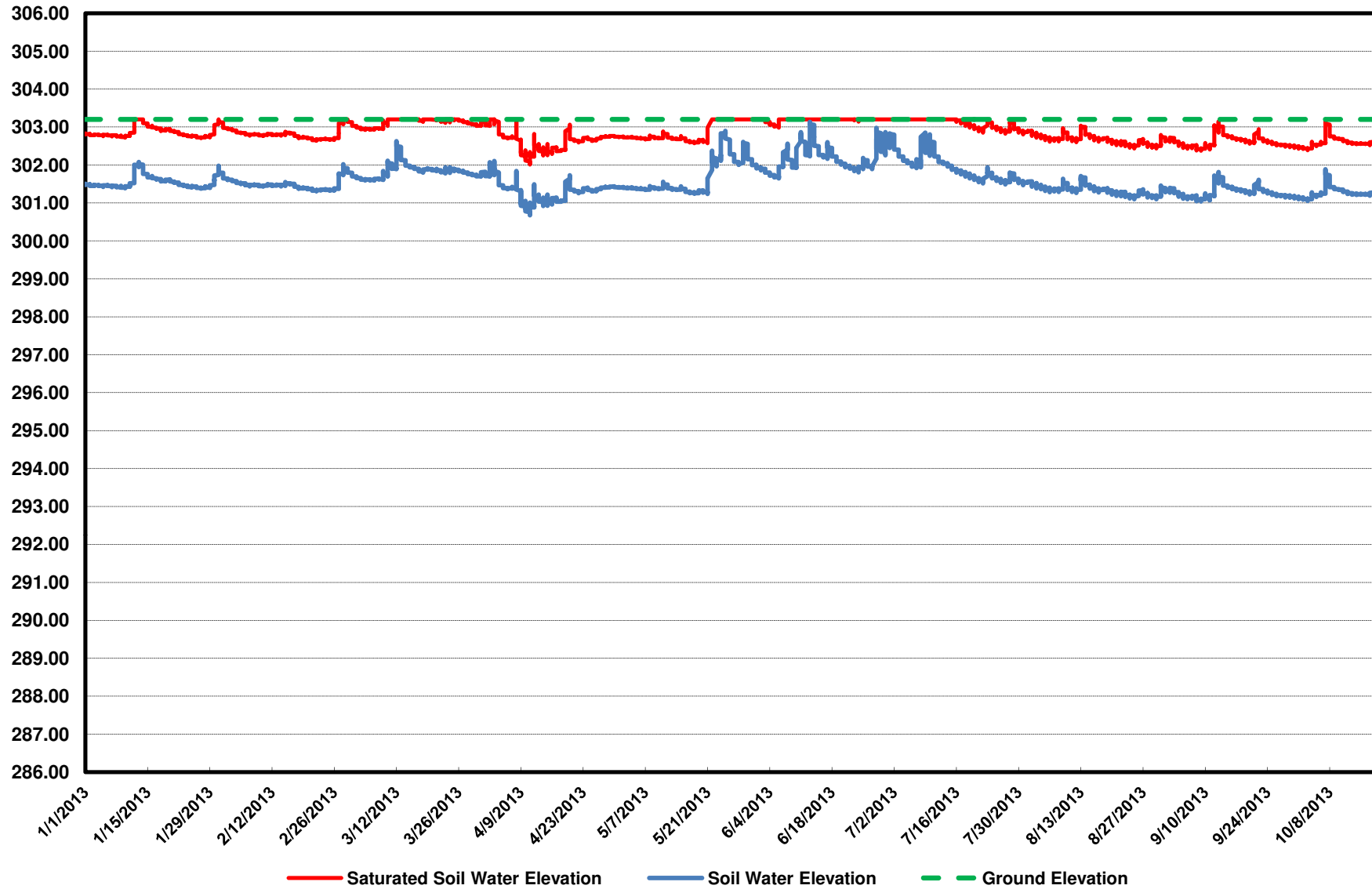
ALBANY TELOG #15 -- GROUND SURFACE AND SOIL WATER ELEVATIONS (FEET)



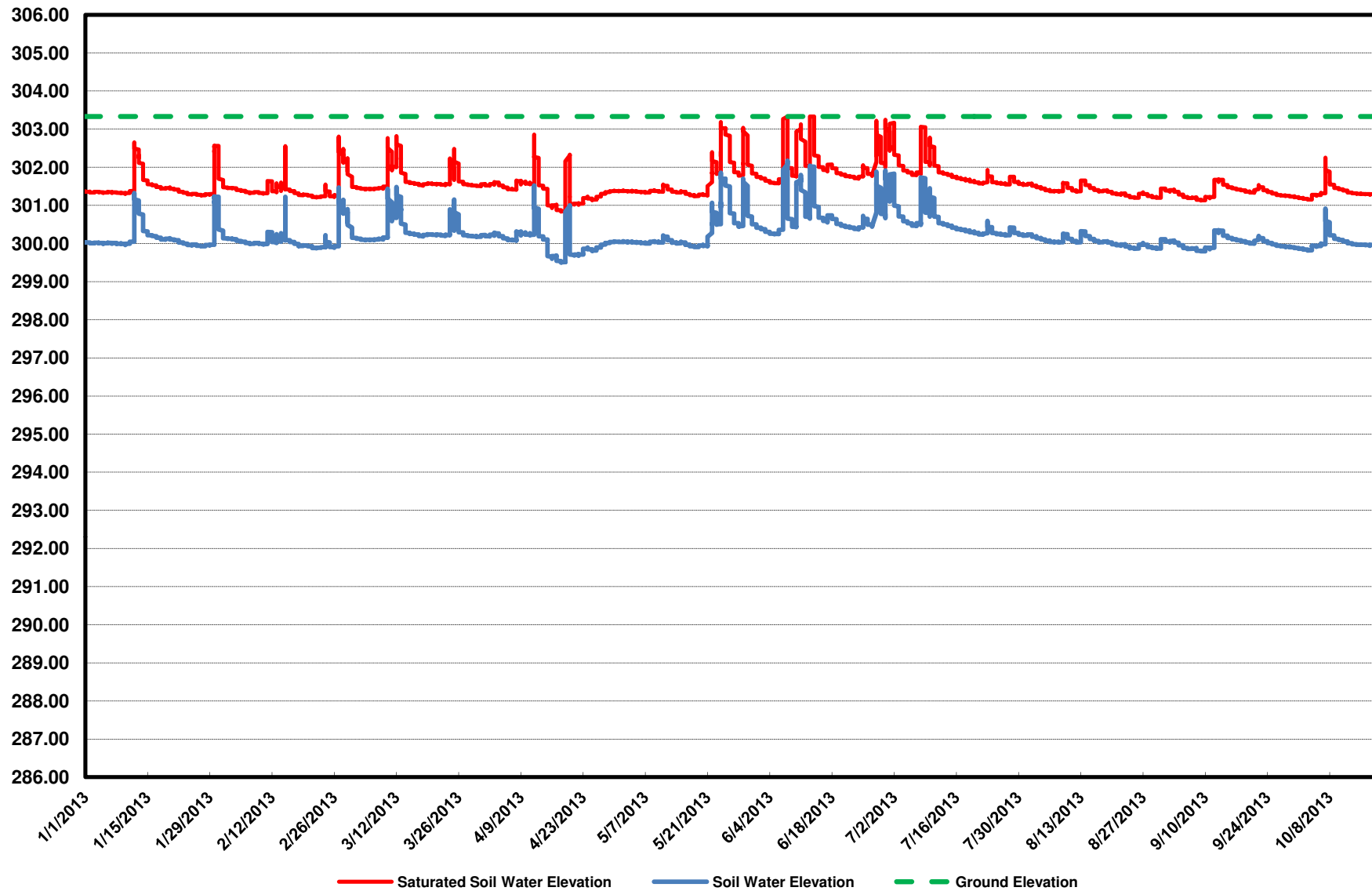
ALBANY TELOG #16 -- GROUND SURFACE AND SOIL WATER ELEVATIONS (FEET)



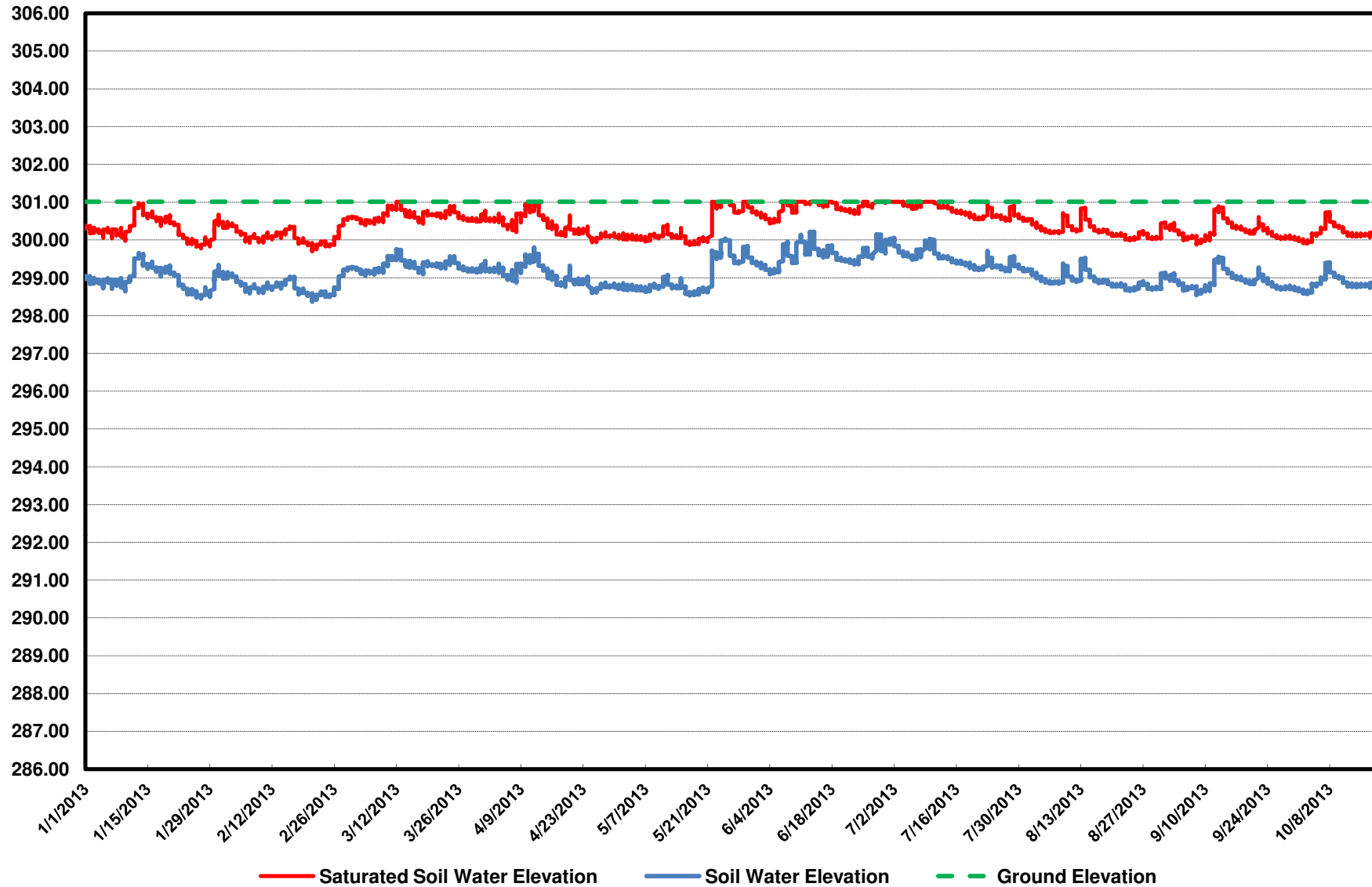
ALBANY TELOG #2 -- GROUND SURFACE AND SOIL WATER ELEVATIONS (FEET)



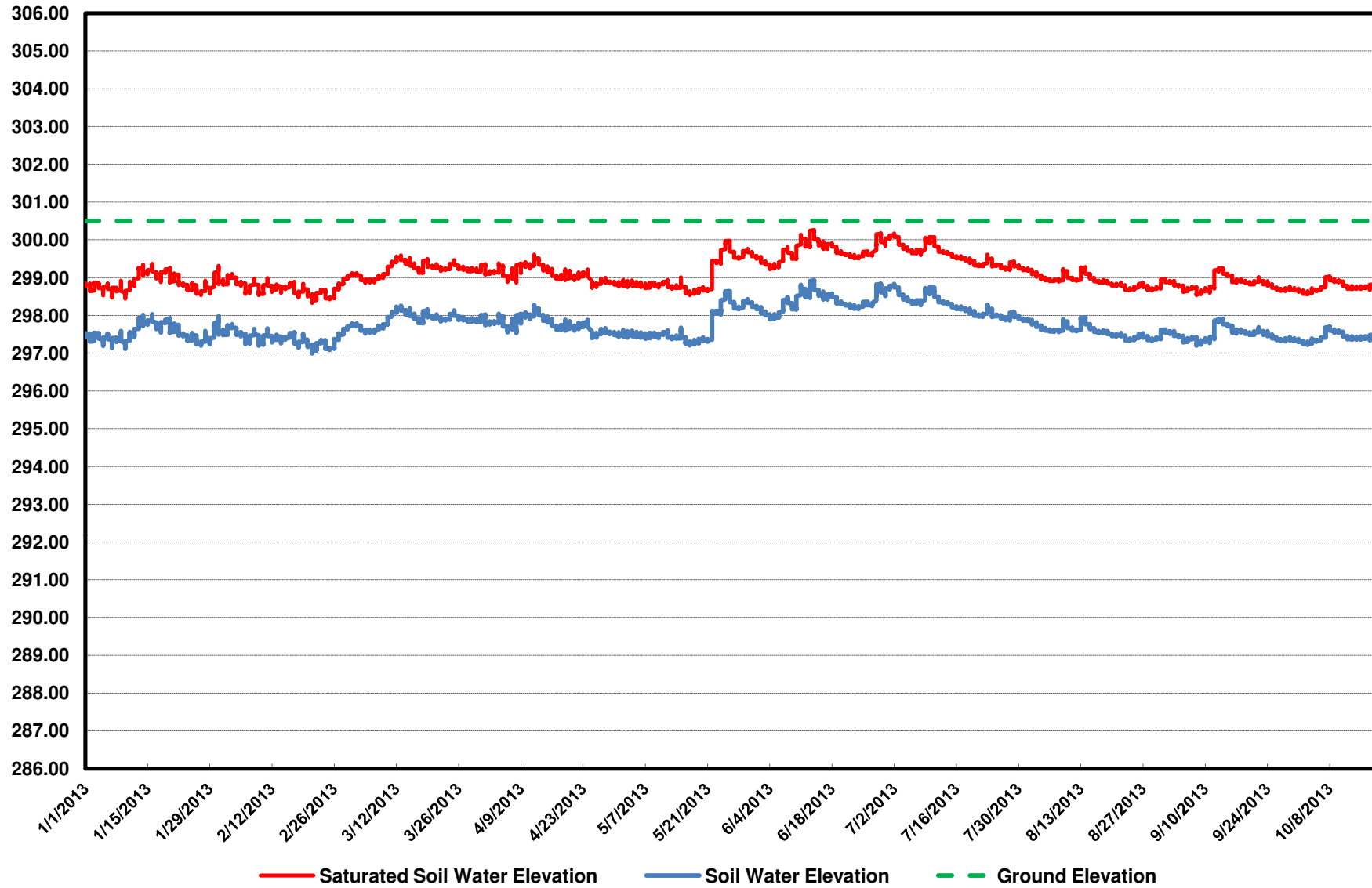
ALBANY TELOG #3 -- GROUND SURFACE AND SOIL WATER ELEVATIONS (FEET)



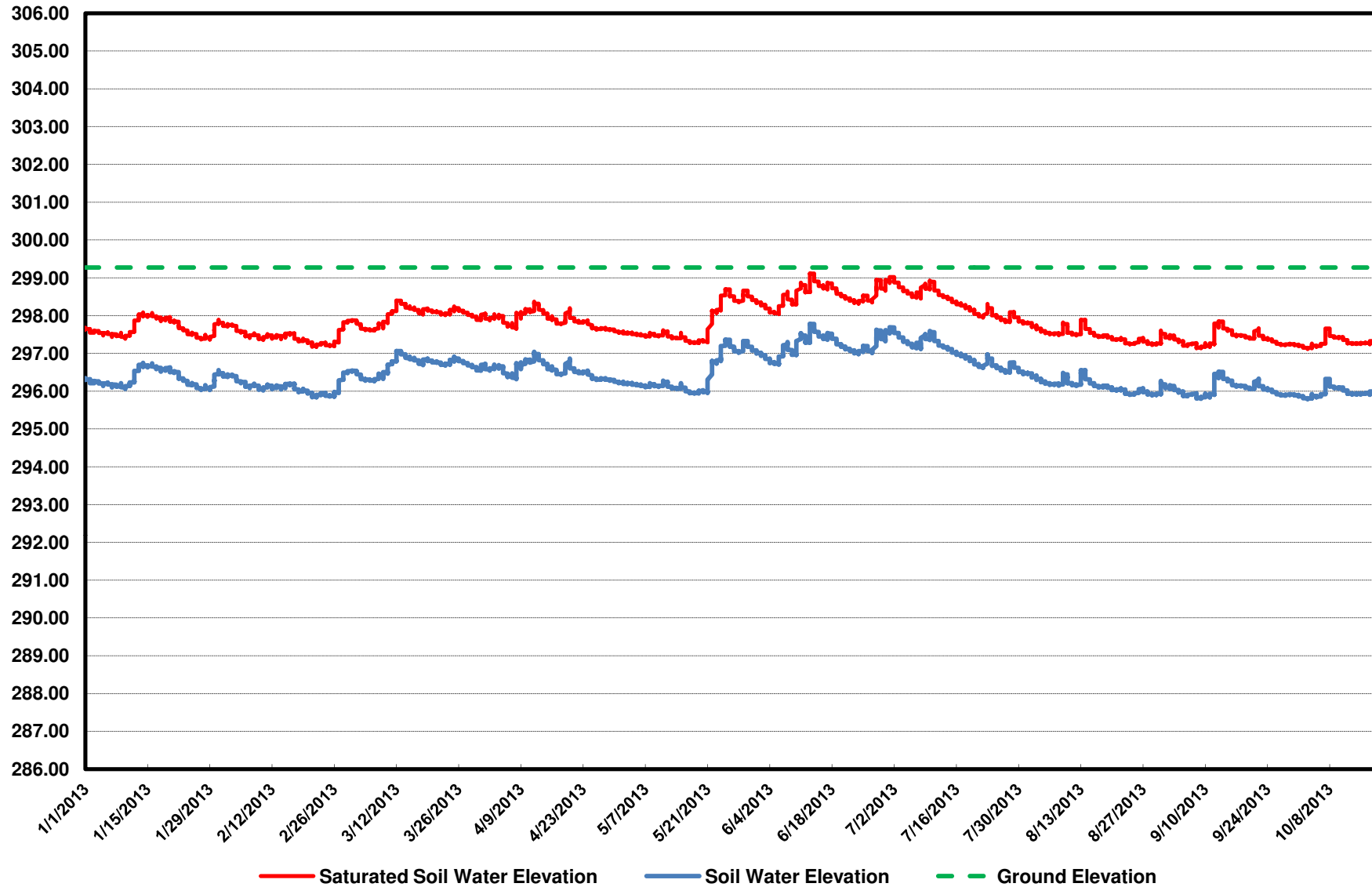
ALBANY TELOG #4 -- GROUND SURFACE AND SOIL WATER ELEVATIONS (FEET)



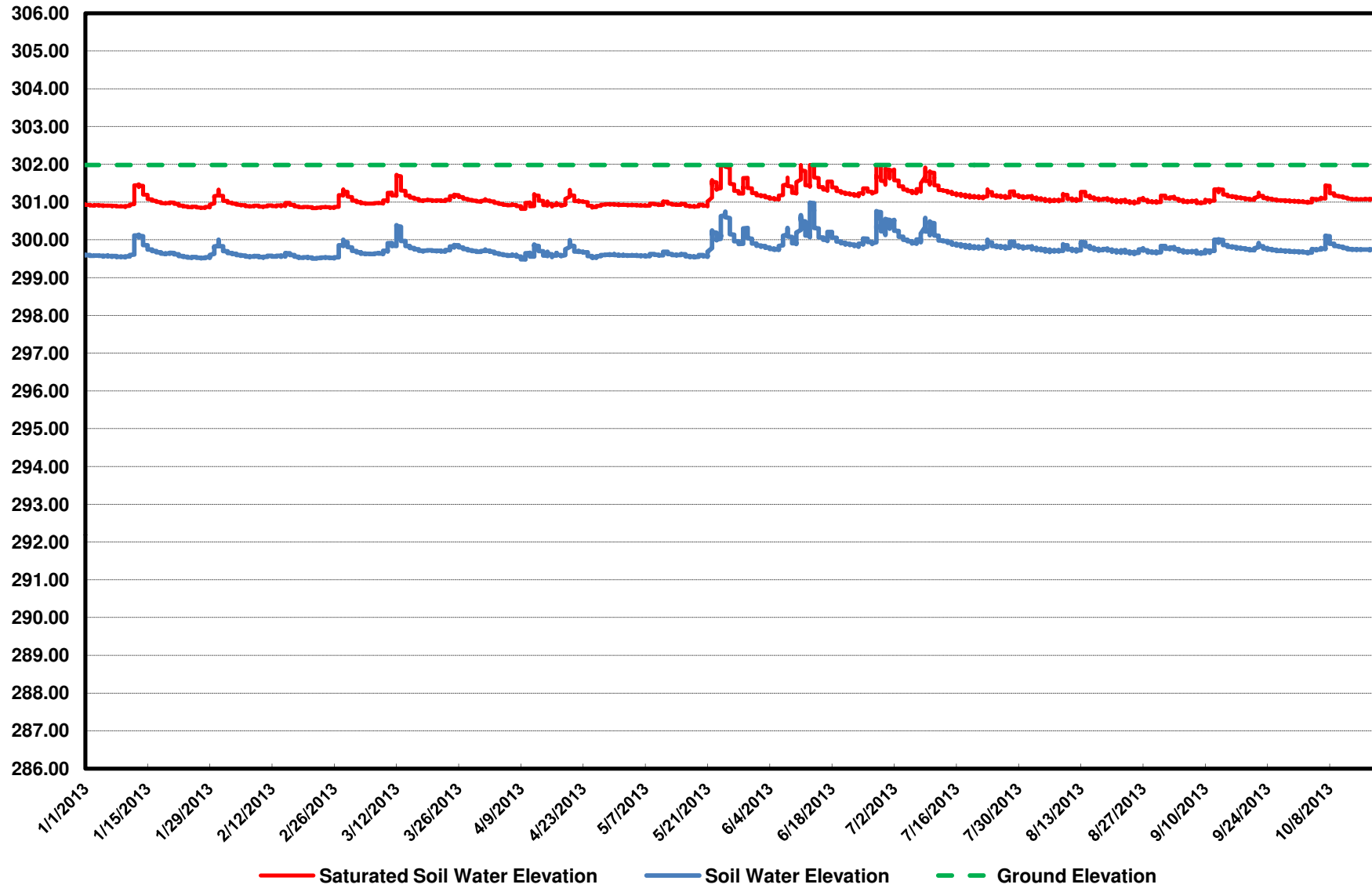
ALBANY TELOG #5 -- GROUND SURFACE AND SOIL WATER ELEVATIONS (FEET)



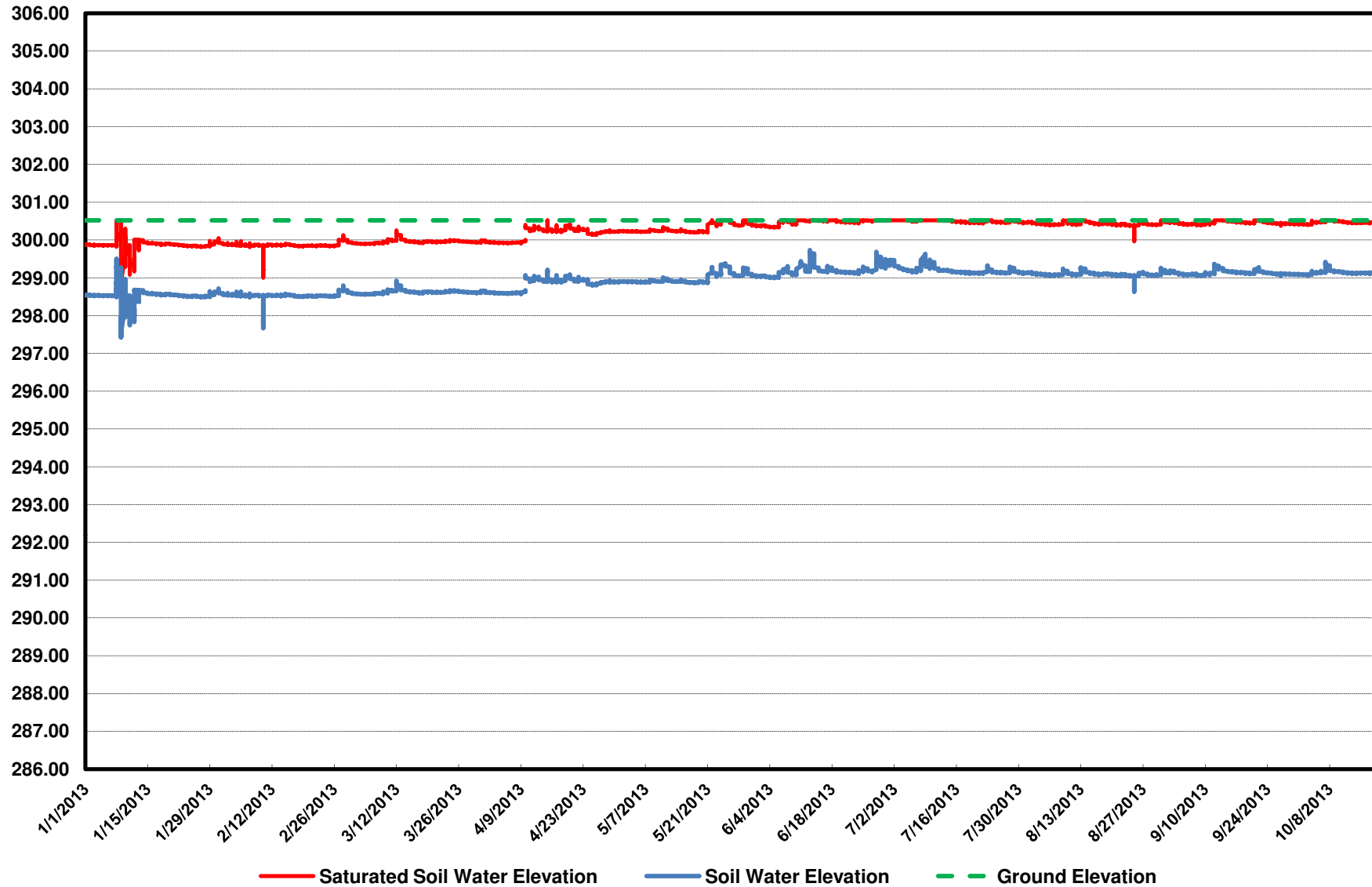
ALBANY TELOG #6 -- GROUND SURFACE AND SOIL WATER ELEVATIONS (FEET)



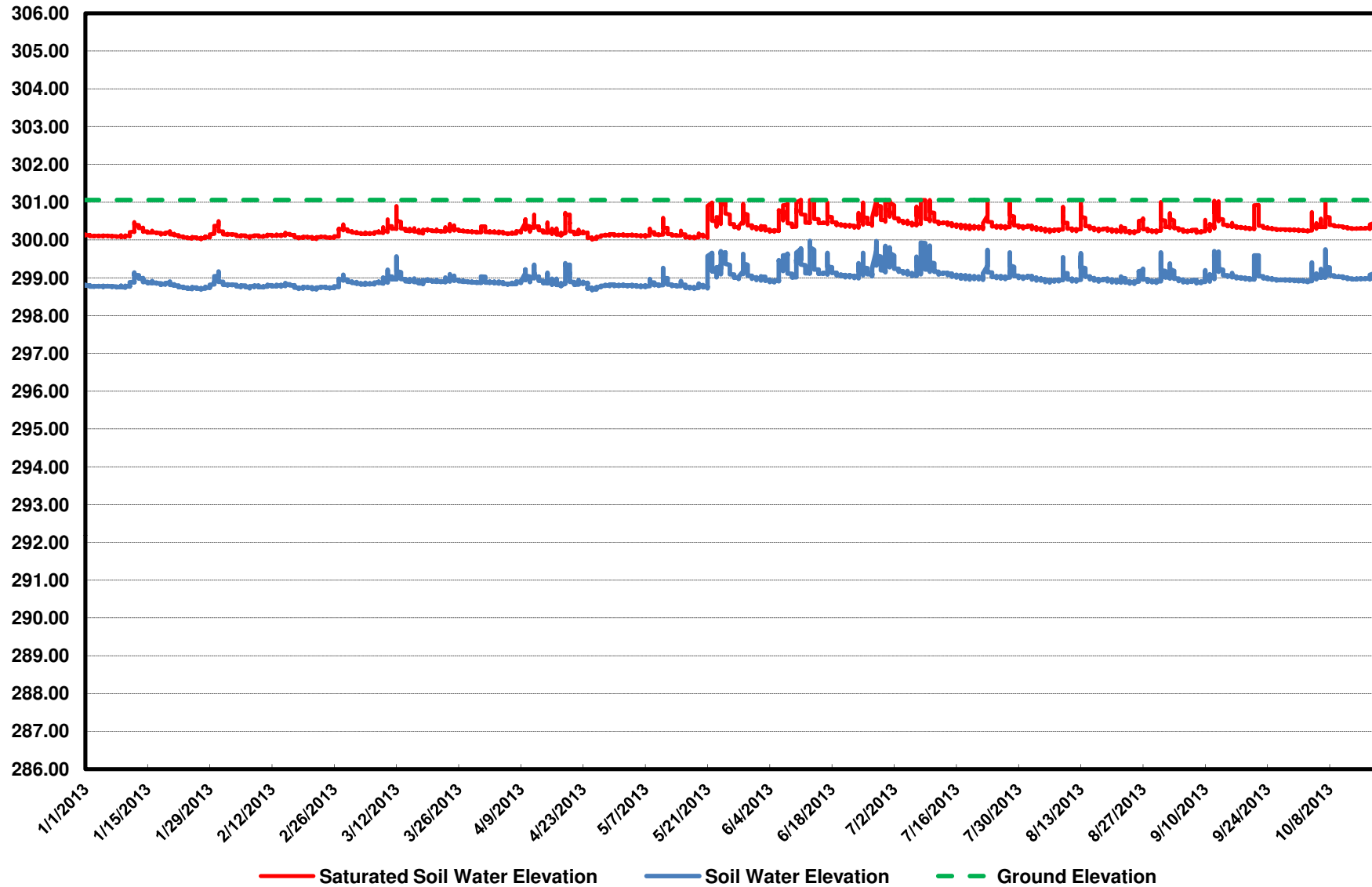
ALBANY TELOG #7 -- GROUND SURFACE AND SOIL WATER ELEVATIONS (FEET)



ALBANY TELOG #8 -- GROUND SURFACE AND SOIL WATER ELEVATIONS (FEET)

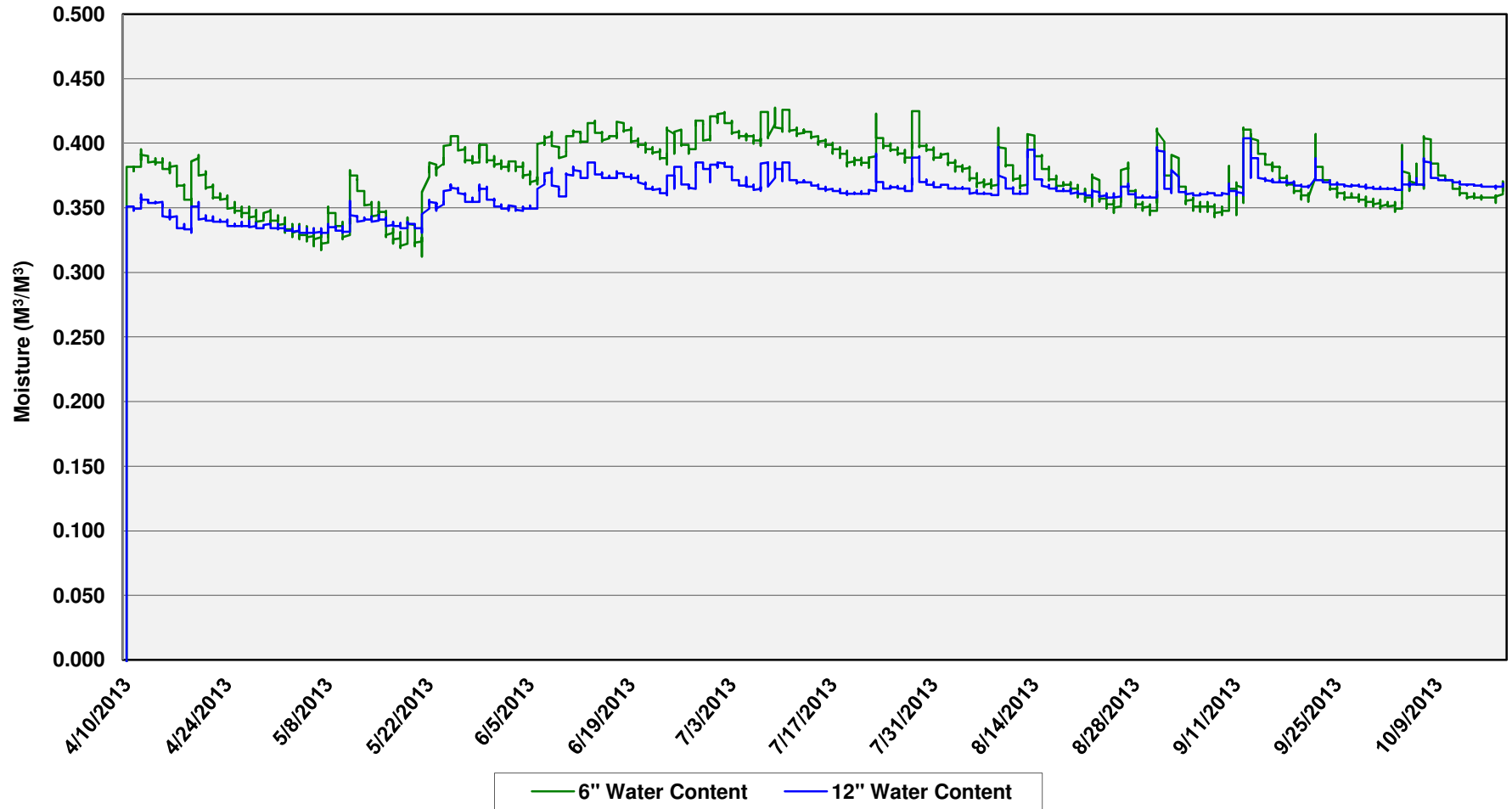


ALBANY TELOG #9 -- GROUND SURFACE AND SOIL WATER ELEVATIONS (FEET)

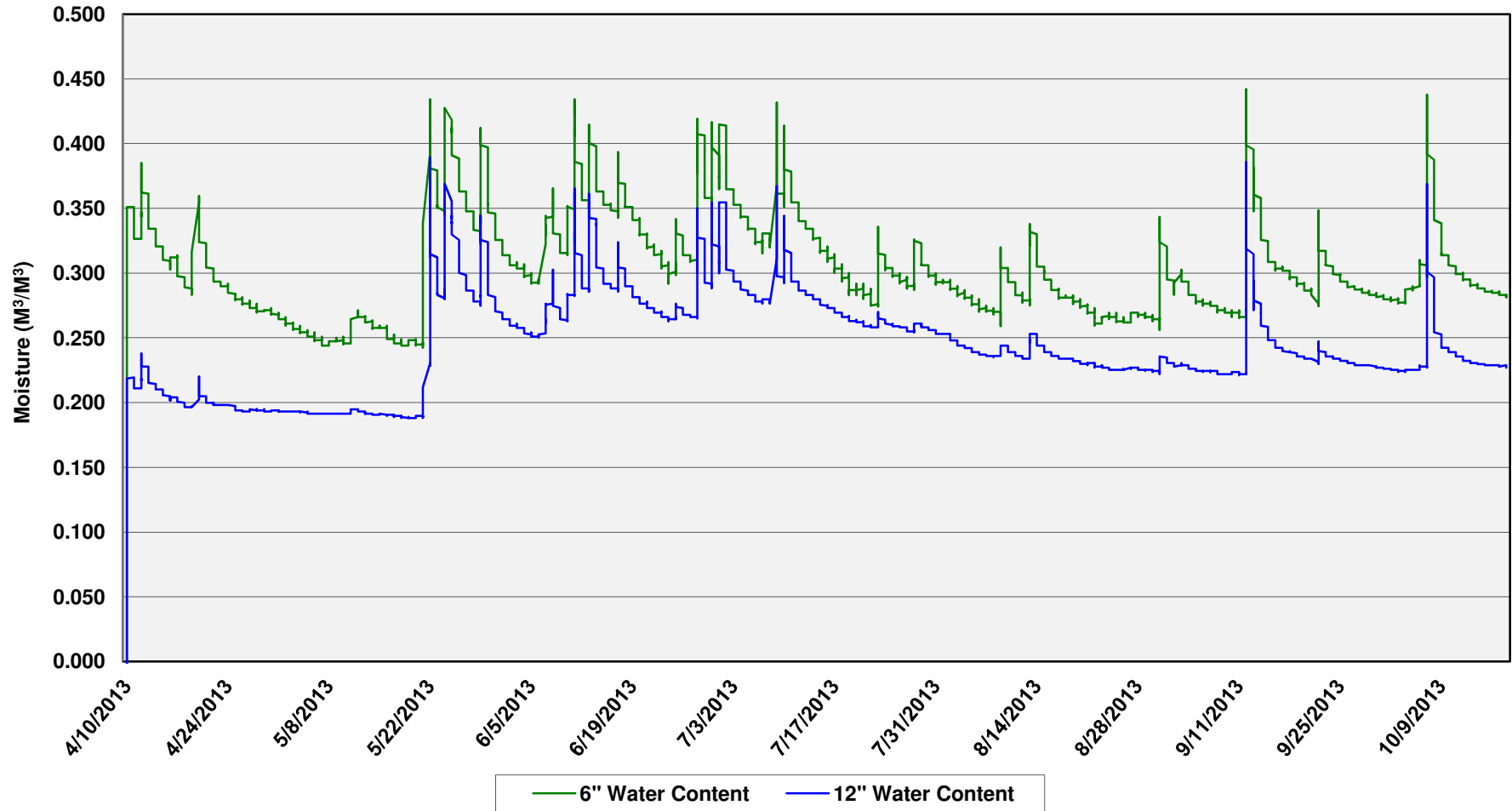


Attachment I-4.
Soil Moisture Meter Monitoring Data 2013
Soil & Hydrologic Monitoring
Albany Rapp Road Landfill

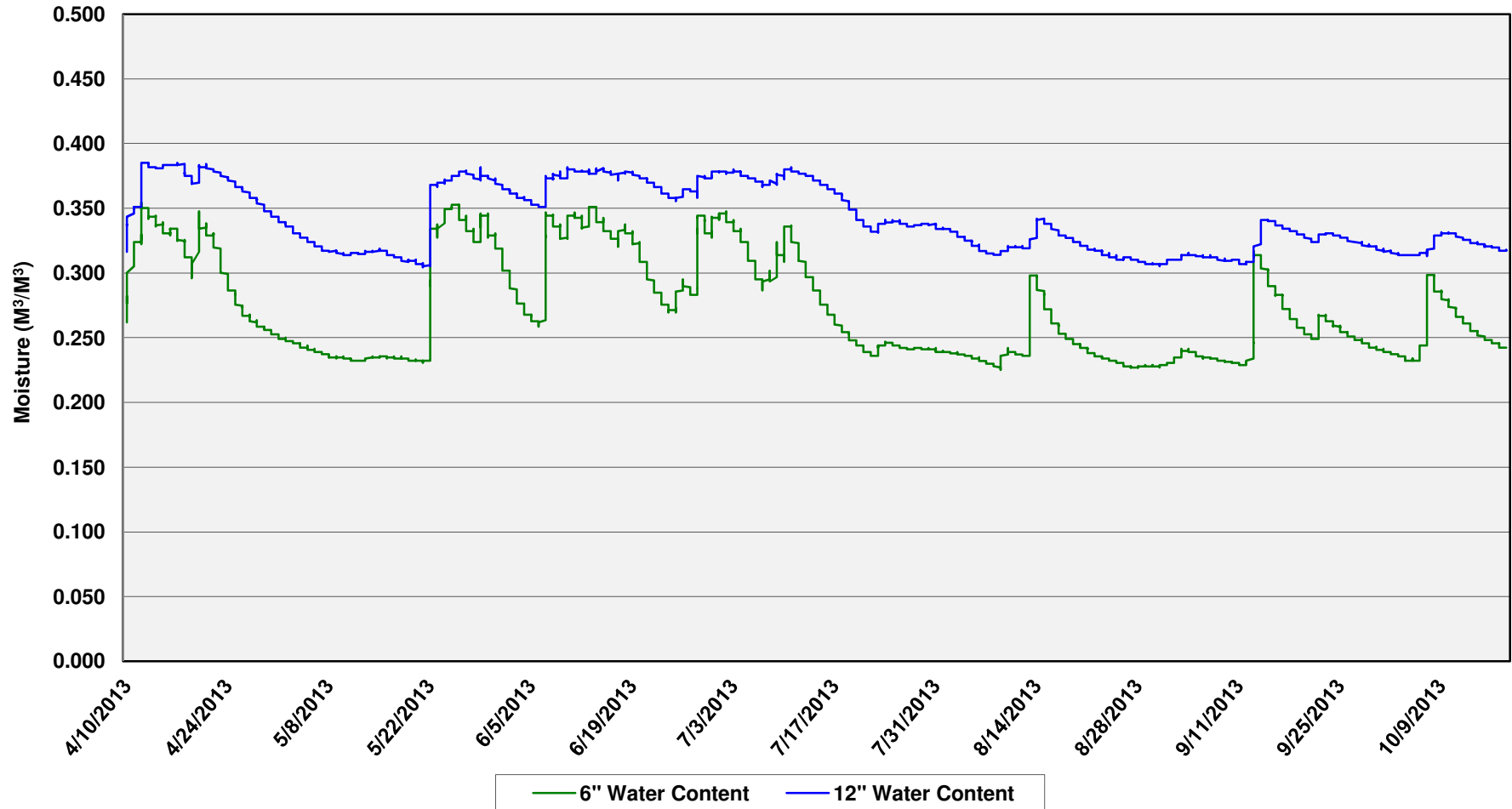
Albany Soil Moisture (23304) Unit #1



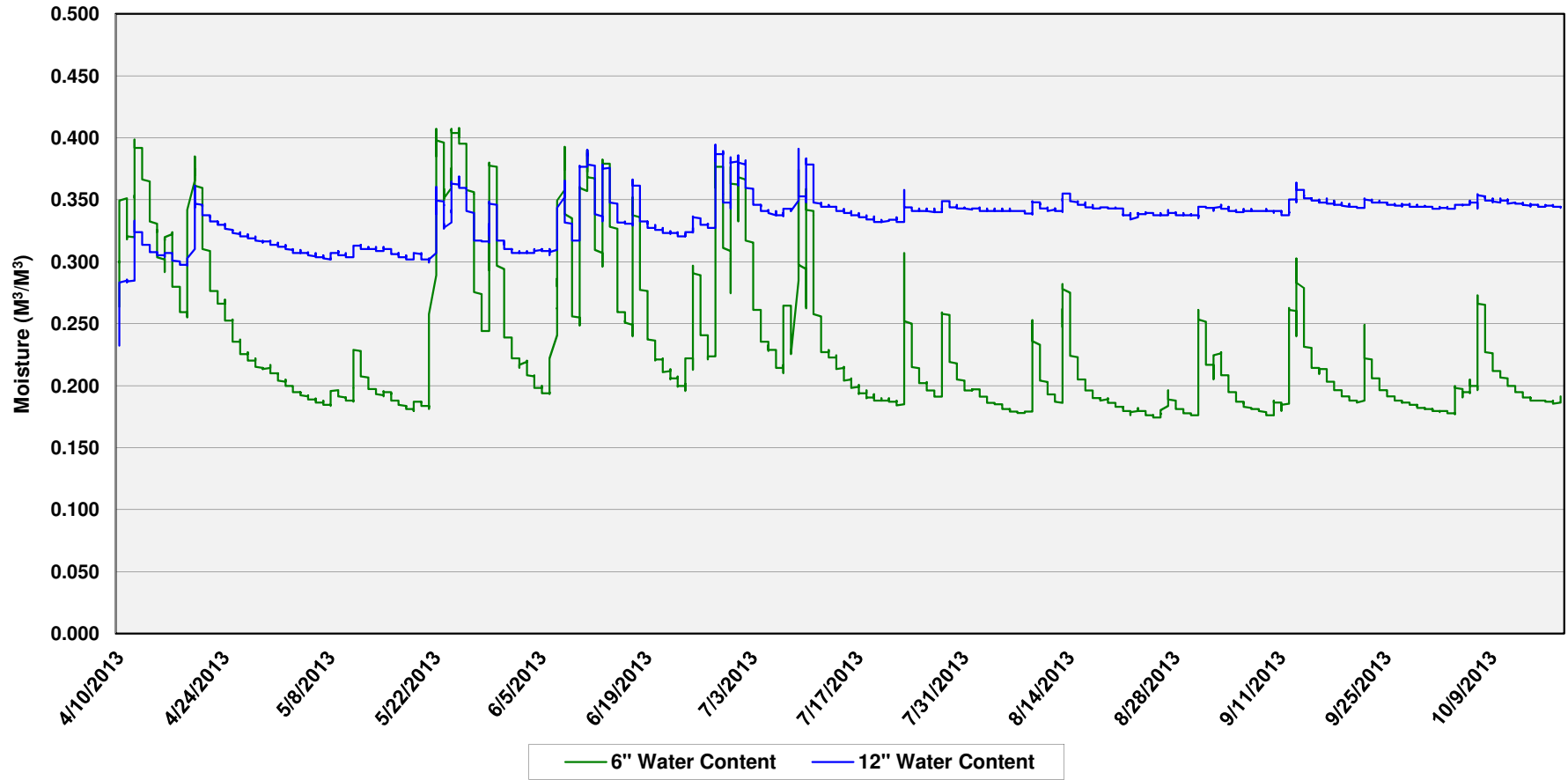
Albany Soil Moisture Unit #2



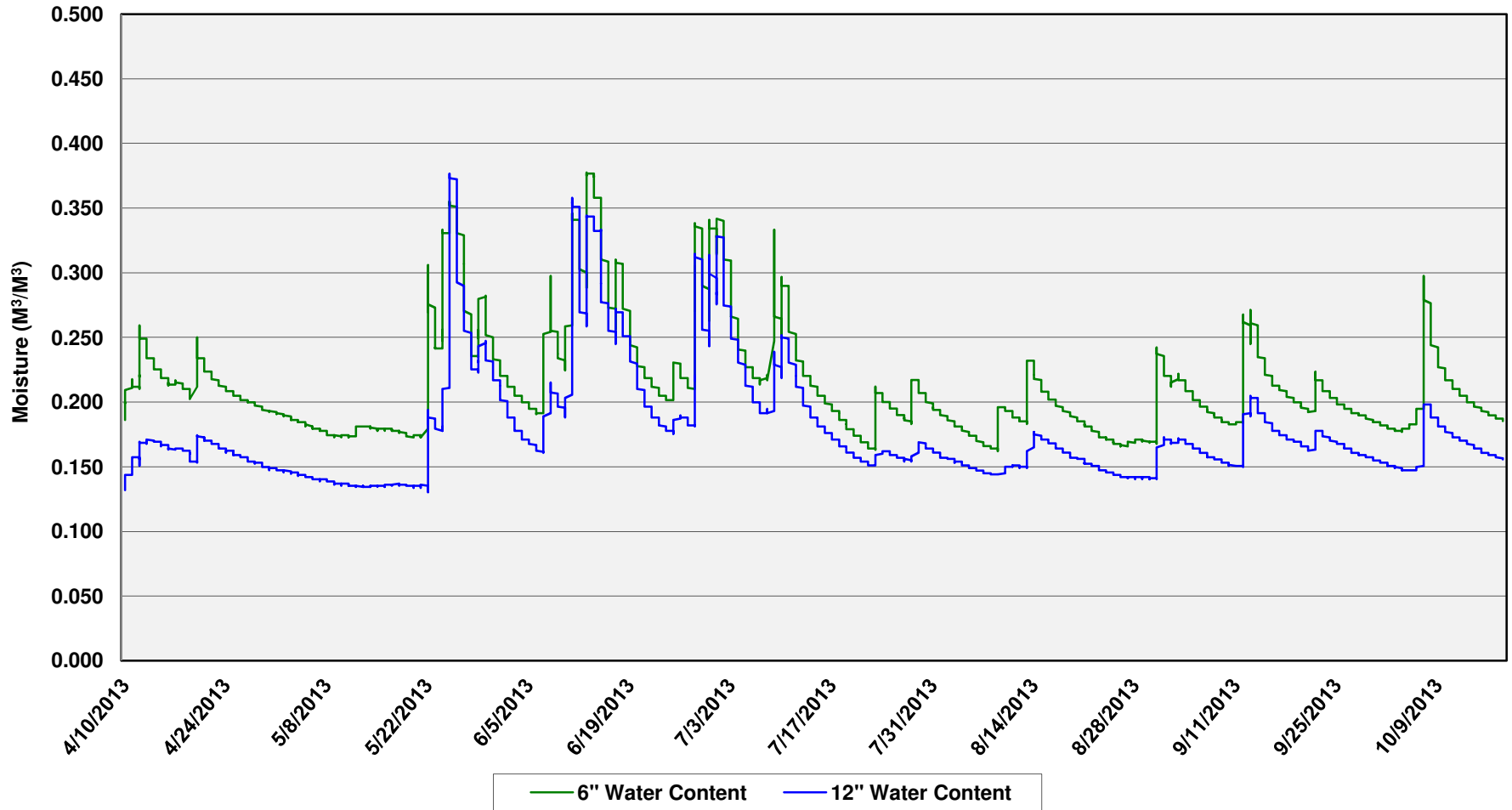
Albany Soil Moisture Unit #3



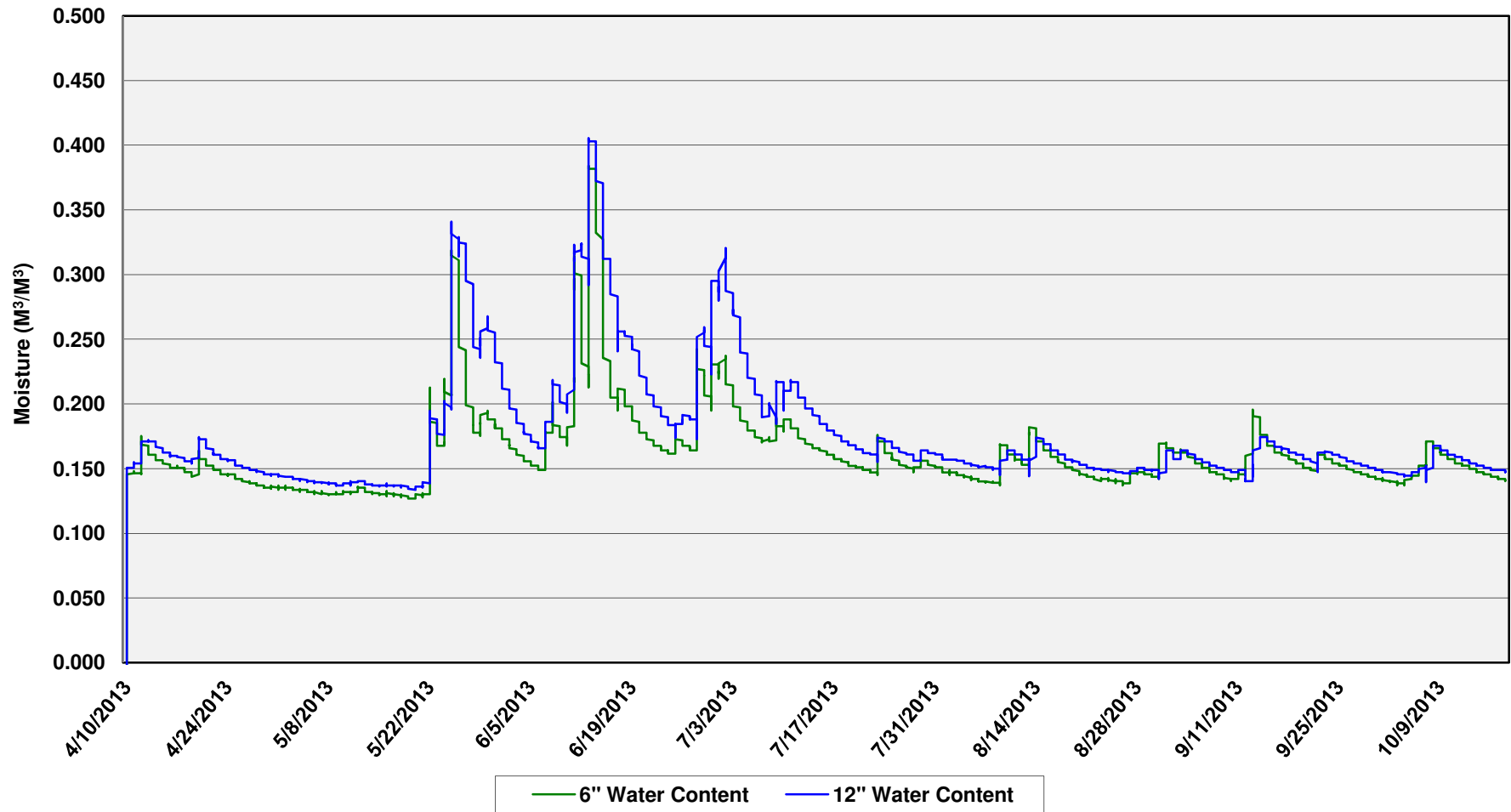
Albany Soil Moisture (23303) Unit #4



Albany Soil Moisture (23305) Unit #5



Albany Soil Moisture (23302) Unit #6



Attachment I-5.
Existing Piezometer Groundwater Monitoring Data 2013
Soil & Hydrologic Monitoring
Albany Rapp Road Landfill

*Albany Landfill
2013 Groundwater Monitoring Data*

Date	Well #	Top of Monitoring Well to Soil (feet)	Top of Monitoring Well to Groundwater (feet)	Surface to Groundwater (feet)
4/11/13	A1	3.10'	4.00'	0.90' below surface
	A2	2.80'	4.50'	1.70' below surface
	A3	2.20'	3.50'	1.30' below surface
	B1	3.25'	4.80'	1.55' below surface
	B2	2.40'	3.80'	1.40' below surface
	B3	2.55'	3.55'	1.00' below surface
5/22/13	A1	3.10'	4.05'	0.95' below surface
	A2	2.80'	4.20'	1.40' below surface
	A3	2.20'	3.00'	0.80' below surface
	B1	3.25'	4.60'	1.35' below surface
	B2	2.40'	3.20'	0.80' below surface
	B3	2.55'	2.95'	0.40' below surface
6/14/13	A1	3.10'	3.95'	0.85' below surface
	A2	2.85'	4.00'	1.15' below surface
	A3	2.30'	2.75'	0.45' below surface
	B1	3.30'	4.40'	1.10' below surface
	B2	2.40'	2.80'	0.40' below surface
	B3	2.60'	2.60'	0.00' below surface
8/15/13	A1	3.05'	4.10'	1.05' below surface
	A2	2.80'	4.80'	2.00' below surface
	A3	2.15'	4.25'	2.10' below surface
	B1	3.30'	5.20'	1.90' below surface
	B2	2.35'	4.75'	2.40' below surface
	B3	2.50'	4.65'	2.15' below surface
10/23/13	A1	3.00'	4.30'	1.30' below surface
	A2	2.80'	4.75'	1.95' below surface
	A3	2.15'	4.20'	2.05' below surface
	B1	3.25'	5.20'	1.95' below surface
	B2	2.35'	4.70'	2.35' below surface
	B3	2.50'	4.70'	2.20' below surface

Attachment J. Ecological Monitoring Compliance Report

Albany Rapp Road Landfill

Ecosystem Mitigation, Restoration & Enhancement Plan

City of Albany, New York

Introduction

This section presents the results of the 2013 ecological monitoring program for vegetation and faunal resources at the Albany Rapp Road Landfill restoration project. The results of this monitoring effort are presented in the appended reports in Attachments J-1 PII & PIII Vegetation Monitoring prepared by AES, with field and graphic assistance from CHA, and Attachment J-2 2013 Wildlife Surveys Report prepared by CHA and AES.

Second-year, post-construction vegetation monitoring was scheduled and executed in the Phase II restoration area in 2013. A single transect (P3-1) had been established and sampled in the Phase III enhancement area in 2012 to measure pre-treatment conditions, in order to provide a baseline for comparing enhancement treatment effects in subsequent years as part of the site vegetation monitoring effort. Monitoring protocols and methods for both vegetation and faunal surveys follow those contained in Appendix 3 Monitoring Plan & Performance Criteria in the Albany Rapp Road Landfill Ecosystem Mitigation, Restoration & Enhancement Plan. Existing conditions at the time of the monitoring effort represent vegetation establishment in the Phase II areas following construction activities that occurred in mid to late 2011, including dormant seeding of cover and native seed in late 2011, followed in spring 2012 by installation of live plant plugs in Phase II areas, particularly to ensure stable conditions in riparian areas and on banks within the stream corridor. Conditions at the time of monitoring followed a growing season of extreme high temperatures and prolonged drought, which may have had some impact on some newly establishing plants, particularly in upland and transitional settings along the hydrological gradient. Applying a strategy of late fall dormant seeding and early installation of plugs in spring however gave germinating seeds and young plant plugs a good start, resulting in overall success of the first year of vegetation establishment in spite of the drought.

Pre-construction faunal surveys were initiated in fall 2009 to establish baseline conditions in the project area. Construction began in 2010 and continued through 2011 establishing the constructed wetlands and uplands. Surveys were continued during this time period. Phase III enhancement work began in 2012 and continued through 2013, involving canopy and understory thinning and removal of exotic shrubs. Phase III enhancement will continue into 2014 with seeding of native species and continued maintenance within all areas to control invasive species and to ensure establishment of the desired vegetation. The faunal surveys conducted this year, however, are considered post-construction surveys since the bulk of the habitat creation element of the plan was completed under Phases I and II. Additionally, the landfill cap will also be converted to pine barrens habitat but cannot begin until the results of the vegetation test plots are analyzed and a plan for placing sand and establishing vegetation is developed. As a result, changes will continue to occur within the restoration areas over the next several years that may continue to effect wildlife establishment in some areas. The restoration project is a long term effort.

Work Activities

Vegetation monitoring investigations were conducted August 3 - 9, 2013 by the AES team, with assistance from CHA biologists. This monitoring effort was conducted in conjunction with monitoring of the establishing vegetation in the newly seeded test plots located on the landfill cap (the report containing the initial findings in the test plots is included in Attachment E Test Plot Seeding, Maintenance and Monitoring). Periodic inspections occurred throughout the growing season to assess site stability and success of the PII and PIII restoration activities. These inspections occurred in conjunction with invasive species management, assessment of tree browse damage, seedback response following enhancement activities, and regular SWPPP inspections.

Post-construction faunal surveys were conducted throughout the 2013 season as planned. The majority of the 2013 survey efforts involved wildlife inventory.

Deviations from Work Plan

Regarding the vegetation monitoring efforts, there were no deviations in scheduling and applying the vegetation monitoring methods as outlined in the restoration plan.

In regard to the faunal surveys:

- Trapping Array (TA) 7 has not yet been installed and TA 8 was not used during any of the 2013 trapping events. TA 8 was located in an area that had to be re-graded/planted in the spring of 2013. TA 12 was not used during the March trapping event because it was damaged or removed during the winter tree clearing activities. However, this TA was installed after the March event and used for the remainder of 2013 trapping events. TA's 7 and 8 will be installed in the spring of 2014 and incorporated into future trapping events.
- The March trapping event was abbreviated due to an unfavorable change in weather conditions for *Ambystoma* salamander migration.
- Two additional bird survey points (B-16 and B-17) were informally added in the spring to cover habitats that were significantly altered during the 2012-2013 winter enhancement tree removal activities.

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**Attachment J-1. PII & PIII Vegetation Monitoring
Albany Rapp Road Landfill
Ecosystem Mitigation, Restoration & Enhancement Plan
City of Albany, New York**

1. Introduction

This report presents the second-year, post-construction vegetation monitoring executed in the Phase II restoration area and the Phase III enhancement area in 2013. Monitoring requirements, performance standards, and methods for monitoring vegetation success follow those contained in Appendix 3 Monitoring Plan & Performance Criteria in the Albany Rapp Road Landfill Ecosystem Mitigation, Restoration & Enhancement Plan.

2. Monitoring Requirements & Performance Standards

2.1 Restoration Milestones

A proposed Management/Maintenance Timeline was presented in the permitted monitoring plan to define milestones in completing the restoration project. This timeline distinguishes the periods of active restoration, short-term and long-term management, and long-term maintenance. Based on these definitions, the Phase II restoration is currently transitioning from the active restoration period to the short-term management period where the focus of management activities is on ensuring site stability. The results of the 2013 vegetation monitoring effort represent the end of the second year growing season following the spring 2012 installation of the live plant plugs. Following this timeline, 2014 will represent year 3 of the Phase II restoration.

2.2 Performance Standards

A set of performance criteria were laid out in the permitted monitoring plan to assess the success of the restored plant communities, including wetlands. The results of annual quantitative vegetation monitoring and hydrological data analysis will be used to measure performance and determine compliance according to the following standards.

Hydrology

Wetland status

Jurisdictional Status: Wetlands created or restored for credit shall meet the criteria for wetlands detailed in the 1987 Corps of Engineers Wetland Delineation Manual, or other such Federal manual used by the Corps at the time the mitigation bank was established, as well as the New York State Environmental Conservation Law, Article 24 (Wetlands) standards.

The 1987 US Army Corps Wetland Delineation Manual indicates that an area exhibits wetland hydrology if it is inundated or saturated within 12 inches of the surface on consecutive days for at least 12.5% of the growing season (Primary Hydrology Indicator). If an area is inundated or saturated for between 5% and 12.5% of the growing season the area must meet at least one primary hydrology indicator and/or two secondary hydrology indicators to exhibit wetland hydrology. Areas inundated or saturated for less than 5% do not exhibit wetland hydrology and therefore, are not wetlands.

According to the local NRCS Office, the average growing season in Albany County is 147 days (May 15th – October 25). If inundation or saturation is within 12 inches of the surface for a minimum 19 consecutive days in Albany County the primary hydrology criteria has been achieved. If not,

additional data will be analyzed and the use of additional primary and secondary hydrology criteria will be evaluated.

Telogs

Telogs will be used as the primary means to measure inundation and saturation (Primary Hydrology Indicator). In addition to Telogs, soil moisture recorders, and a soil moisture probe will also be used to measure for soil saturation.

Sixteen automatic water level recorders (i.e. Telogs) and 6 soil moisture level recorders will be installed at the site in areas designed to be wetlands to measure the water levels above and below ground and the soil moisture. The automatic water level recorder will provide a constant record of water level through electronic measurements via a pressure sensitive transducer.

Soil Moisture Recorders

The soil moisture recorders provide an electronic measurement of the level of moisture in the soil. The data will be downloaded from the automatic water level recorders and soil moisture recorders and graphically displayed. The soil moisture recorder measures the dielectric constant of soil in order to determine its volumetric water content. Six soil moisture recorders will be installed on the site. There will be two different probe depths in each unit. One will record data at 6 inches below the ground's surface and the second will record data at 12 inches below the surface. During operation, values of 0.0 to 0.4 m³/m³ are possible. A value of 0.0 to 0.1 m³/m³ indicates oven dry to dry soil, respectively. A value of 0.3 to 0.4 m³/m³ indicates wet to saturated soil. Thus, any value of 0.3 or greater will be indicative of a saturated soil. These soil saturation levels, which will promote the growth of a predominance of hydrophytic vegetation, will have a value of 0.3 or greater within 12" of the ground surface for a minimum of 19 consecutive days in Albany County.

Soil Moisture Meter Probe

A Soil Moisture probe will also be used along several transects to measure the soil moisture content within 12 inches of the soil surface in areas between the Telogs and soil moisture meters. Several transects will start in an existing wetland and will extend upslope to an upland zone. Following calibration of the moisture meter in 100% saturated soils, the probe will record soil moisture values every 20 meters along each transects to a depth of 12 inches. Each point will be surveyed using a hand-held GPS unit. A soil moisture meter probe value of 0 represents Dry (0% saturation) soil; values of 2-4 represent Average to Dry soil; values of 4-6 represent Average soil moisture, and values greater than 7 generally represent saturated soils. Data collected will be summarized and provide supporting data for achievement of the hydrology performance standard. [Note: due to wear damage caused by use of the instrument in abrasive sand, its use was discontinued out of concern that, as the tip wear increased, the accuracy of the data became less reliable.]

Primary and Secondary Hydrology Indicators

The Corps 1987 Wetland Delineation manual states a site must exhibit one or more "Primary Hydrology Indicators" and/or two or more "Secondary Hydrology Indicators" to meet wetland hydrology requirement.

Primary and secondary hydrology indicators such as drainage patterns, soil survey data, and hydrophytic vegetation dominance (Fac-Neutral Test) will also be evaluated for achievement of the hydrology performance standard.

Local Hydric Soil Map.

The historic Albany County Soil Survey maps showed nearly all lower ground soils in the [former] Mobile Home Park to have been hydric soils that were filled during sand mining and subsequent land leveling conducted to support the existing Mobile Home Park. The historic soil types in this location are somewhat poorly drained and hydric soils in the County. These soil types were confirmed during site visits. The presence of mapped hydric soils is another secondary indicator of hydrology.

A wetland delineation with a GPS boundary survey of wetlands and natural community mapping will be conducted in the spring, beginning in year 2 and be conducted again in years 3, 4, 6, 8, and 10 of the ten-year monitoring period that begins in 2012.

Vegetation

Species Composition

Species selected for the planting shall be native to the county where the mitigation site is located and shall be appropriate for the hydrologic zone to be planted. A minimum number of native perennial species proposed for establishment must be present within each plant community to meet performance standards are as follows:

- Pine barrens vernal pond minimum of 12 native perennial species
- Sedge meadow/wet prairie minimum of 20 native perennial species
- Dry prairie (buffer) minimum of 20 native perennial species
- Forested wetland minimum of 12 native perennial species

In addition, at least 50% of the required minimum number of species must occur at a 10% frequency or greater by year 5.

Species Dominance

Dominance shall be determined by calculating importance values (IV), with at least two parameters, frequency and cover, used to calculate species importance. Cattails (*Typha* spp), reed canary grass (*Phalaris arundinacea*), and non-native species shall cumulatively comprise not more than 20% of the total dominance measure for each community for which credit is granted. The native perennial species within each wetland plant community shall represent at least 70% of the total dominance measure.

3. Monitoring Methods & Techniques

We used the following vegetation sampling methods and techniques to address the vegetation performance standards, according to the permitted restoration plan.

Percent cover

- Line transects and nested meter square sample quadrats
- Permanent transects comparison with annually randomized transects

Diversity

- Line transects and nested meter square sample quadrats
- Comparison between permanent and annually randomized transects

- Nested belt transects to measure woody cover intercept and basal area using diameter at breast height (dbh; measured at approximately 4.5 meters above ground level)
- Derived measures from cover data, including frequency of occurrence and importance values
- Richness from total species lists developed via floristic inventories and transect sampling

3.1 Line Transects & Nested Meter Square Sample Quadrats

Permanent line transects, each 50 meters in length, were established in nine locations throughout the Phase II restoration area, selected to represent the major restored wetland communities (see locations in Figures 01, 01A, and 01B PII/PIII Vegetation Monitoring Map and Enlargements). Each of the newly established transects were located to fall completely within the constructed planting zones. Selected baseline transects, 100 meters in length, that lie within the Phase II restoration area were resampled. The baseline transects intercept multiple constructed planting zones. Transects were initially delineated on a map of the as-built PII restoration site, then subsequently laid out in the field and adjusted to represent as accurately as possible the designed restored plant communities. Transect end points were staked and located using GPS, and used to prepare the final transect location map. A summary and description of the sampled transects is presented in Table 1 Phase II & III Vegetation Monitoring Summary.

Circular sample quadrats, 1m² in area, were placed at 5-meter intervals along each 50-meter transect and at 10-meter intervals along each 100-meter transect, centered over a meter tape pulled between the transect end points. This resulted in sampling 10 quadrats in each transect. At each sample quadrat the plant cover representing the herbaceous vegetation layer (all plant cover, both woody and herbaceous, less than 1.0 meter in height) was measured as percent cover, a measure of the vertical projection of photosynthetic leaf area. Ground surface (substrate) cover by non-plant types, including bare soil, fine and coarse litter (1 hour combustible fuels and >1 hour combustible fuels, respectively), bryophytes (mosses, lichens, liverworts), rock, and water were measured independently as percent cover.

The following measures will be derived from the cover data collected from each quadrat:

- Relative frequency of occurrence for each plant species (percent of the total number of sample quadrats in which each species occurs)
- Richness measured by the number of plant species recored in the study transects and by surveying the transect vicinity in a separate floristic inventory
- Absolute cover (AC) and relative cover (RC)
- Importance Value (IV), the summation of relative cover and relative frequency of occurrence for a given species
IV, percent cover, and frequency of occurrence data will be calculated for each plant species for each transect, community type, and overall site performance level
- Erosion control effectiveness (average +/- standard deviation for percent bare soil and percent total plant and substrate cover per quadrat)

3.2 Floristic Inventory

Plant species richness was sampled in the vicinity of each study transect and surrounding area within the represented plant community type. All native and non-native (adventive) species were documented while systematically walking through the search area to optimize encountering new species. These plant lists typically locate in excess of 90% of the species within the search area. The data are used along with data from the quadrat sampling effort to compile a total species list for the site, and to develop species lists for each transect.

3.3 Nested Belt Transects—Woody Canopy Intercept, Stem Density & Basal Area

Woody vegetation equal to or greater than 1.0 meter in height was sampled along the identical 50-meter and 100-meter linear study transects laid out for sampling the herbaceous layer. Canopy intercept was measured by the vertical projection of photosynthetic leaf area over the lineal distance of transect tape. Two parallel 1.0 meter wide belts were nested on each side of each transect to measure shrub stem densities (counts of stems \leq 2 inches dbh within the meter-wide belt on the right side of the transect) and tree diameters (stems $>$ 2 inches dbh within both meter-wide belts on either side of the transect).

The following measures were derived from the data collected from each belt transect:

- Percent canopy intercept for each species
- Number of stems per hectare for each woody plant species
- Basal area per hectare for trees $>$ 2 inches dbh
- Survivorship (measured as alive or dead canopy intercept)

3.4 Comparison of Permanent Transects with Annually Randomized Transects In Representative Community Types

Three randomized transects were established along with the permanent transects. In 2012, three random transects were established (R-1, R-2, and R-3). These transects were extensions of the first three permanent transects sampled on site, and were included in the same dominant forested wetland plant communities as the permanent transects. In 2013, randomized transects were relocated using a random numbers table to generate three separate numbers. Each number was used to equate with the number of degrees that one of the original random transects would be pivoted away from its original trajectory from its 0-meter point. Random transects were sampled using the same methods as the permanent transects. Data were compared statistically with the analysis from the permanent transects. The statistical comparison evaluates whether the paired samples are from significantly similar populations, and if so, confirm the assumption of random sampling, which strengthens statistical robustness.

3.5 Photo Documentation

Conditions in each transect were photo documented from the 0m and 50m end points of the 50-meter long transects, and from the 0m, 50m, and 100m locations of the 100-meter long transects. Photos taken from the last position of each transect were directed back over the transect. Photos were archived with labels identifying the transect label and direction of view.

1. Results

All transect and floristic inventory data and photo documentation have been summarized and presented in a series of attachments (Attachments 1 – 8). This information is further summarized and tabulated for documenting and assessing site performance (Tables 2 – 4). Table 1 provides a summary of the transect and sampling information to accompany the transect location maps in Figures 01, 01A, and 01B.

1.1 Data Summary Analysis

All plant species recorded in transects and floristic inventories, including test plot data, were compiled to create a master species list representing the site in 2013 (Attachment 1). This floristic data was analyzed by species to provide taxonomic and functional criteria useful for assessing vegetation performance: scientific and common names, family classification, physiognomy, native versus non-native (adventive) status, wetland classification, rare species, nectar/larval food, and seeded/planted species. This floristic analysis was completed for a composite of the species lists generated from the quadrat data (Attachment 2), and for individual and composite floristic inventories conducted in the vicinity of each transect (Attachments 4 and 5). Raw quadrat data was analyzed to generate frequency, cover, and importance values for each transect in Attachment 3. Woody data is presented in Attachments 6 and 7. Transect photos are presented in Attachment 8.

1.2 Performance

The 2013 second-year data provide a measure of species composition and dominance to compare to site performance criteria, which apply to year 5 of the restoration.

Species Composition

A minimum number of native perennial species proposed for establishment must be present within each plant community to meet performance standards are as follows:

- Pine barrens vernal pond minimum of 12 native perennial species: transect DS3 bisects the created pine barrens vernal pond. In 2013, a total of 86 species representing 26 vascular plant families were recorded during the floristic inventory in this location, 73 (84.9%) species of which are native pine barrens species, 60 (69.8%) are perennial forb, grasses, and sedges, 62 (72.1%) are hydrophytic species, and 36 (41.9%) were introduced as seed and plants. This is compared to 2012, when a total of 56 species representing 24 vascular plant families were recorded during the floristic inventory in this location, 52 (92.9%) species of which were native pine barrens species, 34 (60.7%) were perennial forb, grasses, and sedges, 45 (80.4%) were hydrophytic species, and 31 (55.4%) were introduced as seed and plants.
- Sedge meadow/wet prairie minimum of 20 native perennial species: segments of transects DS1 and DS2 bisect the created sedge meadow. In DS2, which bisects the greater extent of sedge meadow, a total of 107 species representing 31 vascular plant families were recorded during the 2013 floristic inventory in this location, 82 (76.6%) species of which are native pine barrens species, 71 (66.3%) are perennial forbs, grasses, and sedges, 58 (54.2%) are hydrophytic species, and 38 (35.5%) were introduced as seed and plants. This is compared to 2012, when a total of 88 species representing 29 vascular plant families were recorded during the floristic inventory in this location, 66 (75.0%) species of which were native pine

barrens species, 54 (61.4%) were perennial forbs, grasses, and sedges, 51 (58.0%) were hydrophytic species, and 38 (43.2%) were introduced as seed and plants.

- Dry prairie (buffer) minimum of 20 native perennial species: transects DS1, DS2, and DS3 all have minimal segments that bisect the Dry Prairie/Sand Flat and Pitch Pine-Scrub Oak Barrens upland communities. In DS1, which intercepts a significant segment of created upland barrens, a total of 99 species representing 31 vascular plant families were recorded during the floristic inventory in this location, 83 (83.8%) species of which are native pine barrens species, 68 (68.6%) are perennial forbs, grasses, and sedges, 37 (37.4%) are non-hydrophytic species, and 40 (40.4%) were introduced as seed and plants. This is compared to 2012, when a total of 115 species representing 35 vascular plant families were recorded during the floristic inventory in this location, 81 (70.4%) species of which were native pine barrens species, 64 (55.7%) were perennial forbs, grasses, and sedges, 54 (47.0%) were non-hydrophytic species, and 45 (39.1%) were introduced as seed and plants.
- Forested wetland minimum of 12 native perennial species: transects P2-1 through P2-9, E4 and E6, and three random transects (R-4, R-5, and R-6) intercept created forested wetland and forest riparian wetland. In 2013, an average of 67 total species representing 28 vascular families were recorded during the floristic inventory in these locations, 55 (82.1%) of which are native pine barrens species, 42 (62.7%) of which are perennial forbs, grasses, and sedges, 42 (62.7%) are hydrophytic species, and 26 (38.8%) were introduced as seed and plants. This is compared to 2012, when an average of 87 total species representing 37 vascular families were recorded, 63 (72.4%) of which are native pine barrens species, 46 (52.9%) of which were perennial forbs, grasses, and sedges, 53 (60.9%) were hydrophytic species, and 32 (36.8%) were introduced as seed and plants.
- At least 50% of the required minimum number of species must occur at a 10% frequency or greater by year 5: in the second year of establishment, as with the first year, none of the communities have achieved this minimum.

Species Dominance

Dominance shall be determined by calculating importance values (IV), with at least two parameters, frequency and cover, used to calculate species importance. Cattails (*Typha* spp), reed canary grass (*Phalaris arundinacea*), and non-native species shall cumulatively comprise not more than 20% of the total dominance measure for each community for which credit is granted. The native perennial species within each wetland plant community shall represent at least 70% of the total dominance measure. At the close of the year two growing season, of the 18 transects sampled in the Phase II area, including selected baseline transects, 11 met the not more than 20% adventive criterion, and 5 met the 70% or more dominance by perennial native species.

2. Discussion

The second year monitoring results of the Phase II wetland restoration demonstrate that the performance standard for species composition according to the permit has been met, and in fact continues to be exceeded, and overall site stability has been on a positive trajectory. A general decrease in species diversity over the site is the result of increases in cover by some species, particularly by native species.

Based on a comparison of the summarized data documented during 2012 and 2013 in all of the PII transects (see Table 2 in each document, which lists and classifies the three most dominant species

and summarizes key cover categories of plant, bare soil, and fine litter), the 2013 growing season has demonstrated a positive trend in all categories in achieving target performances. Of the 51 dominant species compared, there has been a 29% increase in the number of native species (from 49% to 78%) and a 20% increase in the number of hydrophytic species (from 45% to 65%). In the cover categories, there has been an increase in overall vegetative cover of 21% (from 70% to 91%), a decrease in bare soil of 7.5% (from 26% to 18.5%), and an increase in cover by fine litter of 30% (from 16.5% to 46%).

Of the 438 total species recorded onsite, 315 (71.9%) are native species, 111 (25.3%) of which were seeded and planted, and 214 (48.9%) of which are hydrophytic species (see Attachment 1 Master Species List, Summary Floristic Analysis at the bottom of the list). This is compared to the 298 total species recorded onsite in 2012, 224 (75.2%) of which were native species, 110 (28.7%) of which were seeded and planted, and 178 (46.5%) of which were hydrophytic species. Within the study transects and associated species search results (see Table 4 Floristic Monitoring Data Summary) the results were variable, due to increases in cover and competition by some species, many natives, responding to increased moisture in 2013. The lowest number of species recorded was in one of the early baseline transects E-3 (not sampled in 2012) with 42 total species, 37 (88.1%) of which are native, and 20 (47.6%) of which are hydrophytic species; and the highest was in DS-2, with 107 species recorded, 82 (76.6%) of which are native species and 58 (54.2%) of which are hydrophytic species. This is compared to 2012, where the lowest number of species was recorded in DS-3, with 56 total species, 52 (92.9%) of which were native, and 45 (80.4%) of which were hydrophytic species; and the highest in DS-1 with 115, 81 (70.4%) of which were native, and 56 (48.7%) of which were hydrophytic species.

Species dominance in the second year, based on the three species with the highest importance values in each transect indicate that a shift has occurred from the cover crop grasses and annual forbs that dominated in 2012 and performed the important role of stabilizing the site, to a dominance by perennial grasses, sedges, and forbs. As predicted in the 2012 report, the high numbers of native perennial forbs and graminoid species documented in the transects at that time would ensure a dominance by natives as these longer lived species establish roots and expand their cover. This process is underway in the greater part of the site.

The results of hydrological monitoring for 2013 as reported in Attachment I Soil & Hydrological Monitoring provide evidence that the majority of the wetland areas continue to demonstrate the necessary hydrology to support the establishing wetland vegetation. Most sampled transects and species search results support these findings, showing greater than 50% hydrophytic species present based on the total number of species recorded. Some transitional areas within the forested wetland community that did not receive a top dressing of salvageable hydric organic soils from the landfill expansion construction activity continue to establish hydrophytic vegetation more slowly, following a slow start during the hot and dry 2012 growing season. A wetland evaluation will be conducted in year 3 according to the permit, which will assess the presence of other primary and secondary indicators to evaluate the overall project effectiveness in restoring wetland habitat.

Table 1. Phase II & III Vegetation Monitoring Summary

Transect ID	Year Established	Sampling Dates	Transect Length Meters	Number of Quadrats	Photo Locations	Restored Community Intercepted	Comments
DS1	2006	9/26/2006 7/26-27/2010 8/20-22/2012 8/3-4/2013	100 100 100 100	10 10 10 10	0m_NE 50m_NE 100m_SW	Sedge Meadow Dry Prairie/Sand Flat Forested Wetland Enhancement (Red Maple Hardwood Swamp) Forested Wetland (RMHS)	
DS2	2006	9/26/2006 7/26-27/2010 8/20-22/2012 8/3-4/2013	100 100 100	10 10 10	0m_NE 50m_NE 100m_SW	Sedge Meadow Dry Prairie/Sand Flat Pitch Pine-Scrub Oak Barrens Forested Wetland Enhancement (RMHS)	
DS3	2010	7/26-27/2010 8/20-22/2012 8/3-4/2013	100 100	10 10	0m_ESE 70m_ESE 100m_WNW	Pine Barrens Vernal Pond Dry Prairie/Sand Flat	
E1	2006	9/26/2006 7/26-27/2010	270 270	28 28	0m_E/SE 50m_E/SE 100m_E/SE 150m_E/SE 200m_E/SE 250m_E/SE 270m_W/NW	Pine Oak Forest/Forested Wetland Complex	No restoration enhancement activity in 2012 in this location prior to monitoring, so no data or photos collected.
E2	2006	9/26/2006 7/26-27/2010	200 200	20 20	0m_NE 100m_NE 150m_NE 300m_SW	Pine Oak Forest/Forested Wetland Complex	In 2010, started transect on mowed new landfill slope for 60 m (7 quadrats), then entered forested cover for remainder of transect (13 quadrats). No restoration enhancement activity in 2012 in PIII area prior to monitoring, so no data or photos collected.
E3 Extension	2006	9/26/2006 7/26-27/2010	200 100	20 10	0m_E/NE 50m_E/NE 100m_W/SW	Pine Oak Forest/Forested Wetland Complex	A 100m segment of original transect now intercepts active landfill expansion. The remaining 100m extension was sampled in 2010. No significant restoration enhancement activity in 2012 or 2013 in this location prior to monitoring, so no data or photos collected in these years.

Transect ID	Year Established	Sampling Dates	Transect Length Meters	Number of Quadrats	Photo Locations	Restored Community Intercepted	Comments
E4 Extension	2006	9/26/2006 7/26-27/2010 8/20-22/2012 8/3-4/2013	150 100 100	22 10 10	0m_NE 50m_NE 100m_SW	Biofilter Wetland Forested Wetland (RMHS) Forested Riparian Wetland (RMHS) Pine Oak Forest/Forested Wetland Complex	A 50m segment of original transect now intercepts active landfill expansion. The remaining 100m extension was sampled in 2010 and 2012.
E6 Extension	2006	9/26/2006 7/26-27/2010 8/20-22/2012 8/3-4/2013	100 70 100	11 8 10	0m_NE 50m_NE 100m_SW	Biofilter Wetland Forested Wetland (RMHS) Forested Riparian Wetland (RMHS) Pine Oak Forest/Forested Wetland Complex	
P2-1	2012	8/20-22/2012 8/3-4/2013	50	10	0m_NE 50m_SW	Forested Wetland (RMHS)	
P2-2	2012	8/20-22/2012 8/3-4/2013	50	10	0m_SW 50m_NE	Forested Wetland (RMHS)	
P2-3	2012	8/20-22/2012 8/3-4/2013	50	10	0m_SE 50m_NW	Forested Riparian Wetland (RMHS)	
P2-4	2012	8/20-22/2012 8/3-4/2013	50	10	0m_SE 50m_NW	Forested Wetland (RMHS)	
P2-5	2012	8/20-22/2012 8/3-4/2013	50	10	0m_SE 50m_NW	Forested Wetland (RMHS)	
P2-6	2012	8/20-22/2012 8/3-4/2013	50	10	0m_SE 50m_NW	Forested Riparian Wetland (RMHS)	
P2-7	2012	8/20-22/2012 8/3-4/2013	50	10	0m_NW 50m_no photo	Forested Riparian Wetland (RMHS)	
P2-8	2012	8/20-22/2012 8/3-4/2013	50	10	0m_SE 50m_NW	Forested Riparian Wetland (RMHS)	
P2-9	2012	8/20-22/2012 8/3-4/2013	50	10	0m_SE 50m_NW	Forested Riparian Wetland (RMHS)	
R-1 R-4	2012	8/20-22/2012 8/3-4/2013	50	10	0m_SE 50m_NW	Forested Wetland (RMHS)	Random Transect from 50m point of P2-4 following same trajectory
R-2 R-5	2012	8/20-22/2012 8/3-4/2013	50	10	0m_NW 50m_SE	Forested Wetland (RMHS)	Random Transect from 50m point of P2-7 following same trajectory
R-3 R-6	2012	8/20-22/2012 8/3-4/2013	50	10	0m_SW 50m_NE	Forested Wetland (RMHS)	Random Transect from 50m point of P2-2 following same trajectory
P3-1	2012	8/20-22/2012 8/3-4/2013	50	10	0m_SE 50m_NW	Intercepts PIII Enhancement Zones U-9 (target PPSOB) and U-11 (target DP/SF)	
18 transects	2012 Totals		1150 m	180 quadrats	40 photos		

Table 2. Phase II & III Vegetation and Cover Monitoring Data Summary

PII Transects	Communities Intercepted ¹	% Total Species Hydrophytic (FAC, FACW, OBL)	Species (w/ highest importance values)	Physiognomy	Native/ Adventive (Nt/Ad)	Hydrophytic (FAC, FACW, OBL)	Relative Frequency (RF) (%)	Relative Cover (RC) (%)	Importance Value (IV) (%)	Average Cover (AC) (%)	
DS-1	3, 4, 5, 8	62.6	<i>Digitaria sanguinalis</i>	A-Grass	Ad	FACU	2.8	10.7	13.5		
			<i>Carex vulpinoidea</i>	P-Sedge	Nt	OBL	2.1	8.2	10.3		
			<i>Solidago altissima</i>	P-Forb	Nt	FACU	2.1	8.1	10.2		
			Plant Cover								68.1
			Bare Soil								38.5
			Fine Litter								31.9
Water									0		
DS-2	3, 5, 7, 8	54.2	<i>Erigeron canadensis</i>	A-Forb	Nt	FAC	2.7	7.0	9.7		
			<i>Solidago graminifolia</i>	P-Forb	Nt	FACW	2.3	6.8	9.1		
			<i>Rudbeckia hirta</i>	B-Forb	Nt	FACU	2.3	3.1	7.3		
			Plant Cover								94.7
			Bare Soil								29.5
			Fine Litter								29.5
Water											
DS-3	2	72.1	<i>Scirpus validus creber</i>	P-Sedge	Nt	OBL	1.4	22.2	23.6		
			<i>Solidago graminifolia</i>	P-Forb	Nt	FACW	2.8	9.8	12.6		
			<i>Equisetum arvense</i>	Cryptogam	Nt	FAC	2.8	7.4	10.2		
			Plant Cover								33.8
			Bare Soil								12.5
			Fine Litter								0
Water									5.0		
E3		47.6	<i>Celastrus orbiculatus</i>	Vine	Ad	UPL	13.6	19.1	32.8		
			<i>Prunus serotina</i>	Tree	Nt	FACU	7.6	11.8	19.4		
			<i>Parthenocissus quinquefolia</i>	Vine	Nt	FACU	6.1	12.0	18.1		
			Plant Cover								81.5
			Bare Soil								23.2
			Fine Litter								65.0
Water									0		
E4	1, 4, 5, 6	60.5	<i>Panicum acuminatum</i>	P-Grass	Nt	FAC	4.1	20.5	24.6		
			<i>Rubus flagellaris</i>	Shrub	Nt	FACU	4.1	11.6	15.7		
			<i>Acer rubrum</i>	Tree	Nt	FAC	3.3	5.5	8.7		
			Plant Cover								88.0
			Bare Soil								11.8
			Fine Litter								74.2
Water									10.0		
E6	1,4,5,6	71.6	<i>Trifolium repens</i>	P-Forb	Ad	FACU	4.3	7.8	14.0		
			<i>Solidago gigantea</i>	P-Forb	Nt	FACW	3.4	7.8	13.2		
			<i>Verbena hastata</i>	P-Forb	Nt	FACW	4.8	5.2	10.8		
			Plant Cover								80.1
			Bare Soil								21.5
			Fine Litter								35.0
Water									22.0		

PII Transects	Communities Intercepted ¹	% Total Species Hydrophytic (FAC, FACW, OBL)	Species (w/ highest importance values)	Physiognomy	Native/ Adventive (Nt/Ad)	Hydrophytic (FAC, FACW, OBL)	Relative Frequency (RF) (%)	Relative Cover (RC) (%)	Importance Value (IV) (%)	Average Cover (AC) (%)
P2-1	4	65.1	Juncus effusus	P-Grass	Nt	OBL	6.5	21.3	27.8	
			Glyceria grandis	P-Grass	Nt	OBL	3.9	22.6	26.6	
			Scirpus atrovirens	P-Sedge	Nt	OBL	5.2	5.3	10.5	
			Plant Cover							108.2
			Bare Soil							12.0
			Fine Litter							26.9
			Water						.5	
P2-2	4	66.7	Scirpus pendulous	P-Sedge	Nt	OBL	2.1	16.3	18.3	
			Equisetum arvense	Cryptogam	Nt	FAC	4.1	9.1	13.3	
			Solidago altissima	P-Forb	Nt	FACU	1.4	9.1	10.5	
			Plant Cover							79.9
			Bare Soil							22.9
			Fine Litter							44.6
			Water						0	
P2-3	6	60.8	Trifolium hybridum	P-Forb	Ad	FACU	2.8	13.8	16.6	
			Setaria sp.	A-Grass	Ad		3.3	12.5	15.8	
			Equisetum arvense	Cryptogam	Nt	FAC	2.8	11.0	13.7	
			Plant Cover							80.2
			Bare Soil							17.4
			Fine Litter							21.5
			Water						0	
P2-4	4	53.1	Digitaria sanguinalis	A-Grass	Ad	FACU	3.6	21.9	25.5	
			Equisetum arvense	Cryptogam	Nt	FAC	4.9	7.2	12.0	
			Ambrosia artemisiifolia	A-Forb	Nt	FACU	5.5	4.8	10.3	
			Plant Cover							118.9
			Bare Soil							10.2
			Fine Litter							83.3
			Water						1.5	
P2-6	6	70.1	Verbena hastata	P-Forb	Nt	FACW	5.7	10.2	15.8	
			Trifolium repens	P-Forb	Ad	FACU	2.3	11.1	13.4	
			Bidens frondosa	A-Forb	Nt	FACW	5.1	8.1	13.2	
			Plant Cover							108.2
			Bare Soil							4.4
			Fine Litter							88.7
			Water						0	
P2-7	6	67.1	Verbena hastata	P-Forb	Nt	FACW	8.6	16.7	25.3	
			Eupatorium perfoliatum	P-Forb	Nt	FACW	7.7	16.7	24.4	
			Solidago gigantea	P-Forb	Nt	FACW	6.8	7.1	140	
			Plant Cover							122.6
			Bare Soil							4.5
			Fine Litter							95.5
			Water						0	

PII Transects	Communities Intercepted ¹	% Total Species Hydrophytic (FAC, FACW, OBL)	Species (w/ highest importance values)	Physiognomy	Native/ Adventive (Nt/Ad)	Hydrophytic (FAC, FACW, OBL)	Relative Frequency (RF) (%)	Relative Cover (RC) (%)	Importance Value (IV) (%)	Average Cover (AC) (%)
P2-8	6	81.7	Trifolium repens	P-Forb	Ad	FACU	1.6	13.9	15.4	
			Eupatorium perfoliatum	P-Forb	Nt	FACW	4.7	7.7	12.4	
			Lycopus americanus	P-Forb	Nt	OBL	5.2	7.1	12.4	
			Plant Cover							95.3
			Bare Soil							30.5
			Fine Litter							55.9
P2-9	6	50.0	Panicum acuminatum	P-Grass	Nt	FAC	2.8	15.9	18.7	
			Trifolium repens	P-Forb	Ad	FACU	4.0	14.0	18.0	
			Solidago graminifolia nuttallii	P-Forb	Nt	FAC	4.0	7.7	11.7	
			Plant Cover							110.3
			Bare Soil							15.5
			Fine Litter							76.0
R-4	4	55.4	Impatiens capensis	A-Forb	Nt	FACW	4.4	15.5	19.8	
			Verbena hastata	P-Forb	Nt	FACW	4.4	10.0	14.4	
			Digitaria sanguinalis	A-Grass	Ad	FACU	4.4	8.8	13.1	
			Plant Cover							97.0
			Bare Soil							26.7
			Fine Litter							73.0
R-5	4	65.6	Bidens frondosa	A-Forb	Nt	FACW	4.9	15.2	20.1	
			Verbena hastata	P-Forb	Nt	FACW	6.9	12.9	19.7	
			Eupatorium perfoliatum	P-Forb	Nt	FACW	4.9	12.8	17.7	
			Plant Cover							86.2
			Bare Soil							21.5
			Fine Litter							78.5
R-6	4	61.3	Trifolium repens	P-Forb	Ad	FACU	1.9	11.7	13.6	
			Populus deltoides	Tree	Nt	FAC	4.7	8.8	13.4	
			Equisetum arvense	Cryptogam	Nt	FAC	1.9	10.3	12.2	
			Plant Cover							92.3
			Bare Soil							12.8
			Fine Litter							26.0
			Water					0		

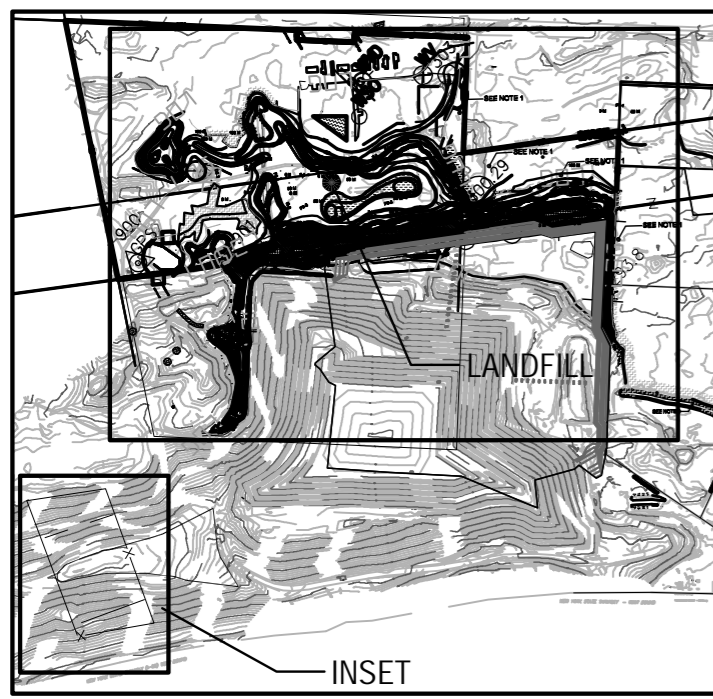
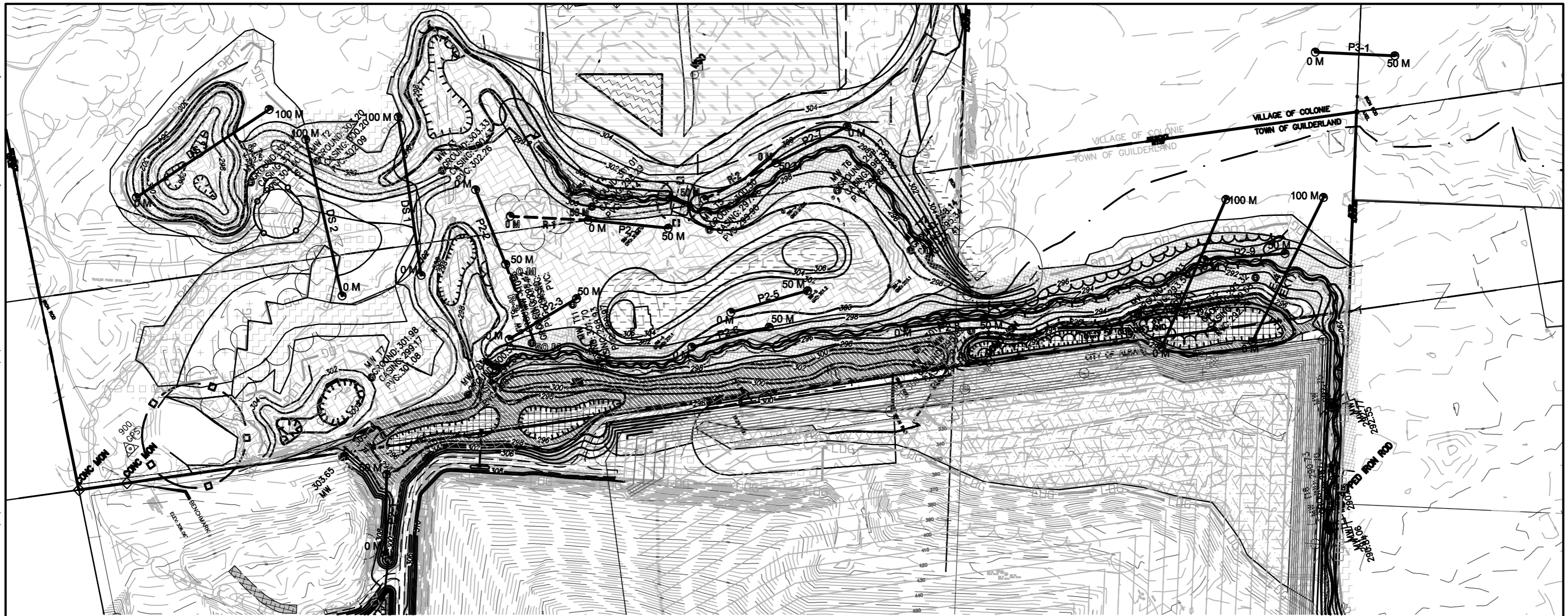
PII Transects	Communities Intercepted ¹	% Total Species Hydrophytic (FAC, FACW, OBL)	Species (w/ highest importance values)	Physiognomy	Native/ Adventive (Nt/Ad)	Hydrophytic (FAC, FACW, OBL)	Relative Frequency (RF) (%)	Relative Cover (RC) (%)	Importance Value (IV) (%)	Average Cover (AC) (%)
P3-1	7, 8	42.4	Lolium multiflorum	A-Grass	Ad	FACU	5.1	25.6	30.6	
			Carex pensylvanica	P-Sedge	Nt	UPL	2.5	23.3	25.8	
			Andropogon scoparius	P-Grass	Nt	FACU	2.5	11.1	13.6	
			Plant Cover							73.1
			Bare Soil							17.3
			Fine Litter							50.8
			Water							0

Table 3. Phase II & III Restored & Enhanced Communities Intercepted by Monitoring Study Transects

Code ¹	Communities ¹
	Wetland Communities
1	Biofilter Wetland
2	Pine Barrens Vernal Pond
3	Sedge Meadow
4	Forested Wetland (Red Maple Hardwood Swamp)
5	Forested Wetland Enhancement (RMHS)
6	Forested Riparian Wetland (RMHS)
	Upland Forested/Grassland Communities
7	Pitch Pine-Scrub Oak Barrens
8	Dry Prairie/Sand Flat
9	Dune/Dune Barrens

Table 4. Phase II & III Floristic Monitoring Data Summary

Phase II/III	Total Species	Native Species	Adventive Species	Hydrophytic Species	Vascular Plant Families	Seeded/Planted Species
	279	213 (76.3%)	61 (21.9%)	143 (51.3%)	67	82 (29.4%)
P II Transects	Total Species	Native Species	Adventive Species	Hydrophytic Species	Vascular Plant Families	Seeded/Planted Species
DS1	99	83 (83.8%)	15 (15.2%)	62 (62.6%)	31	40 (40.4%)
DS2	107	82 (76.6%)	23 (21.5%)	58 (54.2%)	31	38 (35.5%)
DS3	86	73 (84.9%)	12 (14.0 %)	62 (72.1%)	26	36 (41.9%)
E3	42	37 (88.1%)	5 (11.9%)	20 (47.6%)	24	12 (28.6%)
E4	86	68 (79.1%)	17 (19.8%)	52 (60.5%)	25	33 (38.4%)
E6	74	61 (82.4%)	13 (17.6%)	53 (71.6%)	31	26 (35.1%)
P2-1	63	52 (82.5)	11 (17.5%)	41 (65.1%)	24	21 (33.3%)
P2-2	81	68 (84.0%)	12 (14.8%)	54 (66.7%)	30	34 (42.0%)
P2-3	79	63 (79.7%)	16 (20.3%)	48 (60.8%)	32	34 (43.0%)
P2-4	64	46 (71.9%)	18 (28.1%)	34 (53.1%)	31	18 (28.1%)
P2-5	51	40 (78.4%)	11 (21.6%)	28 (54.9%)	28	20 (39.2%)
P2-6	77	67 (87.0%)	10 (13.0%)	54 (70.1%)	32	32 (41.6%)
P2-7	73	63 (86.3%)	10 (13.7%)	49 (67.1%)	31	34 (46.6%)
P2-8	60	57 (95.0%)	3 (5.0%)	49 (81.7%)	25	27 (45.0%)
P2-9	60	54 (90.0%)	5 (8.3%)	30 (50.0%)	25	25 (41.7%)
R-4	74	54 (73.0%)	20 (27.0%)	41 (55.4%)	36	24 (32.4%)
R-5	64	53 (82.8%)	11 (17.2%)	42 (65.5%)	23	25 (39.1%)
R-6	62	47 (75.8%)	15 (24.2%)	38 (61.3%)	27	24 (38.7%)
P III Transect						
P3-1	59	48 (81.4%)	10 (16.9%)	20 (47.6%)	31	18 (30.5%)



LEGEND

- Existing 2' Contours
- Proposed 2' Contours
- Restored Stream
- Existing Stream

Upland Grassland Communities

- Dry Prairie/Sand Flat
3.66 AC
- Dune
1.30 AC
- Upland Forest Communities**
- Pitch Pine-Scrub Oak Barrens
4.85 AC
- Nursery Area
3.77

Wetland Communities

- Biofilter Wetland
1.41 AC
- Pine Barrens Vernal Pond
1.12 AC
- Sedge Meadow
0.63 AC
- Forested Wetland (Red Maple Hardwood Swamp)
13.71 AC
- Forested Wetland Enhancement (Red Maple Hardwood Swamp)
3.05 AC
- Forested Riparian Wetland (Red Maple Hardwood Swamp)
6.50 AC

- 0 M - 50 M Random Transects
- 0 M - 50 M Vegetation Transects



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PII/PIII VEGETATION MONITORING MAP

RAPP ROAD LANDFILL
RESTORATION PLAN

PROJECT NO.
21661

DATE: 11/02/12

FIGURE 01

2013 Albany Compliance Report

S:090636:111113488



LEGEND		
OM ——— 50M	PERMANENT TRANSECTS	
OM - - - - 50M	2013 RANDOM TRANSECTS	
- - - - -	2012 RANDOM TRANSECTS	

S:090636:111113489

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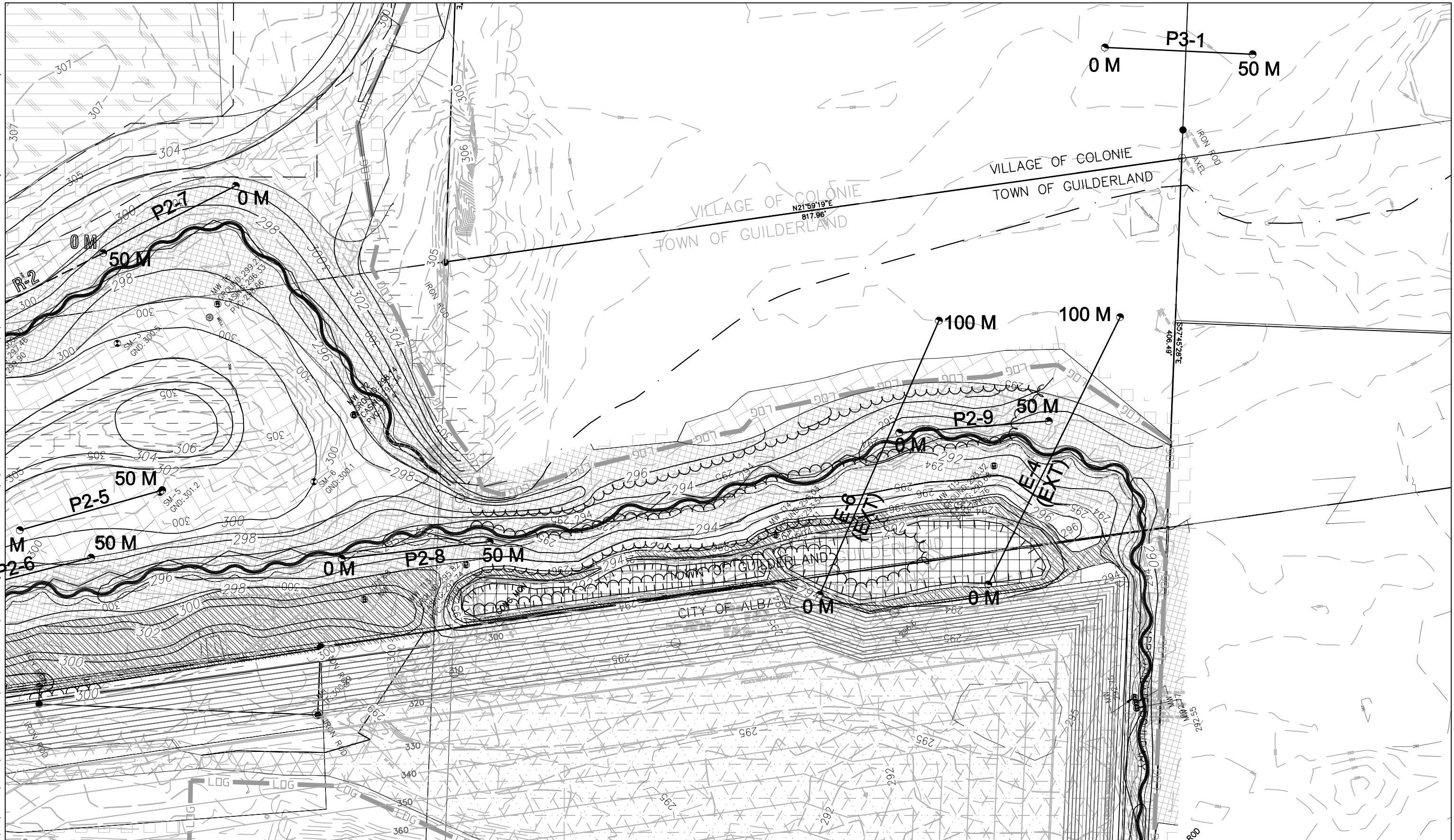
PII/PIII VEGETATION MONITORING MAP
 ENLARGEMENT A
 RAPP ROAD LANDFILL
 RESTORATION PLAN

PROJECT NO.
21661

DATE: 08/26/13

FIGURE 01A

2013 Albany Compliance Report



S:090636:111113490



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P2/P3 VEGETATION MONITORING MAP
ENLARGEMENT B
RAPP ROAD LANDFILL
RESTORATION PLAN

PROJECT NO.
21661

DATE: 11/02/12

FIGURE 01B

2013 Albany Compliance Report

Attachment 1. Phase II & III Master Species List & Floristic Analysis

Rapp Road Landfill - Total Site Species List (compiled from transect data, species searches, & test plot data)

Date: August 3-4, 2013

Scientific Name	Common Name	Family Classification	Physiognomy	Native/Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
<i>Acalypha rhomboidea</i>	Three-seeded mercury	Euphorbiaceae	A-Forb	Nt	FACU			
<i>Acer negundo</i>	Box-elder	Aceraceae	Tree	Nt	FAC			
<i>Acer rubrum</i>	Red maple	Aceraceae	Tree	Nt	FAC			
<i>Achillea millefolium</i>	Common yarrow	Asteraceae	P-Forb	Ad	FACU			
<i>Agalinis tenuifolia</i>	Gerardia	Scrophulariaceae	P-Forb	Nt	FACW			X
<i>Agropyron repens</i>	Quack grass	Poaceae	P-Grass	Ad				
<i>Agrostis alba</i>	Redtop	Poaceae	P-Grass	Ad	FACW			
<i>Agrostis perennans</i>	Autumn bent	Poaceae	P-Grass	Nt	FACU			
<i>Agrostis stolonifera</i>	Creeping bent	Poaceae	P-Grass	Nt	FACW			
<i>Alisma subcordatum</i>	Water-plantain	Alismataceae	P-Forb	Nt	OBL			X
<i>Alliania petiolata</i>	Garlic mustard	Brassicaceae	B-Forb	Ad	FAC			
<i>Amaranthus retroflexus</i>	Pigweed	Amaranthaceae	A-Forb	Ad	FACU			
<i>Amaranthus sp.</i>	Amaranth	Amaranthaceae	A-Forb	Ad				
<i>Ambrosia artemisiifolia</i>	Ragweed	Asteraceae	A-Forb	Nt	FACU			
<i>Ambrosia psilostachya</i>	Western ragweed	Asteraceae	P-Forb	Ad	FACU			
<i>Amelanchier sp</i>	Serviceberry	Rosaceae	Tree	Nt				
<i>Andropogon gerardii</i>	Big bluestem	Poaceae	P-Grass	Nt	FACU			X
<i>Andropogon scoparius</i>	Little bluestem	Poaceae	P-Grass	Nt	FACU			X
<i>Anthoxanthum odoratum</i>	Large sweet vernal grass	Poaceae	P-Grass	Ad	FACU			
<i>Apios americana</i>	Groundnut	Fabaceae	P-Forb	Nt	FACW			X
<i>Apocynum cannabinum</i>	Indian hemp	Apocynaceae	P-Forb	Nt	FAC			X
<i>Apocynum sibiricum</i>	Prairie Indian hemp	Apocynaceae	P-Forb	Nt	FAC			
<i>Aquilegia canadensis</i>	Wild columbine	Ranunculaceae	P-Forb	Nt	FAC			
<i>Arabis glabra</i>	Tower-mustard	Brassicaceae	P-Forb	Nt	UPL			X
<i>Artemisia biennis</i>	Sage-weed	Asteraceae	B-Forb	Ad	FACW			
<i>Artemisia vulgaris</i>	Mugwort	Asteraceae	P-Forb	Ad	UPL			
<i>Asclepias incarnata</i>	Swamp milkweed	Asclepiadaceae	P-Forb	Nt	OBL			X
<i>Asclepias syriaca</i>	Common milkweed	Asclepiadaceae	P-Forb	Nt	UPL		X	X
<i>Asclepias tuberosa</i>	Butterfly-weed	Asclepiadaceae	P-Forb	Nt	UPL		X	X
<i>Aster azureus</i>	Sky blue aster	Asteraceae	P-Forb	Nt	UPL	G5 S1 E		X
<i>Aster cordifolius</i>	Heart-leaved ster	Asteraceae	P-Forb	Nt	UPL			
<i>Aster divaricatus</i>	White wood aster	Asteraceae	P-Forb	Nt	UPL			
<i>Aster ericoides</i>	White heath aster	Asteraceae	P-Forb	Nt	FACU			X
<i>Aster laevis</i>	Smooth blue aster	Asteraceae	P-Forb	Nt	FACU			X
<i>Aster lanceolatus</i>	Old-field aster	Asteraceae	P-Forb	Nt	FACW			
<i>Aster lateriflorus</i>	Calico aster	Asteraceae	P-Forb	Nt	FAC			X
<i>Aster novae-angliae</i>	New England aster	Asteraceae	P-Forb	Nt	FACW			X
<i>Aster pilosus</i>	Heath aster	Asteraceae	P-Forb	Nt	FACU			X
<i>Aster puniceus</i>	Purple-stemmed aster	Asteraceae	P-Forb	Nt	OBL			X
<i>Aster sp.</i>	Aster	Asteraceae	P-Forb	Nt				
<i>Aster umbellatus</i>	Flat-top white aster	Asteraceae	P-Forb	Nt	FACW			X
<i>Athyrium filix-femina</i>	Northern lady fern	Dryopteridaceae	Cryptogam	Nt	FAC			
<i>Atriplex sp</i>	Orache	Chenopodiaceae	Forb	Ad				
<i>Avena sativa</i>	Oats	Poaceae	A-Grass	Ad	UPL			

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<i>Barbarea vulgaris</i>	Cress	Brassicaceae	B-Forb	Ad	FAC			
<i>Berteroa incana</i>	Hoary Alyssum	Brassicaceae	A-Forb	Ad	UPL			
<i>Betula alleghaniensis</i>	Yellow Birch	Betulaceae	Tree	Nt	FAC			
<i>Betula papyrifera</i>	Paper Birch	Betulaceae	Tree	Nt	FACU			
<i>Betula populifolia</i>	Gray Birch	Betulaceae	Tree	Nt	FAC			
<i>Bidens cernua</i>	Stick-tights	Asteraceae	A-Forb	Nt	OBL			X
<i>Bidens comosa</i>	Swamp tickseed	Asteraceae	A-Forb	Nt	OBL			
<i>Bidens coronata</i>	Purple-stemmed tickseed	Asteraceae	A-Forb	Nt	OBL			
<i>Bidens frondosa</i>	Beggar-ticks	Asteraceae	A-Forb	Nt	FACW			X
<i>Bidens sp.</i>	Tickseed	Asteraceae	A-Forb	Nt				
<i>Bidens tripartita</i>	Beggar-ticks	Asteraceae	A-Forb	Nt	FACW			X
<i>Boehmeria cylindrica</i>	Fasle nettle	Urticaceae	P-Forb	Nt	OBL			
<i>Brassica kaber</i>	Charlock	Brassicaceae	A-Forb	Ad	UPL			
<i>Bromus ciliatus</i>	Fringed brome	Poaceae	P-Grass	Nt	FACW			
<i>Bromus inermis</i>	Hungarian brome	Poaceae	P-Grass	Ad	UPL			
<i>Bromus japonicus</i>	Japanese chess	Poaceae	P-Grass	Ad	FACU			
<i>Bromus sp.</i>	Chess	Poaceae	P-Grass	Ad				
<i>Bromus tectorum</i>	Downy chess	Poaceae	P-Grass	Ad	UPL			
<i>Calamagrostis canadensis</i>	Blue joint grass	Poaceae	P-Grass	Nt	OBL			
<i>Campanula aparinoides</i>	Marsh bellflower	Companulaceae	P-Forb	Nt	OBL			
<i>Campsis radicans</i>	Trumpet-creeper	Bignoniaceae	Vine	Ad				
<i>Carex annectens</i>	Yellow-fruit sedge	Cyperaceae	P-Sedge	Nt	FACW			X
<i>Carex bebbii</i>	Bebb's sedge	Cyperaceae	P-Sedge	Nt	OBL			
<i>Carex blanda</i>	Common wood sedge	Cyperaceae	P-Sedge	Nt	FAC			
<i>Carex communis</i>	Common beech sedge	Cyperaceae	P-Sedge	Nt	UPL			
<i>Carex comosa</i>	Bearded sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Carex crinita</i>	Fringed sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Carex debilis</i>	White-edge sedge	Cyperaceae	P-Sedge	Nt	FACW			
<i>Carex granularis</i>	Pale sedge	Cyperaceae	P-Sedge	Nt	FACW			
<i>Carex hystericina</i>	Porcupine sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Carex lupulina</i>	Hop sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Carex pensylvanica</i>	Common oak sedge	Cyperaceae	P-Sedge	Nt	UPL			X
<i>Carex rosea</i>	Curly-styled wood sedge	Cyperaceae	P-Sedge	Nt	UPL			
<i>Carex scoparia</i>	Pointed broom sedge	Cyperaceae	P-Sedge	Nt	FACW			X
<i>Carex sp.</i>	Sedge	Cyperaceae	P-Sedge	Nt				
<i>Carex stricta</i>	Tussock sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Carex vulpinoidea</i>	Common fox sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Carpinus caroliniana</i>	Hop hornbeam	Betulaceae	Tree	Nt	FAC			
<i>Cassia fasciculata</i>	Partridge pea	Fabaceae	A-Forb	Nt	FACU	Review List: G5 S3S4		
<i>Celastrus orbiculatus</i>	Oriental bittersweet	Celastraceae	Vine	Ad	UPL			
<i>Celastrus scandens</i>	Climbing bittersweet	Celastraceae	Vine	Ad	UPL			
<i>Cenchrus longispinus</i>	Field sandbur	Poaceae	A-Grass	Nt	UPL			
<i>Centaurea maculosa</i>	Spotted knapweed	Asteraceae	P-Forb	Ad	UPL			
<i>Ceanothus americana</i>	New Jersey tea	Rhamnaceae	P-Shrub	Nt	UPL			
<i>Cerastium arvense</i>	Field mouse-ear chickweed	Caryophyllaceae	P-Forb	Nt	FACU			
<i>Cerastium vulgatum</i>	Mouse-ear chickweed	Caryophyllaceae	P-Forb	Ad	FACU			
<i>Ceratophyllum demersum</i>	Coontail	Ceratophyllaceae	P-Forb	Nt	OBL			
<i>Chara vulgaris</i>	Common stonewort	Charophyceae	Alga	Nt	OBL			

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<i>Chelone glabra</i>	Turtle-heads	Scrophulariaceae	P-Forb	Nt	OBL			X
<i>Chenopodium album</i>	Lamb's-quarters	Chenopodiaceae	A-Forb	Ad	FACU			
<i>Chenopodium murale</i>	Nettle-leaved goosefoot	Chenopodiaceae	A-Forb	Ad	UPL			
<i>Chrysanthemum leucanthemum</i>	Ox-eye daisy	Asteraceae	P-Forb	Ad	UPL			
<i>Cichorium intybus</i>	Chicory	Asteraceae	P-Forb	Ad	FACU			
<i>Cinna arundinacea</i>	Stout woodreed	Poaceae	P-Grass	Nt	FACW			
<i>Circaea lutetiana</i>	Enchanter's nightshade	Onagraceae	P-Forb	Nt	FACU			
<i>Cirsium arvense</i>	Canada thistle	Asteraceae	P-Forb	Ad	FACU			
<i>Cirsium vulgare</i>	Bull-thistle	Asteraceae	B-Forb	Ad	FACU			
<i>Clematis virginiana</i>	Virgin's bower	Ranunculaceae	Vine	Nt	FAC			X
<i>Convolvulus arvensis</i>	Field bindweed	Convolvulaceae	P-Forb	Ad	UPL			
<i>Convolvulus sepium</i>	Hedge bindweed	Convolvulaceae	P-Forb	Nt	FAC			
<i>Coryza canadensis</i>	Horseweed	Asteraceae	A-Forb	Nt	FACU			X
<i>Coreopsis lanceolata</i>	Coreopsis	Asteraceae	P-Forb	Ad	FACU			
<i>Coreopsis tinctoria</i>	Golden tickseed	Asteraceae	A-Forb	Ad	FAC			
<i>Cornus amomum</i>	Silky dogwood	Cornaceae	Shrub	Nt	FACW			
<i>Cornus drummondii</i>	Rough-leaved dogwood	Cornaceae	Shrub	Nt	FAC			
<i>Cornus racemosa</i>	Gray dogwood	Cornaceae	Shrub	Nt	FAC			
<i>Cornus sp</i>	Dogwood	Cornaceae	Shrub	Nt				
<i>Cornus stolonifera</i>	Red-osier dogwood	Cornaceae	Shrub	Nt	FACW			
<i>Coronilla varia</i>	Crown vetch	Fabaceae	P-Forb	Ad	UPL			
<i>Corylus americana</i>	American hazelnut	Betulaceae	Shrub	Nt	FACU			
<i>Crataegus sp.</i>	Hawthorn	Rosaceae	Tree	Nt				
<i>Cuscuta gronovii</i>	Common dodder	Cuscutaceae	A-Forb	Nt	OBL			
<i>Cuscuta sp.</i>	Dodder	Cuscutaceae	A-Forb	Nt	OBL			
<i>Cycloloma atriplicifolium</i>	Winged-pigweed	Chenopodiaceae	A-Forb	Ad	FACU			
<i>Cyperus esculentus</i>	Yellow nut-grass	Cyperaceae	P-Sedge	Nt	FACW			
<i>Cyperus houghtonii</i>	Smooth sand sedge	Cyperaceae	P-Sedge	Nt	UPL	G3G4 S2 R		X
<i>Cyperus schweinitzii</i>	Sand flat sedge	Cyperaceae	P-Sedge	Nt	FACU	G5 S2 R		X
<i>Cyperus sp</i>	Flat sedge	Cyperaceae	P-Sedge	Nt				
<i>Cyperus strigosus</i>	Straw-colored flat sedge	Cyperaceae	P-Sedge	Nt	FACW			
<i>Dactylis glomerata</i>	Orchard grass	Poaceae	P-Grass	Ad	FACU			
<i>Danthonia spicata</i>	Poverty grass	Poaceae	P-Grass	Nt	UPL			X
<i>Daucus carota</i>	Queen-Anne's-lace	Apiaceae	B-Forb	Ad	UPL			
<i>Deschampsia caespitosa</i>	Tufted hair grass	Poaceae	P-Grass	Nt	FACW			
<i>Desmodium canadense</i>	Giant tick clover	Fabaceae	P-Forb	Nt	FAC			X
<i>Desmodium paniculatum</i>	Panicled tick trefoil	Fabaceae	P-Forb	Nt	FACU			
<i>Dianthus armeria</i>	Deptford pink	Caryophyllaceae	A-Forb	Ad	UPL			
<i>Digitaria sanguinalis</i>	Tall crabgrass	Poaceae	A-Grass	Ad	FACU			
<i>Diodia teres</i>	Poorjoe	Rubiaceae	A-Forb	Nt	FACU			X
<i>Echinochloa crusgalli</i>	Japanese millet	Poaceae	A-Grass	Ad	FAC			
<i>Echinochloa walteri</i>	Water millet	Poaceae	A-Grass	Nt	OBL			
<i>Echinocystis lobata</i>	Wild cucumber	Cucurbitaceae	Vine	Nt	FACW			X
<i>Eleocharis acicularis</i>	Hairgrass	Cyperaceae	P-Sedge	Nt	OBL			
<i>Eleocharis obtusa</i>	Blunt spike-rush	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Eleocharis palustris</i>	Creeping spike-rush	Cyperaceae	P-Sedge	Nt	OBL			
<i>Eleocharis smallii</i>	Marsh spike rush	Cyperaceae	P-Sedge	Nt	OBL			
<i>Eleocharis sp</i>	Spike rush	Cyperaceae	P-Sedge	Nt	OBL			

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<i>Elymus virginicus</i>	Virginia wild rye	Poaceae	P-Grass	Nt	FACW			X
<i>Epilobium coloratum</i>	Purple-leaf willowherb	Onagraceae	P-Forb	Nt	OBL			X
<i>Equisetum arvense</i>	Field horsetail	Equisetaceae	Cryptogam	Nt	FAC			
<i>Equisetum hyemale</i>	Scouring rush	Equisetaceae	Cryptogam	Nt	FAC			
<i>Eragrostis capillaris</i>	Lace grass	Poaceae	A-Grass	Nt	UPL			
<i>Eragrostis hypnoides</i>	Lovegrass	Poaceae	A-Grass	Nt	OBL			
<i>Eragrostis mexicana</i>	Mexican love grass	Poaceae	A-Grass	Ad	FAC			
<i>Eragrostis pectinacea</i>	Small love grass	Poaceae	A-Grass	Nt	FAC			
<i>Erechtites hieracifolia</i>	Fireweed	Asteraceae	A-Forb	Nt	FACU			X
<i>Erigeron annuus</i>	Daisy-fleabane	Asteraceae	A-Forb	Nt	FACU			
<i>Erigeron canadensis</i>	Horseweed	Asteraceae	A-Forb	Nt	FAC			
<i>Erigeron philadelphicus</i>	Fleabane	Asteraceae	B-Forb	Nt	FAC			
<i>Erigeron strigosus</i>	Daisy-fleabane	Asteraceae	A-Forb	Nt	FACU			
<i>Eupatorium maculatum</i>	Spotted Joy-pye weed	Asteraceae	P-Forb	Nt	OBL			
<i>Eupatorium perfoliatum</i>	Thoroughwort	Asteraceae	P-Forb	Nt	FACW			X
<i>Eupatorium rugosum</i>	White snakeroot	Asteraceae	P-Forb	Nt	UPL			X
<i>Euphorbia maculata</i>	Spotted spurge	Euphorbiaceae	P-Forb	Nt	FACU			
Fern sp.	Fern		Cryptogam	Nt				
<i>Festuca elatior</i>	Tall fescue	Poaceae	P-Grass	Ad	FACU			
<i>Festuca rubra</i>	Red fescue	Poaceae	P-Grass	Ad	FACU			
<i>Fragaria virginiana</i>	Field strawberry	Rosaceae	P-Forb	Nt	FACU		X	
<i>Fraxinus americana</i>	White ash	Oleaceae	Tree	Nt	FACU			
<i>Fraxinus pennsylvanica</i>	Green ash	Oleaceae	Tree	Nt	FACW			
<i>Galeopsis tetrahit</i>	Hemp-nettle	Lamiaceae	A-Forb	Ad	FACU			
<i>Galium asprellum</i>	Rough bedstraw	Rubiaceae	P-Forb	Nt	OBL			
<i>Galium boreale</i>	Northern bedstraw	Rubiaceae	P-Forb	Nt	FAC			
<i>Galium obtusum</i>	Blunt-leaf bedstraw	Rubiaceae	P-Forb	Nt	FACW			
<i>Galium odoratum</i>	Sweet woodruff	Rubiaceae	P-Forb	Ad	UPL			
<i>Galium sp.</i>	Bedstraw	Rubiaceae	Forb					
<i>Galium triflorum</i>	Sweet-scented bedstraw	Rubiaceae	P-Forb	Nt	FACU			
<i>Gaylussacia baccata</i>	Box huckleberry	Ericaceae	Shrub	Nt	FACU			
<i>Geranium robertianum</i>	Herb Robert	Geraniaceae	A-Forb	Nt	UPL			
<i>Geum aleppicum</i>	Yellow avens	Rosaceae	P-Forb	Nt	FAC			
<i>Geum canadense</i>	White avens	Rosaceae	P-Forb	Nt	FAC			
<i>Glechoma hederacea</i>	Creeping Charlie	Lamiaceae	P-Forb	Ad	FAC			
<i>Glyceria grandis</i>	Reed meadowgrass	Poaceae	P-Grass	Nt	OBL			X
<i>Glyceria striata</i>	Fowl mannagrass	Poaceae	P-Grass	Nt	OBL			X
<i>Gnaphalium obtusifolium</i>	Catfoot	Asteraceae	P-Forb	Nt	FAC			X
Grass sp	Grass	Poaceae	Grass					
<i>Gratiola neglecta</i>	Mud-hyssop	Scrophulariaceae	A-Forb	Nt	OBL			
<i>Hackelia virginiana</i>	Stickseed	Boraginaceae	P-Forb	Nt	FACU			
<i>Hamamelis virginiana</i>	Witch-hazel	Hamamelidaceae	Shrub	Nt	FACU			
<i>Helianthemum canadense</i>	Frostweed	Cistaceae	P-Forb	Nt	UPL			X
<i>Helianthus divaricatus</i>	Woodland sunflower	Asteraceae	P-Forb	Nt	UPL		X	
<i>Helianthus grosseserratus</i>	Sawtooth sunflower	Asteraceae	P-Forb	Nt	FACW			
<i>Heliopsis helianthoides</i>	False sunflower	Asteraceae	P-Forb	Nt	UPL			
<i>Heteranthera dubia</i>	Grass-leaf mud-plantain	Pontederiaceae	A-Forb	Nt	OBL			
<i>Hieracium sp.</i>	Hawkweed	Asteraceae	P-Forb		UPL			

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Hippuris vulgaris	Common Mare's-tail	Hippuridaceae	P-Forb	Nt	OBL	G5 S1 E		
Hordeum vulgare	Barley	Poaceae	A-Grass	Ad	UPL			X
Hypericum boreale	Northern dwarf St. John's-wort	Clusiaceae	P-Forb	Nt	OBL			
Hypericum canadense	Canadian St. John's-wort	Clusiaceae	P-Forb	Nt	FACW			
Hypericum mutilum	Dwarf St. John's-wort	Clusiaceae	P-Forb	Nt	FACW			
Hypericum perforatum	Common St. John's-wort	Clusiaceae	P-Forb	Ad	UPL			
Hypericum punctatum	St. John's-wort	Clusiaceae	P-Forb	Nt	FAC			
Hypericum sp.	St. John's-wort	Clusiaceae	Forb					
Impatiens capensis	Spotted touch-me-not	Balsaminaceae	A-Forb	Nt	FACW			
Iris versicolor	Blue flag	Iridaceae	P-Forb	Nt	OBL			X
Juglans nigra	Black walnut	Juglandaceae	Tree	Nt	FACU			
Juncus acuminatus	Sharp-fruited rush	Juncaceae	P-Grass	Nt	OBL			
Juncus bufonius	Toad-rush	Juncaceae	P-Grass	Nt	FACW			
Juncus canadensis	Canada rush	Juncaceae	P-Grass	Nt	OBL			X
Juncus dudleyi	Dudley's rush	Juncaceae	P-Grass	Nt	FACW			X
Juncus effusus	Common rush	Juncaceae	P-Grass	Nt	OBL			X
Juncus nodosus	Knotted rush	Juncaceae	P-Grass	Nt	OBL			
Juncus roemerianus	Needlerush	Juncaceae	P-Grass	Nt	OBL			
Juncus sp	Rush	Juncaceae	P-Grass	Nt	FACW			
Juncus tenuis	Slender yard-rush	Juncaceae	P-Grass	Nt	FACW			X
Juncus torreyi	Torrey's rush	Juncaceae	P-Grass	Nt	FACW			X
Lactuca canadensis	Wild lettuce	Asteraceae	B-Forb	Nt	FACU			
Lactuca scariola	Prickly lettuce	Asteraceae	B-Forb	Ad	FAC			
Leersia oryzoides	Rice cutgrass	Poaceae	P-Grass	Nt	OBL			X
Lemna minor	Duckweed	Lemnaceae	P-Forb	Nt	OBL			
Leonurus cardiaca	Motherwort	Lamiaceae	P-Forb	Ad	UPL			
Lepidium virginicum	Wild peppergrass	Brassicaceae	A-Forb	Nt	FACU			
Leptoloma cognatum	Fall witch grass	Poaceae	P-Grass	Nt	UPL			
Lespedeza capitata	Bush-clover	Fabaceae	P-Forb	Nt	FACU		X	X
Lindera benzoin	Spicebush	Lauraceae	Shrub	Nt	FACW			
Lindernia dubia	False pimpernel	Scrophulariaceae	A-Forb	Nt	OBL			
Lobelia cardinalis	Cardinal flower	Campanulaceae	P-Forb	Nt	OBL			X
Lobelia inflata	Indian-tobacco	Campanulaceae	B-Forb	Nt	FACU			X
Lobelia siphilitica	Great lobelia	Campanulaceae	P-Forb	Nt	FACW			X
Lolium multiflorum	Italian rye grass	Poaceae	A-Grass	Ad	FACU			X
Lonicera tatarica	Tartarian honeysuckle	Caprifoliaceae	Shrub	Ad	FACU			
Lotus corniculatus	Bird's-foot trefoil	Fabaceae	P-Forb	Ad	FACU			
Ludwigia palustris americana	Water purslane	Onagraceae	P-Forb	Nt	OBL			
Lupinus perennis	Wild lupine	Fabaceae	P-Forb	Nt	UPL		X	X
Lychnis alba	White campion	Caryophyllaceae	A-Forb	Ad	UPL			
Lycopus americanus	Water-horehound	Lamiaceae	P-Forb	Nt	OBL			X
Lysimachia ciliata	Fringed loosestrife	Primulaceae	P-Forb	Nt	FACW			X
Lysimachia quadrifolia	Whorled loosestrife	Primulaceae	P-Forb	Nt	UPL			
Lysimachia terrestris	Swamp-candles	Primulaceae	P-Forb	Nt	OBL			
Lythrum salicaria	Purple loosestrife	Lythraceae	P-Forb	Ad	OBL			
Maianthemum canadense	False lily-of-the-valley	Liliaceae	P-Forb	Nt	FACU			X
Malus floribunda	Japanese flowering crab apple	Rosaceae	Tree	Ad	UPL			
Malus sp	Apple	Rosaceae	Tree	Ad				

Scientific Name	Common Name	Family Classification	Physiognomy	Native/Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
Medicago lupulina	Black medick	Fabaceae	P-Forb	Ad	FACU			
Medicago sativa	Alfalfa	Fabaceae	P-Forb	Ad	UPL			
Melampyrum lineare	Cow wheat	Scrophulariaceae	A-Forb	Nt	FAC			
Melilotus alba	White sweet-clover	Fabaceae	B-Forb	Ad	FACU			
Melilotus officinalis	Yellow melilotus	Fabaceae	B-Forb	Ad	FACU			
Melilotus sp.	Sweet clover	Fabaceae	B-Forb	Ad	FACU			
Mentha arvensis	Field mint	Lamiaceae	P-Forb	Ad	FACW			
Mimulus ringens	Monkey flower	Lamiaceae	P-Forb	Nt	OBL			X
Mirabilis nyctaginea	Heartleaf umbrella-wort	Nyctaginaceae	P-Forb	Ad	UPL			
Mitchella repens	Partridge-berry	Rubiaceae	P-Forb	Nt	FACU			
Mollugo verticillata	Carpetweed	Molluginaceae	A-Forb	Ad	FAC			
Monarda fistulosa	Wild bergamot	Lamiaceae	P-Forb	Nt	FACU			X
Monarda punctata	Dotted horsemint	Lamiaceae	P-Forb	Nt	UPL		X	X
Muhlenbergia mexicana	Leafy satin grass	Poaceae	P-Grass	Nt	FACW			
Muhlenbergia neomexicana	Muhlenbergia	Poaceae	P-Grass					
Najas flexilis	Naiad	Najadaceae	P-Forb	Nt	OBL			
Nemopanthus mucronata	Mountain holly	Aquifoliaceae	Shrub	Nt	OBL			
Oenothera biennis	Common evening-primrose	Onagraceae	B-Forb	Nt	FACU			X
Onclea sensibilis	Sensitive fern	Dryopteridaceae	Cryptogam	Nt	FACW			
Osmorhiza claytonii	Sweet jarvil	Apiaceae	P-Forb	Nt	FACU			X
Osmunda cinnamomea	Cinnamon fern	Osmundaceae	Cryptogam	Nt	FACW			
Osmunda claytoniana	Interrupted fern	Osmundaceae	Cryptogam	Nt	FAC			
Osmunda regalis	Royal fern	Osmundaceae	Cryptogam	Nt	OBL			
Ostrya virginiana	Hop hornbeam	Betulaceae	Tree	Nt	FACU			
Oxalis europaea	Tall wood-sorrel	Oxalidaceae	A-Forb	Nt	FACU			
Oxalis stricta	Common wood-sorrel	Oxalidaceae	A-Forb	Nt	FACU			
Oxypolis rigidior	Cowbane	Apiaceae	P-Forb	Nt	OBL			
Panicum acuminatum	Old-field Panic grass	Poaceae	P-Grass	Nt	FAC			X
Panicum capillare	Witchgrass	Poaceae	A-Grass	Nt	FAC			X
Panicum clandestinum	Deer-tongue	Poaceae	P-Grass	Nt	FACW			X
Panicum dichotomiflorum	Smooth panic grass	Poaceae	A-Grass	Nt	FACW			
Panicum flexile	Wiry panic grass	Poaceae	A-Grass	Nt	FACW			
Panicum scabrisuculum	Wooly witch grass	Poaceae	P-Grass	Nt				
Panicum sp.	Panic grass	Poaceae	P-Grass					
Panicum villosissimum	Panic grass	Poaceae	P-Grass	Nt	UPL			
Panicum virgatum	Switchgrass	Poaceae	P-Grass	Nt	FAC			
Parthenocissus inserta	Virginia creeper	Vitaceae	Vine	Nt	FACU			
Parthenocissus quinquefolia	Wild quinine	Vitaceae	Vine	Nt	FACU			
Paspalum sp	Lens grass	Poaceae	P-Grass	Ad				
Penstemon sp	Beard tongue	Scrophulariaceae	P-Forb	Nt				
Penthorum sedoides	Ditch-stonecrop	Crassulaceae	P-Forb	Nt	OBL			X
Phleum pratense	Timothy	Poaceae	Grass	Ad	FACU			
Phragmites australis	Common reed	Poaceae	P-Grass	Ad	FACW			
Physalis heterophylla	Clammy ground-cherry	Solanaceae	P-Forb	Nt	UPL			
Physalis virginiana	Virginia ground-cherry	Solanaceae	P-Forb	Nt	UPL	G5T5 SH E		
Physocarpus opulifolius	Ninebark	Rosaceae	Shrub	Nt	FACW			
Physostegia virginiana	False dragon head	Lamiaceae	P-Forb	Nt	FACW	-		X
Phytolacca americana	Pokeweed	Phytolaccaceae	P-Forb	Nt	FACU			

Scientific Name	Common Name	Family Classification	Physiognomy	Native/Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
<i>Pilea pumila</i>	Richweed	Urticaceae	A-Forb	Nt	FACW			
<i>Pinus rigida</i>	Pitch pine	Pinaceae	Tree	Nt	FACU			X
<i>Pinus sp</i>	Pine	Pinaceae	Tree					
<i>Pinus strobus</i>	Eastern white pine	Pinaceae	Tree	Nt	FACU			
<i>Plantago lanceolata</i>	Buck horn plantain	Plantaginaceae	P-Forb	Ad	FACU			
<i>Plantago major</i>	Common plantain	Plantaginaceae	P-Forb	Ad	FACU			
<i>Plantago rugelii</i>	Pale plantain	Plantaginaceae	P-Forb	Nt	FAC			
<i>Poa compressa</i>	Canada bluegrass	Poaceae	P-Grass	Ad	FACU			
<i>Poa pratensis</i>	Kentucky bluegrass	Poaceae	P-Grass	Ad	FACU			
<i>Podophyllum peltatum</i>	May apple	Berberidaceae	P-Forb	Nt	FACU			
<i>Polygonum arifolium</i>	Arrow-leaved tearthumb	Polygonaceae	A-Forb	Nt	OBL			
<i>Polygonum aviculare</i>	Knotweed	Polygonaceae	A-Forb	Ad	FACU			
<i>Polygonum convolvulus</i>	Black bindweed	Polygonaceae	A-Forb	Ad	FAC			
<i>Polygonum lapathifolium</i>	Willow weed	Polygonaceae	A-Forb	Nt	FACW			
<i>Polygonum pensylvanicum</i>	Pinkweed	Polygonaceae	A-Forb	Nt	FACW			
<i>Polygonum persicaria</i>	Lady's thumb	Polygonaceae	A-Forb	Ad	FAC			
<i>Polygonum punctatum</i>	Dotted smartweed	Polygonaceae	A-Forb	Nt	OBL			
<i>Polygonum sagittatum</i>	Tearthumb	Polygonaceae	A-Forb	Nt	OBL			X
<i>Polygonum sp</i>	Knotweed	Polygonaceae	Forb					
<i>Polygonum virginianum</i>	Jumpseed	Polygonaceae	P-Forb	Nt	UPL			X
<i>Populus balsamifera</i>	Balsam poplar	Salicaceae	Tree	Nt	FAC			
<i>Populus deltoides</i>	Cottonwood	Salicaceae	Tree	Nt	FAC			
<i>Populus grandidentata</i>	Big-toothed aspen	Salicaceae	Tree	Nt	FACU			
<i>Populus tremuloides</i>	Quaking aspen	Salicaceae	Tree	Nt	FAC			
<i>Potamogeton pectinatus</i>	Sago pondweed	Potamogetonaceae	P-Forb	Nt	OBL			
<i>Potentilla argentea</i>	Silvery cinquefoil	Rosaceae	P-Forb	Ad	FACU			X
<i>Potentilla canadensis</i>	Dwarf cinquefoil	Rosaceae	P-Forb	Nt				X
<i>Potentilla norvegica</i>	Rough cinquefoil	Rosaceae	P-Forb	Nt	FAC			
<i>Potentilla recta</i>	Sulfur cinquefoil	Rosaceae	P-Forb	Ad	UPL			
<i>Potentilla simplex</i>	Common cinquefoil	Rosaceae	P-Forb	Nt	FACU			
<i>Prunella vulgaris</i>	Self-heal	Lamiaceae	P-Forb	Nt	FAC			
<i>Prunus nigra</i>	Canada plum	Rosaceae	Tree	Nt	FACU			
<i>Prunus serotina</i>	Black cherry	Rosaceae	Tree	Nt	FACU			
<i>Prunus virginiana</i>	Choke cherry	Rosaceae	Shrub	Nt	FACU			
<i>Pteridium aquilinum</i>	Bracken fern	Dennstaedtiaceae	Cryptogam	Nt	FACU			
<i>Pycnanthemum tenuifolium</i>	Narrow-leaf mountain mint	Lamiaceae	P-Forb	Nt	FAC			X
<i>Pycnanthemum virginianum</i>	Virginia mountain mint	Lamiaceae	P-Forb	Nt	FACW			
<i>Quercus alba</i>	White oak	Fagaceae	Tree	Nt	FACU			X
<i>Quercus bicolor</i>	Swamp white oak	Fagaceae	Tree	Nt	FACW			
<i>Quercus coccinea</i>	Scarlet oak	Fagaceae	Tree	Nt	UPL			
<i>Quercus ellipsoidalis</i>	Hill's oak	Fagaceae	Tree	Nt	UPL			
<i>Quercus ilicifolia</i>	Scrub oak	Fagaceae	Tree	Nt	UPL		X	X
<i>Quercus macrocarpa</i>	Burr oak	Fagaceae	Tree	Nt	FACU			
<i>Quercus palustris</i>	Pin oak	Fagaceae	Tree	Nt	FACW			
<i>Quercus rubra</i>	Red oak	Fagaceae	Tree	Nt	FACU			X
<i>Quercus velutina</i>	Black oak	Fagaceae	Tree	Nt	UPL			
<i>Ranunculus abortivus</i>	Small-flowered buttercup	Ranunculaceae	A-Forb	Nt	FACW			
<i>Ranunculus flabellaris</i>	Great yellow water buttercup	Ranunculaceae	P-Forb	Nt	OBL			

Scientific Name	Common Name	Family Classification	Physiognomy	Native/Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
Ranunculus pensylvanicus	Bristly buttercup	Ranunculaceae	B-Forb	Nt	OBL			
Rhamnus cathartica	Common buckthorn	Rhamnaceae	Shrub	Ad	FAC			
Rhamnus frangula	Glossy buckthorn	Rhamnaceae	Shrub	Ad	FAC			
Rhus glabra	Smooth sumac	Anacardiaceae	Shrub	Nt	UPL			
Rhus radicans	Poison ivy	Anacardiaceae	Vine	Nt	FAC			
Rhus typhina	Staghorn sumac	Anacardiaceae	Tree	Nt	UPL			
Robinia pseudoacacia	Black locust	Fabaceae	Tree	Ad	FACU			
Rorippa islandica	Marsh watercress	Brassicaceae	B-Forb	Nt	OBL			
Rosa multiflora	Multiflora rose	Rosaceae	Shrub	Ad	FACU			
Rubus allegheniensis	Northern blackberry	Rosaceae	Shrub	Nt	FACU			
Rubus flagellaris	American dewberry	Rosaceae	Shrub	Nt	FACU		X	X
Rubus hispidus	Swamp dewberry	Rosaceae	Shrub	Nt	FACW			
Rubus idaeus strigosus	Red raspberry	Rosaceae	Shrub	Nt	FACU			
Rubus occidentalis	Black raspberry	Rosaceae	Shrub	Ad	UPL			
Rubus sp	Raspberry	Rosaceae	Shrub	Nt				
Rudbeckia hirta	Black-eyed Susan	Asteraceae	B-Forb	Nt	FACU			X
Rudbeckia laciniata	Cut-leaf coneflower	Asteraceae	P-Forb	Nt	FACW			X
Rumex acetosella	Sheep sorrel	Polygonaceae	B-Forb	Ad	FACU			
Rumex crispus	Curly dock	Polygonaceae	P-Forb	Ad	FAC			
Rumex orbiculatus	Great water dock	Polygonaceae	P-Forb	Nt	OBL			
Salix candida	Sage willow	Salicaceae	Shrub	Nt	OBL			
Salix interior	Sandbar willow	Salicaceae	Shrub	Nt	OBL			
Salix nigra	Black willow	Salicaceae	Tree	Nt	OBL			
Salsola kali	Russian thistle	Chenopodiaceae	A-Forb	Ad	FACU			
Sambucus canadensis	Black elderberry	Caprifoliaceae	Shrub	Nt	FACW			
Saponaria officinalis	Bouncing-bet	Caryophyllaceae	P-Forb	Ad	FACU			
Sassafras albidum	Sassafras	Lauraceae	Tree	Nt	FACU			
Scirpus atrovirens	Dark green bulrush	Cyperaceae	P-Sedge	Nt	OBL			X
Scirpus cyperinus	Cottongrass bulrush	Cyperaceae	P-Sedge	Nt	OBL			X
Scirpus pendulous	Rufous bulrush	Cyperaceae	P-Sedge	Nt	OBL			X
Scirpus tabernaemontani	Soft-stem bulrush	Cyperaceae	P-Sedge	Nt	OBL			X
Scirpus validus creber	Great bulrush	Cyperaceae	P-Sedge	Nt	OBL			
Scutellaria lateriflora	Mad-dog skullcap	Lamiaceae	P-Forb	Nt	OBL			
Secale cereale	Rye	Poaceae	A-Grass	Ad	UPL			
Senecio pauperculus	Northern meadow-groundsel	Asteraceae	P-Forb	Nt	FAC			
Setaria faberi	Japanese bristle grass	Poaceae	A-Grass	Ad	FACU			
Setaria glauca	Yellow bristle grass	Poaceae	A-Grass	Ad	FAC			
Setaria sp.	Bristle grass	Poaceae	A-Grass	Ad				
Setaria verticillata	Bristly foxtail	Poaceae	A-Grass	Ad	FACU			
Setaria viridis	Green foxtail	Poaceae	A-Grass	Ad	FAC			
Silene latifolia	White campion	Caryophyllaceae	A-Forb	Ad	UPL			
Sisyrinchium campestre	Prairie blue-eyed grass	Iridaceae	P-Forb	Nt	UPL			
Smilacina racemosa	Feathery false Solomon's seal	Smilacaceae	P-Forb	Nt	FACU			X
Solanum dulcamara	Trailing nightshade	Solanaceae	Vine	Ad	FAC			
Solanum nigrum	Black nightshade	Solanaceae	P-Forb	Nt	FACU			
Solidago altissima	Tall goldenrod	Asteraceae	P-Forb	Nt	FACU			
Solidago canadensis	Canadian goldenrod	Asteraceae	P-Forb	Nt	FACU			
Solidago gigantea	Late goldenrod	Asteraceae	P-Forb	Nt	FACW			X

Scientific Name	Common Name	Family Classification	Physiognomy	Native/Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
<i>Solidago graminifolia</i>	Common grass-leaved goldenrod	Asteraceae	P-Forb	Nt	FACW			X
<i>Solidago graminifolia nuttallii</i>	Hairy grass-leaved goldenrod	Asteraceae	P-Forb	Nt	FAC			X
<i>Solidago juncea</i>	Early goldenrod	Asteraceae	P-Forb	Nt	UPL			X
<i>Solidago nemoralis</i>	Rough goldenrod	Asteraceae	P-Forb	Nt	UPL			X
<i>Solidago patula</i>	Spreading goldenrod	Asteraceae	P-Forb	Nt	OBL			
<i>Solidago rigida</i>	Stiff goldenrod	Asteraceae	P-Forb	Nt	FACU			
<i>Solidago rugosa</i>	Tall-hairy goldenrod	Asteraceae	P-Forb	Nt	FAC			X
<i>Solidago sp</i>	Goldenrod	Asteraceae	P-Forb	Nt				
<i>Solidago uliginosa</i>	Bog goldenrod	Asteraceae	P-Forb	Nt	OBL			
<i>Solidago ulmifolia</i>	Elm-leaved goldenrod	Asteraceae	P-Forb	Nt	UPL			
<i>Sonchus arvensis</i>	Sow thistle	Asteraceae	P-Forb	Ad	FACU			
<i>Sonchus oleraceus</i>	Common sow thistle	Asteraceae	A-Forb	Ad	UPL			
<i>Sonchus sp.</i>	Thistle	Asteraceae	P-Forb	Ad				
<i>Sorbus americanum</i>	American mountain ash	Rosaceae	Tree	Nt	FAC			X
<i>Sorghastrum nutans</i>	Indian grass	Poaceae	P-Grass	Nt	FACU			X
<i>Sparganium eurycarpum</i>	Bur-reed	Sparganiaceae	P-Forb	Nt	OBL			X
<i>Sphenopholis sp</i>	Wedge grass	Poaceae	P-Grass	Nt	FAC			
<i>Spiraea alba</i>	Meadowsweet	Rosaceae	Shrub	Nt	FACW			X
<i>Sporobolus vaginiflorus</i>	Poverty grass	Poaceae	P-Grass	Nt	UPL			
<i>Stellaria longifolia</i>	Needle-leaf starwort	Caryophyllaceae	P-Forb	Nt	FACU			
<i>Stellaria meadia</i>	Common chickweed	Caryophyllaceae	A-Forb	Ad	FACU			
<i>Symphoricarpos orbiculatus</i>	Coralberry	Caprifoliaceae	Shrub	Ad	FACU			
<i>Symplocarpus foetidus</i>	Skunk-cabbage	Araceae	P-Forb	Nt	OBL			
<i>Tanacetum vulgare</i>	Tansy	Asteraceae	P-Forb	Ad	FACU			
<i>Taraxacum officinale</i>	Common dandelion	Asteraceae	P-Forb	Ad	FACU			
<i>Thalictrum dasycarpum</i>	Purple meadow rue	Ranunculaceae	P-Forb	Nt	FACW			X
<i>Thalictrum revolutum</i>	Waxy meadow rue	Ranunculaceae	P-Forb	Nt	FAC			X
<i>Trichostema dichotomum</i>	Blue curls	Lamiaceae	A-Forb	Nt	UPL			X
<i>Trifolium arvense</i>	Rabbit foot clover	Fabaceae	A-Forb	Ad	UPL			
<i>Trifolium hybridum</i>	Alsike clover	Fabaceae	P-Forb	Ad	FACU			
<i>Trifolium pratense</i>	Red clover	Fabaceae	P-Forb	Ad	FACU			
<i>Trifolium repens</i>	White clover	Fabaceae	P-Forb	Ad	FACU			
<i>Triosteum aurantiacum</i>	Early horse gentain	Caprifoliaceae	P-Forb	Nt	UPL			
<i>Tussilago farfara</i>	Coltsfoot	Asteraceae	P-Forb	Ad	FACU			
<i>Typha angustifolia</i>	Narrow-leaf cattail	Typhaceae	P-Forb	Nt	OBL			
<i>Typha latifolia</i>	Common cattail	Typhaceae	P-Forb	Nt	OBL			
<i>Ulmus americana</i>	American elm	Ulmaceae	Tree	Nt	FACW			
<i>Ulmus pumila</i>	Siberian elm	Ulmaceae	Tree	Ad	UPL			
<i>Ulmus rubra</i>	Slippery elm	Ulmaceae	Tree	Nt	FAC			
<i>Utricularia vulgaris</i>	Common bladderwort	Lentibulariaceae	P-Forb	Nt	OBL			
<i>Vaccinium angustifolium</i>	Lowbush blueberry	Ericaceae	Shrub	Nt	FACU		X	X
<i>Vaccinium myrtilloides</i>	Canada blueberry	Ericaceae	Shrub	Nt	FACW			
<i>Verbascum blattaria</i>	Moth mullein	Scrophulariaceae	B-Forb	Ad	FACU			
<i>Verbascum thapsus</i>	Mullein	Scrophulariaceae	B-Forb	Ad	UPL			
<i>Verbena bracteata</i>	Carpet vervain	Verbenaceae	P-Forb	Nt	FACU			
<i>Verbena hastata</i>	Blue vervain	Verbenaceae	P-Forb	Nt	FACW			X
<i>Verbena urticifolia</i>	White vervain	Verbenaceae	P-Forb	Nt	FAC			X
<i>Veronica officinalis</i>	Speedwell	Scrophulariaceae	P-Forb	Ad	FACU			X

Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
Veronica sp.	Speedwell	Scrophulariaceae	Forb					
Viburnum dentatum	Southern arrowwood	Caprifoliaceae	Shrub	Nt	FAC			X
Viburnum lentago	Sheepberry	Caprifoliaceae	Shrub	Nt	FAC			
Viburnum prunifolium	Black haw	Caprifoliaceae	Shrub	Nt	FACU			
Vicia cracca	Cow vetch	Fabaceae	P-Forb	Ad	UPL			
Vicia sativa	Common vetch	Fabaceae	A-Forb	Ad	FACU			
Vicia sp.	Vetch	Fabaceae	A-Forb	Ad	UPL			
Viola sororia	Woolly blue violet	Violaceae	P-Forb	Nt	FAC			
Viola sp.	Violet	Violaceae	P-Forb					
Vitis riparia	Riverbank grape	Vitaceae	Vine	Nt	FAC			
Xanthium strumarium	Cocklebur	Asteraceae	A-Forb	Nt	FAC			

Summary Floristic Analysis

Categories		
Vascular Plant Families	81	
Non-Vascular Plant Families	1	
	No. Species	Percent
Total Species	438	100.0%
Native Species	315	71.9%
Adventive Species	113	25.8%
Unknown Species	10	2.3%
Largest Families Represented		
Aster Family (Asteraceae)	69	15.8%
Grass Family (Poaceae)	61	13.9%
Sedge Family (Cyperaceae)	31	7.1%
Rose Family (Rosaceae)	25	5.7%
Pea Family (Fabaceae)	21	4.8%
Physiognomy		
Perennial Forbs (P-Forb)	163	37.2%
Annual Forbs (A-Forb)	57	13.0%
Biennial Forbs (B-Forbs)	19	4.3%
Forbs	5	1.1%
Perennial Grass (P-Grass)	49	11.2%
Annual Grass (A-Grass)	20	4.6%
Grasses	2	0.5%
Perennial Sedge (P-Sedge)	31	7.1%
Alga	1	0.2%
Cryptogams	9	2.1%
Trees	40	9.1%
Shrubs	33	7.5%
Vines	9	2.1%
Miscellaneous		
Nectar/Larval Food Plants	10	2.3%
Seeded/Planted Species	111	25.3%
Rare Plants	6	1.4%
Wetland Classification		
Upland (UPL)	72	16.4%
Facultative Upland (FACU)	121	27.6%
Facultative (FAC)	68	15.5%
Facultative Wetland (FACW)	65	14.8%
Obligate Wetland (OBL)	81	18.5%
Unknown Species	31	7.1%
Total Hydrophytic Species	214	48.9%

Taxonomic Synonyms

Monitoring Data	Synonyms	Common Name
<i>Alisma subcordatum</i>	<i>Alisma plantago-aquatica</i>	Water plantain
<i>Alliaria petiolata</i>	<i>Alliaria officinalis</i>	Garlic mustard
<i>Andropogon scoparius</i>	<i>Schizachyrium scoparium</i>	Little bluestem
<i>Aster azureus</i>	<i>Symphotrichum oolentangiense</i>	Sky-blue aster
<i>Aster divaricatus</i>	<i>Symphotrichum divaricatum</i>	White wood aster
<i>Aster ericoides</i>	<i>Symphotrichum ericoides</i>	White heath aster
<i>Aster laevis</i>	<i>Symphotrichum laeve</i>	Smooth blue aster
<i>Aster lanceolatus</i>	<i>Symphotrichum lanceolatum</i>	Old-field aster
<i>Aster lateriflorus</i>	<i>Symphotrichum lateriflorum</i>	Calico aster
<i>Aster novae-angliae</i>	<i>Symphotrichum</i>	New England aster
<i>Aster pilosus</i>	<i>Symphotrichum</i>	Heath aster
<i>Aster puniceus</i>	<i>Symphotrichum puniceum</i>	Purple-stemmed aster
<i>Aster umbellatus</i>	<i>Symphotrichum umbellatum</i>	Flat-top white aster
<i>Cassia fasciculata</i>	<i>Chamaecrista fasciculata</i>	Partridge pea
<i>Conyza canadensis</i>	<i>Erigeron canadensis</i>	Horseweed
<i>Euphorbia maculata</i>	<i>Chamaesyce maculata</i>	Spotted spurge
<i>Matricaria discoidea</i>	<i>Matricaria matricarioides</i>	Pineapple-weed
<i>Panicum acuminatum</i>	<i>Dicanthelium acuminatum</i> , <i>P. lanuginosum</i>	Old-field panic grass
<i>Phragmites australis</i>	<i>Phragmites communis</i>	Common reed
<i>Polygonum virginianum</i>	<i>Tovara virginiana</i>	Jumpseed, woodland knotweed
<i>Rorippa islandica</i>	<i>Rorippa palustris</i> var. <i>fernaldiana</i>	Marsh watercress
<i>Scirpus pendulus</i>	<i>Scirpus lineatus</i>	Rufous bulrush
<i>Scirpus tabernaemontani</i>	<i>Schoenoplectus tabernaemontani</i> , <i>Scirpus validus</i>	Soft-stem bulrush
<i>Silene latifolia</i>	<i>Lychnis alba</i>	White campion
<i>Silene vulgaris</i>	<i>Silene cucubalus</i>	Bladder campion
<i>Solidago graminifolia</i>	<i>Euthamia graminifolia</i>	Grass-leaved goldenrod, bush g.r.

Attachment 2. Phase II & III Quadrat Data—Total Species List & Floristic Analysis

Rapp Road Landfill – PII, PIII Quadrat Data Total Species List								
Date: August 3-4, 2013								
Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
<i>Acalypha rhomboidea</i>	Three-seeded mercury	Euphorbiaceae	A-Forb	Nt	FACU			
<i>Acer rubrum</i>	Red maple	Aceraceae	Tree	Nt	FAC			
<i>Achillea millefolium</i>	Common yarrow	Asteraceae	P-Forb	Ad	FACU			
<i>Agalinis tenuifolia</i>	Gerardia	Scrophulariaceae	P-Forb	Nt	FACW			X
<i>Agropyron repens</i>	Quack grass	Poaceae	P-Grass	Ad				
<i>Agrostis alba</i>	Redtop	Poaceae	P-Grass	Ad	FACW			
<i>Agrostis perennans</i>	Autumn bent	Poaceae	P-Grass	Nt	FACU			
<i>Alisma subcordatum</i>	Water-plantain	Alismataceae	P-Forb	Nt	OBL			X
<i>Alliaria petiolata</i>	Garlic mustard	Brassicaceae	B-Forb	Ad	FAC			
<i>Amaranthus sp.</i>	Amaranth	Amaranthaceae	A-Forb	Ad				
<i>Ambrosia artemisiifolia</i>	Ragweed	Asteraceae	A-Forb	Nt	FACU			
<i>Andropogon gerardii</i>	Big bluestem	Poaceae	P-Grass	Nt	FACU			X
<i>Andropogon scoparius</i>	Little bluestem	Poaceae	P-Grass	Nt	FACU			X
<i>Apocynum cannabinum</i>	Indian hemp	Apocynaceae	P-Forb	Nt	FAC			X
<i>Aquilegia canadensis</i>	Wild columbine	Ranunculaceae	P-Forb	Nt	FAC			
<i>Arabis glabra</i>	Tower-mustard	Brassicaceae	P-Forb	Nt	UPL			X
<i>Artemisia biennis</i>	Sage-weed	Asteraceae	B-Forb	Ad	FACW			
<i>Artemisia vulgaris</i>	Mugwort	Asteraceae	P-Forb	Ad	UPL			
<i>Asclepias incarnata</i>	Swamp milkweed	Asclepiadaceae	P-Forb	Nt	OBL			X
<i>Asclepias syriaca</i>	Common milkweed	Asclepiadaceae	P-Forb	Nt	UPL		X	X
<i>Aster divaricatus</i>	White wood aster	Asteraceae	P-Forb	Nt	UPL			
<i>Aster ericoides</i>	White heath aster	Asteraceae	P-Forb	Nt	FACU			X
<i>Aster lanceolatus</i>	Old-field aster	Asteraceae	P-Forb	Nt	FACW			
<i>Aster lateriflorus</i>	Calico aster	Asteraceae	P-Forb	Nt	FAC			X
<i>Aster novae-angliae</i>	New England aster	Asteraceae	P-Forb	Nt	FACW			X
<i>Aster pilosus</i>	Heath aster	Asteraceae	P-Forb	Nt	FACU			X
<i>Aster puniceus</i>	Purple-stemmed aster	Asteraceae	P-Forb	Nt	OBL			X
<i>Aster sp.</i>	Aster	Asteraceae	P-Forb	Nt				
<i>Avena sativa</i>	Oats	Poaceae	A-Grass	Ad	UPL			
<i>Barbarea vulgaris</i>	Cress	Brassicaceae	B-Forb	Ad	FAC			
<i>Betula populifolia</i>	Gray birch	Betulaceae	Tree	Nt	FAC			
<i>Bidens cernua</i>	Stick-tights	Asteraceae	A-Forb	Nt	OBL			X
<i>Bidens frondosa</i>	Beggar-ticks	Asteraceae	A-Forb	Nt	FACW			X
<i>Bidens tripartita</i>	Beggar-ticks	Asteraceae	A-Forb	Nt	FACW			X
<i>Boehmeria cylindrica</i>	Fasle nettle	Urticaceae	P-Forb	Nt	OBL			
<i>Bromus inermis</i>	Hungarian brome	Poaceae	P-Grass	Ad	UPL			
<i>Bromus sp.</i>	Chess	Poaceae	P-Grass	Ad				
<i>Carex annectens</i>	Yellow-fruit sedge	Cyperaceae	P-Sedge	Nt	FACW			X
<i>Carex bebbii</i>	Bebb's sedge	Cyperaceae	P-Sedge	Nt	OBL			
<i>Carex blanda</i>	Common wood sedge	Cyperaceae	P-Sedge	Nt	FAC			
<i>Carex communis</i>	Common beech sedge	Cyperaceae	P-Sedge	Nt	UPL			
<i>Carex crinita</i>	Fringed sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Carex hystricina</i>	Porcupine sedge	Cyperaceae	P-Sedge	Nt	OBL			X

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Carex lupulina	Hop sedge	Cyperaceae	P-Sedge	Nt	OBL			X
Carex pensylvanica	Common oak sedge	Cyperaceae	P-Sedge	Nt	UPL			X
Carex rosea	Curly-styled wood sedge	Cyperaceae	P-Sedge	Nt	UPL			
Carex scoparia	Pointed broom sedge	Cyperaceae	P-Sedge	Nt	FACW			X
Carex sp	Sedge	Cyperaceae	P-Sedge	Nt				
Carex stricta	Tussock sedge	Cyperaceae	P-Sedge	Nt	OBL			X
Carex vulpinoidea	Common fox sedge	Cyperaceae	P-Sedge	Nt	OBL			X
Carpinus caroliniana	Hop hornbeam	Betulaceae	Tree	Nt	FAC			
Cassia fasciculata	Partridge pea	Fabaceae	A-Forb	Nt	FACU	Review List: G5 S3S4		
Celastrus orbiculatus	Oriental bittersweet	Celastraceae	Vine	Ad	UPL			
Celastrus scandens	Climbing bittersweet	Celastraceae	Vine	Ad	UPL			
Cenchrus longispinus	Field sandbur	Poaceae	A-Grass	Nt	UPL			
Centaurea maculosa	Spotted knapweed	Asteraceae	P-Forb	Ad	UPL			
Cerastium arvense	Field mouse-ear chickweed	Caryophyllaceae	P-Forb	Nt	FACU			
Cerastium vulgatum	Mouse-ear chickweed	Caryophyllaceae	P-Forb	Ad	FACU			
Chelone glabra	Turtle-heads	Scrophulariaceae	P-Forb	Nt	OBL			X
Chenopodium album	Lamb's-quarters	Chenopodiaceae	A-Forb	Ad	FACU			
Circaea lutetiana	Enchanter's nightshade	Onagraceae	P-Forb	Nt	FACU			
Cirsium arvense	Canada thistle	Asteraceae	P-Forb	Ad	FACU			
Clematis virginiana	Virgin's bower	Ranunculaceae	Vine	Nt	FAC			X
Convolvulus sepium	Hedge bindweed	Convolvulaceae	P-Forb	Nt	FAC			
Conyza canadensis	Horseweed	Asteraceae	A-Forb	Nt	FACU			X
Cornus racemosa	Gray dogwood	Cornaceae	Shrub	Nt	FAC			
Cornus stolonifera	Red-osier dogwood	Cornaceae	Shrub	Nt	FACW			
Crataegus sp.	Hawthorn	Rosaceae	Tree	Nt				
Cycloloma atriplicifolium	Winged-pigweed	Chenopodiaceae	A-Forb	Ad	FACU			
Cyperus esculentus	Yellow nut-grass	Cyperaceae	P-Sedge	Nt	FACW			
Cyperus houghtonii	Smooth sand sedge	Cyperaceae	P-Sedge	Nt	UPL	G3G4 S2 R		X
Dactylis glomerata	Orchard grass	Poaceae	P-Grass	Ad	FACU			
Daucus carota	Queen-Anne's-lace	Apiaceae	B-Forb	Ad	UPL			
Desmodium canadense	Giant tick clover	Fabaceae	P-Forb	Nt	FAC			X
Dianthus armeria	Deptford pink	Caryophyllaceae	A-Forb	Ad	UPL			
Digitaria sanguinalis	Tall crabgrass	Poaceae	A-Grass	Ad	FACU			
Diodia teres	Poorjoe	Rubiaceae	A-Forb	Nt	FACU			X
Echinochloa crusgalli	Japanese millet	Poaceae	A-Grass	Ad	FAC			
Echinochloa walteri	Water millet	Poaceae	A-Grass	Nt	OBL			
Eleocharis acicularis	Hairgrass	Cyperaceae	P-Sedge	Nt	OBL			
Eleocharis obtusa	Blunt spike-rush	Cyperaceae	P-Sedge	Nt	OBL			X
Eleocharis palustris	Creeping spike-rush	Cyperaceae	P-Sedge	Nt	OBL			
Elymus virginicus	Virginia wild rye	Poaceae	P-Grass	Nt	FACW			X
Epilobium coloratum	Purple-leaf willowherb	Onagraceae	P-Forb	Nt	OBL			X
Equisetum arvense	Field horsetail	Equisetaceae	Cryptogam	Nt	FAC			
Eragrostis hypnoides	Lovegrass	Poaceae	A-Grass	Nt	OBL			
Erechtites hieracifolia	Fireweed	Asteraceae	A-Forb	Nt	FACU			X
Erigeron annuus	Daisy-fleabane	Asteraceae	A-Forb	Nt	FACU			
Erigeron canadensis	Horseweed	Asteraceae	A-Forb	Nt	FAC			
Erigeron philadelphicus	Fleabane	Asteraceae	B-Forb	Nt	FAC			
Erigeron strigosus	Daisy-fleabane	Asteraceae	A-Forb	Nt	FACU			

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Eupatorium maculatum	Spotted Joy-pye weed	Asteraceae	P-Forb	Nt	OBL			
Eupatorium perfoliatum	Thoroughwort	Asteraceae	P-Forb	Nt	FACW			X
Eupatorium rugosum	White snakeroot	Asteraceae	P-Forb	Nt	UPL			X
Euphorbia maculata	Spotted spurge	Euphorbiaceae	P-Forb	Nt	FACU			
Fern sp.			Cryptogam	Nt				
Fragaria virginiana	Field strawberry	Rosaceae	P-Forb	Nt	FACU		X	
Fraxinus americana	White ash	Oleaceae	Tree	Nt	FACU			
Fraxinus pennsylvanica	Green ash	Oleaceae	Tree	Nt	FACW			
Galeopsis tetrahit	Hemp-nettle	Lamiaceae	A-Forb	Ad	FACU			
Galium boreale	Northern bedstraw	Rubiaceae	P-Forb	Nt	FAC			
Galium odoratum	Sweet woodruff	Rubiaceae	P-Forb	Ad	UPL			
Galium sp.	Bedstraw	Rubiaceae	Forb					
Galium triflorum	Sweet-scented bedstraw	Rubiaceae	P-Forb	Nt	FACU			
Geranium robertianum	Herb Robert	Geraniaceae	A-Forb	Nt	UPL			
Geum aleppicum	Yellow avens	Rosaceae	P-Forb	Nt	FAC			
Geum canadense	White avens	Rosaceae	P-Forb	Nt	FAC			
Glechoma hederacea	Creeping Charlie	Lamiaceae	P-Forb	Ad	FAC			
Glyceria grandis	Reed meadowgrass	Poaceae	P-Grass	Nt	OBL			X
Glyceria striata	Fowl mannagrass	Poaceae	P-Grass	Nt	OBL			X
Grass sp	Grass	Poaceae	Grass					
Hackelia virginiana	Stickseed	Boraginaceae	P-Forb	Nt	FACU			
Hamamelis virginiana	Witch-hazel	Hamamelidaceae	Shrub	Nt	FACU			
Helianthemum canadense	Frostweed	Cistaceae	P-Forb	Nt	UPL			X
Helianthus grosseserratus	Sawtooth sunflower	Asteraceae	P-Forb	Nt	FACW			
Hieracium sp.	Hawkweed	Asteraceae	P-Forb		UPL			
Hypericum boreale	Northern dwarf St. John's-wort	Clusiaceae	P-Forb	Nt	OBL			
Hypericum canadense	Canadian St. John's-wort	Clusiaceae	P-Forb	Nt	FACW			
Hypericum mutilum	Dwarf St. John's-wort	Clusiaceae	P-Forb	Nt	FACW			
Hypericum perforatum	Common St. John's-wort	Clusiaceae	P-Forb	Ad	UPL			
Hypericum punctatum	St. John's-wort	Clusiaceae	P-Forb	Nt	FAC			
Hypericum sp.	St. John's-wort	Clusiaceae	Forb					
Impatiens pensis	Spotted touch-me-not	Balsaminaceae	A-Forb	Nt	FACW			
Juglans nigra	Black walnut	Juglandaceae	Tree	Nt	FACU			
Juncus acuminatus	Sharp-fruited rush	Juncaceae	P-Grass	Nt	OBL			
Juncus dudleyi	Dudley's rush	Juncaceae	P-Grass	Nt	FACW			X
Juncus effusus	Common rush	Juncaceae	P-Grass	Nt	OBL			X
Juncus nodosus	Knotted rush	Juncaceae	P-Grass	Nt	OBL			
Juncus sp	Rush	Juncaceae	P-Grass	Nt				
Juncus tenuis	Slender yard-rush	Juncaceae	P-Grass	Nt	FACW			X
Juncus torreyi	Torrey's rush	Juncaceae	P-Grass	Nt	FACW			X
Lactuca serriola	Prickly lettuce	Asteraceae	B-Forb	Ad	FAC			
Leersia oryzoides	Rice cutgrass	Poaceae	P-Grass	Nt	OBL			X
Lepidium virginicum	Wild peppergrass	Brassicaceae	A-Forb	Nt	FACU			
Lespedeza capitata	Bush-clover	Fabaceae	P-Forb	Nt	FACU		X	X
Lindera benzoin	Spicebush	Lauraceae	Shrub	Nt	FACW			
Lindernia dubia	False pimpernel	Scrophulariaceae	A-Forb	Nt	OBL			
Lobelia cardinalis	Cardinal flower	Campanulaceae	P-Forb	Nt	OBL			X
Lobelia inflata	Indian-tobacco	Campanulaceae	B-Forb	Nt	FACU			X

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Lobelia siphilitica	Great lobelia	Campanulaceae	P-Forb	Nt	FACW			X
Lolium multiflorum	Italian rye grass	Poaceae	A-Grass	Ad	FACU			X
Lonicera tatarica	Tartarian honeysuckle	Caprifoliaceae	Shrub	Ad	FACU			
Lotus corniculatus	Bird's-foot trefoil	Fabaceae	P-Forb	Ad	FACU			
Lupinus perennis	Wild lupine	Fabaceae	P-Forb	Nt	UPL		X	X
Lycopus americanus	Water-horehound	Lamiaceae	P-Forb	Nt	OBL			X
Lysimachia ciliata	Fringed loosestrife	Primulaceae	P-Forb	Nt	FACW			X
Lysimachia quadrifolia	Whorled loosestrife	Primulaceae	P-Forb	Nt	UPL			
Lysimachia terrestris	Swamp-candles	Primulaceae	P-Forb	Nt	OBL			
Lythrum salicaria	Purple loosestrife	Lythraceae	P-Forb	Ad	OBL			
Maianthemum canadense	False lily-of-the-valley	Liliaceae	P-Forb	Nt	FACU			X
Malus sp	Apple	Rosaceae	Tree	Ad				
Medicago lupulina	Black medick	Fabaceae	P-Forb	Ad	FACU			
Melampyrum lineare	Cow wheat	Scrophulariaceae	A-Forb	Nt	FAC			
Mimulus ringens	Monkey flower	Lamiaceae	P-Forb	Nt	OBL			X
Mollugo verticillata	Carpetweed	Molluginaceae	A-Forb	Ad	FAC			
Monarda fistulosa	Wild bergamot	Lamiaceae	P-Forb	Nt	FACU			X
Monarda punctata	Dotted horsemint	Lamiaceae	P-Forb	Nt	UPL		X	X
Muhlenbergia mexicana	Leafy satin grass	Poaceae	P-Grass	Nt	FACW			
Muhlenbergia neomexicana	Muhlenbergia	Poaceae	P-Grass					
Oenothera biennis	Common evening-primrose	Onagraceae	B-Forb	Nt	FACU			X
Onoclea sensibilis	Sensitive fern	Dryopteridaceae	Cryptogam	Nt	FACW			
Osmorhiza claytonii	Sweet jarvil	Apiaceae	P-Forb	Nt	FACU			X
Oxalis europaea	Tall wood-sorrel	Oxalidaceae	A-Forb	Nt	FACU			
Oxalis stricta	Common wood-sorrel	Oxalidaceae	A-Forb	Nt	FACU			
Panicum acuminatum	Old-field Panic grass	Poaceae	P-Grass	Nt	FAC			X
Panicum capillare	Witchgrass	Poaceae	A-Grass	Nt	FAC			X
Panicum clandestinum	Deer-tongue	Poaceae	P-Grass	Nt	FACW			X
Panicum dichotomiflorum	Smooth panic grass	Poaceae	A-Grass	Nt	FACW			
Panicum sp.	Panic grass	Poaceae	P-Grass					
Panicum virgatum	Switchgrass	Poaceae	P-Grass	Nt	FAC			
Parthenocissus inserta	Virginia creeper	Vitaceae	Vine	Nt	FACU			
Parthenocissus quinquefolia	Wild quinine	Vitaceae	Vine	Nt	FACU			
Penthorum sedoides	Ditch-stonecrop	Crassulaceae	P-Forb	Nt	OBL			X
Phragmites australis	Common reed	Poaceae	P-Grass	Ad	FACW			
Physalis virginiana	Virginia ground-cherry	Solanaceae	P-Forb	Nt	UPL	G5T5 SH E		
Physocarpus opulifolius	Ninebark	Rosaceae	Shrub	Nt	FACW			
Phytolacca americana	Pokeweed	Phytolaccaceae	P-Forb	Nt	FACU			
Pilea pumila	Richweed	Urticaceae	A-Forb	Nt	FACW			
Pinus rigida	Pitch pine	Pinaceae	Tree	Nt	FACU			X
Plantago major	Common plantain	Plantaginaceae	P-Forb	Ad	FACU			
Plantago rugelii	Pale plantain	Plantaginaceae	P-Forb	Nt	FAC			
Poa compressa	Canada bluegrass	Poaceae	P-Grass	Ad	FACU			
Poa pratensis	Kentucky bluegrass	Poaceae	P-Grass	Ad	FACU			
Podophyllum peltatum	May apple	Berberidaceae	P-Forb	Nt	FACU			
Polygonum convolvulus	Black bindweed	Polygonaceae	A-Forb	Ad	FAC			
Polygonum pensylvanicum	Pinkweed	Polygonaceae	A-Forb	Nt	FACW			
Polygonum persicaria	Lady's thumb	Polygonaceae	A-Forb	Ad	FAC			

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<i>Polygonum sagittatum</i>	Tearthumb	Polygonaceae	A-Forb	Nt	OBL			X
<i>Populus balsamifera</i>	Balsam poplar	Salicaceae	Tree	Nt	FAC			
<i>Populus deltoides</i>	Cottonwood	Salicaceae	Tree	Nt	FAC			
<i>Populus tremuloides</i>	Quaking aspen	Salicaceae	Tree	Nt	FAC			
<i>Potentilla argentea</i>	Silvery cinquefoil	Rosaceae	P-Forb	Ad	FACU			X
<i>Potentilla canadensis</i>	Dwarf cinquefoil	Rosaceae	P-Forb	Nt				X
<i>Potentilla norvegica</i>	Rough cinquefoil	Rosaceae	P-Forb	Nt	FAC			
<i>Potentilla recta</i>	Sulfur cinquefoil	Rosaceae	P-Forb	Ad	UPL			
<i>Potentilla simplex</i>	Common cinquefoil	Rosaceae	P-Forb	Nt	FACU			
<i>Prunella vulgaris</i>	Self-heal	Lamiaceae	P-Forb	Nt	FAC			
<i>Prunus serotina</i>	Black cherry	Rosaceae	Tree	Nt	FACU			
<i>Prunus virginiana</i>	Choke cherry	Rosaceae	Shrub	Nt	FACU			
<i>Pycnanthemum tenuifolium</i>	Narrow-leaf mountain mint	Lamiaceae	P-Forb	Nt	FAC			X
<i>Quercus alba</i>	White oak	Fagaceae	Tree	Nt	FACU			X
<i>Quercus coccinea</i>	Scarlet oak	Fagaceae	Tree	Nt	UPL			
<i>Quercus rubra</i>	Red oak	Fagaceae	Tree	Nt	FACU			X
<i>Ranunculus abortivus</i>	Small-flowered buttercup	Ranunculaceae	A-Forb	Nt	FACW			
<i>Rhamnus cathartica</i>	Common buckthorn	Rhamnaceae	Shrub	Ad	FAC			
<i>Rhus glabra</i>	Smooth sumac	Anacardiaceae	Shrub	Nt	UPL			
<i>Rhus radicans</i>	Poison ivy	Anacardiaceae	Vine	Nt	FAC			
<i>Rhus typhina</i>	Staghorn sumac	Anacardiaceae	Tree	Nt	UPL			
<i>Robinia pseudoacacia</i>	Black locust	Fabaceae	Tree	Ad	FACU			
<i>Rosa multiflora</i>	Multiflora rose	Rosaceae	Shrub	Ad	FACU			
<i>Rubus allegheniensis</i>	Northern blackberry	Rosaceae	Shrub	Nt	FACU			
<i>Rubus flagellaris</i>	American dewberry	Rosaceae	Shrub	Nt	FACU		X	X
<i>Rubus hispida</i>	Swamp dewberry	Rosaceae	Shrub	Nt	FACW			
<i>Rubus idaeus strigosus</i>	Red raspberry	Rosaceae	Shrub	Nt	FACU			
<i>Rubus occidentalis</i>	Black raspberry	Rosaceae	Shrub	Ad	UPL			
<i>Rudbeckia hirta</i>	Black-eyed Susan	Asteraceae	B-Forb	Nt	FACU			X
<i>Rumex acetosella</i>	Sheep sorrel	Polygonaceae	B-Forb	Ad	FACU			
<i>Rumex crispus</i>	Curly dock	Polygonaceae	P-Forb	Ad	FAC			
<i>Salix nigra</i>	Black willow	Salicaceae	Tree	Nt	OBL			
<i>Sassafras albidum</i>	Sassafras	Lauraceae	Tree	Nt	FACU			
<i>Scirpus atrovirens</i>	Dark green bulrush	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Scirpus cyperinus</i>	Cottongrass bulrush	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Scirpus pendulous</i>	Rufous bulrush	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Scirpus validus creber</i>	Great bulrush	Cyperaceae	P-Sedge	Nt	OBL			
<i>Secale cereale</i>	Rye	Poaceae	A-Grass	Ad	UPL			
<i>Setaria faberi</i>	Japanese bristle grass	Poaceae	A-Grass	Ad	FACU			
<i>Setaria sp.</i>	Bristle grass	Poaceae	A-Grass	Ad				
<i>Setaria viridis</i>	Green foxtail	Poaceae	A-Grass	Ad	FAC			
<i>Solanum nigrum</i>	Black nightshade	Solanaceae	P-Forb	Nt	FACU			
<i>Solidago altissima</i>	Tall goldenrod	Asteraceae	P-Forb	Nt	FACU			
<i>Solidago canadensis</i>	Canadian goldenrod	Asteraceae	P-Forb	Nt	FACU			
<i>Solidago gigantea</i>	Late goldenrod	Asteraceae	P-Forb	Nt	FACW			X
<i>Solidago graminifolia</i>	Common grass-leaved goldenrod	Asteraceae	P-Forb	Nt	FACW			X
<i>Solidago graminifolia nuttallii</i>	Hairy grass-leaved goldenrod	Asteraceae	P-Forb	Nt	FAC			X
<i>Solidago juncea</i>	Early goldenrod	Asteraceae	P-Forb	Nt	UPL			X

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<i>Solidago nemoralis</i>	Rough goldenrod	Asteraceae	P-Forb	Nt	UPL			X
<i>Solidago patula</i>	Spreading goldenrod	Asteraceae	P-Forb	Nt	OBL			
<i>Solidago rugosa</i>	Tall-hairy goldenrod	Asteraceae	P-Forb	Nt	FAC			X
<i>Spiraea alba</i>	Meadowsweet	Rosaceae	Shrub	Nt	FACW			X
<i>Symplocarpus foetidus</i>	Skunk-cabbage	Araceae	P-Forb	Nt	OBL			
<i>Taraxacum officinale</i>	Common dandelion	Asteraceae	P-Forb	Ad	FACU			
<i>Thalictrum dasycarpum</i>	Purple meadow rue	Ranunculaceae	P-Forb	Nt	FACW			X
<i>Thalictrum revolutum</i>	Waxy meadow rue	Ranunculaceae	P-Forb	Nt	FAC			X
<i>Trifolium arvense</i>	Rabbit foot clover	Fabaceae	A-Forb	Ad	UPL			
<i>Trifolium hybridum</i>	Alsike clover	Fabaceae	P-Forb	Ad	FACU			
<i>Trifolium pratense</i>	Red clover	Fabaceae	P-Forb	Ad	FACU			
<i>Trifolium repens</i>	White clover	Fabaceae	P-Forb	Ad	FACU			
<i>Triosteum aurantiacum</i>	Early horse gentain	Caprifoliaceae	P-Forb	Nt	UPL			
<i>Typha angustifolia</i>	Narrow-leaf cattail	Typhaceae	P-Forb	Nt	OBL			
<i>Typha latifolia</i>	Common cattail	Typhaceae	P-Forb	Nt	OBL			
<i>Ulmus americana</i>	American elm	Ulmaceae	Tree	Nt	FACW			
<i>Ulmus pumila</i>	Siberian elm	Ulmaceae	Tree	Ad	UPL			
<i>Vaccinium angustifolium</i>	Lowbush blueberry	Ericaceae	Shrub	Nt	FACU		X	X
<i>Verbascum thapsus</i>	Mullein	Scrophulariaceae	B-Forb	Ad	UPL			
<i>Verbena bracteata</i>	Carpet vervain	Verbenaceae	P-Forb	Nt	FACU			
<i>Verbena hastata</i>	Blue vervain	Verbenaceae	P-Forb	Nt	FACW			X
<i>Verbena urticifolia</i>	White vervain	Verbenaceae	P-Forb	Nt	FAC			X
<i>Veronica sp.</i>	Speedwell	Scrophulariaceae	Forb					
<i>Viburnum dentatum</i>	Southern arrowwood	Caprifoliaceae	Shrub	Nt	FAC			X
<i>Vicia cracca</i>	Cow vetch	Fabaceae	P-Forb	Ad	UPL			
<i>Vicia sp.</i>	Vetch	Fabaceae	A-Forb	Ad	UPL			
<i>Viola sororia</i>	Woolly blue violet	Violaceae	P-Forb	Nt	FAC			
<i>Viola sp.</i>	Violet	Violaceae	P-Forb					
<i>Vitis riparia</i>	Riverbank grape	Vitaceae	Vine	Nt	FAC			
<i>Xanthium strumarium</i>	Cocklebur	Asteraceae	A-Forb	Nt	FAC			

Categories		
Vascular Plant Families	61	
Non-Vascular Plant Families	0	
	No. Species	Percent
Total Species	265	100.0%
Native Species	195	73.6%
Adventive Species	62	23.4%
Unknown Species	8	3.0%
Largest Families Represented		
Aster Family (Asteraceae)	41	15.5%
Grass Family (Poaceae)	35	13.2%
Sedge Family (Cyperaceae)	22	8.3%
Rose Family (Rosaceae)	20	7.5%
Pea Family (Fabaceae)	13	4.9%
Physiognomy		
Perennial Forbs (P-Forb)	103	38.9%
Annual Forbs (A-Forb)	34	12.8%
Biennial Forbs (B-Forbs)	11	4.2%
Forbs	3	1.1%
Perennial Grass (P-Grass)	28	10.6%
Annual Grass (A-Grass)	13	4.9%
Grasses	1	0.4%
Perennial Sedge (P-Sedge)	22	8.3%
Alga	0	0.0%
Cryptogams	3	1.1%
Trees	22	8.3%
Shrubs	18	6.8%
Vines	7	2.6%
Miscellaneous		
Nectar/Larval Food Plants	7	2.6%
Seeded/Planted Species	87	32.8%
Rare Plants	3	1.1%
Wetland Classification		
Upland (UPL)	40	15.1%
Facultative Upland (FACU)	75	28.3%
Facultative (FAC)	49	18.5%
Facultative Wetland (FACW)	40	15.1%
Obligate Wetland (OBL)	43	16.2%
Unknown Species	18	6.8%
Total Hydrophytic Species	132	49.8%

Attachment 3. Phase II & III Quadrat Data

Rapp Road Landfill - PII, PIII Quadrat Data

Transect: DS-1

Date: August 4, 2013

Samplers: John Larson, John Greaves, Matt Shawl

Nt/Ad	Physiog	SPECIES	AVG				IV	STD												
			AF	RF	AC	RC			1	2	3	4	5	6	7	8	9	10		
Ad	A-Grass	<i>Digitaria sanguinalis</i>	4	2.78	7.30	10.72	13.50	13.23	3	40	20	10								
Nt	P-Sedge	<i>Carex vulpinoidea</i>	3	2.08	5.60	8.22	10.31	15.68						5			1			50
Nt	P-Forb	<i>Solidago altissima</i>	3	2.08	5.50	8.08	10.16	15.67	3								2		50	
Nt	P-Forb	<i>Desmodium canadense</i>	4	2.78	2.70	3.96	6.74	6.18	2	20	2			3						
Ad	P-Forb	<i>Trifolium repens</i>	3	2.08	3.00	4.41	6.49	6.32					5	5			20			
Nt	A-Forb	<i>Erigeron canadensis</i>	3	2.08	2.90	4.26	6.34	7.82					3				1		25	
Nt	Tree	<i>Populus deltoides</i>	4	2.78	2.00	2.94	5.71	3.74	8		1				1		10			
Nt	P-Forb	<i>Aster pilosus</i>	2	1.39	2.70	3.96	5.35	7.86	2				25							
Nt	P-Forb	<i>Solidago graminifolia</i>	3	2.08	1.80	2.64	4.73	3.36	3						5		10			
Nt	P-Grass	<i>Andropogon gerardii</i>	4	2.78	1.10	1.62	4.39	1.66	2	5				2	2					
Ad	Vine	<i>Celastrus orbiculatus</i>	5	3.47	0.60	0.88	4.35	0.70	1	1				1			2		1	
Nt	P-Forb	<i>Solidago juncea</i>	3	2.08	1.50	2.20	4.29	2.42	5					5			5			
Ad	A-Grass	<i>Echinochloa crusgalli</i>	2	1.39	1.80	2.64	4.03	4.73	15				3							
Nt	A-Forb	<i>Cassia fasciculata</i>	3	2.08	1.30	1.91	3.99	3.13						2	10				1	
Nt	A-Grass	<i>Eragrostis hypnoides</i>	3	2.08	1.30	1.91	3.99	2.16			3	5	5							
Nt	B-Forb	<i>Rudbeckia hirta</i>	3	2.08	1.30	1.91	3.99	3.13	1					10					2	
Nt	A-Forb	<i>Ambrosia artemisiifolia</i>	4	2.78	0.70	1.03	3.81	0.95		2	2	2					1			
Nt	P-Forb	<i>Alisma subcordatum</i>	1	0.69	2.00	2.94	3.63	6.32								20				
Nt	P-Grass	<i>Leersia oryzoides</i>	3	2.08	1.00	1.47	3.55	1.63							3	3	4			
Nt	P-Forb	<i>Lespedeza capitata</i>	3	2.08	1.00	1.47	3.55	1.63		4	3			3						
Nt	P-Grass	<i>Andropogon scoparius</i>	3	2.08	0.90	1.32	3.40	1.73	3	5	1									
Nt	Tree	<i>Acer rubra</i>	4	2.78	0.40	0.59	3.37	0.52	1		1			1			1			
Nt	Cryptogam	<i>Equisetum arvense</i>	3	2.08	0.80	1.17	3.26	1.40						2	2		4			
Nt	P-Sedge	<i>Scirpus pendulous</i>	3	2.08	0.80	1.17	3.26	1.40						4	2	2				
Nt	P-Grass	<i>Glyceria striata</i>	2	1.39	1.20	1.76	3.15	3.16						10			2			
Nt	P-Forb	<i>Aster ericoides</i>	2	1.39	1.00	1.47	2.86	2.11	5					5						
Nt	P-Sedge	<i>Carex scoparia</i>	2	1.39	1.00	1.47	2.86	2.11						5			5			
Nt	A-Forb	<i>Polygonum pensylvanicum</i>	3	2.08	0.50	0.73	2.82	0.85		1		2					2			
Nt	P-Forb	<i>Verbena hastata</i>	3	2.08	0.50	0.73	2.82	0.85	1					2	2					
Nt	P-Forb	<i>Lycopus americanus</i>	2	1.39	0.90	1.32	2.71	1.91							4		5			
Ad	P-Forb	<i>Plantago major</i>	3	2.08	0.30	0.44	2.52	0.48	1		1	1								
Nt	A-Grass	<i>Panicum capillare</i>	2	1.39	0.70	1.03	2.42	1.49			4	3								
Nt	P-Forb	<i>Eupatorium perfoliatum</i>	2	1.39	0.60	0.88	2.27	1.35						2	4					
Nt	P-Sedge	<i>Cyperus houghtonii</i>	2	1.39	0.60	0.88	2.27	1.35	2											4
Nt	P-Grass	<i>Juncus nodosus</i>	1	0.69	1.00	1.47	2.16	3.16							10					
Nt	P-Sedge	<i>Scirpus atrovirens</i>	1	0.69	1.00	1.47	2.16	3.16							10					
Nt	P-Grass	<i>Juncus tenuis</i>	2	1.39	0.40	0.59	1.98	0.84	2					2						
Nt	P-Forb	<i>Solidago gigantea</i>	2	1.39	0.40	0.59	1.98	0.84							2		2			
Nt	P-Forb	<i>Asclepias incarnata</i>	2	1.39	0.30	0.44	1.83	0.67							1		2			
Nt	P-Forb	<i>Aster novae-angliae</i>	2	1.39	0.30	0.44	1.83	0.67							1		2			
Ad	P-Forb	<i>Medicago lupulina</i>	2	1.39	0.30	0.44	1.83	0.67	2					1						

Ad	A-Forb	<i>Chenopodium album</i>	2	1.39	0.20	0.29	1.68	0.42
Nt	P-Forb	<i>Epilobium coloratum</i>	2	1.39	0.20	0.29	1.68	0.42
Nt	P-Forb	<i>Euphorbia maculata</i>	2	1.39	0.20	0.29	1.68	0.42
Nt	P-Sedge	<i>Eleocharis palustris</i>	1	0.69	0.50	0.73	1.43	1.58
Nt	P-Grass	<i>Juncus effusus</i>	1	0.69	0.50	0.73	1.43	1.58
Nt	P-Grass	<i>Juncus torreyi</i>	1	0.69	0.50	0.73	1.43	1.58
Nt	P-Forb	<i>Monarda punctata</i>	1	0.69	0.50	0.73	1.43	1.58
Nt	P-Forb	<i>Thalictrum revolutum</i>	1	0.69	0.50	0.73	1.43	1.58
Nt	P-Forb	<i>Helianthus grosseserratus</i>	1	0.69	0.40	0.59	1.28	1.26
Nt	P-Sedge	<i>Cyperus esculentus</i>	1	0.69	0.30	0.44	1.13	0.95
Nt	P-Forb	<i>Solidago nemoralis</i>	1	0.69	0.30	0.44	1.13	0.95
Nt	P-Forb	<i>Aster lanceolatus</i>	1	0.69	0.20	0.29	0.99	0.63
Nt	P-Forb	<i>Aster puniceus</i>	1	0.69	0.20	0.29	0.99	0.63
Nt	P-Sedge	<i>Carex hystericina</i>	1	0.69	0.20	0.29	0.99	0.63
Ad	B-Forb	<i>Daucus carota</i>	1	0.69	0.20	0.29	0.99	0.63
Nt	A-Forb	<i>Diodia teres</i>	1	0.69	0.20	0.29	0.99	0.63
Nt	P-Grass	<i>Juncus dudleyi</i>	1	0.69	0.20	0.29	0.99	0.63
Ad	P-Grass	<i>Poa pratensis</i>	1	0.69	0.20	0.29	0.99	0.63
Ad	P-Forb	<i>Potentilla argentea</i>	1	0.69	0.20	0.29	0.99	0.63
Nt	P-Forb	<i>Pycnanthemum tenuifolium</i>	1	0.69	0.20	0.29	0.99	0.63
Nt	P-Forb	<i>Typha latifolia</i>	1	0.69	0.20	0.29	0.99	0.63
Nt	Vine	<i>Vitis riparia</i>	1	0.69	0.20	0.29	0.99	0.63
Nt	P-Forb	<i>Apocynum cannabinum</i>	1	0.69	0.10	0.15	0.84	0.32
Nt	A-Forb	<i>Bidens frondosa</i>	1	0.69	0.10	0.15	0.84	0.32
Nt	A-Forb	<i>Bidens tripartita</i>	1	0.69	0.10	0.15	0.84	0.32
Nt	P-Forb	<i>Lupinus perennis</i>	1	0.69	0.10	0.15	0.84	0.32
Ad	P-Forb	<i>Lythrum salicaria</i>	1	0.69	0.10	0.15	0.84	0.32
Nt	P-Forb	<i>Mimulus ringens</i>	1	0.69	0.10	0.15	0.84	0.32
Nt	A-Forb	<i>Oxalis europaea</i>	1	0.69	0.10	0.15	0.84	0.32
Nt	P-Grass	<i>Panicum acuminatum</i>	1	0.69	0.10	0.15	0.84	0.32
			144	100.00	68.10	100.00	200.00	
Non-vegetative ground cover								
	Soil		9	32.14	38.50	49.61	81.76	37.49
	Fine litter		10	35.71	31.90	41.11	76.82	30.83
	Coarse litter		2	7.14	0.40	0.52	7.66	0.97
	Bryophyte		4	14.29	6.40	8.25	22.53	12.72
	Rock		3	10.71	0.40	0.52	11.23	0.70
	Water		0	0.00	0.00	0.00	0.00	0.00
			28	100.00	77.60	100.00	200.00	

		1		1					
					1			1	
		1	1						
						5			
						5			
	5								
	5								
4									
			3						
				3					
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		1							
1								1	
									1
									1
60	40	75	80	10		100	10	5	5
2	10	10	2	25	75	25	20	75	75
				3	1				
				40	4		15	5	
1		1	2						

Rapp Road Landfill - PII, PIII Quadrat Data

Transect: DS-2

Date: August 4, 2013

Samplers: John Larson, John Greaves, Matt Shawl

Nt/Ad	Physiog	SPECIES	AVG					STD	10									
			AF	RF	AC	RC	IV		1	2	3	4	5	6	7	8	9	10
Nt	A-Forb	<i>Erigeron canadensis</i>	6	2.71	6.60	6.97	9.68	15.44	2	50		1			3		2	8
Nt	P-Forb	<i>Solidago graminifolia</i>	5	2.26	6.40	6.76	9.02	9.72					3	15	25	1	20	
Nt	B-Forb	<i>Rudbeckia hirta</i>	5	2.26	4.80	5.07	7.33	7.45		1			20		15		2	10
Nt	Cryptogam	<i>Equisetum arvense</i>	5	2.26	3.10	3.27	5.54	3.75		5			3		8		5	10
Nt	P-Forb	<i>Verbena hastata</i>	7	3.17	2.20	2.32	5.49	1.87	2	5				5	3	2	2	3
Nt	P-Forb	<i>Solidago juncea</i>	6	2.71	2.30	2.43	5.14	2.21	2			3	5	3	5		5	
Nt	P-Sedge	<i>Carex vulpinoidea</i>	4	1.81	2.90	3.06	4.87	5.28						10	1	15	3	
Nt	P-Sedge	<i>Carex hystericina</i>	1	0.45	4.00	4.22	4.68	12.65								40		
Nt	P-Forb	<i>Eupatorium perfoliatum</i>	4	1.81	2.60	2.75	4.56	3.81						10	5	3	8	
Nt	P-Forb	<i>Solidago gigantea</i>	6	2.71	1.40	1.48	4.19	1.35				1	2	3	3	2	3	
Nt	P-Forb	<i>Pycnanthemum tenuifolium</i>	2	0.90	2.70	2.85	3.76	7.86	25					2				
Ad	A-Forb	<i>Trifolium arvense</i>	4	1.81	1.50	1.58	3.39	3.10		10		2	1		2			
Nt	P-Forb	<i>Aster novae-angliae</i>	4	1.81	1.30	1.37	3.18	1.83						3	2		3	5
Ad	Vine	<i>Celastrus orbiculatus</i>	3	1.36	1.70	1.80	3.15	3.27		10				4	3			
Nt	P-Forb	<i>Lycopus americanus</i>	3	1.36	1.70	1.80	3.15	3.33						10		2	5	
Nt	A-Grass	<i>Panicum capillare</i>	2	0.90	2.00	2.11	3.02	4.22			10						10	
Nt	P-Forb	<i>Solidago altissima</i>	4	1.81	1.10	1.16	2.97	1.66		2			2	2				5
Nt	Tree	<i>Acer rubrum</i>	5	2.26	0.50	0.53	2.79	0.53		1	1	1		1	1			
Ad	P-Forb	<i>Galium odoratum</i>	4	1.81	0.90	0.95	2.76	1.20			3		2	2			2	
Nt	P-Forb	<i>Desmodium canadense</i>	3	1.36	1.30	1.37	2.73	3.13	2		1	10						
Nt	P-Sedge	<i>Scirpus atrovirens</i>	2	0.90	1.60	1.69	2.59	4.72							15	1		
Nt	A-Grass	<i>Eragrostis hypnoides</i>	1	0.45	2.00	2.11	2.56	6.32			20							
Nt	P-Grass	<i>Panicum acuminatum</i>	3	1.36	1.10	1.16	2.52	2.51					1	8	2			
Nt	B-Forb	<i>Oenothera biennis</i>	2	0.90	1.50	1.58	2.49	3.37			10		5					
Ad	A-Grass	<i>Setaria viridis</i>	2	0.90	1.50	1.58	2.49	3.37				10	5					
Nt	P-Grass	<i>Andropogon gerardii</i>	4	1.81	0.60	0.63	2.44	0.84	1				2		2			1
Nt	P-Forb	<i>Potentilla norvegica</i>	4	1.81	0.60	0.63	2.44	0.84		1					2	1	2	
Nt	A-Forb	<i>Ambrosia artemisiifolia</i>	3	1.36	1.00	1.06	2.41	1.89				4			5			1
Nt	P-Forb	<i>Asclepias incarnata</i>	3	1.36	1.00	1.06	2.41	1.76						5		2		3
Nt	P-Sedge	<i>Carex scoparia</i>	3	1.36	0.90	0.95	2.31	1.66					2			5	2	
Nt	P-Grass	<i>Leersia oryzoides</i>	2	0.90	1.30	1.37	2.28	3.20						3		10		
Nt	A-Forb	<i>Erigeron strigosus</i>	3	1.36	0.80	0.84	2.20	1.62				1				5		2
Ad	P-Forb	<i>Trifolium repens</i>	3	1.36	0.80	0.84	2.20	1.32		3				3	2			
Ad	P-Grass	<i>Bromus sp.</i>	1	0.45	1.50	1.58	2.04	4.74								15		
Nt	B-Forb	<i>Lobelia inflata</i>	3	1.36	0.60	0.63	1.99	1.26					1	1				4
Ad	B-Forb	<i>Daucus carota</i>	2	0.90	1.00	1.06	1.96	2.54				8						2
Ad	A-Grass	<i>Digitaria sanguinalis</i>	2	0.90	1.00	1.06	1.96	2.11			5		5					
Ad	P-Forb	<i>Cirsium arvense</i>	3	1.36	0.50	0.53	1.89	0.85		2					1	2		
Nt	P-Forb	<i>Convolvulus sepium</i>	2	0.90	0.90	0.95	1.86	1.91								5	4	
Nt	P-Forb	<i>Fragaria virginiana</i>	2	0.90	0.90	0.95	1.86	2.51					8	1				
Ad	P-Forb	<i>Hypericum perforatum</i>	3	1.36	0.40	0.42	1.78	0.70		1				1	2			
Nt	P-Forb	<i>Lespedeza capitata</i>	3	1.36	0.40	0.42	1.78	0.70	1			2	1					

Ad	B-Forb	<i>Verbascum thapsus</i>	1	0.45	0.20	0.21	0.66	0.63
	Forb	<i>Veronica sp.</i>	1	0.45	0.20	0.21	0.66	0.63
Nt	P-Forb	<i>Apocynum cannabinum</i>	1	0.45	0.10	0.11	0.56	0.32
Ad	A-Forb	<i>Chenopodium album</i>	1	0.45	0.10	0.11	0.56	0.32
Nt	Vine	<i>Clematis virginiana</i>	1	0.45	0.10	0.11	0.56	0.32
Ad	P-Forb	<i>Glechoma hederacea</i>	1	0.45	0.10	0.11	0.56	0.32
Ad	P-Forb	<i>Medicago lupulina</i>	1	0.45	0.10	0.11	0.56	0.32
Nt	P-Forb	<i>Mimulus ringens</i>	1	0.45	0.10	0.11	0.56	0.32
Nt	P-Forb	<i>Penthorum sedoides</i>	1	0.45	0.10	0.11	0.56	0.32
Nt	P-Forb	<i>Plantago rugelii</i>	1	0.45	0.10	0.11	0.56	0.32
Nt	P-Forb	<i>Solidago rugosa</i>	1	0.45	0.10	0.11	0.56	0.32
Nt	Vine	<i>Vitis riparia</i>	1	0.45	0.10	0.11	0.56	0.32
			221	100.00	94.70	100.00	200.00	
Non-vegetative ground cover								
		Soil	10	35.71	29.50	36.33	72.04	31.84
		Fine litter	9	32.14	29.50	36.33	68.47	24.88
		Coarse litter	2	7.14	0.50	0.62	7.76	1.08
		Bryophyte	6	21.43	21.50	26.48	47.91	23.81
		Rock	1	3.57	0.20	0.25	3.82	0.63
		Water	0	0.00	0.00	0.00	0.00	0.00
			28	100.00	81.20	100.00	200.00	

						2			
								2	
					1				
									1
								1	
					1				
						1			
								1	
		1							
			1						
							1		
70	10	80	75	15	5	5	5	10	20
5	10		10	40	50	40	75	15	50
		2							3
	20			50	50	60		10	25
		2							

Nt	A-Forb	<i>Bidens frondosa</i>	1	1.41	0.10	0.30	1.70	0.32
Nt	P-Sedge	<i>Cyperus houghtonii</i>	1	1.41	0.10	0.30	1.70	0.32
Nt	P-Forb	<i>Geum canadense</i>	1	1.41	0.10	0.30	1.70	0.32
Nt	P-Grass	<i>Juncus tenuis</i>	1	1.41	0.10	0.30	1.70	0.32
Nt	B-Forb	<i>Lobelia inflata</i>	1	1.41	0.10	0.30	1.70	0.32
Nt	P-Forb	<i>Potentilla norvegica</i>	1	1.41	0.10	0.30	1.70	0.32
Nt	P-Forb	<i>Solidago rugosa</i>	1	1.41	0.10	0.30	1.70	0.32
			71	100.00	33.80	100.00	200.00	
Non-vegetative ground cover								
		Soil	4	44.44	12.50	54.59	99.03	28.31
		Fine litter	0	0.00	0.00	0.00	0.00	0.00
		Coarse litter	1	11.11	0.20	0.87	11.98	0.63
		Bryophyte	3	33.33	5.20	22.71	56.04	10.45
		Rock	0	0.00	0.00	0.00	0.00	0.00
		Water	1	11.11	5.00	21.83	32.95	15.81
			9	100.00	22.90	100.00	200.00	

									1			
										1		
												1
										1		
												1
											1	
									10	80	5	3
									5	5	90	25
												2
										2	25	25
									50			

Rapp Road Landfill - PII, PIII Quadrat Data
 Transect: E-3
 Date: August 4, 2013
 Samplers: John Larson, John Price

Nt/Ad	Physiog	SPECIES	AVG															
			AF	RF	AC	RC	IV	STD	1	2	3	4	5	6	7	8	9	10
Ad	Vine	<i>Celastrus orbiculatus</i>	9	13.64	15.60	19.14	32.78	16.63	2	5	20	35	50	10	3	25	6	
Nt	Tree	<i>Prunus serotina</i>	5	7.58	9.60	11.78	19.35	14.55	1			40	30	15		10		
Nt	Vine	<i>Parthenocissus quinquefolia</i>	4	6.06	9.80	12.02	18.09	14.92	30	8		40	20					
Ad	A-Grass	<i>Lolium multiflorum</i>	1	1.52	9.50	11.66	13.17	30.04										95
Nt	P-Forb	<i>Osmunda claytoniana</i>	1	1.52	8.00	9.82	11.33	25.30		80								
Nt	Forb	Fern sp.	3	4.55	2.80	3.44	7.98	4.54				10	8		10			
Nt	Shrub	<i>Lindera benzoin</i>	1	1.52	5.00	6.13	7.65	15.81			50							
Nt	Vine	<i>Vitis riparia</i>	3	4.55	1.70	2.09	6.63	3.33	10		5							2
Nt	P-Forb	<i>Symplocarpus foetidus</i>	2	3.03	3.00	3.68	6.71	6.75			10				20			
Nt	Tree	<i>Carpinus caroliniana</i>	3	4.55	1.20	1.47	6.02	1.99					4	3		5		
Nt	Tree	<i>Fraxinus pennsylvanica</i>	2	3.03	2.20	2.70	5.73	4.66				12					10	
Nt	Tree	<i>Acer rubrum</i>	3	4.55	0.40	0.49	5.04	0.70	1						1			2
Nt	P-Forb	<i>Podophyllum peltatum</i>	2	3.03	1.80	2.21	5.24	3.82		10				8				
Nt	Shrub	<i>Hamamelis virginiana</i>	2	3.03	1.60	1.96	4.99	3.37					8		8			
Nt	P-Forb	<i>Phytolacca americana</i>	2	3.03	1.20	1.47	4.50	2.70									4	8
Nt	Shrub	<i>Rubus allegheniensis</i>	2	3.03	0.60	0.74	3.77	1.58	5								1	
Nt	P-Forb	<i>Aster divaricatus</i>	2	3.03	0.30	0.37	3.40	0.67									2	1
Nt	P-Forb	<i>Circaea lutetiana</i>	1	1.52	1.20	1.47	2.99	3.79									12	
Ad	B-Forb	<i>Alliaria petiolata</i>	1	1.52	0.80	0.98	2.50	2.53									8	
Ad	A-Grass	<i>Avena sativa</i>	1	1.52	0.80	0.98	2.50	2.53	8									
Nt	P-Forb	<i>Hackelia virginiana</i>	1	1.52	0.80	0.98	2.50	2.53		8								
Nt	A-Forb	<i>Erechtites hieracifolia</i>	1	1.52	0.50	0.61	2.13	1.58									5	
Nt	P-Forb	<i>Solanum nigrum</i>	1	1.52	0.50	0.61	2.13	1.58										5
Nt	P-Forb	<i>Aster</i> sp.	1	1.52	0.40	0.49	2.01	1.26		4								
Nt	P-Sedge	<i>Carex blanda</i>	1	1.52	0.30	0.37	1.88	0.95									3	
Nt	P-Forb	<i>Eupatorium rugosum</i>	1	1.52	0.30	0.37	1.88	0.95									3	
Nt	Shrub	<i>Prunus virginiana</i>	1	1.52	0.30	0.37	1.88	0.95	3									
Ad	B-Forb	<i>Lactuca seriola</i>	1	1.52	0.20	0.25	1.76	0.63			2							
Nt	A-Forb	<i>Oxalis stricta</i>	1	1.52	0.20	0.25	1.76	0.63										2
Nt	P-Grass	<i>Panicum acuminatum</i>	1	1.52	0.20	0.25	1.76	0.63										2
Ad	Shrub	<i>Rosa multiflora</i>	1	1.52	0.20	0.25	1.76	0.63		2								
Nt	A-Forb	<i>Acalypha rhomboidea</i>	1	1.52	0.10	0.12	1.64	0.32	1									
Ad	A-Forb	<i>Chenopodium album</i>	1	1.52	0.10	0.12	1.64	0.32										1
Nt	A-Forb	<i>Impatiens capensis</i>	1	1.52	0.10	0.12	1.64	0.32			1							
Nt	Cryptogam	<i>Onoclea sensibilis</i>	1	1.52	0.10	0.12	1.64	0.32								1		
Nt	Forb	<i>Viola</i> sp.	1	1.52	0.10	0.12	1.64	0.32		1								
			66	100.00	81.50	100.00	200.00	0.00										
Non-vegetative ground cover																		
		Soil	8	32.00	23.20	23.79	55.79	29.79	14	30	40			10	15	5	18	100
		Fine litter	9	36.00	65.00	66.67	102.67	28.67	85	50	60	85	70	90	40	90	80	
		Coarse litter	7	28.00	9.20	9.44	37.44	10.04		20	10	15	30		10	5	2	

Bryophyte	1	4.00	0.10	0.10	4.10	0.32
Rock	0	0.00	0.00	0.00	0.00	0.00
Water	0	0.00	0.00	0.00	0.00	0.00
	25	100.00	97.50	100.00	200.00	

1									

Rapp Road Landfill - PII, PIII Quadrat Data

Transect: E-4

Date: August 4, 2013

Samplers: Susan Lehnhardt, Chris Einstein, Sue Vilord

Nt/Ad	Physiog	SPECIES	AVG				IV	STD										
			AF	RF	AC	RC			1	2	3	4	5	6	7	8	9	10
Nt	P-Grass	<i>Panicum acuminatum</i>	5	4.10	18.00	20.45	24.55	20.44		40			30	50			40	20
Nt	Shrub	<i>Rubus flagellaris</i>	5	4.10	10.20	11.59	15.69	21.88						4	3	5	20	70
Nt	Tree	<i>Acer rubrum</i>	4	3.28	4.80	5.45	8.73	9.43					1	25		20	2	
Nt	Tree	<i>Prunus serotina</i>	3	2.46	5.00	5.68	8.14	8.82						10		15		25
Nt	Cryptogam	<i>Onoclea sensibilis</i>	4	3.28	3.40	3.86	7.14	9.37			1	2		30		1		
Nt	P-Forb	<i>Verbena hastata</i>	4	3.28	3.20	3.64	6.92	5.07		15	8	6	3					
Ad	P-Forb	<i>Trifolium repens</i>	4	3.28	2.50	2.84	6.12	4.09		10	10	3						2
Nt	A-Forb	<i>Acalypha rhomboidea</i>	3	2.46	2.80	3.18	5.64	6.29			5	20					3	
Nt	P-Forb	<i>Lycopus americanus</i>	3	2.46	2.60	2.95	5.41	5.06			8	15	3					
Nt	Tree	<i>Betula populifolia</i>	2	1.64	3.10	3.52	5.16	9.46		1							30	
Nt	P-Forb	<i>Eupatorium perfoliatum</i>	4	3.28	1.60	1.82	5.10	2.84		2	3	9	2					
Nt	P-Grass	<i>Juncus dudleyi</i>	2	1.64	3.00	3.41	5.05	6.75			20	10						
Nt	A-Forb	<i>Oxalis europaea</i>	3	2.46	2.00	2.27	4.73	3.77		2	8			10				
Nt	Tree	<i>Quercus rubra</i>	3	2.46	1.70	1.93	4.39	3.47							1	10		6
Nt	A-Forb	<i>Erechtites hieracifolia</i>	1	0.82	3.00	3.41	4.23	9.49									30	
Nt	P-Grass	<i>Juncus effusus</i>	4	3.28	0.70	0.80	4.07	2.21			7							
Nt	P-Forb	<i>Solidago graminifolia nuttallii</i>	4	3.28	0.50	0.57	3.85	0.71			1	1	2					1
Nt	P-Forb	<i>Galium triflorum</i>	3	2.46	0.70	0.80	3.25	1.34				2	4				1	
Nt	A-Forb	<i>Polygonum pensylvanicum</i>	3	2.46	0.70	0.80	3.25	1.34			2		1					4
Nt	B-Forb	<i>Lobelia inflata</i>	2	1.64	1.30	1.48	3.12	3.20			10	3						
Ad	A-Grass	<i>Echinochloa crusgalli</i>	1	0.82	2.00	2.27	3.09	6.32		20								
Nt	P-Forb	<i>Solidago juncea</i>	3	2.46	0.30	0.34	2.80	0.48			1	1	1					
Nt	P-Sedge	<i>Carex lupulina</i>	2	1.64	1.00	1.14	2.78	2.11			5	5						
Ad	P-Forb	<i>Rumex crispus</i>	3	2.46	0.10	0.11	2.57	0.32			1							
Nt	P-Forb	<i>Potentilla simplex</i>	2	1.64	0.60	0.68	2.32	1.58		1				5				
Nt	P-Sedge	<i>Cyperus esculentus</i>	2	1.64	0.50	0.57	2.21	1.27									4	1
Nt	Shrub	<i>Spiraea alba</i>	2	1.64	0.50	0.57	2.21	1.27							1			4
Ad	P-Grass	<i>Agrostis alba</i>	2	1.64	0.40	0.45	2.09	0.97				1						3
Nt	P-Forb	<i>Lysimachia ciliata</i>	2	1.64	0.40	0.45	2.09	0.97				1		3				
Nt	A-Forb	<i>Bidens frondosa</i>	1	0.82	1.00	1.14	1.96	3.16			10							
Nt	P-Forb	<i>Plantago rugelii</i>	2	1.64	0.20	0.23	1.87	0.42		1	1							
Nt	P-Forb	<i>Solidago canadensis</i>	2	1.64	0.20	0.23	1.87	0.42		1			1					
Ad	Vine	<i>Celastrus orbiculatus</i>	1	0.82	0.80	0.91	1.73	2.53						8				
Ad	P-Grass	<i>Poa compressa</i>	1	0.82	0.80	0.91	1.73	2.53										8
Nt	Tree	<i>Populus tremuloides</i>	0	0.00	1.40	1.59	1.59	3.17		3		1		10				
Nt	P-Forb	<i>Eupatorium maculatum</i>	1	0.82	0.60	0.68	1.50	1.90				6						
Nt	P-Forb	<i>Triosteum aurantiacum</i>	1	0.82	0.50	0.57	1.39	1.58				5						
Nt	P-Forb	<i>Aster lateriflorus</i>	1	0.82	0.40	0.45	1.27	1.26					4					
Nt	P-Sedge	<i>Carex bebbii</i>	1	0.82	0.40	0.45	1.27	1.26				4						
Nt	A-Forb	<i>Conyza canadensis</i>	1	0.82	0.40	0.45	1.27	1.26		4								
Nt	Tree	<i>Fraxinus pennsylvanica subintegerrima</i>	1	0.82	0.40	0.45	1.27	1.26						4				
Ad	P-Forb	<i>Hypericum perforatum</i>	1	0.82	0.40	0.45	1.27	1.26			4							

Nt	P-Grass	<i>Leersia oryzoides</i>	1	0.82	0.40	0.45	1.27	1.26
Nt	P-Forb	<i>Monarda punctata</i>	1	0.82	0.40	0.45	1.27	1.26
Nt	P-Forb	<i>Hypericum mutilum</i>	1	0.82	0.30	0.34	1.16	0.95
Nt	Tree	<i>Sassafras albidum</i>	1	0.82	0.30	0.34	1.16	0.95
Nt	P-Forb	<i>Solidago gigantea</i>	1	0.82	0.30	0.34	1.16	0.48
Nt	A-Forb	<i>Bidens cernua</i>	1	0.82	0.20	0.23	1.05	0.63
Nt	P-Grass	<i>Juncus tenuis</i>	1	0.82	0.20	0.23	1.05	0.63
Nt	P-Forb	<i>Phytolacca americana</i>	1	0.82	0.20	0.23	1.05	0.63
Nt	Shrub	<i>Rubus allegheniensis</i>	1	0.82	0.20	0.23	1.05	0.63
Nt	P-Grass	<i>Agrostis perennans</i>	1	0.82	0.10	0.11	0.93	0.32
Nt	P-Forb	<i>Boehmeria cylindrica</i>	1	0.82	0.10	0.11	0.93	0.32
Nt	P-Sedge	<i>Carex blanda</i>	1	0.82	0.10	0.11	0.93	0.32
Nt	P-Sedge	<i>Carex hystericina</i>	1	0.82	0.10	0.11	0.93	0.32
Nt	P-Sedge	<i>Carex sp.</i>	1	0.82	0.10	0.11	0.93	0.32
Ad	A-Forb	<i>Chenopodium album</i>	1	0.82	0.10	0.11	0.93	0.32
Nt	P-Forb	<i>Epilobium coloratum</i>	1	0.82	0.10	0.11	0.93	0.32
Ad	P-Forb	<i>Hieracium sp.</i>	1	0.82	0.10	0.11	0.93	0.32
Nt	P-Forb	<i>Hypericum canadense</i>	1	0.82	0.10	0.11	0.93	0.32
Nt	B-Forb	<i>Rudbeckia hirta</i>	1	0.82	0.10	0.11	0.93	0.32
Nt	P-Forb	<i>Solidago patula</i>	1	0.82	0.10	0.11	0.93	0.32
Nt	P-Forb	<i>Solidago rugosa</i>	1	0.82	0.10	0.11	0.93	0.32
Ad	P-Forb	<i>Trifolium hybridum</i>	1	0.82	0.10	0.11	0.93	0.32
Nt	Shrub	<i>Viburnum dentatum</i>	1	0.82	0.10	0.11	0.93	0.32
			122	100.00	88.00	100.00	200.00	

Non-vegetative ground cover

Soil	6	22.22	11.80	11.27	33.49	22.45
Fine litter	9	33.33	74.20	70.87	104.20	35.05
Coarse litter	3	11.11	2.70	2.58	13.69	6.25
Bryophyte	8	29.63	6.00	5.73	35.36	7.32
Rock	0	0.00	0.00	0.00	0.00	0.00
Water	1	3.70	10.00	9.55	13.25	31.62
		27	100.00	104.70	100.00	200.00

			4						
					4				
			3						
									3
	1	1		1					
		2							
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					2				
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			1						
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					1				
				1					
						1			
	1								
			1						
					1				
	25		1	70	1	20			1
	65	95	95	25	98	73	100	91	100
							20	3	4
	10	5	4	5	1	25		5	5
100									

Rapp Road Landfill - PII, PIII Quadrat Data

Transect: E-6

Date: August 4, 2013

Samplers: John Price, Sue Vilord, Susan Lehnardt, John Larson

Nt/Ad	Physiog	SPECIES	AVG															
			AF	RF	AC	RC	IV	STD	1	2	3	4	5	6	7	8	9	10
Ad	P-Forb	<i>Trifolium repens</i>	5	4.27	7.80	9.74	14.01	11.08			25	8	10	5	30			
Nt	P-Forb	<i>Solidago gigantea</i>	4	3.42	7.80	9.74	13.16	21.93				1			6	70	1	
Nt	P-Forb	<i>Verbena hastata</i>	5	4.27	5.20	6.49	10.77	9.26			8	7	2	5	30			
Nt	P-Forb	<i>Aster lateriflorus</i>	6	5.13	4.30	5.37	10.50	6.38				3		20	5	10	4	1
Nt	A-Forb	<i>Bidens tripartita</i>	4	3.42	5.20	6.49	9.91	8.72			15	25	10	2				
Nt	P-Grass	<i>Panicum acuminatum</i>	4	3.42	4.70	5.87	9.29	9.33				8		30	5	4		
Nt	Vine	<i>Parthenocissus quinquefolia</i>	3	2.56	3.80	4.74	7.31	7.96								5	25	8
Nt	P-Grass	<i>Juncus effusus</i>	1	0.85	5.00	6.24	7.10	15.81					50					
Nt	P-Forb	<i>Eupatorium perfoliatum</i>	4	3.42	2.40	3.00	6.42	3.41			8	5		3	8			
Nt	P-Forb	<i>Solidago graminifolia</i>	3	2.56	2.70	3.37	5.93	5.08				8		4	15			
Ad	Vine	<i>Celastrus orbiculatus</i>	3	2.56	2.20	2.75	5.31	3.71								10	6	6
Nt	B-Forb	<i>Lobelia inflata</i>	4	3.42	1.40	1.75	5.17	2.55				2		1	8	3		
Ad	Shrub	<i>Lonicera tatarica</i>	2	1.71	2.20	2.75	4.46	4.66									12	10
Nt	Cryptogam	<i>Onoclea sensibilis</i>	2	1.71	2.00	2.50	4.21	4.83							5			15
Nt	P-Forb	<i>Potentilla canadensis</i>	3	2.56	1.20	1.50	4.06	1.99				5		4	3			
Nt	P-Forb	<i>Solidago canadensis</i>	3	2.56	1.20	1.50	4.06	2.10				5		5	2			
Nt	Tree	<i>Acer rubrum</i>	4	3.42	0.50	0.62	4.04	0.71					1	1	1		2	
Nt	P-Sedge	<i>Carex hystericina</i>	1	0.85	2.50	3.12	3.98	7.91					25					
Nt	P-Forb	<i>Eupatorium maculatum</i>	3	2.56	1.00	1.25	3.81	2.00			1		3		6			
Nt	P-Forb	<i>Lycopus americanus</i>	3	2.56	1.00	1.25	3.81	2.00					1	3	6			
Nt	P-Forb	<i>Mimulus ringens</i>	2	1.71	1.10	1.37	3.08	2.60						3	8			
Nt	Tree	<i>Quercus rubra</i>	1	0.85	1.40	1.75	2.60	4.43										14
Nt	A-Forb	<i>Oxalis stricta</i>	2	1.71	0.60	0.75	2.46	1.58				1			5			
Nt	P-Forb	<i>Solidago rugosa</i>	2	1.71	0.60	0.75	2.46	1.26			3							3
Nt	P-Sedge	<i>Carex rosea</i>	1	0.85	1.00	1.25	2.10	3.16										10
Ad	P-Forb	<i>Trifolium pratense</i>	1	0.85	1.00	1.25	2.10	3.16				10						
Nt	P-Forb	<i>Typha latifolia</i>	1	0.85	1.00	1.25	2.10	3.16					10					
Nt	P-Forb	<i>Asclepias incarnata</i>	2	1.71	0.30	0.37	2.08	0.67				2		1				
Nt	P-Sedge	<i>Cyperus esculentus</i>	2	1.71	0.30	0.37	2.08	0.67				1		2				
Nt	Forb	<i>Hypericum sp.</i>	2	1.71	0.30	0.37	2.08	0.67					2	1				
Nt	A-Forb	<i>Pilea pumila</i>	2	1.71	0.30	0.37	2.08	0.67					1		2			
Nt	Tree	<i>Populus deltoides</i>	2	1.71	0.30	0.37	2.08	0.67				2					1	
Nt	Tree	<i>Betula populifolia</i>	2	1.71	0.20	0.25	1.96	0.42									1	1
Nt	Shrub	<i>Rubus flagellaris</i>	1	0.85	0.80	1.00	1.85	2.53					8					
Nt	P-Forb	<i>Lysimachia ciliata</i>	1	0.85	0.60	0.75	1.60	1.90							6			
Ad	B-Forb	<i>Rumex acetosella</i>	1	0.85	0.60	0.75	1.60	1.90								6		
Nt	P-Forb	<i>Aster sp.</i>	1	0.85	0.50	0.62	1.48	1.58				5						
Nt	A-Forb	<i>Conyza canadensis</i>	1	0.85	0.50	0.62	1.48	1.58				5						
Ad	A-Grass	<i>Lolium multiflorum</i>	1	0.85	0.50	0.62	1.48	1.58					5					
Nt	P-Forb	<i>Solidago juncea</i>	1	0.85	0.50	0.62	1.48	1.58				5						
Nt	P-Grass	<i>Juncus tenuis</i>	1	0.85	0.40	0.50	1.35	1.26						4				
Nt	P-Forb	<i>Monarda fistulosa</i>	1	0.85	0.30	0.37	1.23	0.95				3						

Nt	A-Forb	<i>Acalypha rhomboidea</i>	1	0.85	0.20	0.25	1.10	0.63
Nt	P-Forb	<i>Aster puniceus</i>	1	0.85	0.20	0.25	1.10	0.63
Nt	P-Sedge	<i>Carex sp.</i>	1	0.85	0.20	0.25	1.10	0.63
Nt	P-Forb	<i>Eupatorium rugosum</i>	1	0.85	0.20	0.25	1.10	0.63
Nt	P-Forb	<i>Hypericum punctatum</i>	1	0.85	0.20	0.25	1.10	0.63
Nt	P-Forb	<i>Maianthemum canadense</i>	1	0.85	0.20	0.25	1.10	0.63
Ad	A-Grass	<i>Poa pratensis</i>	1	0.85	0.20	0.25	1.10	0.63
Nt	B-Forb	<i>Rudbeckia hirta</i>	1	0.85	0.20	0.25	1.10	0.63
Nt	P-Forb	<i>Solidago altissima</i>	1	0.85	0.20	0.25	1.10	0.63
Nt	Shrub	<i>Viburnum dentatum</i>	1	0.85	0.20	0.25	1.10	0.63
Nt	P-Forb	<i>Alisma subcordatum</i>	1	0.85	0.10	0.12	0.98	0.32
Nt	P-Forb	<i>Asclepias syriaca</i>	1	0.85	0.10	0.12	0.98	0.32
Nt	P-Forb	<i>Epilobium coloratum</i>	1	0.85	0.10	0.12	0.98	0.32
Nt	P-Forb	<i>Fragaria virginiana</i>	1	0.85	0.10	0.12	0.98	0.32
Nt	P-Forb	<i>Galium triflorum</i>	1	0.85	0.10	0.12	0.98	0.32
Ad	P-Forb	<i>Glechoma hederacea</i>	1	0.85	0.10	0.12	0.98	0.32
Ad	Tree	<i>Malus sp.</i>	1	0.85	0.10	0.12	0.98	0.32
Ad	P-Forb	<i>Plantago major</i>	1	0.85	0.10	0.12	0.98	0.32
Nt	P-Forb	<i>Thalictrum revolutum</i>	1	0.85	0.10	0.12	0.98	0.32
			117	100.00	80.10	100.00	200.00	
Non-vegetative ground cover								
		Soil	6	35.29	21.50	26.88	62.17	26.04
		Fine litter	6	35.29	35.00	43.75	79.04	34.72
		Coarse litter	1	5.88	0.50	0.63	6.51	1.58
		Bryophyte	1	5.88	1.00	1.25	7.13	3.16
		Rock	0	0.00	0.00	0.00	0.00	0.00
		Water	3	17.65	22.00	27.50	45.15	41.58
			17	100.00	80.00	100.00	200.00	

			2						
					2				
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									1
									1
					1				
						1			
					1				
									1
100	100				20				

Rapp Road Landfill - PII, PIII Quadrat Data

Transect: P2-1

Date: August 4, 2013

Samplers: John Greaves, John Larson, Matt Shawl

Nt/Ad	Physiog	SPECIES	AVG				IV	STD										
			AF	RF	AC	RC			1	2	3	4	5	6	7	8	9	10
Nt	P-Grass	<i>Juncus effusus</i>	10	6.54	23.00	21.26	27.79	20.71	5	10	60	15	10	25	60	5	15	25
Nt	P-Grass	<i>Glyceria grandis</i>	6	3.92	24.50	22.64	26.56	36.01	5	5		60	95	70	10			
Nt	P-Sedge	<i>Scirpus atrovirens</i>	8	5.23	5.70	5.27	10.50	5.81			20	5	5	5	5	2	10	5
Nt	A-Forb	<i>Bidens frondosa</i>	8	5.23	4.70	4.34	9.57	6.18	20	10	1	1		2	3	5	5	
Nt	P-Grass	<i>Leersia oryzoides</i>	5	3.27	4.50	4.16	7.43	6.43		20	5	5					5	10
Nt	P-Forb	<i>Epilobium coloratum</i>	6	3.92	3.00	2.77	6.69	4.00			2			10	2	5	10	1
Nt	P-Sedge	<i>Carex vulpinoidea</i>	6	3.92	2.90	2.68	6.60	3.31	10	5		2		5		2		5
Nt	P-Grass	<i>Phragmites australis</i>	5	3.27	2.30	2.13	5.39	3.27		10		5	2		4			2
Nt	P-Grass	<i>Glyceria striata</i>	3	1.96	3.70	3.42	5.38	8.11			2						25	10
Ad	P-Forb	<i>Lythrum salicaria</i>	5	3.27	2.00	1.85	5.12	2.31				5		3	5	2		5
Nt	P-Forb	<i>Verbena hastata</i>	5	3.27	2.00	1.85	5.12	2.79			4	5		8		1	2	
Nt	P-Grass	<i>Juncus dudleyi</i>	5	3.27	1.50	1.39	4.65	1.78						2	5	3	3	2
Nt	P-Sedge	<i>Carex hystericina</i>	4	2.61	2.10	1.94	4.56	2.92				4	4		5			8
Nt	Tree	<i>Populus deltoides</i>	4	2.61	2.00	1.85	4.46	3.27	8	2					2	8		
Nt	P-Forb	<i>Eupatorium perfoliatum</i>	5	3.27	1.10	1.02	4.28	1.37	1			2		2		4		2
Nt	P-Sedge	<i>Carex lupulina</i>	2	1.31	3.00	2.77	4.08	6.75	20	10								
Nt	P-Forb	<i>Typha latifolia</i>	4	2.61	1.50	1.39	4.00	2.12			3	5				2	5	
Nt	P-Forb	<i>Solidago graminifolia</i>	4	2.61	0.70	0.65	3.26	0.95				2		2		2		1
Nt	P-Forb	<i>Lycopus americanus</i>	4	2.61	0.60	0.55	3.17	0.84	2	2	1					1		
Ad	A-Grass	<i>Echinochloa crusgalli</i>	2	1.31	2.00	1.85	3.16	4.22	10	10								
Ad	P-Grass	<i>Poa pratensis</i>	2	1.31	1.80	1.66	2.97	4.73	15						3			
Nt	Tree	<i>Salix nigra</i>	3	1.96	1.00	0.92	2.88	1.63	4							3	3	
Nt	P-Grass	<i>Juncus acuminatus</i>	3	1.96	0.90	0.83	2.79	1.73	3		5						1	
Nt	Grass	<i>Panicum sp.</i>	3	1.96	0.90	0.83	2.79	1.66			2			5	2			
Nt	A-Forb	<i>Bidens cernua</i>	2	1.31	1.20	1.11	2.42	3.16								10	2	
Nt	P-Sedge	<i>Scirpus pendulous</i>	2	1.31	1.00	0.92	2.23	2.54							8		2	
Nt	P-Sedge	<i>Scirpus cyperinus</i>	1	0.65	1.50	1.39	2.04	4.74										15
Nt	P-Sedge	<i>Scirpus validus creber</i>	2	1.31	0.70	0.65	1.95	1.64					2		5			
Nt	A-Forb	<i>Xanthium strumarium</i>	2	1.31	0.70	0.65	1.95	1.64		2		5						
Nt	P-Sedge	<i>Eleocharis obtusa</i>	2	1.31	0.60	0.55	1.86	1.58								5	1	
Nt	P-Sedge	<i>Cyperus esculentus</i>	2	1.31	0.50	0.46	1.77	1.08	3						2			
Nt	P-Forb	<i>Mimulus ringens</i>	2	1.31	0.50	0.46	1.77	1.08	2								3	
Nt	P-Forb	<i>Asclepias incarnata</i>	2	1.31	0.40	0.37	1.68	0.84		2				2				
Nt	P-Sedge	<i>Carex stricta</i>	2	1.31	0.40	0.37	1.68	0.84	2		2							
Nt	A-Forb	<i>Erigeron canadensis</i>	2	1.31	0.40	0.37	1.68	0.84							2	2		
Ad	P-Forb	<i>Lotus corniculatus</i>	2	1.31	0.40	0.37	1.68	0.84	2	2								
Nt	P-Forb	<i>Solidago altissima</i>	2	1.31	0.40	0.37	1.68	0.84			2	2						
Nt	A-Forb	<i>Ambrosia artemisiifolia</i>	1	0.65	0.20	0.18	0.84	0.63		2								
Ad	P-Forb	<i>Cirsium arvense</i>	1	0.65	0.20	0.18	0.84	0.63				2						
Ad	P-Forb	<i>Plantago major</i>	1	0.65	0.20	0.18	0.84	0.63	2									
Nt	Shrub	<i>Rubus idaeus strigosus</i>	1	0.65	0.20	0.18	0.84	0.63						2				
Nt	P-Forb	<i>Solidago gigantea</i>	1	0.65	0.20	0.18	0.84	0.63	2									

Ad	P-Forb	<i>Artemisia vulgaris</i>	1	0.65	0.10	0.09	0.75	0.32
Ad	P-Grass	<i>Bromus sp.</i>	1	0.65	0.10	0.09	0.75	0.32
Nt	P-Forb	<i>Euphorbia maculata</i>	1	0.65	0.10	0.09	0.75	0.32
Nt	P-Forb	<i>Hypericum canadense</i>	1	0.65	0.10	0.09	0.75	0.32
Nt	B-Forb	<i>Lobelia inflata</i>	1	0.65	0.10	0.09	0.75	0.32
Ad	A-Grass	<i>Lolium multiflorum</i>	1	0.65	0.10	0.09	0.75	0.32
Nt	P-Forb	<i>Penthorum sedoides</i>	1	0.65	0.10	0.09	0.75	0.32
Nt	A-Forb	<i>Pilea pumila</i>	1	0.65	0.10	0.09	0.75	0.32
Nt	A-Forb	<i>Polygonum pennsylvanicum</i>	1	0.65	0.10	0.09	0.75	0.32
Nt	P-Forb	<i>Solidago juncea</i>	1	0.65	0.10	0.09	0.75	0.32
Nt	P-Forb	<i>Thalictrum dasycarpum</i>	1	0.65	0.10	0.09	0.75	0.32
			153	100.00	108.20	100.00	200.00	
Non-vegetative ground cover								
		Soil	10	34.48	12.00	25.92	60.40	5.37
		Fine litter	10	34.48	26.90	58.10	92.58	21.47
		Coarse litter	3	10.34	1.30	2.81	13.15	2.16
		Bryophyte	4	13.79	5.50	11.88	25.67	15.66
		Rock	1	3.45	0.10	0.22	3.66	0.32
		Water	1	3.45	0.50	1.08	4.53	1.58
			29	100.00	46.30	100.00	200.00	

								1		
									1	
						1				
									1	
							1			
		1								
										1
								1		
						1				
10	15	20	10	10	5	15	20	10	5	
5	2	50	50	50	25	50	2	10	25	
					3		5	5		
		2					50	2	1	
							1			
									5	

Rapp Road Landfill - PII, PIII Quadrat Data
 Transect: P2-2
 Date: August 3, 2013
 Samplers: John Greaves, John Larson

Nt/Ad	Physiog	SPECIES	AVG					STD										
			AF	RF	AC	RC	IV		1	2	3	4	5	6	7	8	9	10
Nt	P-Sedge	<i>Scirpus pendulous</i>	3	2.05	13.00	16.27	18.33	23.12	50	60								20
Nt	Cryptogam	<i>Equisetum arvense</i>	6	4.11	7.30	9.14	13.25	15.33	4	2	50	2	5					10
Nt	P-Forb	<i>Solidago altissima</i>	2	1.37	7.30	9.14	10.51	22.05		3			70					
Nt	P-Forb	<i>Eupatorium perfoliatum</i>	5	3.42	3.50	4.38	7.81	5.17	10	5	3			15				2
Nt	P-Forb	<i>Solidago graminifolia</i>	5	3.42	3.50	4.38	7.81	4.12	5	10	5	10						5
Nt	P-Forb	<i>Solidago rugosa</i>	1	0.68	5.00	6.26	6.94	15.81				50						
Nt	A-Forb	<i>Bidens frondosa</i>	2	1.37	4.10	5.13	6.50	12.62		1		40						
Nt	Tree	<i>Populus deltoides</i>	4	2.74	2.50	3.13	5.87	4.72	5	3	2							15
Nt	P-Forb	<i>Solidago gigantea</i>	5	3.42	1.90	2.38	5.80	3.11	3	2	1			10				3
Nt	P-Forb	<i>Verbena hastata</i>	5	3.42	1.80	2.25	5.68	3.08		3	10			2	1			2
Nt	A-Forb	<i>Erigeron canadensis</i>	5	3.42	1.50	1.88	5.30	2.51		1			3	2	8			1
Nt	Tree	<i>Acer rubrum</i>	6	4.11	0.90	1.13	5.24	0.99	2	3	1	1			1			1
Nt	A-Forb	<i>Erigeron strigosus</i>	5	3.42	1.30	1.63	5.05	1.42	2	2	3	3		3				
Nt	A-Forb	<i>Oxalis europaea</i>	5	3.42	1.00	1.25	4.68	1.33	1	2	2	1		4				
Ad	A-Grass	<i>Digitaria sanguinalis</i>	2	1.37	2.60	3.25	4.62	7.88			25				1			
Ad	A-Grass	<i>Echinochloa crusgalli</i>	3	2.05	2.00	2.50	4.56	3.50		5				5	10			
Nt	P-Forb	<i>Solidago juncea</i>	4	2.74	1.10	1.38	4.12	1.73	2	3					5			1
Nt	A-Forb	<i>Ambrosia artemisiifolia</i>	4	2.74	0.70	0.88	3.62	0.95		1				2	2			2
Nt	P-Grass	<i>Panicum acuminatum</i>	4	2.74	0.60	0.75	3.49	0.84	1	2	2			1				
Ad	A-Forb	<i>Trifolium arvense</i>	4	2.74	0.60	0.75	3.49	0.84	2		2				1			1
Ad	P-Forb	<i>Trifolium repens</i>	3	2.05	1.00	1.25	3.31	1.70	4	4								2
Ad	P-Sedge	<i>Agropyron repens</i>	2	1.37	1.50	1.88	3.25	3.37				5	10					
Nt	P-Sedge	<i>Eleocharis acicularis</i>	2	1.37	1.50	1.88	3.25	3.37	5									10
Nt	P-Sedge	<i>Cyperus esculentus</i>	3	2.05	0.90	1.13	3.18	1.66	2	5								2
Nt	P-Sedge	<i>Carex hystericina</i>	3	2.05	0.60	0.75	2.81	1.07	1	2								3
Ad	P-Forb	<i>Glechoma hederacea</i>	1	0.68	1.50	1.88	2.56	4.74					15					
Nt	P-Forb	<i>Euphorbia maculata</i>	3	2.05	0.40	0.50	2.56	0.70	1		2				1			
Nt	P-Forb	<i>Agalinis tenuifolia</i>	2	1.37	0.90	1.13	2.50	2.51	8									1
Nt	Tree	<i>Crataegus sp.</i>	2	1.37	0.60	0.75	2.12	1.58		5				1				
Ad	P-Forb	<i>Medicago lupulina</i>	2	1.37	0.40	0.50	1.87	0.84						2				2
Nt	Vine	<i>Vitis riparia</i>	2	1.37	0.40	0.50	1.87	0.97			1			3				
Nt	A-Forb	<i>Acalypha rhomboidea</i>	2	1.37	0.30	0.38	1.75	0.67			2			1				
Nt	Shrub	<i>Rubus occidentalis</i>	2	1.37	0.30	0.38	1.75	0.67			1			2				
Nt	P-Grass	<i>Juncus effusus</i>	1	0.68	0.80	1.00	1.69	2.53										8
Nt	P-Forb	<i>Epilobium coloratum</i>	2	1.37	0.20	0.25	1.62	0.42	1	1								
Nt	P-Forb	<i>Potentilla norvegica</i>	2	1.37	0.20	0.25	1.62	0.42		1								1
Nt	P-Forb	<i>Desmodium canadense</i>	1	0.68	0.50	0.63	1.31	1.58		5								
Nt	P-Forb	<i>Lycopus americanus</i>	1	0.68	0.50	0.63	1.31	1.58	5									
Ad	A-Grass	<i>Secale cereale</i>	1	0.68	0.40	0.50	1.19	1.26					4					
Nt	P-Grass	<i>Agrostis perennans</i>	1	0.68	0.30	0.38	1.06	0.95						3				
Ad	P-Forb	<i>Centaurea maculosa</i>	1	0.68	0.30	0.38	1.06	0.95						3				
Nt	P-Forb	<i>Galium sp.</i>	1	0.68	0.30	0.38	1.06	0.95						3				

Rapp Road Landfill - PII, PIII Quadrat Data
 Transect: P2-3
 Date: August 4, 2013
 Samplers: John Larson, John Greaves, Matt Shawl

Nt/Ad	Physiog	SPECIES	AVG					STD										
			AF	RF	AC	RC	IV		1	2	3	4	5	6	7	8	9	10
Ad	P-Forb	<i>Trifolium hybridum</i>	5	2.76	11.10	13.84	16.60	20.59			50	3			50	2	6	
Ad	Grass	<i>Setaria sp.</i>	6	3.31	10.00	12.47	15.78	13.94	40					30	10	5	10	5
Nt	Cryptogam	<i>Equisetum arvense</i>	5	2.76	8.80	10.97	13.73	16.52		1	40	40		5			2	
Nt	Tree	<i>Populus deltoides</i>	10	5.52	4.90	6.11	11.63	5.36	3	2	3	15	15	2	3	2	3	1
Nt	A-Forb	<i>Erigeron canadensis</i>	9	4.97	5.20	6.48	11.46	4.34	2		10	10	10	1	3	1	5	10
Nt	P-Forb	<i>Solidago juncea</i>	9	4.97	3.30	4.11	9.09	2.26	2	2		2	3	5	2	4	5	8
Nt	P-Forb	<i>Solidago altissima</i>	8	4.42	3.60	4.49	8.91	3.27		3	2	2	2	4	5	8		10
Nt	P-Forb	<i>Verbena hastata</i>	9	4.97	2.00	2.49	7.47	1.25	2	2	2	2			1	2	2	5
Nt	A-Grass	<i>Panicum dichotomiflorum</i>	2	1.10	4.70	5.86	6.97	14.17		45	2							
Nt	P-Forb	<i>Lycopus americanus</i>	6	3.31	2.70	3.37	6.68	6.13	1	1			2	2		20		1
Nt	P-Forb	<i>Solidago graminifolia</i>	5	2.76	1.50	1.87	4.63	1.90	5		2		3	4		1		
Nt	P-Forb	<i>Eupatorium perfoliatum</i>	5	2.76	1.20	1.50	4.26	1.62	5	2		1		2		2		
Nt	P-Forb	<i>Solidago gigantea</i>	5	2.76	1.10	1.37	4.13	1.20	2			2			2	2	3	
Nt	P-Forb	<i>Aster lanceolatus</i>	4	2.21	1.30	1.62	3.83	2.54	3		8			1		1		
Nt	Vine	<i>Celastrus scandens</i>	5	2.76	0.70	0.87	3.64	0.82	1		2	2					1	1
Nt	P-Forb	<i>Solidago rugosa</i>	5	2.76	0.50	0.62	3.39	0.53		1		1	1				1	1
Nt	P-Sedge	<i>Cyperus houghtonii</i>	4	2.21	0.80	1.00	3.21	1.14					1	2		2		3
Nt	Tree	<i>Acer rubrum</i>	4	2.21	0.70	0.87	3.08	1.06	3			1	1	2				
Nt	A-Forb	<i>Acalypha rhomboidea</i>	4	2.21	0.50	0.62	2.83	0.71	1			1	2			1		
Nt	A-Forb	<i>Cassia fasciculata</i>	2	1.10	1.30	1.62	2.73	3.20					10	3				
Ad	A-Grass	<i>Echinochloa crusgalli</i>	2	1.10	1.30	1.62	2.73	3.20				3	10					
Ad	P-Forb	<i>Trifolium repens</i>	3	1.66	0.80	1.00	2.65	1.62	5					2				1
Ad	P-Forb	<i>Trifolium pratense</i>	3	1.66	0.70	0.87	2.53	1.25	1	3	3							
Nt	P-Forb	<i>Aster puniceus</i>	3	1.66	0.50	0.62	2.28	0.85		2			2			1		
Nt	A-Forb	<i>Bidens tripartite</i>	3	1.66	0.40	0.50	2.16	0.70	2			1					1	
Nt	A-Forb	<i>Oxalis europaea</i>	3	1.66	0.40	0.50	2.16	0.70	2		1					1		
Ad	A-Forb	<i>Trifolium arvense</i>	3	1.66	0.40	0.50	2.16	0.70				1				2	1	
Nt	A-Forb	<i>Bidens frondosa</i>	3	1.66	0.30	0.37	2.03	0.48		1		1					1	
Nt	P-Forb	<i>Epilobium coloratum</i>	2	1.10	0.70	0.87	1.98	1.49	3	4								
Ad	A-Grass	<i>Secale cereale</i>	2	1.10	0.70	0.87	1.98	1.64							2			5
Ad	P-Forb	<i>Medicago lupulina</i>	2	1.10	0.40	0.50	1.60	0.97					3		1			
Ad	P-Forb	<i>Galium odoratum</i>	2	1.10	0.30	0.37	1.48	0.67	1	2								
Nt	P-Grass	<i>Panicum acuminatum</i>	2	1.10	0.30	0.37	1.48	0.67	2									1
Nt	Tree	<i>Rhus typhina</i>	2	1.10	0.30	0.37	1.48	0.67			1						2	
Ad	P-Grass	<i>Bromus sp</i>	2	1.10	0.20	0.25	1.35	0.42							1	1		
Nt	P-Forb	<i>Plantago rugelii</i>	2	1.10	0.20	0.25	1.35	0.42			1			1				
Nt	A-Forb	<i>Ambrosia artemisiifolia</i>	1	0.55	0.50	0.62	1.18	1.58		5								
Nt	A-Forb	<i>Erigeron strigosus</i>	1	0.55	0.50	0.62	1.18	1.58						5				
Nt	P-Grass	<i>Juncus effusus</i>	1	0.55	0.50	0.62	1.18	1.58	5									
Nt	B-Forb	<i>Rudbeckia hirta</i>	1	0.55	0.50	0.62	1.18	1.58			5							
Ad	P-Grass	<i>Agrostis alba</i>	1	0.55	0.30	0.37	0.93	0.95	3									
Nt	P-Grass	<i>Juncus torreyi</i>	1	0.55	0.30	0.37	0.93	0.95		3								

Ad	P-Forb	<i>Lotus corniculatus</i>	1	0.55	0.30	0.37	0.93	0.95
Nt	P-Forb	<i>Agalinis tenuifolia</i>	1	0.55	0.20	0.25	0.80	0.63
Nt	P-Forb	<i>Asclepias incarnata</i>	1	0.55	0.20	0.25	0.80	0.63
Nt	P-Forb	<i>Chelone glabra</i>	1	0.55	0.20	0.25	0.80	0.63
Ad	B-Forb	<i>Daucus carota</i>	1	0.55	0.20	0.25	0.80	0.63
	Grass	Grass sp	1	0.55	0.20	0.25	0.80	0.63
Nt	P-Grass	<i>Juncus acuminatus</i>	1	0.55	0.20	0.25	0.80	0.63
Ad	P-Forb	<i>Lythrum salicaria</i>	1	0.55	0.20	0.25	0.80	0.63
Nt	P-Forb	<i>Mimulus ringens</i>	1	0.55	0.20	0.25	0.80	0.63
Nt	B-Forb	<i>Oenothera biennis</i>	1	0.55	0.20	0.25	0.80	0.63
Nt	A-Grass	<i>Panicum capillare</i>	1	0.55	0.20	0.25	0.80	0.63
Nt	P-Sedge	<i>Scirpus pendulous</i>	1	0.55	0.20	0.25	0.80	0.63
Nt	P-Forb	<i>Verbena urticifolia</i>	1	0.55	0.20	0.25	0.80	0.63
Nt	P-Forb	<i>Apocynum cannabinum</i>	1	0.55	0.10	0.12	0.68	0.32
Nt	P-Forb	<i>Boehmeria cylindrica</i>	1	0.55	0.10	0.12	0.68	0.32
Nt	P-Sedge	<i>Carex vulpinoidea</i>	1	0.55	0.10	0.12	0.68	0.32
Ad	P-Forb	<i>Centaurea maculosa</i>	1	0.55	0.10	0.12	0.68	0.32
Ad	A-Grass	<i>Digitaria sanguinalis</i>	1	0.55	0.10	0.12	0.68	0.32
Nt	P-Forb	<i>Eupatorium maculatum</i>	1	0.55	0.10	0.12	0.68	0.32
Ad	P-Forb	<i>Hypericum perforatum</i>	1	0.55	0.10	0.12	0.68	0.32
Nt	P-Grass	<i>Juncus tenuis</i>	1	0.55	0.10	0.12	0.68	0.32
Ad	Tree	<i>Malus sp</i>	1	0.55	0.10	0.12	0.68	0.32
Nt	A-Forb	<i>Polygonum pensylvanicum</i>	1	0.55	0.10	0.12	0.68	0.32
Ad	P-Forb	<i>Taraxacum officinale</i>	1	0.55	0.10	0.12	0.68	0.32
			181	100.00	80.20	100.00	200.00	
Non-vegetative ground cover								
	Soil		10	22.73	17.40	25.07	47.80	14.82
	Fine litter		10	22.73	21.50	30.98	53.71	15.28
	Coarse litter		4	9.09	1.20	1.73	10.82	1.62
	Bryophyte		10	22.73	25.90	37.32	60.05	19.51
	Rock		10	22.73	3.40	4.90	27.63	3.53
	Water		0	0.00	0.00	0.00	0.00	0.00
			44	100.00	69.40	100.00	200.00	

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	2								
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									1
								1	
									1
3	4	2	10	40	20	25	40	25	5
10	15	15	40	5	15	5	30	30	50
		3	2		4		3		
50	25	20	2	10	20	2	40	30	60
2	1	2	1	2	10	2	10	3	1

Rapp Road Landfill - PII, PIII Quadrat Data

Transect: P2-4

Date: August 3, 2013

Samplers: Steve Apfelbaum, John Larson, Nichole Frazer

Nt/Ad	Physiog	SPECIES	AVG					STD	10									
			AF	RF	AC	RC	IV		1	2	3	4	5	6	7	8	9	10
Ad	A-Grass	<i>Digitaria sanguinalis</i>	6	3.64	26.00	21.87	25.50	24.59	30	40	60		30	40			60	
Nt	Cryptogam	<i>Equisetum arvense</i>	8	4.85	8.50	7.15	12.00	7.58	4	20		20		5	8	3	10	15
Nt	A-Forb	<i>Ambrosia artemisiifolia</i>	9	5.45	5.70	4.79	10.25	5.64	1	3	1	4	5	15	15		3	10
Nt	P-Forb	<i>Solidago graminifolia</i>	7	4.24	6.50	5.47	9.71	6.55	3	15			15	10	3		4	15
Nt	B-Forb	<i>Oenothera biennis</i>	7	4.24	5.60	4.71	8.95	6.50	1	2	20		10		8		10	5
Nt	P-Forb	<i>Verbena hastata</i>	7	4.24	3.70	3.11	7.35	4.40	5	3		3	15	3			5	3
Nt	P-Forb	<i>Solidago altissima</i>	4	2.42	5.70	4.79	7.22	8.43	18	15	20	4						
Nt	P-Forb	<i>Potentilla norvegica</i>	6	3.64	2.60	2.19	5.82	2.76		3	3		5			5	8	2
Ad	P-Forb	<i>Centaurea maculosa</i>	3	1.82	4.50	3.78	5.60	7.62			20		15				10	
Ad	B-Forb	<i>Daucus carota</i>	5	3.03	2.90	2.44	5.47	4.70	2			5	2			5	15	
Nt	P-Forb	<i>Euphorbia maculata</i>	4	2.42	3.10	2.61	5.03	5.65		18		3		5	5			
Ad	P-Forb	<i>Lotus corniculatus</i>	2	1.21	4.50	3.78	5.00	10.12				30						15
Ad	B-Forb	<i>Verbascum thapsus</i>	6	3.64	1.60	1.35	4.98	1.51	2	2	3	3	2		4			
Nt	A-Forb	<i>Erigeron strigosus</i>	4	2.42	2.90	2.44	4.86	4.93	7		5					2	15	
Nt	P-Forb	<i>Solidago juncea</i>	4	2.42	2.60	2.19	4.61	4.72			3		15		5		3	
Nt	P-Forb	<i>Aster pilosus</i>	3	1.82	3.30	2.78	4.59	5.58	8						10			15
Ad	P-Forb	<i>Hypericum perforatum</i>	5	3.03	1.20	1.01	4.04	1.40	1			3		3		3		2
Ad	A-Grass	<i>Secale cereale</i>	5	3.03	1.00	0.84	3.87	1.25	1	2	3		3		1			
Ad	P-Forb	<i>Trifolium repens</i>	2	1.21	3.00	2.52	3.74	6.32		15							15	
Ad	A-Forb	<i>Mollugo verticillata</i>	5	3.03	0.60	0.50	3.53	0.70	1	1	1	1				2		
Nt	B-Forb	<i>Rudbeckia hirta</i>	3	1.82	2.00	1.68	3.50	4.69				15	2			3		
Nt	P-Forb	<i>Solidago canadensis</i>	3	1.82	2.00	1.68	3.50	3.50							5	5		10
Nt	A-Forb	<i>Acalypha rhomboidea</i>	4	2.42	0.70	0.59	3.01	0.95	1				2		2			2
Nt	P-Sedge	<i>Carex vulpinoidea</i>	2	1.21	2.00	1.68	2.89	4.83	5									15
Ad	A-Forb	<i>Trifolium arvense</i>	3	1.82	1.20	1.01	2.83	1.99	4			5					3	
Nt	P-Forb	<i>Solidago gigantea</i>	2	1.21	1.70	1.43	2.64	4.72					15	2				
Nt	P-Grass	<i>Panicum virgatum</i>	2	1.21	1.40	1.18	2.39	3.27	10							4		
Nt	A-Forb	<i>Oxalis europaea</i>	3	1.82	0.50	0.42	2.24	0.97	1	1	3							
Nt	A-Forb	<i>Oxalis stricta</i>	2	1.21	1.00	0.84	2.05	2.54				8					2	
Nt	P-Forb	<i>Potentilla simplex</i>	2	1.21	1.00	0.84	2.05	2.11	5									5
Nt	Tree	<i>Acer rubrum</i>	2	1.21	0.90	0.76	1.97	1.91			5		4					
Nt	Vine	<i>Vitis riparia</i>	2	1.21	0.70	0.59	1.80	1.64		2	5							
Nt	A-Grass	<i>Panicum capillare</i>	2	1.21	0.60	0.50	1.72	1.35		4					2			
Nt	P-Sedge	<i>Carex sp</i>	2	1.21	0.40	0.34	1.55	0.97								1	3	
Ad	P-Forb	<i>Potentilla recta</i>	2	1.21	0.30	0.25	1.46	0.67				2		1				
Nt	P-Forb	<i>Aster pilosus</i>	1	0.61	1.00	0.84	1.45	3.16						10				
Nt	P-Grass	<i>Panicum acuminatum</i>	2	1.21	0.20	0.17	1.38	0.42	1			1						
Ad	P-Grass	<i>Agrostis alba</i>	1	0.61	0.40	0.34	0.94	1.26									4	
Nt	P-Forb	<i>Aster lateriflorus</i>	1	0.61	0.30	0.25	0.86	0.95										3
Ad	Vine	<i>Celastrus orbiculatus</i>	1	0.61	0.30	0.25	0.86	0.95					3					
Nt	A-Forb	<i>Conyza canadensis</i>	1	0.61	0.30	0.25	0.86	0.95							3			
Ad	A-Grass	<i>Echinochloa crusgalli</i>	1	0.61	0.30	0.25	0.86	0.95	3									

Nt	P-Forb	<i>Eupatorium maculatum</i>	1	0.61	0.30	0.25	0.86	0.95
Nt	P-Forb	<i>Lycopus americanus</i>	1	0.61	0.30	0.25	0.86	0.95
Ad	P-Grass	<i>Muhlenbergia neomexicana</i>	1	0.61	0.30	0.25	0.86	0.95
Nt	Vine	<i>Parthenocissus inserta</i>	1	0.61	0.30	0.25	0.86	0.95
Ad	P-Forb	<i>Trifolium pratense</i>	1	0.61	0.30	0.25	0.86	0.95
Nt	P-Forb	<i>Verbena urticifolia</i>	1	0.61	0.30	0.25	0.86	0.95
Nt	P-Forb	<i>Asclepias incarnata</i>	1	0.61	0.20	0.17	0.77	0.63
Nt	P-Forb	<i>Asclepias syriaca</i>	1	0.61	0.20	0.17	0.77	0.63
Nt	A-Forb	<i>Bidens frondosa</i>	1	0.61	0.20	0.17	0.77	0.63
Nt	P-Sedge	<i>Carex communis</i>	1	0.61	0.20	0.17	0.77	0.63
Nt	P-Forb	<i>Eupatorium perfoliatum</i>	1	0.61	0.20	0.17	0.77	0.63
Nt	P-Grass	<i>Panicum clandestinum</i>	1	0.61	0.20	0.17	0.77	0.63
Nt	Tree	<i>Populus deltoides</i>	1	0.61	0.20	0.17	0.77	0.63
Ad	Shrub	<i>Rosa multiflora</i>	1	0.61	0.20	0.17	0.77	0.63
Ad	A-Forb	<i>Dianthus armeria</i>	1	0.61	0.10	0.08	0.69	0.32
Nt	A-Forb	<i>Geranium robertianum</i>	1	0.61	0.10	0.08	0.69	0.32
Nt	P-Forb	<i>Lobelia siphilitica</i>	1	0.61	0.10	0.08	0.69	0.32
Ad	P-Forb	<i>Medicago lupulina</i>	1	0.61	0.10	0.08	0.69	0.32
Nt	P-Forb	<i>Verbena bracteata</i>	1	0.61	0.10	0.08	0.69	0.32
Nt	P-Forb	<i>Convolvulus sepium</i>	0	0.00	0.30	0.25	0.25	0.95
			165	100.00	118.90	100.00	200.00	
Non-vegetative ground cover								
		Soil	9	36.00	10.20	10.70	46.70	9.69
		Fine litter	10	40.00	83.30	87.41	127.41	13.98
		Coarse litter	5	20.00	1.50	1.57	21.57	1.90
		Bryophyte	1	4.00	0.30	0.31	4.31	0.95
		Rock	0	0.00	0.00	0.00	0.00	0.00
		Water	0	0.00	0.00	0.00	0.00	0.00
			25	100.00	95.30	100.00	200.00	

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							1		
35	8	5	5	8		5	13	8	15
64	85	95	55	92	90	95	75	92	90
1	5					3		2	4
									3

Rapp Road Landfill - PII, PIII Quadrat Data

Transect: P2-6

Date: August 3, 2013

Samplers: Sue Vilord, Chris Einstein, Susan Lehnhardt

Nt/Ad	Physiog	SPECIES	AVG				IV	STD										
			AF	RF	AC	RC			1	2	3	4	5	6	7	8	9	10
Nt	P-Forb	<i>Verbena hastata</i>	10	5.65	11.00	10.17	15.82	9.98	1	25	5	2	8	25	8	8	25	3
Ad	P-Forb	<i>Trifolium repens</i>	4	2.26	12.00	11.09	13.35	19.89			10		30		20			60
Nt	A-Forb	<i>Bidens frondosa</i>	9	5.08	8.80	8.13	13.22	11.47	2	3	25		1	20	1	3	30	3
Nt	A-Forb	<i>Oxalis europaea</i>	8	4.52	8.40	7.76	12.28	12.78	1	40	20	1		8	1	10	3	
Nt	P-Forb	<i>Eupatorium perfoliatum</i>	6	3.39	9.10	8.41	11.80	13.31		8	10	25	3		40	5		
Nt	P-Sedge	<i>Carex lupulina</i>	6	3.39	5.10	4.71	8.10	5.40		10	5				15	10	3	8
Nt	A-Forb	<i>Acalypha rhomboidea</i>	7	3.95	3.60	3.33	7.28	4.97	2	2		15	10	3		1	3	
Nt	A-Forb	<i>Erigeron canadensis</i>	6	3.39	3.80	3.51	6.90	4.26	10	2		6				8	2	10
Nt	P-Forb	<i>Asclepias incarnata</i>	5	2.82	4.30	3.97	6.80	9.23			3		4		1		5	30
Nt	A-Forb	<i>Polygonum pensylvanicum</i>	3	1.69	5.30	4.90	6.59	15.72	1			2		50				
Nt	P-Forb	<i>Solidago gigantea</i>	6	3.39	2.60	2.40	5.79	3.63		8	2	1	4		1	10		
Nt	P-Forb	<i>Mimulus ringens</i>	5	2.82	2.50	2.31	5.14	3.57		6	2	10	1		6			
Nt	P-Forb	<i>Aster novae-angliae</i>	4	2.26	2.70	2.50	4.76	4.88			1		6		5		15	
Nt	P-Forb	<i>Lycopus americanus</i>	6	3.39	0.60	0.55	3.94	0.52	1		1	1	1		1			1
Nt	Tree	<i>Populus deltoides</i>	5	2.82	0.90	0.83	3.66	1.10	1		3	2	1		2			
Nt	P-Forb	<i>Solidago graminifolia nuttallii</i>	4	2.26	1.50	1.39	3.65	2.32	6		3		1		5			
Ad	A-Grass	<i>Digitaria sanguinalis</i>	1	0.56	3.00	2.77	3.34	9.49									30	
Nt	P-Sedge	<i>Carex annectens</i>	2	1.13	2.20	2.03	3.16	6.29								20		2
Nt	B-Forb	<i>Lobelia inflata</i>	4	2.26	0.90	0.83	3.09	1.37		2	1				2			4
Ad	P-Forb	<i>Taraxacum officinale</i>	4	2.26	0.80	0.74	3.00	1.23		3		3	1		1			
Nt	P-Forb	<i>Lysimachia quadrifolia</i>	3	1.69	1.10	1.02	2.71	2.08			5				1	5		
Nt	B-Forb	<i>Oenothera biennis</i>	2	1.13	1.60	1.48	2.61	4.72	1									15
Nt	P-Forb	<i>Hypericum canadense</i>	2	1.13	1.40	1.29	2.42	2.99			6					8		
Nt	P-Forb	<i>Solidago juncea</i>	3	1.69	0.70	0.65	2.34	1.16			2		3		2			
Nt	P-Grass	<i>Juncus dudleyi</i>	2	1.13	1.10	1.02	2.15	3.14			1				10			
Nt	P-Forb	<i>Plantago rugelii</i>	2	1.13	0.70	0.65	1.78	1.64			2							5
Nt	P-Sedge	<i>Carex vulpinoidea</i>	2	1.13	0.60	0.55	1.68	1.35				4			2			
Nt	Cryptogam	<i>Onoclea sensibilis</i>	2	1.13	0.60	0.55	1.68	1.26				3					3	
Nt	P-Forb	<i>Solidago canadensis</i>	2	1.13	0.60	0.55	1.68	1.26			3		3					
Nt	P-Forb	<i>Verbena urticifolia</i>	2	1.13	0.60	0.55	1.68	1.35					2					4
Nt	P-Sedge	<i>Carex crinita</i>	1	0.56	1.20	1.11	1.67	3.79					12					
Nt	P-Forb	<i>Aster lateriflorus</i>	2	1.13	0.50	0.46	1.59	1.08	2									3
Nt	A-Forb	<i>Ambrosia artemisiifolia</i>	2	1.13	0.40	0.37	1.50	0.97	3							1		
Nt	A-Forb	<i>Bidens cernua</i>	2	1.13	0.40	0.37	1.50	0.97	3					1				
Nt	P-Forb	<i>Euphorbia maculata</i>	2	1.13	0.40	0.37	1.50	0.84	2								2	
Ad	P-Forb	<i>Trifolium hybridum</i>	1	0.56	1.00	0.92	1.49	3.16				10						
Ad	Vine	<i>Celastrus orbiculatus</i>	2	1.13	0.30	0.28	1.41	0.67		2								1
Nt	P-Grass	<i>Panicum acuminatum</i>	2	1.13	0.30	0.28	1.41	0.67			2					1		
Nt	Shrub	<i>Rubus hispidus</i>	2	1.13	0.30	0.28	1.41	0.67							2	1		
Nt	P-Forb	<i>Epilobium coloratum</i>	2	1.13	0.20	0.18	1.31	0.42	1		1							
Nt	Cryptogam	<i>Equisetum arvense</i>	2	1.13	0.20	0.18	1.31	0.42			1	1						
Nt	A-Forb	<i>Erechtites hieracifolia</i>	2	1.13	0.20	0.18	1.31	0.42	1							1		

Nt	P-Forb	<i>Potentilla norvegica</i>	2	1.13	0.20	0.18	1.31	0.42
Ad	A-Grass	<i>Echinochloa crusgalli</i>	1	0.56	0.80	0.74	1.30	2.53
Nt	P-Sedge	<i>Carex stricta</i>	1	0.56	0.40	0.37	0.93	1.26
Nt	Tree	<i>Populus balsamifera</i>	1	0.56	0.30	0.28	0.84	0.95
Nt	P-Forb	<i>Aster lanceolatus</i>	1	0.56	0.20	0.18	0.75	0.63
Nt	P-Sedge	<i>Carex hystericina</i>	1	0.56	0.20	0.18	0.75	0.63
Nt	Tree	<i>Crataegus sp.</i>	1	0.56	0.20	0.18	0.75	0.63
Nt	P-Sedge	<i>Cyperus esculentus</i>	1	0.56	0.20	0.18	0.75	0.63
Nt	P-Forb	<i>Galium boreale</i>	1	0.56	0.20	0.18	0.75	0.63
Ad	P-Forb	<i>Medicago lupulina</i>	1	0.56	0.20	0.18	0.75	0.63
Ad	A-Forb	<i>Polygonum persicaria</i>	1	0.56	0.20	0.18	0.75	0.63
Nt	Tree	<i>Acer rubrum</i>	1	0.56	0.10	0.09	0.66	0.32
Nt	P-Forb	<i>Boehmeria cylindrica</i>	1	0.56	0.10	0.09	0.66	0.32
Ad	P-Forb	<i>Cirsium arvense</i>	1	0.56	0.10	0.09	0.66	0.32
Nt	P-Sedge	<i>Cyperus houghtonii</i>	1	0.56	0.10	0.09	0.66	0.32
Nt	P-Forb	<i>Desmodium canadense</i>	1	0.56	0.10	0.09	0.66	0.32
Nt	P-Grass	<i>Elymus virginicus</i>	1	0.56	0.10	0.09	0.66	0.32
Nt	A-Forb	<i>Erigeron annuus</i>	1	0.56	0.10	0.09	0.66	0.32
Nt	A-Forb	<i>Erigeron strigosus</i>	1	0.56	0.10	0.09	0.66	0.32
Nt	P-Forb	<i>Eupatorium maculatum</i>	1	0.56	0.10	0.09	0.66	0.32
Nt	P-Forb	<i>Hypericum boreale</i>	1	0.56	0.10	0.09	0.66	0.32
Ad	P-Forb	<i>Hypericum perforatum</i>	1	0.56	0.10	0.09	0.66	0.32
Nt	P-Forb	<i>Lobelia cardinalis</i>	1	0.56	0.10	0.09	0.66	0.32
Ad	A-Grass	<i>Lolium multiflorum</i>	1	0.56	0.10	0.09	0.66	0.32
Nt	Tree	<i>Rhus typhina</i>	1	0.56	0.10	0.09	0.66	0.32
Ad	Shrub	<i>Rosa multiflora</i>	1	0.56	0.10	0.09	0.66	0.32
Ad	B-Forb	<i>Verbascum thapsus</i>	1	0.56	0.10	0.09	0.66	0.32
			177	100.00	108.20	100.00	200.00	
Non-vegetative ground cover								
		Soil	7	25.93	4.40	4.60	30.53	7.82
		Fine litter	10	37.04	88.70	92.78	129.82	23.15
		Coarse litter	4	14.81	0.80	0.84	15.65	1.55
		Bryophyte	5	18.52	1.60	1.67	20.19	2.07
		Rock	1	3.70	0.10	0.10	3.81	0.32
		Water	0	0.00	0.00	0.00	0.00	0.00
			27	100.00	95.60	100.00	200.00	

							1			1
8										
		4								
								3		
				2						
		2								
							2			
							2			
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								1		
		1								
1										
						1				
								1		
	1									
						1				
1						1				
								1		
		1								
25		10	2	2	3	1	1			
25	100	80	98	93	97	98	99	97	100	
		5		1		1			1	
5		5	1	3					2	
				1						

Rapp Road Landfill - PII, PIII Quadrat Data

Transect: P2-7

Date: August 3, 2013

Samplers: Susan Lehnhardt, Steve Apfelbaum, Nicole Frazer

Nt/Ad	Physiog	SPECIES	AVG															
			AF	RF	AC	RC	IV	STD	1	2	3	4	5	6	7	8	9	10
Nt	P-Forb	<i>Verbena hastata</i>	10	8.55	20.50	16.72	25.27	12.35	5	25	30	20	15	15	50	15	15	15
Nt	P-Forb	<i>Eupatorium perfoliatum</i>	9	7.69	20.50	16.72	24.41	13.63	5	5		25	25	40	35	30	25	15
Nt	P-Forb	<i>Solidago gigantea</i>	8	6.84	8.70	7.10	13.93	9.49	2	15	3	10	30		2		10	15
Nt	P-Forb	<i>Lycopus americanus</i>	7	5.98	9.50	7.75	13.73	8.32		10	15		25	10	5	15	15	
Nt	A-Forb	<i>Bidens frondosa</i>	7	5.98	7.90	6.44	12.43	7.58			5	15	5	15		4	20	15
Nt	P-Forb	<i>Solidago graminifolia nuttallii</i>	5	4.27	7.80	6.36	10.64	9.16	8		20			10	20			20
Ad	P-Forb	<i>Trifolium repens</i>	2	1.71	9.00	7.34	9.05	20.25	30	60								
Nt	P-Sedge	<i>Carex vulpinoidea</i>	4	3.42	5.00	4.08	7.50	6.67				10	15	15				10
Nt	P-Grass	<i>Juncus tenuis</i>	4	3.42	4.50	3.67	7.09	6.43				15	10	15				5
Nt	P-Forb	<i>Aster puniceus</i>	4	3.42	2.00	1.63	5.05	2.94		5			2	8		5		
Nt	P-Forb	<i>Aster lanceolatus</i>	3	2.56	2.50	2.04	4.60	4.25		5		10	10					
Nt	P-Forb	<i>Aster lateriflorus</i>	3	2.56	2.00	1.63	4.20	3.50					5				10	5
Nt	Tree	<i>Populus deltoides</i>	3	2.56	2.00	1.63	4.20	3.50	10	5		5						
Nt	P-Forb	<i>Verbena urticifolia</i>	3	2.56	2.00	1.63	4.20	4.69			3				2	15		
Nt	P-Forb	<i>Asclepias incarnata</i>	3	2.56	1.40	1.14	3.71	2.27	5	4	5							
Nt	A-Forb	<i>Acalypha rhomboidea</i>	3	2.56	1.20	0.98	3.54	2.10	5							5	2	
Nt	P-Forb	<i>Solidago juncea</i>	2	1.71	1.80	1.47	3.18	3.82								10	8	
Nt	B-Forb	<i>Lobelia inflata</i>	3	2.56	0.50	0.41	2.97	0.85	2			1				2		
Nt	A-Forb	<i>Erigeron strigosus</i>	2	1.71	1.50	1.22	2.93	3.37					10	5				
Ad	P-Forb	<i>Trifolium pratense</i>	2	1.71	0.80	0.65	2.36	1.75				5				3		
Nt	P-Forb	<i>Agalinis tenuifolia</i>	2	1.71	0.70	0.57	2.28	1.49				4	3					
Nt	P-Sedge	<i>Carex bebbii</i>	2	1.71	0.70	0.57	2.28	1.64				5						2
Nt	P-Sedge	<i>Carex lupulina</i>	2	1.71	0.50	0.41	2.12	1.08									2	3
Ad	A-Grass	<i>Echinochloa crusgalli</i>	1	0.85	1.50	1.22	2.08	4.74		15								
Ad	P-Forb	<i>Galium odoratum</i>	1	0.85	1.50	1.22	2.08	4.74		15								
Ad	Vine	<i>Celastrus orbiculatus</i>	2	1.71	0.40	0.33	2.04	0.84						2		2		
Nt	A-Forb	<i>Oxalis stricta</i>	1	0.85	0.80	0.65	1.51	2.53	8									
Nt	P-Sedge	<i>Carex sp</i>	1	0.85	0.50	0.41	1.26	1.58		5								
Nt	B-Forb	<i>Oenothera biennis</i>	1	0.85	0.50	0.41	1.26	1.58		5								
Nt	P-Forb	<i>Solidago altissima</i>	1	0.85	0.50	0.41	1.26	1.58									5	
Ad	P-Forb	<i>Trifolium hybridum</i>	1	0.85	0.50	0.41	1.26	1.58						5				
Nt	Shrub	<i>Rubus idaeus strigosus</i>	1	0.85	0.40	0.33	1.18	1.26							4			
Nt	Tree	<i>Acer rubrum</i>	1	0.85	0.30	0.24	1.10	0.95	3									
Nt	A-Forb	<i>Coryza canadensis</i>	1	0.85	0.30	0.24	1.10	0.95			3							
Nt	Shrub	<i>Cornus stolonifera</i>	1	0.85	0.30	0.24	1.10	0.95					3					
Nt	P-Forb	<i>Hypericum punctatum</i>	1	0.85	0.30	0.24	1.10	0.95							3			
Nt	P-Forb	<i>Mimulus ringens</i>	1	0.85	0.30	0.24	1.10	0.95	3									
Nt	P-Sedge	<i>Carex hystericina</i>	1	0.85	0.20	0.16	1.02	0.63		2								
Nt	A-Forb	<i>Erigeron annuus</i>	1	0.85	0.20	0.16	1.02	0.63				2						
Nt	P-Forb	<i>Lobelia siphilitica</i>	1	0.85	0.20	0.16	1.02	0.63	2									
Ad	P-Forb	<i>Lythrum salicaria</i>	1	0.85	0.20	0.16	1.02	0.63				2						
Nt	P-Forb	<i>Potentilla norvegica</i>	1	0.85	0.20	0.16	1.02	0.63									2	

Ad	A-Forb	<i>Trifolium arvense</i>	1	0.85	0.20	0.16	1.02	0.63
Nt	P-Forb	<i>Lobelia cardinalis</i>	1	0.85	0.10	0.08	0.94	0.32
Ad	Tree	<i>Ulmus pumila</i>	1	0.85	0.10	0.08	0.94	0.32
Ad	B-Forb	<i>Verbascum thapsus</i>	1	0.85	0.10	0.08	0.94	0.32
Nt	A-Forb	<i>Ambrosia artemisiifolia</i>	0	0.00	0.00	0.00	0.00	0.00
			117	100.00	122.60	100.00	200.00	
Non-vegetative ground cover								
		Soil	3	23.08	4.50	4.50	27.58	9.56
		Fine litter	10	76.92	95.50	95.50	172.42	9.56
		Coarse litter	0	0.00	0.00	0.00	0.00	0.00
		Bryophyte	0	0.00	0.00	0.00	0.00	0.00
		Rock	0	0.00	0.00	0.00	0.00	0.00
		Water	0	0.00	0.00	0.00	0.00	0.00
			13	100.00	100.00	100.00	200.00	

2										
1										
1										
									1	
								10	30	5
100	100	100	100	100	100	100	100	90	70	95

Rapp Road Landfill - PII, PIII Quadrat Data
 Transect: P2-8
 Date: August 4, 2013
 Samplers: John Larson, John Price

Nt/Ad	Physiog	SPECIES	AVG					STD	10											
			AF	RF	AC	RC	IV		1	2	3	4	5	6	7	8	9	10		
Ad	P-Forb	<i>Trifolium repens</i>	3	1.57	13.20	13.85	15.42	28.21	80				2		50					
Nt	P-Forb	<i>Eupatorium perfoliatum</i>	9	4.71	7.30	7.66	12.37	7.06	8	1	4	6	9	7	10	25	3			
Nt	P-Forb	<i>Lycopus americanus</i>	10	5.24	6.80	7.14	12.37	4.94	8	2	6	10	2	10	12	15	1	2		
Nt	P-Grass	<i>Juncus dudleyi</i>	9	4.71	5.90	6.19	10.90	4.61	8	7	2	15	2	10	8	5	2			
Nt	P-Grass	<i>Juncus effusus</i>	6	3.14	6.80	7.14	10.28	11.18	1		3		7		2		25	30		
Nt	P-Forb	<i>Solidago graminifolia</i>	9	4.71	4.00	4.20	8.91	3.40	12	5	2	6	1	3	4	2	5			
Nt	Forb	<i>Hypericum sp</i>	9	4.71	3.60	3.78	8.49	3.10	1	6		6	1	10	5	2	3	2		
Nt	P-Sedge	<i>Carex lupulina</i>	4	2.09	5.30	5.56	7.66	8.19	6				7	20		20				
Nt	P-Forb	<i>Aster puniceus</i>	9	4.71	2.80	2.94	7.65	2.15	1	2	3		2	3	4	8	3	2		
Nt	P-Sedge	<i>Carex hystericina</i>	2	1.05	6.00	6.30	7.34	13.50					20						40	
Nt	P-Forb	<i>Verbena hastata</i>	7	3.66	3.30	3.46	7.13	2.83	7	7		5		5	4	4			1	
Nt	Tree	<i>Populus deltoides</i>	7	3.66	2.70	2.83	6.50	2.79	2	1		5		6	8	2	3			
Nt	A-Forb	<i>Bidens tripartite</i>	6	3.14	2.50	2.62	5.76	4.60	1	1			15	1			4	3		
Nt	P-Forb	<i>Mimulus ringens</i>	5	2.62	2.00	2.10	4.72	2.71	1	4	3						8	4		
Nt	P-Forb	<i>Epilobium coloratum</i>	7	3.66	0.80	0.84	4.50	0.63			1	1	1	1	1	1		2		
Ad	P-Forb	<i>Lythrum salicaria</i>	6	3.14	0.90	0.94	4.09	0.99		1	1	1		1	3	2				
Nt	P-Sedge	<i>Carex vulpinoidea</i>	2	1.05	2.70	2.83	3.88	7.86		25					2					
Nt	P-Grass	<i>Glyceria grandis</i>	3	1.57	2.00	2.10	3.67	3.77					8	2					10	
Nt	P-Forb	<i>Asclepias incarnata</i>	4	2.09	1.30	1.36	3.46	2.50	2			2			8				1	
Nt	A-Forb	<i>Conyza canadensis</i>	5	2.62	0.60	0.63	3.25	0.70		2		1	1		1	1				
Nt	B-Forb	<i>Lobelia inflata</i>	5	2.62	0.60	0.63	3.25	0.70			1	1		2		1	1			
Nt	A-Forb	<i>Oxalis stricta</i>	4	2.09	0.70	0.73	2.83	0.95				2			1	2	2			
Nt	A-Forb	<i>Acalypha rhomboidea</i>	4	2.09	0.60	0.63	2.72	0.84	2		1	2			1					
Nt	P-Forb	<i>Solidago gigantea</i>	3	1.57	1.00	1.05	2.62	2.49		1	8						1			
Nt	P-Forb	<i>Potentilla norvegica</i>	4	2.09	0.50	0.52	2.62	0.71	1		1	2				1				
Nt	P-Forb	<i>Aster lateriflorus</i>	3	1.57	0.80	0.84	2.41	1.62		5	1			2						
Nt	Cryptogam	<i>Onoclea sensibilis</i>	3	1.57	0.80	0.84	2.41	1.48					4		1	3				
Nt	P-Forb	<i>Eupatorium maculatum</i>	3	1.57	0.60	0.63	2.20	1.07		3					1		2			
Nt	P-Forb	<i>Solidago canadensis</i>	3	1.57	0.60	0.63	2.20	1.07		2					3	1				
Ad	Vine	<i>Celastrus orbiculatus</i>	3	1.57	0.40	0.42	1.99	0.70		1					1	2				
Ad	Tree	<i>Malus sp</i>	3	1.57	0.30	0.31	1.89	0.48		1		1		1						
Nt	A-Forb	<i>Pilea pumila</i>	3	1.57	0.30	0.31	1.89	0.48					1			1			1	
Nt	P-Forb	<i>Agalinis tenuifolia</i>	2	1.05	0.70	0.73	1.78	1.64	2								5			
Nt	P-Sedge	<i>Carex sp</i>	1	0.52	1.00	1.05	1.57	3.16									10			
Nt	A-Forb	<i>Bidens frondosa</i>	2	1.05	0.50	0.52	1.57	1.08	2						3					
Nt	A-Forb	<i>Erigeron strigosus</i>	2	1.05	0.50	0.52	1.57	1.08		2						3				
Nt	P-Forb	<i>Solidago altissima</i>	2	1.05	0.40	0.42	1.47	0.84	2		2									
Nt	P-Sedge	<i>Scirpus atrovirens</i>	1	0.52	0.80	0.84	1.36	2.53											8	
Nt	Tree	<i>Acer rubrum</i>	2	1.05	0.20	0.21	1.26	0.42						1		1				
Nt	P-Forb	<i>Thalictrum revolutum</i>	2	1.05	0.20	0.21	1.26	0.42	1	1										
Ad	P-Forb	<i>Trifolium pratense</i>	1	0.52	0.60	0.63	1.15	1.90		6										
Nt	P-Sedge	<i>Carex crinita</i>	1	0.52	0.50	0.52	1.05	1.58					5							

Nt	P-Forb	<i>Aster ericoides</i>	1	0.52	0.30	0.31	0.84	0.95
Nt	P-Sedge	<i>Carex stricta</i>	1	0.52	0.30	0.31	0.84	0.95
Nt	P-Forb	<i>Hypericum punctatum</i>	1	0.52	0.30	0.31	0.84	0.95
Nt	P-Sedge	<i>Cyperus esculentus</i>	1	0.52	0.20	0.21	0.73	0.63
Nt	P-Grass	<i>Leersia oryzoides</i>	1	0.52	0.20	0.21	0.73	0.63
Nt	P-Forb	<i>Lysimachia ciliata</i>	1	0.52	0.20	0.21	0.73	0.63
Nt	P-Forb	<i>Solidago patula</i>	1	0.52	0.20	0.21	0.73	0.63
Nt	P-Forb	<i>Aster sp.</i>	1	0.52	0.10	0.10	0.63	0.32
Nt	P-Sedge	<i>Eleocharis obtusa</i>	1	0.52	0.10	0.10	0.63	0.32
Nt	A-Forb	<i>Erigeron annuus</i>	1	0.52	0.10	0.10	0.63	0.32
Nt	P-Grass	<i>Panicum acuminatum</i>	1	0.52	0.10	0.10	0.63	0.32
Nt	A-Forb	<i>Polygonum sagittatum</i>	1	0.52	0.10	0.10	0.63	0.32
			191	100.00	95.30	100.00	200.00	
Non-vegetative ground cover								
		Soil	10	38.46	30.50	32.14	70.60	33.04
		Fine litter	10	38.46	55.90	58.90	97.37	29.22
		Coarse litter	0	0.00	0.00	0.00	0.00	0.00
		Bryophyte	6	23.08	8.50	8.96	32.03	7.84
		Rock	0	0.00	0.00	0.00	0.00	0.00
		Water	0	0.00	0.00	0.00	0.00	0.00
			26	100.00	94.90	100.00	200.00	

3									
		3							
3									
					2				
									2
						2			
							1		
		1							
									1
1									
10	80	95	5	5	20	5	15	20	50
90	9	5	80	45	60	80	70	70	50
	10		15		20	15	15	10	

Rapp Road Landfill - PII, PIII Quadrat Data
 Transect: P2-9
 Date: August 4, 2013
 Samplers: Susan Lehnhardt, Sue Vilord

Nt/Ad	Physiog	SPECIES	AVG				IV	STD											
			AF	RF	AC	RC			1	2	3	4	5	6	7	8	9	10	
Nt	P-Grass	<i>Panicum acuminatum</i>	5	2.82	17.50	15.87	18.69	25.08	60		10	50	50		5				
Ad	P-Forb	<i>Trifolium repens</i>	7	3.95	15.40	13.96	17.92	19.09	8	25	60	6	30			20			5
Nt	P-Forb	<i>Solidago graminifolia nuttallii</i>	7	3.95	8.50	7.71	11.66	6.82	12		15	8	12	8				20	10
Nt	P-Forb	<i>Verbena hastata</i>	8	4.52	6.80	6.17	10.68	12.46	2	2		3	1	1		15	40	4	
Nt	P-Forb	<i>Lycopus americanus</i>	8	4.52	6.00	5.44	9.96	7.64	2	20	20	5	2	1			4		6
Nt	A-Forb	<i>Oxalis europaea</i>	7	3.95	5.80	5.26	9.21	8.98	3	3	1				3	20	25	3	
Nt	P-Forb	<i>Eupatorium perfoliatum</i>	8	4.52	4.90	4.44	8.96	5.07	2	10	3	2	1			15	8	8	
Nt	B-Forb	<i>Lobelia inflata</i>	8	4.52	1.80	1.63	6.15	1.40	1	3	1	3	4		1			2	3
Nt	Cryptogam	<i>Onoclea sensibilis</i>	5	2.82	3.60	3.26	6.09	5.17			4				8	1	15	8	
Nt	P-Forb	<i>Aster novae-angliae</i>	6	3.39	2.30	2.09	5.48	2.71		3	2		1		8	5	4		
Nt	P-Forb	<i>Solidago juncea</i>	6	3.39	2.30	2.09	5.48	2.45	1		2	5	6		4	5			
Nt	P-Forb	<i>Aster lateriflorus</i>	4	2.26	3.40	3.08	5.34	6.26	4	6	4				20				
Nt	P-Forb	<i>Potentilla simplex</i>	6	3.39	2.10	1.90	5.29	2.13	3	4	2	4	2			6			
Nt	P-Grass	<i>Juncus dudleyi</i>	3	1.69	3.70	3.35	5.05	9.43	6	30			1						
Nt	Tree	<i>Acer rubrum</i>	6	3.39	0.60	0.54	3.93	0.52	1	1	1	1	1	1					
Nt	P-Forb	<i>Solidago rugosa</i>	5	2.82	0.80	0.73	3.55	1.23	1			1	1	4					1
Nt	A-Forb	<i>Conyza canadensis</i>	4	2.26	1.10	1.00	3.26	1.91						2	6	2			1
Nt	Shrub	<i>Rubus allegheniensis</i>	2	1.13	2.20	1.99	3.12	5.20							6	16			
Nt	P-Forb	<i>Solidago gigantea</i>	3	1.69	1.30	1.18	2.87	2.58						3	8				2
Nt	P-Forb	<i>Solidago altissima</i>	1	0.56	2.50	2.27	2.83	7.91										25	
Nt	P-Forb	<i>Galium triflorum</i>	3	1.69	1.20	1.09	2.78	2.57		1					3			8	
Nt	P-Sedge	<i>Cyperus esculentus</i>	4	2.26	0.40	0.36	2.62	0.52	1		1	1		1					
Nt	P-Forb	<i>Potentilla norvegica</i>	2	1.13	1.20	1.09	2.22	3.16								2	10		
Nt	P-Forb	<i>Hypericum boreale</i>	3	1.69	0.50	0.45	2.15	0.97	3			1	1						
Nt	P-Sedge	<i>Carex hystericina</i>	2	1.13	1.00	0.91	2.04	2.54		8	2								
Nt	Tree	<i>Populus tremuloides</i>	3	1.69	0.30	0.27	1.97	0.48					1	1					1
Nt	Vine	<i>Parthenocissus quinquefolia</i>	2	1.13	0.90	0.82	1.95	2.51		1					8				
Ad	P-Forb	<i>Trifolium pratense</i>	1	0.56	1.50	1.36	1.92	4.74		15									
Nt	B-Forb	<i>Rudbeckia hirta</i>	2	1.13	0.70	0.63	1.76	1.89						1		6			
Nt	P-Forb	<i>Asclepias incarnata</i>	2	1.13	0.60	0.54	1.67	1.58		5									1
Nt	P-Forb	<i>Monarda punctata</i>	2	1.13	0.60	0.54	1.67	1.58						5					1
Ad	P-Forb	<i>Trifolium hybridum</i>	2	1.13	0.60	0.54	1.67	1.58	1									5	
Nt	P-Forb	<i>Eupatorium maculatum</i>	2	1.13	0.40	0.36	1.49	0.97		3	1								
Ad	Vine	<i>Celastrus orbiculatus</i>	2	1.13	0.20	0.18	1.31	0.42			1	1							
Nt	B-F	<i>Erigeron philadelphicus</i>	2	1.13	0.20	0.18	1.31	0.42							1				1
Nt	P-Forb	<i>Prunella vulgaris</i>	2	1.13	0.20	0.18	1.31	0.42										1	1
Nt	Shrub	<i>Rubus flagellaris</i>	2	1.13	0.20	0.18	1.31	0.42		1			1						
Nt	P-Forb	<i>Viola sororia</i>	2	1.13	0.20	0.18	1.31	0.42	1			1							
Nt	A-Forb	<i>Erigeron strigosus</i>	1	0.56	0.80	0.73	1.29	2.53											8
Nt	Shrub	<i>Rubus occidentalis</i>	1	0.56	0.80	0.73	1.29	2.53										8	
Nt	A-Forb	<i>Bidens frondosa</i>	1	0.56	0.50	0.45	1.02	1.58	5										
Nt	P-Forb	<i>Hypericum punctatum</i>	1	0.56	0.50	0.45	1.02	1.58											5

Nt	P-Forb	<i>Lobelia siphilitica</i>	1	0.56	0.50	0.45	1.02	1.58
Nt	P-Sedge	<i>Carex vulpinoidea</i>	1	0.56	0.40	0.36	0.93	1.26
Nt	P-Forb	<i>Convolvulus sepium</i>	1	0.56	0.40	0.36	0.93	1.26
Ad	B-Forb	<i>Verbascum thapsus</i>	1	0.56	0.40	0.36	0.93	1.26
Nt	P-Forb	<i>Geum aleppicum</i>	1	0.56	0.30	0.27	0.84	0.95
Nt	P-Forb	<i>Mimulus ringens</i>	1	0.56	0.20	0.18	0.75	0.63
Nt	Tree	<i>Populus deltoides</i>	1	0.56	0.20	0.18	0.75	0.63
Nt	Tree	<i>Rhus typhina</i>	1	0.56	0.20	0.18	0.75	0.63
Nt	P-Forb	<i>Agalinis tenuifolia</i>	1	0.56	0.10	0.09	0.66	0.32
Nt	P-Forb	<i>Aquilegia canadensis</i>	1	0.56	0.10	0.09	0.66	0.32
Nt	P-Forb	<i>Aster puniceus</i>	1	0.56	0.10	0.09	0.66	0.32
Nt	Tree	<i>Betula populifolia</i>	1	0.56	0.10	0.09	0.66	0.32
Nt	P-Sedge	<i>Carex blanda</i>	1	0.56	0.10	0.09	0.66	0.32
Nt	P-Sedge	<i>Carex</i> sp	1	0.56	0.10	0.09	0.66	0.32
Nt	Shrub	<i>Cornus racemosa</i>	1	0.56	0.10	0.09	0.66	0.32
Nt	P-Forb	<i>Epilobium coloratum</i>	1	0.56	0.10	0.09	0.66	0.32
Nt	Grass	<i>Grass</i> sp	1	0.56	0.10	0.09	0.66	0.32
Nt	A-Forb	<i>Oxalis stricta</i>	1	0.56	0.10	0.09	0.66	0.32
Nt	P-Forb	<i>Plantago rugelii</i>	1	0.56	0.10	0.09	0.66	0.32
Nt	A-Forb	<i>Polygonum pensylvanicum</i>	1	0.56	0.10	0.09	0.66	0.32
Nt	Tree	<i>Populus balsamifera</i>	1	0.56	0.10	0.09	0.66	0.32
Ad	Shrub	<i>Rhamnus cathartica</i>	1	0.56	0.10	0.09	0.66	0.32
Nt	Shrub	<i>Rhus glabra</i>	1	0.56	0.10	0.09	0.66	0.32
Nt	P-Forb	<i>Solidago canadensis</i>	1	0.56	0.10	0.09	0.66	0.32
			177	100.00	110.30	100.00	200.00	
Non-vegetative ground cover								
		Soil	7	21.88	15.50	15.09	36.97	24.41
		Fine litter	10	31.25	76.00	74.00	105.25	27.06
		Coarse litter	6	18.75	2.70	2.63	21.38	4.62
		Bryophyte	9	28.13	8.50	8.28	36.40	11.76
		Rock	0	0.00	0.00	0.00	0.00	0.00
		Water	0	0.00	0.00	0.00	0.00	0.00
			32	100.00	102.70	100.00	200.00	

									5
4									
								4	
								4	
									3
2									
	2								
								2	
						1			
						1			
1	1								
									1
	1								
		1							
1									
						1			
							1		
1									
	1								
							1		
25				15	10	80	20	3	2
70	100	100	80	50	20	55	90	100	95
5			3	2	1		15	1	
10	1	1	10	40	2	10	6		5

Rapp Road Landfill - PII, PIII Quadrat Data

Transect: P3-1

Date: August 4, 2013

Samplers: Susan Lehnhardt, Sue Vilord, Chris Einstein

Nt/Ad	Physiog	SPECIES	AVG																
			AF	RF	AC	RC	IV	STD	1	2	3	4	5	6	7	8	9	10	
Ad	A-Grass	<i>Lolium multiflorum</i>	4	5.06	18.70	25.58	30.64	32.71								2	95	40	50
Nt	P-Forb	<i>Carex pensylvanica</i>	2	2.53	17.00	23.26	25.79	35.92					90	80					
Nt	P-Grass	<i>Andropogon scoparius</i>	2	2.53	8.10	11.08	13.61	23.58											
Nt	Shrub	<i>Rubus flagellaris</i>	6	7.59	3.80	5.20	12.79	5.05				6	75						
Nt	A-Forb	<i>Polygonum pensylvanicum</i>	3	3.80	3.60	4.92	8.72	7.43											
Nt	P-Sedge	<i>Cyperus houghtonii</i>	5	6.33	1.50	2.05	8.38	2.22											
Nt	A-Forb	<i>Melampyrum lineare</i>	3	3.80	2.40	3.28	7.08	6.26											
Nt	Tree	<i>Betula populifolia</i>	3	3.80	2.20	3.01	6.81	6.27											
Nt	Tree	<i>Quercus rubra</i>	3	3.80	2.20	3.01	6.81	6.27											
Nt	Tree	<i>Acer rubrum</i>	3	3.80	1.70	2.33	6.12	3.47											
Nt	Tree	<i>Rhus typhina</i>	2	2.53	2.60	3.56	6.09	7.88											
Nt	P-Forb	<i>Solidago nemoralis</i>	3	3.80	1.20	1.64	5.44	2.30											
Nt	Tree	<i>Prunus serotina</i>	3	3.80	1.00	1.37	5.17	2.00											
Ad	A-Grass	<i>Avena sativa</i>	3	3.80	0.40	0.55	4.34	0.70											
Nt	P-Forb	<i>Phytolacca americana</i>	3	3.80	0.40	0.55	4.34	0.70											
Nt	P-Forb	<i>Helianthemum canadense</i>	2	2.53	0.90	1.23	3.76	2.51											
Nt	Tree	<i>Populus tremuloides</i>	2	2.53	0.50	0.68	3.22	1.27											
Nt	P-Forb	<i>Lespedeza capitata</i>	2	2.53	0.30	0.41	2.94	0.67											
Nt	P-Sedge	<i>Cyperus esculentus</i>	2	2.53	0.20	0.27	2.81	0.42											
Nt	A-Grass	<i>Panicum capillare</i>	2	2.53	0.20	0.27	2.81	0.42											
Ad	B-Forb	<i>Rumex acetosella</i>	2	2.53	0.20	0.27	2.81	0.42											
Nt	Vine	<i>Vitis riparia</i>	2	2.53	0.20	0.27	2.81	0.42											
Nt	Shrub	<i>Vaccinium angustifolium</i>	1	1.27	1.00	1.37	2.63	3.16											
Nt	P-Forb	<i>Aster divaricatus</i>	1	1.27	0.60	0.82	2.09	1.90											
Nt	P-Grass	<i>Panicum acuminatum</i>	1	1.27	0.60	0.82	2.09	1.90											
Nt	P-Grass	<i>Andropogon gerardii</i>	1	1.27	0.30	0.41	1.68	0.95											
Nt	A-Forb	<i>Acalypha rhomboidea</i>	1	1.27	0.10	0.14	1.40	0.32											
Ad	B-Forb	<i>Artemisia biennis</i>	1	1.27	0.10	0.14	1.40	0.32											
Ad	A-Forb	<i>Chenopodium album</i>	1	1.27	0.10	0.14	1.40	0.32											
Nt	A-Forb	<i>Conyza canadensis</i>	1	1.27	0.10	0.14	1.40	0.32											
Ad	A-Grass	<i>Digitaria sanguinalis</i>	1	1.27	0.10	0.14	1.40	0.32											
Nt	P-Grass	<i>Juncus tenuis</i>	1	1.27	0.10	0.14	1.40	0.32											
Ad	A-Forb	<i>Mollugo verticillata</i>	1	1.27	0.10	0.14	1.40	0.32											
Nt	B-Forb	<i>Oenothera biennis</i>	1	1.27	0.10	0.14	1.40	0.32											
Nt	A-Forb	<i>Oxalis europaea</i>	1	1.27	0.10	0.14	1.40	0.32											
Nt	P-Grass	<i>Panicum clandestinum</i>	1	1.27	0.10	0.14	1.40	0.32											
Nt	Shrub	<i>Rubus allegheniensis</i>	1	1.27	0.10	0.14	1.40	0.32											
Nt	Shrub	<i>Rubus idaeus strigosus</i>	1	1.27	0.10	0.14	1.40	0.32											
Nt	P-Forb	<i>Solidago rugosa</i>	1	1.27	0.10	0.14	1.40	0.32											
			79	100.00	73.10	100.00	200.00												
Non-vegetative ground cover																			

Soil	6	24.00	17.30	19.39	43.39	26.06
Fine litter	10	40.00	50.80	56.95	96.95	39.90
Coarse litter	4	16.00	1.70	1.91	17.91	2.75
Bryophyte	5	20.00	19.40	21.75	41.75	39.92
Rock	0	0.00	0.00	0.00	0.00	0.00
Water	0	0.00	0.00	0.00	0.00	0.00
	25	100.00	89.20	100.00	200.00	

30			1			80	2	30	30
70	100	20	60	100	100	15	10	3	30
				5	8			2	2
		100	90			2	1	1	

Rapp Road Landfill - PII, PIII Quadrat Data

Transect: R-4

Date: August 3, 2013

Samplers: Steve Apfelbaum, John Larson, Nicole Frazer

Nt/Ad	Physiog	SPECIES	AVG				IV	STD	10											
			AF	RF	AC	RC			1	2	3	4	5	6	7	8	9	10		
Nt	A-Forb	<i>Impatiens capensis</i>	4	4.35	15.00	15.46	19.81	25.17	75	25		40	10							
Nt	P-Forb	<i>Verbena hastata</i>	4	4.35	9.70	10.00	14.35	18.81							4	3	50	40		
Ad	A-Grass	<i>Digitaria sanguinalis</i>	4	4.35	8.50	8.76	13.11	13.34						20	15	40	10			
Nt	A-Forb	<i>Conyza canadensis</i>	4	4.35	6.30	6.49	10.84	12.75			3	15	5	40						
Nt	P-Forb	<i>Solidago graminifolia</i>	5	5.43	4.60	4.74	10.18	7.86		3		5				3	25	10		
Nt	A-Forb	<i>Erechtites hieracifolia</i>	4	4.35	4.20	4.33	8.68	6.89			10	10	20	2						
Ad	Vine	<i>Celastrus orbiculatus</i>	4	4.35	3.50	3.61	7.96	5.30	15	5		10	5							
Ad	A-Forb	<i>Galeopsis tetrahit</i>	3	3.26	4.00	4.12	7.38	7.38		5	15		20							
Nt	P-Forb	<i>Solanum nigrum</i>	2	2.17	5.00	5.15	7.33	10.54		25	25									
Ad	A-Grass	<i>Echinochloa crusgalli</i>	3	3.26	2.00	2.06	5.32	4.69				3	2		15					
Nt	Cryptogam	<i>Equisetum arvense</i>	2	2.17	2.00	2.06	4.24	4.22									10	10		
Nt	P-Forb	<i>Euphorbia maculata</i>	2	2.17	2.00	2.06	4.24	4.22							10	10				
Nt	A-Forb	<i>Polygonum pensylvanicum</i>	2	2.17	2.00	2.06	4.24	4.83			5				15					
Ad	A-Grass	<i>Secale cereale</i>	1	1.09	3.00	3.09	4.18	9.49						30						
Nt	A-Forb	<i>Oxalis stricta</i>	2	2.17	1.60	1.65	3.82	4.72			15		1							
Nt	P-Forb	<i>Aster pilosus</i>	2	2.17	1.20	1.24	3.41	3.16			2									10
Ad	A-Forb	<i>Mollugo verticillata</i>	2	2.17	1.20	1.24	3.41	3.16							2		10			
Ad	P-Forb	<i>Trifolium repens</i>	2	2.17	1.20	1.24	3.41	3.16								2				10
Nt	P-Sedge	<i>Carex</i> sp	2	2.17	0.80	0.82	3.00	1.75								3	5			
Nt	P-Grass	<i>Juncus</i> sp	2	2.17	0.80	0.82	3.00	1.75									3			5
Nt	P-Forb	<i>Solidago gigantea</i>	2	2.17	0.80	0.82	3.00	1.75									3			5
Nt	Vine	<i>Vitis riparia</i>	2	2.17	0.80	0.82	3.00	1.75			5					3				
Nt	P-Forb	<i>Apocynum cannabinum</i>	1	1.09	1.50	1.55	2.63	4.74							15					
Nt	B-Forb	<i>Oenothera biennis</i>	1	1.09	1.50	1.55	2.63	4.74							15					
Nt	Shrub	<i>Rubus idaeus strigosus</i>	2	2.17	0.40	0.41	2.59	0.84				2								2
Nt	A-Forb	<i>Erigeron strigosus</i>	1	1.09	1.00	1.03	2.12	3.16												10
Ad	P-Forb	<i>Hypericum perforatum</i>	1	1.09	1.00	1.03	2.12	3.16												10
Nt	A-Grass	<i>Panicum capillare</i>	1	1.09	1.00	1.03	2.12	3.16						10						
Nt	P-Forb	<i>Lycopus americanus</i>	1	1.09	0.80	0.82	1.91	2.53												8
Nt	A-Forb	<i>Oxalis europaea</i>	1	1.09	0.80	0.82	1.91	2.53		8										
Ad	P-Grass	<i>Poa pratensis</i>	1	1.09	0.80	0.82	1.91	2.53			8									
Nt	A-Forb	<i>Ambrosia artemisiifolia</i>	1	1.09	0.50	0.52	1.60	1.58								5				
Nt	P-Forb	<i>Arabis glabra</i>	1	1.09	0.50	0.52	1.60	1.58				5								
Nt	P-Forb	<i>Asclepias incarnata</i>	1	1.09	0.50	0.52	1.60	1.58							5					
Ad	B-Forb	<i>Barbarea vulgaris</i>	1	1.09	0.50	0.52	1.60	1.58						5						
Nt	P-Sedge	<i>Carex vulpinoidea</i>	1	1.09	0.50	0.52	1.60	1.58					5							
Nt	P-Forb	<i>Potentilla norvegica</i>	1	1.09	0.50	0.52	1.60	1.58												5
Nt	Tree	<i>Rhus typhina</i>	1	1.09	0.50	0.52	1.60	1.58							5					
Nt	B-Forb	<i>Rudbeckia hirta</i>	1	1.09	0.50	0.52	1.60	1.58												5
Nt	P-Forb	<i>Eupatorium perfoliatum</i>	1	1.09	0.40	0.41	1.50	1.26												4
Nt	A-Forb	<i>Lepidium virginicum</i>	1	1.09	0.40	0.41	1.50	1.26						4						
Ad	P-Forb	<i>Lythrum salicaria</i>	1	1.09	0.40	0.41	1.50	1.26								4				

Ad	B-Forb	<i>Alliaria petiolata</i>	1	1.09	0.30	0.31	1.40	0.95
Nt	P-Forb	<i>Lysimachia ciliata</i>	1	1.09	0.30	0.31	1.40	0.95
Nt	P-Forb	<i>Phytolacca americana</i>	1	1.09	0.30	0.31	1.40	0.95
Nt	Tree	<i>Populus deltoides</i>	1	1.09	0.30	0.31	1.40	0.95
Nt	Vine	<i>Rhus radicans</i>	1	1.09	0.30	0.31	1.40	0.95
Ad	B-Forb	<i>Verbascum thapsus</i>	1	1.09	0.30	0.31	1.40	0.95
Nt	A-Forb	<i>Bidens frondosa</i>	1	1.09	0.20	0.21	1.29	0.63
Ad	P-Forb	<i>Cirsium arvense</i>	1	1.09	0.20	0.21	1.29	0.63
Nt	P-Forb	<i>Epilobium coloratum</i>	1	1.09	0.20	0.21	1.29	0.63
Nt	A-Forb	<i>Ranunculus abortivus</i>	1	1.09	0.20	0.21	1.29	0.63
Nt	P-Forb	<i>Viola sororia</i>	1	1.09	0.20	0.21	1.29	0.63
			92	100.00	97.00	100.00	200.00	

Non-vegetative ground cover

Soil	8	32.00	26.70	26.10	58.10	24.04
Fine litter	10	40.00	73.00	71.36	111.36	22.23
Coarse litter	7	28.00	2.60	2.54	30.54	2.27
Bryophyte	0	0.00	0.00	0.00	0.00	0.00
Rock	0	0.00	0.00	0.00	0.00	0.00
Water	0	0.00	0.00	0.00	0.00	0.00
		25	100.00	102.30	100.00	200.00

3										
3										
	3									
									3	
3										
							3			
									2	
								2		
	2									
	2									
					2					
20	60	40	50	60	15	20	2			
70	40	60	50	50	85	80	98	97	100	
5	1	5	5	5	2				3	

Rapp Road Landfill - PII, PIII Quadrat Data

Transect: R-5

Date: August 3, 2013

Samplers: Steve Apfelbaum, John Larson, Nicole Frazer

Nt/Ad	Physiog	SPECIES	AVG		10		IV	STD	1	2	3	4	5	6	7	8	9	10
			AF	RF	AC	RC												
Nt	A-Forb	<i>Bidens frondosa</i>	5	4.90	13.10	15.20	20.10	21.79			5	5	15	60	46			
Nt	P-Forb	<i>Verbena hastata</i>	7	6.86	11.10	12.88	19.74	10.75	20	30	20	20	8		10			3
Nt	P-Forb	<i>Eupatorium perfoliatum</i>	5	4.90	11.00	12.76	17.66	14.68	20	15	40	30	5					
Nt	Tree	<i>Populus deltoides</i>	7	6.86	6.10	7.08	13.94	7.58	2		3		5	15	20	1		15
Nt	P-Forb	<i>Lycopus americanus</i>	4	3.92	4.30	4.99	8.91	6.86	10	10	20					3		
Nt	P-Forb	<i>Solidago graminifolia</i>	4	3.92	4.00	4.64	8.56	6.15	5	5	15	15						
Nt	P-Forb	<i>Solidago gigantea</i>	5	4.90	2.80	3.25	8.15	3.39	5	4	5	10			4			
Ad	P-Forb	<i>Trifolium repens</i>	4	3.92	2.00	2.32	6.24	2.94	2	5	8	5						
Nt	P-Grass	<i>Juncus tenuis</i>	2	1.96	3.00	3.48	5.44	7.89	5				25					
Nt	P-Forb	<i>Euphorbia maculata</i>	4	3.92	1.30	1.51	5.43	2.50		2					8	1	2	
Nt	A-Forb	<i>Coryza canadensis</i>	4	3.92	1.20	1.39	5.31	1.75			2			3	5			2
Nt	P-Forb	<i>Aster simplex</i>	2	1.96	2.50	2.90	4.86	6.35					20	5				
Nt	A-Forb	<i>Erigeron strigosus</i>	2	1.96	2.50	2.90	4.86	5.40	10		15							
Ad	P-Forb	<i>Medicago lupulina</i>	2	1.96	1.90	2.20	4.16	4.77								15	4	
Nt	P-Sedge	<i>Carex vulpinoidea</i>	2	1.96	1.30	1.51	3.47	3.20	3	10								
Nt	A-Forb	<i>Bidens cernua</i>	2	1.96	1.00	1.16	3.12	2.54	8	2								
Nt	P-Forb	<i>Potentilla norvegica</i>	2	1.96	1.00	1.16	3.12	2.11	5		5							
Nt	P-Forb	<i>Lobelia siphilitica</i>	2	1.96	0.90	1.04	3.00	2.51		1							8	
Nt	A-Forb	<i>Acalypha rhomboidea</i>	2	1.96	0.70	0.81	2.77	1.64	2		5							
Ad	A-Grass	<i>Echinochloa crusgalli</i>	2	1.96	0.70	0.81	2.77	1.49		4					3			
Nt	P-Grass	<i>Andropogon gerardii</i>	1	0.98	1.50	1.74	2.72	4.74					15					
Nt	A-Forb	<i>Polygonum pensylvanicum</i>	1	0.98	1.50	1.74	2.72	4.74									15	
Nt	Tree	<i>Acer rubrum</i>	2	1.96	0.60	0.70	2.66	1.58								1		5
Ad	Vine	<i>Celastrus orbiculatus</i>	2	1.96	0.40	0.46	2.42	0.97					3					1
Nt	B-Forb	<i>Lobelia inflata</i>	2	1.96	0.20	0.23	2.19	0.42	1	1								
Nt	P-Sedge	<i>Carex sp</i>	1	0.98	1.00	1.16	2.14	3.16					10					
Nt	P-Sedge	<i>Cyperus esculentus</i>	1	0.98	1.00	1.16	2.14	3.16						10				
Nt	P-Forb	<i>Asclepias incarnata</i>	1	0.98	0.50	0.58	1.56	1.58			5							
Nt	P-Forb	<i>Aster lateriflorus</i>	1	0.98	0.50	0.58	1.56	1.58										5
Ad	A-Forb	<i>Dianthus ameria</i>	1	0.98	0.50	0.58	1.56	1.58	5									
Ad	A-Grass	<i>Digitaria sanguinalis</i>	1	0.98	0.50	0.58	1.56	1.58								5		
Nt	P-Grass	<i>Glyceria striata</i>	1	0.98	0.50	0.58	1.56	1.58					5					
Nt	P-Forb	<i>Mimulus ringens</i>	1	0.98	0.50	0.58	1.56	1.58								5		
Nt	P-Forb	<i>Solidago juncea</i>	1	0.98	0.50	0.58	1.56	1.58										5
Nt	A-Forb	<i>Ambrosia artemisiifolia</i>	1	0.98	0.40	0.46	1.44	1.26									4	
Nt	P-Forb	<i>Aster pilosus</i>	1	0.98	0.40	0.46	1.44	1.26							4			
Nt	P-Forb	<i>Aster puniceus</i>	1	0.98	0.30	0.35	1.33	0.95		3								
Nt	P-Forb	<i>Desmodium canadense</i>	1	0.98	0.30	0.35	1.33	0.95										3
Nt	B-Forb	<i>Rudbeckia hirta</i>	1	0.98	0.30	0.35	1.33	0.95					3					
Ad	A-Grass	<i>Secale cereale</i>	1	0.98	0.30	0.35	1.33	0.95				3						
Nt	P-Forb	<i>Solidago canadensis</i>	1	0.98	0.30	0.35	1.33	0.95						3				
Nt	P-Forb	<i>Solidago rugosa</i>	1	0.98	0.30	0.35	1.33	0.95					3					

Nt	Vine	<i>Vitis riparia</i>	1	0.98	0.30	0.35	1.33	0.95
Nt	P-Forb	<i>Eupatorium maculatum</i>	1	0.98	0.20	0.23	1.21	0.63
Nt	P-Forb	<i>Lobelia cardinalis</i>	1	0.98	0.20	0.23	1.21	0.63
Nt	A-Forb	<i>Oxalis stricta</i>	1	0.98	0.20	0.23	1.21	0.63
Nt	P-Grass	<i>Panicum acuminatum</i>	1	0.98	0.20	0.23	1.21	0.63
Nt	P-Forb	<i>Physostegia virginiana</i>	1	0.98	0.20	0.23	1.21	0.63
Nt	A-Grass	<i>Cenchrus longispinus</i>	1	0.98	0.10	0.12	1.10	0.32
Ad	A-Forb	<i>Mollugo verticillata</i>	1	0.98	0.10	0.12	1.10	0.32
			102	100.00	86.20	100.00	200.00	
Non-vegetative ground cover								
	Soil		6	42.86	21.50	21.50	64.36	41.44
	Fine litter		8	57.14	78.50	78.50	135.64	41.44
	Coarse litter		0	0.00	0.00	0.00	0.00	0.00
	Bryophyte		0	0.00	0.00	0.00	0.00	0.00
	Rock		0	0.00	0.00	0.00	0.00	0.00
	Water		0	0.00	0.00	0.00	0.00	0.00
			14	100.00	100.00	100.00	200.00	

							3		
	2								
								2	
2									
2									
2									
								1	
								1	
2	8	2					3		100
98	92	98	100	100	100	97	100		100

Rapp Road Landfill - PII, PIII Quadrat Data
 Transect: R-6
 Date: August 3, 2013
 Samplers: John Greaves, John Larson

Nt/Ad	Physiog	SPECIES	AVG					STD	10											
			AF	RF	AC	RC	IV		1	2	3	4	5	6	7	8	9	10		
Ad	P-Forb	<i>Trifolium repens</i>	4	1.86	10.80	11.70	13.56	19.63	20						3	60				25
Nt	Tree	<i>Populus deltoides</i>	10	4.65	8.10	8.78	13.43	5.11	8	10	20	10	3	5	2	10	5		8	
Nt	Cryptogam	<i>Equisetum arvense</i>	4	1.86	9.50	10.29	12.15	16.41		20				20			5	50		
Nt	P-Forb	<i>Solidago graminifolia</i>	8	3.72	4.70	5.09	8.81	3.33	5	8	3	5		5			3	8	10	
Nt	P-Forb	<i>Lycopus americanus</i>	9	4.19	3.30	3.58	7.76	2.87	2	1	2	5	2	10	4	2			5	
Nt	A-Forb	<i>Erigeron canadensis</i>	8	3.72	2.90	3.14	6.86	2.02		2	5			2	3	5	5	5	2	
Nt	P-Forb	<i>Eupatorium perfoliatum</i>	8	3.72	2.90	3.14	6.86	2.42		5	3			4	8	2	1	3	3	
Nt	P-Forb	<i>Solidago altissima</i>	7	3.26	2.60	2.82	6.07	2.01	3	4	4			5		3	5	2		
Nt	P-Forb	<i>Verbena hastata</i>	7	3.26	2.50	2.71	5.96	1.96	2	3				3	5	3			4	5
Nt	P-Sedge	<i>Scirpus pendulous</i>	5	2.33	2.70	2.93	5.25	4.64	15		5	3		2					2	
Nt	A-Grass	<i>Panicum dichotomiflorum</i>	3	1.40	3.50	3.79	5.19	6.69						5		20	10			
Nt	A-Forb	<i>Ambrosia artemisiifolia</i>	5	2.33	2.40	2.60	4.93	4.06	10		10					2	1	1		
Nt	Tree	<i>Acer rubrum</i>	6	2.79	1.60	1.73	4.52	1.71		2	5	3	2	3					1	
Nt	P-Forb	<i>Solidago juncea</i>	6	2.79	1.60	1.73	4.52	1.43		3	2	3	3				2	3		
Ad	A-Forb	<i>Trifolium arvense</i>	5	2.33	1.80	1.95	4.28	2.62	1	3		8					2		4	
Nt	P-Forb	<i>Agalinis tenuifolia</i>	3	1.40	2.60	2.82	4.21	6.31	5		1	20								
Nt	P-Forb	<i>Epilobium coloratum</i>	6	2.79	1.30	1.41	4.20	1.25				1	2	3	3			2	2	
Nt	P-Forb	<i>Solidago gigantea</i>	6	2.79	1.20	1.30	4.09	1.03	2		2	2		2				2	2	
Ad	A-Grass	<i>Digitaria sanguinalis</i>	4	1.86	2.00	2.17	4.03	3.30						2	10	3			5	
Nt	P-Forb	<i>Solidago rugosa</i>	6	2.79	0.80	0.87	3.66	0.92	1		1	1				3	1	1		
Ad	P-Forb	<i>Lotus corniculatus</i>	4	1.86	1.50	1.63	3.49	2.12							5	2	5		3	
Nt	A-Grass	<i>Panicum capillare</i>	4	1.86	1.20	1.30	3.16	2.49		2				8	1				1	
Ad	P-Forb	<i>Galium odoratum</i>	5	2.33	0.70	0.76	3.08	0.82	1			1	1	2			2			
Nt	P-Forb	<i>Euphorbia maculata</i>	4	1.86	0.80	0.87	2.73	1.03						2	2	2			2	
Ad	Shrub	<i>Rhamnus cathartica</i>	4	1.86	0.80	0.87	2.73	1.03		2	2	2	2	2	2					
Nt	A-Forb	<i>Bidens tripartite</i>	4	1.86	0.70	0.76	2.62	1.06						2	3	1		1		
Nt	P-Forb	<i>Aster lateriflorus</i>	3	1.40	1.10	1.19	2.59	1.91				5					2	4		
N	P-Forb	<i>Boehmeria cylindrica</i>	4	1.86	0.60	0.65	2.51	0.84				1	2	2				1		
Nt	A-Forb	<i>Oxalis europaea</i>	4	1.86	0.50	0.54	2.40	0.71		1	2					1		1		
Ad	P-Forb	<i>Medicago lupulina</i>	3	1.40	0.90	0.98	2.37	1.66				1	4					4		
Nt	P-Sedge	<i>Eleocharis acicularis</i>	1	0.47	1.50	1.63	2.09	4.74	15											
Nt	P-Forb	<i>Apocynum cannabinum</i>	3	1.40	0.60	0.65	2.05	1.07		3		2							1	
Nt	P-Sedge	<i>Carex vulpinoidea</i>	3	1.40	0.60	0.65	2.05	0.97		2	2	2								
Nt	P-Sedge	<i>Cyperus esculentus</i>	3	1.40	0.60	0.65	2.05	0.97	2	2		2								
Nt	P-Grass	<i>Juncus effusus</i>	2	0.93	0.70	0.76	1.69	1.49	4						3					
Ad	A-Grass	<i>Secale cereale</i>	2	0.93	0.70	0.76	1.69	1.64		2	5									
Nt	P-Forb	<i>Mimulus ringens</i>	1	0.47	1.00	1.08	1.55	3.16							10					
Nt	P-Forb	<i>Aster puniceus</i>	2	0.93	0.50	0.54	1.47	1.08							3	2				
Nt	A-Forb	<i>Erigeron strigosus</i>	2	0.93	0.50	0.54	1.47	1.08	3			2								
Nt	P-Forb	<i>Plantago rugelii</i>	2	0.93	0.50	0.54	1.47	1.08	2		3									
Ad	A-Grass	<i>Echinochloa crusgalli</i>	2	0.93	0.40	0.43	1.36	0.84				2							2	
Nt	P-Grass	<i>Leersia oryzoides</i>	2	0.93	0.40	0.43	1.36	0.84	2	2										

Nt	P-Grass	<i>Panicum clandestinum</i>	2	0.93	0.40	0.43	1.36	0.84
Nt	P-Forb	<i>Aster lanceolatus</i>	1	0.47	0.80	0.87	1.33	2.53
Nt	P-Forb	<i>Lysimachia ciliata</i>	2	0.93	0.20	0.22	1.15	0.42
Nt	B-Forb	<i>Rudbeckia hirta</i>	1	0.47	0.50	0.54	1.01	1.58
	Forb	<i>Vicia sp.</i>	1	0.47	0.50	0.54	1.01	1.58
Ad	P-Grass	<i>Bromus sp.</i>	1	0.47	0.30	0.33	0.79	0.95
Ad	P-Forb	<i>Lythrum salicaria</i>	1	0.47	0.30	0.33	0.79	0.95
Ad	B-Forb	<i>Verbascum thapsus</i>	1	0.47	0.30	0.33	0.79	0.95
Ad	P-Forb	<i>Achillea millefolium</i>	1	0.47	0.20	0.22	0.68	0.63
Ad	Sedge	<i>Agropyron repens</i>	1	0.47	0.20	0.22	0.68	0.63
Nt	P-Sedge	<i>Carex hystericina</i>	1	0.47	0.20	0.22	0.68	0.63
Nt	A-Forb	<i>Cassia fasciculata</i>	1	0.47	0.20	0.22	0.68	0.63
Nt	P-Grass	<i>Juncus dudleyi</i>	1	0.47	0.20	0.22	0.68	0.63
Nt	P-Grass	<i>Panicum acuminatum</i>	1	0.47	0.20	0.22	0.68	0.63
Nt	Tree	<i>Populus tremuloides</i>	1	0.47	0.20	0.22	0.68	0.63
Nt	P-Forb	<i>Potentilla simplex</i>	1	0.47	0.20	0.22	0.68	0.63
Nt	Tree	<i>Rhus typhina</i>	1	0.47	0.20	0.22	0.68	0.63
Ad	Shrub	<i>Rosa multiflora</i>	1	0.47	0.20	0.22	0.68	0.63
Nt	Tree	<i>Salix nigra</i>	1	0.47	0.20	0.22	0.68	0.63
Ad	P-Forb	<i>Trifolium hybridum</i>	1	0.47	0.20	0.22	0.68	0.63
Nt	Vine	<i>Vitis riparia</i>	1	0.47	0.20	0.22	0.68	0.63
Nt	A-Forb	<i>Bidens cernua</i>	1	0.47	0.10	0.11	0.57	0.32
Nt	P-Sedge	<i>Carex scoparia</i>	1	0.47	0.10	0.11	0.57	0.32
Ad	P-Forb	<i>Cerastium vulgatum</i>	1	0.47	0.10	0.11	0.57	0.32
	Grass	Grass sp	1	0.47	0.10	0.11	0.57	0.32
Nt	A-Forb	<i>Lindernia dubia</i>	1	0.47	0.10	0.11	0.57	0.32
Nt	B-Forb	<i>Oenothera biennis</i>	1	0.47	0.10	0.11	0.57	0.32
Nt	Shrub	<i>Rhus glabra</i>	1	0.47	0.10	0.11	0.57	0.32
Ad	P-Forb	<i>Taraxacum officinale</i>	1	0.47	0.10	0.11	0.57	0.32
			215	100.00	92.30	100.00	200.00	
Non-vegetative ground cover								
	Soil		9	23.68	12.80	13.90	37.58	15.04
	Fine litter		10	26.32	26.00	28.23	54.55	15.60
	Coarse litter		2	5.26	0.40	0.43	5.70	0.84
	Bryophyte		10	26.32	51.50	55.92	82.23	26.04
	Rock		7	18.42	1.40	1.52	19.94	1.58
	Water		0	0.00	0.00	0.00	0.00	0.00
			38	100.00	92.10	100.00	200.00	

2	2									
				8						
1			1							
5										
									5	
		3								
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						2				
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						2				
2						2				
	1									
						1				
									1	
						1				
						1				
							1			
4	15	20			2	5	2	50	10	20
50	25	25	20	40	50	10	10	10	10	20
2				2						
60	50	50	90	80	30	20	10	75	50	
			1	3	2	1		5	1	1

Attachment 4. Phase II & III Floristic Inventory—Total Species List & Floristic Analysis

Rapp Road Landfill - PII, PIII Species Search

Transect: Total Species Search (compiled from species searches in vicinity of each transect)

Date: August 3-4, 2013

Samplers: Steve Apfelbaum

Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/ Larval Food Species	Seeded/ Planted Species
<i>Acalypha rhomboidea</i>	Three-seeded mercury	Euphorbiaceae	A-Forb	Nt	FACU			
<i>Acer negundo</i>	Box-elder	Aceraceae	Tree	Nt	FAC			
<i>Acer rubrum</i>	Red maple	Aceraceae	Tree	Nt	FAC			
<i>Agalinis tenuifolia</i>	Gerardia	Scrophulariaceae	P-Forb	Nt	FACW			X
<i>Agropyron repens</i>	Quack grass	Poaceae	P-Grass	Ad				
<i>Agrostis alba</i>	Redtop	Poaceae	P-Grass	Ad	FACW			
<i>Alisma subcordatum</i>	Water-plantain	Alismataceae	P-Forb	Nt	OBL			X
<i>Alliaria petiolata</i>	Garlic mustard	Brassicaceae	B-Forb	Ad	FAC			
<i>Ambrosia artemisiifolia</i>	Ragweed	Asteraceae	A-Forb	Nt	FACU			
<i>Amelanchier sp</i>	Serviceberry	Rosaceae	Tree	Nt				
<i>Andropogon gerardii</i>	Big bluestem	Poaceae	P-Grass	Nt	FACU			
<i>Andropogon scoparius</i>	Little bluestem	Poaceae	P-Grass	Nt	FACU			X
<i>Apocynum cannabinum</i>	Indian hemp	Apocynaceae	P-Forb	Nt	FAC			X
<i>Arabis glabra</i>	Tower-mustard	Brassicaceae	P-Forb	Nt	UPL			X
<i>Artemisia vulgaris</i>	Mugwort	Asteraceae	P-Forb	Ad	UPL			
<i>Asclepias incarnata</i>	Swamp milkweed	Asclepiadaceae	P-Forb	Nt	OBL			X
<i>Asclepias syriaca</i>	Common milkweed	Asclepiadaceae	P-Forb	Nt	UPL		X	X
<i>Aster cordifolius</i>	Heart-leaved ster	Asteraceae	P-Forb	Nt	UPL			
<i>Aster divaricatus</i>	White wood aster	Asteraceae	P-Forb	Nt	UPL			
<i>Aster ericoides</i>	White heath aster	Asteraceae	P-Forb	Nt	FACU			X
<i>Aster laevis</i>	Smooth blue aster	Asteraceae	P-Forb	Nt	FACU			X
<i>Aster lanceolatus</i>	Old-field aster	Asteraceae	P-Forb	Nt	FACW			
<i>Aster lateriflorus</i>	Calico aster	Asteraceae	P-Forb	Nt	FAC			X
<i>Aster novae-angliae</i>	New England aster	Asteraceae	P-Forb	Nt	FACW			X
<i>Aster pilosus</i>	Heath aster	Asteraceae	P-Forb	Nt	FACU			X
<i>Aster puniceus</i>	Purple-stemmed aster	Asteraceae	P-Forb	Nt	OBL			X
<i>Aster umbellatus</i>	Flat-top white aster	Asteraceae	P-Forb	Nt	FACW			X
<i>Athyrium filix-femina</i>	Northern lady fern	Dryopteridaceae	Cryptogam	Nt	FAC			
<i>Avena sativa</i>	Oats	Poaceae	A-Grass	Ad	UPL			
<i>Barbarea vulgaris</i>	Cress	Brassicaceae	B-Forb	Ad	FAC			
<i>Betula alleghaniensis</i>	Yellow birch	Betulaceae	Tree	Nt	FAC			
<i>Betula papyrifera</i>	Paper birch	Betulaceae	Tree	Nt	FACU			
<i>Betula populifolia</i>	Gray birch	Betulaceae	Tree	Nt	FAC			
<i>Bidens cernua</i>	Stick-tights	Asteraceae	A-Forb	Nt	OBL			X
<i>Bidens comosa</i>	Swamp tickseed	Asteraceae	A-Forb	Nt	OBL			
<i>Bidens coronata</i>	Purple-stemmed tickseed	Asteraceae	A-Forb	Nt	OBL			
<i>Bidens frondosa</i>	Beggar-ticks	Asteraceae	A-Forb	Nt	FACW			X
<i>Bidens sp</i>	Tickseed	Asteraceae	A-Forb					
<i>Boehmeria cylindrica</i>	Pasle nettle	Urticaceae	P-Forb	Nt	OBL			
<i>Bromus inermis</i>	Hungarian brome	Poaceae	P-Grass	Ad	UPL			

Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/ Larval Food Species	Seeded/ Planted Species
<i>Bromus japonicus</i>	Japanese chess	Poaceae	P-Grass	Ad	FACU			
<i>Calamagrostis canadensis</i>	Blue joint grass	Poaceae	P-Grass	Nt	OBL			
<i>Campanula aparinoides</i>	Marsh bellflower	Companulaceae	P-Forb	Nt	OBL			
<i>Carex annectens</i>	Yellow-fruit sedge	Cyperaceae	P-Sedge	Nt	FACW			X
<i>Carex bebbii</i>	Bebb's sedge	Cyperaceae	P-Sedge	Nt	OBL			
<i>Carex communis</i>	Common beech sedge	Cyperaceae	P-Sedge	Nt	UPL			
<i>Carex comosa</i>	Bearded sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Carex crinita</i>	Fringed sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Carex granularis</i>	Pale sedge	Cyperaceae	P-Sedge	Nt	FACW			
<i>Carex hystricina</i>	Porcupine sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Carex lupulina</i>	Hop sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Carex pennsylvanica</i>	Common oak sedge	Cyperaceae	P-Sedge	Nt	UPL			X
<i>Carex scoparia</i>	Pointed broom sedge	Cyperaceae	P-Sedge	Nt	FACW			X
<i>Carex sp</i>	Sedge	Cyperaceae	P-Sedge	Nt				
<i>Carex stricta</i>	Tussock sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Carex vulpinoidea</i>	Common fox sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Cassia fasciculata</i>	Partridge pea	Fabaceae	A-Forb	Nt	FACU	Rev.List: G5 S3S4		
<i>Celastrus orbiculatus</i>	Oriental bittersweet	Celastraceae	Vine	Ad	UPL			
<i>Centaurea maculosa</i>	Spotted knapweed	Asteraceae	P-Forb	Ad	UPL			
<i>Chelone glabra</i>	Turtle-heads	Scrophulariaceae	P-Forb	Nt	OBL			X
<i>Chenopodium album</i>	Lamb's-quarters	Chenopodiaceae	A-Forb	Ad	FACU			
<i>Chrysanthemum leucanthemum</i>	Ox-eye daisy	Asteraceae	P-Forb	Ad	UPL			
<i>Cichorium intybus</i>	Chicory	Asteraceae	P-Forb	Ad	FACU			
<i>Circaea lutetiana</i>	Enchanter's nightshade	Onagraceae	P-Forb	Nt	FACU			
<i>Cirsium arvense</i>	Canada thistle	Asteraceae	P-Forb	Ad	FACU			
<i>Convolvulus sepium</i>	Hedge bindweed	Convolvulaceae	P-Forb	Nt	FAC			
<i>Conyza canadensis</i>	Horseweed	Asteraceae	A-Forb	Nt	FACU			X
<i>Cornus amomum</i>	Silky dogwood	Cornaceae	Shrub	Nt	FACW			
<i>Cornus racemosa</i>	Gray dogwood	Cornaceae	Shrub	Nt	FAC			
<i>Coronilla varia</i>	Crown vetch	Fabaceae	P-Forb	Ad	UPL			
<i>Corylus americana</i>	American hazelnut	Betulaceae	Shrub	Nt	FACU			
<i>Crataegus sp.</i>	Hawthorn	Rosaceae	Tree	Nt				
<i>Cuscuta gronovii</i>	Common dodder	Cuscutaceae	A-Forb	Nt	OBL			
<i>Cuscuta sp.</i>	Dodder	Cuscutaceae	A-Forb	Nt	OBL			
<i>Cycloloma atriplicifolium</i>	Winged-pigweed	Chenopodiaceae	A-Forb	Ad	FACU			
<i>Cyperus esculentus</i>	Yellow nut-grass	Cyperaceae	P-Sedge	Nt	FACW			
<i>Cyperus schweinitzii</i>	Sand flat sedge	Cyperaceae	P-Sedge	Nt	FACU	G5 S2 R		X
<i>Cyperus sp</i>	Flat sedge	Cyperaceae	P-Sedge	Nt				
<i>Cyperus strigosus</i>	Straw-colored flat sedge	Cyperaceae	P-Sedge	Nt	FACW			
<i>Dactylis glomerata</i>	Orchard grass	Poaceae	P-Grass	Ad	FACU			
<i>Danthonia spicata</i>	Poverty grass	Poaceae	P-Grass	Nt	UPL			X
<i>Daucus carota</i>	Queen-Anne's-lace	Apiaceae	B-Forb	Ad	UPL			
<i>Desmodium canadense</i>	Giant tick clover	Fabaceae	P-Forb	Nt	FAC			X
<i>Dianthus armeria</i>	Deptford pink	Caryophyllaceae	A-Forb	Ad	UPL			
<i>Digitaria sanguinalis</i>	Tall crabgrass	Poaceae	A-Grass	Ad	FACU			
<i>Diodia teres</i>	Poorjoe	Rubiaceae	A-Forb	Nt	FACU			X

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<i>Echinochloa crusgalli</i>	Japanese millet	Poaceae	A-Grass	Ad	FAC			
<i>Echinochloa walteri</i>	Water millet	Poaceae	A-Grass	Nt	OBL			
<i>Echinocystis lobata</i>	Wild cucumber	Cucurbitaceae	Vine	Nt	FACW			X
<i>Eleocharis acicularis</i>	Hairgrass	Cyperaceae	P-Sedge	Nt	OBL			
<i>Eleocharis obtusa</i>	Blunt spike-rush	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Eleocharis smallii</i>	Marsh spike rush	Cyperaceae	P-Sedge	Nt	OBL			
<i>Eleocharis sp</i>	Spike rush	Cyperaceae	P-Sedge	Nt	OBL			
<i>Elymus virginicus</i>	Virginia wild rye	Poaceae	P-Grass	Nt	FACW			X
<i>Epilobium coloratum</i>	Purple-leaf willowherb	Onagraceae	P-Forb	Nt	OBL			X
<i>Equisetum arvense</i>	Field horsetail	Equisetaceae	Cryptogam	Nt	FAC			
<i>Eragrostis hypnoides</i>	Lovegrass	Poaceae	A-Grass	Nt	OBL			
<i>Eragrostis pectinacea</i>	Small love grass	Poaceae	A-Grass	Nt	FAC			
<i>Erechtites hieracifolia</i>	Fireweed	Asteraceae	A-Forb	Nt	FACU			X
<i>Erigeron annuus</i>	Daisy-fleabane	Asteraceae	A-Forb	Nt	FACU			
<i>Erigeron strigosus</i>	Daisy-fleabane	Asteraceae	A-Forb	Nt	FACU			
<i>Eupatorium maculatum</i>	Spotted Joy-pye weed	Asteraceae	P-Forb	Nt	OBL			
<i>Eupatorium perfoliatum</i>	Thoroughwort	Asteraceae	P-Forb	Nt	FACW			X
<i>Eupatorium rugosum</i>	White snakeroot	Asteraceae	P-Forb	Nt	UPL			X
<i>Euphorbia maculata</i>	Spotted spurge	Euphorbiaceae	P-Forb	Nt	FACU			
<i>Festuca elatior</i>	Tall fescue	Poaceae	P-Grass	Ad	FACU			
<i>Festuca rubra</i>	Red fescue	Poaceae	P-Grass	Ad	FACU			
<i>Fragaria virginiana</i>	Field strawberry	Rosaceae	P-Forb	Nt	FACU		X	
<i>Fraxinus americana</i>	White ash	Oleaceae	Tree	Nt	FACU			
<i>Galeopsis tetrahit</i>	Hemp-nettle	Lamiaceae	A-Forb	Ad	FACU			
<i>Galium odoratum</i>	Sweet woodruff	Rubiaceae	P-Forb	Ad	UPL			
<i>Gaylussacia baccata</i>	Box huckleberry	Ericaceae	Shrub	Nt	FACU			
<i>Glechoma hederacea</i>	Creeping Charlie	Lamiaceae	P-Forb	Ad	FAC			
<i>Glyceria grandis</i>	Reed meadowgrass	Poaceae	P-Grass	Nt	OBL			
<i>Glyceria striata</i>	Fowl mannagrass	Poaceae	P-Grass	Nt	OBL			X
<i>Hackelia virginiana</i>	Stickseed	Boraginaceae	P-Forb	Nt	FACU			
<i>Hamamelis virginiana</i>	Witch-hazel	Hamamelidaceae	Shrub	Nt	FACU			
<i>Helianthemum canadense</i>	Frostweed	Cistaceae	P-Forb	Nt	UPL			
<i>Helianthus divaricatus</i>	Woodland sunflower	Asteraceae	P-Forb	Nt	UPL		X	X
<i>Heliopsis helianthoides</i>	False sunflower	Asteraceae	P-Forb	Nt	UPL			
<i>Hypericum boreale</i>	Northern dwarf St. John's-wort	Clusiaceae	P-Forb	Nt	OBL			X
<i>Hypericum perforatum</i>	Common St. John's-wort	Clusiaceae	P-Forb	Ad	UPL			
<i>Hypericum punctatum</i>	St. John's-wort	Clusiaceae	P-Forb	Nt	FAC			
<i>Impatiens capensis</i>	Spotted touch-me-not	Balsaminaceae	A-Forb	Nt	FACW			
<i>Iris versicolor</i>	Blue flag	Iridaceae	P-Forb	Nt	OBL			
<i>Juglans nigra</i>	Black walnut	Juglandaceae	Tree	Nt	FACU			X
<i>Juncus bufonius</i>	Toad-rush	Juncaceae	P-Grass	Nt	FACW			
<i>Juncus canadensis</i>	Canada rush	Juncaceae	P-Grass	Nt	OBL			
<i>Juncus dudleyi</i>	Dudley's rush	Juncaceae	P-Grass	Nt	FACW			X
<i>Juncus effusus</i>	Common rush	Juncaceae	P-Grass	Nt	OBL			X
<i>Juncus nodosus</i>	Knotted rush	Juncaceae	P-Grass	Nt	OBL			X
<i>Juncus roemerianus</i>	Needlerush	Juncaceae	P-Grass	Nt	OBL			

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<i>Juncus sp</i>	Rush	Juncaceae	P-Grass	Nt				
<i>Juncus tenuis</i>	Slender yard-rush	Juncaceae	P-Grass	Nt	FACW			
<i>Juncus torreyi</i>	Torrey's rush	Juncaceae	P-Grass	Nt	FACW			X
<i>Leersia oryzoides</i>	Rice cutgrass	Poaceae	P-Grass	Nt	OBL			
<i>Leptoloma cognatum</i>	Fall witch grass	Poaceae	P-Grass	Nt	UPL			
<i>Lespedeza capitata</i>	Bush-clover	Fabaceae	P-Forb	Nt	FACU			
<i>Lindernia dubia</i>	False pimpernel	Scrophulariaceae	A-Forb	Nt	OBL			X
<i>Lobelia cardinalis</i>	Cardinal flower	Campanulaceae	P-Forb	Nt	OBL			X
<i>Lobelia inflata</i>	Indian-tobacco	Campanulaceae	B-Forb	Nt	FACU			
<i>Lobelia siphilitica</i>	Great lobelia	Campanulaceae	P-Forb	Nt	FACW			X
<i>Lolium multiflorum</i>	Italian rye grass	Poaceae	A-Grass	Ad	FACU			X
<i>Lonicera tatarica</i>	Tartarian honeysuckle	Caprifoliaceae	Shrub	Ad	FACU			X
<i>Lotus corniculatus</i>	Bird's-foot trefoil	Fabaceae	P-Forb	Ad	FACU			
<i>Lupinus perennis</i>	Wild lupine	Fabaceae	P-Forb	Nt	UPL			
<i>Lychnis alba</i>	White campion	Caryophyllaceae	A-Forb	Ad	UPL		X	X
<i>Lycopus americanus</i>	Water-horehound	Lamiaceae	P-Forb	Nt	OBL			
<i>Lysimachia ciliata</i>	Fringed loosestrife	Primulaceae	P-Forb	Nt	FACW			X
<i>Lysimachia terrestris</i>	Swamp-candles	Primulaceae	P-Forb	Nt	OBL			
<i>Lythrum salicaria</i>	Purple loosestrife	Lythraceae	P-Forb	Ad	OBL			
<i>Maianthemum canadense</i>	False lily-of-the-valley	Liliaceae	P-Forb	Nt	FACU			
<i>Medicago lupulina</i>	Black medick	Fabaceae	P-Forb	Ad	FACU			
<i>Melampyrum lineare</i>	Cow wheat	Scrophulariaceae	A-Forb	Nt	FAC			
<i>Melilotus alba</i>	White sweet-clover	Fabaceae	B-Forb	Ad	FACU			
<i>Melilotus officinalis</i>	Yellow melilotus	Fabaceae	B-Forb	Ad	FACU			
<i>Mentha arvensis</i>	Field mint	Lamiaceae	P-Forb	Ad	FACW			
<i>Mimulus ringens</i>	Monkey flower	Lamiaceae	P-Forb	Nt	OBL			
<i>Mollugo verticillata</i>	Carpetweed	Molluginaceae	A-Forb	Ad	FAC			
<i>Monarda fistulosa</i>	Wild bergamot	Lamiaceae	P-Forb	Nt	FACU			
<i>Monarda punctata</i>	Dotted horsemint	Lamiaceae	P-Forb	Nt	UPL			X
<i>Muhlenbergia neomexicana</i>	Muhlenbergia	Poaceae	P-Grass					
<i>Najas flexilis</i>	Naiad	Najadaceae	P-Forb	Nt	OBL			
<i>Oenothera biennis</i>	Common evening-primrose	Onagraceae	B-Forb	Nt	FACU			
<i>Onoclea sensibilis</i>	Sensitive fern	Dryopteridaceae	Cryptogam	Nt	FACW			X
<i>Osmunda cinnamomea</i>	Cinnamon fern	Osmundaceae	Cryptogam	Nt	FACW			X
<i>Osmunda claytoniana</i>	Interrupted fern	Osmundaceae	Cryptogam	Nt	FAC			
<i>Osmunda regalis</i>	Royal fern	Osmundaceae	Cryptogam	Nt	OBL			
<i>Ostrya virginiana</i>	Hop hornbeam	Betulaceae	Tree	Nt	FACU			
<i>Oxalis stricta</i>	Common wood-sorrel	Oxalidaceae	A-Forb	Nt	FACU			
<i>Oxypolis rigidior</i>	Cowbane	Apiaceae	P-Forb	Nt	OBL			
<i>Panicum acuminatum</i>	Old-field Panic grass	Poaceae	P-Grass	Nt	FAC			
<i>Panicum capillare</i>	Witchgrass	Poaceae	A-Grass	Nt	FAC			X
<i>Panicum clandestinum</i>	Deer-tongue	Poaceae	P-Grass	Nt	FACW			X
<i>Panicum flexile</i>	Wiry panic grass	Poaceae	A-Grass	Nt	FACW			
<i>Panicum scabrisuculum</i>	Wooly witch grass	Poaceae	P-Grass	Nt				
<i>Panicum sp.</i>	Panic grass	Poaceae	P-Grass					
<i>Panicum villosissimum</i>	Panic grass	Poaceae	P-Grass	Nt	UPL			

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<i>Panicum virgatum</i>	Switchgrass	Poaceae	P-Grass	Nt	FAC			
<i>Parthenocissus inserta</i>	Virginia creeper	Vitaceae	Vine	Nt	FACU			
<i>Paspalum</i> sp	Lens grass	Poaceae	P-Grass	Ad				
<i>Penstemon</i> sp	Beard tongue	Scrophulariaceae	P-Forb	Nt				
<i>Penthorum sedoides</i>	Ditch-stonecrop	Crassulaceae	P-Forb	Nt	OBL			
<i>Phleum pratense</i>	Timothy	Poaceae	Grass	Ad	FACU			X
<i>Phragmites australis</i>	Common reed	Poaceae	P-Grass	Ad	FACW			
<i>Physocarpus opulifolius</i>	Ninebark	Rosaceae	Shrub	Nt	FACW	G5T5 SH E		
<i>Physostegia virginiana</i>	False dragon head	Lamiaceae	P-Forb	Nt	FACW			
<i>Phytolacca americana</i>	Pokeweed	Phytolaccaceae	P-Forb	Nt	FACU	-		X
<i>Pinus</i> sp	Pine	Pinaceae	Tree					X
<i>Pinus strobus</i>	Eastern white pine	Pinaceae	Tree	Nt	FACU			
<i>Plantago lanceolata</i>	Buck horn plantain	Plantaginaceae	P-Forb	Ad	FACU			
<i>Plantago rugelii</i>	Pale plantain	Plantaginaceae	P-Forb	Nt	FAC			
<i>Poa pratensis</i>	Kentucky bluegrass	Poaceae	P-Grass	Ad	FACU			
<i>Podophyllum peltatum</i>	May apple	Berberidaceae	P-Forb	Nt	FACU			
<i>Polygonum arifolium</i>	Arrow-leaved tearthumb	Polygonaceae	A-Forb	Nt	OBL			
<i>Polygonum convolvulus</i>	Black bindweed	Polygonaceae	A-Forb	Ad	FAC-			
<i>Polygonum lapathifolium</i>	Willow weed	Polygonaceae	A-Forb	Nt	FACW			
<i>Polygonum pensylvanicum</i>	Pinkweed	Polygonaceae	A-Forb	Nt	FACW			
<i>Polygonum punctatum</i>	Dotted smartweed	Polygonaceae	A-Forb	Nt	OBL			
<i>Populus deltoides</i>	Cottonwood	Salicaceae	Tree	Nt	FAC			
<i>Populus grandidentata</i>	Big-toothed aspen	Salicaceae	Tree	Nt	FACU			
<i>Populus tremuloides</i>	Quaking aspen	Salicaceae	Tree	Nt	FAC			
<i>Potentilla argentea</i>	Silvery cinquefoil	Rosaceae	P-Forb	Ad	FACU			X
<i>Potentilla norvegica</i>	Rough cinquefoil	Rosaceae	P-Forb	Nt	FAC			X
<i>Potentilla simplex</i>	Common cinquefoil	Rosaceae	P-Forb	Nt	FACU			
<i>Prunella vulgaris</i>	Self-heal	Lamiaceae	P-Forb	Nt	FAC			
<i>Prunus serotina</i>	Black cherry	Rosaceae	Tree	Nt	FACU			
<i>Pycnanthemum virginianum</i>	Virginia mountain mint	Lamiaceae	P-Forb	Nt	FACW			X
<i>Quercus alba</i>	White oak	Fagaceae	Tree	Nt	FACU			
<i>Quercus bicolor</i>	Swamp white oak	Fagaceae	Tree	Nt	FACW			X
<i>Quercus ilicifolia</i>	Scrub oak	Fagaceae	Tree	Nt	UPL			
<i>Quercus macrocarpa</i>	Burr oak	Fagaceae	Tree	Nt	FACU		X	X
<i>Quercus rubra</i>	Red oak	Fagaceae	Tree	Nt	FACU			
<i>Quercus velutina</i>	Black oak	Fagaceae	Tree	Nt	UPL			X
<i>Rhamnus frangula</i>	Glossy buckthorn	Rhamnaceae	Shrub	Ad	FAC			
<i>Rhus radicans</i>	Poison ivy	Anacardiaceae	Vine	Nt	FAC			
<i>Rhus typhina</i>	Staghorn sumac	Anacardiaceae	Tree	Nt	UPL			
<i>Robinia pseudoacacia</i>	Black locust	Fabaceae	Tree	Ad	FACU			
<i>Rorippa islandica</i>	Marsh watercress	Brassicaceae	B-Forb	Nt	OBL			
<i>Rosa multiflora</i>	Multiflora rose	Rosaceae	Shrub	Ad	FACU			
<i>Rubus allegheniensis</i>	Northern blackberry	Rosaceae	Shrub	Nt	FACU			
<i>Rubus hispida</i>	Swamp dewberry	Rosaceae	Shrub	Nt	FACW		X	X
<i>Rubus idaeus strigosus</i>	Red raspberry	Rosaceae	Shrub	Nt	FACU			
<i>Rudbeckia hirta</i>	Black-eyed Susan	Asteraceae	B-Forb	Nt	FACU			

Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/ Larval Food Species	Seeded/ Planted Species
Rumex acetosella	Sheep sorrel	Polygonaceae	B-Forb	Ad	FACU			
Rumex crispus	Curly dock	Polygonaceae	P-Forb	Ad	FAC			
Rumex orbiculatus	Great water dock	Polygonaceae	P-Forb	Nt	OBL			
Salix interior	Sandbar willow	Salicaceae	Shrub	Nt	OBL			
Salix nigra	Black willow	Salicaceae	Tree	Nt	OBL			
Sambucus canadensis	Black elderberry	Caprifoliaceae	Shrub	Nt	FACW			
Sassafras albidum	Sassafras	Lauraceae	Tree	Nt	FACU			
Scirpus atrovirens	Dark green bulrush	Cyperaceae	P-Sedge	Nt	OBL			
Scirpus cyperinus	Cottongrass bulrush	Cyperaceae	P-Sedge	Nt	OBL			X
Scirpus pendulous	Rufous bulrush	Cyperaceae	P-Sedge	Nt	OBL			X
Scirpus tabernaemontani	Soft-stem bulrush	Cyperaceae	P-Sedge	Nt	OBL			X
Scutellaria lateriflora	Mad-dog skullcap	Lamiaceae	P-Forb	Nt	OBL			
Secale cereale	Rye	Poaceae	A-Grass	Ad	UPL			
Senecio pauperculus	Northern meadow-groundsel	Asteraceae	P-Forb	Nt	FAC			
Setaria faberi	Japanese bristle grass	Poaceae	A-Grass	Ad	FACU			
Setaria verticillata	Bristly foxtail	Poaceae	A-Grass	Ad	FACU			
Setaria viridis	Green foxtail	Poaceae	A-Grass	Ad	FAC			
Sisyrinchium campestre	Prairie blue-eyed grass	Iridaceae	P-Forb	Nt	UPL			
Smilacina racemosa	Feathery false Solomon's seal	Smilacaceae	P-Forb	Nt	FACU			
Solanum nigrum	Black nightshade	Solanaceae	P-Forb	Nt	FACU			
Solidago altissima	Tall goldenrod	Asteraceae	P-Forb	Nt	FACU			
Solidago gigantea	Late goldenrod	Asteraceae	P-Forb	Nt	FACW			
Solidago graminifolia	Common grass-leaved goldenrod	Asteraceae	P-Forb	Nt	FACW			X
Solidago juncea	Early goldenrod	Asteraceae	P-Forb	Nt	UPL			X
Solidago nemoralis	Rough goldenrod	Asteraceae	P-Forb	Nt	UPL			X
Solidago rugosa	Tall-hairy goldenrod	Asteraceae	P-Forb	Nt	FAC			
Solidago sp	Goldenrod	Asteraceae	P-Forb	Nt				X
Solidago uliginosa	Bog goldenrod	Asteraceae	P-Forb	Nt	OBL			
Sorghastrum nutans	Indian grass	Poaceae	P-Grass	Nt	FACU			X
Sparganium eurycarpum	Bur-reed	Sparganiaceae	P-Forb	Nt	OBL			X
Sphenopholis sp	Wedge grass	Poaceae	P-Grass	Nt	FAC			X
Spiraea alba	Meadowsweet	Rosaceae	Shrub	Nt	FACW			
Stellaria longifolia	Needle-leaf starwort	Caryophyllaceae	P-Forb	Nt	FACU			
Taraxacum officinale	Common dandelion	Asteraceae	P-Forb	Ad	FACU			
Thalictrum dasycarpum	Purple meadow rue	Ranunculaceae	P-Forb	Nt	FACW			
Trifolium arvense	Rabbit foot clover	Fabaceae	A-Forb	Ad	UPL			X
Trifolium hybridum	Alsike clover	Fabaceae	P-Forb	Ad	FACU			
Trifolium pratense	Red clover	Fabaceae	P-Forb	Ad	FACU			
Trifolium repens	White clover	Fabaceae	P-Forb	Ad	FACU			
Tussilago farfara	Coltsfoot	Asteraceae	P-Forb	Ad	FACU			
Typha angustifolia	Narrow-leaf cattail	Typhaceae	P-Forb	Nt	OBL			
Typha latifolia	Common cattail	Typhaceae	P-Forb	Nt	OBL			
Ulmus americana	American elm	Ulmaceae	Tree	Nt	FACW			
Vaccinium myrtilloides	Canada blueberry	Ericaceae	Shrub	Nt	FACW		X	X
Verbascum thapsus	Mullein	Scrophulariaceae	B-Forb	Ad	UPL			
Verbena bracteata	Carpet vervain	Verbenaceae	P-Forb	Nt	FACU			

Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/ Larval Food Species	Seeded/ Planted Species
Verbena hastata	Blue vervain	Verbenaceae	P-Forb	Nt	FACW			
Verbena urticifolia	White vervain	Verbenaceae	P-Forb	Nt	FAC			X
Veronica sp.	Speedwell	Scrophulariaceae	Forb					X
Viburnum dentatum	Southern arrowwood	Caprifoliaceae	Shrub	Nt	FAC			
Viburnum prunifolium	Black haw	Caprifoliaceae	Shrub	Nt	FACU			
Vicia cracca	Cow vetch	Fabaceae	P-Forb	Ad	UPL			
Viola sororia	Woolly blue violet	Violaceae	P-Forb	Nt	FAC			
Vitis riparia	Riverbank grape	Vitaceae	Vine	Nt	FAC			
Xanthium strumarium	Cocklebur	Asteraceae	A-Forb	Nt	FAC			

Categories		
Vascular Plant Families	67	
Non-Vascular Plant Families	0	
	No. Species	Percent
Total Species	279	100.0%
Native Species	213	76.3%
Adventive Species	61	21.9%
Unknown Species	5	1.8%
Largest Families Represented		
Aster Family (Asteraceae)	43	15.4%
Grass Family (Poaceae)	41	14.7%
Sedge Family (Cyperaceae)	25	9.0%
Rose Family (Rosaceae)	13	4.7%
Pea Family (Fabaceae)	15	5.4%
Physiognomy		
Perennial Forbs (P-Forb)	103	36.9%
Annual Forbs (A-Forb)	32	11.5%
Biennial Forbs (B-Forbs)	11	3.9%
Forbs	1	0.4%
Perennial Grass (P-Grass)	37	13.3%
Annual Grass (A-Grass)	13	4.7%
Grasses	1	0.4%
Perennial Sedge (P-Sedge)	25	9.0%
Alga	0	0.0%
Cryptogams	6	2.2%
Trees	27	9.7%
Shrubs	18	6.5%
Vines	5	1.8%
Miscellaneous		
Nectar/Larval Food Plants	7	2.5%
Seeded/Planted Species	82	29.4%
Rare Plants	3	1.1%
Wetland Classification		
Upland (UPL)	37	13.3%
Facultative Upland (FACU)	84	30.1%
Faculative (FAC)	39	14.0%
Facultative Wetland (FACW)	43	15.4%
Obligate Wetland (OBL)	61	21.9%
Unknown Species	15	5.4%
Total Hydrophytic Species	143	51.3%

Attachment 5. Phase II & III Floristic Inventory—Transects

Rapp Road Landfill - PII, PIII Species Search

Transect: DS-1

Date: August 4, 2013

Samplers: Steve Apfelbaum

Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
<i>Acer rubrum</i>	Red maple	Aceraceae	Tree	Nt	FAC			
<i>Agalinis tenuifolia</i>	Gerardia	Scrophulariaceae	P-Forb	Nt	FACW			X
<i>Agrostis alba</i>	Redtop	Poaceae	P-Grass	Ad	FACW			
<i>Alisma subcordatum</i>	Water-plantain	Alismataceae	P-Forb	Nt	OBL			X
<i>Ambrosia artemisiifolia</i>	Ragweed	Asteraceae	A-Forb	Nt	FACU			
<i>Andropogon gerardii</i>	Big bluestem	Poaceae	P-Grass	Nt	FACU			
<i>Andropogon scoparius</i>	Little bluestem	Poaceae	P-Grass	Nt	FACU			X
<i>Asclepias incarnata</i>	Swamp milkweed	Asclepiadaceae	P-Forb	Nt	OBL			X
<i>Aster ericoides</i>	White heath aster	Asteraceae	P-Forb	Nt	FACU			X
<i>Aster lanceolatus</i>	Old-field aster	Asteraceae	P-Forb	Nt	FACW			
<i>Aster novae-angliae</i>	New England aster	Asteraceae	P-Forb	Nt	FACW			X
<i>Aster puniceus</i>	Purple-stemmed aster	Asteraceae	P-Forb	Nt	OBL			X
<i>Betula populifolia</i>	Gray birch	Betulaceae	Tree	Nt	FAC			
<i>Bidens cernua</i>	Stick-tights	Asteraceae	A-Forb	Nt	OBL			X
<i>Bidens frondosa</i>	Beggar-ticks	Asteraceae	A-Forb	Nt	FACW			X
<i>Bromus japonicus</i>	Japanese chess	Poaceae	P-Grass	Ad	FACU			
<i>Carex annectens</i>	Yellow-fruit sedge	Cyperaceae	P-Sedge	Nt	FACW			X
<i>Carex communis</i>	Common beech sedge	Cyperaceae	P-Sedge	Nt	UPL			
<i>Carex hystericina</i>	Porcupine sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Carex vulpinoidea</i>	Common fox sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Cassia fasciculata</i>	Partridge pea	Fabaceae	A-Forb	Nt	FACU	Rev. List: G5 S3S4		
<i>Celastrus orbiculatus</i>	Oriental bittersweet	Celastraceae	Vine	Ad	UPL			
<i>Chenopodium album</i>	Lamb's-quarters	Chenopodiaceae	A-Forb	Ad	FACU			
<i>Cirsium arvense</i>	Canada thistle	Asteraceae	P-Forb	Ad	FACU			
<i>Convolvulus sepium</i>	Hedge bindweed	Convolvulaceae	P-Forb	Nt	FAC			
<i>Conyza canadensis</i>	Horseweed	Asteraceae	A-Forb	Nt	FACU			X
<i>Cornus amomum</i>	Silky dogwood	Cornaceae	Shrub	Nt	FACW			
<i>Cyperus esculentus</i>	Yellow nut-grass	Cyperaceae	P-Sedge	Nt	FACW			
<i>Daucus carota</i>	Queen-Anne's-lace	Apiaceae	B-Forb	Ad	UPL			
<i>Desmodium canadense</i>	Giant tick clover	Fabaceae	P-Forb	Nt	FAC			X
<i>Echinochloa walteri</i>	Water millet	Poaceae	A-Grass	Nt	OBL			
<i>Eleocharis acicularis</i>	Hairgrass	Cyperaceae	P-Sedge	Nt	OBL			
<i>Eleocharis obtusa</i>	Blunt spike-rush	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Eleocharis smallii</i>	Marsh spike rush	Cyperaceae	P-Sedge	Nt	OBL			
<i>Equisetum arvense</i>	Field horsetail	Equisetaceae	Cryptogam	Nt	FAC			
<i>Eragrostis pectinacea</i>	Small love grass	Poaceae	A-Grass	Nt	FAC			
<i>Erechtites hieracifolia</i>	Fireweed	Asteraceae	A-Forb	Nt	FACU			X
<i>Erigeron strigosus</i>	Daisy-fleabane	Asteraceae	A-Forb	Nt	FACU			
<i>Eupatorium maculatum</i>	Spotted Joy-pye weed	Asteraceae	P-Forb	Nt	OBL			
<i>Eupatorium perfoliatum</i>	Thoroughwort	Asteraceae	P-Forb	Nt	FACW			X

Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
Euphorbia maculata	Spotted spurge	Euphorbiaceae	P-Forb	Nt	FACU			
Festuca elatior	Tall fescue	Poaceae	P-Grass	Ad	FACU			
Glyceria striata	Fowl mannagrass	Poaceae	P-Grass	Nt	OBL			X
Juncus canadensis	Canada rush	Juncaceae	P-Grass	Nt	OBL			
Juncus dudleyi	Dudley's rush	Juncaceae	P-Grass	Nt	FACW			X
Juncus effusus	Common rush	Juncaceae	P-Grass	Nt	OBL			X
Juncus nodosus	Knotted rush	Juncaceae	P-Grass	Nt	OBL			X
Juncus tenuis	Slender yard-rush	Juncaceae	P-Grass	Nt	FACW			
Juncus torreyi	Torrey's rush	Juncaceae	P-Grass	Nt	FACW			X
Lespedeza capitata	Bush-clover	Fabaceae	P-Forb	Nt	FACU			
Lindernia dubia	False pimpernel	Scrophulariaceae	A-Forb	Nt	OBL			X
Lobelia cardinalis	Cardinal flower	Campanulaceae	P-Forb	Nt	OBL			X
Lobelia inflata	Indian-tobacco	Campanulaceae	B-Forb	Nt	FACU			
Lobelia siphilitica	Great lobelia	Campanulaceae	P-Forb	Nt	FACW			X
Lotus corniculatus	Bird's-foot trefoil	Fabaceae	P-Forb	Ad	FACU			
Lupinus perennis	Wild lupine	Fabaceae	P-Forb	Nt	UPL			
Lychnis alba	White campion	Caryophyllaceae	A-Forb	Ad	UPL		X	X
Lycopus americanus	Water-horehound	Lamiaceae	P-Forb	Nt	OBL			
Medicago lupulina	Black medick	Fabaceae	P-Forb	Ad	FACU			
Mimulus ringens	Monkey flower	Lamiaceae	P-Forb	Nt	OBL			
Monarda punctata	Dotted horsemint	Lamiaceae	P-Forb	Nt	UPL			X
Oxalis stricta	Common wood-sorrel	Oxalidaceae	A-Forb	Nt	FACU			
Oxypolis rigidior	Cowbane	Apiaceae	P-Forb	Nt	OBL			
Panicum capillare	Witchgrass	Poaceae	A-Grass	Nt	FAC			X
Panicum sp.	Panic grass	Poaceae	P-Grass					
Penstemon sp	Beard tongue	Scrophulariaceae	P-Forb	Nt				
Penthorum sedoides	Ditch-stonecrop	Crassulaceae	P-Forb	Nt	OBL			
Phragmites australis	Common reed	Poaceae	P-Grass	Ad	FACW			
Physostegia virginiana	False dragon head	Lamiaceae	P-Forb	Nt	FACW			
Phytolacca americana	Pokeweed	Phytolaccaceae	P-Forb	Nt	FACU	-		X
Plantago lanceolata	Buck horn plantain	Plantaginaceae	P-Forb	Ad	FACU			
Plantago rugelii	Pale plantain	Plantaginaceae	P-Forb	Nt	FAC			
Polygonum convolvulus	Black bindweed	Polygonaceae	A-Forb	Ad	FAC			
Polygonum pensylvanicum	Pinkweed	Polygonaceae	A-Forb	Nt	FACW			
Populus deltoides	Cottonwood	Salicaceae	Tree	Nt	FAC			
Potentilla norvegica	Rough cinquefoil	Rosaceae	P-Forb	Nt	FAC			X
Prunus serotina	Black cherry	Rosaceae	Tree	Nt	FACU			
Pycnanthemum virginianum	Virginia mountain mint	Lamiaceae	P-Forb	Nt	FACW			X
Quercus macrocarpa	Burr oak	Fagaceae	Tree	Nt	FACU		X	X
Rubus allegheniensis	Northern blackberry	Rosaceae	Shrub	Nt	FACU			
Rubus hispidus	Swamp dewberry	Rosaceae	Shrub	Nt	FACW		X	X
Rubus idaeus strigosus	Red raspberry	Rosaceae	Shrub	Nt	FACU			
Rudbeckia hirta	Black-eyed Susan	Asteraceae	B-Forb	Nt	FACU			
Scirpus atrovirens	Dark green bulrush	Cyperaceae	P-Sedge	Nt	OBL			
Scirpus cyperinus	Cottongrass bulrush	Cyperaceae	P-Sedge	Nt	OBL			X
Scirpus pendulous	Rufous bulrush	Cyperaceae	P-Sedge	Nt	OBL			X
Scirpus tabernaemontani	Soft-stem bulrush	Cyperaceae	P-Sedge	Nt	OBL			X

Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
Secale cereale	Rye	Poaceae	A-Grass	Ad	UPL			
Solidago altissima	Tall goldenrod	Asteraceae	P-Forb	Nt	FACU			
Solidago gigantea	Late goldenrod	Asteraceae	P-Forb	Nt	FACW			
Solidago graminifolia	Common grass-leaved goldenrod	Asteraceae	P-Forb	Nt	FACW			X
Solidago juncea	Early goldenrod	Asteraceae	P-Forb	Nt	UPL			X
Sparganium eurycarpum	Bur-reed	Sparganiaceae	P-Forb	Nt	OBL			X
Thalictrum dasycarpum	Purple meadow rue	Ranunculaceae	P-Forb	Nt	FACW			
Trifolium pratense	Red clover	Fabaceae	P-Forb	Ad	FACU			
Typha angustifolia	Narrow-leaf cattail	Typhaceae	P-Forb	Nt	OBL			
Typha latifolia	Common cattail	Typhaceae	P-Forb	Nt	OBL			
Verbena hastata	Blue vervain	Verbenaceae	P-Forb	Nt	FACW			
Verbena urticifolia	White vervain	Verbenaceae	P-Forb	Nt	FAC			X

Categories		
Vascular Plant Families	31	
Non-Vascular Plant Families	0	
	No. Species	Percent
Total Species	99	100.0%
Native Species	83	83.8%
Adventive Species	15	15.2%
Unknown Species	1	1.0%
Largest Families Represented		
Aster Family (Asteraceae)	18	18.2%
Grass Family (Poaceae)	12	12.1%
Sedge Family (Cyperaceae)	12	12.1%
Rose Family (Rosaceae)	5	5.1%
Pea Family (Fabaceae)	8	8.1%
Physiognomy		
Perennial Forbs (P-Forb)	42	42.4%
Annual Forbs (A-Forb)	13	13.1%
Biennial Forbs (B-Forbs)	3	3.0%
Forbs	0	0.0%
Perennial Grass (P-Grass)	14	14.1%
Annual Grass (A-Grass)	4	4.0%
Grasses	0	0.0%
Perennial Sedge (P-Sedge)	12	12.1%
Alga	0	0.0%
Cryptogams	1	1.0%
Trees	5	5.1%
Shrubs	4	4.0%
Vines	1	1.0%
Miscellaneous		
Nectar/Larval Food Plants	3	3.0%
Seeded/Planted Species	40	40.4%
Rare Plants	1	1.0%
Wetland Classification		
Upland (UPL)	8	8.1%

Facultative Upland (FACU)	27	27.3%
Facultative (FAC)	12	12.1%
Facultative Wetland (FACW)	22	22.2%
Obligate Wetland (OBL)	28	28.3%
Unknown Species	2	2.0%
Total Hydrophytic Species	62	62.6%

Rapp Road Landfill - PII, PIII Species Search
 Transect: DS-2
 Date: August 4, 2013
 Samplers: Steve Apfelbaum

Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
<i>Acer negundo</i>	Box-elder	Aceraceae	Tree	Nt	FAC			
<i>Acer rubrum</i>	Red maple	Aceraceae	Tree	Nt	FAC			
<i>Agalinus tenuifolia</i>	Gerardia	Scrophulariaceae	P-Forb	Nt	FACW			X
<i>Agrostis alba</i>	Redtop	Poaceae	P-Grass	Ad	FACW			
<i>Ambrosia artemisiifolia</i>	Ragweed	Asteraceae	A-Forb	Nt	FACU			
<i>Andropogon gerardii</i>	Big bluestem	Poaceae	P-Grass	Nt	FACU			
<i>Andropogon scoparius</i>	Little bluestem	Poaceae	P-Grass	Nt	FACU			X
<i>Arabis glabra</i>	Tower-mustard	Brassicaceae	P-Forb	Nt	UPL			X
<i>Artemisia vulgaris</i>	Mugwort	Asteraceae	P-Forb	Ad	UPL			
<i>Asclepias incarnata</i>	Swamp milkweed	Asclepiadaceae	P-Forb	Nt	OBL			X
<i>Aster ericoides</i>	White heath aster	Asteraceae	P-Forb	Nt	FACU			X
<i>Aster lanceolatus</i>	Old-field aster	Asteraceae	P-Forb	Nt	FACW			
<i>Aster lateriflorus</i>	Calico aster	Asteraceae	P-Forb	Nt	FAC			X
<i>Aster novae-angliae</i>	New England aster	Asteraceae	P-Forb	Nt	FACW			X
<i>Aster puniceus</i>	Purple-stemmed aster	Asteraceae	P-Forb	Nt	OBL			X
<i>Bidens cernua</i>	Stick-tights	Asteraceae	A-Forb	Nt	OBL			X
<i>Bidens frondosa</i>	Beggar-ticks	Asteraceae	A-Forb	Nt	FACW			X
<i>Bidens sp</i>	Tickseed	Asteraceae	A-Forb					
<i>Bromus inermis</i>	Hungarian brome	Poaceae	P-Grass	Ad	UPL			
<i>Bromus japonicus</i>	Japanese chess	Poaceae	P-Grass	Ad	FACU			
<i>Calamagrostis canadensis</i>	Blue joint grass	Poaceae	P-Grass	Nt	OBL			
<i>Carex annectens</i>	Yellow-fruit sedge	Cyperaceae	P-Sedge	Nt	FACW			X
<i>Carex bebbii</i>	Bebb's sedge	Cyperaceae	P-Sedge	Nt	OBL			
<i>Carex communis</i>	Common beech sedge	Cyperaceae	P-Sedge	Nt	UPL			
<i>Carex crinita</i>	Fringed sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Carex hystericina</i>	Porcupine sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Carex lupulina</i>	Hop sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Carex scoparia</i>	Pointed broom sedge	Cyperaceae	P-Sedge	Nt	FACW			X
<i>Carex sp</i>	Sedge	Cyperaceae	P-Sedge	Nt				
<i>Cassia fasciculata</i>	Partridge pea	Fabaceae	A-Forb	Nt	FACU	Review List: G5 S3S4		
<i>Celastrus orbiculatus</i>	Oriental bittersweet	Celastraceae	Vine	Ad	UPL			
<i>Centaurea maculosa</i>	Spotted knapweed	Asteraceae	P-Forb	Ad	UPL			
<i>Chrysanthemum leucanthemum</i>	Ox-eye daisy	Asteraceae	P-Forb	Ad	UPL			
<i>Cirsium arvense</i>	Canada thistle	Asteraceae	P-Forb	Ad	FACU			
<i>Conyza canadensis</i>	Horseweed	Asteraceae	A-Forb	Nt	FACU			X
<i>Cornus amomum</i>	Silky dogwood	Cornaceae	Shrub	Nt	FACW			
<i>Cornus racemosa</i>	Gray dogwood	Cornaceae	Shrub	Nt	FAC			
<i>Cycloloma atriplicifolium</i>	Winged-pigweed	Chenopodiaceae	A-Forb	Ad	FACU			
<i>Daucus carota</i>	Queen-Anne's-lace	Apiaceae	B-Forb	Ad	UPL			
<i>Desmodium canadense</i>	Giant tick clover	Fabaceae	P-Forb	Nt	FAC			X
<i>Dianthus armeria</i>	Deptford pink	Caryophyllaceae	A-Forb	Ad	UPL			

Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
<i>Diodea teres</i>	Poorjoe	Rubiaceae	A-Forb	Nt	FACU			X
<i>Echinochloa crusgalli</i>	Japanese millet	Poaceae	A-Grass	Ad	FAC			
<i>Echinochloa walteri</i>	Water millet	Poaceae	A-Grass	Nt	OBL			
<i>Epilobium coloratum</i>	Purple-leaf willowherb	Onagraceae	P-Forb	Nt	OBL			X
<i>Equisetum arvense</i>	Field horsetail	Equisetaceae	Cryptogam	Nt	FAC			
<i>Eragrostis hypnoides</i>	Lovegrass	Poaceae	A-Grass	Nt	OBL			
<i>Erigeron annuus</i>	Daisy-fleabane	Asteraceae	A-Forb	Nt	FACU			
<i>Eupatorium maculatum</i>	Spotted Joy-pye weed	Asteraceae	P-Forb	Nt	OBL			
<i>Eupatorium perfoliatum</i>	Thoroughwort	Asteraceae	P-Forb	Nt	FACW			X
<i>Festuca rubra</i>	Red fescue	Poaceae	P-Grass	Ad	FACU			
<i>Fragaria virginiana</i>	Field strawberry	Rosaceae	P-Forb	Nt	FACU		X	
<i>Glyceria grandis</i>	Reed meadowgrass	Poaceae	P-Grass	Nt	OBL			
<i>Glyceria striata</i>	Fowl mannagrass	Poaceae	P-Grass	Nt	OBL			X
<i>Hackelia virginiana</i>	Stickseed	Boraginaceae	P-Forb	Nt	FACU			
<i>Hypericum perforatum</i>	Common St. John's-wort	Clusiaceae	P-Forb	Ad	UPL			
<i>Hypericum punctatum</i>	St. John's-wort	Clusiaceae	P-Forb	Nt	FAC			
<i>Juncus effusus</i>	Common rush	Juncaceae	P-Grass	Nt	OBL			X
<i>Juncus nodosus</i>	Knotted rush	Juncaceae	P-Grass	Nt	OBL			X
<i>Juncus sp</i>	Rush	Juncaceae	P-Grass	Nt				
<i>Juncus torreyi</i>	Torrey's rush	Juncaceae	P-Grass	Nt	FACW			X
<i>Leersia oryzoides</i>	Rice cutgrass	Poaceae	P-Grass	Nt	OBL			
<i>Leptoloma cognatum</i>	Fall witch grass	Poaceae	P-Grass	Nt	UPL			
<i>Lespedeza capitata</i>	Bush-clover	Fabaceae	P-Forb	Nt	FACU			
<i>Lobelia cardinalis</i>	Cardinal flower	Campanulaceae	P-Forb	Nt	OBL			X
<i>Lobelia inflata</i>	Indian-tobacco	Campanulaceae	B-Forb	Nt	FACU			
<i>Lobelia siphilitica</i>	Great lobelia	Campanulaceae	P-Forb	Nt	FACW			X
<i>Lotus corniculatus</i>	Bird's-foot trefoil	Fabaceae	P-Forb	Ad	FACU			
<i>Lupinus perennis</i>	Wild lupine	Fabaceae	P-Forb	Nt	UPL			
<i>Lycopus americanus</i>	Water-horehound	Lamiaceae	P-Forb	Nt	OBL			
<i>Lythrum salicaria</i>	Purple loosestrife	Lythraceae	P-Forb	Ad	OBL			
<i>Mimulus ringens</i>	Monkey flower	Lamiaceae	P-Forb	Nt	OBL			
<i>Monarda punctata</i>	Dotted horsemint	Lamiaceae	P-Forb	Nt	UPL			X
<i>Muhlenbergia neomexicana</i>	Muhlenbergia	Poaceae	P-Grass					
<i>Oenothera biennis</i>	Common evening-primrose	Onagraceae	B-Forb	Nt	FACU			
<i>Onoclea sensibilis</i>	Sensitive fern	Dryopteridaceae	Cryptogam	Nt	FACW			X
<i>Oxypolis rigidior</i>	Cowbane	Apiaceae	P-Forb	Nt	OBL			
<i>Panicum acuminatum</i>	Old-field Panic grass	Poaceae	P-Grass	Nt	FAC			
<i>Panicum clandestinum</i>	Deer-tongue	Poaceae	P-Grass	Nt	FACW			X
<i>Panicum villosissimum</i>	Panic grass	Poaceae	P-Grass	Nt	UPL			
<i>Panicum virgatum</i>	Switchgrass	Poaceae	P-Grass	Nt	FAC			
<i>Penstemon sp</i>	Beard tongue	Scrophulariaceae	P-Forb	Nt				
<i>Phytolacca americana</i>	Pokeweed	Phytolaccaceae	P-Forb	Nt	FACU	-		X
<i>Polygonum convolvulus</i>	Black bindweed	Polygonaceae	A-Forb	Ad	FAC			
<i>Polygonum pensylvanicum</i>	Pinkweed	Polygonaceae	A-Forb	Nt	FACW			
<i>Populus deltoides</i>	Cottonwood	Salicaceae	Tree	Nt	FAC			
<i>Potentilla norvegica</i>	Rough cinquefoil	Rosaceae	P-Forb	Nt	FAC			X
<i>Potentilla simplex</i>	Common cinquefoil	Rosaceae	P-Forb	Nt	FACU			

Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
<i>Pycnanthemum virginianum</i>	Virginia mountain mint	Lamiaceae	P-Forb	Nt	FACW			X
<i>Rhus typhina</i>	Staghorn sumac	Anacardiaceae	Tree	Nt	UPL			
<i>Rubus hispidus</i>	Swamp dewberry	Rosaceae	Shrub	Nt	FACW		X	X
<i>Rudbeckia hirta</i>	Black-eyed Susan	Asteraceae	B-Forb	Nt	FACU			
<i>Salix interior</i>	Sandbar willow	Salicaceae	Shrub	Nt	OBL			
<i>Scirpus atrovirens</i>	Dark green bulrush	Cyperaceae	P-Sedge	Nt	OBL			
<i>Scirpus cyperinus</i>	Cottongrass bulrush	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Secale cereale</i>	Rye	Poaceae	A-Grass	Ad	UPL			
<i>Setaria faberi</i>	Japanese bristle grass	Poaceae	A-Grass	Ad	FACU			
<i>Solidago altissima</i>	Bristly foxtail	Poaceae	A-Grass	Ad	FACU			
<i>Solidago gigantea</i>	Late goldenrod	Asteraceae	P-Forb	Nt	FACW			
<i>Solidago juncea</i>	Early goldenrod	Asteraceae	P-Forb	Nt	UPL			X
<i>Sorghastrum nutans</i>	Indian grass	Poaceae	P-Grass	Nt	FACU			X
<i>Trifolium arvense</i>	Rabbit foot clover	Fabaceae	A-Forb	Ad	UPL			X
<i>Trifolium pratense</i>	Red clover	Fabaceae	P-Forb	Ad	FACU			
<i>Typha latifolia</i>	Common cattail	Typhaceae	P-Forb	Nt	OBL			
<i>Verbascum thapsus</i>	Mullein	Scrophulariaceae	B-Forb	Ad	UPL			
<i>Verbena urticifolia</i>	White vervain	Verbenaceae	P-Forb	Nt	FAC			X
<i>Vitis riparia</i>	Riverbank grape	Vitaceae	Vine	Nt	FAC			

Categories		
Vascular Plant Families	31	
Non-Vascular Plant Families	0	
	No. Species	Percent
Total Species	107	100.0%
Native Species	82	76.6%
Adventive Species	23	21.5%
Unknown Species	2	1.9%
Largest Families Represented		
Aster Family (Asteraceae)	18	16.8%
Grass Family (Poaceae)	23	21.5%
Sedge Family (Cyperaceae)	10	9.3%
Rose Family (Rosaceae)	4	3.7%
Pea Family (Fabaceae)	7	6.5%
Physiognomy		
Perennial Forbs (P-Forb)	40	37.4%
Annual Forbs (A-Forb)	13	12.1%
Biennial Forbs (B-Forbs)	5	4.7%
Forbs	0	0.0%
Perennial Grass (P-Grass)	21	19.6%
Annual Grass (A-Grass)	6	5.6%
Grasses	0	0.0%
Perennial Sedge (P-Sedge)	10	9.3%
Alga	0	0.0%
Cryptogams	2	1.9%
Trees	4	3.7%
Shrubs	4	3.7%

Vines	2	1.9%
Miscellaneous		
Nectar/Larval Food Plants	2	1.9%
Seeded/Planted Species	38	35.5%
Rare Plants	1	0.9%
Wetland Classification		
Upland (UPL)	19	17.8%
Facultative Upland (FACU)	25	23.4%
Faculative (FAC)	15	14.0%
Facultative Wetland (FACW)	17	15.9%
Obligate Wetland (OBL)	26	24.3%
Unknown Species	5	4.7%
Total Hydrophytic Species	58	54.2%

Rapp Road Landfill - PII, PIII Species Search
 Transect: DS-3
 Date: August 4, 2013
 Samplers: Steve Apfelbaum

Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
<i>Agalinus tenuifolia</i>	Gerardia	Scrophulariaceae	P-Forb	Nt	FACW			X
<i>Agrostis alba</i>	Redtop	Poaceae	P-Grass	Ad	FACW			
<i>Ambrosia artemisiifolia</i>	Ragweed	Asteraceae	A-Forb	Nt	FACU			
<i>Andropogon scoparius</i>	Little bluestem	Poaceae	P-Grass	Nt	FACU			X
<i>Apocynum cannabinum</i>	Indian hemp	Apocynaceae	P-Forb	Nt	FAC			X
<i>Asclepias incarnata</i>	Swamp milkweed	Asclepiadaceae	P-Forb	Nt	OBL			X
<i>Aster ericoides</i>	White heath aster	Asteraceae	P-Forb	Nt	FACU			X
<i>Aster lanceolatus</i>	Old-field aster	Asteraceae	P-Forb	Nt	FACW			
<i>Aster novae-angliae</i>	New England aster	Asteraceae	P-Forb	Nt	FACW			X
<i>Aster puniceus</i>	Purple-stemmed aster	Asteraceae	P-Forb	Nt	OBL			X
<i>Bidens cernua</i>	Stick-tights	Asteraceae	A-Forb	Nt	OBL			X
<i>Bidens coronata</i>	Purple-stemmed tickseed	Asteraceae	A-Forb	Nt	OBL			
<i>Bidens frondosa</i>	Beggar-ticks	Asteraceae	A-Forb	Nt	FACW			X
<i>Calamagrostis canadensis</i>	Blue joint grass	Poaceae	P-Grass	Nt	OBL			
<i>Carex annectens</i>	Yellow-fruit sedge	Cyperaceae	P-Sedge	Nt	FACW			X
<i>Carex communis</i>	Common beech sedge	Cyperaceae	P-Sedge	Nt	UPL			
<i>Carex crinita</i>	Fringed sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Carex hystericina</i>	Porcupine sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Carex lupulina</i>	Hop sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Carex stricta</i>	Tussock sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Carex vulpinoidea</i>	Common fox sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Cassia fasciculata</i>	Partridge pea	Fabaceae	A-Forb	Nt	FACU	Review List: G5 S3S4		
<i>Centaurea maculosa</i>	Spotted knapweed	Asteraceae	P-Forb	Ad	UPL			
<i>Conyza canadensis</i>	Horseweed	Asteraceae	A-Forb	Nt	FACU			X
<i>Cyperus esculentus</i>	Yellow nut-grass	Cyperaceae	P-Sedge	Nt	FACW			
<i>Daucus carota</i>	Queen-Anne's-lace	Apiaceae	B-Forb	Ad	UPL			
<i>Desmodium canadense</i>	Giant tick clover	Fabaceae	P-Forb	Nt	FAC			X
<i>Dianthus armeria</i>	Deptford pink	Caryophyllaceae	A-Forb	Ad	UPL			
<i>Digitaria sanguinalis</i>	Tall crabgrass	Poaceae	A-Grass	Ad	FACU			
<i>Echinochloa crusgalli</i>	Japanese millet	Poaceae	A-Grass	Ad	FAC			
<i>Echinochloa walteri</i>	Water millet	Poaceae	A-Grass	Nt	OBL			
<i>Eleocharis obtusa</i>	Blunt spike-rush	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Epilobium coloratum</i>	Purple-leaf willowherb	Onagraceae	P-Forb	Nt	OBL			X
<i>Equisetum arvense</i>	Field horsetail	Equisetaceae	Cryptogam	Nt	FAC			
<i>Eupatorium maculatum</i>	Spotted Joy-pye weed	Asteraceae	P-Forb	Nt	OBL			
<i>Eupatorium perfoliatum</i>	Thoroughwort	Asteraceae	P-Forb	Nt	FACW			X
<i>Fragaria virginiana</i>	Field strawberry	Rosaceae	P-Forb	Nt	FACU		X	
<i>Galeopsis tetrahit</i>	Hemp-nettle	Lamiaceae	A-Forb	Ad	FACU			
<i>Glyceria grandis</i>	Reed meadowgrass	Poaceae	P-Grass	Nt	OBL			
<i>Glyceria striata</i>	Fowl mannagrass	Poaceae	P-Grass	Nt	OBL			X
<i>Helianthus divaricatus</i>	Woodland sunflower	Asteraceae	P-Forb	Nt	UPL		X	X
<i>Hypericum punctatum</i>	St. John's-wort	Clusiaceae	P-Forb	Nt	FAC			

Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
<i>Juncus bufonius</i>	Toad-rush	Juncaceae	P-Grass	Nt	FACW			
<i>Juncus canadensis</i>	Canada rush	Juncaceae	P-Grass	Nt	OBL			
<i>Juncus effusus</i>	Common rush	Juncaceae	P-Grass	Nt	OBL			X
<i>Juncus nodosus</i>	Knotted rush	Juncaceae	P-Grass	Nt	OBL			X
<i>Juncus roemerianus</i>	Needlerush	Juncaceae	P-Grass	Nt	OBL			
<i>Juncus tenuis</i>	Slender yard-rush	Juncaceae	P-Grass	Nt	FACW			
<i>Juncus torreyi</i>	Torrey's rush	Juncaceae	P-Grass	Nt	FACW			X
<i>Leersia oryzoides</i>	Rice cutgrass	Poaceae	P-Grass	Nt	OBL			
<i>Lespedeza capitata</i>	Bush-clover	Fabaceae	P-Forb	Nt	FACU			
<i>Lindernia dubia</i>	False pimpernel	Scrophulariaceae	A-Forb	Nt	OBL			X
<i>Lobelia cardinalis</i>	Cardinal flower	Campanulaceae	P-Forb	Nt	OBL			X
<i>Lobelia inflata</i>	Indian-tobacco	Campanulaceae	B-Forb	Nt	FACU			
<i>Lobelia siphilitica</i>	Great lobelia	Campanulaceae	P-Forb	Nt	FACW			X
<i>Lotus corniculatus</i>	Bird's-foot trefoil	Fabaceae	P-Forb	Ad	FACU			
<i>Lycopus americanus</i>	Water-horehound	Lamiaceae	P-Forb	Nt	OBL			
<i>Lythrum salicaria</i>	Purple loosestrife	Lythraceae	P-Forb	Ad	OBL			
<i>Mimulus ringens</i>	Monkey flower	Lamiaceae	P-Forb	Nt	OBL			
<i>Monarda punctata</i>	Dotted horsemint	Lamiaceae	P-Forb	Nt	UPL			X
<i>Muhlenbergia neomexicana</i>	Muhlenbergia	Poaceae	P-Grass					
<i>Oenothera biennis</i>	Common evening-primrose	Onagraceae	B-Forb	Nt	FACU			
<i>Oxalis stricta</i>	Common wood-sorrel	Oxalidaceae	A-Forb	Nt	FACU			
<i>Panicum capillare</i>	Witchgrass	Poaceae	A-Grass	Nt	FAC			X
<i>Panicum virgatum</i>	Switchgrass	Poaceae	P-Grass	Nt	FAC			
<i>Paspalum</i> sp	Virginia creeper	Vitaceae	Vine	Nt	FACU			
<i>Penthorum sedoides</i>	Ditch-stonecrop	Crassulaceae	P-Forb	Nt	OBL			
<i>Phragmites australis</i>	Common reed	Poaceae	P-Grass	Ad	FACW			
<i>Polygonum lapathifolium</i>	Willow weed	Polygonaceae	A-Forb	Nt	FACW			
<i>Polygonum pensylvanicum</i>	Pinkweed	Polygonaceae	A-Forb	Nt	FACW			
<i>Populus deltoides</i>	Cottonwood	Salicaceae	Tree	Nt	FAC			
<i>Pycnanthemum virginianum</i>	Virginia mountain mint	Lamiaceae	P-Forb	Nt	FACW			X
<i>Rorippa islandica</i>	Marsh watercress	Brassicaceae	B-Forb	Nt	OBL			
<i>Scirpus atrovirens</i>	Dark green bulrush	Cyperaceae	P-Sedge	Nt	OBL			
<i>Scirpus cyperinus</i>	Cottongrass bulrush	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Scirpus tabernaemontani</i>	Soft-stem bulrush	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Scutellaria lateriflora</i>	Mad-dog skullcap	Lamiaceae	P-Forb	Nt	OBL			
<i>Secale cereale</i>	Rye	Poaceae	A-Grass	Ad	UPL			
<i>Setaria faberi</i>	Japanese bristle grass	Poaceae	A-Grass	Ad	FACU			
<i>Solidago gigantea</i>	Late goldenrod	Asteraceae	P-Forb	Nt	FACW			
<i>Solidago graminifolia</i>	Common grass-leaved goldenrod	Asteraceae	P-Forb	Nt	FACW			X
<i>Solidago juncea</i>	Early goldenrod	Asteraceae	P-Forb	Nt	UPL			X
<i>Sparganium eurycarpum</i>	Bur-reed	Sparganiaceae	P-Forb	Nt	OBL			X
<i>Typha latifolia</i>	Common cattail	Typhaceae	P-Forb	Nt	OBL			
<i>Verbena hastata</i>	Blue vervain	Verbenaceae	P-Forb	Nt	FACW			
<i>Vitis riparia</i>	Riverbank grape	Vitaceae	Vine	Nt	FAC			

Categories		
Vascular Plant Families	26	
Non-Vascular Plant Families	0	
	No. Species	Percent
Total Species	86	100.0%
Native Species	73	84.9%
Adventive Species	12	14.0%
Unknown Species	1	1.2%
Largest Families Represented		
Aster Family (Asteraceae)	16	18.6%
Grass Family (Poaceae)	15	17.4%
Sedge Family (Cyperaceae)	12	14.0%
Mint Family (Lamiaceae)	6	7.0%
Rush Family (Juncaceae)	7	8.1%
Physiognomy		
Perennial Forbs (P-Forb)	32	37.2%
Annual Forbs (A-Forb)	12	14.0%
Biennial Forbs (B-Forbs)	4	4.7%
Forbs	0	0.0%
Perennial Grass (P-Grass)	16	18.6%
Annual Grass (A-Grass)	6	7.0%
Grasses	0	0.0%
Perennial Sedge (P-Sedge)	12	14.0%
Alga	0	0.0%
Cryptogams	1	1.2%
Trees	2	2.3%
Shrubs	0	0.0%
Vines	1	1.2%
Miscellaneous		
Nectar/Larval Food Plants	2	2.3%
Seeded/Planted Species	36	41.9%
Rare Plants	1	1.2%
Wetland Classification		
Upland (UPL)	8	9.3%
Facultative Upland (FACU)	15	17.4%
Facultative (FAC)	9	10.5%
Facultative Wetland (FACW)	19	22.1%
Obligate Wetland (OBL)	34	39.5%
Unknown Species	1	1.2%
Total Hydrophytic Species	62	72.1%

Rapp Road Landfill - PII, PIII Species Search
 Transect: E4-E6
 Date: August 4, 2013
 Samplers: Steve Apfelbaum

Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
<i>Acer rubrum</i>	Red maple	Aceraceae	Tree	Nt	FAC			
<i>Aster cordifolius</i>	Heart-leaved ster	Asteraceae	P-Forb	Nt	UPL			
<i>Avena sativa</i>	Oats	Poaceae	A-Grass	Ad	UPL			
<i>Betula alleghaniensis</i>	Yellow birch	Betulaceae	Tree	Nt	FAC			
<i>Carex bebbii</i>	Bebb's sedge	Cyperaceae	P-Sedge	Nt	OBL			
<i>Celastrus orbiculatus</i>	Oriental bittersweet	Celastraceae	Vine	Ad	UPL			
<i>Circaea lutetiana</i>	Enchanter's nightshade	Onagraceae	P-Forb	Nt	FACU			
<i>Conyza canadensis</i>	Horseweed	Asteraceae	A-Forb	Nt	FACU			X
<i>Crataegus sp</i>	Hawthorn	Rosaceae	Tree	Nt				
<i>Cyperus strigosus</i>	Straw-colored flat sedge	Cyperaceae	P-Sedge	Nt	FACW			
<i>Dactylis glomerata</i>	Orchard grass	Poaceae	P-Grass	Ad	FACU			
<i>Elymus virginicus</i>	Virginia wild rye	Poaceae	P-Grass	Nt	FACW			X
<i>Erechtites hieracifolia</i>	Fireweed	Asteraceae	A-Forb	Nt	FACU			X
<i>Eupatorium perfoliatum</i>	Thoroughwort	Asteraceae	P-Forb	Nt	FACW			X
<i>Fraxinus americana</i>	White ash	Oleaceae	Tree	Nt	FACU			
<i>Hamamelis virginiana</i>	Witch-hazel	Hamamelidaceae	Shrub	Nt	FACU			
<i>Juncus tenuis</i>	Slender yard-rush	Juncaceae	P-Grass	Nt	FACW			
<i>Lolium multiflorum</i>	Italian rye grass	Poaceae	A-Grass	Ad	FACU			X
<i>Lysimachia ciliata</i>	Fringed loosestrife	Primulaceae	P-Forb	Nt	FACW			X
<i>Maianthemum canadense</i>	False lily-of-the-valley	Liliaceae	P-Forb	Nt	FACU			
<i>Osmunda cinnamomea</i>	Cinnamon fern	Osmundaceae	Cryptogam	Nt	FACW			X
<i>Osmunda regalis</i>	Royal fern	Osmundaceae	Cryptogam	Nt	OBL			
<i>Ostrya virginiana</i>	Hop hornbeam	Betulaceae	Tree	Nt	FACU			
<i>Oxalis stricta</i>	Common wood-sorrel	Oxalidaceae	A-Forb	Nt	FACU			
<i>Phytolacca americana</i>	Pokeweed	Phytolaccaceae	P-Forb	Nt	FACU	-		X
<i>Polygonum convolvulus</i>	Black bindweed	Polygonaceae	A-Forb	Ad	FAC			
<i>Populus deltoides</i>	Cottonwood	Salicaceae	Tree	Nt	FAC			
<i>Populus grandidentata</i>	Big-toothed aspen	Salicaceae	Tree	Nt	FACU			
<i>Prunus serotina</i>	Black cherry	Rosaceae	Tree	Nt	FACU			
<i>Quercus alba</i>	White oak	Fagaceae	Tree	Nt	FACU			
<i>Quercus rubra</i>	Red oak	Fagaceae	Tree	Nt	FACU			
<i>Rhus radicans</i>	Poison ivy	Anacardiaceae	Vine	Nt	FAC			
<i>Rubus hispids</i>	Swamp dewberry	Rosaceae	Shrub	Nt	FACW		X	X
<i>Rubus idaeus strigosus</i>	Red raspberry	Rosaceae	Shrub	Nt	FACU			
<i>Rumex orbiculatus</i>	Great water dock	Polygonaceae	P-Forb	Nt	OBL			
<i>Sassafras albidum</i>	Sassafras	Lauraceae	Tree	Nt	FACU			
<i>Solanum nigrum</i>	Black nightshade	Solanaceae	P-Forb	Nt	FACU			
<i>Solidago graminifolia</i>	Common grass-leaved goldenrod	Asteraceae	P-Forb	Nt	FACW			X
<i>Sphenopholis sp</i>	Wedge grass	Poaceae	P-Grass	Nt	FAC			X
<i>Verbena hastata</i>	Blue vervain	Verbenaceae	P-Forb	Nt	FACW			
<i>Verbena urticifolia</i>	White vervain	Verbenaceae	P-Forb	Nt	FAC			X

Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
Vitis riparia	Riverbank grape	Vitaceae	Vine	Nt	FAC			

Categories		
Vascular Plant Families	24	
Non-Vascular Plant Families	0	
	No. Species	Percent
Total Species	42	100.0%
Native Species	37	88.1%
Adventive Species	5	11.9%
Unknown Species	0	0.0%
Largest Families Represented		
Aster Family (Asteraceae)	5	11.9%
Grass Family (Poaceae)	5	11.9%
Sedge Family (Cyperaceae)	2	4.8%
Rose Family (Rosaceae)	4	9.5%
Pea Family (Fabaceae)	2	4.8%
Physiognomy		
Perennial Forbs (P-Forb)	11	26.2%
Annual Forbs (A-Forb)	4	9.5%
Biennial Forbs (B-Forbs)	0	0.0%
Forbs	0	0.0%
Perennial Grass (P-Grass)	4	9.5%
Annual Grass (A-Grass)	2	4.8%
Grasses	0	0.0%
Perennial Sedge (P-Sedge)	2	4.8%
Alga	0	0.0%
Cryptogams	2	4.8%
Trees	11	26.2%
Shrubs	3	7.1%
Vines	3	7.1%
Miscellaneous		
Nectar/Larval Food Plants	1	2.4%
Seeded/Planted Species	12	28.6%
Rare Plants	0	0.0%
Wetland Classification		
Upland (UPL)	3	7.1%
Facultative Upland (FACU)	18	42.9%
Facultative (FAC)	8	19.0%
Facultative Wetland (FACW)	9	21.4%
Obligate Wetland (OBL)	3	7.1%
Unknown Species	1	2.4%
Total Hydrophytic Species	20	47.6%

Rapp Road Landfill - PII, PIII Species Search
 Transect: E4-E6
 Date: August 4, 2013
 Samplers: Steve Apfelbaum

Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
<i>Acalypha rhomboidea</i>	Three-seeded mercury	Euphorbiaceae	A-Forb	Nt	FACU			
<i>Agalinis tenuifolia</i>	Gerardia	Scrophulariaceae	P-Forb	Nt	FACW			X
<i>Andropogon scoparius</i>	Little bluestem	Poaceae	P-Grass	Nt	FACU			X
<i>Asclepias incarnata</i>	Swamp milkweed	Asclepiadaceae	P-Forb	Nt	OBL			X
<i>Aster laevis</i>	Smooth blue aster	Asteraceae	P-Forb	Nt	FACU			X
<i>Aster lanceolatus</i>	Old-field aster	Asteraceae	P-Forb	Nt	FACW			
<i>Aster novae-angliae</i>	New England aster	Asteraceae	P-Forb	Nt	FACW			X
<i>Aster puniceus</i>	Purple-stemmed aster	Asteraceae	P-Forb	Nt	OBL			X
<i>Betula populifolia</i>	Gray birch	Betulaceae	Tree	Nt	FAC			
<i>Bidens cernua</i>	Stick-tights	Asteraceae	A-Forb	Nt	OBL			X
<i>Bidens frondosa</i>	Beggar-ticks	Asteraceae	A-Forb	Nt	FACW			X
<i>Carex annectens</i>	Yellow-fruit sedge	Cyperaceae	P-Sedge	Nt	FACW			X
<i>Carex bebbii</i>	Bebb's sedge	Cyperaceae	P-Sedge	Nt	OBL			
<i>Carex hystericina</i>	Porcupine sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Carex lupulina</i>	Hop sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Carex pensylvanica</i>	Common oak sedge	Cyperaceae	P-Sedge	Nt	UPL			X
<i>Carex stricta</i>	Tussock sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Celastrus orbiculatus</i>	Oriental bittersweet	Celastraceae	Vine	Ad	UPL			
<i>Centaurea maculosa</i>	Spotted knapweed	Asteraceae	P-Forb	Ad	UPL			
<i>Chenopodium album</i>	Lamb's-quarters	Chenopodiaceae	A-Forb	Ad	FACU			
<i>Cirsium arvense</i>	Canada thistle	Asteraceae	P-Forb	Ad	FACU			
<i>Conyza canadensis</i>	Horseweed	Asteraceae	A-Forb	Nt	FACU			X
<i>Coronilla varia</i>	Crown vetch	Fabaceae	P-Forb	Ad	UPL			
<i>Cyperus esculentus</i>	Yellow nut-grass	Cyperaceae	P-Sedge	Nt	FACW			
<i>Cyperus strigosus</i>	Straw-colored flat sedge	Cyperaceae	P-Sedge	Nt	FACW			
<i>Digitaria sanguinalis</i>	Tall crabgrass	Poaceae	A-Grass	Ad	FACU			
<i>Echinochloa crusgalli</i>	Japanese millet	Poaceae	A-Grass	Ad	FAC			
<i>Echinochloa walteri</i>	Water millet	Poaceae	A-Grass	Nt	OBL			
<i>Eleocharis obtusa</i>	Blunt spike-rush	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Elymus virginicus</i>	Virginia wild rye	Poaceae	P-Grass	Nt	FACW			X
<i>Erechtites hieracifolia</i>	Fireweed	Asteraceae	A-Forb	Nt	FACU			X
<i>Erigeron strigosus</i>	Daisy-fleabane	Asteraceae	A-Forb	Nt	FACU			
<i>Eupatorium maculatum</i>	Spotted Joy-pye weed	Asteraceae	P-Forb	Nt	OBL			
<i>Fragaria virginiana</i>	Field strawberry	Rosaceae	P-Forb	Nt	FACU		X	
<i>Glyceria grandis</i>	Reed meadowgrass	Poaceae	P-Grass	Nt	OBL			
<i>Hypericum boreale</i>	Northern dwarf St. John's-wort	Clusiaceae	P-Forb	Nt	OBL			X
<i>Hypericum perforatum</i>	Common St. John's-wort	Clusiaceae	P-Forb	Ad	UPL			
<i>Hypericum punctatum</i>	St. John's-wort	Clusiaceae	P-Forb	Nt	FAC			
<i>Juncus effusus</i>	Common rush	Juncaceae	P-Grass	Nt	OBL			X
<i>Juncus sp</i>	Rush	Juncaceae	P-Grass	Nt				
<i>Juncus tenuis</i>	Slender yard-rush	Juncaceae	P-Grass	Nt	FACW			

Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
<i>Juncus torreyi</i>	Torrey's rush	Juncaceae	P-Grass	Nt	FACW			X
<i>Leersia oryzoides</i>	Rice cutgrass	Poaceae	P-Grass	Nt	OBL			
<i>Lobelia inflata</i>	Indian-tobacco	Campanulaceae	B-Forb	Nt	FACU			
<i>Lobelia siphilitica</i>	Great lobelia	Campanulaceae	P-Forb	Nt	FACW			X
<i>Lolium multiflorum</i>	Italian rye grass	Poaceae	A-Grass	Ad	FACU			X
<i>Lonicera tatarica</i>	Tartarian honeysuckle	Caprifoliaceae	Shrub	Ad	FACU			X
<i>Lupinus perennis</i>	Wild lupine	Fabaceae	P-Forb	Nt	UPL			
<i>Lycopus americanus</i>	Water-horehound	Lamiaceae	P-Forb	Nt	OBL			
<i>Mimulus ringens</i>	Monkey flower	Lamiaceae	P-Forb	Nt	OBL			
<i>Monarda punctata</i>	Dotted horsemint	Lamiaceae	P-Forb	Nt	UPL			X
<i>Onoclea sensibilis</i>	Sensitive fern	Dryopteridaceae	Cryptogam	Nt	FACW			X
<i>Panicum acuminatum</i>	Old-field Panic grass	Poaceae	P-Grass	Nt	FAC			
<i>Panicum capillare</i>	Witchgrass	Poaceae	A-Grass	Nt	FAC			X
<i>Panicum flexile</i>	Wiry panic grass	Poaceae	A-Grass	Nt	FACW			
<i>Panicum scabriusculum</i>	Woolly witch grass	Poaceae	P-Grass	Nt				
<i>Panicum villosissimum</i>	Panic grass	Poaceae	P-Grass	Nt	UPL			
<i>Penthorum sedoides</i>	Ditch-stonecrop	Crassulaceae	P-Forb	Nt	OBL			
<i>Phragmites australis</i>	Common reed	Poaceae	P-Grass	Ad	FACW			
<i>Podophyllum peltatum</i>	May apple	Berberidaceae	P-Forb	Nt	FACU			
<i>Polygonum pensylvanicum</i>	Pinkweed	Polygonaceae	A-Forb	Nt	FACW			
<i>Populus deltoides</i>	Cottonwood	Salicaceae	Tree	Nt	FAC			
<i>Potentilla norvegica</i>	Rough cinquefoil	Rosaceae	P-Forb	Nt	FAC			X
<i>Potentilla simplex</i>	Common cinquefoil	Rosaceae	P-Forb	Nt	FACU			
<i>Prunus serotina</i>	Black cherry	Rosaceae	Tree	Nt	FACU			
<i>Quercus bicolor</i>	Swamp white oak	Fagaceae	Tree	Nt	FACW			X
<i>Quercus velutina</i>	Black oak	Fagaceae	Tree	Nt	UPL			X
<i>Rhamnus frangula</i>	Glossy buckthorn	Rhamnaceae	Shrub	Ad	FAC			
<i>Rosa multiflora</i>	Multiflora rose	Rosaceae	Shrub	Ad	FACU			
<i>Rubus allegheniensis</i>	Northern blackberry	Rosaceae	Shrub	Nt	FACU			
<i>Rubus hispidus</i>	Swamp dewberry	Rosaceae	Shrub	Nt	FACW		X	X
<i>Rubus idaeus strigosus</i>	Red raspberry	Rosaceae	Shrub	Nt	FACU			
<i>Rumex acetosella</i>	Sheep sorrel	Polygonaceae	B-Forb	Ad	FACU			
<i>Rumex crispus</i>	Curly dock	Polygonaceae	P-Forb	Ad	FAC			
<i>Salix nigra</i>	Black willow	Salicaceae	Tree	Nt	OBL			
<i>Scirpus atrovirens</i>	Dark green bulrush	Cyperaceae	P-Sedge	Nt	OBL			
<i>Scirpus cyperinus</i>	Cottongrass bulrush	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Solidago gigantea</i>	Late goldenrod	Asteraceae	P-Forb	Nt	FACW			
<i>Solidago graminifolia</i>	Common grass-leaved goldenrod	Asteraceae	P-Forb	Nt	FACW			X
<i>Trifolium pratense</i>	Red clover	Fabaceae	P-Forb	Ad	FACU			
<i>Trifolium repens</i>	White clover	Fabaceae	P-Forb	Ad	FACU			
<i>Typha angustifolia</i>	Narrow-leaf cattail	Typhaceae	P-Forb	Nt	OBL			
<i>Typha latifolia</i>	Common cattail	Typhaceae	P-Forb	Nt	OBL			
<i>Verbena hastata</i>	Blue vervain	Verbenaceae	P-Forb	Nt	FACW			
<i>Veronica sp</i>	Speedwell	Scrophulariaceae	Forb					X
<i>Vitis riparia</i>	Riverbank grape	Vitaceae	Vine	Nt	FAC			

Categories		
Vascular Plant Families	25	
Non-Vascular Plant Families	0	
	No. Species	Percent
Total Species	86	100.0%
Native Species	68	79.1%
Adventive Species	17	19.8%
Unknown Species	1	1.2%
Largest Families Represented		
Aster Family (Asteraceae)	14	16.3%
Grass Family (Poaceae)	14	16.3%
Sedge Family (Cyperaceae)	11	12.8%
Rose Family (Rosaceae)	8	9.3%
Pea Family (Fabaceae)	6	7.0%
Physiognomy		
Perennial Forbs (P-Forb)	31	36.0%
Annual Forbs (A-Forb)	8	9.3%
Biennial Forbs (B-Forbs)	2	2.3%
Forbs	1	1.2%
Perennial Grass (P-Grass)	12	14.0%
Annual Grass (A-Grass)	6	7.0%
Grasses	0	0.0%
Perennial Sedge (P-Sedge)	11	12.8%
Alga	0	0.0%
Cryptogams	1	1.2%
Trees	6	7.0%
Shrubs	6	7.0%
Vines	2	2.3%
Miscellaneous		
Nectar/Larval Food Plants	2	2.3%
Seeded/Planted Species	33	38.4%
Rare Plants	0	0.0%
Wetland Classification		
Upland (UPL)	9	10.5%
Facultative Upland (FACU)	22	25.6%
Facultative (FAC)	10	11.6%
Facultative Wetland (FACW)	20	23.3%
Obligate Wetland (OBL)	22	25.6%
Unknown Species	3	3.5%
Total Hydrophytic Species	52	60.5%

Rapp Road Landfill - PII, PIII Species Search
 Transect: E4-E6
 Date: August 4, 2013
 Samplers: Steve Apfelbaum

Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
<i>Acalypha rhomboidea</i>	Three-seeded mercury	Euphorbiaceae	A-Forb	Nt	FACU			
<i>Acer rubrum</i>	Red maple	Aceraceae	Tree	Nt	FAC			
<i>Agalinis tenuifolius</i>	Gerardia	Scrophulariaceae	P-Forb	Nt	FACW			X
<i>Alisma subcordatum</i>	Water-plantain	Alismataceae	P-Forb	Nt	OBL			X
<i>Ambrosia artemisiifolia</i>	Ragweed	Asteraceae	A-Forb	Nt	FACU			
<i>Artemisia vulgaris</i>	Mugwort	Asteraceae	P-Forb	Ad	UPL			
<i>Aster divaricatus</i>	White wood aster	Asteraceae	P-Forb	Nt	UPL			
<i>Aster lanceolatus</i>	Old-field aster	Asteraceae	P-Forb	Nt	FACW			
<i>Aster puniceus</i>	Purple-stemmed aster	Asteraceae	P-Forb	Nt	OBL			X
<i>Aster umbellatus</i>	Flat-top white aster	Asteraceae	P-Forb	Nt	FACW			X
<i>Betula populifolia</i>	Gray birch	Betulaceae	Tree	Nt	FAC			
<i>Bidens cernua</i>	Stick-tights	Asteraceae	A-Forb	Nt	OBL			X
<i>Bidens frondosa</i>	Beggar-ticks	Asteraceae	A-Forb	Nt	FACW			X
<i>Carex annectens</i>	Yellow-fruit sedge	Cyperaceae	P-Sedge	Nt	FACW			X
<i>Carex scoparia</i>	Pointed broom sedge	Cyperaceae	P-Sedge	Nt	FACW			X
<i>Carex stricta</i>	Tussock sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Carex vulpinoidea</i>	Common fox sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Convolvulus sepium</i>	Hedge bindweed	Convolvulaceae	P-Forb	Nt	FAC			
<i>Cornus racemosa</i>	Gray dogwood	Cornaceae	Shrub	Nt	FAC			
<i>Cyperus strigosus</i>	Straw-colored flat sedge	Cyperaceae	P-Sedge	Nt	FACW			
<i>Dactylis glomerata</i>	Orchard grass	Poaceae	P-Grass	Ad	FACU			
<i>Echinochloa crusgalli</i>	Japanese millet	Poaceae	A-Grass	Ad	FAC			
<i>Echinochloa walteri</i>	Water millet	Poaceae	A-Grass	Nt	OBL			
<i>Eleocharis obtusa</i>	Blunt spike-rush	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Epilobium coloratum</i>	Purple-leaf willowherb	Onagraceae	P-Forb	Nt	OBL			X
<i>Equisetum arvense</i>	Field horsetail	Equisetaceae	Cryptogam	Nt	FAC			
<i>Erechtites hieracifolia</i>	Fireweed	Asteraceae	A-Forb	Nt	FACU			X
<i>Erigeron strigosus</i>	Daisy-fleabane	Asteraceae	A-Forb	Nt	FACU			
<i>Eupatorium maculatum</i>	Spotted Joy-pye weed	Asteraceae	P-Forb	Nt	OBL			
<i>Eupatorium perfoliatum</i>	Thoroughwort	Asteraceae	P-Forb	Nt	FACW			X
<i>Galium odoratum</i>	Sweet woodruff	Rubiaceae	P-Forb	Ad	UPL			
<i>Glyceria grandis</i>	Reed meadowgrass	Poaceae	P-Grass	Nt	OBL			
<i>Hypericum boreale</i>	Northern dwarf St. John's-wort	Clusiaceae	P-Forb	Nt	OBL			X
<i>Impatiens capensis</i>	Spotted touch-me-not	Balsaminaceae	A-Forb	Nt	FACW			
<i>Juncus dudleyi</i>	Dudley's rush	Juncaceae	P-Grass	Nt	FACW			X
<i>Juncus effusus</i>	Common rush	Juncaceae	P-Grass	Nt	OBL			X
<i>Juncus roemerianus</i>	Needlerush	Juncaceae	P-Grass	Nt	OBL			
<i>Juncus torreyi</i>	Torrey's rush	Juncaceae	P-Grass	Nt	FACW			X
<i>Lobelia inflata</i>	Indian-tobacco	Campanulaceae	B-Forb	Nt	FACU			
<i>Lobelia siphilitica</i>	Great lobelia	Campanulaceae	P-Forb	Nt	FACW			X
<i>Lolium multiflorum</i>	Italian rye grass	Poaceae	A-Grass	Ad	FACU			X

Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
<i>Lysimachia ciliata</i>	Fringed loosestrife	Primulaceae	P-Forb	Nt	FACW			X
<i>Melilotus officinalis</i>	Yellow melilotus	Fabaceae	B-Forb	Ad	FACU			
<i>Mimulus ringens</i>	Monkey flower	Lamiaceae	P-Forb	Nt	OBL			
<i>Najas flexilis</i>	Naiad	Najadaceae	P-Forb	Nt	OBL			
<i>Oncoclea sensibilis</i>	Sensitive fern	Dryopteridaceae	Cryptogam	Nt	FACW			X
<i>Osmunda cinnamomea</i>	Cinnamon fern	Osmundaceae	Cryptogam	Nt	FACW			X
<i>Oxalis stricta</i>	Common wood-sorrel	Oxalidaceae	A-Forb	Nt	FACU			
<i>Panicum scabriusculum</i>	Woolly witch grass	Poaceae	P-Grass	Nt				
<i>Parthenocissus inserta</i>	Virginia creeper	Vitaceae	Vine	Nt	FACU			
<i>Penthorum sedoides</i>	Ditch-stonecrop	Crassulaceae	P-Forb	Nt	OBL			
<i>Phragmites australis</i>	Common reed	Poaceae	P-Grass	Ad	FACW			
<i>Polygonum arifolium</i>	Arrow-leaved tearthumb	Polygonaceae	A-Forb	Nt	OBL			
<i>Polygonum convolvulus</i>	Black bindweed	Polygonaceae	A-Forb	Ad	FAC			
<i>Polygonum pensylvanicum</i>	Pinkweed	Polygonaceae	A-Forb	Nt	FACW			
<i>Polygonum punctatum</i>	Dotted smartweed	Polygonaceae	A-Forb	Nt	OBL			
<i>Populus deltoides</i>	Cottonwood	Salicaceae	Tree	Nt	FAC			
<i>Populus grandidentata</i>	Big-toothed aspen	Salicaceae	Tree	Nt	FACU			
<i>Potentilla norvegica</i>	Rough cinquefoil	Rosaceae	P-Forb	Nt	FAC			X
<i>Rudbeckia hirta</i>	Black-eyed Susan	Asteraceae	B-Forb	Nt	FACU			
<i>Rumex crispus</i>	Curly dock	Polygonaceae	P-Forb	Ad	FAC			
<i>Salix nigra</i>	Black willow	Salicaceae	Tree	Nt	OBL			
<i>Scirpus atrovirens</i>	Dark green bulrush	Cyperaceae	P-Sedge	Nt	OBL			
<i>Solidago gigantea</i>	Late goldenrod	Asteraceae	P-Forb	Nt	FACW			
<i>Solidago graminifolia</i>	Common grass-leaved goldenrod	Asteraceae	P-Forb	Nt	FACW			X
<i>Solidago juncea</i>	Early goldenrod	Asteraceae	P-Forb	Nt	UPL			X
<i>Solidago rugosa</i>	Tall-hairy goldenrod	Asteraceae	P-Forb	Nt	FAC			
<i>Solidago uliginosa</i>	Bog goldenrod	Asteraceae	P-Forb	Nt	OBL			
<i>Trifolium pratense</i>	Red clover	Fabaceae	P-Forb	Ad	FACU			
<i>Trifolium repens</i>	White clover	Fabaceae	P-Forb	Ad	FACU			
<i>Tussilago farfara</i>	Coltsfoot	Asteraceae	P-Forb	Ad	FACU			
<i>Typha angustifolia</i>	Narrow-leaf cattail	Typhaceae	P-Forb	Nt	OBL			
<i>Verbena hastata</i>	Blue vervain	Verbenaceae	P-Forb	Nt	FACW			
<i>Vicia cracca</i>	Cow vetch	Fabaceae	P-Forb	Ad	UPL			

Categories		
Vascular Plant Families	31	
Non-Vascular Plant Families	0	
	No. Species	Percent
Total Species	74	100.0%
Native Species	61	82.4%
Adventive Species	13	17.6%
Unknown Species	0	0.0%
Largest Families Represented		
Aster Family (Asteraceae)	19	25.7%
Grass Family (Poaceae)	7	9.5%
Sedge Family (Cyperaceae)	7	9.5%
Smartweed Family (Polygonaceae)	5	6.8%
Pea Family (Fabaceae)	4	5.4%
Physiognomy		
Perennial Forbs (P-Forb)	31	41.9%
Annual Forbs (A-Forb)	12	16.2%
Biennial Forbs (B-Forbs)	3	4.1%
Forbs	0	0.0%
Perennial Grass (P-Grass)	8	10.8%
Annual Grass (A-Grass)	3	4.1%
Grasses	0	0.0%
Perennial Sedge (P-Sedge)	7	9.5%
Alga	0	0.0%
Cryptogams	3	4.1%
Trees	5	6.8%
Shrubs	1	1.4%
Vines	1	1.4%
Miscellaneous		
Nectar/Larval Food Plants	0	0.0%
Seeded/Planted Species	26	35.1%
Rare Plants	0	0.0%
Wetland Classification		
Upland (UPL)	5	6.8%
Facultative Upland (FACU)	15	20.3%
Facultative (FAC)	11	14.9%
Facultative Wetland (FACW)	20	27.0%
Obligate Wetland (OBL)	22	29.7%
Unknown Species	1	1.4%
Total Hydrophytic Species	53	71.6%

Rapp Road Landfill - PII, PIII Species Search
 Transect: P2-1
 Date: August 4, 2013
 Samplers: Steve Apfelbaum

Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
<i>Acer rubrum</i>	Red maple	Aceraceae	Tree	Nt	FAC			
<i>Alisma subcordatum</i>	Water-plantain	Alismataceae	P-Forb	Nt	OBL			X
<i>Ambrosia artemisiifolia</i>	Ragweed	Asteraceae	A-Forb	Nt	FACU			
<i>Andropogon scoparius</i>	Little bluestem	Poaceae	P-Grass	Nt	FACU			X
<i>Asclepias incarnata</i>	Swamp milkweed	Asclepiadaceae	P-Forb	Nt	OBL			X
<i>Aster lanceolatus</i>	Old-field aster	Asteraceae	P-Forb	Nt	FACW			
<i>Aster puniceus</i>	Purple-stemmed aster	Asteraceae	P-Forb	Nt	OBL			X
<i>Betula populifolia</i>	Gray birch	Betulaceae	Tree	Nt	FAC			
<i>Bidens cernua</i>	Stick-tights	Asteraceae	A-Forb	Nt	OBL			X
<i>Bidens frondosa</i>	Beggar-ticks	Asteraceae	A-Forb	Nt	FACW			X
<i>Carex lupulina</i>	Hop sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Celastrus orbiculatus</i>	Oriental bittersweet	Celastraceae	Vine	Ad	UPL			
<i>Centaurea maculosa</i>	Spotted knapweed	Asteraceae	P-Forb	Ad	UPL			
<i>Conyza canadensis</i>	Horseweed	Asteraceae	A-Forb	Nt	FACU			X
<i>Cyperus strigosus</i>	Straw-colored flat sedge	Cyperaceae	P-Sedge	Nt	FACW			
<i>Dactylis glomerata</i>	Orchard grass	Poaceae	P-Grass	Ad	FACU			
<i>Echinochloa crusgalli</i>	Japanese millet	Poaceae	A-Grass	Ad	FAC			
<i>Epilobium coloratum</i>	Purple-leaf willowherb	Onagraceae	P-Forb	Nt	OBL			X
<i>Equisetum arvense</i>	Field horsetail	Equisetaceae	Cryptogam	Nt	FAC			
<i>Erigeron strigosus</i>	Daisy-fleabane	Asteraceae	A-Forb	Nt	FACU			
<i>Eupatorium maculata</i>	Spotted Joy-pye weed	Asteraceae	P-Forb	Nt	OBL			
<i>Glyceria grandis</i>	Reed meadowgrass	Poaceae	P-Grass	Nt	OBL			
<i>Glyceria striata</i>	Fowl mannagrass	Poaceae	P-Grass	Nt	OBL			X
<i>Hypericum punctatum</i>	St. John's-wort	Clusiaceae	P-Forb	Nt	FAC			
<i>Juncus dudleyi</i>	Dudley's rush	Juncaceae	P-Grass	Nt	FACW			X
<i>Juncus effusus</i>	Common rush	Juncaceae	P-Grass	Nt	OBL			X
<i>Leersia oryzoides</i>	Rice cutgrass	Poaceae	P-Grass	Nt	OBL			
<i>Lobelia inflata</i>	Indian-tobacco	Campanulaceae	B-Forb	Nt	FACU			
<i>Lobelia siphilitica</i>	Great lobelia	Campanulaceae	P-Forb	Nt	FACW			X
<i>Lotus corniculatus</i>	Bird's-foot trefoil	Fabaceae	P-Forb	Ad	FACU			
<i>Lycopus americanus</i>	Water-horehound	Lamiaceae	P-Forb	Nt	OBL			
<i>Lythrum salicaria</i>	Purple loosestrife	Lythraceae	P-Forb	Ad	OBL			
<i>Medicago lupulina</i>	Black medick	Fabaceae	P-Forb	Ad	FACU			
<i>Mimulus ringens</i>	Monkey flower	Lamiaceae	P-Forb	Nt	OBL			
<i>Monarda punctata</i>	Dotted horsemint	Lamiaceae	P-Forb	Nt	UPL			X
<i>Oenothera biennis</i>	Common evening-primrose	Onagraceae	B-Forb	Nt	FACU			
<i>Oxalis stricta</i>	Common wood-sorrel	Oxalidaceae	A-Forb	Nt	FACU			
<i>Panicum virgatum</i>	Switchgrass	Poaceae	P-Grass	Nt	FAC			
<i>Penthorum sedoides</i>	Ditch-stonecrop	Crassulaceae	P-Forb	Nt	OBL			
<i>Phragmites australis</i>	Common reed	Poaceae	P-Grass	Ad	FACW			
<i>Plantago rugelii</i>	Pale plantain	Plantaginaceae	P-Forb	Nt	FAC			

Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
<i>Poa pratensis</i>	Kentucky bluegrass	Poaceae	P-Grass	Ad	FACU			
<i>Polygonum pennsylvanicum</i>	Pinkweed	Polygonaceae	A-Forb	Nt	FACW			
<i>Polygonum punctatum</i>	Dotted smartweed	Polygonaceae	A-Forb	Nt	OBL			
<i>Populus deltoides</i>	Cottonwood	Salicaceae	Tree	Nt	FAC			
<i>Potentilla norvegica</i>	Rough cinquefoil	Rosaceae	P-Forb	Nt	FAC			X
<i>Prunus serotina</i>	Black cherry	Rosaceae	Tree	Nt	FACU			
<i>Pycnanthemum virginianum</i>	Virginia mountain mint	Lamiaceae	P-Forb	Nt	FACW			X
<i>Rhus typhina</i>	Staghorn sumac	Anacardiaceae	Tree	Nt	UPL			
<i>Rubus idaeus strigosus</i>	Red raspberry	Rosaceae	Shrub	Nt	FACU			
<i>Rudbeckia hirta</i>	Black-eyed Susan	Asteraceae	B-Forb	Nt	FACU			
<i>Scirpus atrovirens</i>	Dark green bulrush	Cyperaceae	P-Sedge	Nt	OBL			
<i>Scirpus cyperinus</i>	Cottongrass bulrush	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Scirpus pendulous</i>	Rufous bulrush	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Scirpus tabernaemontani</i>	Soft-stem bulrush	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Secale cereale</i>	Rye	Poaceae	A-Grass	Ad	UPL			
<i>Setaria faberi</i>	Japanese bristle grass	Poaceae	A-Grass	Ad	FACU			
<i>Solidago altissima</i>	Tall goldenrod	Asteraceae	P-Forb	Nt	FACU			
<i>Solidago gigantea</i>	Late goldenrod	Asteraceae	P-Forb	Nt	FACW			
<i>Solidago graminifolia</i>	Common grass-leaved goldenrod	Asteraceae	P-Forb	Nt	FACW			X
<i>Solidago juncea</i>	Early goldenrod	Asteraceae	P-Forb	Nt	UPL			X
<i>Typha latifolia</i>	Common cattail	Typhaceae	P-Forb	Nt	OBL			
<i>Xanthium strumarium</i>	Cocklebur	Asteraceae	A-Forb	Nt	FAC			

Categories		
Vascular Plant Families	24	
Non-Vascular Plant Families	0	
	No. Species	Percent
Total Species	63	100.0%
Native Species	52	82.5%
Adventive Species	11	17.5%
Unknown Species	0	0.0%
Largest Families Represented		
Aster Family (Asteraceae)	15	23.8%
Grass Family (Poaceae)	11	17.5%
Sedge Family (Cyperaceae)	6	9.5%
Mint Family (Lamiaceae)	4	6.3%
Rose Family (Rosaceae)	3	4.8%
Physiognomy		
Perennial Forbs (P-Forb)	24	38.1%
Annual Forbs (A-Forb)	9	14.3%
Biennial Forbs (B-Forbs)	3	4.8%
Forbs	0	0.0%
Perennial Grass (P-Grass)	10	15.9%
Annual Grass (A-Grass)	3	4.8%
Grasses	0	0.0%
Perennial Sedge (P-Sedge)	6	9.5%
Alga	0	0.0%
Cryptogams	1	1.6%
Trees	5	7.9%
Shrubs	1	1.6%
Vines	1	1.6%
Miscellaneous		
Nectar/Larval Food Plants	0	0.0%
Seeded/Planted Species	21	33.3%
Rare Plants	0	0.0%
Wetland Classification		
Upland (UPL)	6	9.5%
Facultative Upland (FACU)	16	25.4%
Facultative (FAC)	10	15.9%
Facultative Wetland (FACW)	10	15.9%
Obligate Wetland (OBL)	21	33.3%
Unknown Species	0	0.0%
Total Hydrophytic Species	41	65.1%

Rapp Road Landfill - PII, PIII Species Search
 Transect: P2-2
 Date: August 4, 2013
 Samplers: Steve Apfelbaum

Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
<i>Acalypha rhomboidea</i>	Three-seeded mercury	Euphorbiaceae	A-Forb	Nt	FACU			
<i>Acer rubrum</i>	Red maple	Aceraceae	Tree	Nt	FAC			
<i>Agalinis tenuifolius</i>	Gerardia	Scrophulariaceae	P-Forb	Nt	FACW			X
<i>Agrostis alba</i>	Redtop	Poaceae	P-Grass	Ad	FACW			
<i>Alisma subcordatum</i>	Water-plantain	Alismataceae	P-Forb	Nt	OBL			X
<i>Ambrosia artemisiifolia</i>	Ragweed	Asteraceae	A-Forb	Nt	FACU			
<i>Asclepias incarnata</i>	Swamp milkweed	Asclepiadaceae	P-Forb	Nt	OBL			X
<i>Aster laevis</i>	Smooth blue aster	Asteraceae	P-Forb	Nt	FACU			X
<i>Aster lanceolatus</i>	Old-field aster	Asteraceae	P-Forb	Nt	FACW			
<i>Aster puniceus</i>	Purple-stemmed aster	Asteraceae	P-Forb	Nt	OBL			X
<i>Bidens cernua</i>	Stick-tights	Asteraceae	A-Forb	Nt	OBL			X
<i>Bidens frondosa</i>	Beggar-ticks	Asteraceae	A-Forb	Nt	FACW			X
<i>Boehmeria cylindrica</i>	Fasle nettle	Urticaceae	P-Forb	Nt	OBL			
<i>Bromus japonicus</i>	Japanese chess	Poaceae	P-Grass	Ad	FACU			
<i>Carex annectens</i>	Yellow-fruit sedge	Cyperaceae	P-Sedge	Nt	FACW			X
<i>Carex hystericina</i>	Porcupine sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Carex lupulina</i>	Hop sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Carex stricta</i>	Tussock sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Carex vulpinoidea</i>	Common fox sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Cassia fasciculata</i>	Partridge pea	Fabaceae	A-Forb	Nt	FACU	Review List: G5 S3S4		
<i>Conyza canadensis</i>	Horseweed	Asteraceae	A-Forb	Nt	FACU			X
<i>Cornus amomum</i>	Silky dogwood	Cornaceae	Shrub	Nt	FACW			
<i>Corylus americana</i>	American hazelnut	Betulaceae	Shrub	Nt	FACU			
<i>Dianthus armeria</i>	Deptford pink	Caryophyllaceae	A-Forb	Ad	UPL			
<i>Eleocharis obtusa</i>	Blunt spike-rush	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Eleocharis sp</i>	Spike rush	Cyperaceae	P-Sedge	Nt	OBL			
<i>Epilobium coloratum</i>	Purple-leaf willowherb	Onagraceae	P-Forb	Nt	OBL			X
<i>Equisetum arvense</i>	Field horsetail	Equisetaceae	Cryptogam	Nt	FAC			
<i>Erigeron strigosus</i>	Daisy-fleabane	Asteraceae	A-Forb	Nt	FACU			
<i>Eupatorium perfoliatum</i>	Thoroughwort	Asteraceae	P-Forb	Nt	FACW			X
<i>Euphorbia maculata</i>	Spotted spurge	Euphorbiaceae	P-Forb	Nt	FACU			
<i>Glyceria grandis</i>	Reed meadowgrass	Poaceae	P-Grass	Nt	OBL			
<i>Glyceria striata</i>	Fowl mannagrass	Poaceae	P-Grass	Nt	OBL			X
<i>Hypericum punctatum</i>	St. John's-wort	Clusiaceae	P-Forb	Nt	FAC			
<i>Iris versicolor</i>	Blue flag	Iridaceae	P-Forb	Nt	OBL			
<i>Juncus bufonius</i>	Toad-rush	Juncaceae	P-Grass	Nt	FACW			
<i>Juncus dudleyi</i>	Dudley's rush	Juncaceae	P-Grass	Nt	FACW			X
<i>Juncus effusus</i>	Common rush	Juncaceae	P-Grass	Nt	OBL			X
<i>Juncus nodosus</i>	Knotted rush	Juncaceae	P-Grass	Nt	OBL			X
<i>Juncus sp</i>	Rush	Juncaceae	P-Grass	Nt				
<i>Juncus tenuis</i>	Slender yard-rush	Juncaceae	P-Grass	Nt	FACW			

Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
<i>Juncus torreyi</i>	Torrey's rush	Juncaceae	P-Grass	Nt	FACW			X
<i>Lobelia inflata</i>	Indian-tobacco	Campanulaceae	B-Forb	Nt	FACU			
<i>Lobelia siphilitica</i>	Great lobelia	Campanulaceae	P-Forb	Nt	FACW			X
<i>Lotus corniculatus</i>	Bird's-foot trefoil	Fabaceae	P-Forb	Ad	FACU			
<i>Lycopus americanus</i>	Water-horehound	Lamiaceae	P-Forb	Nt	OBL			
<i>Lythrum salicaria</i>	Purple loosestrife	Lythraceae	P-Forb	Ad	OBL			
<i>Medicago lupulina</i>	Black medick	Fabaceae	P-Forb	Ad	FACU			
<i>Melilotus officinalis</i>	Yellow melilotus	Fabaceae	B-Forb	Ad	FACU			
<i>Monarda punctata</i>	Dotted horsemint	Lamiaceae	P-Forb	Nt	UPL			X
<i>Panicum capillare</i>	Witchgrass	Poaceae	A-Grass	Nt	FAC			X
<i>Panicum sp</i>	Panic grass	Poaceae	P-Grass					
<i>Penthorum sedoides</i>	Ditch-stonecrop	Crassulaceae	P-Forb	Nt	OBL			
<i>Phragmites australis</i>	Common reed	Poaceae	P-Grass	Ad	FACW			
<i>Physocarpus opulifolius</i>	Ninebark	Rosaceae	Shrub	Nt	FACW	G5T5 SH E		
<i>Plantago rugelii</i>	Pale plantain	Plantaginaceae	P-Forb	Nt	FAC			
<i>Polygonum lapathifolium</i>	Willow weed	Polygonaceae	A-Forb	Nt	FACW			
<i>Populus deltoides</i>	Cottonwood	Salicaceae	Tree	Nt	FAC			
<i>Potentilla norvegica</i>	Rough cinquefoil	Rosaceae	P-Forb	Nt	FAC			X
<i>Quercus velutina</i>	Black oak	Fagaceae	Tree	Nt	UPL			X
<i>Rubus idaeus strigosus</i>	Red raspberry	Rosaceae	Shrub	Nt	FACU			
<i>Rudbeckia hirta</i>	Black-eyed Susan	Asteraceae	B-Forb	Nt	FACU			
<i>Sambucus canadensis</i>	Black elderberry	Caprifoliaceae	Shrub	Nt	FACW			
<i>Scirpus atrovirens</i>	Dark green bulrush	Cyperaceae	P-Sedge	Nt	OBL			
<i>Scirpus cyperinus</i>	Cottongrass bulrush	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Scirpus pendulous</i>	Rufous bulrush	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Scirpus tabernaemontani</i>	Soft-stem bulrush	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Secale cereale</i>	Rye	Poaceae	A-Grass	Ad	UPL			
<i>Solidago altissima</i>	Tall goldenrod	Asteraceae	P-Forb	Nt	FACU			
<i>Solidago gigantea</i>	Late goldenrod	Asteraceae	P-Forb	Nt	FACW			
<i>Solidago graminifolia</i>	Common grass-leaved goldenrod	Asteraceae	P-Forb	Nt	FACW			X
<i>Solidago juncea</i>	Early goldenrod	Asteraceae	P-Forb	Nt	UPL			X
<i>Solidago rugosa</i>	Tall-hairy goldenrod	Asteraceae	P-Forb	Nt	FAC			
<i>Solidago sp</i>	Goldenrod	Asteraceae	P-Forb	Nt				X
<i>Trifolium arvense</i>	Rabbit foot clover	Fabaceae	A-Forb	Ad	UPL			X
<i>Trifolium hybridum</i>	Alsike clover	Fabaceae	P-Forb	Ad	FACU			
<i>Trifolium pratense</i>	Red clover	Fabaceae	P-Forb	Ad	FACU			
<i>Typha angustifolia</i>	Narrow-leaf cattail	Typhaceae	P-Forb	Nt	OBL			
<i>Typha latifolia</i>	Common cattail	Typhaceae	P-Forb	Nt	OBL			
<i>Verbena hastata</i>	Blue vervain	Verbenaceae	P-Forb	Nt	FACW			
<i>Verbena urticifolia</i>	White vervain	Verbenaceae	P-Forb	Nt	FAC			X

Categories		
Vascular Plant Families	30	
Non-Vascular Plant Families	0	
	No. Species	Percent
Total Species	81	100.0%
Native Species	68	84.0%
Adventive Species	12	14.8%
Unknown Species	1	1.2%
Largest Families Represented		
Aster Family (Asteraceae)	16	19.8%
Grass Family (Poaceae)	8	9.9%
Sedge Family (Cyperaceae)	11	13.6%
Rush Family (Juncaceae)	7	8.6%
Pea Family (Fabaceae)	8	9.9%
Physiognomy		
Perennial Forbs (P-Forb)	33	40.7%
Annual Forbs (A-Forb)	10	12.3%
Biennial Forbs (B-Forbs)	3	3.7%
Forbs	0	0.0%
Perennial Grass (P-Grass)	13	16.0%
Annual Grass (A-Grass)	2	2.5%
Grasses	0	0.0%
Perennial Sedge (P-Sedge)	11	13.6%
Alga	0	0.0%
Cryptogams	1	1.2%
Trees	3	3.7%
Shrubs	5	6.2%
Vines	0	0.0%
Miscellaneous		
Nectar/Larval Food Plants	0	0.0%
Seeded/Planted Species	34	42.0%
Rare Plants	2	2.5%
Wetland Classification		
Upland (UPL)	6	7.4%
Facultative Upland (FACU)	18	22.2%
Facultative (FAC)	9	11.1%
Facultative Wetland (FACW)	19	23.5%
Obligate Wetland (OBL)	26	32.1%
Unknown Species	3	3.7%
Total Hydrophytic Species	54	66.7%

Rapp Road Landfill - PII, PIII Species Search
 Transect: P2-3
 Date: August 4, 2013
 Samplers: Steve Apfelbaum

Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
<i>Acalypha rhomboidea</i>	Three-seeded mercury	Euphorbiaceae	A-Forb	Nt	FACU			
<i>Acer rubrum</i>	Red maple	Aceraceae	Tree	Nt	FAC			
<i>Alisma subcordatum</i>	Water-plantain	Alismataceae	P-Forb	Nt	OBL			X
<i>Ambrosia artemisiifolia</i>	Ragweed	Asteraceae	A-Forb	Nt	FACU			
<i>Apocynum cannabinum</i>	Indian hemp	Apocynaceae	P-Forb	Nt	FAC			X
<i>Asclepias incarnata</i>	Swamp milkweed	Asclepiadaceae	P-Forb	Nt	OBL			X
<i>Asclepias syriaca</i>	Common milkweed	Asclepiadaceae	P-Forb	Nt	UPL		X	X
<i>Aster ericoides</i>	White heath aster	Asteraceae	P-Forb	Nt	FACU			X
<i>Aster laevis</i>	Smooth blue aster	Asteraceae	P-Forb	Nt	FACU			X
<i>Aster lanceolatus</i>	Old-field aster	Asteraceae	P-Forb	Nt	FACW			
<i>Aster novae-angliae</i>	New England aster	Asteraceae	P-Forb	Nt	FACW			X
<i>Aster puniceus</i>	Purple-stemmed aster	Asteraceae	P-Forb	Nt	OBL			X
<i>Bidens cernua</i>	Stick-tights	Asteraceae	A-Forb	Nt	OBL			X
<i>Bidens frondosa</i>	Beggar-ticks	Asteraceae	A-Forb	Nt	FACW			X
<i>Bromus japonicus</i>	Japanese chess	Poaceae	P-Grass	Ad	FACU			
<i>Carex annectens</i>	Yellow-fruit sedge	Cyperaceae	P-Sedge	Nt	FACW			X
<i>Carex crinita</i>	Fringed sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Carex hystericina</i>	Porcupine sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Carex lupulina</i>	Hop sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Carex vulpinoidea</i>	Common fox sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Cassia fasciculata</i>	Partridge pea	Fabaceae	A-Forb	Nt	FACU	Review List: G5 S3S4		
<i>Celastrus orbiculatus</i>	Oriental bittersweet	Celastraceae	Vine	Ad	UPL			
<i>Convolvulus sepium</i>	Hedge bindweed	Convolvulaceae	P-Forb	Nt	FAC			
<i>Conyza canadensis</i>	Horseweed	Asteraceae	A-Forb	Nt	FACU			X
<i>Cornus amomum</i>	Silky dogwood	Cornaceae	Shrub	Nt	FACW			
<i>Cyperus sp</i>	Flat sedge	Cyperaceae	P-Sedge	Nt				
<i>Daucus carota</i>	Queen-Anne's-lace	Apiaceae	B-Forb	Ad	UPL			
<i>Digitaria sanguinalis</i>	Tall crabgrass	Poaceae	A-Grass	Ad	FACU			
<i>Echinochloa crusgalli</i>	Japanese millet	Poaceae	A-Grass	Ad	FAC			
<i>Echinochloa walteri</i>	Water millet	Poaceae	A-Grass	Nt	OBL			
<i>Eleocharis obtusa</i>	Blunt spike-rush	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Epilobium coloratum</i>	Purple-leaf willowherb	Onagraceae	P-Forb	Nt	OBL			X
<i>Equisetum arvense</i>	Field horsetail	Equisetaceae	Cryptogam	Nt	FAC			
<i>Erechtites hieracifolia</i>	Fireweed	Asteraceae	A-Forb	Nt	FACU			X
<i>Eupatorium maculatum</i>	Spotted Joy-pye weed	Asteraceae	P-Forb	Nt	OBL			
<i>Eupatorium perfoliatum</i>	Thoroughwort	Asteraceae	P-Forb	Nt	FACW			X
<i>Euphorbia maculata</i>	Spotted spurge	Euphorbiaceae	P-Forb	Nt	FACU			
<i>Fraxinus americana</i>	White ash	Oleaceae	Tree	Nt	FACU			
<i>Galium odoratum</i>	Sweet woodruff	Rubiaceae	P-Forb	Ad	UPL			
<i>Glyceria grandis</i>	Reed meadowgrass	Poaceae	P-Grass	Nt	OBL			
<i>Hypericum boreale</i>	Northern dwarf St. John's-wort	Clusiaceae	P-Forb	Nt	OBL			X

Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
<i>Hypericum perforatum</i>	Common St. John's-wort	Clusiaceae	P-Forb	Ad	UPL			
<i>Juncus effusus</i>	Common rush	Juncaceae	P-Grass	Nt	OBL			X
<i>Juncus tenuis</i>	Slender yard-rush	Juncaceae	P-Grass	Nt	FACW			
<i>Lobelia cardinalis</i>	Cardinal flower	Campanulaceae	P-Forb	Nt	OBL			X
<i>Lotus corniculatus</i>	Bird's-foot trefoil	Fabaceae	P-Forb	Ad	FACU			
<i>Lycopus americanus</i>	Water-horehound	Lamiaceae	P-Forb	Nt	OBL			
<i>Lysimachia ciliata</i>	Fringed loosestrife	Primulaceae	P-Forb	Nt	FACW			X
<i>Lythrum salicaria</i>	Purple loosestrife	Lythraceae	P-Forb	Ad	OBL			
<i>Mimulus ringens</i>	Monkey flower	Lamiaceae	P-Forb	Nt	OBL			
<i>Monarda fistulosa</i>	Wild bergamot	Lamiaceae	P-Forb	Nt	FACU			
<i>Oenothera biennis</i>	Common evening-primrose	Onagraceae	B-Forb	Nt	FACU			
<i>Panicum capillare</i>	Witchgrass	Poaceae	A-Grass	Nt	FAC			X
<i>Panicum villosissimum</i>	Panic grass	Poaceae	P-Grass	Nt	UPL			
<i>Parthenocissus inserta</i>	Virginia creeper	Vitaceae	Vine	Nt	FACU			
<i>Phleum pratense</i>	Timothy	Poaceae	Grass	Ad	FACU			X
<i>Plantago rugelii</i>	Pale plantain	Plantaginaceae	P-Forb	Nt	FAC			
<i>Polygonum pensylvanicum</i>	Pinkweed	Polygonaceae	A-Forb	Nt	FACW			
<i>Populus deltoides</i>	Cottonwood	Salicaceae	Tree	Nt	FAC			
<i>Potentilla norvegica</i>	Rough cinquefoil	Rosaceae	P-Forb	Nt	FAC			X
<i>Quercus velutina</i>	Black oak	Fagaceae	Tree	Nt	UPL			X
<i>Scirpus atrovirens</i>	Dark green bulrush	Cyperaceae	P-Sedge	Nt	OBL			
<i>Scirpus cyperinus</i>	Cottongrass bulrush	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Scirpus pendulous</i>	Rufous bulrush	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Secale cereale</i>	Rye	Poaceae	A-Grass	Ad	UPL			
<i>Setaria viridis</i>	Green foxtail	Poaceae	A-Grass	Ad	FAC			
<i>Solidago gigantea</i>	Late goldenrod	Asteraceae	P-Forb	Nt	FACW			
<i>Solidago graminifolia</i>	Common grass-leaved goldenrod	Asteraceae	P-Forb	Nt	FACW			X
<i>Solidago juncea</i>	Early goldenrod	Asteraceae	P-Forb	Nt	UPL			X
<i>Solidago rugosa</i>	Tall-hairy goldenrod	Asteraceae	P-Forb	Nt	FAC			
<i>Stellaria longifolia</i>	Needle-leaf starwort	Caryophyllaceae	P-Forb	Nt	FACU			
<i>Trifolium arvense</i>	Rabbit foot clover	Fabaceae	A-Forb	Ad	UPL			X
<i>Trifolium hybridum</i>	Alsike clover	Fabaceae	P-Forb	Ad	FACU			
<i>Trifolium repens</i>	White clover	Fabaceae	P-Forb	Ad	FACU			
<i>Typha angustifolia</i>	Narrow-leaf cattail	Typhaceae	P-Forb	Nt	OBL			
<i>Typha latifolia</i>	Common cattail	Typhaceae	P-Forb	Nt	OBL			
<i>Verbena hastata</i>	Blue vervain	Verbenaceae	P-Forb	Nt	FACW			
<i>Verbena urticifolia</i>	White vervain	Verbenaceae	P-Forb	Nt	FAC			X
<i>Vicia cracca</i>	Cow vetch	Fabaceae	P-Forb	Ad	UPL			

Categories		
Vascular Plant Families	32	
Non-Vascular Plant Families	0	
	No. Species	Percent
Total Species	79	100.0%
Native Species	63	79.7%
Adventive Species	16	20.3%
Unknown Species	0	0.0%
Largest Families Represented		
Aster Family (Asteraceae)	16	20.3%
Grass Family (Poaceae)	10	12.7%
Sedge Family (Cyperaceae)	10	12.7%
Mint Family (Lamiaceae)	3	3.8%
Pea Family (Fabaceae)	6	7.6%
Physiognomy		
Perennial Forbs (P-Forb)	38	48.1%
Annual Forbs (A-Forb)	9	11.4%
Biennial Forbs (B-Forbs)	2	2.5%
Forbs	0	0.0%
Perennial Grass (P-Grass)	5	6.3%
Annual Grass (A-Grass)	6	7.6%
Grasses	1	1.3%
Perennial Sedge (P-Sedge)	10	12.7%
Alga	0	0.0%
Cryptogams	1	1.3%
Trees	4	5.1%
Shrubs	1	1.3%
Vines	2	2.5%
Miscellaneous		
Nectar/Larval Food Plants	1	1.3%
Seeded/Planted Species	34	43.0%
Rare Plants	1	1.3%
Wetland Classification		
Upland (UPL)	11	13.9%
Facultative Upland (FACU)	19	24.1%
Facultative (FAC)	12	15.2%
Facultative Wetland (FACW)	12	15.2%
Obligate Wetland (OBL)	24	30.4%
Unknown Species	1	1.3%
Total Hydrophytic Species	48	60.8%

Rapp Road Landfill - PII, PIII Species Search
 Transect: P2-4
 Date: August 4, 2013
 Samplers: Steve Apfelbaum

Scientific Name	Common Name	Family Classification	Physiognomy	Native/Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
<i>Acalypha rhomboidea</i>	Three-seeded mercury	Euphorbiaceae	A-Forb	Nt	FACU			
<i>Acer rubrum</i>	Red maple	Aceraceae	Tree	Nt	FAC			
<i>Agrostis alba</i>	Redtop	Poaceae	P-Grass	Ad	FACW			
<i>Ambrosia artemisiifolia</i>	Ragweed	Asteraceae	A-Forb	Nt	FACU			
<i>Apocynum cannabinum</i>	Indian hemp	Apocynaceae	P-Forb	Nt	FAC			X
<i>Artemisia vulgaris</i>	Mugwort	Asteraceae	P-Forb	Ad	UPL			
<i>Asclepias incarnata</i>	Swamp milkweed	Asclepiadaceae	P-Forb	Nt	OBL			X
<i>Asclepias syriaca</i>	Common milkweed	Asclepiadaceae	P-Forb	Nt	UPL		X	X
<i>Aster lanceolatus</i>	Old-field aster	Asteraceae	P-Forb	Nt	FACW			
<i>Aster pilosus</i>	Heath aster	Asteraceae	P-Forb	Nt	FACU			X
<i>Barbarea vulgaris</i>	Cress	Brassicaceae	B-Forb	Ad	FAC			
<i>Betula populifolia</i>	Gray birch	Betulaceae	Tree	Nt	FAC			
<i>Bromus japonicus</i>	Japanese chess	Poaceae	P-Grass	Ad	FACU			
<i>Carex vulpinoidea</i>	Common fox sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Celastrus orbiculatus</i>	Oriental bittersweet	Celastraceae	Vine	Ad	UPL			
<i>Centaurea maculosa</i>	Spotted knapweed	Asteraceae	P-Forb	Ad	UPL			
<i>Cichorium intybus</i>	Chicory	Asteraceae	P-Forb	Ad	FACU			
<i>Circaea lutetiana</i>	Enchanter's nightshade	Onagraceae	P-Forb	Nt	FACU			
<i>Conyza canadensis</i>	Horseweed	Asteraceae	A-Forb	Nt	FACU			X
<i>Crataegus sp.</i>	Hawthorn	Rosaceae	Tree	Nt				
<i>Cuscuta sp.</i>	Dodder	Cuscutaceae	A-Forb	Nt	OBL			
<i>Cyperus esculentus</i>	Yellow nut-grass	Cyperaceae	P-Sedge	Nt	FACW			
<i>Daucus carota</i>	Queen-Anne's-lace	Apiaceae	B-Forb	Ad	UPL			
<i>Digitaria sanguinalis</i>	Tall crabgrass	Poaceae	A-Grass	Ad	FACU			
<i>Equisetum arvense</i>	Field horsetail	Equisetaceae	Cryptogam	Nt	FAC			
<i>Erigeron strigosus</i>	Daisy-fleabane	Asteraceae	A-Forb	Nt	FACU			
<i>Eupatorium perfoliatum</i>	Thoroughwort	Asteraceae	P-Forb	Nt	FACW			X
<i>Euphorbia maculata</i>	Spotted spurge	Euphorbiaceae	P-Forb	Nt	FACU			
<i>Galium odoratum</i>	Sweet woodruff	Rubiaceae	P-Forb	Ad	UPL			
<i>Hypericum punctatum</i>	St. John's-wort	Clusiaceae	P-Forb	Nt	FAC			
<i>Juncus dudleyi</i>	Dudley's rush	Juncaceae	P-Grass	Nt	FACW			X
<i>Juncus tenuis</i>	Slender yard-rush	Juncaceae	P-Grass	Nt	FACW			
<i>Lobelia cardinalis</i>	Cardinal flower	Campanulaceae	P-Forb	Nt	OBL			X
<i>Lobelia siphilitica</i>	Great lobelia	Campanulaceae	P-Forb	Nt	FACW			X
<i>Lotus corniculatus</i>	Bird's-foot trefoil	Fabaceae	P-Forb	Ad	FACU			
<i>Lycopus americanus</i>	Water-horehound	Lamiaceae	P-Forb	Nt	OBL			
<i>Lythrum salicaria</i>	Purple loosestrife	Lythraceae	P-Forb	Ad	OBL			
<i>Mollugo verticillata</i>	Carpetweed	Molluginaceae	A-Forb	Ad	FAC			
<i>Osmunda cinnamomea</i>	Cinnamon fern	Osmundaceae	Cryptogam	Nt	FACW			X
<i>Oxalis stricta</i>	Common wood-sorrel	Oxalidaceae	A-Forb	Nt	FACU			
<i>Panicum acuminatum</i>	Old-field Panic grass	Poaceae	P-Grass	Nt	FAC			

Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
<i>Panicum capillare</i>	Witchgrass	Poaceae	A-Grass	Nt	FAC			X
<i>Panicum virgatum</i>	Switchgrass	Poaceae	P-Grass	Nt	FAC			
<i>Physostegia virginiana</i>	False dragon head	Lamiaceae	P-Forb	Nt	FACW			
<i>Plantago rugelii</i>	Pale plantain	Plantaginaceae	P-Forb	Nt	FAC			
<i>Populus deltoides</i>	Cottonwood	Salicaceae	Tree	Nt	FAC			
<i>Potentilla norvegica</i>	Rough cinquefoil	Rosaceae	P-Forb	Nt	FAC			X
<i>Potentilla simplex</i>	Common cinquefoil	Rosaceae	P-Forb	Nt	FACU			
<i>Quercus macrocarpa</i>	Burr oak	Fagaceae	Tree	Nt	FACU		X	X
<i>Robinia pseudoacacia</i>	Black locust	Fabaceae	Tree	Ad	FACU			
<i>Rubus idaeus strigosus</i>	Red raspberry	Rosaceae	Shrub	Nt	FACU			
<i>Rudbeckia hirta</i>	Black-eyed Susan	Asteraceae	B-Forb	Nt	FACU			
<i>Rumex crispus</i>	Curly dock	Polygonaceae	P-Forb	Ad	FAC			
<i>Secale cereale</i>	Rye	Poaceae	A-Grass	Ad	UPL			
<i>Solidago altissima</i>	Tall goldenrod	Asteraceae	P-Forb	Nt	FACU			
<i>Solidago gigantea</i>	Late goldenrod	Asteraceae	P-Forb	Nt	FACW			
<i>Solidago graminifolia</i>	Common grass-leaved goldenrod	Asteraceae	P-Forb	Nt	FACW			X
<i>Solidago juncea</i>	Early goldenrod	Asteraceae	P-Forb	Nt	UPL			X
<i>Trifolium arvense</i>	Rabbit foot clover	Fabaceae	A-Forb	Ad	UPL			X
<i>Trifolium pratense</i>	Red clover	Fabaceae	P-Forb	Ad	FACU			
<i>Verbena bracteata</i>	Carpet vervain	Verbenaceae	P-Forb	Nt	FACU			
<i>Verbena hastata</i>	Blue vervain	Verbenaceae	P-Forb	Nt	FACW			
<i>Verbena urticifolia</i>	White vervain	Verbenaceae	P-Forb	Nt	FAC			X
<i>Vitis riparia</i>	Riverbank grape	Vitaceae	Vine	Nt	FAC			

Categories		
Vascular Plant Families	31	
Non-Vascular Plant Families	0	
	No. Species	Percent
Total Species	64	100.0%
Native Species	46	71.9%
Adventive Species	18	28.1%
Unknown Species	0	0.0%
Largest Families Represented		
Aster Family (Asteraceae)	14	21.9%
Grass Family (Poaceae)	7	10.9%
Vervain Family (Verbenaceae)	3	4.7%
Rose Family (Rosaceae)	4	6.3%
Pea Family (Fabaceae)	4	6.3%
Physiognomy		
Perennial Forbs (P-Forb)	31	48.4%
Annual Forbs (A-Forb)	8	12.5%
Biennial Forbs (B-Forbs)	3	4.7%
Forbs	0	0.0%
Perennial Grass (P-Grass)	6	9.4%
Annual Grass (A-Grass)	3	4.7%
Grasses	0	0.0%
Perennial Sedge (P-Sedge)	2	3.1%
Alga	0	0.0%
Cryptogams	2	3.1%
Trees	6	9.4%
Shrubs	1	1.6%
Vines	2	3.1%
Miscellaneous		
Nectar/Larval Food Plants	2	3.1%
Seeded/Planted Species	18	28.1%
Rare Plants	0	0.0%
Wetland Classification		
Upland (UPL)	9	14.1%
Facultative Upland (FACU)	20	31.3%
Faculative (FAC)	16	25.0%
Facultative Wetland (FACW)	12	18.8%
Obligate Wetland (OBL)	6	9.4%
Unknown Species	1	1.6%
Total Hydrophytic Species	34	53.1%

Rapp Road Landfill - PII, PIII Species Search
 Transect: P2-5
 Date: August 4, 2013
 Samplers: Steve Apfelbaum

Scientific Name	Common Name	Family Classification	Physiognomy	Native/Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
<i>Acer rubrum</i>	Red maple	Aceraceae	Tree	Nt	FAC			
<i>Ambrosia artemisiifolia</i>	Ragweed	Asteraceae	A-Forb	Nt	FACU			
<i>Apocynum cannabinum</i>	Indian hemp	Apocynaceae	P-Forb	Nt	FAC			X
<i>Asclepias incarnata</i>	Swamp milkweed	Asclepiadaceae	P-Forb	Nt	OBL			X
<i>Aster laevis</i>	Smooth blue aster	Asteraceae	P-Forb	Nt	FACU			X
<i>Aster novae-angliae</i>	New England aster	Asteraceae	P-Forb	Nt	FACW			X
<i>Aster puniceus</i>	Purple-stemmed aster	Asteraceae	P-Forb	Nt	OBL			X
<i>Betula populifolia</i>	Gray birch	Betulaceae	Tree	Nt	FAC			
<i>Carex crinita</i>	Fringed sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Carex lupulina</i>	Hop sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Celastrus orbiculatus</i>	Oriental bittersweet	Celastraceae	Vine	Ad	UPL			
<i>Conyza canadensis</i>	Horseweed	Asteraceae	A-Forb	Nt	FACU			X
<i>Daucus carota</i>	Queen-Anne's-lace	Apiaceae	B-Forb	Ad	UPL			
<i>Desmodium canadense</i>	Giant tick clover	Fabaceae	P-Forb	Nt	FAC			X
<i>Echinochloa crusgalli</i>	Japanese millet	Poaceae	A-Grass	Ad	FAC			
<i>Erigeron strigosus</i>	Daisy-fleabane	Asteraceae	A-Forb	Nt	FACU			
<i>Eupatorium maculatum</i>	Spotted Joy-pye weed	Asteraceae	P-Forb	Nt	OBL			
<i>Eupatorium perfoliatum</i>	Thoroughwort	Asteraceae	P-Forb	Nt	FACW			X
<i>Euphorbia maculatum</i>	Spotted spurge	Euphorbiaceae	P-Forb	Nt	FACU			
<i>Juglans nigra</i>	Black walnut	Juglandaceae	Tree	Nt	FACU			X
<i>Lespedeza capitata</i>	Bush-clover	Fabaceae	P-Forb	Nt	FACU			
<i>Lobelia cardinalis</i>	Cardinal flower	Campanulaceae	P-Forb	Nt	OBL			X
<i>Lobelia siphilitica</i>	Great lobelia	Campanulaceae	P-Forb	Nt	FACW			X
<i>Lycopus americanus</i>	Water-horehound	Lamiaceae	P-Forb	Nt	OBL			
<i>Medicago lupulina</i>	Black medick	Fabaceae	P-Forb	Ad	FACU			X
<i>Melilotus alba</i>	White sweet-clover	Fabaceae	B-Forb	Ad	FACU			
<i>Mollugo verticillata</i>	Carpetweed	Molluginaceae	A-Forb	Ad	FAC			
<i>Monarda punctata</i>	Dotted horsemint	Lamiaceae	P-Forb	Nt	UPL			X
<i>Oenothera biennis</i>	Common evening-primrose	Onagraceae	B-Forb	Nt	FACU			
<i>Onoclea sensibilis</i>	Sensitive fern	Dryopteridaceae	Cryptogam	Nt	FACW			X
<i>Osmunda cinnamomea</i>	Cinnamon fern	Osmundaceae	Cryptogam	Nt	FACW			X
<i>Oxalis stricta</i>	Common wood-sorrel	Oxalidaceae	A-Forb	Nt	FACU			
<i>Penstemon sp</i>	Beard tongue	Scrophulariaceae	P-Forb	Nt				
<i>Physocarpus opulifolius</i>	Ninebark	Rosaceae	Shrub	Nt	FACW	G5T5 SH E		
<i>Plantago rugelii</i>	Pale plantain	Plantaginaceae	P-Forb	Nt	FAC			
<i>Polygonum pensylvanicum</i>	Pinkweed	Polygonaceae	A-Forb	Nt	FACW			
<i>Populus deltoides</i>	Cottonwood	Salicaceae	Tree	Nt	FAC			
<i>Prunus serotina</i>	Black cherry	Rosaceae	Tree	Nt	FACU			
<i>Quercus bicolor</i>	Swamp white oak	Fagaceae	Tree	Nt	FACW			X
<i>Rudbeckia hirta</i>	Black-eyed Susan	Asteraceae	B-Forb	Nt	FACU			
<i>Rumex crispus</i>	Curly dock	Polygonaceae	P-Forb	Ad	FAC			

Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
Setaria faberi	Japanese bristle grass	Poaceae	A-Grass	Ad	FACU			
Solidago gigantea	Late goldenrod	Asteraceae	P-Forb	Nt	FACW			
Solidago graminifolia	Common grass-leaved goldenrod	Asteraceae	P-Forb	Nt	FACW			X
Solidago juncea	Early goldenrod	Asteraceae	P-Forb	Nt	UPL			X
Taraxacum officinale	Common dandelion	Asteraceae	P-Forb	Ad	FACU			
Trifolium arvense	Rabbit foot clover	Fabaceae	A-Forb	Ad	UPL			X
Trifolium repens	White clover	Fabaceae	P-Forb	Ad	FACU			
Verbena hastata	Blue vervain	Verbenaceae	P-Forb	Nt	FACW			
Viburnum prunifolium	Black haw	Caprifoliaceae	Shrub	Nt	FACU			
Vitis riparia	Riverbank grape	Vitaceae	Vine	Nt	FAC			

Categories		
Vascular Plant Families	28	
Non-Vascular Plant Families	0	
	No. Species	Percent
Total Species	51	100.0%
Native Species	40	78.4%
Adventive Species	11	21.6%
Unknown Species	0	0.0%
Largest Families Represented		
Aster Family (Asteraceae)	13	25.5%
Grass Family (Poaceae)		0.0%
Sedge Family (Cyperaceae)		0.0%
Rose Family (Rosaceae)		0.0%
Pea Family (Fabaceae)	6	11.8%
Physiognomy		
Perennial Forbs (P-Forb)	24	47.1%
Annual Forbs (A-Forb)	7	13.7%
Biennial Forbs (B-Forbs)	4	7.8%
Forbs	0	0.0%
Perennial Grass (P-Grass)	0	0.0%
Annual Grass (A-Grass)	2	3.9%
Grasses	0	0.0%
Perennial Sedge (P-Sedge)	2	3.9%
Alga	0	0.0%
Cryptogams	2	3.9%
Trees	6	11.8%
Shrubs	2	3.9%
Vines	2	3.9%
Miscellaneous		
Nectar/Larval Food Plants	0	0.0%
Seeded/Planted Species	20	39.2%
Rare Plants	1	2.0%
Wetland Classification		
Upland (UPL)	5	9.8%
Facultative Upland (FACU)	17	33.3%
Faculative (FAC)	10	19.6%
Facultative Wetland (FACW)	11	21.6%
Obligate Wetland (OBL)	7	13.7%
Unknown Species	1	2.0%
Total Hydrophytic Species	28	54.9%

Rapp Road Landfill - PII, PIII Species Search
 Transect: P2-6
 Date: August 4, 2013
 Samplers: Steve Apfelbaum

Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
<i>Acalypha rhomboidea</i>	Three-seeded mercury	Euphorbiaceae	A-Forb	Nt	FACU			
<i>Acer rubrum</i>	Red maple	Aceraceae	Tree	Nt	FAC			
<i>Alisma subcordatum</i>	Water-plantain	Alismataceae	P-Forb	Nt	OBL			X
<i>Apocynum cannabinum</i>	Indian hemp	Apocynaceae	P-Forb	Nt	FAC			X
<i>Asclepias incarnata</i>	Swamp milkweed	Asclepiadaceae	P-Forb	Nt	OBL			X
<i>Aster laevis</i>	Smooth blue aster	Asteraceae	P-Forb	Nt	FACU			X
<i>Aster lanceolatus</i>	Old-field aster	Asteraceae	P-Forb	Nt	FACW			
<i>Aster novae-angliae</i>	New England aster	Asteraceae	P-Forb	Nt	FACW			X
<i>Aster puniceus</i>	Purple-stemmed aster	Asteraceae	P-Forb	Nt	OBL			X
<i>Aster umbellatus</i>	Flat-top white aster	Asteraceae	P-Forb	Nt	FACW			X
<i>Bidens cernua</i>	Stick-tights	Asteraceae	A-Forb	Nt	OBL			X
<i>Bidens frondosa</i>	Beggar-ticks	Asteraceae	A-Forb	Nt	FACW			X
<i>Boehmeria cylindrica</i>	False nettle	Urticaceae	P-Forb	Nt	OBL			
<i>Campanula aparinoides</i>	Marsh bellflower	Companulaceae	P-Forb	Nt	OBL			
<i>Carex annectens</i>	Yellow-fruit sedge	Cyperaceae	P-Sedge	Nt	FACW			X
<i>Carex communis</i>	Common beech sedge	Cyperaceae	P-Sedge	Nt	UPL			
<i>Carex crinita</i>	Fringed sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Carex hystericina</i>	Porcupine sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Carex lupulina</i>	Hop sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Carex scoparia</i>	Pointed broom sedge	Cyperaceae	P-Sedge	Nt	FACW			X
<i>Carex stricta</i>	Tussock sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Carex vulpinoidea</i>	Common fox sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Celastrus orbiculatus</i>	Oriental bittersweet	Celastraceae	Vine	Ad	UPL			
<i>Conyza canadensis</i>	Horseweed	Asteraceae	A-Forb	Nt	FACU			X
<i>Epilobium coloratum</i>	Purple-leaf willowherb	Onagraceae	P-Forb	Nt	OBL			X
<i>Erigeron strigosus</i>	Daisy-fleabane	Asteraceae	A-Forb	Nt	FACU			
<i>Eupatorium maculatum</i>	Spotted Joy-pye weed	Asteraceae	P-Forb	Nt	OBL			
<i>Eupatorium perfoliatum</i>	Thoroughwort	Asteraceae	P-Forb	Nt	FACW			X
<i>Euphorbia maculata</i>	Spotted spurge	Euphorbiaceae	P-Forb	Nt	FACU			
<i>Galium odoratum</i>	Sweet woodruff	Rubiaceae	P-Forb	Ad	UPL			
<i>Glechoma hederacea</i>	Creeping Charlie	Lamiaceae	P-Forb	Ad	FAC			
<i>Glyceria grandis</i>	Reed meadowgrass	Poaceae	P-Grass	Nt	OBL			
<i>Glyceria striata</i>	Fowl mannagrass	Poaceae	P-Grass	Nt	OBL			X
<i>Heliopsis helianthoides</i>	False sunflower	Asteraceae	P-Forb	Nt	UPL			
<i>Hypericum perforatum</i>	Common St. John's-wort	Clusiaceae	P-Forb	Ad	UPL			
<i>Hypericum punctatum</i>	St. John's-wort	Clusiaceae	P-Forb	Nt	FAC			
<i>Iris versicolor</i>	Blue flag	Iridaceae	P-Forb	Nt	OBL			
<i>Juncus effusus</i>	Common rush	Juncaceae	P-Grass	Nt	OBL			X
<i>Juncus roemerianus</i>	Needlerush	Juncaceae	P-Grass	Nt	OBL			
<i>Juncus torreyi</i>	Torrey's rush	Juncaceae	P-Grass	Nt	FACW			X
<i>Leersia oryzoides</i>	Rice cutgrass	Poaceae	P-Grass	Nt	OBL			

Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
<i>Lobelia cardinalis</i>	Cardinal flower	Campanulaceae	P-Forb	Nt	OBL			X
<i>Lobelia inflata</i>	Indian-tobacco	Campanulaceae	B-Forb	Nt	FACU			
<i>Lobelia siphilitica</i>	Great lobelia	Campanulaceae	P-Forb	Nt	FACW			X
<i>Lycopus americanus</i>	Water-horehound	Lamiaceae	P-Forb	Nt	OBL			
<i>Lysimachia ciliata</i>	Fringed loosestrife	Primulaceae	P-Forb	Nt	FACW			X
<i>Lythrum salicaria</i>	Purple loosestrife	Lythraceae	P-Forb	Ad	OBL			
<i>Mimulus ringens</i>	Monkey flower	Lamiaceae	P-Forb	Nt	OBL			
<i>Monarda fistulosa</i>	Wild bergamot	Lamiaceae	P-Forb	Nt	FACU			
<i>Oenothera biennis</i>	Common evening-primrose	Onagraceae	B-Forb	Nt	FACU			
<i>Onoclea sensibilis</i>	Sensitive fern	Dryopteridaceae	Cryptogam	Nt	FACW			X
<i>Oxalis stricta</i>	Common wood-sorrel	Oxalidaceae	A-Forb	Nt	FACU			
<i>Panicum acuminatum</i>	Old-field Panic grass	Poaceae	P-Grass	Nt	FAC			
<i>Penthorum sedoides</i>	Ditch-stonecrop	Crassulaceae	P-Forb	Nt	OBL			
<i>Polygonum arifolium</i>	Arrow-leaved tearthumb	Polygonaceae	A-Forb	Nt	OBL			
<i>Polygonum pennsylvanicum</i>	Pinkweed	Polygonaceae	A-Forb	Nt	FACW			
<i>Populus deltoides</i>	Cottonwood	Salicaceae	Tree	Nt	FAC			
<i>Potentilla norvegica</i>	Rough cinquefoil	Rosaceae	P-Forb	Nt	FAC			X
<i>Prunella vulgaris</i>	Self-heal	Lamiaceae	P-Forb	Nt	FAC			
<i>Rhus typhina</i>	Staghorn sumac	Anacardiaceae	Tree	Nt	UPL			
<i>Rosa multiflora</i>	Multiflora rose	Rosaceae	Shrub	Ad	FACU			
<i>Rubus idaeus strigosus</i>	Red raspberry	Rosaceae	Shrub	Nt	FACU			
<i>Rudbeckia hirta</i>	Black-eyed Susan	Asteraceae	B-Forb	Nt	FACU			
<i>Scirpus cyperinus</i>	Dark green bulrush	Cyperaceae	P-Sedge	Nt	OBL			
<i>Scirpus pendulous</i>	Rufous bulrush	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Scutellaria lateriflora</i>	Mad-dog skullcap	Lamiaceae	P-Forb	Nt	OBL			
<i>Secale cereale</i>	Rye	Poaceae	A-Grass	Ad	UPL			
<i>Setaria faberi</i>	Japanese bristle grass	Poaceae	A-Grass	Ad	FACU			
<i>Solidago gigantea</i>	Late goldenrod	Asteraceae	P-Forb	Nt	FACW			
<i>Solidago graminifolia</i>	Common grass-leaved goldenrod	Asteraceae	P-Forb	Nt	FACW			X
<i>Solidago juncea</i>	Early goldenrod	Asteraceae	P-Forb	Nt	UPL			X
<i>Sparganium eurycarpum</i>	Bur-reed	Sparganiaceae	P-Forb	Nt	OBL			X
<i>Trifolium repens</i>	White clover	Fabaceae	P-Forb	Ad	FACU			
<i>Typha angustifolia</i>	Narrow-leaf cattail	Typhaceae	P-Forb	Nt	OBL			
<i>Typha latifolia</i>	Common cattail	Typhaceae	P-Forb	Nt	OBL			
<i>Verbascum thapsus</i>	Mullein	Scrophulariaceae	B-Forb	Ad	UPL			
<i>Verbena urticifolia</i>	White vervain	Verbenaceae	P-Forb	Nt	FAC			X

Categories		
Vascular Plant Families	32	
Non-Vascular Plant Families	0	
	No. Species	Percent
Total Species	77	100.0%
Native Species	67	87.0%
Adventive Species	10	13.0%
Unknown Species	0	0.0%
Largest Families Represented		
Aster Family (Asteraceae)	16	20.8%
Mint Family (Lamiaceae)	6	7.8%
Sedge Family (Cyperaceae)	10	13.0%
Rose Family (Rosaceae)	6	7.8%
Bellflower Family (Campanulaceae)	3	3.9%
Physiognomy		
Perennial Forbs (P-Forb)	39	50.6%
Annual Forbs (A-Forb)	8	10.4%
Biennial Forbs (B-Forbs)	4	5.2%
Forbs	0	0.0%
Perennial Grass (P-Grass)	7	9.1%
Annual Grass (A-Grass)	2	2.6%
Grasses	0	0.0%
Perennial Sedge (P-Sedge)	10	13.0%
Alga	0	0.0%
Cryptogams	1	1.3%
Trees	3	3.9%
Shrubs	2	2.6%
Vines	1	1.3%
Miscellaneous		
Nectar/Larval Food Plants	0	0.0%
Seeded/Planted Species	32	41.6%
Rare Plants	0	0.0%
Wetland Classification		
Upland (UPL)	9	11.7%
Facultative Upland (FACU)	14	18.2%
Facultative (FAC)	9	11.7%
Facultative Wetland (FACW)	14	18.2%
Obligate Wetland (OBL)	31	40.3%
Unknown Species	0	0.0%
Total Hydrophytic Species	54	70.1%

Rapp Road Landfill - PII, PIII Species Search
 Transect: P2-7
 Date: August 4, 2013
 Samplers: Steve Apfelbaum

Scientific Name	Common Name	Family Classification	Physiognomy	Native/Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
<i>Acalypha rhomboidea</i>	Three-seeded mercury	Euphorbiaceae	A-Forb	Nt	FACU			
<i>Agalinis tenuifolius</i>	Gerardia	Scrophulariaceae	P-Forb	Nt	FACW			X
<i>Alisma subcordatum</i>	Water-plantain	Alismataceae	P-Forb	Nt	OBL			X
<i>Ambrosia artemisiifolia</i>	Ragweed	Asteraceae	A-Forb	Nt	FACU			
<i>Apocynum cannabinum</i>	Indian hemp	Apocynaceae	P-Forb	Nt	FAC			X
<i>Artemisia vulgaris</i>	Mugwort	Asteraceae	P-Forb	Ad	UPL			
<i>Asclepias incarnata</i>	Swamp milkweed	Asclepiadaceae	P-Forb	Nt	OBL			X
<i>Aster laevis</i>	Smooth blue aster	Asteraceae	P-Forb	Nt	FACU			X
<i>Aster lanceolatus</i>	Old-field aster	Asteraceae	P-Forb	Nt	FACW			
<i>Aster puniceus</i>	Purple-stemmed aster	Asteraceae	P-Forb	Nt	OBL			X
<i>Betula populifolia</i>	Gray birch	Betulaceae	Tree	Nt	FAC			
<i>Bidens cernua</i>	Stick-tights	Asteraceae	A-Forb	Nt	OBL			X
<i>Bidens frondosa</i>	Beggar-ticks	Asteraceae	A-Forb	Nt	FACW			X
<i>Carex annectens</i>	Yellow-fruit sedge	Cyperaceae	P-Sedge	Nt	FACW			X
<i>Carex comosa</i>	Bearded sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Carex crinita</i>	Fringed sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Carex hystericina</i>	Porcupine sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Carex lupulina</i>	Hop sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Carex vulpinoidea</i>	Common fox sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Celastrus orbiculatus</i>	Oriental bittersweet	Celastraceae	Vine	Ad	UPL			
<i>Conyza canadensis</i>	Horseweed	Asteraceae	A-Forb	Nt	FACU			X
<i>Cuscuta gronovii</i>	Common dodder	Cuscutaceae	A-Forb	Nt	OBL			
<i>Cyperus strigosus</i>	Straw-colored flat sedge	Cyperaceae	P-Sedge	Nt	FACW			
<i>Echinochloa crusgalli</i>	Japanese millet	Poaceae	A-Grass	Ad	FAC			
<i>Echinochloa walteri</i>	Water millet	Poaceae	A-Grass	Nt	OBL			
<i>Epilobium coloratum</i>	Purple-leaf willowherb	Onagraceae	P-Forb	Nt	OBL			X
<i>Erechtites hieracifolia</i>	Fireweed	Asteraceae	A-Forb	Nt	FACU			X
<i>Eupatorium maculatum</i>	Spotted Joy-pye weed	Asteraceae	P-Forb	Nt	OBL			
<i>Eupatorium perfoliatum</i>	Thoroughwort	Asteraceae	P-Forb	Nt	FACW			X
<i>Euphorbia maculata</i>	Spotted spurge	Euphorbiaceae	P-Forb	Nt	FACU			
<i>Hypericum punctatum</i>	St. John's-wort	Clusiaceae	P-Forb	Nt	FAC			
<i>Iris versicolor</i>	Blue flag	Iridaceae	P-Forb	Nt	OBL			
<i>Juncus dudleyi</i>	Dudley's rush	Juncaceae	P-Grass	Nt	FACW			X
<i>Juncus nodosus</i>	Knotted rush	Juncaceae	P-Grass	Nt	OBL			X
<i>Juncus torreyi</i>	Torrey's rush	Juncaceae	P-Grass	Nt	FACW			X
<i>Lobelia cardinalis</i>	Cardinal flower	Campanulaceae	P-Forb	Nt	OBL			X
<i>Lobelia inflata</i>	Indian-tobacco	Campanulaceae	B-Forb	Nt	FACU			
<i>Lobelia siphilitica</i>	Great lobelia	Campanulaceae	P-Forb	Nt	FACW			X
<i>Lycopus americanus</i>	Water-horehound	Lamiaceae	P-Forb	Nt	OBL			
<i>Lythrum salicaria</i>	Purple loosestrife	Lythraceae	P-Forb	Ad	OBL			
<i>Medicago lupulina</i>	Black medick	Fabaceae	P-Forb	Ad	FACU			

Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
Mimulus ringens	Monkey flower	Lamiaceae	P-Forb	Nt	OBL			
Monarda punctata	Dotted horsemint	Lamiaceae	P-Forb	Nt	UPL			X
Oenothera biennis	Common evening-primrose	Onagraceae	B-Forb	Nt	FACU			
Onoclea sensibilis	Sensitive fern	Dryopteridaceae	Cryptogam	Nt	FACW			X
Oxalis stricta	Common wood-sorrel	Oxalidaceae	A-Forb	Nt	FACU			
Panicum scabriusculum	Woolly witch grass	Poaceae	P-Grass	Nt				
Penthorum sedoides	Ditch-stonecrop	Crassulaceae	P-Forb	Nt	OBL			
Physocarpus opulifolius	Ninebark	Rosaceae	Shrub	Nt	FACW	G5T5 SH E		
Polygonum punctatum	Dotted smartweed	Polygonaceae	A-Forb	Nt	OBL			
Populus deltoides	Cottonwood	Salicaceae	Tree	Nt	FAC			
Potentilla norvegica	Rough cinquefoil	Rosaceae	P-Forb	Nt	FAC			X
Potentilla simplex	Common cinquefoil	Rosaceae	P-Forb	Nt	FACU			
Quercus macrocarpa	Burr oak	Fagaceae	Tree	Nt	FACU		X	X
Rhus typhina	Staghorn sumac	Anacardiaceae	Tree	Nt	UPL			
Rosa multiflora	Multiflora rose	Rosaceae	Shrub	Ad	FACU			
Scirpus atrovirens	Dark green bulrush	Cyperaceae	P-Sedge	Nt	OBL			
Scirpus cyperinus	Cottongrass bulrush	Cyperaceae	P-Sedge	Nt	OBL			X
Scirpus pendulous	Rufous bulrush	Cyperaceae	P-Sedge	Nt	OBL			X
Secale cereale	Rye	Poaceae	A-Grass	Ad	UPL			
Solidago gigantea	Late goldenrod	Asteraceae	P-Forb	Nt	FACW			
Solidago graminifolia	Common grass-leaved goldenrod	Asteraceae	P-Forb	Nt	FACW			X
Solidago juncea	Early goldenrod	Asteraceae	P-Forb	Nt	UPL			X
Solidago nemoralis	Rough goldenrod	Asteraceae	P-Forb	Nt	UPL			X
Solidago rugosa	Tall-hairy goldenrod	Asteraceae	P-Forb	Nt	FAC			
Trifolium arvense	Rabbit foot clover	Fabaceae	A-Forb	Ad	UPL			X
Trifolium repens	White clover	Fabaceae	P-Forb	Ad	FACU			
Typha latifolia	Common cattail	Typhaceae	P-Forb	Nt	OBL			
Ulmus americana	American elm	Ulmaceae	Tree	Nt	FACW			
Verbascum thapsus	Mullein	Scrophulariaceae	B-Forb	Ad	UPL			
Verbena hastata	Blue vervain	Verbenaceae	P-Forb	Nt	FACW			
Verbena urticifolia	White vervain	Verbenaceae	P-Forb	Nt	FAC			X
Viburnum dentatum	Southern arrowwood	Caprifoliaceae	Shrub	Nt	FAC			

Categories		
Vascular Plant Families	31	
Non-Vascular Plant Families	0	
	No. Species	Percent
Total Species	73	100.0%
Native Species	63	86.3%
Adventive Species	10	13.7%
Unknown Species	0	0.0%
Largest Families Represented		
Aster Family (Asteraceae)	16	21.9%
Grass Family (Poaceae)	4	5.5%
Sedge Family (Cyperaceae)	10	13.7%
Rose Family (Rosaceae)	4	5.5%
Pea Family (Fabaceae)		0.0%
Physiognomy		
Perennial Forbs (P-Forb)	33	45.2%
Annual Forbs (A-Forb)	10	13.7%
Biennial Forbs (B-Forbs)	3	4.1%
Forbs	0	0.0%
Perennial Grass (P-Grass)	4	5.5%
Annual Grass (A-Grass)	3	4.1%
Grasses	0	0.0%
Perennial Sedge (P-Sedge)	10	13.7%
Alga	0	0.0%
Cryptogams	1	1.4%
Trees	5	6.8%
Shrubs	3	4.1%
Vines	1	1.4%
Miscellaneous		
Nectar/Larval Food Plants	1	1.4%
Seeded/Planted Species	34	46.6%
Rare Plants	1	1.4%
Wetland Classification		
Upland (UPL)	9	12.3%
Facultative Upland (FACU)	14	19.2%
Faculative (FAC)	9	12.3%
Facultative Wetland (FACW)	15	20.5%
Obligate Wetland (OBL)	25	34.2%
Unknown Species	1	1.4%
Total Hydrophytic Species	49	67.1%

Rapp Road Landfill - PII, PIII Species Search
 Transect: P2-8
 Date: August 4, 2013
 Samplers: Steve Apfelbaum

Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
<i>Agalinis tenuifolius</i>	Gerardia	Scrophulariaceae	P-Forb	Nt	FACW			X
<i>Alisma subcordatum</i>	Water-plantain	Alismataceae	P-Forb	Nt	OBL			X
<i>Apocynum cannabinum</i>	Indian hemp	Apocynaceae	P-Forb	Nt	FAC			X
<i>Asclepias incarnata</i>	Swamp milkweed	Asclepiadaceae	P-Forb	Nt	OBL			X
<i>Aster lanceolatus</i>	Old-field aster	Asteraceae	P-Forb	Nt	FACW			
<i>Betula papyrifera</i>	Paper birch	Betulaceae	Tree	Nt	FACU			
<i>Bidens cernua</i>	Stick-tights	Asteraceae	A-Forb	Nt	OBL			X
<i>Bidens frondosa</i>	Beggar-ticks	Asteraceae	A-Forb	Nt	FACW			X
<i>Carex annectens</i>	Yellow-fruit sedge	Cyperaceae	P-Sedge	Nt	FACW			X
<i>Carex bebbii</i>	Bebb's sedge	Cyperaceae	P-Sedge	Nt	OBL			
<i>Carex crinita</i>	Fringed sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Carex lupulina</i>	Hop sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Carex vulpinoidea</i>	Common fox sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Cassia fasciculata</i>	Partridge pea	Fabaceae	A-Forb	Nt	FACU	Review List: G5 S3S4		
<i>Celastrus orbiculatus</i>	Oriental bittersweet	Celastraceae	Vine	Ad	UPL			
<i>Chelone glabra</i>	Turtle-heads	Scrophulariaceae	P-Forb	Nt	OBL			X
<i>Cornus amomum</i>	Silky dogwood	Cornaceae	Shrub	Nt	FACW			
<i>Cyperus strigosus</i>	Straw-colored flat sedge	Cyperaceae	P-Sedge	Nt	FACW			
<i>Daucus carota</i>	Queen-Anne's-lace	Apiaceae	B-Forb	Ad	UPL			
<i>Epilobium coloratum</i>	Purple-leaf willowherb	Onagraceae	P-Forb	Nt	OBL			X
<i>Erigeron strigosus</i>	Daisy-fleabane	Asteraceae	A-Forb	Nt	FACU			
<i>Eupatorium maculatum</i>	Spotted Joy-pye weed	Asteraceae	P-Forb	Nt	OBL			
<i>Eupatorium perfoliatum</i>	Thoroughwort	Asteraceae	P-Forb	Nt	FACW			X
<i>Glyceria grandis</i>	Reed meadowgrass	Poaceae	P-Grass	Nt	OBL			
<i>Glyceria striata</i>	Fowl mannagrass	Poaceae	P-Grass	Nt	OBL			X
<i>Hypericum boreale</i>	Northern dwarf St. John's-wort	Clusiaceae	P-Forb	Nt	OBL			X
<i>Hypericum perforatum</i>	Common St. John's-wort	Clusiaceae	P-Forb	Ad	UPL			
<i>Hypericum punctatum</i>	St. John's-wort	Clusiaceae	P-Forb	Nt	FAC			
<i>Impatiens capensis</i>	Spotted touch-me-not	Balsaminaceae	A-Forb	Nt	FACW			
<i>Juncus dudleyi</i>	Dudley's rush	Juncaceae	P-Grass	Nt	FACW			X
<i>Juncus effusus</i>	Common rush	Juncaceae	P-Grass	Nt	OBL			X
<i>Juncus roemerianus</i>	Needlerush	Juncaceae	P-Grass	Nt	OBL			
<i>Juncus tenuis</i>	Slender yard-rush	Juncaceae	P-Grass	Nt	FACW			
<i>Juncus torreyi</i>	Torrey's rush	Juncaceae	P-Grass	Nt	FACW			X
<i>Leersia oryzoides</i>	Rice cutgrass	Poaceae	P-Grass	Nt	OBL			
<i>Lespedeza capitata</i>	Bush-clover	Fabaceae	P-Forb	Nt	FACU			
<i>Lobelia cardinalis</i>	Cardinal flower	Campanulaceae	P-Forb	Nt	OBL			X
<i>Lobelia inflata</i>	Indian-tobacco	Campanulaceae	B-Forb	Nt	FACU			
<i>Lobelia siphilitica</i>	Great lobelia	Campanulaceae	P-Forb	Nt	FACW			X
<i>Lycopus americanus</i>	Water-horehound	Lamiaceae	P-Forb	Nt	OBL			
<i>Lysimachia ciliata</i>	Fringed loosestrife	Primulaceae	P-Forb	Nt	FACW			X

Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
Mimulus ringens	Monkey flower	Lamiaceae	P-Forb	Nt	OBL			
Oenothera biennis	Common evening-primrose	Onagraceae	B-Forb	Nt	FACU			
Polygonum pensylvanicum	Pinkweed	Polygonaceae	A-Forb	Nt	FACW			
Polygonum punctatum	Dotted smartweed	Polygonaceae	A-Forb	Nt	OBL			
Populus deltoides	Cottonwood	Salicaceae	Tree	Nt	FAC			
Potentilla norvegica	Rough cinquefoil	Rosaceae	P-Forb	Nt	FAC			X
Quercus bicolor	Swamp white oak	Fagaceae	Tree	Nt	FACW			X
Quercus macrocarpa	Burr oak	Fagaceae	Tree	Nt	FACU		X	X
Rudbeckia hirta	Black-eyed Susan	Asteraceae	B-Forb	Nt	FACU			
Scirpus atrovirens	Dark green bulrush	Cyperaceae	P-Sedge	Nt	OBL			
Scirpus pendulous	Rufous bulrush	Cyperaceae	P-Sedge	Nt	OBL			X
Scirpus tabernaemontani	Soft-stem bulrush	Cyperaceae	P-Sedge	Nt	OBL			X
Solidago gigantea	Late goldenrod	Asteraceae	P-Forb	Nt	FACW			
Solidago uliginosa	Bog goldenrod	Asteraceae	P-Forb	Nt	OBL			
Thalictrum dasycarpum	Purple meadow rue	Ranunculaceae	P-Forb	Nt	FACW			
Typha angustifolia	Narrow-leaf cattail	Typhaceae	P-Forb	Nt	OBL			
Typha latifolia	Common cattail	Typhaceae	P-Forb	Nt	OBL			
Verbena hastata	Blue vervain	Verbenaceae	P-Forb	Nt	FACW			
Verbena urticifolia	White vervain	Verbenaceae	P-Forb	Nt	FAC			X

Categories		
Vascular Plant Families	25	
Non-Vascular Plant Families	0	
	No. Species	Percent
Total Species	60	100.0%
Native Species	57	95.0%
Adventive Species	3	5.0%
Unknown Species	0	0.0%
Largest Families Represented		
Aster Family (Asteraceae)	9	15.0%
Grass Family (Poaceae)	3	5.0%
Sedge Family (Cyperaceae)	9	15.0%
Rush Family (Juncaceae)	5	8.3%
Bellflower Family (Campanulaceae)	3	5.0%
Physiognomy		
Perennial Forbs (P-Forb)	26	43.3%
Annual Forbs (A-Forb)	7	11.7%
Biennial Forbs (B-Forbs)	4	6.7%
Forbs	0	0.0%
Perennial Grass (P-Grass)	8	13.3%
Annual Grass (A-Grass)	0	0.0%
Grasses	0	0.0%
Perennial Sedge (P-Sedge)	9	15.0%
Alga	0	0.0%
Cryptogams	0	0.0%
Trees	4	6.7%
Shrubs	1	1.7%
Vines	1	1.7%
Miscellaneous		
Nectar/Larval Food Plants	1	1.7%
Seeded/Planted Species	27	45.0%
Rare Plants	1	1.7%
Wetland Classification		
Upland (UPL)	3	5.0%
Facultative Upland (FACU)	8	13.3%
Facultative (FAC)	5	8.3%
Facultative Wetland (FACW)	18	30.0%
Obligate Wetland (OBL)	26	43.3%
Unknown Species	0	0.0%
Total Hydrophytic Species	49	81.7%

Rapp Road Landfill - PII, PIII Species Search
 Transect: P2-9
 Date: August 4, 2013
 Samplers: Steve Apfelbaum

Scientific Name	Common Name	Family Classification	Physiognomy	Native/Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
<i>Acer rubrum</i>	Red maple	Aceraceae	Tree	Nt	FAC			
<i>Andropogon gerardii</i>	Big bluestem	Poaceae	P-Grass	Nt	FACU			
<i>Andropogon scoparius</i>	Little bluestem	Poaceae	P-Grass	Nt	FACU			X
<i>Artemisia vulgaris</i>	Mugwort	Asteraceae	P-Forb	Ad	UPL			
<i>Asclepias incarnata</i>	Swamp milkweed	Asclepiadaceae	P-Forb	Nt	OBL			X
<i>Aster laevis</i>	Smooth blue aster	Asteraceae	P-Forb	Nt	FACU			X
<i>Aster puniceus</i>	Purple-stemmed aster	Asteraceae	P-Forb	Nt	OBL			X
<i>Betula populifolia</i>	Gray birch	Betulaceae	Tree	Nt	FAC			
<i>Carex annectens</i>	Yellow-fruit sedge	Cyperaceae	P-Sedge	Nt	FACW			X
<i>Carex hystricina</i>	Porcupine sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Carex lupulina</i>	Hop sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Carex scoparia</i>	Pointed broom sedge	Cyperaceae	P-Sedge	Nt	FACW			X
<i>Carex vulpinoidea</i>	Common fox sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Celastrus orbiculatus</i>	Oriental bittersweet	Celastraceae	Vine	Ad	UPL			
<i>Conyza canadensis</i>	Horseweed	Asteraceae	A-Forb	Nt	FACU			X
<i>Cyperus schweinitzii</i>	Sand flat sedge	Cyperaceae	P-Sedge	Nt	FACU	G5 S2 R		X
<i>Cyperus strigosus</i>	Straw-colored flat sedge	Cyperaceae	P-Sedge	Nt	FACW			
<i>Desmodium canadense</i>	Giant tick clover	Fabaceae	P-Forb	Nt	FAC			X
<i>Epilobium coloratum</i>	Purple-leaf willowherb	Onagraceae	P-Forb	Nt	OBL			X
<i>Eupatorium perfoliatum</i>	Thoroughwort	Asteraceae	P-Forb	Nt	FACW			X
<i>Euphorbia maculata</i>	Spotted spurge	Euphorbiaceae	P-Forb	Nt	FACU			
<i>Glyceria grandis</i>	Reed meadowgrass	Poaceae	P-Grass	Nt	OBL			
<i>Hypericum punctatum</i>	St. John's-wort	Clusiaceae	P-Forb	Nt	FAC			
<i>Juncus dudleyi</i>	Dudley's rush	Juncaceae	P-Grass	Nt	FACW			X
<i>Juncus tenuis</i>	Slender yard-rush	Juncaceae	P-Grass	Nt	FACW			
<i>Leersia oryzoides</i>	Rice cutgrass	Poaceae	P-Grass	Nt	OBL			
<i>Lespedeza capitata</i>	Bush-clover	Fabaceae	P-Forb	Nt	FACU			
<i>Lobelia inflata</i>	Indian-tobacco	Campanulaceae	B-Forb	Nt	FACU			
<i>Lupinus perennis</i>	Wild lupine	Fabaceae	P-Forb	Nt	UPL			
<i>Lycopus americanus</i>	Water-horehound	Lamiaceae	P-Forb	Nt	OBL			
<i>Monarda punctata</i>	Dotted horsemint	Lamiaceae	P-Forb	Nt	UPL			X
<i>Onoclea sensibilis</i>	Sensitive fern	Dryopteridaceae	Cryptogam	Nt	FACW			X
<i>Oxalis stricta</i>	Common wood-sorrel	Oxalidaceae	A-Forb	Nt	FACU			
<i>Panicum acuminatum</i>	Old-field Panic grass	Poaceae	P-Grass	Nt	FAC			
<i>Panicum scabriusculum</i>	Woolly witch grass	Poaceae	P-Grass	Nt				
<i>Panicum villosissimum</i>	Panic grass	Poaceae	P-Grass	Nt	UPL			
<i>Parthenocissus inserta</i>	Virginia creeper	Vitaceae	Vine	Nt	FACU			
<i>Pinus sp</i>	Pine	Pinaceae	Tree					X
<i>Podophyllum peltatum</i>	May apple	Berberidaceae	P-Forb	Nt	FACU			
<i>Polygonum arifolium</i>	Arrow-leaved tearthumb	Polygonaceae	A-Forb	Nt	OBL			
<i>Populus grandidentata</i>	Big-toothed aspen	Salicaceae	Tree	Nt	FACU			

Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
Potentilla argentea	Silvery cinquefoil	Rosaceae	P-Forb	Ad	FACU			X
Potentilla norvegica	Rough cinquefoil	Rosaceae	P-Forb	Nt	FAC			X
Potentilla simplex	Common cinquefoil	Rosaceae	P-Forb	Nt	FACU			
Prunella vulgaris	Self-heal	Lamiaceae	P-Forb	Nt	FAC			
Prunus serotina	Black cherry	Rosaceae	Tree	Nt	FACU			
Quercus velutina	Black oak	Fagaceae	Tree	Nt	UPL			X
Rubus allegheniensis	Northern blackberry	Rosaceae	Shrub	Nt	FACU			
Rubus idaeus strigosus	Red raspberry	Rosaceae	Shrub	Nt	FACU			
Rudbeckia hirta	Black-eyed Susan	Asteraceae	B-Forb	Nt	FACU			
Scirpus atrovirens	Dark green bulrush	Cyperaceae	P-Sedge	Nt	OBL			
Scirpus cyperinus	Cottongrass bulrush	Cyperaceae	P-Sedge	Nt	OBL			X
Senecio pauperculus	Northern meadow-groundsel	Asteraceae	P-Forb	Nt	FAC			
Solidago gigantea	Late goldenrod	Asteraceae	P-Forb	Nt	FACW			
Solidago graminifolia	Common grass-leaved goldenrod	Asteraceae	P-Forb	Nt	FACW			X
Solidago juncea	Early goldenrod	Asteraceae	P-Forb	Nt	UPL			X
Sorghastrum nutans	Indian grass	Poaceae	P-Grass	Nt	FACU			X
Trifolium pratense	Red clover	Fabaceae	P-Forb	Ad	FACU			
Typha latifolia	Common cattail	Typhaceae	P-Forb	Nt	OBL			
Verbascum thapsus	Mullein	Scrophulariaceae	B-Forb	Ad	UPL			

Categories		
Vascular Plant Families	25	
Non-Vascular Plant Families	0	
	No. Species	Percent
Total Species	60	100.0%
Native Species	54	90.0%
Adventive Species	5	8.3%
Unknown Species	1	1.7%
Largest Families Represented		
Aster Family (Asteraceae)	10	16.7%
Grass Family (Poaceae)	8	13.3%
Sedge Family (Cyperaceae)	9	15.0%
Rose Family (Rosaceae)	6	10.0%
Pea Family (Fabaceae)	4	6.7%
Physiognomy		
Perennial Forbs (P-Forb)	24	40.0%
Annual Forbs (A-Forb)	3	5.0%
Biennial Forbs (B-Forbs)	3	5.0%
Forbs	0	0.0%
Perennial Grass (P-Grass)	10	16.7%
Annual Grass (A-Grass)	0	0.0%
Grasses	0	0.0%
Perennial Sedge (P-Sedge)	9	15.0%
Alga	0	0.0%
Cryptogams	1	1.7%
Trees	6	10.0%
Shrubs	2	3.3%
Vines	2	3.3%
Miscellaneous		
Nectar/Larval Food Plants	0	0.0%
Seeded/Planted Species	25	41.7%
Rare Plants	1	1.7%
Wetland Classification		
Upland (UPL)	8	13.3%
Facultative Upland (FACU)	20	33.3%
Faculative (FAC)	8	13.3%
Facultative Wetland (FACW)	9	15.0%
Obligate Wetland (OBL)	13	21.7%
Unknown Species	2	3.3%
Total Hydrophytic Species	30	50.0%

Rapp Road Landfill - PII, PIII Species Search
 Transect: P3-1
 Date: August 4, 2013
 Samplers: Steve Apfelbaum

Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
<i>Acalypha rhomboidea</i>	Three-seeded mercury	Euphorbiaceae	A-Forb	Nt	FACU			
<i>Agrostis alba</i>	Redtop	Poaceae	P-Grass	Ad	FACW			
<i>Alliaria petiolata</i>	Garlic mustard	Brassicaceae	B-Forb	Ad	FAC			
<i>Andropogon gerardii</i>	Big bluestem	Poaceae	P-Grass	Nt	FACU			
<i>Andropogon scoparius</i>	Little bluestem	Poaceae	P-Grass	Nt	FACU			X
<i>Aster divaricatus</i>	White wood aster	Asteraceae	P-Forb	Nt	UPL			
<i>Aster laevis</i>	Smooth blue aster	Asteraceae	P-Forb	Nt	FACU			X
<i>Aster umbellatus</i>	Flat-top white aster	Asteraceae	P-Forb	Nt	FACW			X
<i>Athyrium filix-femina</i>	Northern lady fern	Dryopteridaceae	Cryptogam	Nt	FAC			
<i>Avena sativa</i>	Oats	Poaceae	A-Grass	Ad	UPL			
<i>Betula alleghaniensis</i>	Yellow birch	Betulaceae	Tree	Nt	FAC			
<i>Carex pensylvanica</i>	Common oak sedge	Cyperaceae	P-Sedge	Nt	UPL			X
<i>Centaurea maculosa</i>	Spotted knapweed	Asteraceae	P-Forb	Ad	UPL			
<i>Chenopodium album</i>	Lamb's-quarters	Chenopodiaceae	A-Forb	Ad	FACU			
<i>Conyza canadensis</i>	Horseweed	Asteraceae	A-Forb	Nt	FACU			X
<i>Cyperus sp</i>	Flat sedge	Cyperaceae	P-Sedge	Nt				
<i>Cyperus strigosus</i>	Straw-colored flat sedge	Cyperaceae	P-Sedge	Nt	FACW			
<i>Danthonia spicata</i>	Poverty grass	Poaceae	P-Grass	Nt	UPL			X
<i>Echinochloa crusgalli</i>	Japanese millet	Poaceae	A-Grass	Ad	FAC			
<i>Equisetum arvense</i>	Field horsetail	Equisetaceae	Cryptogam	Nt	FAC			
<i>Erechtites hieracifolia</i>	Fireweed	Asteraceae	A-Forb	Nt	FACU			X
<i>Fraxinus americana</i>	White ash	Oleaceae	Tree	Nt	FACU			
<i>Galium odoratum</i>	Sweet woodruff	Rubiaceae	P-Forb	Ad	UPL			
<i>Gaylussacia baccata</i>	Box huckleberry	Ericaceae	Shrub	Nt	FACU			
<i>Hackelia virginiana</i>	Stickseed	Boraginaceae	P-Forb	Nt	FACU			
<i>Helianthemum canadense</i>	Frostweed	Cistaceae	P-Forb	Nt	UPL			
<i>Juglans nigra</i>	Black walnut	Juglandaceae	Tree	Nt	FACU			X
<i>Juncus tenuis</i>	Slender yard-rush	Juncaceae	P-Grass	Nt	FACW			
<i>Lolium multiflorum</i>	Italian rye grass	Poaceae	A-Grass	Ad	FACU			X
<i>Lonicera tatarica</i>	Tartarian honeysuckle	Caprifoliaceae	Shrub	Ad	FACU			X
<i>Lysimachia terrestris</i>	Swamp-candles	Primulaceae	P-Forb	Nt	OBL			
<i>Melampyrum lineare</i>	Cow wheat	Scrophulariaceae	A-Forb	Nt	FAC			
<i>Mollugo verticillata</i>	Carpetweed	Molluginaceae	A-Forb	Ad	FAC			
<i>Onoclea sensibilis</i>	Sensitive fern	Dryopteridaceae	Cryptogam	Nt	FACW			X
<i>Panicum acuminatum</i>	Old-field Panic grass	Poaceae	P-Grass	Nt	FAC			
<i>Panicum scabrisuculum</i>	Wooly witch grass	Poaceae	P-Grass	Nt				
<i>Phytolacca americana</i>	Pokeweed	Phytolaccaceae	P-Forb	Nt	FACU	-		X
<i>Pinus strobus</i>	Eastern white pine	Pinaceae	Tree	Nt	FACU			
<i>Podophyllum peltatum</i>	May apple	Berberidaceae	P-Forb	Nt	FACU			
<i>Polygonum pensylvanicum</i>	Pinkweed	Polygonaceae	A-Forb	Nt	FACW			
<i>Populus deltoides</i>	Cottonwood	Salicaceae	Tree	Nt	FAC			

Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
<i>Populus tremuloides</i>	Quaking aspen	Salicaceae	Tree	Nt	FAC			
<i>Prunus serotina</i>	Black cherry	Rosaceae	Tree	Nt	FACU			
<i>Quercus alba</i>	White oak	Fagaceae	Tree	Nt	FACU			
<i>Quercus ilicifolia</i>	Scrub oak	Fagaceae	Tree	Nt	UPL			
<i>Quercus rubra</i>	Red oak	Fagaceae	Tree	Nt	FACU			
<i>Rhus radicans</i>	Poison ivy	Anacardiaceae	Vine	Nt	FAC			
<i>Rhus typhina</i>	Staghorn sumac	Anacardiaceae	Tree	Nt	UPL			
<i>Rubus allegheniensis</i>	Northern blackberry	Rosaceae	Shrub	Nt	FACU			
<i>Rubus hispidus</i>	Swamp dewberry	Rosaceae	Shrub	Nt	FACW		X	X
<i>Solanum nigrum</i>	Black nightshade	Solanaceae	P-Forb	Nt	FACU			
<i>Solidago gigantea</i>	Late goldenrod	Asteraceae	P-Forb	Nt	FACW			
<i>Solidago juncea</i>	Early goldenrod	Asteraceae	P-Forb	Nt	UPL			X
<i>Solidago rugosa</i>	Tall-hairy goldenrod	Asteraceae	P-Forb	Nt	FAC			
<i>Spiraea alba</i>	Meadowsweet	Rosaceae	Shrub	Nt	FACW			
<i>Vaccinium myrtilloides</i>	Canada blueberry	Ericaceae	Shrub	Nt	FACW		X	X
<i>Verbena urticifolia</i>	White vervain	Verbenaceae	P-Forb	Nt	FAC			X
<i>Veronica sp</i>	Speedwell	Scrophulariaceae	Forb					X
<i>Vitis riparia</i>	Riverbank grape	Vitaceae	Vine	Nt	FAC			

Categories		
Vascular Plant Families	31	
Non-Vascular Plant Families	0	
	No. Species	Percent
Total Species	59	100.0%
Native Species	48	81.4%
Adventive Species	10	16.9%
Unknown Species	1	1.7%
Largest Families Represented		
Aster Family (Asteraceae)	9	15.3%
Grass Family (Poaceae)	9	15.3%
Beech Family (Fagaceae)	3	5.1%
Rose Family (Rosaceae)	4	6.8%
		0.0%
Physiognomy		
Perennial Forbs (P-Forb)	15	25.4%
Annual Forbs (A-Forb)	7	11.9%
Biennial Forbs (B-Forbs)	1	1.7%
Forbs	1	1.7%
Perennial Grass (P-Grass)	7	11.9%
Annual Grass (A-Grass)	3	5.1%
Grasses	0	0.0%
Perennial Sedge (P-Sedge)	3	5.1%
Alga	0	0.0%
Cryptogams	3	5.1%
Trees	11	18.6%
Shrubs	6	10.2%
Vines	2	3.4%
Miscellaneous		
Nectar/Larval Food Plants	2	3.4%
Seeded/Planted Species	18	30.5%
Rare Plants	0	0.0%
Wetland Classification		
Upland (UPL)	10	16.9%
Facultative Upland (FACU)	21	35.6%
Faculative (FAC)	14	23.7%
Facultative Wetland (FACW)	10	16.9%
Obligate Wetland (OBL)	1	1.7%
Unknown Species	3	5.1%
Total Hydrophytic Species	25	42.4%

Rapp Road Landfill - PII, PIII Species Search
 Transect: R-4
 Date: August 4, 2013
 Samplers: Steve Apfelbaum

Scientific Name	Common Name	Family Classification	Physiognomy	Native/Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
<i>Acalypha rhomboidea</i>	Three-seeded mercury	Euphorbiaceae	A-Forb	Nt	FACU			
<i>Acer rubrum</i>	Red maple	Aceraceae	Tree	Nt	FAC			
<i>Agrostis alba</i>	Redtop	Poaceae	P-Grass	Ad	FACW			
<i>Ambrosia artemisiifolia</i>	Ragweed	Asteraceae	A-Forb	Nt	FACU			
<i>Artemisia vulgaris</i>	Mugwort	Asteraceae	P-Forb	Ad	UPL			
<i>Asclepias incarnata</i>	Swamp milkweed	Asclepiadaceae	P-Forb	Nt	OBL			X
<i>Asclepias syriaca</i>	Common milkweed	Asclepiadaceae	P-Forb	Nt	UPL		X	X
<i>Aster lanceolatus</i>	Old-field aster	Asteraceae	P-Forb	Nt	FACW			
<i>Aster pilosus</i>	Heath aster	Asteraceae	P-Forb	Nt	FACU			X
<i>Aster puniceus</i>	Purple-stemmed aster	Asteraceae	P-Forb	Nt	OBL			X
<i>Barbarea vulgaris</i>	Cress	Brassicaceae	B-Forb	Ad	FAC			
<i>Betula populifolia</i>	Gray birch	Betulaceae	Tree	Nt	FAC			
<i>Bromus japonicus</i>	Japanese chess	Poaceae	P-Grass	Ad	FACU			
<i>Carex hystericina</i>	Porcupine sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Carex vulpinoidea</i>	Common fox sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Celastrus orbiculatus</i>	Oriental bittersweet	Celastraceae	Vine	Ad	UPL			
<i>Centaurea maculosa</i>	Spotted knapweed	Asteraceae	P-Forb	Ad	UPL			
<i>Conyza canadensis</i>	Horseweed	Asteraceae	A-Forb	Nt	FACU			X
<i>Cyperus esculentus</i>	Yellow nut-grass	Cyperaceae	P-Sedge	Nt	FACW			
<i>Daucus carota</i>	Queen-Anne's-lace	Piaceae	B-Forb	Ad	UPL			
<i>Digitaria sanguinalis</i>	Tall crabgrass	Poaceae	A-Grass	Ad	FACU			
<i>Echinochloa crusgalli</i>	Japanese millet	Poaceae	A-Grass	Ad	FAC			
<i>Echinocystis lobata</i>	Wild cucumber	Cucurbitaceae	Vine	Nt	FACW			X
<i>Equisetum arvense</i>	Field horsetail	Equisetaceae	Cryptogam	Nt	FAC			
<i>Erechtites hieracifolia</i>	Fireweed	Asteraceae	A-Forb	Nt	FACU			X
<i>Erigeron strigosus</i>	Daisy-fleabane	Asteraceae	A-Forb	Nt	FACU			
<i>Eupatorium maculatum</i>	Spotted Joy-pye weed	Asteraceae	P-Forb	Nt	OBL			
<i>Eupatorium perfoliatum</i>	Thoroughwort	Asteraceae	P-Forb	Nt	FACW			X
<i>Galeopsis tetrahit</i>	Hemp-nettle	Lamiaceae	A-Forb	Ad	FACU			
<i>Glyceria striata</i>	Fowl mannagrass	Poaceae	P-Grass	Nt	OBL			X
<i>Hackelia virginiana</i>	Stickseed	Boraginaceae	P-Forb	Nt	FACU			
<i>Impatiens capensis</i>	Spotted touch-me-not	Balsaminaceae	A-Forb	Nt	FACW			
<i>Juglans nigra</i>	Black walnut	Juglandaceae	Tree	Nt	FACU			X
<i>Juncus dudleyi</i>	Dudley's rush	Juncaceae	P-Grass	Nt	FACW			X
<i>Juncus tenuis</i>	Slender yard-rush	Juncaceae	P-Grass	Nt	FACW			
<i>Lobelia cardinalis</i>	Cardinal flower	Campanulaceae	P-Forb	Nt	OBL			X
<i>Lobelia siphilitica</i>	Great lobelia	Campanulaceae	P-Forb	Nt	FACW			X
<i>Lolium multiflorum</i>	Italian rye grass	Poaceae	A-Grass	Ad	FACU			X
<i>Lycopus americanus</i>	Water-horehound	Lamiaceae	P-Forb	Nt	OBL			
<i>Lysimachia ciliata</i>	Fringed loosestrife	Primulaceae	P-Forb	Nt	FACW			X
<i>Lythrum salicaria</i>	Purple loosestrife	Lythraceae	P-Forb	Ad	OBL			

Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
Mimulus ringens	Monkey flower	Lamiaceae	P-Forb	Nt	OBL			
Mollugo verticillata	Carpetweed	Molluginaceae	A-Forb	Ad	FAC			
Oenothera biennis	Common evening-primrose	Onagraceae	B-Forb	Nt	FACU			
Osmunda claytoniana	Interrupted fern	Osmundaceae	Cryptogam	Nt	FAC			
Panicum capillare	Witchgrass	Poaceae	A-Grass	Nt	FAC			X
Panicum virgatum	Switchgrass	Poaceae	P-Grass	Nt	FAC			
Parthenocissus inserta	Virginia creeper	Vitaceae	Vine	Nt	FACU			
Penthorum sedoides	Ditch-stonecrop	Crassulaceae	P-Forb	Nt	OBL			
Phytolacca americana	Pokeweed	Phytolaccaceae	P-Forb	Nt	FACU	-		X
Plantago rugelii	Pale plantain	Plantaginaceae	P-Forb	Nt	FAC			
Poa pratensis	Kentucky bluegrass	Poaceae	P-Grass	Ad	FACU			
Polygonum convolvulus	Black bindweed	Polygonaceae	A-Forb	Ad	FAC			
Polygonum pensylvanicum	Pinkweed	Polygonaceae	A-Forb	Nt	FACW			
Populus deltoides	Cottonwood	Salicaceae	Tree	Nt	FAC			
Potentilla norvegica	Rough cinquefoil	Rosaceae	P-Forb	Nt	FAC			X
Quercus macrocarpa	Common cinquefoil	Rosaceae	P-Forb	Nt	FACU			
Quercus velutina	Black oak	Fagaceae	Tree	Nt	UPL			X
Rubus idaeus strigosus	Red raspberry	Rosaceae	Shrub	Nt	FACU			
Rudbeckia hirta	Black-eyed Susan	Asteraceae	B-Forb	Nt	FACU			
Secale cereale	Rye	Poaceae	A-Grass	Ad	UPL			
Setaria faberi	Japanese bristle grass	Poaceae	A-Grass	Ad	FACU			
Sisyrinchium campestre	Prairie blue-eyed grass	Iridaceae	P-Forb	Nt	UPL			
Solanum nigrum	Black nightshade	Solanaceae	P-Forb	Nt	FACU			
Solidago altissima	Tall goldenrod	Asteraceae	P-Forb	Nt	FACU			
Solidago gigantea	Late goldenrod	Asteraceae	P-Forb	Nt	FACW			
Solidago graminifolia	Common grass-leaved goldenrod	Asteraceae	P-Forb	Nt	FACW			X
Trifolium arvense	Rabbit foot clover	Fabaceae	A-Forb	Ad	UPL			X
Trifolium repens	White clover	Fabaceae	P-Forb	Ad	FACU			
Verbascum thapsus	Mullein	Scrophulariaceae	B-Forb	Ad	UPL			
Verbena hastata	Blue vervain	Verbenaceae	P-Forb	Nt	FACW			
Verbena urticifolia	White vervain	Verbenaceae	P-Forb	Nt	FAC			X
Viola sororia	Woolly blue violet	Violaceae	P-Forb	Nt	FAC			
Vitis riparia	Riverbank grape	Vitaceae	Vine	Nt	FAC			

Categories		
Vascular Plant Families	36	
Non-Vascular Plant Families	0	
	No. Species	Percent
Total Species	74	100.0%
Native Species	54	73.0%
Adventive Species	20	27.0%
Unknown Species	0	0.0%
Largest Families Represented		
Aster Family (Asteraceae)	15	20.3%
Grass Family (Poaceae)	11	14.9%
Sedge Family (Cyperaceae)	3	4.1%
Mint Family (Lamiaceae)	3	4.1%
Rose Family (Rosaceae)	3	4.1%
Physiognomy		
Perennial Forbs (P-Forb)	30	40.5%
Annual Forbs (A-Forb)	11	14.9%
Biennial Forbs (B-Forbs)	5	6.8%
Forbs	0	0.0%
Perennial Grass (P-Grass)	7	9.5%
Annual Grass (A-Grass)	6	8.1%
Grasses	0	0.0%
Perennial Sedge (P-Sedge)	3	4.1%
Alga	0	0.0%
Cryptogams	2	2.7%
Trees	5	6.8%
Shrubs	1	1.4%
Vines	4	5.4%
Miscellaneous		
Nectar/Larval Food Plants	1	1.4%
Seeded/Planted Species	24	32.4%
Rare Plants	0	0.0%
Wetland Classification		
Upland (UPL)	10	13.5%
Facultative Upland (FACU)	23	31.1%
Faculative (FAC)	16	21.6%
Facultative Wetland (FACW)	14	18.9%
Obligate Wetland (OBL)	11	14.9%
Unknown Species	0	0.0%
Total Hydrophytic Species	41	55.4%

Rapp Road Landfill - PII, PIII Species Search
 Transect: R-5
 Date: August 4, 2013
 Samplers: Steve Apfelbaum

Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
<i>Acer rubrum</i>	Red maple	Aceraceae	Tree	Nt	FAC			
<i>Agropyron repens</i>	Quack grass	Poaceae	P-Grass	Ad				
<i>Ambrosia artemisiifolia</i>	Ragweed	Asteraceae	A-Forb	Nt	FACU			
<i>Apocynum cannabinum</i>	Indian hemp	Apocynaceae	P-Forb	Nt	FAC			X
<i>Aster ericoides</i>	White heath aster	Asteraceae	P-Forb	Nt	FACU			X
<i>Aster lanceolatus</i>	Old-field aster	Asteraceae	P-Forb	Nt	FACW			
<i>Aster lateriflorus</i>	Calico aster	Asteraceae	P-Forb	Nt	FAC			X
<i>Aster novae-angliae</i>	New England aster	Asteraceae	P-Forb	Nt	FACW			X
<i>Aster puniceus</i>	Purple-stemmed aster	Asteraceae	P-Forb	Nt	OBL			X
<i>Betula populifolia</i>	Gray birch	Betulaceae	Tree	Nt	FAC			
<i>Bidens comosa</i>	Swamp tickseed	Asteraceae	A-Forb	Nt	OBL			
<i>Bidens frondosa</i>	Beggar-ticks	Asteraceae	A-Forb	Nt	FACW			X
<i>Bromus japonicus</i>	Japanese chess	Poaceae	P-Grass	Ad	FACU			
<i>Carex bebbii</i>	Bebb's sedge	Cyperaceae	P-Sedge	Nt	OBL			
<i>Carex crinita</i>	Fringed sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Carex granularis</i>	Pale sedge	Cyperaceae	P-Sedge	Nt	FACW			
<i>Carex lupulina</i>	Hop sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Cirsium arvense</i>	Canada thistle	Asteraceae	P-Forb	Ad	FACU			
<i>Conyza canadensis</i>	Horseweed	Asteraceae	A-Forb	Nt	FACU			X
<i>Corylus americana</i>	American hazelnut	Betulaceae	Shrub	Nt	FACU			
<i>Cyperus esculentus</i>	Yellow nut-grass	Cyperaceae	P-Sedge	Nt	FACW			
<i>Desmodium canadense</i>	Giant tick clover	Fabaceae	P-Forb	Nt	FAC			X
<i>Diodea teres</i>	Poorjoe	Rubiaceae	A-Forb	Nt	FACU			X
<i>Echinochloa crusgalli</i>	Japanese millet	Poaceae	A-Grass	Ad	FAC			
<i>Equisetum arvense</i>	Field horsetail	Equisetaceae	Cryptogam	Nt	FAC			
<i>Eragrostis pectinacea</i>	Small love grass	Poaceae	A-Grass	Nt	FAC			
<i>Erigeron strigosus</i>	Daisy-fleabane	Asteraceae	A-Forb	Nt	FACU			
<i>Eupatorium perfoliatum</i>	Thoroughwort	Asteraceae	P-Forb	Nt	FACW			X
<i>Hypericum perforatum</i>	Common St. John's-wort	Clusiaceae	P-Forb	Ad	UPL			
<i>Hypericum punctatum</i>	St. John's-wort	Clusiaceae	P-Forb	Nt	FAC			
<i>Iris versicolor</i>	Blue flag	Iridaceae	P-Forb	Nt	OBL			
<i>Juglans nigra</i>	Black walnut	Juglandaceae	Tree	Nt	FACU			X
<i>Juncus dudleyi</i>	Dudley's rush	Juncaceae	P-Grass	Nt	FACW			X
<i>Juncus tenuis</i>	Slender yard-rush	Juncaceae	P-Grass	Nt	FACW			
<i>Lobelia cardinalis</i>	Cardinal flower	Campanulaceae	P-Forb	Nt	OBL			X
<i>Lobelia inflata</i>	Indian-tobacco	Campanulaceae	B-Forb	Nt	FACU			
<i>Lobelia siphilitica</i>	Great lobelia	Campanulaceae	P-Forb	Nt	FACW			X
<i>Lycopus americanus</i>	Water-horehound	Lamiaceae	P-Forb	Nt	OBL			
<i>Medicago lupulina</i>	Black medick	Fabaceae	P-Forb	Ad	FACU			
<i>Mentha arvensis</i>	Field mint	Lamiaceae	P-Forb	Ad	FACW			
<i>Mimulus ringens</i>	Monkey flower	Lamiaceae	P-Forb	Nt	OBL			

Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
Monarda punctata	Dotted horsemint	Lamiaceae	P-Forb	Nt	UPL			X
Oxalis stricta	Common wood-sorrel	Oxalidaceae	A-Forb	Nt	FACU			
Panicum virgatum	Switchgrass	Poaceae	P-Grass	Nt	FAC			
Penthorum sedoides	Ditch-stonecrop	Crassulaceae	P-Forb	Nt	OBL			
Physocarpus opulifolius	Ninebark	Rosaceae	Shrub	Nt	FACW	G5T5 SH E		
Plantago rugelii	Pale plantain	Plantaginaceae	P-Forb	Nt	FAC			
Potentilla norvegica	Rough cinquefoil	Rosaceae	P-Forb	Nt	FAC			X
Quercus macrocarpa	Burr oak	Fagaceae	Tree	Nt	FACU		X	X
Rubus idaeus strigosus	Red raspberry	Rosaceae	Shrub	Nt	FACU			
Scirpus atrovirens	Dark green bulrush	Cyperaceae	P-Sedge	Nt	OBL			
Scirpus cyperinus	Cottongrass bulrush	Cyperaceae	P-Sedge	Nt	OBL			X
Scirpus pendulous	Rufous bulrush	Cyperaceae	P-Sedge	Nt	OBL			X
Secale cereale	Rye	Poaceae	A-Grass	Ad	UPL			
Setaria faberi	Japanese bristle grass	Poaceae	A-Grass	Ad	FACU			
Solidago gigantea	Late goldenrod	Asteraceae	P-Forb	Nt	FACW			
Solidago graminifolia	Common grass-leaved goldenrod	Asteraceae	P-Forb	Nt	FACW			X
Solidago juncea	Early goldenrod	Asteraceae	P-Forb	Nt	UPL			X
Trifolium arvense	Rabbit foot clover	Fabaceae	A-Forb	Ad	UPL			X
Trifolium repens	White clover	Fabaceae	P-Forb	Ad	FACU			
Typha latifolia	Common cattail	Typhaceae	P-Forb	Nt	OBL			
Verbena hastata	Blue vervain	Verbenaceae	P-Forb	Nt	FACW			
Verbena urticifolia	White vervain	Verbenaceae	P-Forb	Nt	FAC			X
Vitis riparia	Riverbank grape	Vitaceae	Vine	Nt	FAC			

Categories		
Vascular Plant Families	23	
Non-Vascular Plant Families	0	
	No. Species	Percent
Total Species	64	100.0%
Native Species	53	82.8%
Adventive Species	11	17.2%
Unknown Species	0	0.0%
Largest Families Represented		
Aster Family (Asteraceae)	15	23.4%
Grass Family (Poaceae)	7	10.9%
Sedge Family (Cyperaceae)	8	12.5%
Mint Family (Lamiaceae)	4	6.3%
Pea Family (Fabaceae)	4	6.3%
Physiognomy		
Perennial Forbs (P-Forb)	29	45.3%
Annual Forbs (A-Forb)	8	12.5%
Biennial Forbs (B-Forbs)	1	1.6%
Forbs	0	0.0%
Perennial Grass (P-Grass)	5	7.8%
Annual Grass (A-Grass)	4	6.3%
Grasses	0	0.0%
Perennial Sedge (P-Sedge)	8	12.5%
Alga	0	0.0%
Cryptogams	1	1.6%
Trees	4	6.3%
Shrubs	3	4.7%
Vines	1	1.6%
Miscellaneous		
Nectar/Larval Food Plants	1	1.6%
Seeded/Planted Species	25	39.1%
Rare Plants	1	1.6%
Wetland Classification		
Upland (UPL)	5	7.8%
Facultative Upland (FACU)	16	25.0%
Faculative (FAC)	14	21.9%
Facultative Wetland (FACW)	14	21.9%
Obligate Wetland (OBL)	14	21.9%
Unknown Species	1	1.6%
Total Hydrophytic Species	42	65.6%

Rapp Road Landfill - PII, PIII Species Search
 Transect: R-6
 Date: August 4, 2013
 Samplers: Steve Apfelbaum

Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
<i>Acer rubrum</i>	Red maple	Aceraceae	Tree	Nt	FAC			
<i>Agalinis tenuifolius</i>	Gerardia	Scrophulariaceae	P-Forb	Nt	FACW			X
<i>Ambrosia artemisiifolia</i>	Ragweed	Asteraceae	A-Forb	Nt	FACU			
<i>Asclepias incarnata</i>	Swamp milkweed	Asclepiadaceae	P-Forb	Nt	OBL			X
<i>Betula populifolia</i>	Gray birch	Betulaceae	Tree	Nt	FAC			
<i>Bidens cernua</i>	Stick-tights	Asteraceae	A-Forb	Nt	OBL			X
<i>Bidens frondosa</i>	Beggar-ticks	Asteraceae	A-Forb	Nt	FACW			X
<i>Carex hystricina</i>	Porcupine sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Carex lupulina</i>	Hop sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Carex vulpinoidea</i>	Common fox sedge	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Cassia fasciculata</i>	Partridge pea	Fabaceae	A-Forb	Nt	FACU	Review List: G5 S3S4		
<i>Celastrus orbiculatus</i>	Oriental bittersweet	Celastraceae	Vine	Ad	UPL			
<i>Chelone glabra</i>	Turtle-heads	Scrophulariaceae	P-Forb	Nt	OBL			X
<i>Conyza canadensis</i>	Horseweed	Asteraceae	A-Forb	Nt	FACU			X
<i>Cornus amomum</i>	Silky dogwood	Cornaceae	Shrub	Nt	FACW			
<i>Cyperus esculentus</i>	Yellow nut-grass	Cyperaceae	P-Sedge	Nt	FACW			
<i>Daucus carota</i>	Queen-Anne's-lace	Apiaceae	B-Forb	Ad	UPL			
<i>Dianthus armeria</i>	Deptford pink	Caryophyllaceae	A-Forb	Ad	UPL			
<i>Digitaria sanguinalis</i>	Tall crabgrass	Poaceae	A-Grass	Ad	FACU			
<i>Echinochloa crusgalli</i>	Japanese millet	Poaceae	A-Grass	Ad	FAC			
<i>Echinochloa walteri</i>	Water millet	Poaceae	A-Grass	Nt	OBL			
<i>Eleocharis obtusa</i>	Blunt spike-rush	Cyperaceae	P-Sedge	Nt	OBL			X
<i>Equisetum arvense</i>	Field horsetail	Equisetaceae	Cryptogam	Nt	FAC			
<i>Eupatorium maculatum</i>	Spotted Joy-pye weed	Asteraceae	P-Forb	Nt	OBL			
<i>Eupatorium perfoliatum</i>	Thoroughwort	Asteraceae	P-Forb	Nt	FACW			X
<i>Glyceria striata</i>	Fowl mannagrass	Poaceae	P-Grass	Nt	OBL			X
<i>Hypericum punctatum</i>	St. John's-wort	Clusiaceae	P-Forb	Nt	FAC			
<i>Juncus dudleyi</i>	Dudley's rush	Juncaceae	P-Grass	Nt	FACW			X
<i>Juncus effusus</i>	Common rush	Juncaceae	P-Grass	Nt	OBL			X
<i>Juncus tenuis</i>	Slender yard-rush	Juncaceae	P-Grass	Nt	FACW			
<i>Juncus torreyi</i>	Torrey's rush	Juncaceae	P-Grass	Nt	FACW			X
<i>Lobelia inflata</i>	Indian-tobacco	Campanulaceae	B-Forb	Nt	FACU			
<i>Lycopus americanus</i>	Water-horehound	Lamiaceae	P-Forb	Nt	OBL			
<i>Lythrum salicaria</i>	Purple loosestrife	Lythraceae	P-Forb	Ad	OBL			
<i>Melilotus alba</i>	White sweet-clover	Fabaceae	B-Forb	Ad	FACU			
<i>Mimulus ringens</i>	Monkey flower	Lamiaceae	P-Forb	Nt	OBL			
<i>Oenothera biennis</i>	Common evening-primrose	Onagraceae	B-Forb	Nt	FACU			
<i>Osmunda cinnamomea</i>	Cinnamon fern	Osmundaceae	Cryptogam	Nt	FACW			X
<i>Populus deltoides</i>	Cottonwood	Salicaceae	Tree	Nt	FAC			
<i>Quercus macrocarpa</i>	Burr oak	Fagaceae	Tree	Nt	FACU		X	X
<i>Quercus velutina</i>	Black oak	Fagaceae	Tree	Nt	UPL			X

Scientific Name	Common Name	Family Classification	Physiognomy	Native/ Adventive	Wetland Classification	Rare Plants	Nectar/Larval Food Species	Seeded/Planted Species
Rhus typhina	Staghorn sumac	Anacardiaceae	Tree	Nt	UPL			
Rosa multiflora	Multiflora rose	Rosaceae	Shrub	Ad	FACU			
Rudbeckia hirta	Black-eyed Susan	Asteraceae	B-Forb	Nt	FACU			
Scirpus atrovirens	Dark green bulrush	Cyperaceae	P-Sedge	Nt	OBL			
Scirpus cyperinus	Cottongrass bulrush	Cyperaceae	P-Sedge	Nt	OBL			X
Scirpus pendulous	Rufous bulrush	Cyperaceae	P-Sedge	Nt	OBL			X
Secale cereale	Rye	Poaceae	A-Grass	Ad	UPL			
Setaria verticillata	Bristly foxtail	Poaceae	A-Grass	Ad	FACU			
Solidago gigantea	Late goldenrod	Asteraceae	P-Forb	Nt	FACW			
Solidago graminifolia	Common grass-leaved goldenrod	Asteraceae	P-Forb	Nt	FACW			X
Solidago juncea	Early goldenrod	Asteraceae	P-Forb	Nt	UPL			X
Solidago rugosa	Tall-hairy goldenrod	Asteraceae	P-Forb	Nt	FAC			
Trifolium arvense	Rabbit foot clover	Fabaceae	A-Forb	Ad	UPL			X
Trifolium hybridum	Alsike clover	Fabaceae	P-Forb	Ad	FACU			
Trifolium pratense	Red clover	Fabaceae	P-Forb	Ad	FACU			
Trifolium repens	White clover	Fabaceae	P-Forb	Ad	FACU			
Verbascum thapsus	Mullein	Scrophulariaceae	B-Forb	Ad	UPL			
Verbena hastata	Blue vervain	Verbenaceae	P-Forb	Nt	FACW			
Verbena urticifolia	White vervain	Verbenaceae	P-Forb	Nt	FAC			X
Viburnum prunifolium	Black haw	Caprifoliaceae	Shrub	Nt	FACU			
Vitis riparia	Riverbank grape	Vitaceae	Vine	Nt	FAC			

Categories		
Vascular Plant Families	27	
Non-Vascular Plant Families	0	
	No. Species	Percent
Total Species	62	100.0%
Native Species	47	75.8%
Adventive Species	15	24.2%
Unknown Species	0	0.0%
Largest Families Represented		
Aster Family (Asteraceae)	11	17.7%
Grass Family (Poaceae)	6	9.7%
Sedge Family (Cyperaceae)	8	12.9%
Rush Family (Juncaceae)	4	6.5%
Pea Family (Fabaceae)	6	9.7%
Physiognomy		
Perennial Forbs (P-Forb)	18	29.0%
Annual Forbs (A-Forb)	7	11.3%
Biennial Forbs (B-Forbs)	6	9.7%
Forbs	0	0.0%
Perennial Grass (P-Grass)	5	8.1%
Annual Grass (A-Grass)	5	8.1%
Grasses	0	0.0%
Perennial Sedge (P-Sedge)	8	12.9%
Alga	0	0.0%
Cryptogams	2	3.2%
Trees	6	9.7%
Shrubs	3	4.8%
Vines	2	3.2%
Miscellaneous		
Nectar/Larval Food Plants	1	1.6%
Seeded/Planted Species	24	38.7%
Rare Plants	1	1.6%
Wetland Classification		
Upland (UPL)	9	14.5%
Facultative Upland (FACU)	15	24.2%
Facultative (FAC)	9	14.5%
Facultative Wetland (FACW)	12	19.4%
Obligate Wetland (OBL)	17	27.4%
Unknown Species	0	0.0%
Total Hydrophytic Species	38	61.3%

Attachment 6. Phase II & III Woody Transect Data—Canopy Intercept

Transect DS-2

Albany Rapp Road Landfill
 Sampler: Larson, Greaves, Sankey
 8/4/2013

Species	Lines intercept on 100 m line	Total	Relative Intercept Cover
<i>Cornus racemosa</i>	19.65-20.0	0.35	26.7%
<i>Vitis riparia</i>	18.9-18.93; 19.36-20.4; 18.95-19.20	0.96	73.3%
TOTAL		1.31	100.0%

Transect E3

Albany Rapp Road Landfill
 Sampler: Larson, Price
 8/4/2013

Species	Lines intercept on 100 m line	Total	Relative Intercept Cover
<i>Hamamelis virginiana</i>	45.3-49; 59.1-65.6; .4	10.6	6.1%
<i>Carpinus caroliniana virginiana</i>	34.2-44.5; 50.3-71.9; 79.8-82.3	34.4	19.7%
<i>Lindera benzoin</i>	27.8-29.4; 32.3-35; 65.3-68.6; 71-73.5	10.1	5.8%
<i>Fraxinus pennsylvanica subintegerrima</i>	16.3-16.9; 17.7-17.1; 29-33.3; 65.6-77.8	17.2	9.8%
<i>Quercus rubra</i>	4-16, 19.2-25; 37.6-52.1	32.3	18.5%
<i>Prunus virginiana</i>	16.9-17.5; 18.6-18.7	0.7	0.4%
<i>Acer rubrum</i>	22.7-38; 50.2-61;	35.1	20.1%
<i>Prunus serotina</i>	36.7-40.6; 48.7-49.3; 51.4-51.5; 86.3-87.1; 89.6-89.9	5.7	3.3%
<i>Ulmus americana</i>	70.4-81.4	11	6.3%
<i>Quercus alba</i>	79.1-97	17.9	10.2%
TOTAL		175	100.0%

Transect E4

Albany Rapp Road Landfill
 Sampler: Einstein
 8/4/2013

Species	Lines intercept on 100 m line	Total	Relative Intercept Cover
<i>Acer rubrum</i>	62.5-63.26; 65.64-67.31; 70.4-73.1	5.13	41.9%
<i>Quercus coccinea</i>	64.6-65.76; 66.88-68.4	2.78	22.7%
<i>Populus tremuloides</i>	67.3-69.1	1.8	14.7%
<i>Quercus rubra</i>	68.4-74.0	1.6	13.1%
<i>Prunus serotina</i>	72.4-72.95; 82.85-83.22	0.92	7.5%
TOTAL		12.23	100.0%

Transect E6

Albany Rapp Road Landfill
 Sampler: Lehnardt, Lapointe
 8/4/2013

Species	Lines intercept on 100 m line	Total	Relative Intercept Cover
Fraxinus pennsylvanica subintegerrima	75.75-75.91; 80.11-80.27; 86.90-88.90	2.32	9.8%
Celastrus orbiculatus	76.37-76.45; 79.61-79.69	0.16	0.7%
Populus tremuloides	82.72-82.75; 83.0-88.1; 88.7-90.9	7.33	31.0%
Prunus serotina	86.7-89.7; 90.10-100	11.9	50.4%
Pinus rigida	98.10-100	1.9	8.0%
TOTAL		23.61	100.0%

Transect P2-2

Albany Rapp Road Landfill
 Sampler: Larson, Greaves
 8/3/2013

Species	Lines intercept on 100 m line	Total	Relative Intercept Cover
Betula populifolia	31.6-32.4	0.08	14.3%
Acer rubrum	23.5-28.3	0.48	85.7%
TOTAL		0.56	100.0%

Transect P2-4

Albany Rapp Road Landfill
 Sampler: Apfelbaum, Larson Frasier
 8/3/2013

Species	Lines intercept on 100 m line	Total	Relative Intercept Cover
Acer rubrum	14.9-14.93	0.03	4.6%
Betula populifolia	44.10-44.20	0.6	92.3%
Robinia pseudoacacia	46.65-46.70	0.05	7.7%
TOTAL		0.65	100.0%

Transect P2-9

Albany Rapp Road Landfill
 Sampler: Villord
 8/4/2013

Species	Lines intercept on 100 m line	Total	Relative Intercept Cover
Acer rubrum	29.83-29.9	0.16	100.0%
TOTAL		0.16	100.0%

Transect P3-1

Albany Rapp Road Landfill

Samplers: Einstein

8/4/2013

Species	Lines intercept on 100 m line	Total	Relative Intercept Cover
Populus tremuloides	0-1.53	1.53	5.1%
Quercus coccinea	11.85-12.5	0.65	2.2%
Quercus rubra	17.6-18.2; 20.0-35.2; 36.0-47.0	26.8	89.5%
Quercus alba	24.1-25.05	0.95	3.2%
TOTAL		29.93	100.0%

Transect R-4

Albany Rapp Road Landfill

Samplers: Apfelbaum, Larson, Frasier

8/3/2013

Species	Lines intercept on 100 m line	Total	Relative Intercept Cover
Acer rubrum	0-20.6; 20.6-24.4; 24.4-32.9	32.9	98.3%
Juglans nigra	0-0.56	0.56	1.7%
TOTAL		33.46	100.0%

Attachment 7. Phase II & III Woody Transect Data—Tree Diameter & Woody Stem Densities

Transect DS-2

Albany Rapp Road Landfill
 Samplers: Larson, Sankey, Greaves
 8/4/2013

Species	Segment					Total (cm)	Basal Area m ² /ha
Tree diameters (inches)	0-10	10-20	20-30	30-40	40-50		
						0	0
Shrub No.'s						Total Stems	Stems/ha
Quercus bicolor	1					1	200

Transect E3

Albany Rapp Road Landfill
 Samplers: Larson
 8/4/2013

Species	Segment						Total (cm)	Basal Area m ² /ha
Tree diameters (inches)	0-5	15-30	30-45	45-60	60-75	75-90		
Quercus rubra		1	1				5.08	0.20
Prunus serotina			1				2.54	0.05
Fraxinus pennsylvanica subintegerrima		2				1	7.62	0.46
Carpinus caroliniana virginiana				1	1		5.08	0.20
Shrub No.'s							Total Stems	Stems/ha
Hamamelis virginiana		6		1			7	700
Prunus virginiana		10					10	1000
Prunus serotina			1	1			2	200
Lindera benzoin					10		10	1000

Transect E4

Albany Rapp Road Landfill
 Samplers: Lehnhardt, LaPointe
 8/4/2013

Species	Segment					Total (cm)	Basal Area m ² /ha
Tree diameters	0-15	15-30	30-45	45-60	60-75		
Quercus coccinea					1	2.54	0.03
Populus tremuloides					1	2.54	0.03
Quercus rubra					1	2.54	0.03
Shrub No.'s						Total Stems	Stems/ha
Acer rubrum						14	1400
Populus tremuloides						2	200
Prunus serotina						1	100

Transect E6

Albany Rapp Road Landfill
 Samplers: Lehnardt, LaPointe
 8/4/2013

Species	Segment						Total (cm)	Basal Area m ² /ha	
Tree diameters	0-15	15-30	30-45	45-60	60-75	75-90	90-100		
Acer rubra			1					2.54	0.05
Prunus serotina						2		5.08	0.10
Pinus rigida							1	2.54	0.03
Shrub No.'s								Total Stems	Stems/ha
Populus tremuloides						2		2	200

Transect P2-1

Albany Rapp Road Landfill
 Samplers: Larson, Greaves, Sankey
 8/4/2013

Species	Segment					Total (cm)	Basal Area m ² /ha
Tree diameters (inches)	0-10	10-20	20-30	30-40	40-50		
						0	0
Shrub No.'s						Total Stems	Stems/ha
Acer rubra (dead)	1					1	200

Transect P2-3

Albany Rapp Road Landfill
 Samplers: Greaves, Larson
 8/3/2013

Species	Segment				Total (cm)	Basal Area m ² /ha
Tree diameters (inches)	30-35					
					0	0
Shrub No.'s					Total Stems	Stems/ha
Betula populifolia	1				1	200
						0

Transect P2-4

Albany Rapp Road Landfill
 Samplers: Apfelbaum, Larson, Frasier
 8/3/2013

Species	Segment				Total (cm)	Basal Area m ² /ha	
Tree diameters (inches)	0-10	10-20	20-30	30-40	40-50		
						0	
Shrub No.'s						Total Stems	Stems/ha
Acer rubra			1			1	200
Betula populifolia					3	3	600

Transect P2-7

Albany Rapp Road Landfill
 Samplers: Apfelbaum, Larson, Frasier
 8/20/2012

Species	Segment					Total (cm)	Basal Area m ² /ha
Tree diameters (inches)	0-10	10-20	20-30	30-40	40-50		
						0	0
Shrub No.'s						Total Stems	Stems/ha
Cornus stolonifera					22	22	4400

Transect P2-9

Albany Rapp Road Landfill
 Samplers: Villord, Lehnhardt
 8/4/2013

Species	Segment					Total (cm)	Basal Area m ² /ha
Tree diameters (inches)	0-10	10-20	20-30	30-40	40-50		
						0	0
Shrub No.'s						Total Stems	Stems/ha
Acer rubra			1			1	200

Transect P3-1

Albany Rapp Road Landfill
 Samplers: Einstein
 8/4/2013

Species	Segment					Total (cm)	Basal Area m ² /ha
Tree diameters	0-10	10-20	20-30	30-40	40-50		
Shrub No.'s						Total Stems	Stems/ha
Populus tremuloides	1					1	200
Quercus rubra	2	2	1			5	1000
Quercus alba			1			1	200

Transect R-4

Albany Rapp Road Landfill
 Samplers: Apfelbaum, Larson, Frasier
 8/3/2013

Species	Segment					Total (cm)	Basal Area m ² /ha
Tree diameters (inches)	0-10	10-20	20-30	30-40	40-50		
Acer rubra		1				2.54	0.05
Shrub No.'s						Total Stems	Stems/acre
Acer rubra			1			1	200
							0

Transect R-5

Albany Rapp Road Landfill

Samplers: Apfelbaum, Larson, Frasier

8/3/2013

Species	Segment					Total (cm)	Basal Area m²/ha
Tree diameters (inches)	0-10	10-20	20-30	30-40	40-50		
							0.00
Shrub No.'s						Total Stems	Stems/acre
Physocarpus opulifolius					5	5	1000

Attachment 5. Phase II & III Transect Photos



DS-1 0m NE



DS-1 50m NE



DS-1 100m SW



DS-2 0m NE



DS-2 50m NE



DS-2 100m SW



DS-3 0m ESE



DS-3 70m ESE



DS-3 100m WNW



E4 0m NE



E4 100m NE



E4 100m SW



E6 0m NE



E6 100m NE



E6 100m SW



P2-1 0m NE



P2-1 50m SW



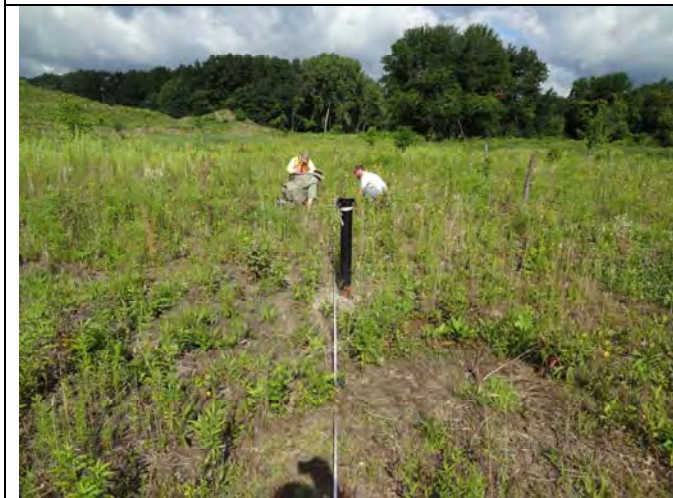
P2-2 0m SW



P2-2 50m NE



P2-3 0m ESE



P2-3 50m WNW



P2-4 0m SE



P2-4 50m NW



P2-5 0m SE



P2-5 50m NW



P2-6 0m SE



P2-6 50m NW



P2-7 0m WNW



P2-7 50m ESE



P2-8 0m SE



P2-8 50m NW



P2-9 0m SW



P2-9 50m NW



P3-1 0m NW



P3-1 0m SE



P3-1 50m NW



R4 0m NW



R-4 50m SE



R5 0m NW



R-5 50m SE



R6 0m S



R6 50m N



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Attachment J-2. 2012 Wildlife Surveys Report
Albany Rapp Road Landfill
Ecosystem Mitigation, Restoration & Enhancement Plan
City of Albany, New York

City of Albany Rapp Road Landfill Eastern Expansion

2013 Faunal Surveys Report

Albany Co., New York

Prepared for:

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November 8, 2013

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ATTACHMENTS

Attachment 1	Post Construction Faunal Monitoring Plan
Attachment 2	Survey Protocols
Attachment 3	Data Sheets
Attachment 4	Cumulative Lists of Species Documented Using the Study Area
Attachment 5	Site Photographs

1.0 INTRODUCTION

This report describes the results of the wildlife surveys that were conducted from March 12, 2013 to October 23, 2013 within the Albany Rapp Road Landfill Ecosystem Mitigation, Restoration & Enhancement Plan restoration areas. The purpose of these surveys is to monitor response of species to restoration activities in the area, document any additional species that may have self-relocated due to restoration activities, and provide continuous monitoring of existing/known populations. The Post Construction Faunal Monitoring Plan, provided as Attachment 1 of this document, identifies the study area as well as each transect and survey point location.

Wildlife surveys focused on state and federal threatened and endangered species, special concern species, and species of greatest conservation need that have the possibility to occur in the Pine Bush and surrounding lands. However, all species that were detected were recorded. The purpose of the 2013 wildlife surveys was to identify species use of the site during the second year of site development following the major grading and restoration activities.

2.0 METHODOLOGY

Survey protocols are described in Attachment 2. For some species there are mandated or recommended survey protocols (i.e. Karner blue butterfly (*Lycaeides melissa samuelis*), frosted elfin (*Callophrys irus*), American woodcock (*Scolopax minor*) and whip-poor-will (*Caprimulgus vociferus*)). Those protocols were used for those species. For species that do not have special protocols, standard survey practices specific to the targeted species were used. Survey protocols were previously reviewed and approved by the Albany Pine Bush Preserve Commission (APBPC) staff and the New York State (NYS) Department of Environmental Conservation (NYSDEC). Unless otherwise mandated by protocol, a minimum of two surveys were conducted during the appropriate timeframes and under appropriate weather conditions.

To cover all target species, separate surveys were conducted using either line transects, point/trap locations, or wandering passive searches. For diurnal moths and butterflies, as well as insect and passive herp (reptile and amphibian) surveys, ten transects were established across the entire restoration and expansion areas. Passive walking surveys were conducted along and adjacent to these transects. Surveys were conducted with one to several biologists spread out over the transect corridor to cover as much land area as possible.

Reptiles and amphibians (herps) were surveyed by conducting wandering passive searches and by using trapping arrays consisting of drift fence with pitfall traps and funnel traps. It should be noted that 10 of the 12 Trapping Arrays illustrated on the Post Construction Faunal Monitoring Plan (Attachment 1) were used in 2013. Trapping Arrays 7 and 8 were not used. Trapping Array 7 is in the location of a proposed access road and Trapping Array 8 is in an area that had to be re-graded/planted. Additionally, cover boards were placed in the vicinity of the arrays. These arrays have proven to be effective in capturing herps as well as small mammals and insects. All herps and mammals, as well as most insects that were captured were recorded.

Birds were surveyed based on breeding and migrating bird survey protocol. Fifteen survey point locations were established and surveys were conducted throughout the year to document breeding, resident and migratory bird usage. It should be noted that two additional survey points (B-16 and B-17) were informally added in the spring to cover habitats that were significantly altered during the 2012/2013 winter tree removal activities.

Incidental sightings of non-target survey species were recorded.

The 2013 surveys generally excluded areas under active construction where surveying might pose a danger to the biologists and would likely deter most wildlife from occurring.

3.0 SURVEY RESULTS

The following information presents the results of the surveys conducted in 2013. Data sheets are provided in Attachment 3.

3.1 DIURNAL INSECT SURVEYS

Passive insect surveys (insect and passive herp surveys) were conducted along transects throughout the restoration and expansion areas.

A total of 12 diurnal insect surveys were conducted between May 3, 2013 and October 23, 2013. In total, 108 insect species were documented during the 2013 diurnal surveys. One endangered butterfly, the Karner blue and one threatened butterfly, the frosted elfin, were observed on-site during their flight periods (described below in Section 3.2). A state-listed special concern species, the mottled duskywing (*Erynnis martialis*), was observed on May 3, 2013 in the nursery and July 25, 2013 in a sandy area with scattered sedges located between Trapping Arrays 1 and

2. This species is also listed as a Species of Greatest Conservation Need (SGCN) in New York State.

The most common species observed throughout all surveys from 2009-2013 is the cabbage white butterfly (*Pieris rapae*), which has been consistently documented in most of the habitats of the study area (excluding dense forest). A total of 215 insect species have been documented since surveys commenced in 2009.

A cumulative list of species observed since commencing surveys in 2009 is provided as Attachment 4. Photographs of some species observed during the 2013 surveys are provided as Attachment 5.

3.2 KARNER BLUE BUTTERFLY & FROSTED ELFIN SURVEYS

The timing of our 2013 Karner blue butterfly (KBB) and frosted elfin (FE) surveys was based on coordination with the APBPC. Surveys were commenced when the APBPC identified that KBB's and FE's were flying.

In addition to the project study area, known lupine patches located immediately adjacent to (west of) the project study area, within the Preserve, were also investigated. Historically this area has been documented as supporting a KBB population but no individuals have been observed in this area over the past several years. FE's have recently been documented as occupying these lupine patches.

Between the winter of 2012/2013 and the commencement (May 3, 2013) of the 2013 KBB/FE surveys, CHA and Applied Ecological Services (AES) biologists had been on-site numerous times for other wildlife surveys, construction monitoring, vegetation observations, etc. During those site visits, areas with lupine (*Lupinus perennis*) and nectar plants were observed, which helped to guide KBB and FE survey efforts. Lupine (planted, seeded and naturally regenerating) was observed growing throughout most of the upland portions of the restoration area and in the nursery in addition to the areas where it occurred prior to the restoration efforts. Nectaring plants were observed throughout all habitats of the site. With the exception of dense cover forested areas and habitats with standing water, all of the vegetated areas were included in the 2013 survey efforts for KBB and FE. The data CHA collected during their formal KBB and FE surveys was supplemented with the observations of AES biologists who were on-site almost daily throughout the 2013 survey period.

CHA conducted FE surveys on May 3, 10 and 20, 2013. On May 10, 2013 a single FE (Attachment 5 - Photos) was observed on a blue lupine plant located approximately 50 feet southwest of Trapping Array # 4. This sighting was in a restored dry prairie/sand flat habitat that contains many blue lupine and nectaring plants. This observation reflects the fact that high quality habitat is now present and it is attracting key species from the neighboring Pine Bush habitats.

First-brood KBB surveys were conducted on May 30, June 3, June 5 and June 14, 2013. After the June 14 survey CHA was informed by Mr. Gifford that the KBB flight was over so a fifth survey was not conducted. No KBB's or FE's were detected during those surveys. The four first-brood KBB/FE surveys consisted of 14.5 person hours total or an average of 3.63 person hours per survey. In addition, an AES biologist had a probable (but not confirmed) sighting of a KBB on June 4, 2013 in the restored pitch pine-scrub oak barrens habitat located immediately west of the northwest edge of the nursery.

According to Kathy O'Brien with the NYSDEC, the first emerged second brood KBB's in Wilton, NY were observed on or around July 3, 2013. According to Neil Gifford, the KBB second-brood flight period commenced in the Pine Bush on or around July 4, 2013. CHA conducted five second-brood surveys between July 8, 2013 and July 24, 2013. The five second-brood KBB surveys consisted of 25.0 person hours total or an average of 5.0 person hours per survey.

The following are observations of KBB during the 2013 field survey season within the newly restored portions of the project location:

July 10 - One male KBB was observed on a spotted beebalm (*Monarda punctata*) plant located west of the northwest edge of the nursery in a restored pitch pine-scrub oak barrens habitat. This is the same location as AES' June 4 probable KBB sighting. Additionally, another KBB (believed to be a male) was observed flying in a patch of Virginia mountainmint (*Pycnanthemum virginianum*) located near Trapping Array # 4 in a restored dry prairie/sand flat.

July 11 - An AES biologist observed a male KBB hovering around New Jersey tea (*Ceanothus americanus*) in an enhancement habitat located due east of Trapping Array # 1, midway between it and the created vernal pool.

July 12 - One male KBB was observed west of the nursery in the same location as the July 10 observation. Additionally, five KBB (four males and one female) were observed near Trapping Array # 4 in the restored dry prairie/sand flat. These were found in the same location where a KBB (believed to be male) was detected during the July 10 survey.

July 15 - One female KBB was observed near Trapping Array # 4 in the restored dry prairie/sand flat. This is the same location where KBBs were observed during the July 10 and 12 surveys.

July 24 - One female KBB was observed west of the nursery in the same location as the July 10 and 12 observations.

July 25 - One female KBB was observed in the restored dry prairie/sand flat habitat near TA 4. This butterfly was first observed on *Lupinus perennis* then it flew to *Pycnanthemum virginianum*.

Please refer to Attachment 3 for the data sheets and Attachment 5 for the photographs from the surveys referenced above.

The detection of FE and KBB's within the restoration area in the second year following restoration efforts is very promising. It shows that suitable habitats are present and are attracting these important species from nearby areas.

3.3 INLAND BARRENS BUCKMOTH SURVEYS

Surveys for inland barrens buckmoth (*Hemileuca maia maia*) were conducted on September 18, 19 and 25, 2013 and October 8, 2013. These surveys were commenced in response to notification from Neil Gifford that optimal conditions were present for buckmoth flight. No buckmoths were detected during these or other surveys conducted in 2013. Data sheets are provided in Attachment 3.

3.4 REPTILE AND AMPHIBIAN SURVEYS

Five trapping events and twenty-four formal passive surveys were conducted during 2013. No endangered or threatened reptile or amphibian species were identified. In total, 5 reptile and 11 amphibian species were detected during the 2013 surveys. Since the commencement of surveys in 2009, 7 reptile and 15 amphibian species have been detected on-site. Please refer to

Attachment 3 for data sheets that document the results of each survey and Attachment 4 for the cumulative list of species documented from 2009 to 2013.

Although no spotted turtles (*Clemmys guttata*) were observed during the 2013 surveys, Karl Parker (NYSDEC) has indicated they are known to use the created vernal pool and nearby habitats.

No eastern spadefoot toads (*Scaphiopus h. holbrookii*) were detected during the 2013 surveys. It should be noted that the on-site vernal pool where they were detected before was observed to have standing water after some of the major rainfall events during the 2013 spring and summer.

3.4.1 Systematic Trapping Surveys

The 2013 trapping events were conducted on March 11-12, April 7-12, June 10-14, August 26-30 and September 16-20. It should be noted that Trapping Array (TA) 7 has not yet been installed and TA 8 was not used during any of the 2013 trapping events. TA 8 was located in an area that had to be re-graded/planted in the spring of 2013. TA 12 was not used during the March trapping event because it was damaged/removed during the winter tree clearing activities. However this TA was installed after the March event and used for the remaining 2013 trapping events. TA's 7 and 8 will be installed in the spring of 2014 and incorporated into future trapping events.

The March 11-12 survey was conducted because the weather conditions at that time favored *Ambystoma* salamander migration. Following this event the weather conditions changed to unfavorable conditions for migration so the traps were deactivated.

No NYS-listed endangered, threatened or special concern herpetological species were captured during the 2013 trapping events.

NYS-listed special concern herpetological species captured during the 2013 trapping events include what appear to be pure Jefferson salamanders (*Ambystoma jeffersonianum*) and/or the polyploidy complex of Jefferson/blue-spotted salamanders (*Ambystoma laterale*). Some of these had features suggesting pure and others had features suggesting polyploid individuals. It should be noted that during the 2013 surveys, these species were only captured at TA's 1, 2 and 4 and under objects in the vicinity of those TA's but nowhere else throughout the restoration area.

During the September trapping event we had our first captured turtle, a neonate common snapping turtle (*Chelydra serpentina*). It should be noted that in September we also observed a roadkill neonate common snapping turtle on the road at the base of the landfill near the south end of Transect 5.

3.4.2 Passive (Visual Encounter and Cover Turning) Surveys

Passive surveys for reptiles and amphibians were conducted during most visits to the study area. Formal passive (visual encounter and cover turning) surveys were conducted during suitable weather and seasonal variables to target herpetofauna. A total of 24 formal passive herp surveys were conducted. Of these, 11 were conducted by one observer/field herpetologist. Therefore, spatial constraints were used to maximize search efficiency.

On May 2, 2013 during a time constrained search, what appeared to be two blue-spotted salamanders (NYS-listed special concern) were detected under cover objects on the edge of the property north of Trapping Array # 4. Blue-spotted salamander is a NYS-listed special concern species.

A predated snapping turtle nest was located on the sand stockpile near Rapp Road in the southern portion of the restoration area along with numerous predated painted turtle nests. An unpredated turtle nest was observed on the northwest side slope of the created vernal pool. Based on the size of the nest and claw marks it appears to be either a painted turtle (*Chrysemys picta*) or red-eared slider (*Trachemys scripta elegans*) nest (both species observed basking in the created vernal pool). A predated turtle nest was observed on the top of the sand dune in the vicinity of Trapping Array 9. Adult and juvenile snapping turtles were observed in the farm pond located near the south end of Transect 9.

Northern leopard frogs (*Lithobates pipiens*) were documented in relatively low numbers throughout the 2010-2012 studies. The increase in grassland habitat interspersed with aquatic features appears to be supporting a greater population of this frog because they were observed rather frequently during the 2013 surveys.

3.5 BIRD SURVEYS

The 2013 bird surveys were conducted using modified methods designed for quantification of richness and relative abundance of bird species (described in Attachment 2). In total, 4 breeding and 5 migrant passerine surveys were conducted.

Breeding bird surveys were conducted on June 12, 13, 25, & 26, 2013. The migrant bird surveys were conducted on May 3, August 27, August 28, September 18, and September 19, 2013. Behavior codes are standardized and, therefore, early breeding season activity was documented during point-count surveys in June. Surveys were aimed at documenting passerine species that use the area for breeding and migratory stopover purposes, but also noted any observed raptor, waterfowl or other non-passerine species. In addition to the point-count passerine surveys, all opportunistic observations of bird species while conducting other onsite activities were documented.

Due to observed off-site American woodcock activity in early April, American woodcock singing ground surveys were commenced. Surveys were conducted on April 4 and May 2, 2013. Two male American woodcocks were heard peenting on-site during the April 4 survey. These were located in the vicinity of Nocturnal Bird Survey Point # 1 and Trapping Array # 3. These observations indicate that American woodcock continues to breed on-site. American woodcocks were not detected during the May 2, 2013 survey.

Whip-poor-will surveys were conducted on May 20 and June 20, 2013. No whip-poor-wills were detected during the surveys.

A total of 132 bird species were documented within the study area during the 2013 study period. Two new bird species were observed onsite in 2013. Grassland bird species which were previously not observed onsite but documented this year include grasshopper sparrow (*Ammodrammus savannarum*). This is a direct response to the open-canopied, recently established portions of the restoration site which currently consist of numerous grasses and forbs, providing suitable structural habitat for this species. Savannah sparrow was detected again this year (*Passerculus sandwichensis*). Although it is likely that this species' presence onsite is temporary in nature (as the plant communities mature the suitability for this species will decrease), a male savannah sparrow was documented singing/maintaining a territory during the breeding bird survey. Breeding success was not confirmed. An Acadian flycatcher (*Empidonax virescens*) was observed on site as well in 2013 (also documented in 2011). This species typically does not breed this far north. It is likely that this animal traveled too far north during spring migration and left the site shortly thereafter. "Overshooting" breeding grounds in spring migration is a behavior which is well-documented in neotropical passerine of North America. Lastly, a pair of red-headed woodpeckers (*Melanerpes erythrocephalus*) was observed in a recently restored savannah habitat on site. This species has not been previously documented in

the Albany Pine Bush Preserve, making this the first documented occurrence of this species. Drawing many onlookers, the pair was observed occupying a cavity in a dead snag and the male was observed carrying food to the cavity, both highly suggestive of breeding behavior (in fact, the carrying food event is classified as “Confirmed Breeding” in the NYDEC Breeding Bird Codes). However, no fledgling red-headed woodpeckers were observed in the vicinity of the nest cavity. As resident (non-migratory) birds, this species should be observable caching food in dead snags this November if it intends to spend the winter here. Their presence onsite in 2013 is likely a direct function of onsite restoration activities (in this case, opening up the canopy layer by thinning trees, clearing understory, and leaving dead trees erect).

A total of 163 bird species have been documented using the study area since surveys were commenced in 2009. Please refer to Attachment 3 for data sheets that document the results of each survey and Attachment 4 for the cumulative list of species documented from 2009 to 2013.

No NYS-listed endangered birds were detected during the 2013 surveys.

One NYS-listed threatened bird species was detected using the study area during the year:

- bald eagle (*Haliaeetus leucocephalus*) (NYS-listed threatened) (perching/roosting, flyovers, migration).

Eight NYS-listed special concern bird species were detected using the study area during the 2013 surveys. These include:

- Cooper’s hawk (*Accipiter cooperii*) (probable breeder),
- common nighthawk (*Chordeiles minor*) (migration),
- sharp-shinned hawk (*Accipiter striatus*) (possible breeder),
- vesper sparrow (*Poecetes gramineus*) (migrant),
- red-shouldered hawk (*Buteo lineatus*) (migrant),
- red-headed woodpecker (*Melanerpes erythrocephalus*) (probable breeder),
- vesper sparrow (*Poecetes gramineus*) (migrant) and
- grasshopper sparrow (*Ammodramus savannarum*) (migrant).

Twenty-two bird Species of Greatest Conservation Need (SGCN) were documented using the study area during the 2013 surveys. These include:

- American woodcock (confirmed breeder),

- bald eagle (migration),
- bay-breasted warbler (*Setophaga castanea*) (migration),
- black-billed cuckoo (*Coccyzus erythrophthalmus*) (possible breeder),
- black-throated blue warbler (*Setophaga caerulescens*) (migration),
- brown thrasher (*Toxostoma rufum*) (migration),
- Cape May warbler (*Setophaga tigrina*) (migration),
- common nighthawk (migration),
- Cooper's hawk (probable breeder),
- grasshopper sparrow (migrant),
- greater yellowlegs (*Tringa melanoleuca*) (migration),
- laughing gull (*Larus atricilla*) (migration, over landfill),
- prairie warbler (*Setophaga discolor*) (migration),
- red-headed woodpecker (probable breeder),
- red-shouldered hawk (*Buteo lineatus*) (migration),
- scarlet tanager (*Piranga olivacea*) (probable breeder),
- sharp-shinned hawk (possible breeder),
- Tennessee warbler (*Oreothylpis peregrina*) (migration),
- vesper sparrow (migrant),
- willow flycatcher (*Empidonax traillii*) (possible breeder),
- wood thrush (*Hylocichla mustelina*) (probable breeder) and
- yellow-billed cuckoo (*Coccyzus americanus*) (possible breeder).

3.6 MAMMALS OBSERVED

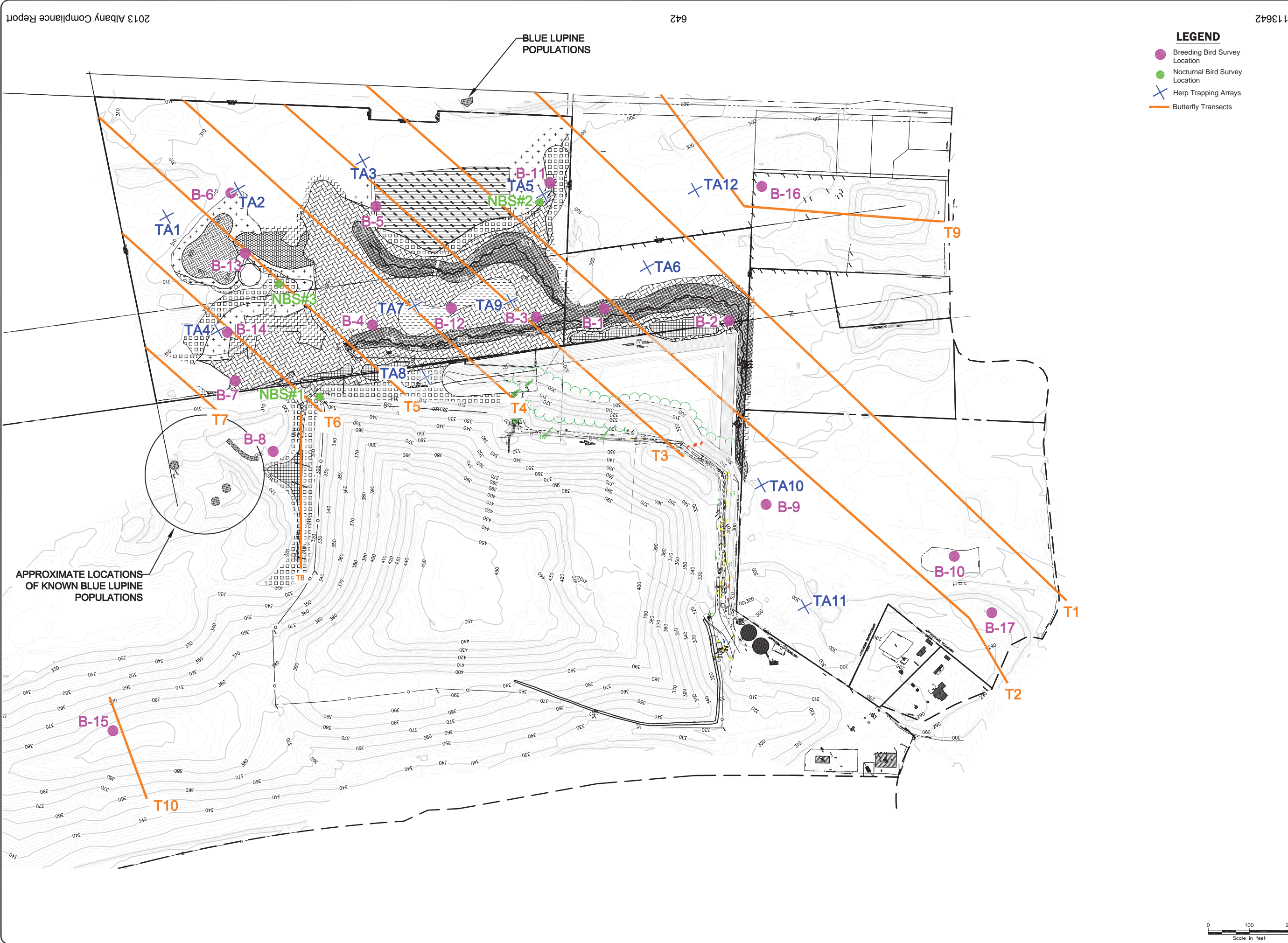
Surveys specific to mammals were not conducted. However many mammals were captured during the herp surveys, as well as detected by direct observations of the animal or by their tracks or other evidence. In 2011 and 2012 we collected mammals that expired in traps during trapping events and gave them to the New York State Museum. In 2013 some of the mammals that had expired in traps were collect for the Museum. However, when contacted to deliver the specimens the Museum representative indicated that they were no longer interested in the particular species we had collected. Therefore we disposed of the specimens.

A total of 21 mammal species were documented during the 2013 surveys. In total, 31 mammal species have been detected within the study area during the studies conducted between 2009 and 2013. The list of species is provided as Attachment 4.

No endangered, threatened or special concern mammals were identified during the 2013 wildlife surveys. One SGCN, eastern red bat (*Lasiurus borealis*), was documented during the 2012 surveys. Least shrew (*Cryptotis parva*), also a SGCN, was documented during the 2009 surveys.

Attachment 1

Post Construction Faunal Monitoring Plan



LEGEND

- Breeding Bird Survey Location
- Nocturnal Bird Survey Location
- X Herp Trapping Arrays
- Butterfly Transects

No.	Submitter / Revision	App'd. By	Date



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RAPP ROAD LANDFILL RESTORATION PLAN
 POST CONSTRUCTION FAUNAL MONITORING PLAN

Project No.: 211661 Scale: AS NOTED
 Issue Date: 03/26/13

GRAPHIC

Attachment 2

Survey Protocols

Attachment K. Ecological Monitoring Plan

Albany Rapp Road Landfill

Ecosystem Mitigation, Restoration & Enhancement Plan

City of Albany, New York

Introduction

Ecological monitoring of vegetation and wildlife will continue in spring 2013, encompassing the Phase I test plots; Phase II constructed wetlands, streams, and uplands; and Phase III enhancement areas. The monitoring protocols and methods that will be applied to both vegetation and faunal surveys are contained in Appendix 3 of the Monitoring Plan & Performance Criteria of the Albany Rapp Road Landfill Ecosystem Mitigation, Restoration & Enhancement Plan. Vegetation and faunal surveys conducted in 2006, 2009, 2010, and 2011 have established baseline and during-construction (faunal only) conditions. Data collected during the 2012 vegetation and faunal surveys represent the first year of post-construction results. These data will be combined with future data to assess restoration success and mitigation performance according to performance standards defined in the Appendix 3 Monitoring Plan & Performance Criteria.

The following faunal survey methods and scheduling used for the 2012 post-construction surveys will continue to be applied for specific Threatened & Endangered (T&E) Species. Attached map figures in this section include the Post Construction Faunal Monitoring Plan and the Phase II/III Vegetation Monitoring Map set as presented in the 2012 Compliance Report.

T&E Survey Methods

Survey methods will consist of a combination of Point Counts and Wandering Transects. Prior to the survey, transect routes and point count locations will be identified as appropriate for each species (see information provided in the Natural Resources Inventory Calendar with Survey Dates and Protocols at the end of this section).

In order to increase the efficiency of the survey efforts, surveys for more than one species can be conducted concurrently. For example, transects established for butterflies and dragonflies will occur within the same area as a bird survey point count. Additionally while one surveyor is conducting point counts the other may search cover objects for reptiles and amphibians. In order to obtain data during peak detection periods four surveys are proposed: late-May - early June, mid to late July, mid to late August and late September - early October.

Butterfly & Dragonfly Surveys

Modified transect counts using the Pollard Walk Method (1977) will be used to detect butterflies and dragonflies. Each survey transect will be located within areas where the presence of wild lupine or nectar plants are present and traverse a range of habitat deemed most representative of butterfly and dragonfly habitat.

Surveys will be conducted during optimal time and weather conditions listed below:

- Between 10 am and 5 pm
- Temperatures above 65° F
 - When temperatures are between 65-70°F, surveys should only be conducted under mostly sunny skies (< 50% cloud cover) with calm to light wind
- Do not conduct surveys under drizzly or rainy conditions or delay survey after heavy rain until the vegetation and butterflies have had a chance to dry out.

Observers will slowly walk in a zigzag pattern along each transect stopping frequently to scan the area for movement. Vegetation will be gently prodded using a butterfly net or meter stick. All butterflies, dragonflies and damselflies will be recorded.

If a potentially listed species is detected outside the established transect, observers will leave the transect and properly identify the species. If identification confirms a T&E or special concern (SC) species, observers will search the area for other individuals and mark the area using GPS before returning to the established transect.

Time spent on each transect will be recorded to the second. Time spent outside the transect will be subtracted from transect time.

Butterflies

Species identification will be made visually, using binoculars when needed. If it is required to capture a butterfly with a net for proper identification, care should be taken to release the insect unharmed. Individuals will be recorded only once. The sex of a butterfly should be recorded during the walk if it is obvious to the observer. Karner blue butterfly (*Lycæides melissa samuelis*) (KBB) nectar species should be noted when observed.

Dragonflies and Damselflies

If a dragonfly or damselfly is located and identification is difficult, the observer will attempt to capture the individual. Net dragonflies in flight by swinging nets at them from behind. When perched, approach them with very slow movements. Once in the net, remove the specimen by hand. If collecting the individual, place the specimen in a paper envelope with its wings held back together. Close the envelope with a paperclip and label it with the date and location.

Things to bring to the field:

Data form and pencil	GPS unit	Map
Clipboard	Hand lens	Field guides
Butterfly net	Camera	Wind & temperature meter
Specimen envelopes	Binoculars	
Storage for specimen containers (backpack, vest, etc.)		

(See survey form and reference USFWS monitoring protocols for Karner blue butterfly below)

Karner Blue Butterfly (*Lycaeides melissa samuelis*) Survey Protocols Within the State of New York

Prepared by:
U.S. Fish and Wildlife Service (Service), New York Field Office
New York State Department of Environmental Conservation (NYSDEC)
May 2008

The following protocols were developed to determine whether a given site has the potential to support Federally- and State-listed endangered Karner blue butterflies and if so, to determine whether Karner blue butterflies are present at the site. These protocols do not replace methods for the annual monitoring of known occupied sites. These recommendations are based on our current understanding of Karner blue butterflies and their habitat. In addition, the State-listed threatened frosted elfin (*Callophrys irus*) butterfly is also found in the same habitat as Karner blue butterflies and these protocols can be used for that species as well. Note that on Long Island some frosted elfin populations feed on Baptisia rather than lupine. Therefore, surveys for frosted elfin on Long Island should include both lupine and Baptisia habitats. Please contact the NYSDEC for further information regarding the frosted elfin.

Karner blue butterflies have generally been observed to conduct localized movements of approximately ≤ 200 meters (Service 2003). Therefore, the Service and NYSDEC define “occupied” habitat to include all lupine patches directly observed to be occupied by the butterflies, as well as all additional lupine (whether any of the butterflies were directly observed during surveys or not) within 200 meters of those patches. Therefore, all lupine within 200 meters of each other will be considered as one functioning patch. The definition of “occupied” habitat also may include suitable nectar plants (plants that provide nectar to small butterflies and that bloom during the first and/or second flight periods) and grassy areas (areas not regularly mowed during the growing season) that provide shelter for the butterflies within a lupine patch and extending 200 meters from the edge of a lupine patch. The NYSDEC and Service shall determine whether areas without lupine but containing nectar within 200 meters of occupied lupine are considered occupied.

There are four phases of the surveys:

- Conduct preliminary site assessment;
- Conduct lupine and nectar surveys;
- Monitor for butterfly presence; and
- Continue monitoring for relative butterfly abundance (optional but recommended).

We recommend site assessments be conducted for all project sites within and possibly outside portions of the Glacial Lake Albany Recovery Unit where Karner blue butterfly populations are known or likely to occur. This includes portions of Albany, Schenectady, Saratoga, and Warren Counties.

Site Assessments

Preliminary site assessments are needed to identify potential butterfly habitat and shall be conducted before the first butterfly survey to identify which portions of a given site should be surveyed for wild lupine, nectar plants, and the butterflies. These assessments involve conducting a general field

survey of the site and broadly mapping site features including ecological communities, improved areas, and infrastructure. The map should indicate areas to be excluded and areas to be included as potential butterfly survey areas.

Lupine is generally found in more open areas, however, plants can continue to survive for periods of time in more closed-canopy situations. Therefore, all areas with well-drained, predominantly sandy or other well-drained soils, should be surveyed, except for those listed below.

Areas to exclude from future surveys include:

- Active row-cropped agricultural lands;
- Paved developed areas (buildings, roads, etc.);
- Other non-sandy or poorly drained soil areas;
- Areas regularly mowed during the growing season (lawns); and
- Areas with >50% canopy cover (only if there are no openings, trails, or paths through such areas).

Habitat may exist directly adjacent to, or outside the footprint of the above-listed areas, and should be surveyed for lupine, nectar, and the butterflies.

Lupine and Nectar Surveys

Surveys for wild lupine may be conducted prior to surveying for butterflies, in conjunction with the site assessment, to expedite butterfly surveys or you may chose to initially survey for both wild lupine and the butterflies at the same time. An individual who is knowledgeable in the identification of lupine should conduct the surveys. We provide the following guidance on when to survey for lupine:

- In places where lupine flowers early (sunny areas), survey from late May to mid-June. In places where lupine flowers rarely, or not at all (usually more shaded areas), surveys should be conducted from late May through mid-July.

While lupine is essential for butterfly larvae, adult butterflies rely on a variety of plants as nectar sources, especially during the second flight period as lupine plants senesce. Potential nectar plants will provide nectar to small butterflies and bloom during the first and/or second flight periods. Please refer to Appendix C of the Karner Blue Butterfly Recovery Plan (Service 2003) for a list of potential nectar sources.

To adequately assess the site, both wild lupine and nectar areas should be mapped as accurately as possible. In addition, descriptions of the lupine patches (*e.g.*, estimated size and number of lupine stems within a patch) should be provided. Provide a list of the observed nectar plants and include descriptions on the map (*e.g.*, where vigorous, dense clusters of plants were observed, where nectar plants were scattered throughout, etc.).

Survey Methodology for Potential Karner Blue Butterfly Sites

The Karner blue butterfly has two broods and flight periods per year; the first flight normally begins in mid- to late May and ends in mid- to late June and the second flight normally begins in mid-July and ends in mid-August. However, the timing of the flight periods can vary by as much as 2-3 weeks from year to year and/or site to site due to weather and microclimatic influences. The length of the flight periods may also vary from year to year (generally 2-5 weeks). Since it cannot be known when the flight periods commence until field observers begin to report sightings of the butterflies, discussions with the Service/State are necessary prior to conducting surveys for either species to refine the survey window for any particular year.

Surveys shall be conducted by an individual knowledgeable in identification of the butterflies (see descriptions and photographs in the Recovery Plan for the Karner blue butterfly attached below). Identification photographs of butterflies can also be obtained from the State/Service.

Please note that scientific collector permits are required by the State for butterfly surveys. Please allow for adequate processing time to ensure that permits are in place prior to the first flight period.

Determining Butterfly Presence: Intensive Search Method

- Survey all potential habitat areas for the butterflies. This includes all lupine patches as well as nectar and grassy areas that may provide adult food and/or shelter for butterflies.
 - All of the lupine, nectar, and nearby grass habitat should be carefully searched by slowly walking over it, gently prodding vegetation with a butterfly net or meter stick, and/or stopping frequently and scanning the area for movement. The search should criss-cross all of the potential habitat area until the surveyor can be confident that all potential habitats have been searched. If more than five individuals are found, a zigzag transect may be done in later surveys to establish relative butterfly abundance (see Zigzag Transect Methods below).
- To determine butterfly presence, conduct a minimum of 5 surveys per Karner blue butterfly flight period with a total of 10 surveys needed to establish baseline conditions for the Karner blue butterfly (weather permitting) (call the State to confirm the start and finish of flight periods at nearby locations). Please Note: At least 2 of the surveys should be conducted during the last two weeks of May to overlap with the frosted elfin flight period. The remaining 3 first flight surveys must occur in early June (as stated above, coordinate with Service/State regarding survey windows).
- Conduct all 5 first flight period surveys until both species of butterfly are observed (or all surveys complete).
- If neither species is observed during the first flight, continue with second flight surveys until Karner blue butterflies are observed (or all 5 second flight surveys are complete).

- We recommend conducting all 10 surveys, even if butterfly presence is documented during an earlier survey, to document the use of nectar areas and get the best possible peak count of butterflies within each flight period. This will assist the Service/State with determining an initial index count of butterflies within the site, which can be monitored over time to determine the effects of the proposed management actions.
- Visits should be spaced every 2-5 days.
- Conduct surveys during optimal time and weather conditions as listed below:
 - between 8:00 a.m. and 6:00 p.m.
 - when temperatures are 65-95°F
 - when temperatures are between 65-70°F, surveys should only be conducted under mostly sunny skies with calm to light wind
 - when temperatures are above 70°F, no restrictions on cloud cover
 - when eye-level winds are less than 20 mph
- Additional weather notes:
 - do not survey under drizzly or rainy conditions; however, surveys can continue through very light rain if the sun is shining and the temperature is 75°F or higher. Please Note: No more than 1 site visit per flight period should occur under these conditions.
 - delay surveying after heavy rain until the vegetation and the butterflies have had a chance to dry
 - if suboptimal weather conditions continue for extended periods, contact the Service/State for guidance.
- Time Keeping
 - Record the duration of each survey. For sites with more than one transect, record duration of each transect and provide a total time (and total butterflies) as a separate data sheet entry. Duration must be recorded to the second. Do not round off minutes! Record time of day in military time. Record the time of day you visit the site even if you use a stopwatch to time the duration. If you are not using a stopwatch, record your start time and end times in military time and include the second (*e.g.*, 1417:00 - 1418:23). It helps to start at 00 seconds or 30 seconds to make it easier to subtract out later. Include duration of search even for zigzag and exhaustive searches.

Determining Relative Butterfly Abundance at Occupied Sites: Zigzag Transects Method

- Establishing Transects
 - As reported in McCabe (1993), zigzag transects should be designed to cover each site. Transects should remain constant from day to day and for both broods. If monitoring longer term, transects should also remain constant from year to year so that data can be accurately compared through time. If the transect needs to be expanded (i.e., due to expansion of lupine population), it should be segmented so that data collected from the original transect can continue to be compared to that of previous years.
 - The distance between zigzags shall be sufficient to avoid counting an individual butterfly more than once. The distance between zigzags can be increased in areas where high butterfly densities would have resulted in many butterflies being counted more than once.
 - If the zigzag method is employed and surveys do not pick up butterflies regularly, abundance cannot be determined using this method (consult with State).
- Standard Methods
 - Observers walk at a comfortable pace gently swinging a butterfly net above the vegetation to stir the butterflies into motion. All butterflies seen, both at rest and in flight, are counted and their numbers recorded on a data sheet. Butterflies that fly into areas not yet walked are to be counted only if they fly no further than one zigzag ahead. Butterflies which fly farther than one zigzag ahead are left to be counted later in the walk-through (McCabe 1993). Butterflies that fly out of the census area are counted.
 - The sex of a butterfly should be recorded during the walk if it is obvious to the observer (i.e., a butterfly sitting in the path of the observer with its wings open). However, sexing butterflies during the transect walk should be done judiciously so as not to change the length of time necessary to walk the site or introduce inaccuracies caused by losing track of counted butterflies. A separate walk-through should be conducted in order to determine the sex ratio of the butterflies.
 - After completing the transect walk and sex ratio determination, Karner blue butterfly nectar species should be noted and the number of butterflies observed to be nectaring recorded. Other plants in bloom and weather notes should also be recorded on the data sheet.
 - Follow weather and time protocols listed above.
 - Marked transects may be along a continuous line or in zigzags, as long as they cover the entire potential habitat on a site.
 - Keep eyes forward a short distance ahead but regularly glance toward your feet and about 10 feet ahead. This will help you to stay on the transect and avoid trampling too much lupine. Also sometimes the butterflies will not fly up as you step over them.

- Keep walking at a steady pace, about one heart beat per step. Avoid the tendency to slow down as you get into a lot of butterflies and speed up when there is not much lupine. If you wander off the transect route by more than a few feet, start over again. Do not try to slow down or speed up to keep your time exactly the same, but practice your pace to try to keep it steady enough that you are doing the transect within 10-15 seconds of the same duration each time.
- **NOTE: CENSUS NUMBERS SHOULD NOT BE INTERPRETED AS THE ABSOLUTE NUMBER OF KARNER BLUE BUTTERFLIES IN A GIVEN SUB-POPULATION. RATHER, THEY REPRESENT AN INDEX FOR THE SIZE OF AN INDIVIDUAL SUB-POPULATION THAT CAN BE COMPARED FROM YEAR TO YEAR. ONLY IN INSTANCES WHERE THE SUB-POPULATION IS QUITE SMALL AND CONFINED TO A WELL-DEFINED AREA THAT CAN BE CENSUSED THOROUGHLY DO CENSUS NUMBERS APPROACH THE ABSOLUTE NUMBER OF KARNER BLUES IN A GIVEN SUB-POPULATION AT A GIVEN DAY.**
- Zigzag surveys (for sites too small to effectively monitor with marked transects)
 - Monitors should strive to walk the same areas each time, but essentially should cover the entire habitat without counting butterflies twice. The zigzag surveys for unmarked transects should be done as described above for marked transects.

Similar Species

- Karner blue butterfly
 - There are two blue butterflies similar in appearance to Karner blue butterfly that may be present in Karner blue butterfly sites during both adult flights: the eastern tailed blue (*Everes comyntas*) and spring azure (*Celastrina ladon*). (See photographs provided below)
 - Eastern tailed males are blue on the upper side of the wings like male Karner blues, but have small orange dots at the bottom of the upper side of the hind wing. Female eastern tailed blues are similar to female Karner blues except that the orange on the upper side of the hind wing is limited to a few small dots instead of the row of orange crescents along the entire edge of the hindwing. In both sexes, the underside of the wings looks similar to Karner blues except the Karner blue has a row of orange crescents that line the entire edge of the hindwing and sometimes part of the forewing. Eastern tailed blues have only 2 or 3 small orange dots at the bottom of the hindwing. The Eastern tailed blue has small slender projections or “tails” at the bottom of the hindwing, but these may be difficult to see or broken off.
 - Both sexes of spring azures are blue on the upper side of the wings, but have a larger blue margin, especially the females. The underside of the wings has no orange dots or crescents. Spring azures are very likely to fly high up and fly off into tree canopies while Karner blues will do so very infrequently. This behavior is not enough to confirm identification, however.

- The wing markings are extremely difficult to see while the animals are in flight. At sites where Karner blue butterfly presence is not documented or where numbers are known to be very low, blue butterflies must be closely observed for field markings when perched or else captured in nets and seen through the net or placed in a clear jar for confirmation. An unknown blue butterfly should not be recorded as a Karner blue unless it is confirmed. However, a blue butterfly that was not identified should be noted in the field data sheet.
- Frosted elfin butterfly
 - Frosted elfins can easily be confused with both the Hoary elfin (*Incisalia polios*) and Henry's elfin (*I. henrici*). Frosted elfins are brown butterflies, 1" to 1-1/4" in size. They can be identified by a black spot above a short tail stump on the hindwing. They are named for the gray "frosting" on the hindwing.



Frosted elfin butterfly – ventral surface
www.google.com/images



Female



Male

Karner blue butterfly – dorsal view (K. Breisch)



Eastern tailed blue
ventral surface
(www.google.com/images)



Spring azure
ventral surface
(www.google.com/images)



Karner blue butterfly
ventral view
(K. Breisch)

References Cited:

McCabe, T. 1993. Albany Pine Bush Project 1991-1992 entomological report. Report to The Nature Conservancy.

U.S. Fish and Wildlife Service. 2003. Final Recovery Plan for the Karner Blue Butterfly (*Lycaeides melissa samuelis*). U.S. Fish and Wildlife Service, Fort Snelling, Minnesota. 273 pp.

Williams, E. March 5, 2007. Electronic mail to R. Niver.

Bird Surveys

Breeding birds will be sampled as a measure of wildlife habitat quality. Bird surveys were conducted during the baseline year (2007) and again in 2009 and each year since. These surveys will continue through the monitoring and maintenance period for the restored communities. Richness (number of species of birds), breeding bird density (number of breeding pairs by species) and spatial and habitat-use affinities (mapped locations of bird use relative to habitat types) are the avian variables that will be measured. Sampling will be conducted during the period late May through late June during the breeding season. An additional sampling of bird species will occur in spring and fall/winter for detecting migratory species. Sampling points will be spatially correlated or may coincide with transect end points and habitat types.

Representative study locations have been identified throughout the Property based on the complexity, patchiness, and types of avian habitat present. The study points are spaced sufficiently to ensure independence of data from other study points. Study points are illustrated on the Post Construction Faunal Monitoring Plan.

Avian surveys will use modified methods¹ designed for quantification of richness and relative abundance of bird species. At each study point birds will be surveyed daily at dawn through mid-morning over four consecutive days during summer breeding under suitable meteorological conditions. Arrival at each study point will be followed by one-to-two minutes of acclimation while data sheets are being labeled as to time, date, surveyor, study point number, and survey identification. During timed surveys (using stopwatch) the bird species heard or observed each minute will be recorded and locations mapped. Surveys will be continued until no additional species are recorded at each study point, often requiring 15-20 minutes of total survey time. Only after at least four consecutive minutes with no new-recorded species are surveys complete at each point and the survey is terminated. The modification of the Reynolds et al. (Ibid.) method is similar to the Goff's proposal for surveying plants. Additional listings of birds observed or heard in the property but not at study points will be noted while moving between study points. Identification and nomenclature for birds follows Robbins² and the American Ornithological Union³.

A raw field data sheet will be entered into a database to create a list of birds as well as summary and analysis. The study will determine the breeding status of species identified during the surveys. Avian breeding status on the site will follow the criteria adopted by the New York State Department of Environmental Conservation (NYSDEC) Breeding Bird Atlas Behavioral Codes⁴. The behavior categories and breeding listed in the table below will be used in the study.

(See data form below)

¹ Reynolds, R. T., J. M. Scott and R. A. Nussbaum. 1980. A variable circular-plot method for estimating bird numbers. *Condor* 82:309-313.

² Robbins, C. S., B. Bruun, and H. S. Zim. 1966. *Birds of North America*. Golden Press, Western Publishing Company, Racine, WI. 340 pp.

³ American Ornithologists' Union. 1983. *Check-list of North American Birds*. 7th edition. American Ornithologists' Union, Washington, D.C. (and associated supplements)

⁴ New York State Department of Environmental Conservation (NYSDEC) Breeding Bird Atlas Behavioral Codes (<http://www.dec.ny.gov/animals/7308.html>)

Breeding Behavior Categories and Breeding Codes

Breeding Behavior	Breeding Code	Description
Possible Breeding (PO)	X	Species observed in possible nesting habitat, but no other indication of breeding noted; singing male(s) present (or breeding calls heard) in breeding season.
Probable Breeding (PR)	S	Singing male present (or breeding calls heard).
	P	Pair observed in suitable habitat in breeding season.
	T	Bird (or pair) apparently holding territory. In addition to territorial singing, chasing of other individuals of same species often marks a territory.
	D	Courtship and display, agitated behavior or anxiety calls from adults suggesting probable presence nearby of a nest or young; well-developed brood-patch or cloacal protuberance on trapped adult. Includes copulation.
	N	Visiting probable nest site. Nest building by wrens and woodpeckers. Wrens may build many nests. Woodpeckers, although they usually drill only one nest cavity, also drill holes just for roosting.
	B	Nest building or excavation of a nest hole.
Confirmed Breeding (CO)	DD	Distraction display or injury-feigning. Agitated behavior and/or anxiety calls are Probable-D.
	UN	Used nest found. Caution: These must be carefully identified if they are to be counted as evidence. Some nests (e.g. Baltimore Oriole) are persistent and very characteristic. Most are difficult to identify correctly.
	FE	Female with egg in the oviduct (by bird bander).
	FL	Recently fledged young (including downy young of precocious species – waterfowl, shorebirds). This code should be used with caution for species such as blackbirds and swallows, which may move some distance soon after fledging. Recently fledged passerines are still dependent on their parents and are fed by them.
	ON	Adults(s) entering or leaving nest site in circumstances indicating occupied nest. NOT generally used for open nesting birds. It should be used for hole nesters only when a bird enters a hole and remains inside, makes a change-over at a hole, or leaves a hole after having been inside for some time. If you simply see a bird fly into or out of a bush or tree, and do not find nest, the correct code would be Probable-N.
	FS	Adult carrying fecal sac.
	FY	Adult(s) with food for young. Some birds (gulls, terns, and raptors) continue to feed their young long after they are fledged, and even after they have moved considerable distances. Also, some birds (e.g. terns) may carry food over long distances to their young in a neighboring block. Be especially careful on the edge of a block. Care should be taken to avoid confusion with courtship feeding (Probable-D).
	NE	Identifiable nest and eggs, bird setting on nest or egg. Identifiable eggshells found beneath nest, or identifiable dead nestling(s). If you find a cowbird egg in a nest, it is NE for Cowbird, and NE for the identified nest's owner.
NY	Nest with young. If you find a young cowbird with other young, it is NY for cowbird and NY for identified nest owner.	

PASSERINE - Bird Point Count Data Sheet

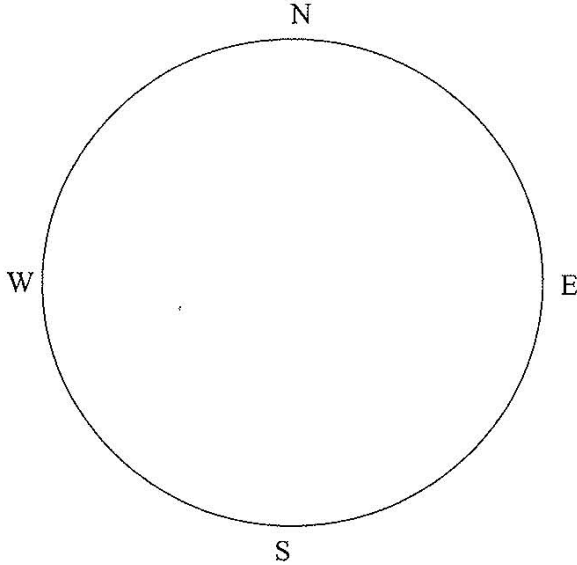
Project Name _____ Sample Point ID # & Name _____

Date _____ Start Time _____ Stop Time _____ X coordinate, Y coordinate _____

Observer _____ Wind Spd. _____ Wind Dir. _____ Sky _____ Temp _____

Dominant (>50%) AES Habitat Type _____

Other Habitats _____



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes:

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes

American woodcock surveys

Singing-ground surveys will be conducted according to *Protocol: Locating Woodcock Singing Ground Survey Routes* and Cooper, T.R., and K. Parker 2009⁵ with the exception of a modified route. We have identified three listening point locations spaced far apart enough to cover the entire study area. These survey point locations are identified on the Post Construction Wildlife Surveys Map as Nocturnal Bird Survey Locations. Two surveys will be conducted between April 25 and May 10 according to the preferred environmental conditions and seasonal and daily timing outlined in those documents. Observers will arrive to the site at or shortly after sunset. Observers will listen for two minutes at each point and will also record all birds heard as they walk and use the listening stops as reference points. Number of woodcocks heard peenting will be recorded and their approximate locations will be documented. Surveys will last no longer than 36 minutes. These surveys will only be used to document presence and approximate abundance. Population trends will not be evaluated.

(See data form below)

⁵ Cooper, T. R., and K. Parker. 2009. American woodcock population status, 2009. U.S. Fish and Wildlife Service, Laurel, Maryland. 15 pp.

WOODCOCK SINGING GROUND SURVEY DATA SHEET

Location: _____

Observer: _____ Date: _____

Route No: _____ Route Name: _____

Official Sunset: _____ + 22 or 15 = Starting time: _____ End Time: _____

Circle at start:

Cloud Conditions: Clear 25% Overcast 50% Overcast 75% Overcast >75% Overcast

Precipitation: None Mist Snow Light Rain Moderate Rain Heavy Rain Fog

Temperature (F°): <40 >40

Fill in for each stop:

Wind: Calm Gentle Light Moderate Strong **Noise Disturbance:** NO LO MOD HI

Stop No:	Odometer	Wind	Noise Disturbance	# Males Peenting	Flights	Other:	Description of Courting Area
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
SUM							

(1) Make sure to conduct survey at proper time of day according to sky conditions

Starting Time: <75% overcast = 22 Minutes after sunset

>75% overcast = 15 Minutes after sunset

(2) Entire survey should be completed within 36 minutes

(3) Stops are at designated survey point locations; listen for exactly 2 minutes at each stop.

(4) Do not conduct survey if temperature is below 40° F (5° C), in strong wind, or in heavy precipitation.

--If possible, please designate type of clearing that is used by courting woodcock (i.e. Field, Clear-cut, Strip cut, Natural Opening, Log landing, etc.)

--Count only the number of different woodcock heard peenting at a stop.

--Record birds heard flying but not peenting in column for "Flights".

Optional: Record Owls, whip poor wills, and any other night signing birds in the "Other" column.

Whip-poor-will surveys

Surveys will be conducted according to the methodologies identified in *A Proposed Survey Methodology for Monitoring Nightjars (Caprimulgidae, Caprimulgus) in Eastern North America*⁶ with the exception that we are not able to space survey points more than one mile apart to minimize the risk of double-counting individuals. Three survey point locations were located at distances sufficient to cover all areas of disturbance while trying to limit potential double-counting of individuals. Two surveys will be conducted between May 15 and June 30. Surveys will commence during the period of maximum lunar illumination ($\geq 50\%$) when the moon is not obscured by cloud cover ($<25\%$) or the horizon. Surveys will begin after the sun has set completely. There will be double-observer point counts consisting of three two-minute periods at each survey point location. At each point, two observers will independently record individual birds as detected in each interval, with a new line for each bird. The resulting data sheet will look something like this (taken directly but modified from above cited source):

(See data form below)

⁶ Pamela D. Hunt. A proposed Survey Methodology for Monitoring Nightjars (Caprimulgidae, *Caprimulgus*) in Eastern North America. Audubon Society of New Hampshire.

WHIP-POOR-WILL SURVEY DATA SHEET

Location: _____

Observer: _____ **Date:** _____

Official Sunset: _____ **Starting time:** _____ **End Time:** _____

Circle at start:

Cloud Conditions: **Clear 25% Overcast 50% Overcast 75% Overcast >75% Overcast**

Precipitation: **None Mist Snow Light Rain Moderate Rain Heavy Rain Fog**

Temperature (F°):

Fill in for each stop:

Wind: **Calm Gentle Light Moderate Strong** **Noise Disturbance:** **NO LO MOD HI**

Point	Species	Time Period			Notes
		1-2	3-4	5-6	
1					
2					
3					

Notes: _____

Reptile and Amphibian Surveys

Systematic Sampling:

Systematic sampling will occur only in areas proposed for habitat displacement (i.e. the expansion area) and other areas proposed for land disturbance/grading (i.e. select portions of the restoration area). Refer to the Post Construction Faunal Monitoring Plan for the locations of the herp systematic trapping arrays.

In these areas, two systematic sampling techniques will be used to sample for herps:

1. Wooden cover boards were placed on the ground in various areas and will be checked throughout the survey periods (locations are not illustrated on the map). Cover boards consist of flat-edged rough cut lumber and scrap wood of varying dimensions.
2. Trapping arrays are composed of drift fencing (silt fencing), metal snake funnel traps and pitfall traps (5 gallon buckets) established in key areas upslope of aquatic habitats with the intent of capturing herps as they migrate to and from potential breeding, nesting or foraging areas. Timing of the trapping events will be conducted during two distinct timeframes. The first is early spring to target Ambystomatid salamanders (1 trapping week – triggered when ice begins to melt on pooled areas) and a little later in spring when frog calling/breeding activity has begun (1 trapping week). The second will be during late spring/early summer to target species such as the hognose snake (*Heterodon platirhinos*) and eastern spadefoot toad (*Scaphiopus holbrookii*) (2 separate trapping weeks proposed – 1 during dry weather and 1 during major rainfall events >45 degrees Fahrenheit between March and August). Trapping arrays will be functional for 1 week (5 day) intervals with no more than 4 trapping weeks (20 days) proposed.

It is likely that other animals such as small mammals will be captured in the trapping arrays. The trapping arrays will be checked once daily before noon. All species captured will be identified, documented and released.

At each sampling station, time, air temperature, water temperature, weather, wind conditions, and investigator initials will be recorded. At the end of each trapping session, all traps will be closed or removed to prevent accidental trapping or death of animals.

Passive Searches

Passive surveys for reptiles and amphibians will occur on established butterfly and dragonfly transects. Observers will constantly scan the areas they are traversing for any visible herps. Any potential cover object such as rocks, logs and debris will be turned over and searched. If the cover object is too large to lift or search under, a GPS location will be taken to document the site for future reference. If the object is to be disturbed during construction, staff biologists will be on hand to search under the object at this time. Visual and audio observations will be recorded. Stage of development will be noted. Individuals will only be recorded once.

Call surveys will be conducted for eastern spadefoot toads during and after major rainfall events >45 degrees Fahrenheit between March and August. These passive surveys will consist of listening for calling toads and looking for them in the vicinity of pooled areas. A spotlight or powerful flashlight may be used to look for eye reflections.

If proper identification cannot be made, a photograph of the species will be collected for future identification.

Things to bring to the field:

Data form and pencil

Clipboard

Binoculars

GPS unit

Field guides

Map

Camera

Survey Data Form

Site Name: Albany Landfill

Transect ID No. _____

Date: _____

Observer(s): _____

Start Time: _____

End Time: _____

Weather:

Start Temp.: _____ End Temp.: _____ %Cloud cover: _____

Start Wind: _____ End Wind: _____

Time	Species	Sex*	Notes

* if can be determined

NATURAL RESOURCES INVENTORY CALENDAR WITH SURVEY DATES AND PROTOCOL

Rapp Road Landfill Eastern Expansion

FEB - JUNE

Rare Species	Recommended Survey Dates	Recommended Time of Day	Habitat	Special Considerations	Required Survey Protocol	Proposed Survey Techniques
Jefferson salamander <i>Ambystoma jeffersonianum</i>	Early spring (Feb-April)	Check traps 1x/day before noon. Early season night surveys for migration to woodland pools.	Vernal woodland pools, under cover objects & underground.	Very early season while snow is still on the ground but pooled areas are starting to melt.	NA	Systematic sampling and passive searches.
Blue-spotted salamander <i>Ambystoma laterale</i>	Early spring (Feb-April)	Check traps 1x/day before noon. Early season night surveys for migration to woodland pools.	Vernal woodland pools, under cover objects & underground.	Very early season while snow is still on the ground but pooled areas are starting to melt.	NA	Systematic sampling and passive searches.
Henry's Elfin <i>Callophrys henrici</i>	Most of May with a few stragglers into June	10 a.m to 5 p.m.	Pine-oak barrens	Redbud, blueberries, viburnum host plants	NA	Pollard-Yates. Butterfly net w/ wandering pattern
Frosted Elfin <i>Callophyrus irus</i>	mid April through early June	between 8 a.m. & 6 p.m. - Refer to May 2008 Protocol	Lupine, barrens	Contact DEC for current flight periods prior to surveying	May 2008 USFWS/DEC	USFWS/DEC search protocols
Karner Blue Butterfly <i>Lycaeides melissa samuelis</i>	May-Jun & Jul-Aug	between 8 a.m. & 6 p.m. - Refer to May 2008 Protocol	Lupine, barrens	Contact DEC for current flight periods prior to surveying	May 2008 USFWS/DEC	USFWS/DEC search protocols
Tawny Crescent <i>Phyciodes batesii batesii</i>	May-July	10 a.m to 5 p.m.	Moist meadows	wavy leaved aster, other asters hosts	NA	Pollard-Yates. Butterfly net w/ wandering pattern
Bird Dropping Moth <i>Cerma cora</i>	May-Jun	10 a.m to 5 p.m.	Pine-oak barrens	pin cherry host	NA	Pollard-Yates. Butterfly net w/ wandering pattern

FEB - JUNE continued						
Rare Species	Recommended Survey Dates	Recommended Time of Day	Habitat	Special Considerations	Required Survey Protocol	Proposed Survey Techniques
Forcinate emerald <i>Somatochlora forcipata</i>	late May to mid August	10 a.m to 5 p.m.	bogs and small forested streams	adults forage in forest openings & along roads, often flying rather low. Males patrol streams.	NA	Pollard-Yates. Butterfly net w/ wandering pattern
Ringed Boghaunter <i>Williamsonia lintneri</i>	Mid April-May	10 a.m to 5 p.m.	Fens, Rushes	near wetlands	NA	Pollard-Yates. Butterfly net w/ wandering pattern
Dusted Skipper <i>Atrytonopsis hianna</i>	May-Jun	10 a.m to 5 p.m.	Grassland, barrens	little bluestem and big bluestem hosts	NA	Pollard-Yates. Butterfly net w/ wandering pattern
Broad-lined Catopyrrha <i>Erastria coloraria</i>	there are two broods in mid or late May to early June and much of July; a few may be present earlier in spring or later in June	10 a.m to 5 p.m. also at night	barrens and other dry, brushy places	closely associated with New Jersey tea. Adults can be flushed from NJ tea plants or nearby in daytime. Also active at night and come to lights.	NA	Pollard-Yates. Butterfly net w/ wandering pattern. May be detected at nocturnal sheet/light setups.
Persius duskywing <i>Erynnis persius persius</i>	April to June (1 flight season)	any time when it's light out enough to see	pine barrens, oak savanna, and other open, sunny locations (such as powerline rights of way), marshes	host plants: lupine and indigo	NA	Pollard-Yates. Butterfly net w/ wandering pattern
American woodcock <i>Scolopax minor</i>	Spring courtship ritual. Nesting: mid March into June.	On or shortly after sunset	shrublands and forests (land along riverbanks), as well as upland shrublands, early successional forests and forest thickets. second growth hardwoods	courtship flight distinct	Protocol: Locating Woodcock Singing Ground Survey routes and Cooper, T.R., and K. Parker 2009	Singing-ground surveys

FEB - JUNE continued						
Rare Species	Recommended Survey Dates	Recommended Time of Day	Habitat	Special Considerations	Required Survey Protocol	Proposed Survey Techniques
Red-shouldered hawk <i>Buteo linneatus</i>	breed once per year between April and July, with peak activity occurring between early April and mid June.	1/2 hour before sunrise to 09:00	forests, but favors mature, mixed deciduous-coniferous woodlands, especially bottomland hardwood, riparian areas, and flooded deciduous swamps.	Courtship displays occur on the breeding grounds, and involve soaring together in broad circles while calling, or soaring and diving toward one another. Males may also perform the "sky-dance" by soaring high in the air, and then making a series of steep dives, each followed by a wide spiral and rapid ascent	NA	BBS.
Willow flycatcher <i>Empidonax traillii</i>	Early spring	1/2 hour before sunrise to 09:00	Breeds in moist shrubby areas often with standing or running water.	NA	NA	BBS.
Ruffed grouse <i>Bonasa umbellus</i>	Early spring	1/2 hour before sunrise to 09:00	Aspen woodlands and early successional, mixed deciduous forests with small clearings.	Males establish territory and drum to attract females	NA	BBS.
Dusted Skipper <i>Atrytonopsis hianna</i>	May-Jun	10 am to 5 p.m.	Grassland, barrens	little bluestem and big bluestem hosts	NA	Pollard-Yates. Butterfly net w/ wandering pattern

FEB - JUNE continued						
Rare Species	Recommended Survey Dates	Recommended Time of Day	Habitat	Special Considerations	Required Survey Protocol	Proposed Survey Techniques
Broad-lined Catopyrrha Erastria coloraria	there are two broods in mid or late May to early June and much of July; a few may be present earlier in spring or later in June	10 a.m to 5 p.m. also at night	barrens and other dry, brushy places	closely associated with New Jersey tea. Adults can be flushed from NJ tea plants or nearby in daytime. Also active at night and come to lights.	NA	Pollard-Yates. Butterfly net w/ wandering pattern. May be detected at nocturnal sheet/light setups.
Persius duskywing Erynnis persius persius	April to June (1 flight season)	any time when it's light out enough to see	pine barrens, oak savanna, and other open, sunny locations (such as powerline rights of way), marshes	host plants: lupine and indigo	NA	Pollard-Yates. Butterfly net w/ wandering pattern
<p>Note: If a rare species is observed or captured, the specific location will be documented and detailed information pertaining to the vegetative community in which the species is observed or captured will be collected. In all cases, vegetative communities will be identified according to Ecological Communities of New York State, Edinger, 2002. Pertinent notes, such as interspersions of surrounding communities, and other species-specific habitat relationships or observations will be taken. Representative photographs will be taken of the specific location and its surrounding areas.</p>						

JUNE/JULY/AUGUST						
Rare Species	Recommended Survey Dates	Recommended Time of Day	Habitat	Special Considerations	Required Survey Protocol	Proposed Survey Techniques
Karner Blue Butterfly <i>Lycaeides melissa samuelis</i>	May-Jun, Jul-Aug	between 8 a.m. & 6 p.m. - Refer to May 2008 Protocol	Lupine, barrens	Contact DEC for current flight periods prior to surveying	May 2008 USFWS/DEC	USFWS/DEC search protocols
Edwards' Hairstreak <i>Satyrium edwardsii</i>	June-July	10 a.m to 5 p.m.	Oak barrens	scrub oak host	NA	Pollard-Yates. Butterfly net w/ wandering pattern
A Noctuid Moth <i>Chytonix sensilis</i>	August	nocturnal	Pine-oak barrens	night search	NA	Nigth survey with sheet and lights set-up
Pine barrens zancloagnatha <i>Zancloagnatha martha</i>	July but mostly mid-to-late July	nocturnal	pitch pine scrub oak barrens	night search	NA	Nigth survey with sheet and lights set-up
A Noctuid Moth <i>Macrochilo bivittata</i>	July	night search	Wet meadows	night search	NA	Nigth survey with sheet and lights set-up
Regal frillillary <i>Speyeria idalia</i>	one flight period from mid-June to mid-August	10 a.m to 5 p.m.	open sunny locations, including meadows, marshes, and mountain pastures	Larval host plants are violets	NA	Pollard-Yates. Butterfly net w/ wandering pattern
Barrens dagger moth <i>Acronicta albarufa</i>	July to mid-August	nocturnal	Pine-oak barrens or forest	night search	NA	Nigth survey with sheet and lights set-up
Broad-lined Catopyrrha <i>Erastria coloraria</i>	there are two broods in mid or late May to early June and much of July; a few may be present earlier in spring or later in June	10 a.m to 5 p.m. also at night	barrens and other dry, brushy places	closely associated with New Jersey tea. Adults can be flushed from NJ tea plants or nearby in daytime. Also active at night and come to lights.	NA	Pollard-Yates. Butterfly net w/ wandering pattern. May be detected at nocturnal sheet/light setups.

JUNE/JULY/AUGUST continued						
Rare Species	Recommended Survey Dates	Recommended Time of Day	Habitat	Special Considerations	Required Survey Protocol	Proposed Survey Techniques
Barrens itame, Itame sp. 1 nr. <i>Inextricata</i>	July	nocturnal	Pine-oak barrens	night search	NA	Nigth survey with sheet and lights set-up
Spatterdock darter <i>Rhionaeschna mutata</i>	Early June to early July	10 a.m to 5 p.m.	fishless ponds usually with water lilies	Adults hunt along forest edges, dirt roads and fields, often in vicinity of the wetlands where eggs are laid.	NA	Pollard-Yates. Butterfly net w/ wandering pattern
Subarctic darter <i>Aeshna subarctica</i>	mid-July to late September	10 a.m to 5 p.m.	muskeg ponds, bogs and northern swamps	fly low over wet areas and pools. Also open areas away from breeding habitat.	NA	Pollard-Yates. Butterfly net w/ wandering pattern
Seepage dancer <i>Argia bipunctulata</i>	early July to mid September	10 a.m to 5 p.m.	grassy seepages, small lakes, ponds and streams and pine barren bogs	NA	NA	Pollard-Yates. Butterfly net w/ wandering pattern
Mocha emerald <i>Somatochlora linearis</i>	Mid June thru early September	10 a.m to 5 p.m.	small shaded streams	adults hunt in fields and forest openings, usually flying at height of 6-10'. Most active morning and evening	NA	Pollard-Yates. Butterfly net w/ wandering pattern
Incurvate emerald <i>Somatochlora incurvata</i>	late June to early September	10 a.m to 5 p.m.	Sphagnum bogs	identifiable only in-hand	NA	Pollard-Yates. Butterfly net w/ wandering pattern
Common sanddragon <i>Progomphus obscurus</i>	mid June thru mid August	10 a.m to 5 p.m.	sandy-bottomed ponds, lakes and streams	the only clubtail in the northeast with dark basal wing markings.	NA	Pollard-Yates. Butterfly net w/ wandering pattern
Prairie Warbler <i>Dendrocia discolor</i>	Spring & summer	1/2 hour before sunrise to 09:00	Dunes, fields	stays near ground	Breeding Survey, Call survey	BBS.

JUNE/JULY/AUGUST continued						
Rare Species	Recommended Survey Dates	Recommended Time of Day	Habitat	Special Considerations	Required Survey Protocol	Proposed Survey Techniques
Sharp-shinned hawk <i>Accipiter striatus</i>	Year round	1/2 hour before sunrise to 09:00	Mature mixed for.	stays near ground	Breeding Survey, Call survey	BBS.
Cooper's hawk <i>Accipiter cooperii</i>	Year round	1/2 hour before sunrise to 09:00	Woods, shrubs	edges of woods	Breeding Survey, Call survey	BBS.
Wood Thrush <i>Hylocichla mustelina</i>	Spring & summer	1/2 hour before sunrise to 09:00	Mature decide. for.	in forest	Breeding Survey, Call survey	BBS.
Blue-winged warbler <i>Vermivora chrysoptera</i>	Spring & summer	1/2 hour before sunrise to 09:00	Shrubs, weeds	hybridizes with golden wing	Breeding Survey, Call survey	BBS.
Golden-winged warbler <i>Vermivora chrysoptera</i>	Spring & summer	1/2 hour before sunrise to 09:00	Shrubs, weeds	hybridizes with blue wing	Breeding Survey, Call survey	BBS.
Black-throated blue warbler <i>Dendroica caerulescens</i>	Spring & summer	1/2 hour before sunrise to 09:00	Conifers, shade	tries to stay out of direct sunlight	Breeding Survey, Call survey	BBS.
Yellow breasted chat <i>Ictera virens</i>	Spring & summer	1/2 hour before sunrise to 09:00	Brush, woods	scrub shrub inhabitant	Breeding Survey, Call survey	BBS.
Whip-poor-will Caprimulgus vociferous	Summer	After the sun has set completely	Mixed pine, deciduous woodland	active at night	Pamela D. Hunt. A proposed Survey Methodology for Monitoring Nightjars (Caprimulgidae, Caprimulgus) in Eastern North America. Audubon Society of New Hampshire	Modified point count surveys based on this source.

JUNE/JULY/AUGUST continued						
Rare Species	Recommended Survey Dates	Recommended Time of Day	Habitat	Special Considerations	Required Survey Protocol	Proposed Survey Techniques
Scarlet tanager <i>Piranga olivacea</i>	May to August	1/2 hour before sunrise to 09:00	mainly mature deciduous forests or mixed deciduous forests w/ hemlock & pine. Can also be found in younger deciduous forests, sometimes in heavily wooded suburban areas.	Males use a silent courtship display in which they fly to exposed branches below a female and extend their wings and neck to expose their scarlet back	NA	BBS.
Wood turtle <i>Clemmys insculpta</i>	summer	10 a.m to 5 p.m.	at home in water. woods, meadows, farmlands.	NA	NA	Systematic sampling and passive searches.
Snapping turtle <i>Chelydra serpentina</i>	summer	10 a.m to 5 p.m.	any permanent body of fresh water	NA	NA	Systematic sampling and passive searches.
Spotted turtle <i>Clemmys guttata</i>	March to October (breeding March to May)	10 a.m to 5 p.m.	marshy meadows, bogs, swamps, ponds, ditches, or other small bodies of still water. Daylight hours are spent eating and basking in the sun	In May females search for nesting areas: open site, such as a meadow, field, or the edge of a road	NA	Systematic sampling and passive searches.
Eastern hognose snake <i>Heterodon platyrhinos</i>	Spring, summer	10 a.m to 5 p.m.	Sandy areas	toads	NA	Systematic sampling and passive searches.

JUNE/JULY/AUGUST continued						
Rare Species	Recommended Survey Dates	Recommended Time of Day	Habitat	Special Considerations	Required Survey Protocol	Proposed Survey Techniques
Worm snake <i>Carphophis amoenus</i>	Spring, summer	10 a.m to 5 p.m.	Moist soils, rotting logs	underground, rotting logs	NA	Systematic sampling and passive searches.
Northern black racer <i>Coluber constrictor constrictor</i>	Spring, summer	10 a.m to 5 p.m.	dry sunny areas with access to cover; also damper sites	sunny days	NA	Systematic sampling and passive searches.
Black rat snake <i>Elaphe obsoleta</i>	Spring, summer	10 a.m to 5 p.m.	rocky timber hillsides to farmlands	sunny days	NA	Systematic sampling and passive searches.
Smooth greensnake <i>Opheodrys vernalis</i>	Spring, summer	10 a.m to 5 p.m.	largely terrestrial	sunny days	NA	Systematic sampling and passive searches.
Eastern spadefoot toad <i>Scaphiopus holbrookii</i>	March to August on days >45 degrees F with heavy rains	Day and night following appropriate weather conditions.	Sandy areas	best time to survey pouring rain	Call survey	Systematic sampling and passive searches.
Fowler's Toad <i>Bufo woodhousei</i>	Spring, summer	10 a.m to 5 p.m.	Moist soils, sandy	Diurnal	Call survey	Systematic sampling and passive searches.

SEPTEMBER/OCTOBER						
Rare Species	Recommended Survey Dates	Recommended Time of Day	Habitat	Special Considerations	Required Survey Protocol	Proposed Survey Techniques
Mottled Duskywing <i>Erynnis martialis</i>	Apr-Sep	10 a.m to 5 p.m.	Barrens	new jersey tea host	NA	Pollard-Yates. Butterfly net w/ wandering pattern
A Noctuid Moth <i>Chaetagnaea cerata</i>	Sep-Oct	Nocturnal	Pine-oak barrens	search at night	NA	Night survey with sheet and lights set-up
Inland Barrens Buckmoth <i>Hemileuca maia maia</i>	Sep-Dec	10 a.m to 5 p.m.	Oak barrens	scrub oak	NA	Pollard-Yates. Butterfly net w/ wandering pattern
<p>Note: If a rare species is observed or captured, the specific location will be documented and detailed information pertaining to the vegetative community in which the species is observed or captured will be collected. In all cases, vegetative communities will be identified according to Ecological Communities of New York State, Edinger, 2002. Pertinent notes, such as interspersions of surrounding communities, and other species-specific habitat relationships or observations will be taken. Representative photographs will be taken of the specific location and its surrounding areas.</p>						

Attachment 3

Data Sheets

American Woodcock Surveys

Location: Albany Pine Bush Restoration Site

Observer: SJV Date: 4/4/13

Route No: NBS Route Name: NBS-AMWO

Official Sunset: 1925 + 22 or 15 = Starting time: 1947

End Time: 2020

Circle at start:

Cloud Conditions: clear

Precipitation: None Temperature (°F): >40 (actual = 51°F)

Wind: See below Noise Disturbance: See below

Location	Wind (Beaufort)	Noise Disturbance	# Males Peenting	Flights (# males displaying)	Other:	Description of Courting Area
NBS # 1	1.3 mph	LO	0	0	Spring peeper, RWBL, AMRO, SOSP, CAGO, MALL	-
NBS # 2	0.2 mph	MOD	0	0	Cars, pump house, AMRO	-
NBS # 3	1.1 mph	LO	2	0	Spring peeper, AMRO	(1) Wooded wetland. (2) Near wetland between wooded areas.
Location # 4 (horse barn)	1.0	MOD	0	0	cars	
Location # 5 (Ice Age property)	1.0	MOD	0	0	traffic	
SUM			2	0	-	-

Notes: *Refer to attached map for locations.

(1) Make sure to conduct survey at proper time of day according to sky conditions

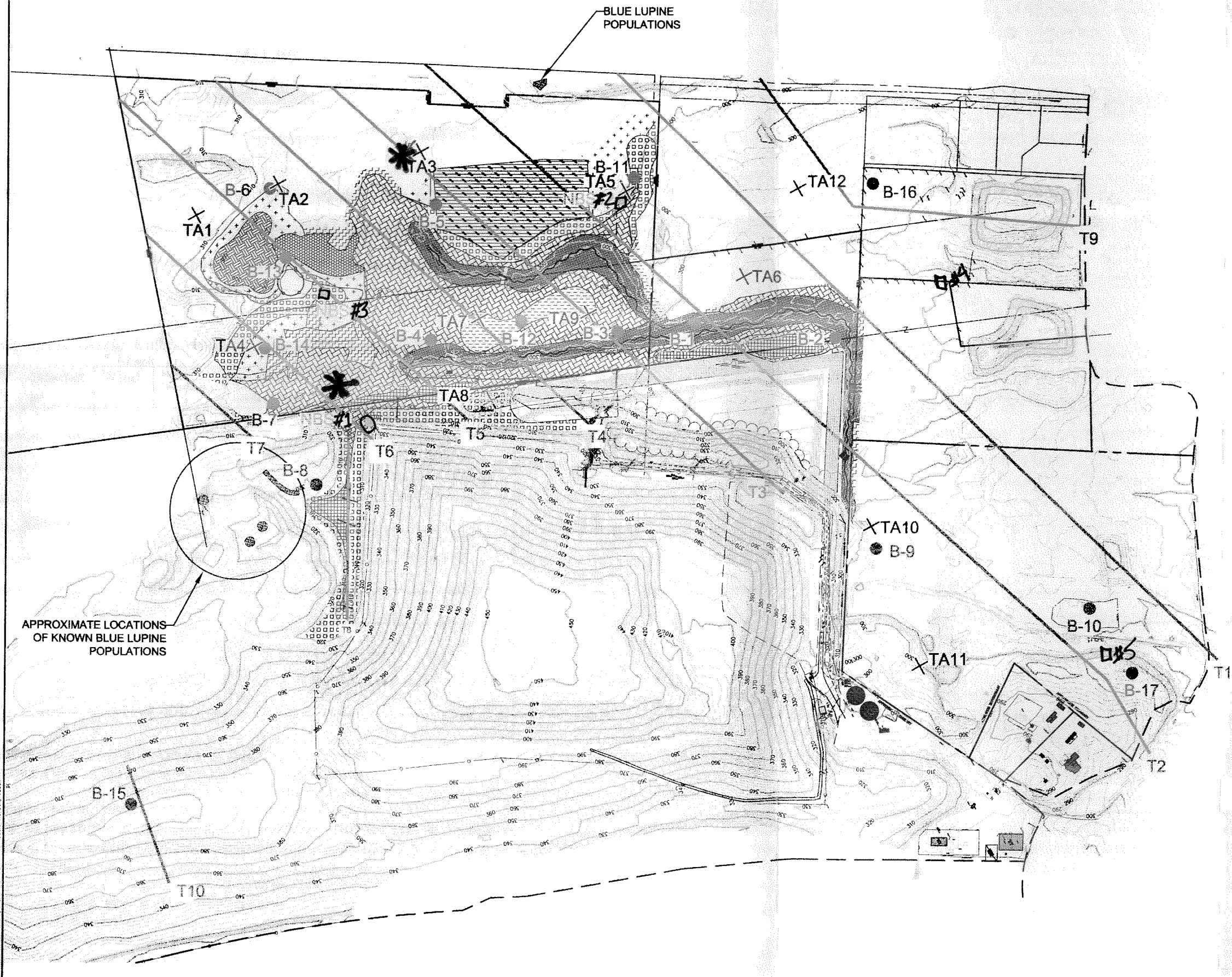
Starting Time: <75% overcast = 22 Minutes after sunset

>75% overcast = 15 Minutes after sunset

(2) Entire survey should be completed within 36 minutes

(3) Stops are at designated survey point locations; listen for exactly 2 minutes at each stop.

(4) Do not conduct survey if temperature is below 40° F (5° C), in strong wind, or in heavy precipitation.



LEGEND

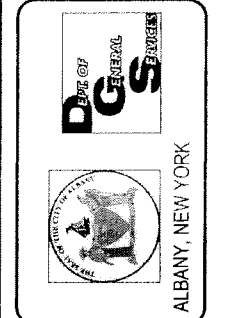
- Breeding Bird Survey Location
- Nocturnal Bird Survey Location
- ✕ Herp Trapping Arrays
- Butterfly Transects

APPROXIMATE LOCATIONS OF KNOWN BLUE LUPINE POPULATIONS

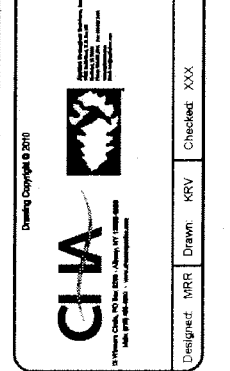
BLUE LUPINE POPULATIONS

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 S:\000636-111113678

Date	
By	
App'd	
Submitted / Revision	
No.	

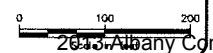


DESIGNED BY: MRR
 DRAWN BY: KRV
 CHECKED BY: XXX



RAPP ROAD LANDFILL RESTORATION PLAN
 POST CONST. FAUNAL MONITORING PLAN
 Issue Date: 05/28/13 | Project No: 21951 | Scale: AS NOTED

GRAPHIC
 2013 Albany Compliance Report



Location: Albany Pine Bush Restoration Site

Observer: JWG & MJM Date: 5/2/13

Route No: NBS Route Name: NBS-AMWO

Official Sunset: 1957 + 22 or 15 = Starting time: 2021

End Time: 2100

Circle at start:

Cloud Conditions: 75% overcast

Precipitation: None Temperature: >40 (actual = 70°F)

Wind: Beaufort 0 Noise Disturbance: LOW to MOD

Location	Wind (Beaufort)	Noise Disturbance	# Males Peenting	Flights (# males displaying)	Other:	Description of Courting Area
NBS # 1	0	MOD	0	0	2054-2100	-
NBS # 2	0	LOW	0	0	2021-2026	-
NBS # 3	0	LOW	0	0	2038-2043	-
SUM			0	0	-	-

Notes: *American toads, northern gray treefrogs and spring peepers were calling and adding to the noise disturbance. Other disturbances include distant highway noise. A bat was observed flying.

(1) Make sure to conduct survey at proper time of day according to sky conditions

Starting Time: <75% overcast = 22 Minutes after sunset

>75% overcast = 15 Minutes after sunset

(2) Entire survey should be completed within 36 minutes

(3) Stops are at designated survey point locations; listen for exactly 2 minutes at each stop.

(4) Do not conduct survey if temperature is below 40° F (5° C), in strong wind, or in heavy precipitation.

--If possible, please designate type of clearing that is used by courting woodcock (i.e. Field, Clear-cut, Strip cut, Natural Opening, Log landing, etc.)

--Count only the number of different woodcock heard peenting at a stop.

--Record birds heard flying but not peenting in column for "Flights".

Optional: Record Owls, whip poor wills, and any other night signing birds in the "Other" column.

Whip-Poor-Will Surveys

Whip-Poor-Will Survey Data Sheet

Location: Albany Rapp Rd. Landfill Restoration Area

Observer: John Greaves Date: 5/20/13

Official Sunset: 2016 **Starting time:** 2050 **End Time:** 2121 **Moon Rise:** 1514 (78.3% illuminated Waxing Gibbous)

Cloud Conditions: Clear 25% Overcast 50% Overcast 75% Overcast >75% Overcast

Precipitation: None Mist Snow Light Rain Moderate Rain Heavy Rain Fog

Temperature (78°F):

Fill in for each stop:

Fill in for each stop: **Wind:** Calm Gentle Light Moderate Strong **Noise Disturbance:** NO LO MOD HI

Time	Point	Species	Time Period			Notes
			1 to 2	3 to 4	5 to 6	
2105-2111	NBS # 1		No WHIP	No WHIP	No WHIP	Noise = MOD. Wind = calm. American toads calling from stream area.
No whip-poor-will's detected						
2115-2121	NBS # 2		No WHIP	No WHIP	No WHIP	Noise = MOD. Wind = calm.
No whip-poor-will's detected						
2050-2056	NBS # 3		No WHIP	No WHIP	No WHIP	Noise = MOD. Wind = calm. American toads (few), northern gray treefrogs (many), green frogs (few) and spring peepers (many) calling from nearby areas.
No whip-poor-will's detected						
General Notes: Good survey conditions for all Survey Points. Moon above the tree line and not obscured by clouds throughout the entire survey.						

Whip-Poor-Will Survey Data Sheet

Location: Albany Rapp Rd. Landfill Restoration Area

Observer: John Greaves Date: 6/20/13

Official Sunset: 2036 **Starting time:** 2056 **End Time:** 2124 **Moon Rise:** 1529 (3/4 full Waxing Gibbous)

Cloud Conditions: Clear (5%) 25% Overcast 50% Overcast 75% Overcast >75% Overcast

Precipitation: None Mist Snow Light Rain Moderate Rain Heavy Rain Fog

Temperature (72°F):

Fill in for each stop:

Fill in for each stop: *Wind:* Calm Gentle Light Moderate Strong *Noise Disturbance:* NO LO MOD HI

Time	Point	Species	Time Period			Notes
			1 to 2	3 to 4	5 to 6	
2104-2110	NBS # 1		No WHIP	No WHIP	No WHIP	Noise = MOD, Wind = calm.
						Green frogs & Gray treefrogs calling from biofilter area.
No whip-poor-will's detected						
2118-2124	NBS # 2		No WHIP	No WHIP	No WHIP	Noise = MOD (highway and frogs calling. Also landfill pump house noise. Wind = calm.
No whip-poor-will's detected						
2056-2102	NBS # 3		No WHIP	No WHIP	No WHIP	Noise = MOD.
						Wind = calm.
No whip-poor-will's detected						
General notes: noise disturbance from the highway and calling northern gray treefrogs. Fire flies out. Also detected: AMRO, SOSPO, GRCA. Moon well above the tree line and not obscured by clouds throughout the entire survey.						

Breeding & Migrant Bird Surveys

Total Bird Species Observed at the City of Albany Landfill Expansion/ Albany Pine Bush Restoration Site in 2013.

ALPHA CODE	Common Name	Taxonomic Binomial	Mar	Apr	May					June					Jul	August					Sept		Oct	Notes/Comments			
			12	4	2	3	10	12	13	20	25	26	10	15	26	27	28	29	18	19	8						
COLO	common loon	<i>Gavia immer</i>																									
PBGR	pieb-billed grebe	<i>Podylimbus podiceps</i>																									
DCCO	double crested cormorant	<i>Phalacrocorax auritus</i>																									
GBHE	great blue heron	<i>Ardea herodias</i>													X	X	X						X				mostly flyovers. Occasional onsite forager
GREG	great egret	<i>Ardea alba</i>																									
GRHE	green heron	<i>Butorides virens</i>			X	X					X						X						X				foraging in P4 wetland also observed perched on farm pond spillway
CAGO	Canada goose	<i>Branta canadensis</i>				X									X	X							X				many. Breeding onsite and migration
SNGO	snow goose	<i>Chen caerulescens</i>																									
WODU	wood duck	<i>Aix sponsa</i>			X										X							X			X		Western pond and surrounding forest. Also 3 in the forested wetland at the south end of Transect 5
MALL	mallard	<i>Anas platyrhynchos</i>	X		X	X	X	X	X	X	X	X										X	X	X			mainly in newly created wetlands
ABDU	American black duck	<i>Anas rubripes</i>																									
NOPI	northern pintail	<i>Anas acuta</i>																									
BWTE	blue-winged teal	<i>Anas discors</i>																									
GWTE	green-winged teal	<i>Anas crecca</i>																									
HOME	hooded merganser	<i>Lophodytes cucullatus</i>																									
COMO	common merganser	<i>Mergus merganser</i>	X																								m/f pair observed on the created vernal pool
TUVU	turkey vulture	<i>Cathartes aura</i>			X	X	X	X	X	X	X	X			X	X	X					X	X				roosting on treeline at edge of landfill
BLVU	black vulture	<i>Caragyps atratus</i>													X	X						X	X				occasionally observed with TUVU
NOHA	northern harrier	<i>Circus cyaneus</i>																									
SSHA	sharp-shinned hawk	<i>Accipiter striatus</i>					X																X				mainly in migration.
COHA	Cooper's hawk	<i>Accipiter cooperii</i>													X	X							X				pair observed onsite. Courship. Also migrants
RSHA	red-shouldered hawk	<i>Buteo lineatus</i>														X							X				likely migrant
BWHA	broad-winged hawk	<i>Buteo platypterus</i>																					X				juvy flushed from GBVP area, roosting migrant
RTHA	red-tailed hawk	<i>Buteo jamaicensis</i>	X		X	X	X	X	X	X					X	X	X					X	X				same nesting area, did not observe YOY... possibly disturbed by restoration activity
BAEA	bald eagle	<i>Haliaeetus leucocephalus</i>					X															X	X				flyovers. On-site on 10/8.
OSPR	osprey	<i>Pandion haliaetus</i>																									
MERL	merlin	<i>Falco columbarius</i>																					X				hunting
AM.KE	American kestrel	<i>Falco sparverius</i>													X	X	X					X					Entire family of kestrels (5 animals) observed regularly foraging and flying together. Observed carrying food
WITU	wild turkey	<i>Gallopavo gallopavo</i>			X	X	X	X	X	X	X	X			X	X							X				forested locations
SORA	sora	<i>Porzana carolina</i>																									
KILL	killdeer	<i>Charadrius vociferus</i>	X		X	X	X	X	X	X	X	X											X				Many. Nest at base of tree on Transect 3 (May 10)
GRYE	greater yellowlegs	<i>Tringa melanoleuca</i>																				X					in newly created wetlands
LEYE	lesser yellowlegs	<i>Tringa flavipes</i>																					X				in newly created wetlands
SESA	semi-palmated sandpiper	<i>Calidris pusilla</i>																									
LESA	least sandpiper	<i>Calidris minutilla</i>																				X					in newly created wetlands
SOSA	solitary sandpiper	<i>Tringa solitaria</i>					X																X				in newly created wetlands
SPSA	spotted sandpiper	<i>Actitis macularia</i>				X	X	X	X	X	X												X				in newly created wetlands
AMWO	American woodcock	<i>Scolopax minor</i>		X																							full displays at two different locations on-site
COSN	common snipe	<i>Gallinago gallinago</i>			X					X																	no displays observed. June observation was flushed from WL edge
BOGU	Bonaparte's gull	<i>Larus philadelphia</i>																									5 birds in with other gulls over landfill
LAGU	laughing gull	<i>Larus atricilla</i>																					X				over landfill/edge of site

Total Bird Species Observed at the City of Albany Landfill Expansion/ Albany Pine Bush Restoration Site in 2013, continued.

ALPHA CODE	Common Name	Taxonomic Binomial	Mar	Apr	May					June					Jul	August					Sept	Oct	Notes/Comments
			12	4	2	3	10	12	13	20	25	26	10	15	26	27	28	29	18	19	8		
RBGU	ring-billed gull	<i>Larus delawarensis</i>				X			X	X		X	X			X	X	X		X		many	
HEGU	herring gull	<i>Larus argentatus</i>				X										X	X	X				over landfill/edge of site	
GBBG	greater black-backed gull	<i>Larus marinus</i>																					
CATE	caspian tern	<i>Sterna caspia</i>																					
COTE	common tern	<i>Sterna hirundo</i>																					
MODO	mourning dove	<i>Zenaida macroura</i>			X	X		X	X		X	X		X	X	X		X	X				
ROPI	rock pigeon	<i>Columba livia</i>						X											X				
YBCU	yellow-billed cuckoo	<i>Coccyzus americanus</i>						X			X								X				
BBCU	black-billed cuckoo	<i>Coccyzus erythrophthalmus</i>									X												
GHOW	great horned owl	<i>Bubo virginiana</i>			X																		
ESOW	eastern screech owl	<i>Otus asio</i>																					
CONI	common nighthawk	<i>Chordeiles minor</i>														X						10 in migration (2 different groups)	
CHSW	chinmey swift	<i>Chaetura pelagica</i>													X	X			X	X			
RTHU	ruby-throated hummingbird	<i>Archilochus colubris</i>									X					X	X						
BEKI	belted kingfisher	<i>Ceryle alcyon</i>				X	X		X		X			X								usually along linear stream at edge of LF or perching near bio infil	
RBWO	red-bellied woodpecker	<i>Melanerpes carolinus</i>				X		X	X		X	X					X		X	X			
RHWO	red-headed woodpecker	<i>Melanerpes erythrocephalus</i>											X		X	X	X					First record in Pine Bush. Others observed adults carrying food	
YBSA	yellow-bellied sapsucker	<i>Sphyrapicus varius</i>																	X	X			
DOWO	downy woodpecker	<i>Picoides pubescens</i>				X			X		X	X		X	X	X		X	X				
HAWO	hairy woodpecker	<i>Picoides villosus</i>						X						X		X		X	X				
NOFL	northern flicker	<i>Colaptes auratus</i>				X		X	X		X	X		X	X	X		X	X			carrying food plus young of the year	
PIWO	pileated woodpecker	<i>Dryocopus pileatus</i>			X	X					X	X								X			
EAWP	eastern wood-pewee	<i>Contopus virens</i>						X	X		X	X		X		X		X	X				
UNFL	unidentified flycatcher sp.																		X				
ACFL	Acadian flycatcher	<i>Empidonax virescens</i>							X													a rare observation this far north. Explosive final note is diagnostic	
WIFL	willow flycatcher	<i>Empidonax traillii</i>									X												
ALFL	alder flycatcher	<i>Empidonax alnorum</i>													X								
LEFL	least flycatcher	<i>Empidonax minimus</i>													X							previous breeder, but not observed during BBS this year	
EAPH	eastern phoebe	<i>Sayornis phoebe</i>						X			X	X		X	X			X	X				
GCFL	great crested flycatcher	<i>Myiarchus crinitus</i>						X	X		X	X											
EAKI	eastern kingbird	<i>Tyrannus tyrannus</i>						X	X		X	X			X				X			at P4 wetland	
REVI	red-eyed vireo	<i>Vireo olivaceus</i>						X	X		X	X		X	X			X	X			abundant in breeding season	
WAVI	warbling vireo	<i>Vireo gilvus</i>				X		X	X		X	X			X					X			
PHVI	Philadelphia vireo	<i>Vireo philadelphicus</i>																		X			
YTVI	yellow-throated vireo	<i>Vireo flavifrons</i>																			X		
BHVI	blue-headed vireo	<i>Vireo solitarius</i>																	X	X		many in migration	
BLJA	blue jay	<i>Cyanocitta cristata</i>	X			X		X	X		X	X		X	X	X		X	X				
CORA	common raven	<i>Corvus corax</i>						X			X			X	X			X	X			often harassed by AMCR. A pair observed this year (previously one bird)	
AMCR	American crow	<i>Corvus brachyrhynchos</i>	X		X	X		X	X		X	X		X	X	X		X	X				
FICR	fish crow	<i>Corvus ossifragus</i>			X	X		X	X													seemingly migratory	
HOLA	horned lark	<i>Eremophila alpestris</i>																					
PUMA	purple martin	<i>Prong subis</i>																		X		in migration	
NRWS	northern rough-winged swallow	<i>Stelgidopteryx serripennis</i>			X	X													X	X		in migration	

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			12	4	2	3	10	12	13	20	25	26	10	15	26	27	28	29	18	19	8			
BANS	bank swallow	<i>Riparia riparia</i>						X			X	X			X	X			X					observed in created colony at edge of landfill expansion. Foraging sitewide
TRSW	tree swallow	<i>Tachycineta bicolor</i>			X	X		X	X		X	X			X	X			X	X				increased nesting habitat this year and higher numbers
BARS	barn swallow	<i>Hirundo rustica</i>			X	X		X	X		X	X			X	X	X							breeding in barn onsite, many nests
ETTI	eastern tufted titmouse	<i>Baeolophis bicolor</i>				X		X	X		X	X			X	X	X		X	X				
BCCH	black-capped chickadee	<i>Poecile atricapilla</i>			X	X			X		X	X			X	X	X		X	X				
RBNU	red-breasted nuthatch	<i>Sitta canadensis</i>													X		X		X	X				possible breeder in pitch pines
WBNU	white-breasted nuthatch	<i>Sitta carolinensis</i>			X	X					X	X			X	X	X		X	X				
BRCR	brown creeper	<i>Certhia americana</i>				X																X		not documented during breeding season, but likely breeding onsite
CAWR	Carolina wren	<i>Thyrothorus ludovicianus</i>				X		X	X		X								X					
HOWR	house wren	<i>Troglodytes aedon</i>				X		X											X	X				carrying food
WIWR	winter wren	<i>Troglodytes troglodytes</i>																						
GCKI	golden crowned kinglet	<i>Regulus satrapa</i>																				X		abundant in migration
RCKI	ruby crowned kinglet	<i>Regulus calendula</i>																		X		X		abundant in migration
BGGN	blue-gray gnatcatcher	<i>Poliophtila caerulea</i>							X		X	X												only one location
EABL	eastern bluebird	<i>Sialia sialis</i>							X														X	
AMRO	American robin	<i>Turdus migratorius</i>			X	X		X	X		X	X			X	X	X		X	X				
WOTH	wood thrush	<i>Hylocichla mustelina</i>									X	X												less than previous years due to canopy opening in 2013
VEER	veery	<i>Catharus fuscescens</i>																			X			less than previous years due to canopy opening in 2014
SWTH	Swainson's thrush	<i>Catharus ustulatus</i>																				X		less than previous years due to canopy opening in 2015
(BITH)	Bicknell's thrush	<i>Catharus bicknelli</i>																						unconfirmed, but potential
HETH	hermit thrush	<i>Catharus guttatus</i>																					X	
GRCA	gray catbird	<i>Dumetella carolinensis</i>			X			X	X		X	X			X	X	X		X	X				
NOMO	northern mockingbird	<i>Mimus polyglottus</i>			X	X			X		X	X			X	X			X	X				
BRTH	brown thrasher	<i>Toxostoma rufum</i>																				X		in forest edge NW of TA-1, predict breeding next year
EUST	European starling	<i>Sturnus vulgaris</i>			X	X		X	X		X	X			X	X	X		X	X				flocking near landfill and surrounding forested areas
CEDW	cedar waxwing	<i>Bombycilla cedrorum</i>						X	X		X	X			X	X	X		X	X				
NOPA	northern parula	<i>Parula americana</i>																				X		
OCWA	orange-crowned warbler	<i>Oreothlypis celata</i>																						
TEWA	Tennessee warbler	<i>Oreothlypis peregrina</i>																				X	X	
BWWA	blue-winged warbler	<i>Vermivora pinus</i>																						
NAWA	Nashville warbler	<i>Oreothlypis ruficapilla</i>			X														X	X				
YWAR	yellow warbler	<i>Setophaga petechia</i>				X		X	X		X	X												less pairs than last year
CSWA	chestnut-sided warbler	<i>Setophaga pensylvanica</i>						X	X		X	X										X		carrying food
MAWA	Magnolia warbler	<i>Setophaga magnolia</i>													X	X			X	X				
CMWA	Cape May warbler	<i>Setophaga tigrina</i>																			X			two observations in one day
BTBW	black-throated blue warbler	<i>Setophaga caerulescens</i>																				X		less than previous years
BLWA	blackburnian warbler	<i>Setophaga fusca</i>																	X	X				abundant in migration
YRWA	yellow-rumped warbler	<i>Setophaga coronata</i>			X																	X		abundant in migration
BTGW	black throated green warbler	<i>Setophaga virens</i>			X																X	X		abundant in migration
PRAW	prairie warbler	<i>Setophaga discolor</i>													X							X		predict breeding next year
PAWA	palm warbler	<i>Setophaga palmarum</i>																				X		
PIWA	pine warbler	<i>Setophaga pinus</i>			X	X		X																in spruce trees near Rapp Rd.
BBWA	bay-breasted warbler	<i>Setophaga castanea</i>																				X		

Total Bird Species Observed at the City of Albany Landfill Expansion/ Albany Pine Bush Restoration Site in 2013, continued.

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			12	4	2	3	10	12	13	20	25	26	10	15	26	27	28	29		18	19
BLPW	blackpoll warbler	<i>Setophaga striata</i>																X	X	abundant in migration	
BAWW	black-and-white warbler	<i>Mniotilta varia</i>																	X		
AMRE	American redstart	<i>Setophaga ruticilla</i>						X	X					X					X	less than previous years	
OVEN	ovenbird	<i>Seiurus aurocapilla</i>				X				X										less than previous years	
NOWA	northern waterthrush	<i>Seiurus novaeborcensis</i>																			
COYE	common yellowthroat	<i>Geothlypis trichas</i>						X	X	X			X	X	X			X	X		
WIWA	Wilson's warbler	<i>Cardellina pusilla</i>																X			
CAWA	Canada warbler	<i>Cardellina canadensis</i>																			
HOWA	hooded warbler	<i>Setophaga citrina</i>																			
SCTA	scarlet tanager	<i>Piranga virescens</i>					X	X		X			X	X							
NOCA	northern cardinal	<i>Cardinalis cardinalis</i>	X			X		X	X	X			X	X	X			X	X		
RBGR	rose-breasted grosbeak	<i>Phuecticus ludovicianus</i>						X	X	X			X	X	X			X	X		
INBU	indigo bunting	<i>Passerina cyanea</i>					X	X	X	X			X	X	X			X	X		
EATO	eastern towhee	<i>Pipilo erythrophthalmus</i>			X	X	X	X	X	X			X	X	X			X	X		
ATSP	American tree sparrow	<i>Spizella arborea</i>																			
FISP	field sparrow	<i>Spizella pusilla</i>				X	X			X	X			X	X			X	X	two breeding pairs in the field NNW of TA-2	
CHSP	chipping sparrow	<i>Spizella passerina</i>			X	X	X	X	X	X				X				X	X		
GRSP	grasshopper sparrow	<i>Ammodramus savannarum</i>			X															migrant	
SAVS	savannah sparrow	<i>Passerculus sandwichensis</i>						X		X								X		one was observed singing during the breeding season	
VESP	vesper sparrow	<i>Poecetes gramineus</i>																	X		
WTSP	white-throated sparrow	<i>Zonotrichia albicollis</i>																	X	X	
WCSP	white-crowned sparrow	<i>Zonotrichia leucophrys</i>																	X		
SOSP	song sparrow	<i>Melospiza melodia</i>			X	X	X	X	X	X			X	X	X			X	X		
LISP	Lincoln's sparrow	<i>Melospiza lincolnii</i>																X	X	high numbers during fall migration	
SWSP	swamp sparrow	<i>Melospiza georgiana</i>																	X	in migration	
DEJU	dark-eyed junco	<i>Junco hyemalis</i>	X		X	X														large flock in migration	
BOBO	bobolink	<i>Dolichonyx oryzivorus</i>																		on north slope of landfill	
BHCO	brown-headed cowbird	<i>Molothrus ater</i>				X	X	X	X	X										observed being fed by YWAR	
RWBL	red-winged blackbird	<i>Agelaius phoeniceus</i>			X	X	X	X	X	X				X				X	X	breeding in the barnyard grass	
COGR	common grackle	<i>Quiscalus quiscula</i>			X	X	X	X	X	X									X	breeding in forest by <i>Cephalanthus</i> swamp	
BAOR	Baltimore oriole	<i>Icterus galbula</i>					X	X	X	X			X	X	X					observed numerous active nests onsite	
OROR	orchard oriole	<i>Icterus spurius</i>												X						early migrant?	
PUFI	purple finch	<i>Carpodacus purpureus</i>					X				X									in spruce trees near Rapp Rd. (seemed like YOY learning song	
HOFI	house finch	<i>Carpodacus mexicanus</i>							X	X			X	X					X	near houses and planted conifers	
AMGO	American goldfinch	<i>Carduelis tristis</i>			X	X	X	X	X	X			X	X	X			X	X	abundant!	
HOSP	house sparrow	<i>Passer domesticus</i>				X			X	X									X	near houses	
	Observation confirms breeding onsite per NY Breeding Bird Codes																			51 CONFIRMED BREEDING SPECIES	
	Observation denotes probable breeder per NY Breeding Bird Codes																			14 PROBABLE BREEDERS	
	Observation denotes possible breeder per NY Breeding Bird Codes																			7 POSSIBLE BREEDERS	
grayed	Observed in 2012 but not in 2013																			3 NEW SPECIES	
maroon	New species for the site as of 2013																			133 TOTAL BIRD SPECIES OBSERVED IN 2013	

MATERIALS

Maps

- General Navigation

- CAN USE OLD MAPS

(if we GPS coordinate our notes, we can later add to poling list)

Footnotes

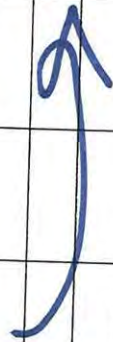
SINCE

DATA SHEETS

Safety Sheet

McGraw

Field Notes



5/2/13	Album	SKN 0	WINDS -1
4:30 PM	SWANNY WARM	30.9%	17% hca
AMND	AMTD		Cabbage white
FIRK	NETF		
ZMST	NGRNTF		
TRIS	EP PZP		
AMCO			
NRWS	A. L. K. rate (pines) ||		
KILL	Φ emenung (1+2+5+ed) ||		
SOP			
BATS			
GRB			chipmunk
MAUK			
MOBO			
WSTH (offsite NDB)			
JUNVA			
SOLOW (feather)			
EWBL			* lots of plastic trash on site
SCCH			* INSE VP *
AMND			removed trash from PLWL
GRCA			↳ LF show id clean site
ESTO (offsite W)			
ETHO			
BEK			
EAPH			
NGMC			
CLSP			
DEJN			
PLWD			
YMA			
YRUM			
MAWA			
GRKE			
GRSP			
BTNW			

New Pools

AMTD

FEAP

NETF

PHCS

PASSERINE - Bird Point Count Data Sheet

09-0636

B2

Project Name

Sample Point ID # & Name

5/3/13

0613

0618

Date

Start Time

Stop Time

X coordinate, Y coordinate

Observer

Wind Spd. 0

Wind Dir. -

Sky 20

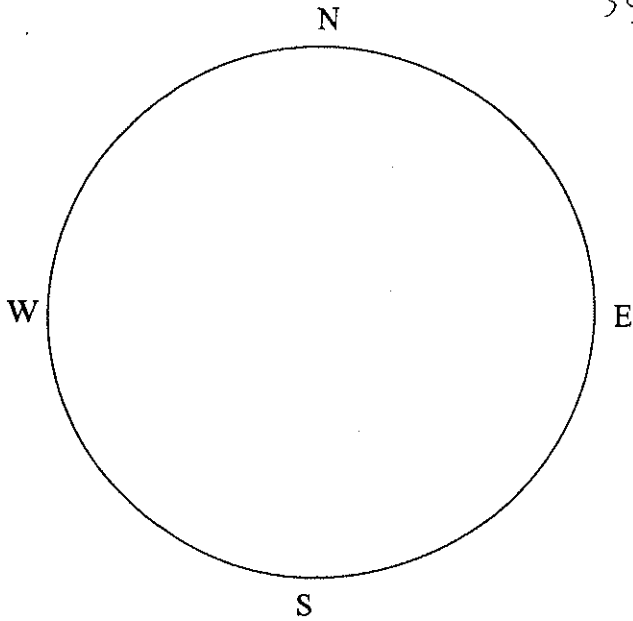
Temp 13.4

Dominant (>50%) AES Habitat Type

Other Habitats

Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes: rabbit scat
gray squirrel

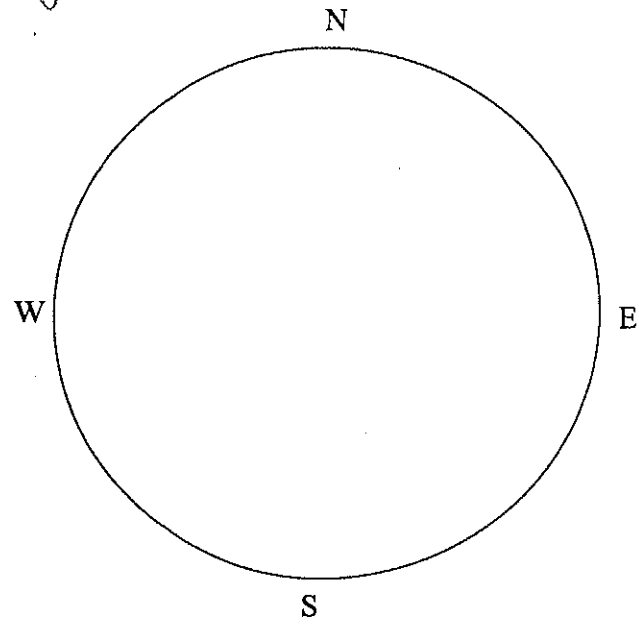


Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
DOWN	C	S	30								
NUXA	C	SE	40								
TRFS	C/F	W	40	vor	5-10	///					
KILL	C/F	NNW	120	SW	20	1					some of your point?
RUBL	C	N	30			1					
NOFL	C	NE	150			1					
RLJA	C	NE	200			11					
ANGL	C	NNE	150			1					
RWBL	C	W	40			1					
RUBL	C	WNW	75			1					
SUSP	C	E	15			1					
BLJA	P/C	N	20				///				
TRUM	S	W	300	vor	20	1					
TRWS	F	S	50	E	35		11				
EATU	C	SSE	200				1				
3HCO	C	W → 25 →					1				on telephone wire
AMRU	FD	S	10				11				
BOCH	C	SE	100				1				

PASSERINE - Bird Point Count Data Sheet

Project Name 09-0634 Sample Point ID # & Name B3
 Date 4/3 Start Time 0604 Stop Time 0609
 Observer [Signature] Wind Spd. 1 Wind Dir. SE Sky 30 Temp 13.3

X coordinate, Y coordinate _____
 Dominant (>50%) AES Habitat Type _____
 Other Habitats _____



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		AES Habitat Type
F = flying		Upland Coniferous Forest
S = soaring		Upland Mixed Forest
P = perching or on water		Wetland Forested
Fo = foraging		Wetland Shrub-Scrub
MD = mating display		Wetland Emergent
O = other		Open Water

Notes:

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
RWBL	C	NW	250			1					
RWBL	C	NW	175			1					
MOOD	F	E	10	N	10	1					
RWBL	C/P/T	W	100			11					pair
NOCA	C	NNE	300			1					
HEGU	F	S	200	SW	40	11					
BARS	C/F/T					1111					
KIU	P/E/T	E	20			1					display (broken wing)
NONO	C	N	300				1				
WAVI	C	N	250				1				
AMRO	P	N	10				1				in Pine
SO SP	C	S	75				1				
EAST	F	NW	100	S	10		111				
KILL	C/P	S	25				111				
AMCR	F/C	SW	100				111				
FICR	F/C	W	200				11				
AMRO	P	S	25				111				

PASSERINE - Bird Point Count Data Sheet

09-0636

B 4, 5, 12 (combines/triangulation)

Project Name

Sample Point ID# & Name

9/3/13

0645

0650

Date

Start Time

Stop Time

X coordinate, Y coordinate

myr/jc

2

SE

5

52

Observer

Wind Spd.

Wind Dir.

Sky

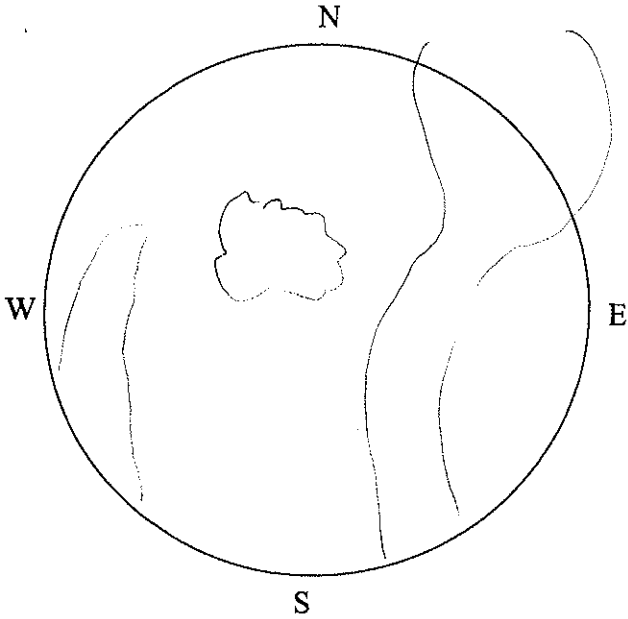
Temp

Dominant (>50%) AES Habitat Type

Other Habitats

Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes: points too close together



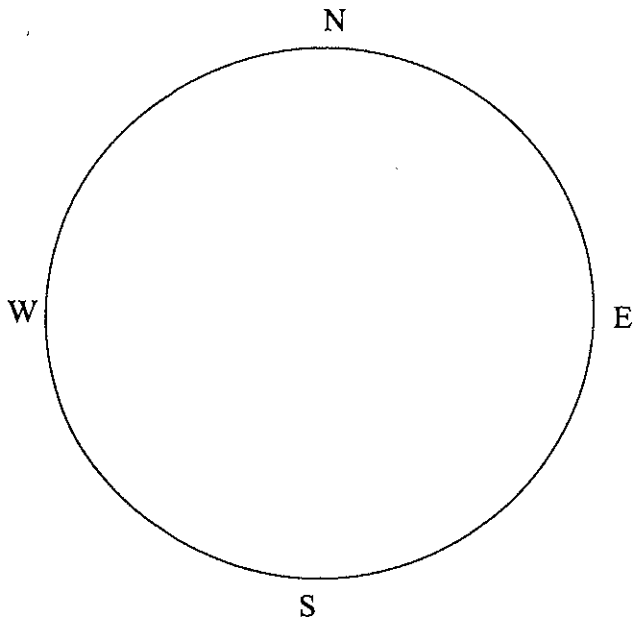
Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
TRES	F	S	2	N	3	///					
EWST	F	N	25	SW	10	///					
EWBL	C	W	200			///					
AMCR	F					|					
EWBL	P	N	70			|					
WEAL						|					
AMCR	Fo	N	150			|					
AMCR						|					
AMCR	C	N	200				|				
AMCR	F	N	350	S	50		|				
MOLL	Fo/P	N	300				///				
HOSP	C	NE	400				||				by houses

→ from NW - ~~WSW~~ WSW (total = 20)

PASSERINE - Bird Point Count Data Sheet

Project Name 09-0636 Sample Point ID # & Name 36 (modified)
 Date 5/3/13 Start Time 0731 Stop Time 0736
 Observer gjs/je Wind Spd. 1-2 Wind Dir. SE Sky 0 Temp 54.0

X coordinate, Y coordinate _____
 Dominant (>50%) AES Habitat Type _____
 Other Habitats _____



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes:

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
mall	F	S	75	001	15	111					
SOSP	C	NW	10			1					
RMBG	C	E	25			1					
BHCO	C	N	10			1					
WOSP	C	S	50			1					
RHST	F	NW	75	SE	15	1					
AMCR	F	S	150	W	20	1	1				
RUBL	F	SE	75	S	15	1					
NOGA	C	SE	200			1	1				
RBBU	S	S	500	S		111					
BCLD	C	N	7								
KILL	C	S	30			1	1				
TUVU	S	S	750	E	50		1				

PASSERINE - Bird Point Count Data Sheet

89-0636

Project Name

Sample Point ID # & Name

5/13/13

0701

0706

Date

Start Time

Stop Time

X coordinate, Y coordinate

Bioswale / Landfill

Observer JG

Wind Spd. 1

Wind Dir. SE

Sky 0

Temp 53°

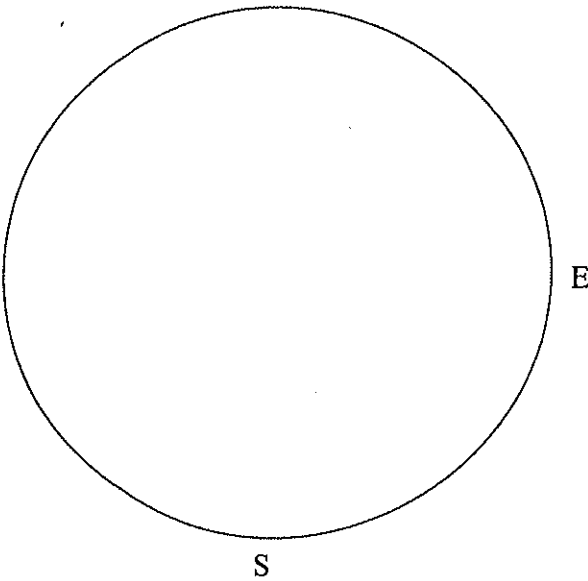
Dominant (>50%) AES Habitat Type

Other Habitats edge forest

N

Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes:



Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
RTHA	P/F	W	50								
MOLL	P	W	10								
KILL	P	W	25								
AMPJ	C/T	VAR				x 4					
RNBL	C/T					x 9					
PIND	F	S	30	S	25	1					
FICR	C	NE	150			1					
BRER	C	N	100			1					
WAVI	C	NE	75			1	1				

PASSERINE - Bird Point Count Data Sheet

090636

B-9

Project Name _____ Sample Point ID # & Name _____

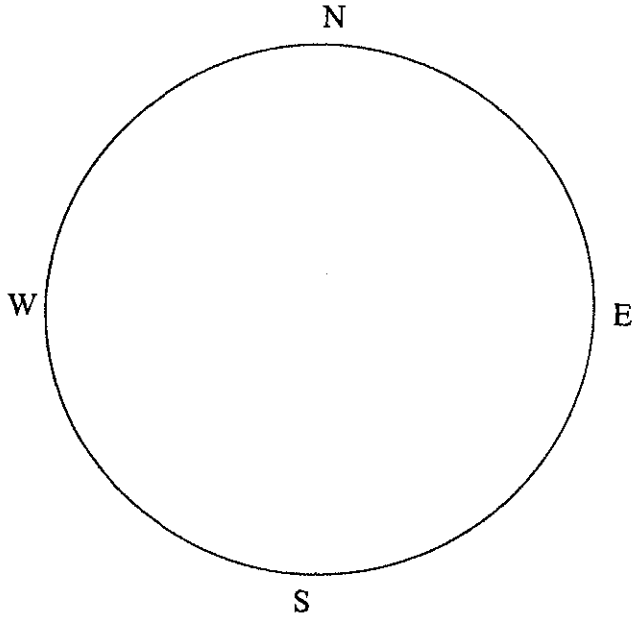
Date 5/3/12 Start Time 0609 Stop Time 0614

Observer gm/sc Wind Spd. 01 Wind Dir. SE Sky 0 Temp 58°

X coordinate, Y coordinate _____

Dominant (>50%) AES Habitat Type _____

Other Habitats _____



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes: *ng + F*

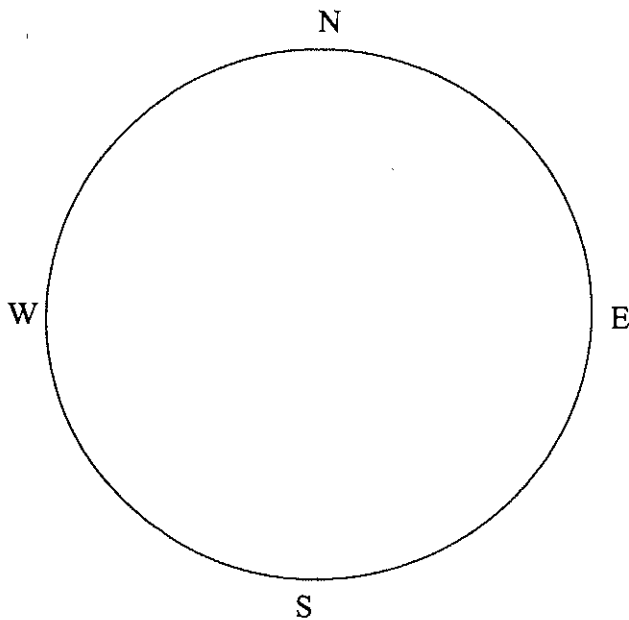
Lithobated sp. in stream (2)

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
RWXL	C	NW	75			1/1					
NOLA	C	NE	50			1					
MODU	F	S	5	SW	15	1					
AMRO	P	S	75			1					
CPWR	C	S	100			1					
KILL	C	W	300			1					
SOSP	C	N	25			1					
AMRO	P	N	20			1					
RARS	C	N	150			1					

PASSERINE - Bird Point Count Data Sheet

Project Name: 09-0636 Sample Point ID # & Name: B10
 Date: 5/3/13 Start Time: 7:58 Stop Time: 08:03
 Observer: myjs Wind Spd.: 1 Wind Dir.: SE Sky: 0 Temp: 57°

X coordinate, Y coordinate: _____
Forested WL
 Dominant (>50%) AES Habitat Type: _____
 Other Habitats: developed/urban/landfill



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes: WT DEER

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
OUEN	C	SW	10			1					
TUTI	C	N	75			1					
WDLI	C	N	20			1					
RIWU	C	S	100			1					
BJCO	C	SW	10			1					
BLVA	C	S	100			||||	||				
CAWR	C	W	75			1					
KMRD	C	SE	25			1					
RBLD	C	W	15			1					
WBNH	C	W	25			1					
NOXA	C	S	50			1	1				
AMCR	F	NW	75	N	S	1					
AMCR											
KMGD	C	W	50				|||				
SOSP	C	NW	75				1				

PASSERINE - Bird Point Count Data Sheet

APBP 09-0632

B11

Project Name

Sample Point ID # & Name

9/3/13

0542

0547

Date

Start Time

Stop Time

X coordinate, Y coordinate

mp/yk

1

S

30

13.3° (55.6)

Observer

Wind Spd.

Wind Dir.

Sky

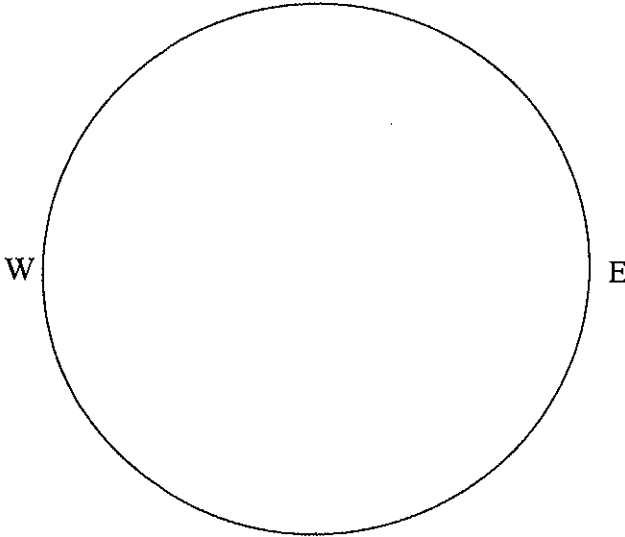
Temp

Dominant (>50%) AES Habitat Type

N

36% rh

Other Habitats



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

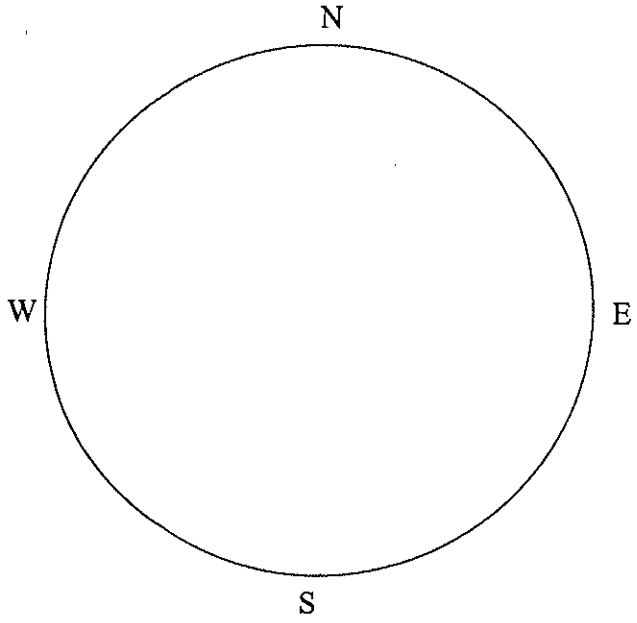
Notes: NGTF

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
AMRO	C	SSW	20			1					
BHO		NE	100			1					
BHO		NE	200			1					
AMRO	P/F	W	410			1					
SOSP		NNE	100			1					
BLJA		S	200			1					
RWBL		W	10			1					
EATO		S	15			1					
EATO		N	150			1					
SOSP		N	75			1					
FISP		N	100				1				
AMCR	F	N	250	S	20		1/1/1				
AMED	C	E	150				1				
DUWD		E	25				1				
MAK	F	N	300	E	50		1/1/1				
LAGO	C	W	200				1				
EUST	P/F	N	200	SE	10		1				
BCCH	C	E	50			1					
MDDU	C	NW	150				1				

PASSERINE - Bird Point Count Data Sheet

Project Name 010636 Sample Point ID # & Name B14
 Date 9/3/13 Start Time 0720 Stop Time 0725
 Observer myh/16 Wind Spd. 0-1 Wind Dir. S Sky 0 Temp 54.0

X coordinate, Y coordinate _____
 Dominant (>50%) AES Habitat Type _____
 Other Habitats _____



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		
F = flying		Upland Coniferous Forest
S = soaring		Upland Mixed Forest
P = perching or on water		Wetland Forested
Fo = foraging		Wetland Shrub-Scrub
MD = mating display		Wetland Emergent
O = other		Open Water

Notes: YRWA (111) by

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
YNAR	T	S	30	var	2-5	11					territorial chase
YNAR	C/T/F	VAR	R			17+					
BNGO	C	E	150			1					
EUST	CF	SW	50	N	20	1					
WILL	F	S	10	var	15	1					
MILL	F	S	50	NW	10	1111					
POSP	C	S	50			1					
MOXD	P	W	75				1				
ANRO	C	E	100				1				
WGO	C	S	500				1111				

PASSERINE - Bird Point Count Data Sheet

B-15

Project Name

5/3/13

0840

Sample Point ID # & Name

0845

Date

Start Time

Stop Time

JG, MJM
Observer

~10 mph
Wind Spd.

N
Wind Dir.

clear
Sky

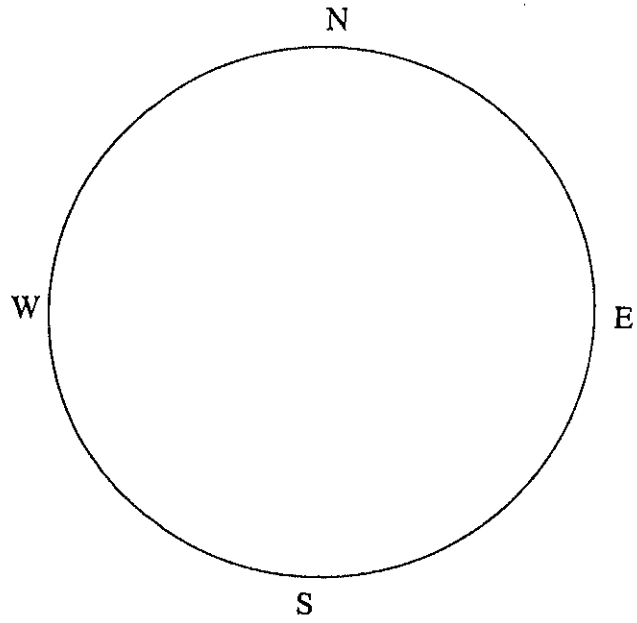
62°F
Temp

X coordinate, Y coordinate

Land Fill Test Plots

Dominant (>50%) AES Habitat Type

Other Habitats Pine Oak Forest / Urban developed



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3 mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes:

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
AMTU	O	N	40		0	///					
AMCR	F/C	N	150	W	20	///	||				
EUST	F	S	30	W	10	///					
EATO	C	N	250	—		1					
RWBL	P	W	15	—	2	1					
SOSP	S	N	150	—		1					
AMRO	C	NE	150	—		1					
DOWP	C	SW	100			1					
BHCO	C	SW	50			1					
PIWA	C	N/NE	300			1					

PASSERINE - Bird Point Count Data Sheet

Project Name 09-0636 Sample Point ID # & Name B16

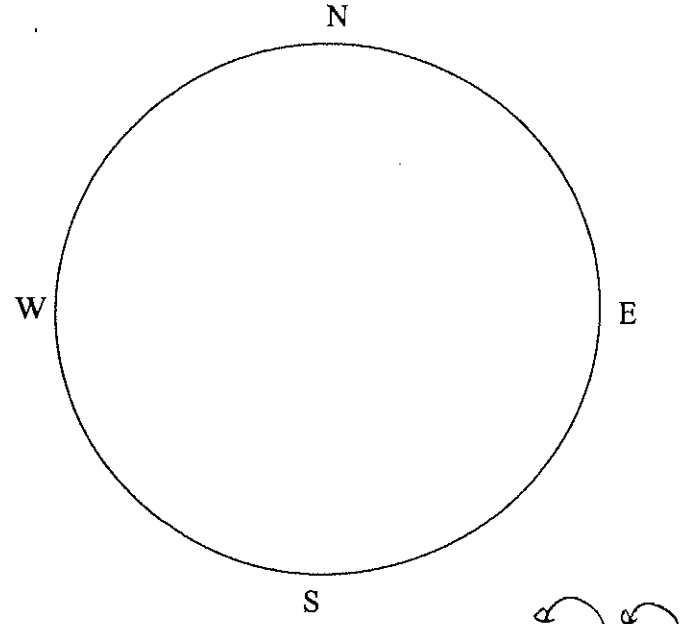
Date 5/3/13 Start Time 0628 Stop Time 0633

Observer gn/x Wind Spd. 1 Wind Dir. SE Sky 20 Temp 57°

X coordinate, Y coordinate
cleared / swampy

Dominant (>50%) AES Habitat Type

Other Habitats _____



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes:

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
CHSP	C	N	125		1						
COXR		N	150		1						
EUST		N	40		111						
BJA	C/F	NE	100	W/20	1						
DNCO		S	50		1						
WRM		E	150		1						
AMRO		S	40		1						
DWD		NW	200		1						
HWR	C	NE	150		1						
NOMO	C	E	200		1						
AMGO	C/F	W			1						
JSFP	C	E	100		1						
BCCH	C	E	75			1					
MODU	P	NNE	250			1					
KILL	C	W	150			1					
NOFL	C	E				1					

PASSERINE - Bird Point Count Data Sheet

09-0636

B 17

Project Name

Sample Point ID # & Name

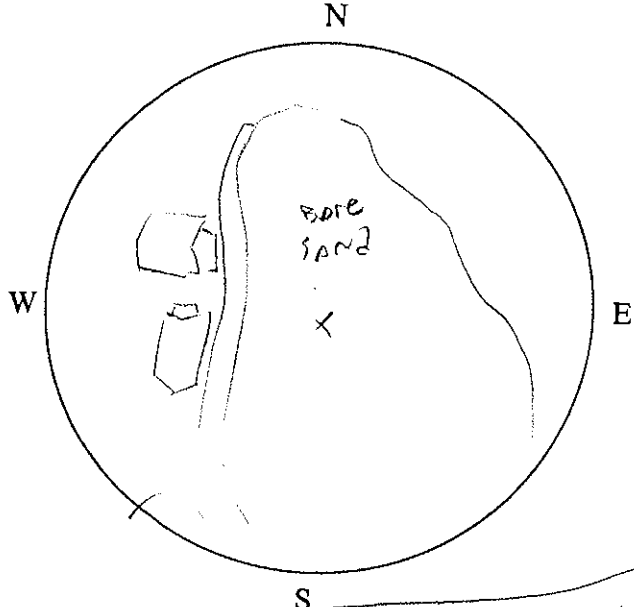
Date 5/3/13 Start Time 0824 Stop Time 0829

Observer m/s Wind Spd. 2 Wind Dir. SE Sky 0 Temp 60°

X coordinate, Y coordinate

Dominant (>50%) AES Habitat Type

Other Habitats



Legend table for Wind, Sky, and AES Habitat Type with corresponding codes and descriptions.

Notes: noise pollution

Main data table with columns for Alpha Code, Behav. Code, Dir. from Point, Dist. from Point (m), Flight Dir., Ht. (ft or m), and time intervals (0-3 min to 15+ min).

PASSERINE - Bird Point Count Data Sheet

Alb. Landfill Restor

B-1

Project Name

Sample Point ID # & Name

6/12/13

OS14

OS21

Date

Start Time

Stop Time

X coordinate, Y coordinate

JLS MJM

9-3

W/SW

Partly cloudy

55°F

Observer

Wind Spd.

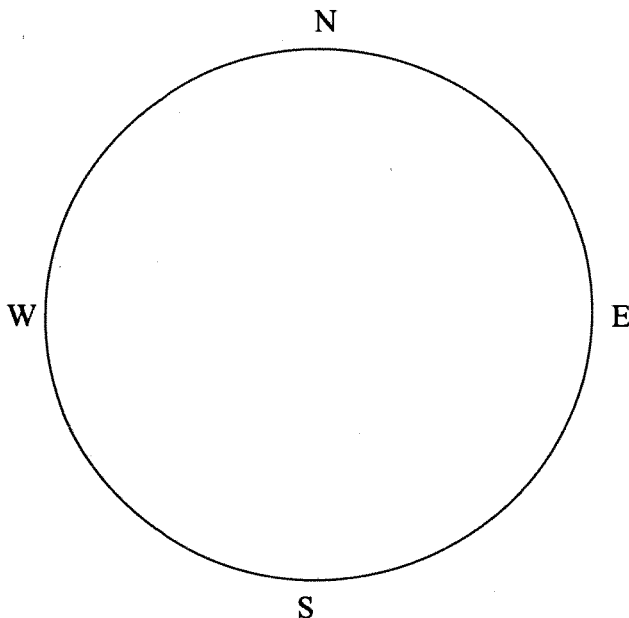
Wind Dir.

Sky

Temp

Dominant (>50%) AES Habitat Type

Other Habitats



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes:

Green Frog (?) calling
Sig. noise disturbance from generator.
cottontail

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
RWBL	C/P/T	W	25			|					
R		S	15			|					
		S/SE	30			|					
		S/SE	55			|					
		E	75			|					
		E	5								
WAVI	C	E/NE	25			|					
REVI	C	E/NE	30			|					
SOSP	C	E	75			|					
AMCR	C	N	150			|					
AMCR	C	NE	200			|	|				
SOSP	C	N	20				|				
GRCA	C	NE	20				|				
AMCR	C	NW	150				|				
TUVU	F	S	150	N	50		||||				Coming off of FOF roost in tree line
TUVU	F	W	300	VAR	50(100)		||||				same ↑
MALL	C	N	150				|				

PASSERINE - Bird Point Count Data Sheet

Alb. Land. Restor

B-2

Project Name

Sample Point ID # & Name

6/12/13

0524

0531

Date

Start Time

Stop Time

X coordinate, Y coordinate

JG MJM

2:3

S/SW

partly cloudy 55°F

Observer

Wind Spd.

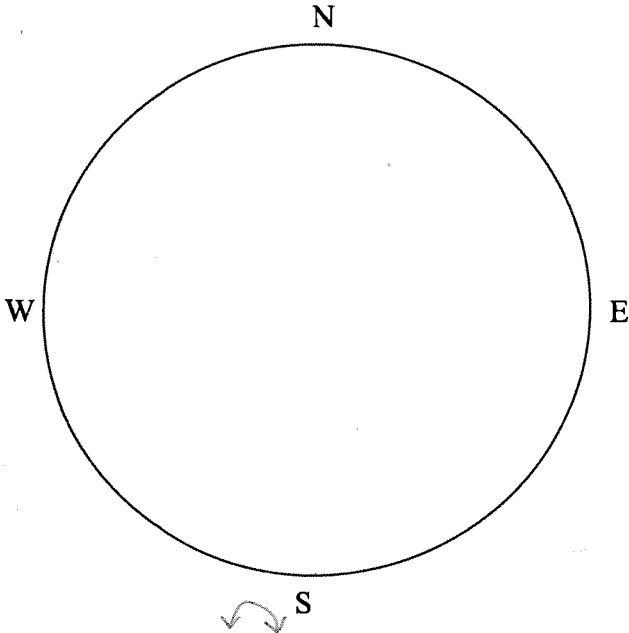
Wind Dir.

Sky

Temp

Dominant (>50%) AES Habitat Type

Other Habitats



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes: wind gusty

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
SOSP	AC	30	N			1					
CCFL	AC	50	N			1					
RWBL	C/P/T	50	W			1					
		30	S								
		5	N								
		30	S			1					Territorial dispute w/ 2 males
TUVU	F	400	SW	VAR		18					Soaring over open face of L.F.
AMCR	C	150	N			11					
WALL	F	75	N	W	30	11					
WAVE	C	100	NW			1					
COGR	F	15	N	E	20	1					
BARS	F	0	E	N/NE	15		1				
EVST	F	20	N/NE	S/SW	15		1				
EAKI	C	10	N				1				
AMRO	C	110	N				1				

PASSERINE - Bird Point Count Data Sheet

Alb. Landfill

B-3

Project Name

Sample Point ID # & Name

6/12/13

050Z

0509

Date

Start Time

Stop Time

JG MJM

2-3

W/SW

overcast

55°F

Observer

Wind Spd.

Wind Dir.

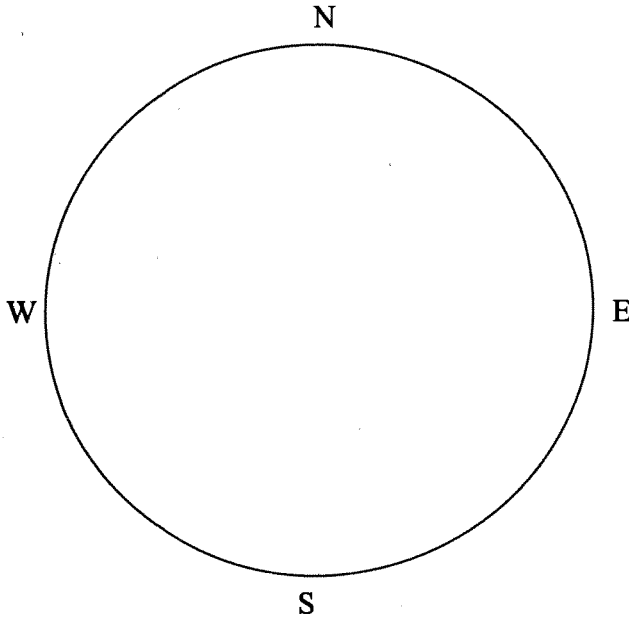
Sky

Temp

X coordinate, Y coordinate

Dominant (>50%) AES Habitat Type

Other Habitats



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes:

spring peeper calling (1)
green Frog calling (4)

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
RWBL	C/P	S	10			|| → → →					
RWBL	C/P	S/SE	30			| → →					
RWBL	C/P	S/SE	50			| → →					
SPSA	C	W	20			|	|				
AMCR	F	SW	75	N	30	||					
MALL	F	S	5	E	3	|					
KILL	C	S	60			|					
AMRO	F	W	100	W	10		|				
WITU	C	E	100				|				
HACK	C	SE	100				|				
BANS	F/C	N	1	VAR	10-20			||			
MALL	F	N	150	SW	15			||			
AMCR	F/C	N	90	VAR	10-30			||			
TRES	F/C	N	1	VAR	10-20			|			
REVI	C	E/SE	40					|			

PASSERINE - Bird Point Count Data Sheet

B-4

Project Name _____

Sample Point ID # & Name _____

Date 6/12/12 Start Time 0553

Stop Time 0600

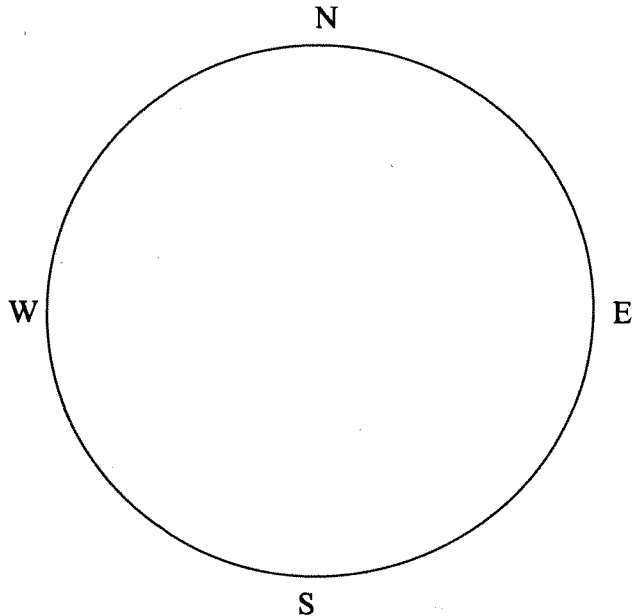
X coordinate, Y coordinate _____

Observer M/JG Wind Spd. 2-3 Wind Dir. WSW

Sky 5% Temp 56F

Dominant (>50%) AES Habitat Type _____

Other Habitats _____



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes:

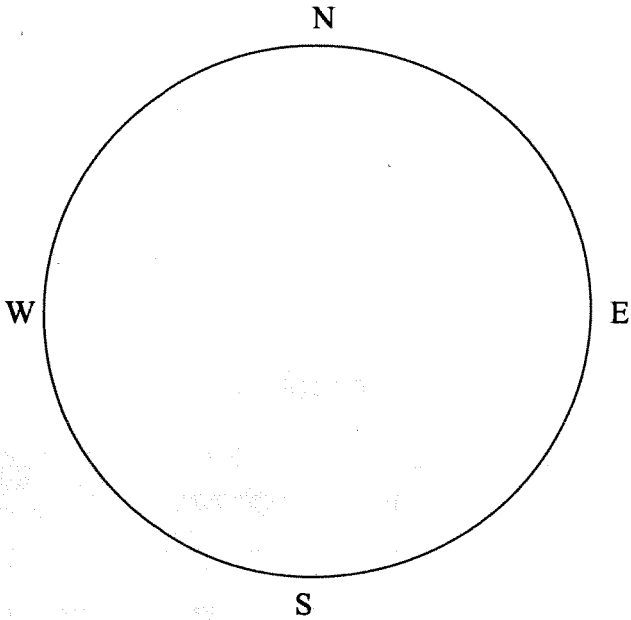
NSFR
WT DEER (BUCK) + 2 DOE

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
WAVI	C	N	75			1					
COCR	P	NE	150			111					
FICK	P	NE	150			1					
YWDL	C	N	250			1					
MOIL	P	N	30			111					
RVBL	C/P	N	25			1					Many territorial disputes
	C/P	W	50			1					
		SW	75			1					
		SW	30			1					
		S	20			1					
SUSP	C	N	75			1					
MODU	F	W	40	N	2	1					
TUVH	Fo	S	200	VAR	10 AGL		11111				
ROGW	Fo	S	200	VAR	10 AGL		111				
AMCR	Fo/F	S	20	N	10		1				carryng food from LF
SPSA	C	W	150					1			

PASSERINE - Bird Point Count Data Sheet

Project Name APBP Sample Point ID # & Name B5
 Date 6/12/13 Start Time 0706 Stop Time 0719
 Observer JG, mjr Wind Spd. 2-3 Wind Dir. W Sky 0 Temp 60

X coordinate, Y coordinate _____
 Dominant (>50%) AES Habitat Type _____
 Other Habitats _____



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		AES Habitat Type
F = flying		Upland Coniferous Forest
S = soaring		Upland Mixed Forest
P = perching or on water		Wetland Forested
Fo = foraging		Wetland Shrub-Scrub
MD = mating display		Wetland Emergent
O = other		Open Water

Notes: cottonwood

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
NOFL	C	N	50			1					
AM60	C	N	30			1					
MOU	P	W	60			(13)					in creek bed
BHCO	C	E	40			1					
AMCR	F	SN	75	SE	2	1					
AMCR	C	SW	150			1					
YWAR	C	N	50			1					
AMCR	F	S	25	var	2	11					chasing each other
AMCR	C	SW	150				1				
EBGW	F	S	300	var	50		111				
YWAR	C	NW	100				1				center song
SOSP	C	NW	100				1				
SOSP	C	N	10				1				
GCFL	C	NE	90				1				
SS.HA	F	NW	100	N	10		1		1		Big Female Harassed by crows
AMCR	P	SW	100				13				
TRSW	FO	SE	10	VAR	1-10		1				Gleaning insects over nursery
AMCR	P	W	200						30		perched on ground

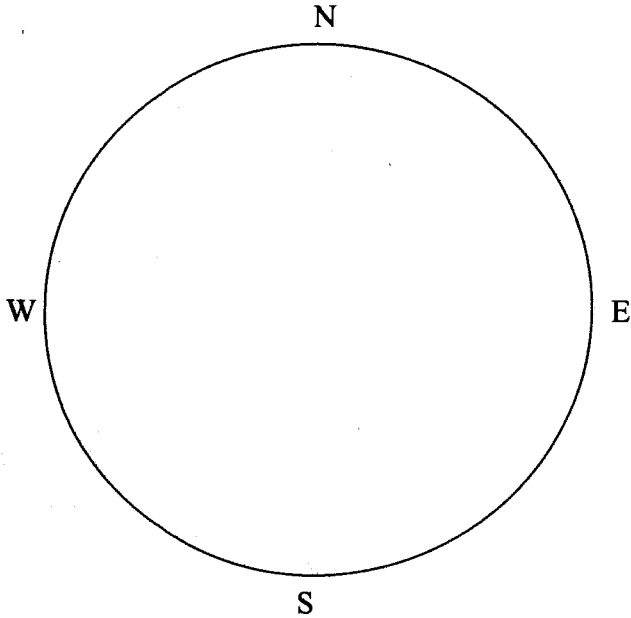
PASSERINE - Bird Point Count Data Sheet

Project Name APBP Sample Point ID # & Name B6
 Date 6/12/13 Start Time 0653 Stop Time 0701
 Observer mg/jg Wind Spd. 2-3 Wind Dir. SW Sky 0 Temp 58°

X coordinate, Y coordinate _____

Dominant (>50%) AES Habitat Type _____

Other Habitats _____



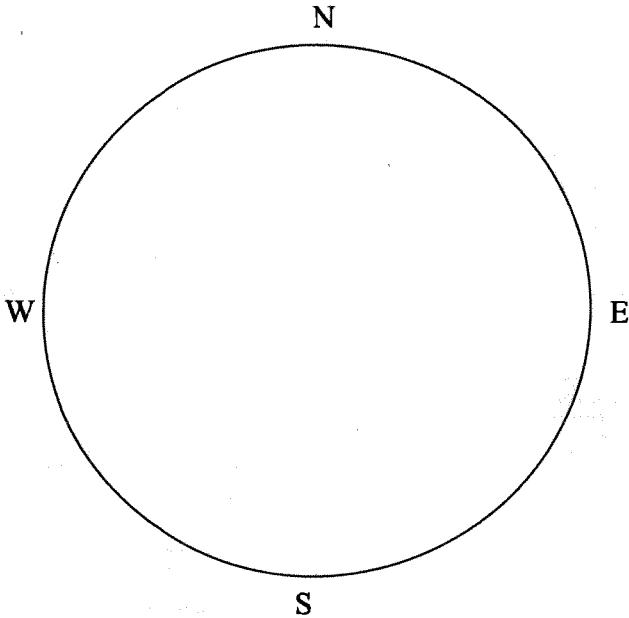
Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes:

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
FICR	C	S	200			1					
RMGO	P	S	40			111					
SOSP	C	W	50			1					Banded Nole f. ~ stub 1- up
AMCR	C	SW	300			11					
MOLK	P	SW	75			11					in up
COGR	F	S	10	W	20	1					
GCFL	C	SW	200			1					
AMGO	C	N	50			1					
RWBL	C	SE	200				11				
YWAR	C	NE	10				1				
TVVH	F/S	E	100	N	20		1				
SSHQ	F/Fo	NE	20	W	20		1				resting in pines?
MOLL	F	S	200	SE	30			11			
RWBL	F	SW	5	NE	20			11			
MOTD	F	W	20	S	50			1			
EUST	Fo/F	S	500	VAR	VAR			75+			
TRES	F	SW	75	VAR	40			1			

PASSERINE - Bird Point Count Data Sheet

Project Name: APBP Sample Point ID # & Name: B7
 Date: 4/12/13 Start Time: 0615 Stop Time: 0622
 Observer: JG/mgm Wind Spd.: 2-3 Wind Dir.: SW Sky: 0 Temp: 57
 X coordinate, Y coordinate:
 Dominant (>50%) AES Habitat Type:
 Other Habitats:



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes:

wind gusts in trees is loud

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
BAOR	C	NW	30			1					
WAVI	C	NE	15			1					
TUTI	C	NW	20			1					
RBWD	C	NW	20			1					
SOSP	C	NE	75			1					
AMCR	C	NW	150			1					
FWBL	C	SW	50				1				
DEVI	C	S	25				1				
EATO	T/C/Fo	S	10				1				skulking on Forest Floor
PNBL	C	NE	50				1				
RCFL	C	WNW	90				1				
LEDW	C	N	10				5+				
EATO	C/T	S	40					1			center singing w/ other EATO
AMRO	F	S	10	W	2		3	1			
AMRO	F	S	15	SL	8		3	1			
RMGO	C	N	75					111			

PASSERINE - Bird Point Count Data Sheet

Project Name APBP

Sample Point ID # & Name B8

Date 6/12/13

Start Time 0607

Stop Time 0619

X coordinate, Y coordinate

Observer JG/mgr

Wind Spd. 1-2

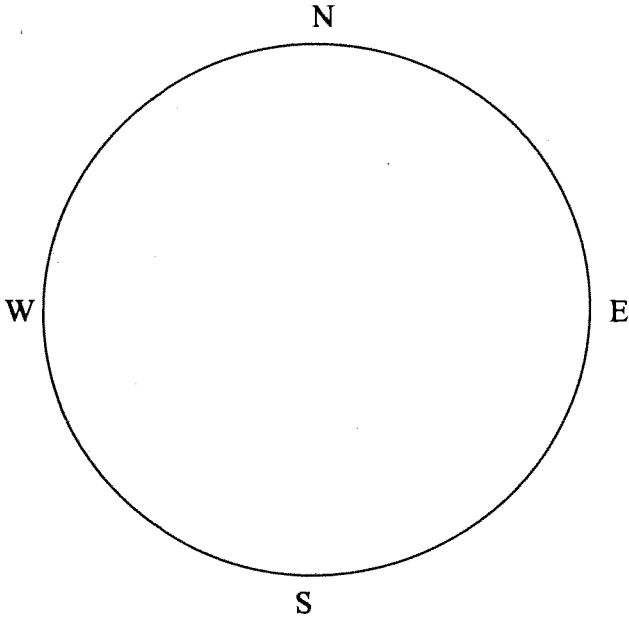
Wind Dir. SW

Sky 0

Temp 56

Dominant (>50%) AES Habitat Type

Other Habitats



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes: noise disturbance from highway

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
MTI	C	NW	50			1					
AMCR	C	N	50			11					
RWBL	C	SE	75			1					
RWBL	C	S	70			1					
WAVI	C	NE	25			1					
AMRO	P	SW	70			11					
EAUP	C	N	300			1					
BLOP	P/C	W	70			1					
EMST	P	SW	100				1				

PASSERINE - Bird Point Count Data Sheet

B9

Project Name APBP Sample Point ID # & Name _____

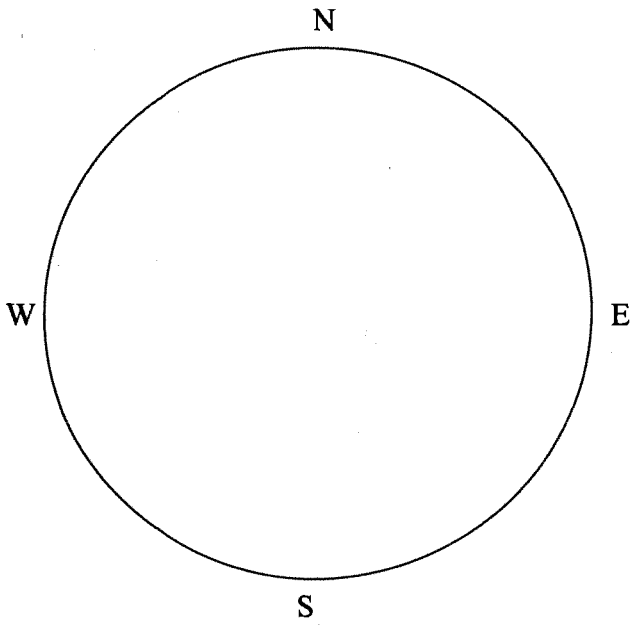
Date 6/12/13 Start Time 0759 Stop Time 0805

Observer JSB Wind Spd. 2 Wind Dir. W Sky 0 Temp 60°F

X coordinate, Y coordinate _____

Dominant (>50%) AES Habitat Type _____

Other Habitats _____



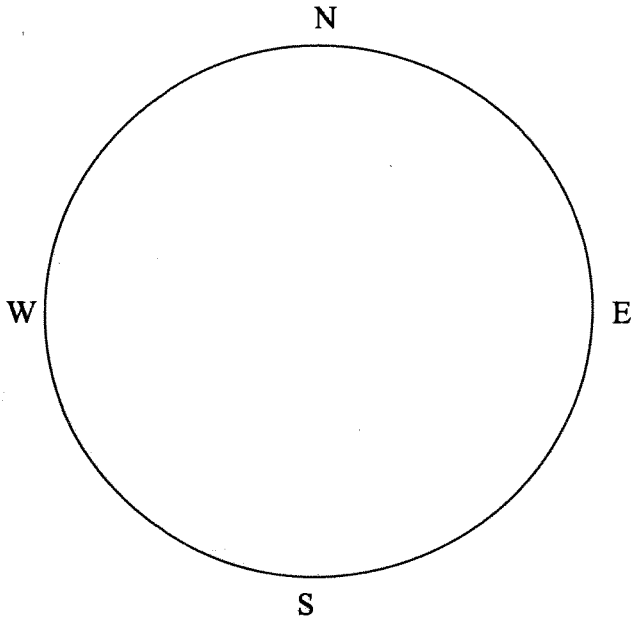
Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes:
 noise pollution (Hwy), wind + LF equip)
 TM
 Box W - acelznd

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
INBA	C	NE	10			1					
BLJA	C	S	40			1					
CAWR	C	N	50			1					
CEW	C	W	10			111+					
SOSP	C	SW	25				1				
RTHA	C	SW	50				1				

PASSERINE - Bird Point Count Data Sheet

Project Name APBP Sample Point ID # & Name B-10
 Date 6/12/13 Start Time 0750 Stop Time 0755
 Observer J6, MJM Wind Spd. 2 Wind Dir. W Sky 20% Temp 60°F
X coordinate, Y coordinate _____
Dominant (>50%) AES Habitat Type _____
Other Habitats _____



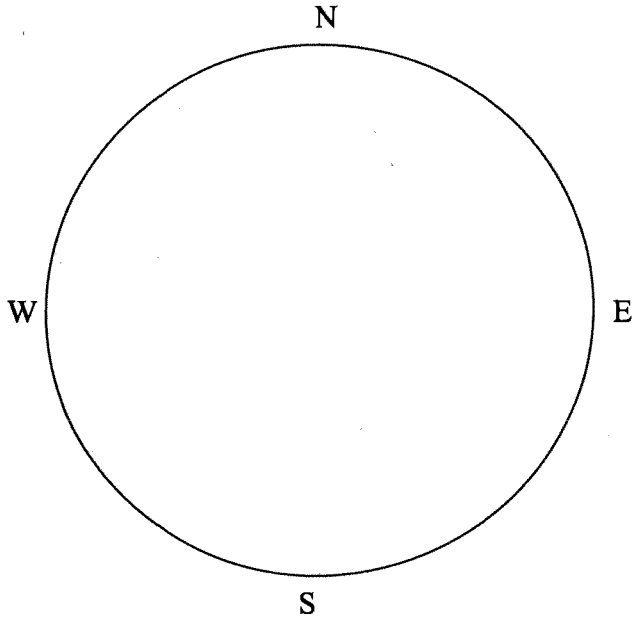
Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes: NS FR

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
IATO	C	NE	30			1					
GRCA	C	S	30			1					
ESTO	C	N	50			1					<i>counting</i>
ROBR	C	SW	60			1					
REVI	C	S	20			1					
SOSP	C	E	50			1					
AMCO	C	NNE	25			1					
AMRO	C	N	75				1				
SAWP	C	SW	60				1				

PASSERINE - Bird Point Count Data Sheet

Project Name: Alb. Land. Restor Sample Point ID # & Name: B-12
 Date: 6/12/13 Start Time: 0539 Stop Time: 0549
 Observer: JG, MJM Wind Spd.: 2-3 Wind Dir.: S/SW Sky: clear Temp: 55°F
 X coordinate, Y coordinate: _____
 Dominant (>50%) AES Habitat Type: _____
 Other Habitats: _____



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes:

Black cut on L.F.
 Generator noise lower here
 Dog, coyote and deer tracks.

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
TRES	F	N	10	VAR	2	1					
EUST	F	N	15	S	10	(7) + 5					
MOBO	F	N/NE	150	NE	20	1					
SOSP	C	NE	200			1					
RWBL	F	N	30	W	15	1					
JPSA	C	W	60			1 →					incessant calling
SOSP	C	S	75			1					
AMCR	P	N	250			11					
TUVU	P	S/SW	350			(16)					
SOSP	C	W	40				1				
BANS	C	S	S	VAR	?		||||				
KILL	C	200	SE				1				
RWBL	C	150	W				1				
↓	C	100	W				1				
BHCO	C	150	W/SW				1				
AMRO	F	10	N	N	20		1				
MALL	F/	300	N/W	N/VAR	0-50		|||				Flushed from ↓, circled back to ↓
RBGU	F/FO	300	SW	VAR	VAR		|||				(AGL)
EUST	FO	W	200	VAR	0-2		200+				

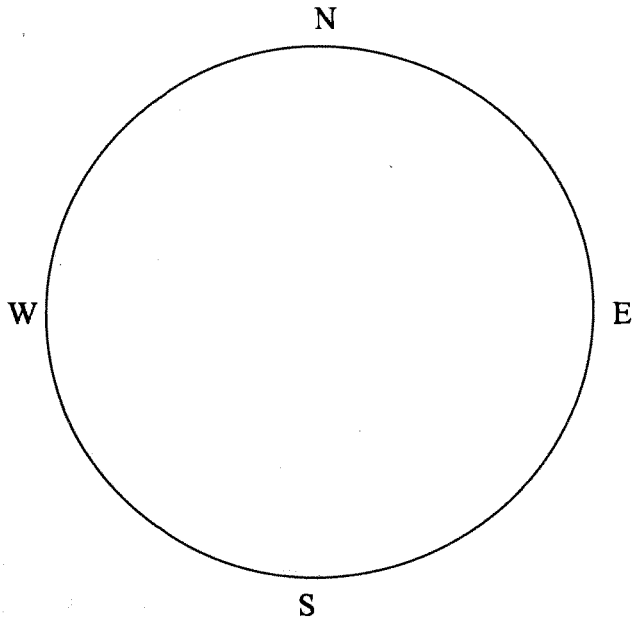
PASSERINE - Bird Point Count Data Sheet

Project Name APBP B-13
Sample Point ID # & Name
Date 6/12/13 0638 0646
Start Time **Stop Time**
Observer 36, MSM **Wind Spd.** 2 **Wind Dir.** SW **Sky** 10% **Temp** 58°F

X coordinate, Y coordinate

Dominant (>50%) AES Habitat Type

Other Habitats



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		AES Habitat Type
F = flying		Upland Coniferous Forest
S = soaring		Upland Mixed Forest
P = perching or on water		Wetland Forested
Fo = foraging		Wetland Shrub-Scrub
MD = mating display		Wetland Emergent
O = other		Open Water

Notes: Green Frog calling from v.p. (few)
Banded (Silver) Song Sparrows on root mass in v.p.

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
BLJA	F	E	20			1					Flushed from root stump in v.p.
AMRO	F	N	10			1					Gathering nesting material
JOSP	C	W	5			1					
YUAR	C	W	60			1					
GCFL	C	W	75			1					
↓	C	E	20			1					
COYT	C	S	30			1					
CEWA	F	S	50	W	15	1					
AMRO	C	W	70			1					chip call
RUBL	C	SW	100			1					
TUTM	C	W	100			1					
AMCR	C	E	200			1					
WAVI	C	W/SW	100			1					
SOSP	C	NE	70			1					
SPSA	C	E	150			1					
AMRO	P/Fo	E	30			1					
BLJA	F	W	35	N	5		1				
GRCA	P	SW	3				1				Silent flying together. Breed. pair likely
SOSP	C	N	75				1				
BAOR	C	W	100				1				
BAOR	F	N	75	S	20			1			carrying food
TUNV	Fo/s	S	400	VAR	VAR			7			
BHCO	C	SW	20					1			

PASSERINE - Bird Point Count Data Sheet

B14

APBR

Project Name

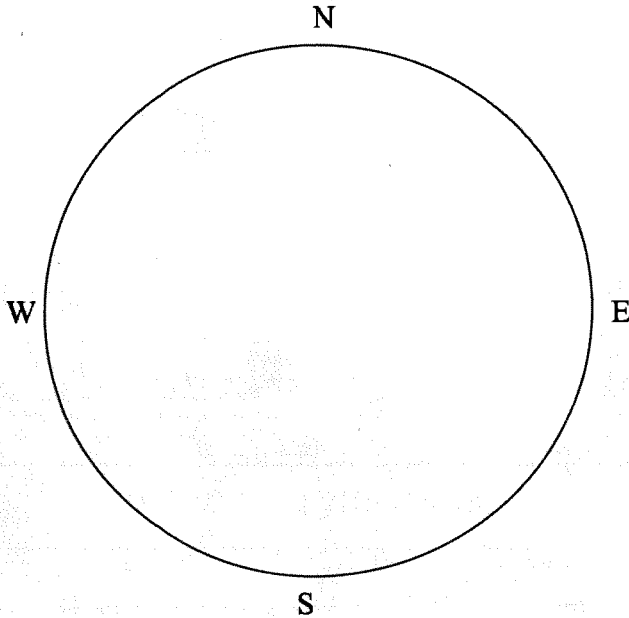
Sample Point ID # & Name

Date: 6/12/0
 Start Time: 0627
 Stop Time: 0634
 Observer: MM/JS
 Wind Spd.: 2
 Wind Dir.: SW
 Sky: 10%
 Temp: 28°

X coordinate, Y coordinate

Dominant (>50%) AES Habitat Type

Other Habitats



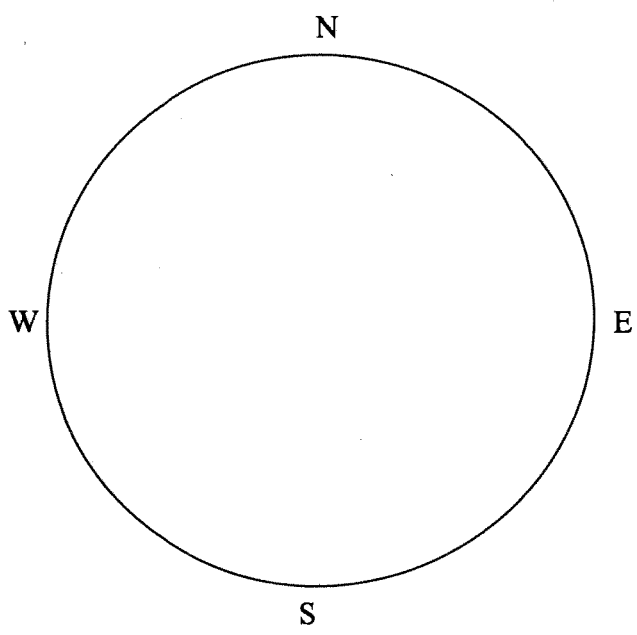
Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes:

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
BAOR	C	N	25			1					
CEW	C	S	40			1					
CCFL	C	N	40			1					
COGR	F	SW	30	W	10	1					
RWBL	C	NE	75								from air line
CCFL	C	NE	100			1					
AMGO	C/F	S	20	W	10	1					
YWR	C	S	40			1					
TAU	C	W	75			1					
RWBL	C	SW	50			1					
AMCR	F	S	300	VAR	30-80		1111				
SOASP	C	SE	120				1				
WAVI	C	E	200				1				
SOASP	C	S	20					1			
WAVI	C	W	50					1			
CAZE	C	NW	40					1			
COGR	F	S	5	N	20			1			Twds BB swamp
CEW	P/Fo	W	30					1			

PASSERINE - Bird Point Count Data Sheet

APBP B-15
 Project Name: APBP
 Sample Point ID # & Name: B-15
 Date: 6/12/13 Start Time: 0858 Stop Time: 0911
 Observer: JB, MJA Wind Spd: 4 Wind Dir: NW Sky: 85% chd Temp: 60°F
 X coordinate, Y coordinate: _____
 Dominant (>50%) AES Habitat Type: _____
 Other Habitats: _____



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		AES Habitat Type
F = flying		Upland Coniferous Forest
S = soaring		Upland Mixed Forest
P = perching or on water		Wetland Forested
Fo = foraging		Wetland Shrub-Scrub
MD = mating display		Wetland Emergent
O = other		Open Water

Notes:

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
TUVU	P	U/NW	3-30			①					perched/sunning on hill top
RWBL	T	NW	30			|					
BARS	FO	N	30	VAR	0-5	7					
AMGF	C	N	75			||					
YWAR	C	W	100			|					
JNBV	C	S	75			|					
AMCR	C	N	120			|					
BLJA	C	NE	150			|					
RWBL	C	E	100			|||					
BARS	FO	NE	30			|	|				
WAVI	C	N	75			|					
CSWA	C	N/NE	100				|				
EATO	C	N	100					|			
SOSP	C	N	120								

PASSERINE - Bird Point Count Data Sheet

APBP

B-16

Project Name

Sample Point ID # & Name

6/12/13

0729

0739

Date

Start Time

Stop Time

JG, MJM

2-3

W

25%

60

Observer

Wind Spd.

Wind Dir.

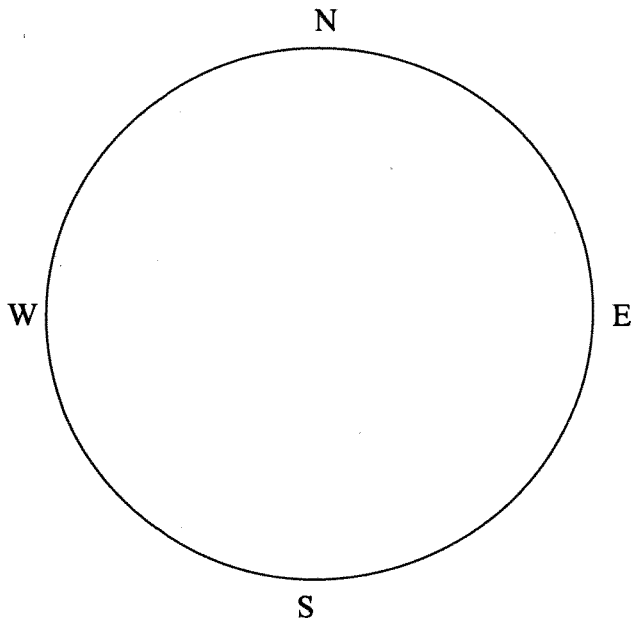
Sky

Temp

X coordinate, Y coordinate

Dominant (>50%) AES Habitat Type

Other Habitats



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

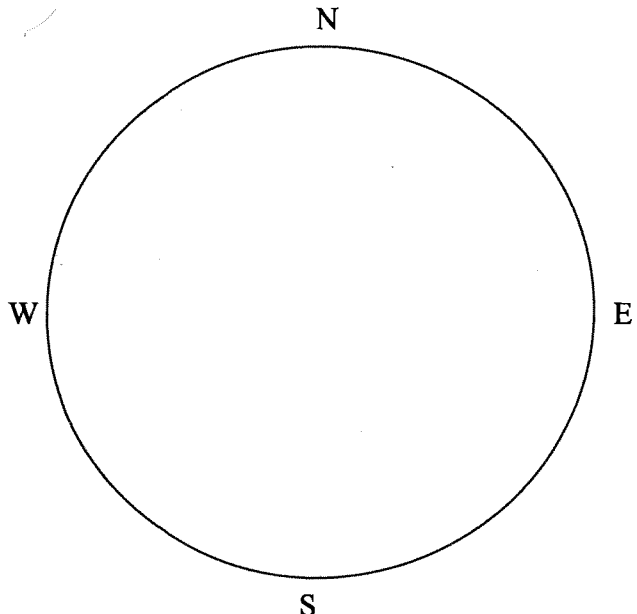
Notes:

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
AMRO	C	W	10			1					Chipping
MDO	F	N	20	S	10	1					
AMRO	C	W	23			1					
SOSP	P	W	15			1					
FISP	C	W/SW	20			1					
BLJA	C	S	25			1					
RUBL	P	U/SW	150			1					on pine tree
BHCO	C/P	W	120			11					
EATO	C	N	35			1					
DLJA	C	N	30			11					
COGR	C	S/SW	100			1					
EAKI	FO	N/NW	60			1					
BAOR	F	N/NW	60	N	20	1					Harassing Kingbird
EUST	C	S	20			1					
TUTM	F/FO	N/NE	30			11					
BCCH	C	NE	15					1			
LEDW	C	NI	40					1			
UNPA	F	N	50	S/SE	15			1			
BARS	F	S/SW	150	SW	15			11			
AMCR	C	S	250					11			
TUVV	S	N	300	NW	70			1			
BRCA	C	W	200					1			
GLFL	C	S	300					1			

PASSERINE - Bird Point Count Data Sheet

Project Name: APBP Sample Point ID # & Name: B-17
 Date: 6/12/13 Start Time: 0814 Stop Time: 0836
 Observer: JG, MJM Wind Spd.: 2-3 Wind Dir.: W Sky: 60° Temp: 60°F

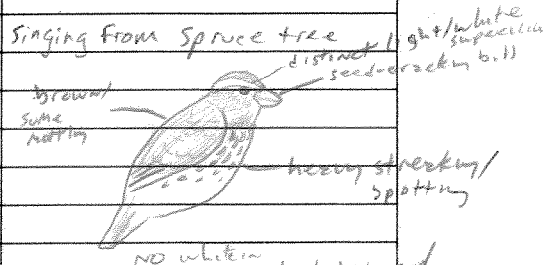
X coordinate, Y coordinate _____
 Dominant (>50%) AES Habitat Type _____
 Other Habitats _____



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes: *Abuse pollution high-load traffic/wind
 E. tiger swallowtail*

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
PIWA	C	SW	40			1					1st spruce/pine planting @ residence
COYE	C	NE	25			1					
RBWD	C	N	10			1					
HAWD	C	N	20			1					
AMRO	C	SE	50			1					
SOSP	C	E	60			1					
PIWA	C	W	50			1					Counter singing
GRCA	C	N	50			1					
CAWR	C	E/E	30			1					
EUST	F	S	150	E	30	11					M+F (male carrying food)
WAVE	C	S	40			1					
CEWA	P	W	75				1				perched in spruce tree
SOSP	C	W/W	75				1				
BHCO	C	W	55				1				
GCFL	C	SW	75					1			
TUTM	C	SW	70					1			
AMRO	FO	S	100					1			
EAPH	C	W	40					1			
BAOR	F	S	50	N	20				1		
UNPA	C	S	40						11		Singing from spruce tree



S:090636:11113717

717

2013 Albany Compliance Report

NOT RBGR
singing → mown-like quality to song
nearby a warbler (2-3 notes though)

PASSERINE - Bird Point Count Data Sheet

Project Name APBTP

Sample Point ID # & Name B1 (just past stream convergence)

Date 6/13/13

Start Time 0811

Stop Time 0818

Observer SU, mym

Wind Spd. 0-1

Wind Dir. _____

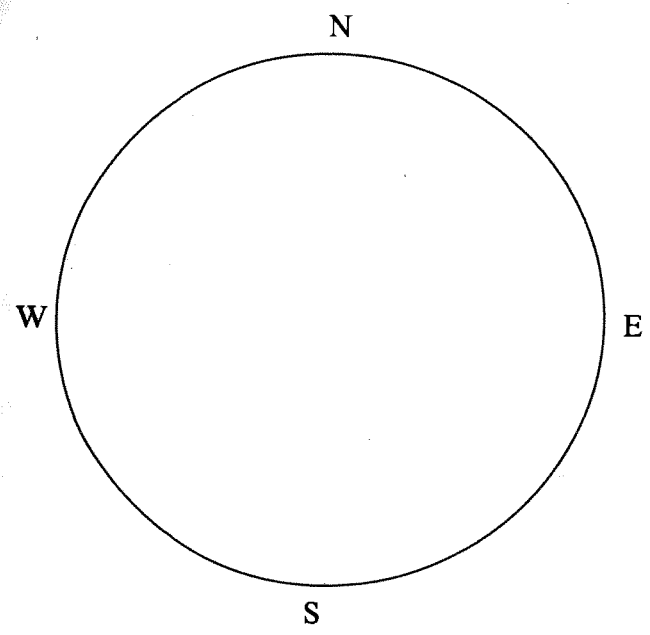
Sky 3+4

Temp 60°F

X coordinate, Y coordinate _____

Dominant (>50%) AES Habitat Type _____

Other Habitats _____



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes:

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
AMRO	P	NNE	5			1					
SoSp	P	E	5			1					
MoDo	P	N	15			1					
RWBB	AGG	Overhead	0			1					♂
RWBB	C	S	10			1					♀
RWBB	C/F	S	30	Var		2					pair
BGGN	C	E	30			1					
GRCA	C	E	15			1					
RWBB	C	SSE	75			1					
RWBB	F	S	50	E	25	1					
TUNV	S	W	200	Var/E	20AGL	2					Lf, slope
NoCa	C	E	100			1					
RBGR	Fo/F	SE	200	Var	10AGL	2					over Lf,
RWBB	F	NNE	30	Var	15	2					♂ terr disp.
CoGR	F	N	20	E	15			1			
AmGr	F	E	150	N	15			1			

PASSERINE - Bird Point Count Data Sheet

APBP

B2 (at turn in stream/forest edge)

Project Name

Sample Point ID # & Name

6/13/13

0820

0820

Date

Start Time

Stop Time

X coordinate, Y coordinate

SV, MM

3-4

59°F

Observer

Wind Spd.

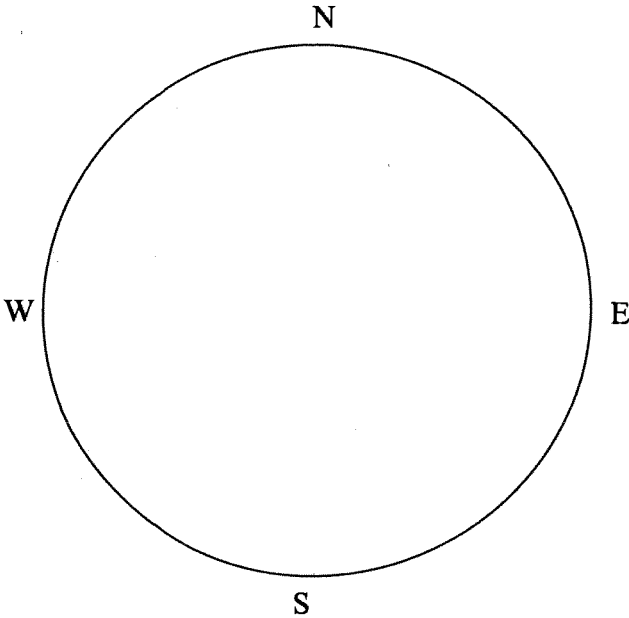
Wind Dir.

Sky

Temp

Dominant (>50%) AES Habitat Type

Other Habitats



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes: Lt rain

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
BCCH	C	N	30			1					
RWBL	C	N	15			1					
WAVI	C	S	40			1					
RWBL	C	E	50			1					
RWBL	C	ENE	75			1					
GRCA	C	NE	15			1					
EUST	F	S	100	SW	20m	2					
PARS	Fo	S	30	Var	3-10m	4					
NoCo	C	N	100			1					
TUWU	S	S	150	Var/N	20m	4					
BHCO	C	NE	25			1					
RWBL	P/Agg	S	20				2				♂ territorial display
MODD	F	S	10	N	7m	1					
TRES	Fo/F	SSW	30	Var	2-5m			1			
EUST	P/Fo	SW	300					200+			on fresh dirt working face Lt

PASSERINE - Bird Point Count Data Sheet

APBP

B-3 (stream considered SE of TA9)

Project Name

Sample Point ID # & Name

6/13/13

0759

0809

Date

Start Time

Stop Time

X coordinate, Y coordinate

SV, mym

Observer

Wind Spd.

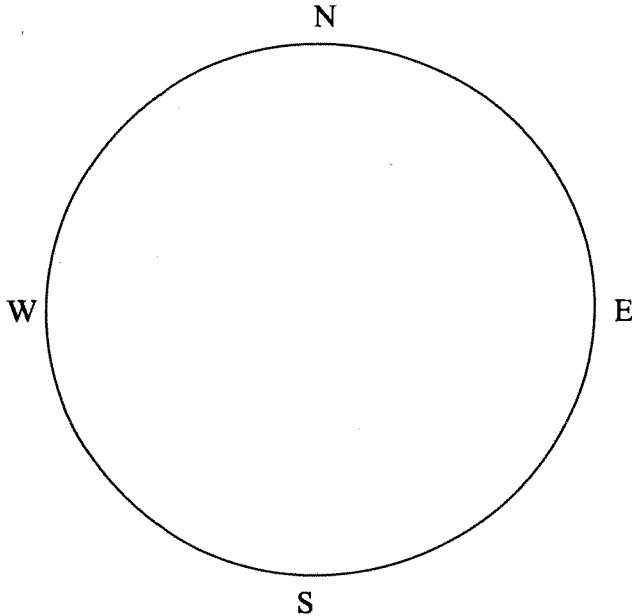
Wind Dir.

Sky

Temp

Dominant (>50%) AES Habitat Type

Other Habitats



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes:

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
KILL	C	WSW	100			1					
RRGW	Fo	SSW	250	Var	Var	3					above landfill
SPSA	F	WSW	20	E	2	1					flow low + researched 30m S
RWBL	F	W	300	S	10 AGL	4					above landfill
LoYE	C	S	5			1					
RWBL	C	S	40			1					
Tres	Fo	S	40	Var	1-10	1					
SPSP	C	NE	75			1					
NbCa	C	N	250			1					
CHCO	C	NNE	200			1					
ELST	C	S	100			1	1				
AMCH	F	W	75	N	20		1				
RWBL	P	W	40				1				
MODD	F	N	250	N	15			1			
BAOR	C	E	30					1			
SoSo	C	W	75					1			
RWBL	AGG	W	300+					3			
Tres	0	S	40					2			Pair: observed copulation over Landfill
TiVU	F	SSW	250	Var	5m AGL						
SoSP	P	S	25								

PASSERINE - Bird Point Count Data Sheet

Project Name APBP

Sample Point ID # & Name B4 (west of TA7)

Date 6/13/13

Start Time 0706

Stop Time 0713

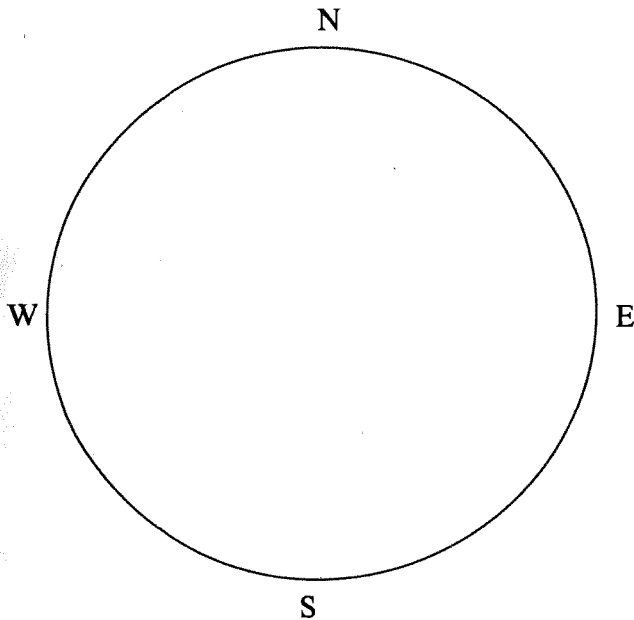
X coordinate, Y coordinate

SV, MM

Observer L Wind Spd. 4 Wind Dir. 4 Sky 4 Temp

Dominant (>50%) AES Habitat Type

Other Habitats



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes: Green Frog calling

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
RBBU	Fo	S	250	Var	1-5m ^{AGL}	5					over landfill
EUST	Fo	S	250	Var	1-10	17					" "
RWBL	C	S	25			1					
RWBL	C	SE	30			1					
RWBL	C	SSW	20			1					
RWBL	C	N	15			1					
RWBL	C	West	50			1					
MALL	P	N	30			12					
BATOR	C	ESSE	30			1					
AMCK	F	E	15	N	10	1					
EUST	F	N	1	S	20	1					
TUTI	C	NNW	75			1					
RWBL	F	E	250	E	30	1	1				
FLOR	C	N	150			1	1				
TRES	F	N	5	S	15	1	1				
TWBU	S	S	500	Var	Var 30 AGL	1					
SPSH	C	SE	100			1	1				
AMCK	F	N	40	E	10		1				perched in treesland 50m N/E
BOYE	C	W	100								

PASSERINE - Bird Point Count Data Sheet

APBP

B5 (by nursery)

Project Name

Sample Point ID # & Name

6/13/13

0552

0602

Date

Start Time

Stop Time

X coordinate, Y coordinate

SV, MM

Observer

Wind Spd.

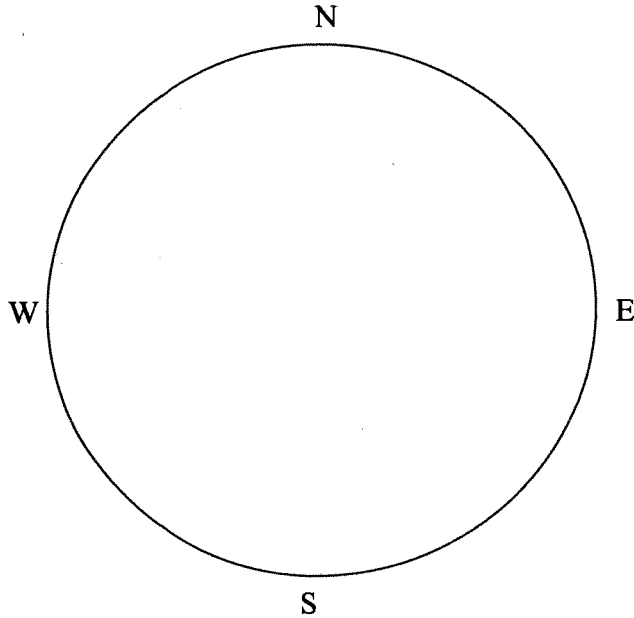
Wind Dir.

Sky

Temp

Dominant (>50%) AES Habitat Type

Other Habitats



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		AES Habitat Type
F = flying		Upland Coniferous Forest
S = soaring		Upland Mixed Forest
P = perching or on water		Wetland Forested
Fo = foraging		Wetland Shrub-Scrub
MD = mating display		Wetland Emergent
O = other		Open Water

Notes:

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
AMCR	P	SSW	50			||||					
AMCR	F	E	350	SE	20	||					
RWBL	F	W	200	SE	15	|					
AMGO	C	N	20			|					
SOSP	C	N	10			|					
BHCO	C	NW	75			|					
SOSP		SW	50			|					
RWBL	P/C	W	40			|					
GCPL	C	W	150			|					
YNAR	C	NE	75			|					
TRES	F	NE	50	N	10	|					
NOFL	C	N	150			|					
YWAR	C	W	120			|					
COVE	C	W	50			|					
YWAR	C	NNW	70				|				
RWBL	F	S	200	W	15		||				
EUST	F	S	200	W	15		||				
MDDO	F	S	150	E	10		|				
WITU	C	SW	350				|				
LDGR	F	S	10	NE	5		|				
FICR	C	S	200					|			
AMRE	C	N	10					|			
EUST	F	W	150	S	15			||			
EUST	C	W	75					|			
CEWA	F	N	20	W	30			4			
CKSP	C	E	50					|			
AmCr	FD	W	200					4			

PASSERINE - Bird Point Count Data Sheet

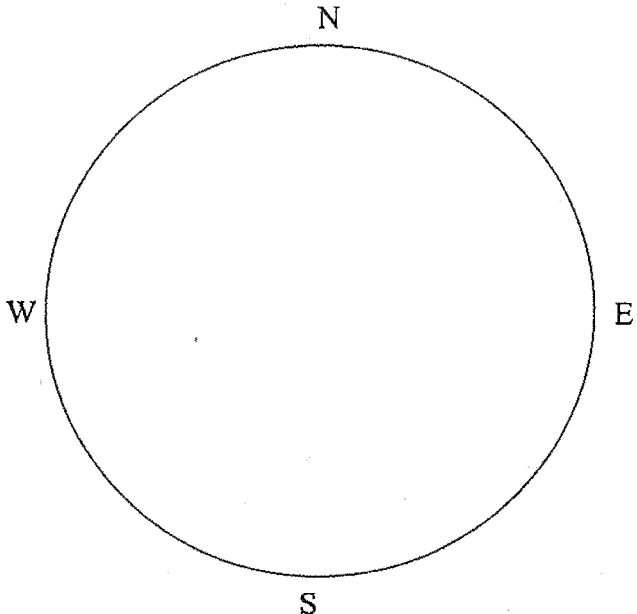
B6 (by TAZ)

Project Name: APBP
 Date: 6/13/13 Start Time: 0608 Stop Time: 0618
 Observer: SV/MM Wind Spd.: 0 Wind Dir.: - Sky: 3 Temp: 58°F

X coordinate, Y coordinate

Dominant (>50%) AES Habitat Type

Other Habitats



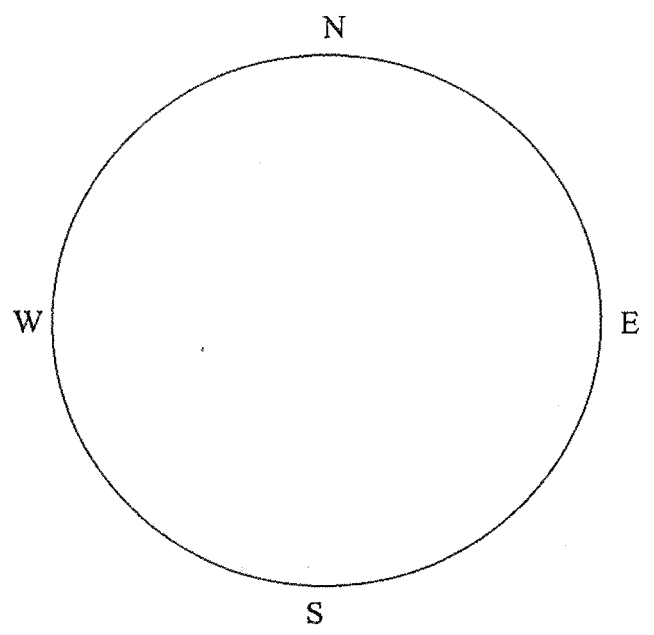
Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		
F = flying		Upland Coniferous Forest
S = soaring		Upland Mixed Forest
P = perching or on water		Wetland Forested
Fo = foraging		Wetland Shrub-Scrub
MD = mating display		Wetland Emergent
O = other		Open Water

Notes:
Northern Green Frog

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
WITV	P	S	15			6					1 then 4/5 young
TUTI	C	S	100			1					
AMRE	C	E	40			1					
AMCR	C/F	S	300	W	20	1					
SOSP	C	W	15			1					
BAOR	L	SSW	150			1					
YNAL	C	SSW	150			1					
REVI	C	N	100			1					
AMCR	C	N	200				1				
COYE	C	SW	200				1				
AMBO	C	N	15					1			
EABL	L	NW	25					1			
BAOR	L	W	10					1			
BHCO	C	S	150					1			
RWBL	C	S	100					1			
RBGR	C	ESE	75					1			

PASSERINE - Bird Point Count Data Sheet

Project Name APBP Sample Point ID # & Name B7 (woods near Luptre trail pond)
 Date 6/13/13 Start Time 0640 Stop Time 0646
 Observer SV, MJM Wind Spd. _____ Wind Dir. _____ Sky _____ Temp 59°F
 X coordinate, Y coordinate _____
 Dominant (>50%) AES Habitat Type _____
 Other Habitats _____



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes:

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
REVI	C/AGG	NE	15			1					
PAOL	C	N	25			1					
BLJA	C	W	15			1					
RWBL	C	NNE	50			1					
COYE	C	NNE	40			1					
AMPL	C	WSW	50			1					
RWBL	P	W	15			1					
EATD	C	S	20			1					
WAVI	C	E	50			1					
RWBL	C	N	75				1				
NOCA	C	W	50				1				
EATD	C	WNW	20				1				counter chirp notes

PASSERINE - Bird Point Count Data Sheet

APBP

B8 (edge forest by landfill + bio-retention) Snake

Project Name

Sample Point ID # & Name

Date 6/13/13

Start Time 0648

Stop Time 0700

X coordinate, Y coordinate

Observer SV, mm

Wind Spd. 1

Wind Dir.

Sky 4

Temp 56.0°F

Observer

Wind Spd.

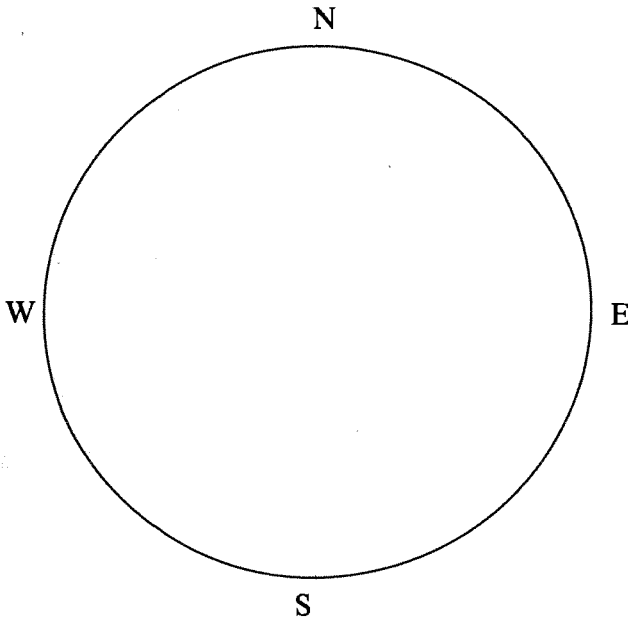
Wind Dir.

Sky

Temp

Dominant (>50%) AES Habitat Type

Other Habitats



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes: Green frog in bio-filter to S

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
WAVI	C	NNE	10			1					
RWBL	C	S	250			1					on landfill
AMCR	C	SW	200			1					
BACE	C	W	15			1					
AMRD	P/C	S	20			1					♂
AMRE	C	N	25			1					
SOSP	C	W	75			1					
RWBL	C	E	50			1					
SOSP	C	NE	75				1				
AMRD	C	NW	80				1				
EATD	C	SW	75				1				
RWBL	C	S	15				1				(in cattail flow in + out shortly aft
BLJA	C	N	5				1				& suspected feeding young
TUTI	C	N	30				1				
TUVU	S	N	30	Var	5(AGL)		1				atop landfill
EUST	F	S	300	E	2(AGL)		14				" "
AMCR	F	S	150	N	15		1				
PPGH	F	S	150	NE	10(AGL)			1			over landfill (1 imm)
RWBL	F/T/AGLS	S	300	Var	0-5			5			♂ in territorial dispute
BARN	F/FO	S	200	Var	1(AGL)			1			forage over veg on l.f. slope

PASSERINE - Bird Point Count Data Sheet

APBP

B9

Project Name

Sample Point ID # & Name

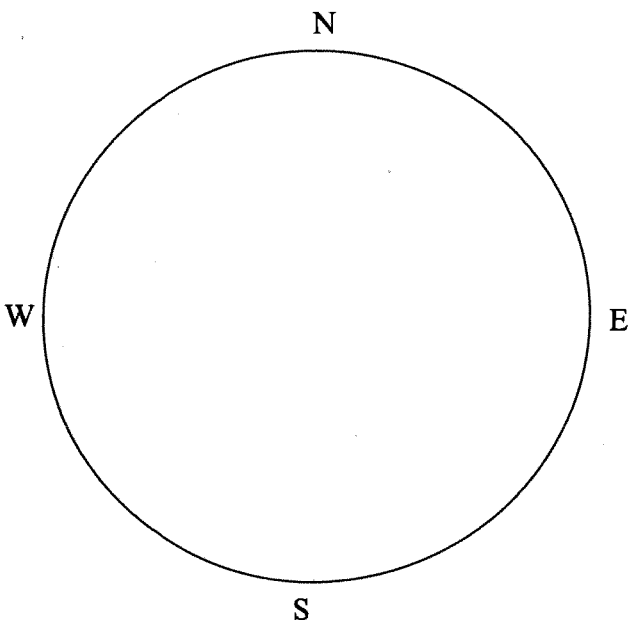
Date 6/13/13 Start Time 0454 Stop Time 0507

X coordinate, Y coordinate

Observer SV, ngm Wind Spd. 0 Wind Dir. - Sky 3 Temp 85°

Dominant (>50%) AES Habitat Type

Other Habitats



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes:

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
AMRO	C	S	5			1					
BCJA	C	S	10			1					
SOSP	C	NE	15			1					
COYE	C	NE	20			1					
NOCA	C	E	25			1					
GRCA	C	N	40				1				
SOSP	C	W	25				1				
AMRO	C	W	40				1				
NOCA	C	N	150					1			

PASSERINE - Bird Point Count Data Sheet

APBP

810

Project Name

Sample Point ID # & Name

6/13/13

0439

0449

Date

Start Time

Stop Time

X coordinate, Y coordinate

SV/mjm

0

0

100

53.6

Observer

Wind Spd.

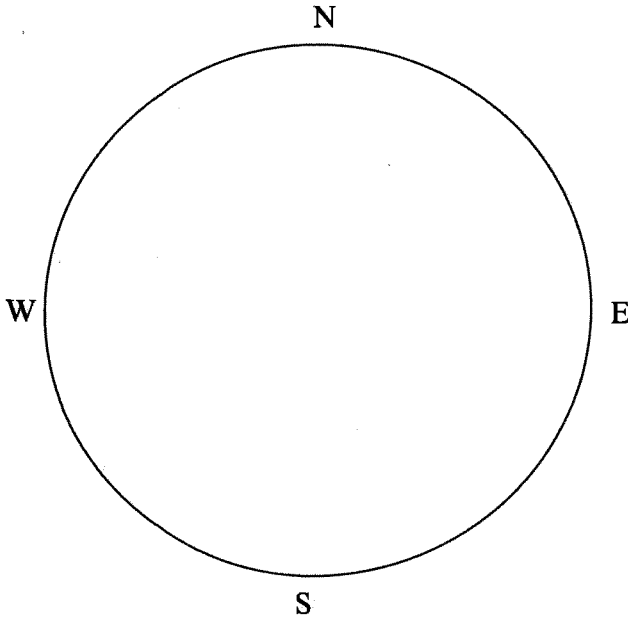
Wind Dir.

Sky

Temp

Dominant (>50%) AES Habitat Type

Other Habitats



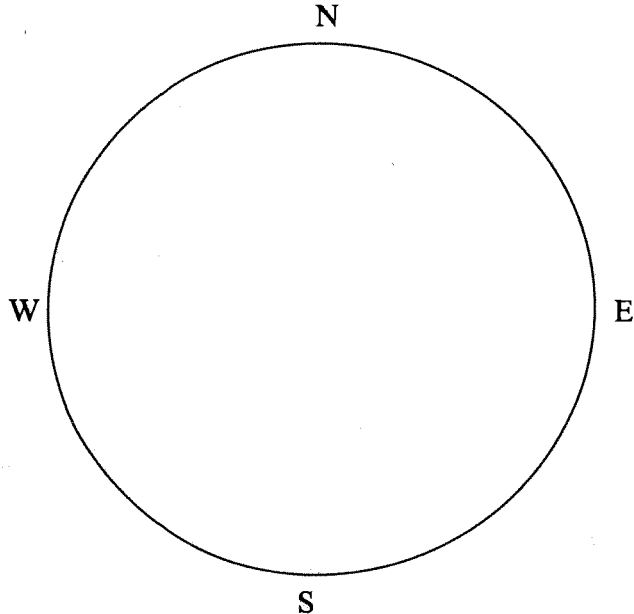
Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes:

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
ACFL	C	S	40			1					
AMRO	C	SE	50			1					
AMRU	C	SW	30			1					
NOCA	C	NE	100			1					
EAUP	C	NE	50			1					
AMRO	C	N	40				1				
WONO	SE	SE	100				1				
DOWN	E	S	20				1				
SCTA	C	W	50				1				
SOSP	C	S	60					1			

PASSERINE - Bird Point Count Data Sheet

APBP
 Project Name _____ **B11 (by TAS)**
 Sample Point ID # & Name _____
 Date **6/13/10** Start Time **0748** Stop Time **0754**
 X coordinate, Y coordinate _____
 Observer **SV, mjm** Wind Spd. _____ Wind Dir. _____ Sky **3-4** Temp **59°F**
 Dominant (>50%) AES Habitat Type _____
 Other Habitats _____



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes:

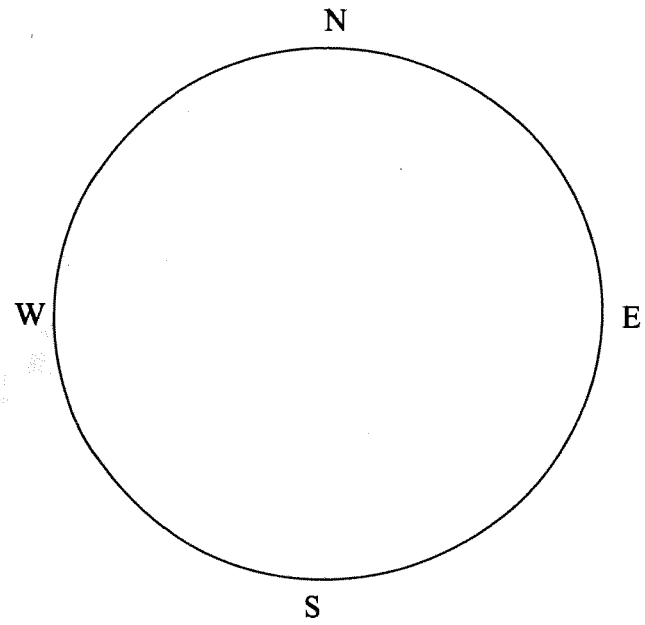
Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
BHCO	P	NE	15			5					4♂ 1♀
RWBL	C	S	75			1					
SOSP	C	SSE	25			1					
AMGO	C	W	200			1					
AMCR	F	W	300	SW	20	1					
YNAR	C	NNE	75			1					
AMRO	C	E	40			1					
AMRO	C	SE	50			1					
FCR	F	S	40	W	15	1					
EVST	Fo	S	400			18					Foraging over LF
SOSP	C	N	50				1				
REVI	C	ESE	75				1				
CGR	P	NNW	150				1				
NOND	C	N	50				1				
CGR	F	N	20	S	15		4				
ECEL	C	S	20				1				
RTHA	P/F	S	120	E	20		1				Harrassed by RWBL
SPEA	C	SSW	75				1				

PASSERINE - Bird Point Count Data Sheet

Project Name APBP Sample Point ID # & Name B 12 (bw dove rises)
Date 6/13/13 Start Time 0714 Stop Time 0722
Observer SV,MM Wind Spd. 1.0 Wind Dir. W Sky 4 Temp 57
X coordinate, Y coordinate
Dominant (>50%) AES Habitat Type
Other Habitats

Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

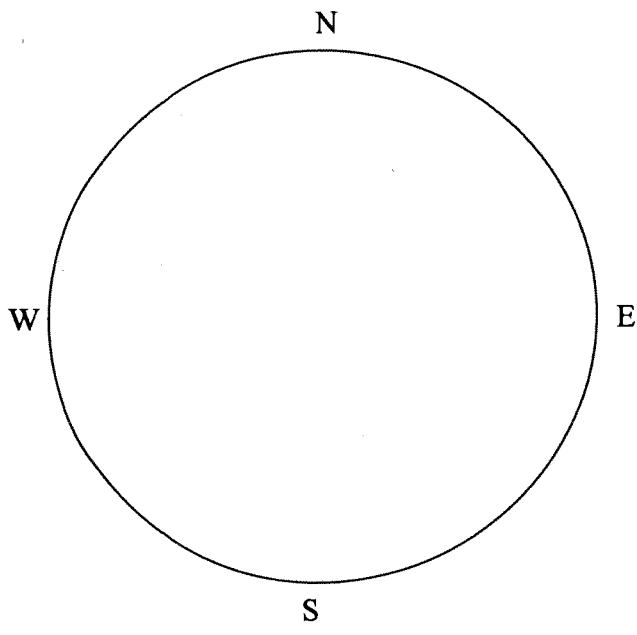
Notes:



Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
EWBL	C	W	150			1					
SOSP	C	WSW	40			1					
EWBL	C	N	200			1					
AMCO	C	ENE	150			1					
AMCC	C	N	250			1					
AMCO	F	E	1	NE	15	1					
EWBL	C	E	150					1			
BAWS	F/KF	S	15	W	5			1			

PASSERINE - Bird Point Count Data Sheet

Project Name APBP Sample Point ID # & Name B13 (other side of cup)
 Date 6/13/13 Start Time 0621 Stop Time 0629
 Observer SV/mm Wind Spd. 1 Wind Dir. W Sky 3 Temp 59°
 X coordinate, Y coordinate _____
 Dominant (>50%) AES Habitat Type _____
 Other Habitats _____



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes:

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
RWBL	C	SW	100			1					
WITU	P/FO	S	350			4					1 hum 1 tom 2 polt - on land fill slope
RWBL	C	S	150			1					
RWBL	C	SE	200			1					
RWBL	C	E	250			1					
YWAR	C	S	20			1					
COYE	C	S	25			1					
SO SP	C	SW	15			1					
BADE	C	ESE	15			1					
BHCO	C	ESE	15			1					
AMCR	C	E	200			4					
SO SP	C	NNE	50			1					
RWBL	C	W	100			1					
AMCR	F	NE	100	S	10	1					
YWAR	C	NE	100				1				
AMRO	C	NE	250				1				
TRES	F	N	50	N	20		1				
NAHI	C	S	200				1				
RWBL	F	NE	50	W	15			1			
AMCO	C	N	150					1			
WAVI	C	NNW	200					1			
AMGO	F	E	75	NE	10			11			
RWBL	F	E	200	N	20			111			
S:090636:111113730						730					2013 Albany Compliance Report

PASSERINE - Bird Point Count Data Sheet

Project Name APBP Sample Point ID # & Name B14 (by TA4)

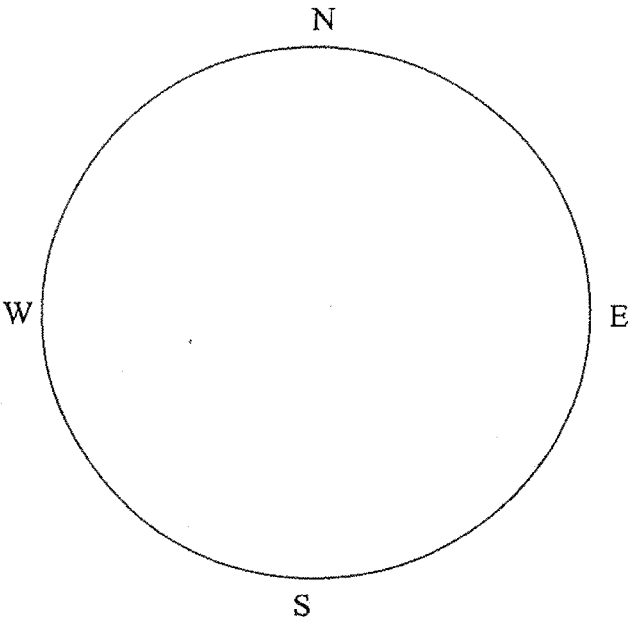
Date 6/13/13 Start Time 0631 Stop Time 0638

Observer SV, MM Wind Spd. _____ Wind Dir. _____ Sky light rain Temp 56°F

X coordinate, Y coordinate _____

Dominant (>50%) AES Habitat Type _____

Other Habitats _____



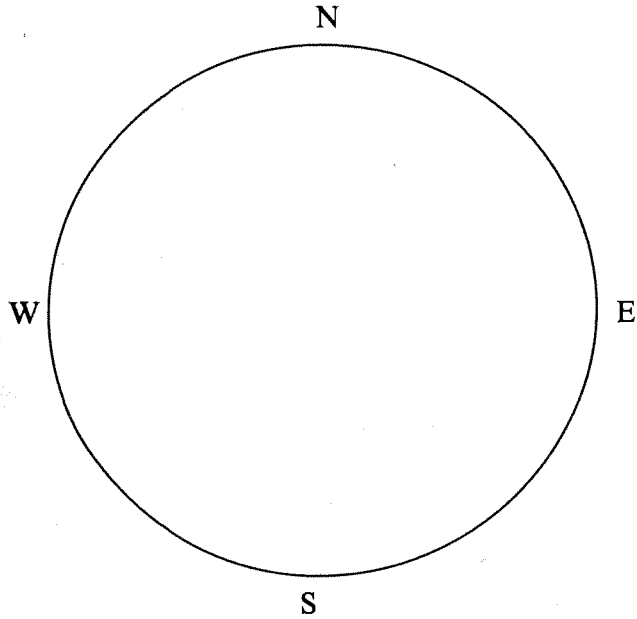
Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes:

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
RWBL	C	SSE	75			1					
YWAR	C	SSE	10			1					
GRAB	C	NE	15			1					
RWBL	C	SSW	40			1					
COXE	C	S	50			1					
BHCO	C	E	50			1					
AMRD	C	N	75			1					
RWBL	C	N	100			1					
RWBL	F/C	N	10	SW	10		1				
AMCR	C	S	250				1				
SDSP	C	NNE	150				1				
AMRD	P	N	10				1				
BAOR	C	SW	75				1				
WHI	C	S	40				1				
AMCR	C	W	200				1				
BLJA	C	W	40				1				
AMCR	F/C	E	20	E	15		1				
SDSP	C	SE	15					1			
CEVA	C	W	40					1			

PASSERINE - Bird Point Count Data Sheet

Project Name APBP Sample Point ID # & Name B-15 (test dots)
 Date 6/13/13 Start Time 0730 Stop Time 0739
 Observer W. MM Wind Spd. 1-2 Wind Dir. S Sky 4+3 Temp _____
 X coordinate, Y coordinate _____
 Dominant (>50%) AES Habitat Type _____
 Other Habitats _____



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes:

traffic noise

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
ANFL	P/AGG	W	20			5					♂/AGG
ANFL	P	E	30	Var	0-2m	7					
INBU	C	S	100			1					
TUNU	P	E	50			11					
SOSP	C	SW	40			1					
BLCO	C	NE	75			1					
TUNU	P	N	200			11					
BLTD	C	N	150			1					
AMGO	C	NW	200			1					
CENA	C	NE	200			1					
ANFL	F	N	20	N	10	2					
ANFL	P/C	NW	15			1					
BOYE											
AMRO		E	150				1				
CENR		NNE	100				1				
ANFL	P/AGG	NNW	75				2				terr dispute 2 or perched along path - counter sing
INBU	F/CMD	S	5	E	5		1				
SOSP	C	NW	200				1				

PASSERINE - Bird Point Count Data Sheet

BIG NE field by stream

Project Name APBP

Sample Point ID # & Name

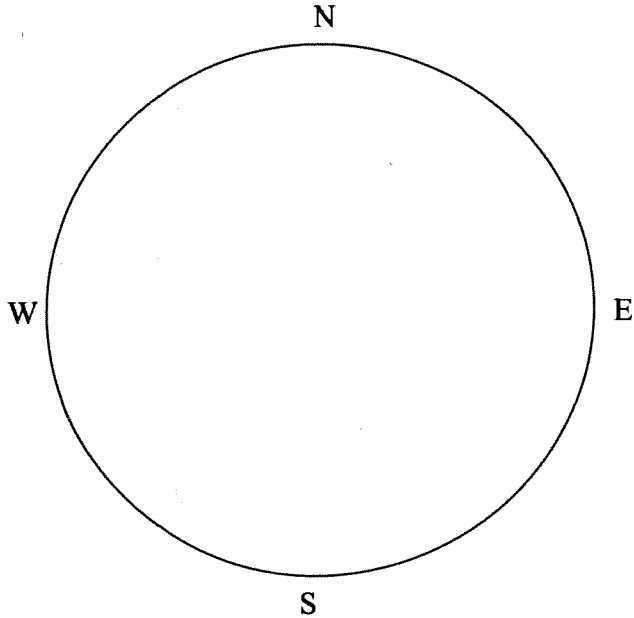
Date 6/13/13 Start Time 0534 Stop Time 0548

X coordinate, Y coordinate

Observer SV, MM Wind Spd. 0 Wind Dir. 3 Sky 3 Temp 58°F

Dominant (>50%) AES Habitat Type

Other Habitats



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		AES Habitat Type
F = flying		Upland Coniferous Forest
S = soaring		Upland Mixed Forest
P = perching or on water		Wetland Forested
Fo = foraging		Wetland Shrub-Scrub
MD = mating display		Wetland Emergent
O = other		Open Water

Notes:

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
EAKI	C/P	NNW	15m			|					
PCCH	C	N	20m			|					
EATO	C	NNE	30m			|					
NBMD	C	NE	100m			|					
EUST	F	S	300m	SW	75m	|					
RTHA	C/P	W	250m			|					
MALL	F	S	150m	W	20m	|					
GRCA	C	WSW	75m			|					
WITU	O	N	35			|					visual
SOJ	C	E	20m			|					
EANP	C	SE	20m			|					
BARS	F	S	5m	W	4m		|				
BHCB	P	W	150m				|				
EAWP	C	NNW	100m				|				
EATO	C	S	50m				|				
AMCR	C	S	300m				|				
FISP	C	S	100m				|				
COYE	C	N	75m				|				
GRCA	C	E	10m				|				
SOSP	C	SSW	250m					|			
MALL	F	W	200m	S	25m			|			
PBWA	C	W	100m					|			
MDDO	F	E	5m	W	5m			|			
COGR	F	WSW	250	W	20m			|			
INBU	C	E	150m					|			
GCFL	C	SE	100m					|			

PASSERINE - Bird Point Count Data Sheet

Project Name

Sample Point ID # & Name

6/25/13

0610

0618

Date

Start Time

Stop Time

X coordinate, Y coordinate

Observer

Wind Spd.

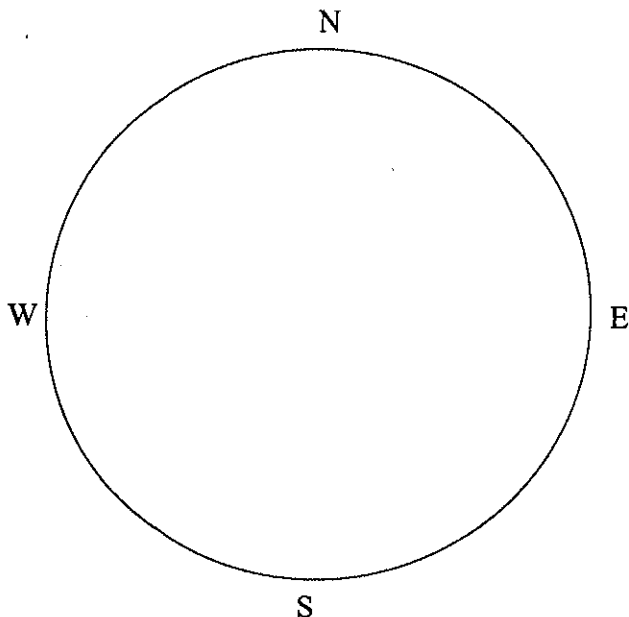
Wind Dir.

Sky

Temp

Dominant (>50%) AES Habitat Type

Other Habitats



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		
F = flying		Upland Coniferous Forest
S = soaring		Upland Mixed Forest
P = perching or on water		Wetland Forested
Fo = foraging		Wetland Shrub-Scrub
MD = mating display		Wetland Emergent
O = other		Open Water

Notes:

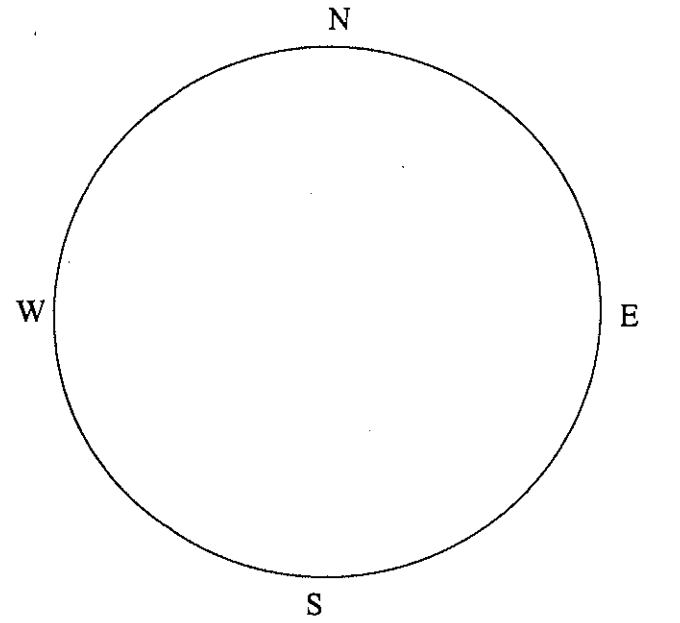
N 1000 ft
 1000 ft

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
MODO	F	S	50	E	6	1					
RWBL	C	N	20			1					
RWBL		NE	70			1					
RWBL		S	20			1					
RWBL		SE	40			1					
SWCP		NE	10			1					
BLJA		NE	75			1					
AMCR	✓	W	150			1					
AMCR	F	ESE	50			1					
AMCR	F	S	5	NE	4	1					
EUST	P	W	200			(33)					on fence on LF
Sparrow	P	W	300			(17)					"
CEBW	C	NE	30			111					
SOCP	C	SE	150				1				
ERBL	F	WSW	200	S	10		1				
RWBL	F	S	150	E	5		1				
AMCR	F	S	200		1		1				
RWBL	P/ry	S	40				11				
WAUI	C	SE	150				1				
AMCR	F	SE	200	SW	20		1				
AMCR	F/C/P	N	15					1			calling in field
GCFL	C	E	110					1			
COBL	F	S	20	N	15			1			
AMCR	C	N	150					1			
SNCP	C	W	70					1			

PASSERINE - Bird Point Count Data Sheet

B2

Project Name: 09-0636
 Date: 6/25/13
 Start Time: 0621
 Stop Time: 0631
 Sample Point ID # & Name: SE corner of restoration (wooded area)
 X coordinate, Y coordinate:
 Observer: [Signature]
 Wind Spd.: 0
 Wind Dir.: -
 Sky: 5
 Temp: 70°



Dominant (>50%) AES Habitat Type:
 Other Habitats:

Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3 mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		
F = flying		Upland Coniferous Forest
S = soaring		Upland Mixed Forest
P = perching or on water		Wetland Forested
Fo = foraging		Wetland Shrub-Scrub
MD = mating display		Wetland Emergent
O = other		Open Water

Notes: none for
 BY = Begging young
 recently not sampled. AMTU

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
SOSP	C	N	10			1					
SOSP	|	E	50			1					
SOSP	V	SE	70			1					
WBL	C	NW	100			11					
|	C	NE	30			1					
|	C	N	40			1					
|	P	S	15			1					
|	P	SW	50			1					
V	P	W	75			1					
COYE	C	NE	40			1					
WANO	NE	NE	100			1					down north in response
BLIA	C	E	75			1					
ESUP	C	ENE	100			1					
AMCR	C	NE	150			1					
TUVA	P	W	400			(11)					on fence atop LF
EBST	P	W	400			(26)					"
SPRIMP	P	W	400			(7)					"
NAVI	C	S	40				1				
BARPS	Fo	S	30	vor	10		11				
SEOW	C	S	10				(57)				
AMCR	C	N	100					11			
AMCR	C	S	50					1			
AMCR	C	W	50					1			
RBGR	C	SSE	40					1			
SOSP	BY	N	5					111			in the big row
DOWL	C	SE	75					1			
RBGR	Fo	W	250	S	5051			1			
BARPS	Fo/RV	S	40	vor	0-4			1111			

Handwritten notes in the table: "Kean... call... etc)"

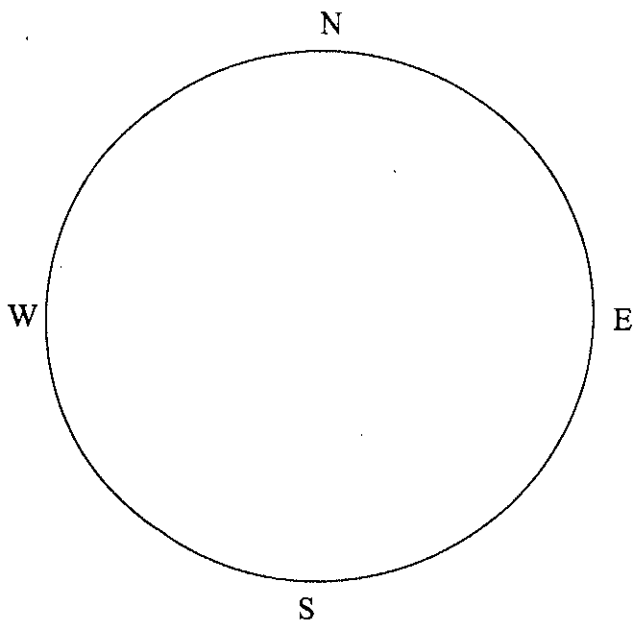
S.090636.111113737

4 BY 7 adults...

PASSERINE - Bird Point Count Data Sheet

Project Name 09-0636 Sample Point ID # & Name B3
 Date 6/7/09 Start Time 0558 Stop Time 0608
 Observer [initials] Wind Spd. — Wind Dir. — Sky 5 Temp 70°

09E South of #11
 X coordinate, Y coordinate _____
 Dominant (>50%) AES Habitat Type _____
 Other Habitats _____



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		
F = flying		Upland Coniferous Forest
S = soaring		Upland Mixed Forest
P = perching or on water		Wetland Forested
Fo = foraging		Wetland Shrub-Scrub
MD = mating display		Wetland Emergent
O = other		Open Water

Notes: noise pollution from generators
 H = [unclear] / [unclear]

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
RWBL		W	50			1					
AWCR		S	150			1					
CEEDW		E	70			1					
P.BCLW	F	EW	20	W	12	1					
AWCR	C	SE	70			1					
RWBL	C/P/T	S	60	var	2	1					notes closing
AWBL	C	E	150			1					
AWBL	P	E	100			1					
AWBL	C	S	250			1					
RWBL	C	SE	150				1				
AWBL	C	ESE	100				1				
EAST	Fo	SSW	350				(30+)				
KILL	C	EW	150				1				
AWCR	Fo	SSW	350				(7)				
AWBL	Fo	SSW	300	var	5-10		1				
KILL	F	W	250	N	5			1			
RWBL	F/Fi	S	40	F	15			1			no tails molting
AWCR	C	E	65					1			

PASSERINE - Bird Point Count Data Sheet

B4

NU of obs by moment

Project Name 0175

Sample Point ID # & Name 0170

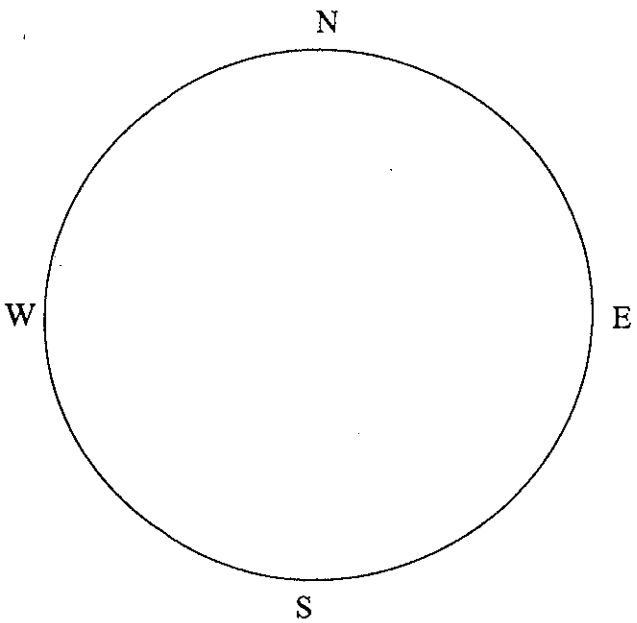
Date 0-1 Start Time S Stop Time 1

X coordinate, Y coordinate

Observer [initials] Wind Spd. 0-1 Wind Dir. S Sky 1 Temp 71°

Dominant (>50%) AES Habitat Type

Other Habitats



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		
F = flying		Upland Coniferous Forest
S = soaring		Upland Mixed Forest
P = perching or on water		Wetland Forested
Fo = foraging		Wetland Shrub-Scrub
MD = mating display		Wetland Emergent
O = other		Open Water

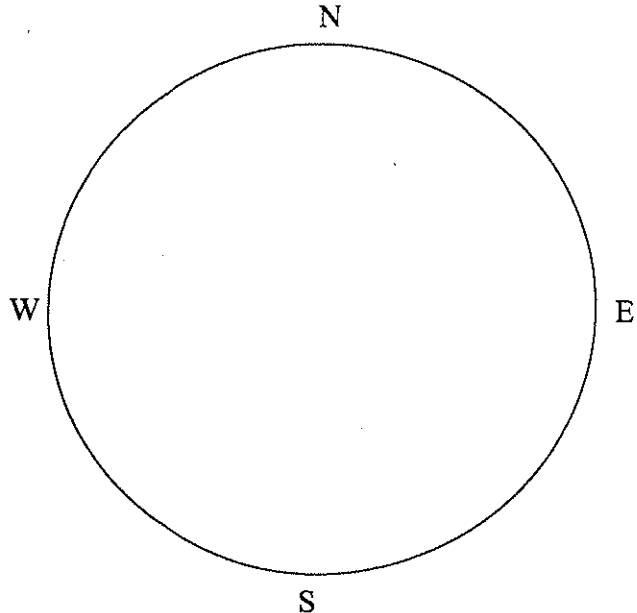
Notes: N green frogs

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
TWT1	C	W	150			1					
AMCR	P	NE	50			(17)					
AMCR	C	SU	150			11					
RWBL	C/P	W	40			(9)					
RWBL	P	NU	S			1					Female
WV1	C	W	125			1					
EUST	F	N	30	N	10	11					
PARS	Fo	E	5	N/UD	4	1					
AMCR	F	S	75	N	25	1					
COCR	F	N	40	E	10	11					
WV1	C	N	50			1					
BAOR	C	NNW	100			1					
RWBL		N	30			1					
COCP	C	NNW	50				1				
EUST	P	S	250								
TRES	Fo	W	30	VOR	15		1				
KUU	Fo/F	S	275				111				
SPOR	C/P	S	275				111				
TRIS	Fo	S	250	VOR	0-10		111				
CHSD	C	NE	75				1				
AMCR	C	NE	110					1			
PARS	Fo	11	30	W/N	S			11			
AMCR	F	N	75	W	10				1		
TRIS	F	11	115	W	15				1		

* Pat FICP

PASSERINE - Bird Point Count Data Sheet

Project Name: 09-0636 Sample Point ID # & Name: B5
 Date: 6/25/13 Start Time: 0820 Stop Time: 0830
 Observer: [Signature] Wind Spd.: 1 Wind Dir.: SE Sky: 0 Temp: 73°
 X coordinate, Y coordinate: _____
 Dominant (>50%) AES Habitat Type: _____
 Other Habitats: _____



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		AES Habitat Type
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes: Ticks + LF 890V noise

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
HOSP	P/C	SW	3			11					note + female
MALL	P	NW	40			(13)					7 birds 6 seen
AMGO	C	NE	50			1					
AMCR	C	S	150			1					
BORS	F/C	VAR	20-30	VAR	2-10	|||||					
RWBL	F	N	75	S	15	1					
AMCR	C	N	200			1*					
HOSP	C	N	15			1					
BHCO	F/agg	SW	10	N	5	11					
HOSP	C	NE	25			1					
WAVI	C	N	40			1					
DOWN	C	N	30			1					
COVE	C	N	50			1					
AMCR	F	W	75	S	15		1				
WOMV	P	E	100				1				on house
WALI	C	SW	150				1				
COGR	C/F	N	20	W	15		1				
SCSO	P	NW	200					1			
INSC	F	NW	225					11			2 ♂
HAFI	P/C	SW	10					1			♀, clipping
YWAR	C	N	20					1			
CHSO	C	E	100					1			
MOTD	C	E	150					1			
BNOR	C	NNW	200					1			
AMCR	F	W	175	N	20			1			
WAVI	P	SW	35					|||||			edge of clearing + noise

PASSERINE - Bird Point Count Data Sheet

19-0636

B/C

N side of CUP by TABZ

Project Name

Sample Point ID # & Name

Date 6/25/13

Start Time 0805

Stop Time 0915

X coordinate, Y coordinate

Observer *mgm*

Wind Spd. 01

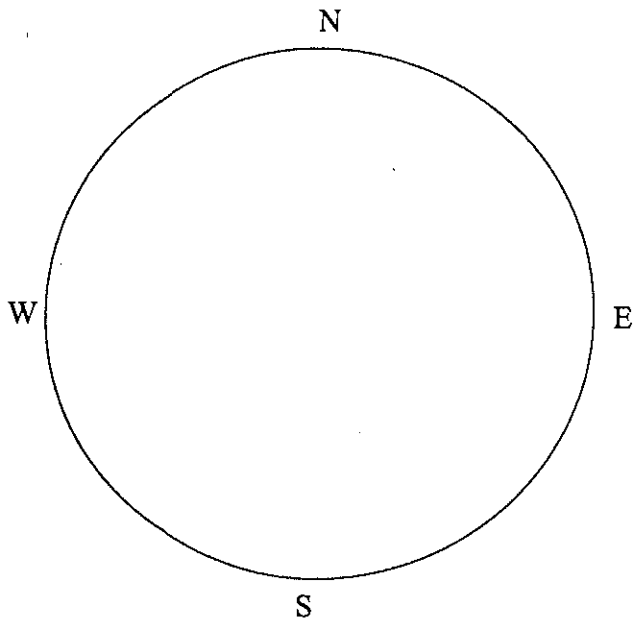
Wind Dir. SE

Sky 0-1

Temp 73°

Dominant (>50%) AES Habitat Type

Other Habitats



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		
F = flying		Upland Coniferous Forest
S = soaring		Upland Mixed Forest
P = perching or on water		Wetland Forested
Fo = foraging		Wetland Shrub-Scrub
MD = mating display		Wetland Emergent
O = other		Open Water

Notes:

Bosky C p picko in CUP
chipmunk

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
WBNL	C	NE	30			1					
Fisp	Fy/Bk/F	N	25			11					2 adults + 1 baby flying in ground
SOSP	C	S	40			1					
WBNL	C/P	W	30			1					on stump in CUP (border of)
SOSP	C	N	45			1					
WBNL	C	NNW	75			1					
WBNL	C	S	20			5+					
PNBL	F	S	250	Wor/w	2	11					make chasy kerber
BGGN	C	N	25			1					
BCHH	C	E	75			1					
AMPO	C	S	30				11				
AMPO	C	SE	25				1				
BCHH	Fo/CF	N	5				1				
COGR	F	NW	50	E	15			11			
AMPO	C	S	100					1			
REVI	C	NE	30					1			
IPSE	C	SE	30					1			
THUN	P	SSW	250					1			
PNBL	F/ass	SSW	250					111			horribly THUN
EAK1	P	NW	45					1			on stump in CUP
SOSP	P/ass	NW	45					1			kerber trying to leave off EAK1

PASSERINE - Bird Point Count Data Sheet

Project Name 09-0636

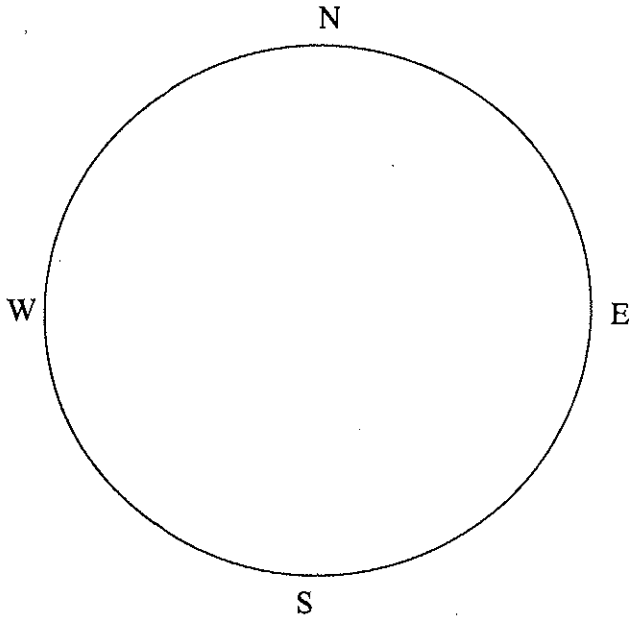
Sample Point ID # & Name B7 In woods south west of P4102

Date 6/25/13 Start Time 0717 Stop Time 0727
 Observer [Signature] Wind Spd. 1 Wind Dir. SE Sky 1 Temp 70°

X coordinate, Y coordinate _____

Dominant (>50%) AES Habitat Type _____

Other Habitats _____



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes: *with 100% accuracy*

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
COYP	C	W	20			1					
POYE	C	NNE	25			1					
AMYG	C	S	20			1					
PI-PL	C	NE	75			1					
WCA	C	E	50			1					
ANCR	P	W	40			1					
COGR	C	N	100			1					
PBIB		N	50			1					
SOSP	C	NE	75			1					
ANCR	C	SE	40			1					
CASA	C	N	15			1					
BLVA	C	E	50			1					
WCA	C	W	40			1					
JUSTO		NW	75			1					
PLBL	C	NE	150			1					
PUBL	C	N	30				1				
LOPL	C	NW	40				1				
ANCR	C		10				1				
REUI	AGG	E	15					1			
SATD	C	S	30					1			
TRFI	C	SW	75					1			
ANCR			40					1			
COGR	C	NE	75					1			
S-TR	C	S	60					1			check back

PASSERINE - Bird Point Count Data Sheet

Project Name 09-0636

Sample Point ID # & Name 88 LF + LUPINE WOODS

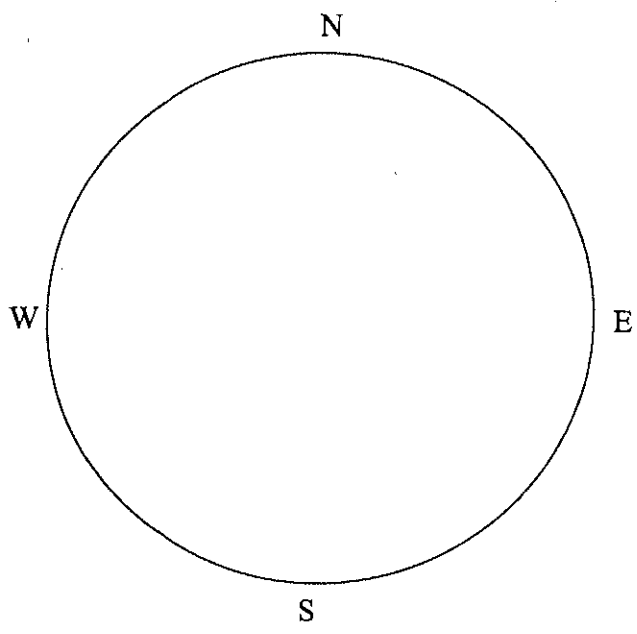
Date 6/25/13 Start Time 0729 Stop Time 0739

X coordinate, Y coordinate _____

Observer [Signature] Wind Spd. 1 Wind Dir. 135 Sky 1 Temp 70°

Dominant (>50%) AES Habitat Type _____

Other Habitats _____



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		AES Habitat Type
F = flying		Upland Coniferous Forest
S = soaring		Upland Mixed Forest
P = perching or on water		Wetland Forested
Fo = foraging		Wetland Shrub-Scrub
MD = mating display		Wetland Emergent
O = other		Open Water

Notes: *some noise pulling from LF @ 9:00*

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
AMPO	P	SW	15			1					
AMPO	C	NE	30			1					
LPPO	C	N	20			1					
PURL	C	S	30			1					
PURL	C	E	70			1					
SURP	C	E	25			1					
PURL	S/T		210			unl					perched on LF slope
AMPO	C	NW	10			1					
AMPO	C	NE	50			1					
AMPO	F	S	250	SW	10(m) (7)						in LF
AMPO	P	SW	15			1					flushed approx 4 min p
AMPO	C	SW	50				1				
AMPO	C	NW	150				2+				presumably same as previous
AMPO	C	NE	75				1				
AMPO		NE	5				1)				in LF
AMPO	C	S	40					1			
AMPO	C	SW	50					1			
AMPO	C	SW	70					1			
AMPO	C	SW	20					1			
AMPO	C	N	40					1)			
AMPO	C	S	5					1			possible result from above

PASSERINE - Bird Point Count Data Sheet

09-0636

B9

in woods near TA

Project Name

Sample Point ID # & Name

6/25

0453

0503

Date

Start Time

Stop Time

X coordinate, Y coordinate

[Signature]
Observer

0
Wind Spd.

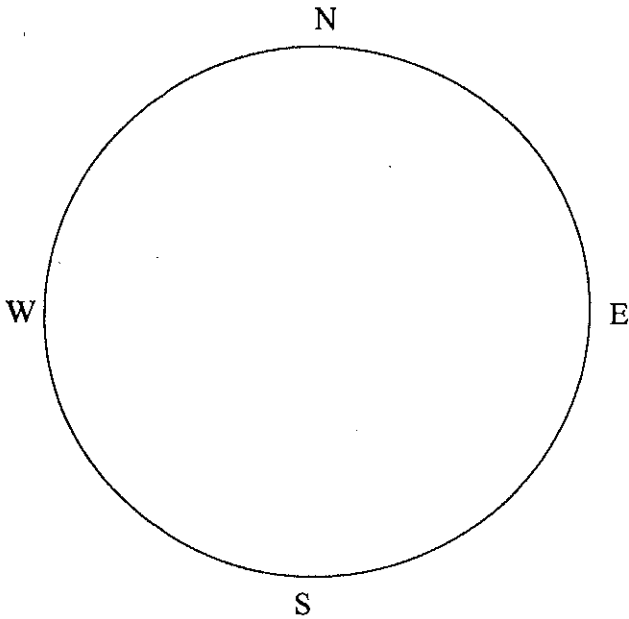
—
Wind Dir.

—
Sky

68°
Temp

Dominant (>50%) AES Habitat Type

Other Habitats



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		AES Habitat Type
F = flying		Upland Coniferous Forest
S = soaring		Upland Mixed Forest
P = perching or on water		Wetland Forested
Fo = foraging		Wetland Shrub-Scrub
MD = mating display		Wetland Emergent
O = other		Open Water

Notes:

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
WOTH		E	50			1					
WOTH		NE	75			1					
SOSP		NNW	100			1					
DLJA		S	10			1					
WRED		SW	40			1					
REVI		ESE	50			1	1				
EATD		NE	120				1				
SOSP		S	100				1				
CREA		NE	40				1				
BLJA		N	150				1)				
ANRO	C	N	75					1			counting song
ANRO	C	NNE	100					1			
WOTH	C	S	20					1			
EAMP	C	S	75					1			
RBWD	C	SW	120					1			
EAPH	C	SE	70					1			

PASSERINE - Bird Point Count Data Sheet

09-0636

B10 Forest near dead elm s

Project Name

Sample Point ID # & Name

4/25

0438

0449

Date

Start Time

Stop Time

X coordinate, Y coordinate

Observer

Wind Spd.

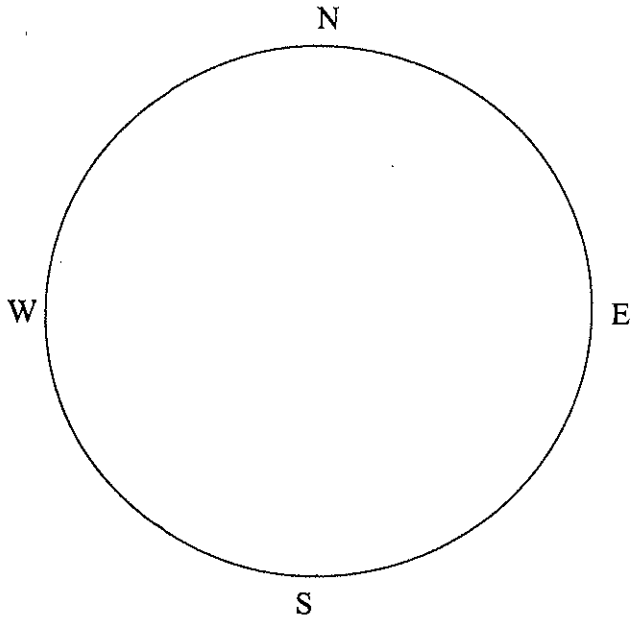
Wind Dir.

Sky

Temp

Dominant (>50%) AES Habitat Type

Other Habitats



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		
F = flying		Upland Coniferous Forest
S = soaring		Upland Mixed Forest
P = perching or on water		Wetland Forested
Fo = foraging		Wetland Shrub-Scrub
MD = mating display		Wetland Emergent
O = other		Open Water

Notes:

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
WOTH	C	N	150			1					
WOTH		NNE	30			1					
WOTH		S	25			1					
COYE		NE	15			1					
EA WPA	V	NNE	75			1					
AMRO		SW	15			1					
AMRO		NW	40			1					
NDCA		S	10			1					
GRCA	C	S	20				1				
COYE	C	S	75				1				
BSCH	C	NE	20				1				
BSJA	C	W	20					1			

PASSERINE - Bird Point Count Data Sheet

Project Name: 09-16-13 Sample Point ID # & Name: B11 11220 pch by 11-12

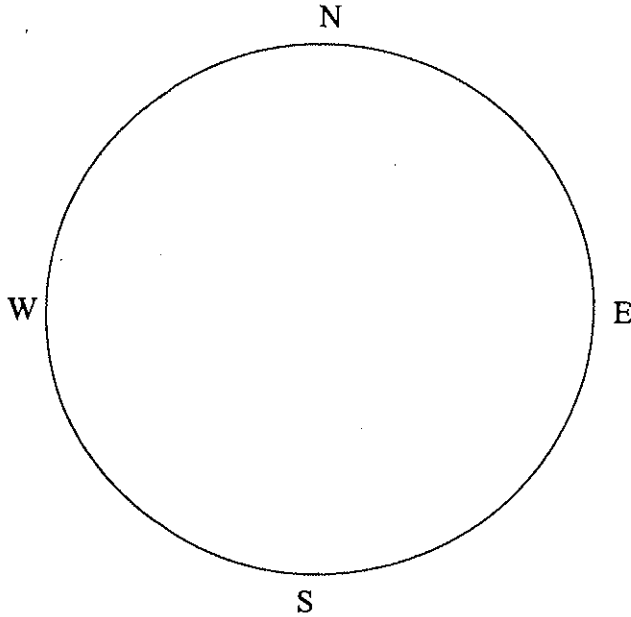
Date: 6/13/13 Start Time: 0546 Stop Time: 0556

Observer: [Signature] Wind Spd.: - Wind Dir.: - Sky: 3 Temp: 68°

X coordinate, Y coordinate: _____

Dominant (>50%) AES Habitat Type: _____

Other Habitats: _____



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		
F = flying		Upland Coniferous Forest
S = soaring		Upland Mixed Forest
P = perching or on water		Wetland Forested
Fo = foraging		Wetland Shrub-Scrub
MD = mating display		Wetland Emergent
O = other		Open Water

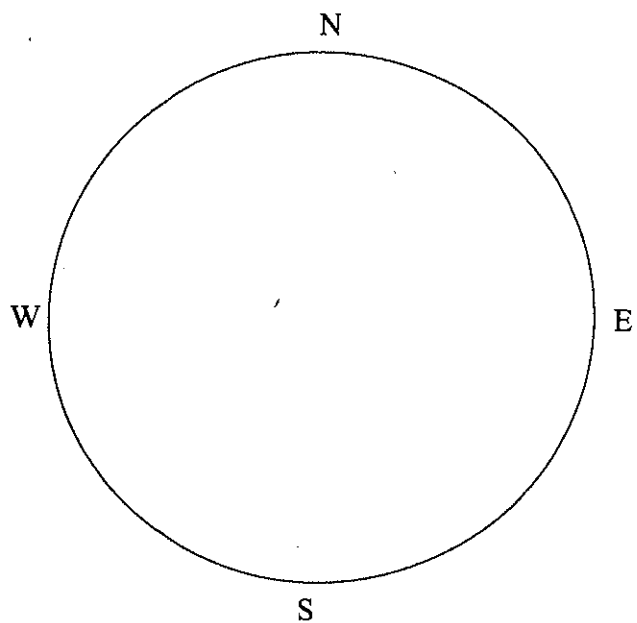
Notes:

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
AMPS		N	100			1					
AMRL		NE	50			1					
AMRO		NW	50			1					
SATD		NE	75			1					
INBL		E	100			1					
WILL		SW	150			1					
ITL		S	200			1					
WMO		N	75			1					
LDW		NNE	50			111					
WKO		NE	50			1					
TLTL		E	70			1					
AMCR	C	W	250			1111					
RMBL		W	200			1					
RMBL	C	SSE	100				111				
SO SP	C	ESS	20				1				
AMCR	F	S	75	E	20		1				
RMBL	F	N	150	E	25		1				
FWBL	P	N	120					1			
BARS	F	S	10	N	10			1			
COGR	F	S	10	N	15			1			
MOLL	F	S	150	W	2			11			

PASSERINE - Bird Point Count Data Sheet

Project Name 09-0636 Sample Point ID # & Name B12 B/w JAMES
 Date 6/25/13 Start Time 0636 Stop Time 0646
 Observer AG Wind Spd. — Wind Dir. — Sky 1/5 Temp 70°

X coordinate, Y coordinate _____
 Dominant (>50%) AES Habitat Type _____
 Other Habitats _____



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		
F = flying		Upland Coniferous Forest
S = soaring		Upland Mixed Forest
P = perching or on water		Wetland Forested
Fo = foraging		Wetland Shrub-Scrub
MD = mating display		Wetland Emergent
O = other		Open Water

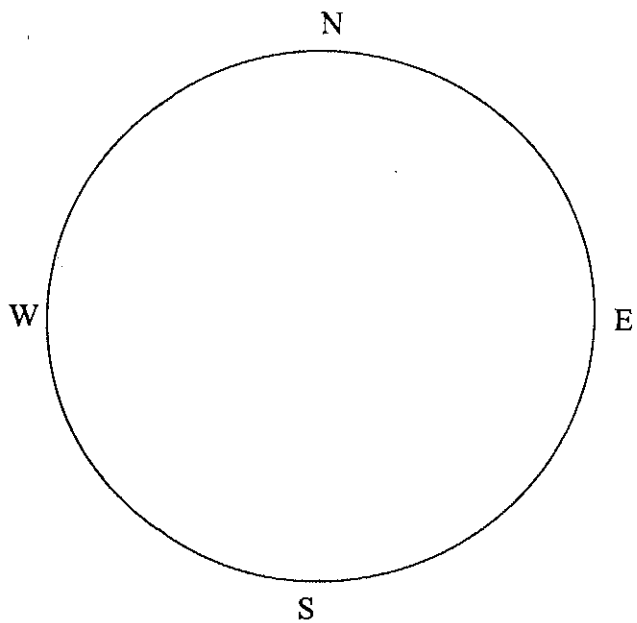
Notes: *no downy young (this note at quarter is wrong) less birds*

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
RWBL	K	W	150			11					
KILL	C	W	75			1					
WASP	C	SSW	100			1					
AMCR	F	W	200	S	11	111111					
FWBL	C	SW	50			1					
	C	S	75			1					
	P/T	S	150			11					notes
REGU	F	SW	30	SW	15	1					trud Lf
NGRO	C	NNE	200'			1					same as previous
AMCO	F	NW	50	SSW	10	1					trud Lf
ROU	F	N	300	E	2	111111					
KILL	F	N	200	SW	3	1					
AMCR	P/Fo	N	220			111111					no ground in next area
WARR	C	NNE	200				1				
WASP	C	E	175				1				
SPSA	C/F	N	30				1				near where nest was previous
FIRST	P/Fo	SSW	300				25*				
TRYS	F	SSW	300				111				
WARR	C	N	100					1			
RWBL	T/P/E	NW	275	WSE	11-3			1111			notes on catbird at this time
AMCO	C	N	150					1			
RWBL	F	N	200'	N	25			(6)			
AMCO	C	NW	15					1			
AMCR	C	NW	150					11			
AMCO	F/P	NNE	200					11			perch in adjacency of fence
WARR	C	SSW	75					1			
CELDW	C/F	N	20	E	15			1111			
CRAL	F	N	200					11			

PASSERINE - Bird Point Count Data Sheet

Project Name: 08-0636 Sample Point ID # & Name: sw of CVP B13
 Date: 6/25/13 Start Time: 07:14 Stop Time: 0754
 Observer: [Signature] Wind Spd.: 0-1 Wind Dir.: SE Sky: 0-1 Temp: 72°

X coordinate, Y coordinate _____
 Dominant (>50%) AES Habitat Type _____
 Other Habitats _____



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes: *snapping turtle in w pond*
agony *(coming to point)*

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
YBCN	C	S	75M			1					!
DHCO	P/Fo	E	10			111					in recent platings
GAER	F/P	SE	5	W	0-1	11					pair, perched ssw 2m
EATD	C	"	10			1					
SOCD	C	"	10			1					
SWP	S	E	30			1					
P		W	75			1					
RWB	F	N	100	SW	20	11					
COYE	C	S	35			1					
AMCO	C	E	100			1					
INBU	F/Fo	NE	20	S	10	111					family
AMCR	C	SW	75			3	1				
BHCO	P	SE	40				1				female
CEBW	C	S	50				(2+)				
MOLL	F	E	25	W	5			1			
CEBW	Fo	N	25	vor	15			1			fly catch by
YWAR	C	S	50					1			
AMCR	F	E	200	N	20			1			
SCPA	C	W	75+					1			likely some as well
AMCR	F	S	120	W	20			1			
GREY	P.Y	W	10					1			> fed by pair
WIFL	Fo/P	E	3								yellow planks
SPIA	P/Fo	N	25								on stump in CVP

2019 (swamp)

PASSERINE - Bird Point Count Data Sheet

B14

Project Name: 09-0020A Sample Point ID # & Name: B14

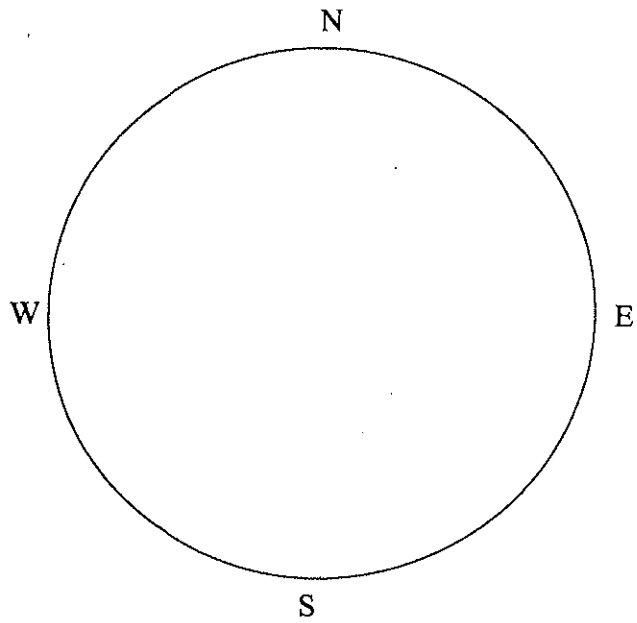
Date: 11/19/13 Start Time: 0705 Stop Time: 0715

Observer: [signature] Wind Spd.: 0-1 Wind Dir.: S Sky: 1 Temp: 70

X coordinate, Y coordinate: _____

Dominant (>50%) AES Habitat Type: _____

Other Habitats: _____



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		
F = flying		Upland Coniferous Forest
S = soaring		Upland Mixed Forest
P = perching or on water		Wetland Forested
Fo = foraging		Wetland Shrub-Scrub
MD = mating display		Wetland Emergent
O = other		Open Water

Notes: *many flying many RUBL!*

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
WBL		S	10			1					
EDW	E/E ₀	W	5	S	10	1					flight by
WBL	Fo	W	5								in canopy or around
WBL	F/C	E	40	W/E	5	1					
WBL	C/P	N	20			||||					
WBL		NE	70			1					
WBL	P/P	W	30			||					
WBL		S	50			1					
WBL	V	W	25			1					
WBL	C/AG	SW	10			||||					2 male, 2 female
WBL	C	S	75			1					
GRD	C	NE	25			1					
WBL	C	S	50			1					
WBL	F	E	2	W	3	|||					2 ♂ 1 ♀
BOOR	C	N	50				1				
COBA	P/C	NE	25				1				
WBL	C/E	W	15				1				♀
WBL	F	S	10	W	10		1				
PAOR	E/P	W	75	S	30			1			ARL
WBL	F/P/AG	E	50	W/E	10-20			||||			Wetland, in the canopy
WBL	F/C	W	15	E	20			|||			
EDW	P	W	20					|||			

PASSERINE - Bird Point Count Data Sheet

09-0636

B15

Test Plots

Project Name

Sample Point ID # & Name

6/25/13

0900

Date

Start Time

Stop Time

X coordinate, Y coordinate

Observer

Wind Spd. 1

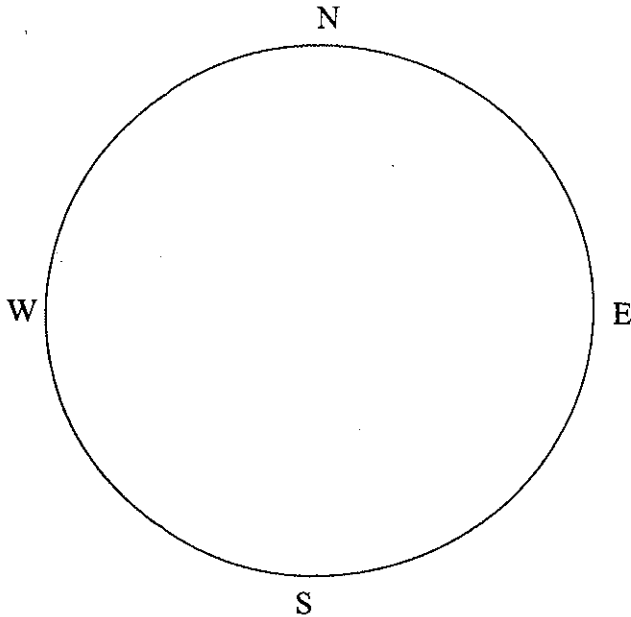
Wind Dir. SE

Sky 1

Temp 74°

Dominant (>50%) AES Habitat Type

Other Habitats



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		
F = flying		Upland Coniferous Forest
S = soaring		Upland Mixed Forest
P = perching or on water		Wetland Forested
Fo = foraging		Wetland Shrub-Scrub
MD = mating display		Wetland Emergent
O = other		Open Water

Notes: noise from Hwy + airplanes
cab whi
C10 SWI

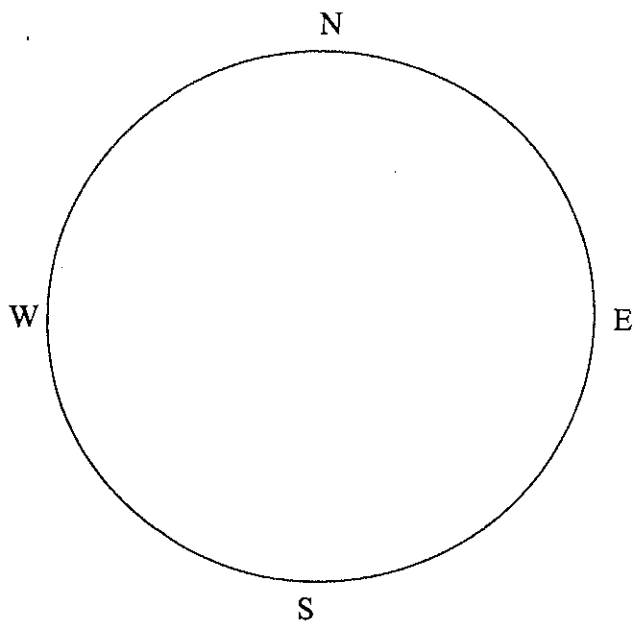
Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
TUWA	P/S	W	2	var	0-10	||||					flushed on approach
BANS	Fo	var	0-50	var	0-10	(25)					colony 100m ESE along path
RWBL	F/T	W	50	var	5)					
RWBL	C/P	N	75)					
RWBL	C/P	NE	100)					
INBH	C	S	100)					
EATD	C	NNE	150)					
INAC	C	N	100)					
CSP	C	W	50)					
EAKI	C	W	20)					
CHWA	C	NE	125)				
AMRO	C	E	175)				
SOSP	C	N	75)				
PHCO	C	NW	100)				
AMPO	C	S	100)			
COYE	C	NNE	120)			
RWBL	F	E	150	N	40)			
RTHA	P	N	250)			
AMCR	F/C	NNE	200	E	30			|||			
MDDU	F	S	20	NW	10			||			
RWBL	P	E	250)			
RWBL	F	NW	75	W	2)			
AMGO	C	N	30)			
BARS	Fo	SSE	40	var/N	6)			
ECSTFO	SSE	30						)			GN path
ESR	"	"	")			

Perched
apparently
feeding

PASSERINE - Bird Point Count Data Sheet

Project Name: 09-0636 Sample Point ID # & Name: B16 W NE scrubby field
 Date: 06/25/13 Start Time: 0840 Stop Time: 0851
 Observer: my Wind Spd.: 1 Wind Dir.: SE Sky: 0 Temp: 74°

X coordinate, Y coordinate _____
 Dominant (>50%) AES Habitat Type _____
 Other Habitats _____



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		
F = flying		Upland Coniferous Forest
S = soaring		Upland Mixed Forest
P = perching or on water		Wetland Forested
Fo = foraging		Wetland Shrub-Scrub
MD = mating display		Wetland Emergent
O = other		Open Water

Notes: 1 dead + 1000s in scrubby area near to the center

Gray Hornstreak sp.
2-3 birds

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
WITB	MD/P	N	50			(4)					on road 1 hour 3 hrs
BWICB	F	N	40			11					in scrubby area near
HOSS	F	N	11			11					"
WBAW	C	N	30			1					
WITB	F/P	N	40			11					in scrubby area
SEW	F	S	5	VLC	2	11					teaching young to sing & fly? <small>could be adult + 1</small>
SHCO	Fy/P	N	3			1					ticks allow mouth
NOFL	C	W	10			1					
SEW	C	SW	50			1					
SEW	C	SE	20			1					
NOFL	C	N	50			1					
DOND	C	NE	20			1	1				water carrying food to BY
ELMP	C	NE	75			1					
TUW	S	S	150	W	75		1				
FHCO	C/P	SW	60				1				chipping
COGR	F/C	N	70	W	10		11				
SEW	C	W	75				111				
PLP	C	N	15					1			
NOFL	C	W	75					1			
RBGL	C	NW	50								chip

PASSERINE - Bird Point Count Data Sheet

09-0636

B17

SE open field by Roppel

Project Name

Sample Point ID # & Name

0506

0506

0516

Date

Start Time

Stop Time

Observer

Wind Spd.

Wind Dir.

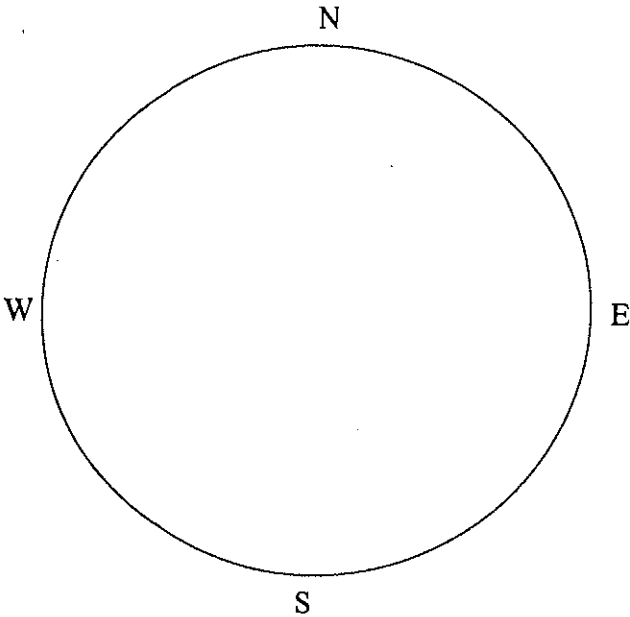
Sky

Temp

X coordinate, Y coordinate

Dominant (>50%) AES Habitat Type

Other Habitats



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		
F = flying		Upland Coniferous Forest
S = soaring		Upland Mixed Forest
P = perching or on water		Wetland Forested
Fo = foraging		Wetland Shrub-Scrub
MD = mating display		Wetland Emergent
O = other		Open Water

Notes:

NEAR
MUGGLES
UT DEER
MUGGLES!

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
WAUI	SSW	C	100			1					
COYE	NNE	|	40			1					
SOUP	NE	|	25			1					
WAUI	NE	|	50			1					
AMPO		S	120			1					
AMPO		SW	150			1					
COYE		N	35			1					
LRCP		N	50			1					
AMRS	NNE	NNE	100			1					
CEDW	C	NNE	100				1111				
GRCA	C	W	100				1				
CAWR	C	SW	175				1				
BCCH	C	SW	50				1				
REVI	C	W	75					1			
RBGR	C	W	30					1			
AMRO	C	N	10					1			
DOUW	C	SSW	150					1			
EATO	C	N	75					1			

PASSERINE - Bird Point Count Data Sheet

B-1 (@ stream bend)

Project Name _____

Sample Point ID # & Name _____

Date 6/26/13

Start Time 0550

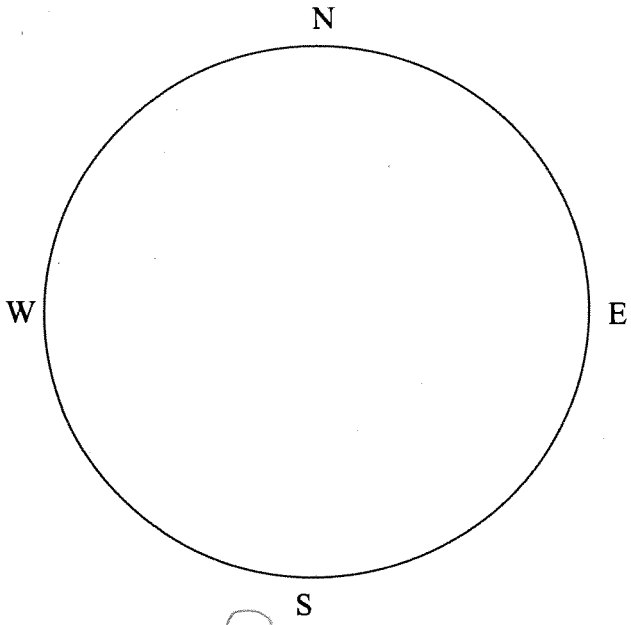
Stop Time 0600

X coordinate, Y coordinate _____

Observer _____ Wind Spd. _____ Wind Dir. _____ Sky _____ Temp _____

Dominant (>50%) AES Habitat Type _____

Other Habitats _____



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes: *green frog calling*

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
PIWO	C	75	E			|					
COYE	C	115	N			|					
SOSP	C	18	N			|					
AMRO	C	25	E			||					Counter calling
RWBL	P	15	S/SW			|					
RWBL	C	55	W			|					
CEWA	F/C	25	NE	NE	15	||||					
NO MO	C	100	NE			|					
NO MO	C	200	SE				|				
BARS	F	10	N/NW	SW	10		|				
RWBL	P	10	W					|			Female
EOST	F	350	SW	N	5			||			
WITU	P	350	SW					|			
AMRO	F	10	W	E	10			|			
AMCR	C	250	N/NW					|			
NOCA	C	200	E/NE					|			
EAPH	C	250	S/SW					|			
INBU	P/C	8	E					|			

PASSERINE - Bird Point Count Data Sheet

B-2

Project Name: 6/26/13 Sample Point ID # & Name: 0540

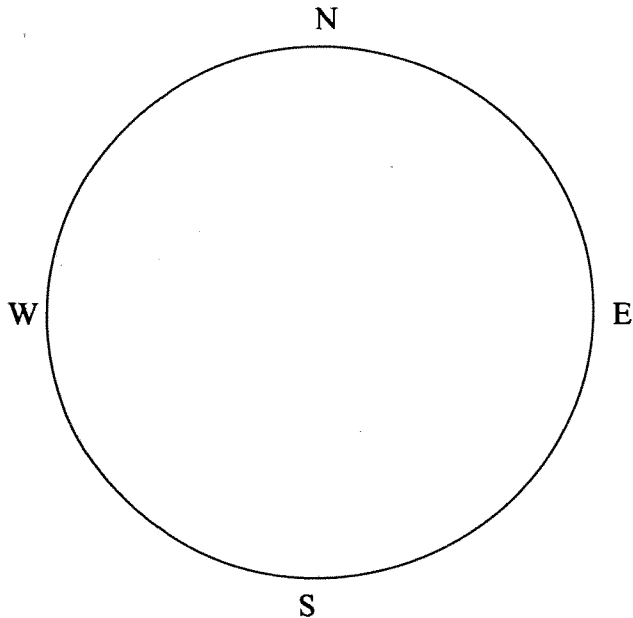
Date: 6/26/13 Start Time: 0540 Stop Time:

X coordinate, Y coordinate:

Observer: _____ Wind Spd. _____ Wind Dir. _____ Sky _____ Temp _____

Dominant (>50%) AES Habitat Type _____

Other Habitats _____



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		AES Habitat Type
F = flying		Upland Coniferous Forest
S = soaring		Upland Mixed Forest
P = perching or on water		Wetland Forested
Fo = foraging		Wetland Shrub-Scrub
MD = mating display		Wetland Emergent
O = other		Open Water

Notes:

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
RBGR	C	E	10			|					
SOSP	C/P	E	7			||					
AMRO	C/P	S	10			|					
INBU	C	N	75			|					
RWBL	C	S/SW	20			|					
RWBL	C	S	50			|					
RWBL	C	SE	100			|					
GRFL	C	S	150			|					
EATO	C	E	150			|					
RBGO	F	W	250	NW	10		||				above Land Fill
RWBL	F	S	50	W	20		|				toward Land Fill
AMRO	C/ON	S	10				|				Robin nest
GRCA	C	W	30					|			

PASSERINE - Bird Point Count Data Sheet

South of TA#9 (B-3)

Project Name _____ Sample Point ID # & Name _____

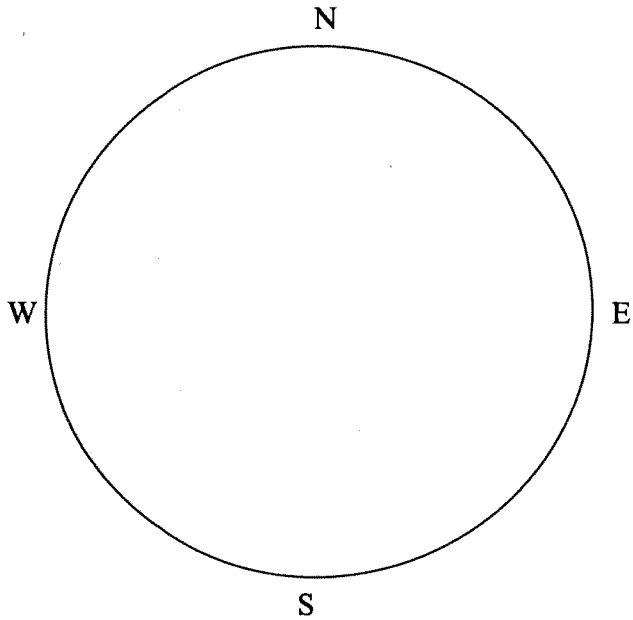
Date 6/26/13 Start Time 0530 Stop Time 0538

X coordinate, Y coordinate _____

Observer _____ Wind Spd. _____ Wind Dir. _____ Sky _____ Temp _____

Dominant (>50%) AES Habitat Type _____

Other Habitats _____



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes: noise from generator

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
RWBL	P/F/T	S	100	W	17-20	1					Green frog
RWBL	C	S	50		1	1					3 deer
AMRO	C	NE	25		1						
AMCE	C	NW	150		1						
INBU	C	N	35		1						
AMCR	F	NW	250	W	45	5					
RWBL	P	W	250		1						
SOFA	P/C	S	10		1						
EAKI	C	N	45		1						
AMRO	C	E	25		1						noise
CEDW	C	E	40		1						
RWBL	C	S/SW	75		1						
RWBL	F	S	30	S/SE	10	1					
BARS	F	S	50	S/SE	10	1					
EUST	F	N	30	SW	15			1			

PASSERINE - Bird Point Count Data Sheet

B-4

(next to NBS # 1 / weekend of June)

Project Name

6/26/13 0737

Sample Point ID # & Name

Date

Start Time

Stop Time

X coordinate, Y coordinate

Observer

Wind Spd.

Wind Dir.

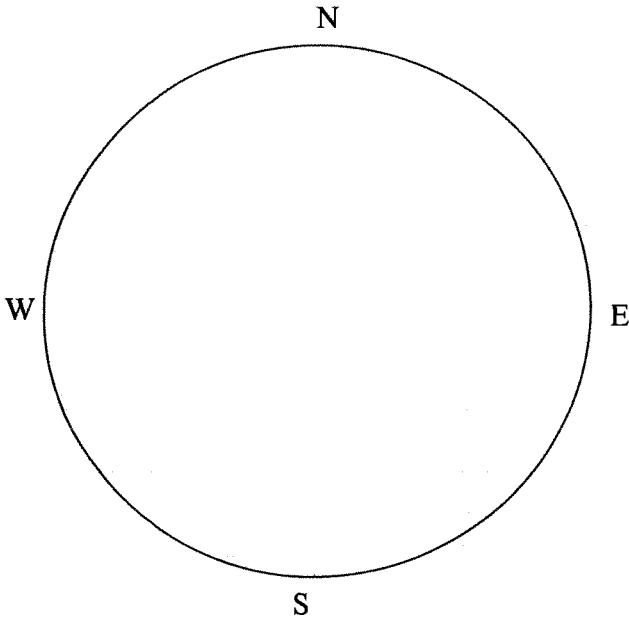
Sky

Temp

Dominant (>50%) AES Habitat Type

Other Habitats

Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		
F = flying		Upland Coniferous Forest
S = soaring		Upland Mixed Forest
P = perching or on water		Wetland Forested
Fo = foraging		Wetland Shrub-Scrub
MD = mating display		Wetland Emergent
O = other		Open Water



Notes: Green Frogs calling from bio filter (few)

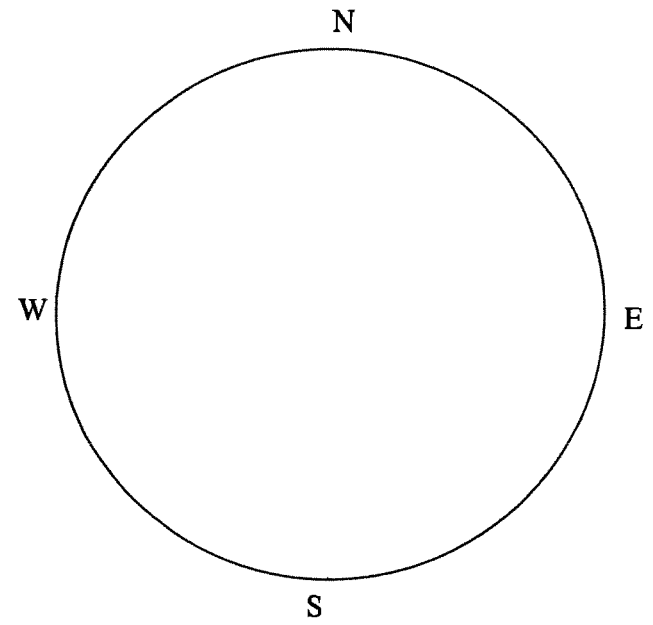
Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
COGR	P	NE	15			11					
AMCR	P	NE	15			1					
RWBL	C	S	10			1					lots of territorial
	C	SW	15			1					action from RWBL
	C	SW	40			1					
	C	W	50			1					
	C	N	75			1					
	F/T/Agg	N	35	W	1	11					Males
MOD0	F	N	100	E	15	1					
SOSP	C	NE	75			1					70
SOSP	C	NW	40			1					
AMCR	P	NWE	100			5					
RWBL	F	S	200	W	2	1					
MOD0	F	S	150	E	30		1				
RBLV	F	S	300	NW	5		3				
COYT	C	NW	70				1				chip note
TRES	F	N	70	NE	25		1				
EUST	P/Fo	SW	300				Agg	30+			on Land F: 11
Sparrow Sp.	"	"	"				5	5			Sparrow Sp.
RWBL	Agg/F	ESE	30	S	10		5	1			RWBL chasing AMCR
AMCR	F	ESE	30	S	10		1	1			
SOSA	C	S/SW	30				1	1			

PASSERINE - Bird Point Count Data Sheet

B-5 (next to nursery)

Project Name _____
 Date 6/20/13 Start Time 0619 Stop Time 0628
 Observer _____ Wind Spd. 0 Wind Dir. _____ Sky 2 Temp 75

Sample Point ID # & Name _____
 X coordinate, Y coordinate _____
 Dominant (>50%) AES Habitat Type _____
 Other Habitats _____



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		
F = flying		Upland Coniferous Forest
S = soaring		Upland Mixed Forest
P = perching or on water		Wetland Forested
Fo = foraging		Wetland Shrub-Scrub
MD = mating display		Wetland Emergent
O = other		Open Water

Notes:

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
COYT	C	N	10			1					
SOSP	C	W	25			1					
COUR	F	N	30	W	10	11					
AMCR	P	W	200+			5					ground foraging
MALL	P	W	200			7					
RWBL	P	W	200			5					
SOSP	C	N	20			1					
DOWP	C	N	50			1					
AMRO	C	NE	100			1					
AMGO	C	E	70			1					
MO DO	P	E	50			1					
BAOR	P	NE	75			1					
EUST	F	E	75	SW		11					
TUTM	C	W/SW	250			1					
RWBL	C	W/SW	250			1					
MO DO	F	N	30	W	10	11					
THCO	C	W	75			1					
NAMO	C	E	150			1					
MALL	F	W	150	SW	20	1					male
CSWA	C	N/NE	50			1					
MALL	F	W	150	SW	20	1					Female
AMRO	P	E	30			1					

PASSERINE - Bird Point Count Data Sheet

B-6 (next to TAZ)

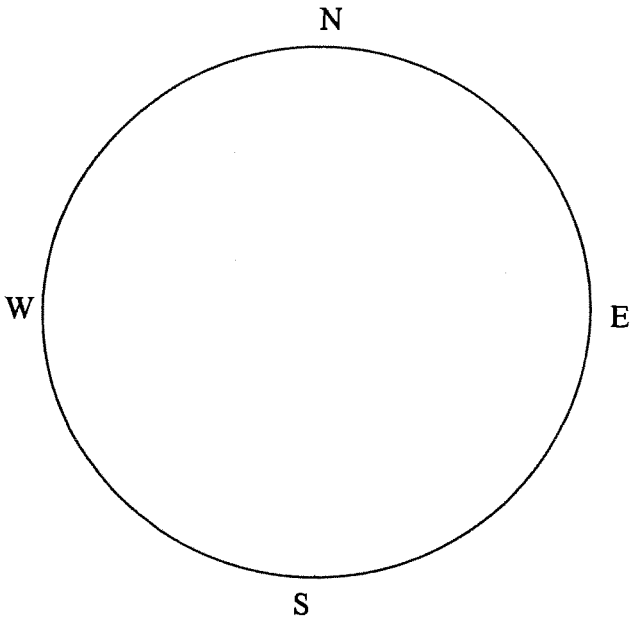
Project Name _____
 Date 6/26/13 Start Time 0633 Stop Time 0643
 Sample Point ID# & Name _____

X coordinate, Y coordinate _____

Observer _____ Wind Spd. _____ Wind Dir. _____ Sky _____ Temp _____

Dominant (>50%) AES Habitat Type _____

Other Habitats _____



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes:

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
EATO	C	W	70			|					
FISP	C	N	35			|					
RB6R	C	E	20			|					
AM60	C	SE	20			|					
WOTH	C	E	75			||					
AM60	C	E	60			|					
SOSP	C	S	70			|					
AMCR	F	NW	100	S	25	|					
COBR	F	N	25	E	30	|					
WOTH	C	NE	100				|				
AMRO	C	N	150				|				
BAOR	C	W	100				|				
EAWP	C	N	120					|			
SOSP	P	W	75								Perched on snag in CVR.
AM60	C	N	200					|			
VEDW	C	SW	50					|			
TUTM	C	SKW	200					|			

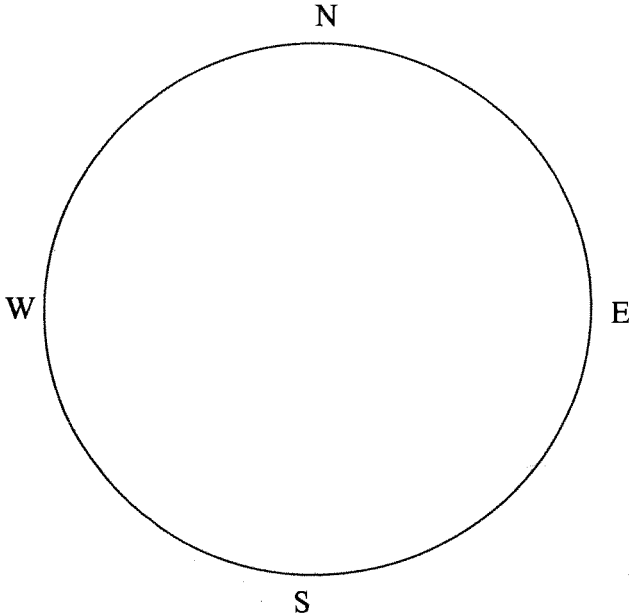
PASSERINE - Bird Point Count Data Sheet

B-7

(in woods strip P4)

Project Name: 06/26/13 0709 0719
 Date: 06/26 Start Time: 0 Stop Time: 2
 Observer: MG/AG Wind Spd.: 0 Wind Dir.: 0 Sky: 2 Temp: 76.0

Sample Point ID # & Name: _____
 X coordinate, Y coordinate: _____
 Dominant (>50%) AES Habitat Type: _____
 Other Habitats: _____



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		
F = flying		Upland Coniferous Forest
S = soaring		Upland Mixed Forest
P = perching or on water		Wetland Forested
Fo = foraging		Wetland Shrub-Scrub
MD = mating display		Wetland Emergent
O = other		Open Water

Notes: Green Frogs calling from P-4 pond.
 chipmunk calling from S side of P-4 pond

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
SAMP	R	NE	20			1					
BHCO	C	W	25			1					
SOSP	E	E	50			1					
BAOR	C	NE	25			1					
BLJA	C	SW	100			1					
AMCR	C	S	150			1					
WAVI	C	SE	75			1					
AMGO	C	N	75			1					
AURO	C	N	100			1					
WBND	C	S	50			1					
COYT	C	SE	100			1					
EAKI	C	N	50				1				
RWBL	C	N/NE	100				1				
AMRO	P/FO	N/NE	20				1				eating a berry
TUTM	C	S/SE	100					1			
RBGR	C	N	75					1			
AMCR	C	E	250					2+			
PIWP	C	SE	50					1			
AMCR	F	N	20	W	20			2.5			

PASSERINE - Bird Point Count Data Sheet

B-8 (off of lupine trail)

Project Name

Sample Point ID # & Name

6/26/13 0721

0731

Date

Start Time

Stop Time

X coordinate, Y coordinate

Observer

Wind Spd.

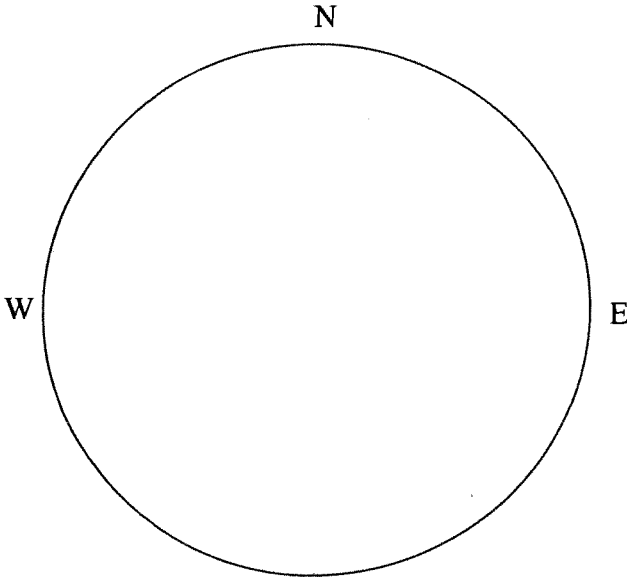
Wind Dir.

Sky

Temp

Dominant (>50%) AES Habitat Type

Other Habitats



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes:

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
BAOR	C	815	S			|					
AMRO	P	810	E			|					
EAWP	C	50	N			|					
FNBU	C	40	S			|					
AMRO	C	50	W			|					
AMCR	C	100	NW			|					
RWBL	C	50	S			|					
CEOW	C	100	S			2+					
WAVE	C	50	E			|					
RWBL	C	75	N			|					
SOSP	C	150	NE				|				
RWBL	F	250	S	W	3		|				above Land F. "
RWBL	C	200	S				|				Land F. " slope
BLJA	C	40	NW					|			
RWBL	C	20	NW					|			
AMRO	C	25	E/SE					|			
AMRO	C	10	NE					|			
BAOR	C	15	W					|			
EATO	C	15	W					|			
OVEN	C	10	S					|			

PASSERINE - Bird Point Count Data Sheet

B-9 (near TA 10)

Project Name

Sample Point ID # & Name

06/26/13

0830

0840

Date

Start Time

Stop Time

X coordinate, Y coordinate

JL/ML

0

3

Observer

Wind Spd.

Wind Dir.

Sky

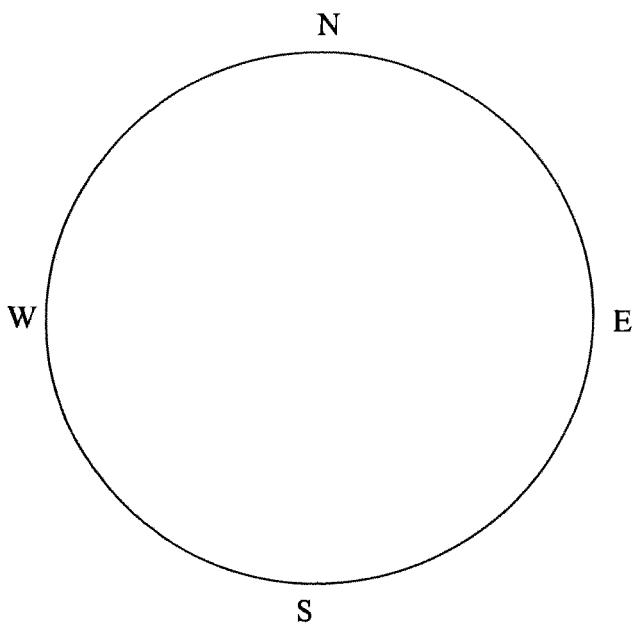
Temp

Dominant (>50%) AES Habitat Type

Other Habitats

Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		
F = flying		Upland Coniferous Forest
S = soaring		Upland Mixed Forest
P = perching or on water		Wetland Forested
Fo = foraging		Wetland Shrub-Scrub
MD = mating display		Wetland Emergent
O = other		Open Water

Notes: mod. land fill noise



Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
NOR A	C	E	200			|					
AMRO	C	W	100			|					
AMRO	C	SW	10			|					
COYT	C	E	40			|					
WBAU	C	E	100			|					
AMRO	P	N	25			|					
BARS	F	W	20	S	40		||	|||			
SO SP	C	W	75					|			
CE DW	C	S	75					|			
EA WP	C	NE	150					|			
REVI	C	S	100					|			
GRCA	C	W	30					|			
REVI	C	E	75					|			

PASSERINE - Bird Point Count Data Sheet

B-10

(in woods by Rapp
RC)

Project Name _____

Sample Point ID # & Name _____

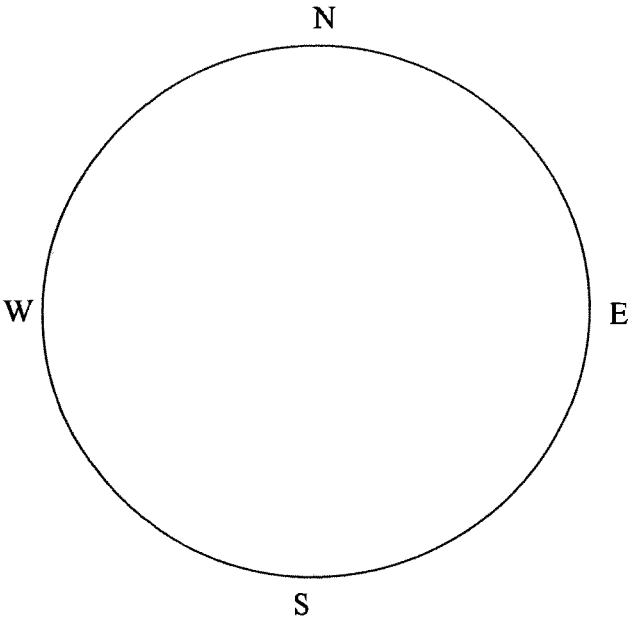
Date 06/26/13 Start Time 0815 Stop Time 0828

X coordinate, Y coordinate _____

Observer JB/lyr Wind Spd. 0 Wind Dir. - Sky 3 Temp 76°

Dominant (>50%) AES Habitat Type _____

Other Habitats _____



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

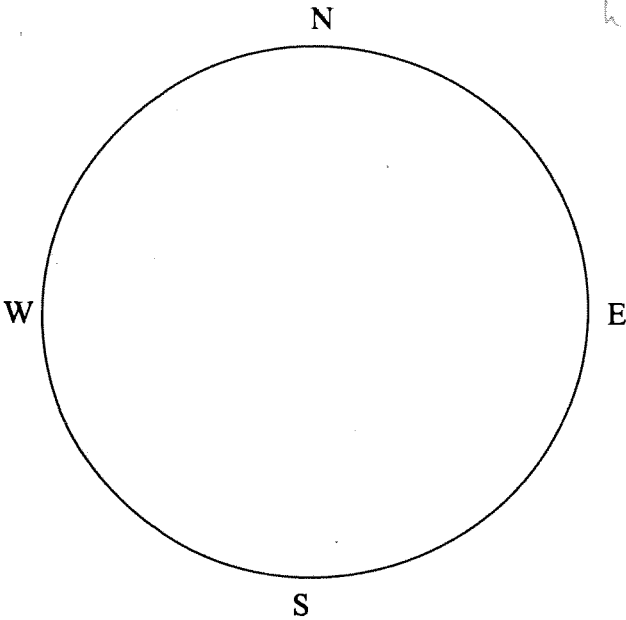
Notes:

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
GRCA	C	N	5			1					
DOWD	C	S	15			1					
BRRH	C	W	25			1					
BRCA	C	S	10			1					
TLATP	C	E	20			1					
WSTH	C	N	75			1					
AMPO	C	NE	100			1					
NRM	P/Fo	NW	25			11					
GRCA	C	W	30			1					
EALP	WNW	C	85			4	1				
COYE	C	C	40			3	1				
VWDR	C	E	70			3	1				
NACA	C	S	100				1	1			
REVI	C	NW	75					1			
RAOR	C	N	100					1			
BHCO	C	W	100					1			

PASSERINE - Bird Point Count Data Sheet

B-11 (next to TAMS)

Project Name 6/26/13 OS17 OS27
 Date 6/26/13 Start Time 0 Stop Time 2
 Observer 0 Wind Spd. 0 Wind Dir. 2 Sky 750F Temp 750F
 X coordinate, Y coordinate _____
 Dominant (>50%) AES Habitat Type _____
 Other Habitats _____



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes:

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
SOSP	C	S	75			1					
GACA	C	N/NE	100			1					
AMRO	C	N	70			1					
AMRO	C	W	200			1					
AMCR	C	W	200			1					
AMCR	C	E	200			1					
AMRO	C	S	40			1					
EAKI	C	E	250+			1					
WONO	P/Fo	N	60			1					Edge of Nursery
TUTI	C	E/SE	150			1					
AMCR	F	S/SW	400	E	10		11				over land fill
NALL	F	S/SW	20	W	7		0				
YWAR	C	N	150				1				
INBU	C	N/NE	120				1				
RWBL	C	SW	200				1				
WAVE	C	S/SE	75					1			
CEWJ	C	NE	75					2+			
AMCR	F	W	200	SE	40			1			

D. Schaefer
 609
 618
 3999

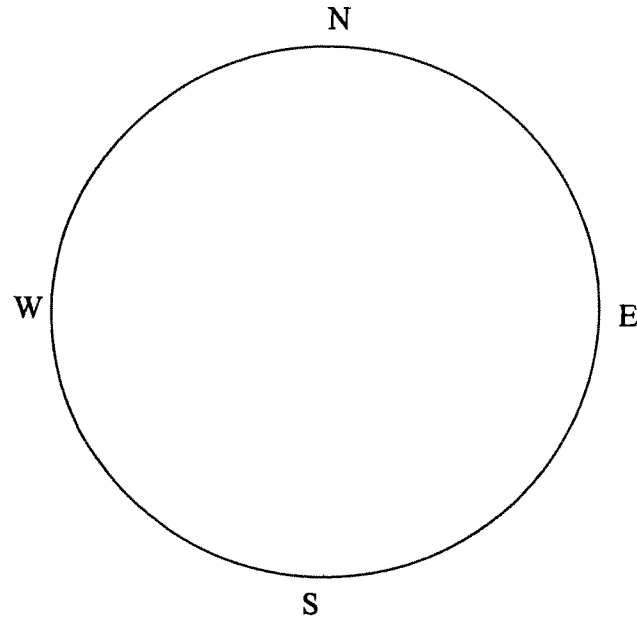
PASSERINE - Bird Point Count Data Sheet

Project Name: Albany Sample Point ID# & Name: B-12 (B/W OWCS)
 Date: 6/26/13 Start Time: 0605 Stop Time: 0615
 Observer: gmg/16 Wind Spd.: 0 Wind Dir.: - Sky: 2 Temp: 76.0

X coordinate, Y coordinate _____

Dominant (>50%) AES Habitat Type _____

Other Habitats _____



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes:

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
AMCR	P	N	250			1					Perched
AMCR	c/p	NNW	250			20+					in forest + near
RWBL		W	200			1					
EAK1		E	25			1					circling over
AMRO		SE	125			1					
RWBL		SW	75			1					
NBH		E	200			1					
AMRO		NE	250			1					
NOCA	C	E	100			1					
RBGL	F	SW	250	SW	15	10K					ON LF
EUST	F	SW	250	E	2	(10)					
DOLO	C	E	200				1				
AMCO	F	W	75	E	20		1				
CEOW	F	N	30	S	20		11				
YWAR	C	N	250					1			
THUN	F/S	SW	250	var	S			1			
IKIL	C	SW	200					1			
AMCR	F	S	150	SW	20			1			
NOCA	C	NE	150					1			
MALL	F	N	150	NW	15			1			

PASSERINE - Bird Point Count Data Sheet

(SW side of CVP) B-13

Project Name

Sample Point ID # & Name

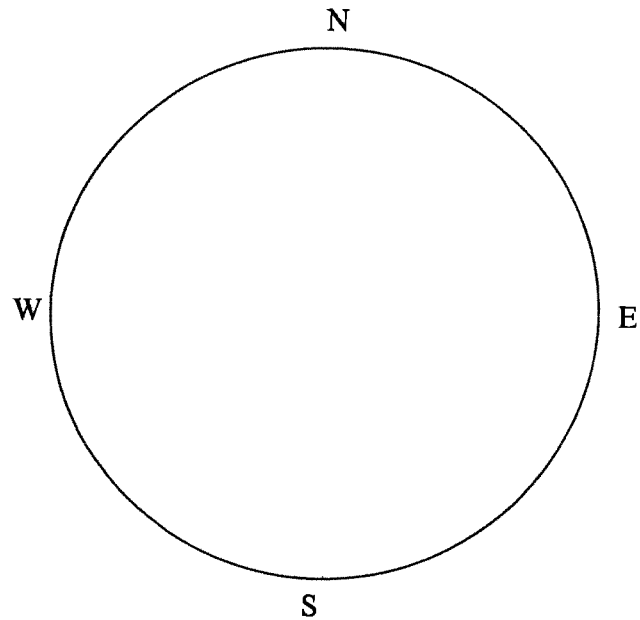
Date 06/26/13 Start Time 0647 Stop Time 0655

X coordinate, Y coordinate

Observer JG, mjm Wind Spd. 0 Wind Dir. - Sky 2 Temp 76°

Dominant (>50%) AES Habitat Type

Other Habitats



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes: wind / muggy

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
SOSP	P	NNW	20			||					on song - cwp note is heard
WAVI	C	S	75			|					
COYE	C	S	50			|					
CHCO	R/C	SSE	20			|					
CEBW						|					
AMCR	F	SE	100	S	35	|					
SAFO	C	N	75			|					
EAFO	C	W	100			|					
AMCR	C	E	250			||||					
SOSP	C	E	75			|					
AMGO	C	NE	150			|					
ERCA	C/ov	SW	10			||					
AMRO	F	S	25	W	5	|					
BHLS	P/fo	E	40				||||				on ground
BAOR	C	N	50			|					
AMRO	C	SW	200			|					
MOIL	P	S	210				||||				
EUST	P	S	500					(30)			on fence on LF
SOSP	C	NE	100					|			
EAUP	C	NNE	200					|			
MOU	F	N	20	SE	2			|			low
SPOA	P	SE	25					|			
TRES	F	E	100	SE	5			|			
AMRY	C	S	720					|||			

PASSERINE - Bird Point Count Data Sheet

B-14

(34/104)

Project Name

Sample Point ID # & Name

06/26/13

0657

0705

Date

Start Time

Stop Time

X coordinate, Y coordinate

06/mgr

0

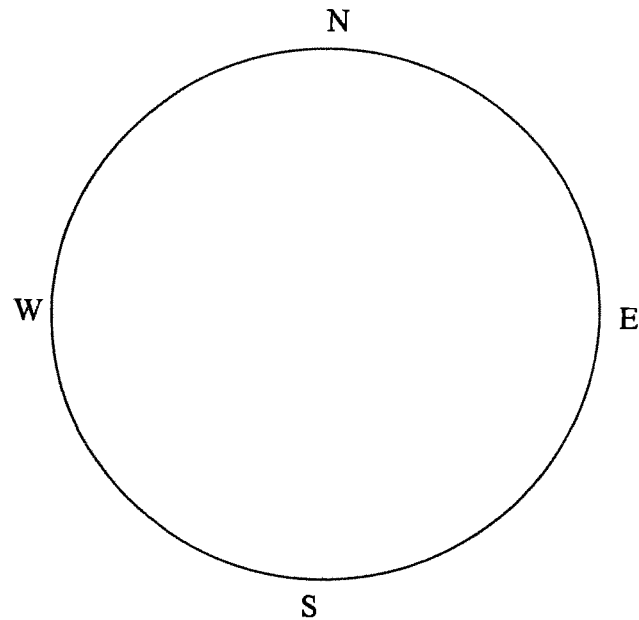
-

2

76°

Dominant (>50%) AES Habitat Type

Other Habitats



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		
F = flying		Upland Coniferous Forest
S = soaring		Upland Mixed Forest
P = perching or on water		Wetland Forested
Fo = foraging		Wetland Shrub-Scrub
MD = mating display		Wetland Emergent
O = other		Open Water

Notes:

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
COYE	C	S	10			1					
AMPO	C	S	75			1					
GRCA	C	NNE	50			1					
SOSP	C	N	75			1					
YNPR	C	S	40			1					
SOSP	C	W	40			1					
SOSP	C	S	50			1					
MODJ	F	N	30	NE	BD	11					
RWBL	F	SW	10			1					♀
RWBL	C	SW	40			1					
GRCA	P	W	60			1					
COGR	F	W	30	N		1					
WAW	C	SW	100			1					
BEKI	C	N	80			1					
AMRO	P	N	50				111				
CAUP	♀	W	150				1				
BOOR	C	N	100				1				
RWBL	C	S	80				1				
MODJ	F	SE	100	W	10		11				
GRCA	P	E	80				11				likely point from family NNE
RWBL	F	W	20				1				

PASSERINE - Bird Point Count Data Sheet

(Test plots) B-15

Project Name

Sample Point ID # & Name

6/26/13

0902

0912

Date

Start Time

Stop Time

X coordinate, Y coordinate

SG MJM

1

S

3

750 F

Observer

Wind Spd.

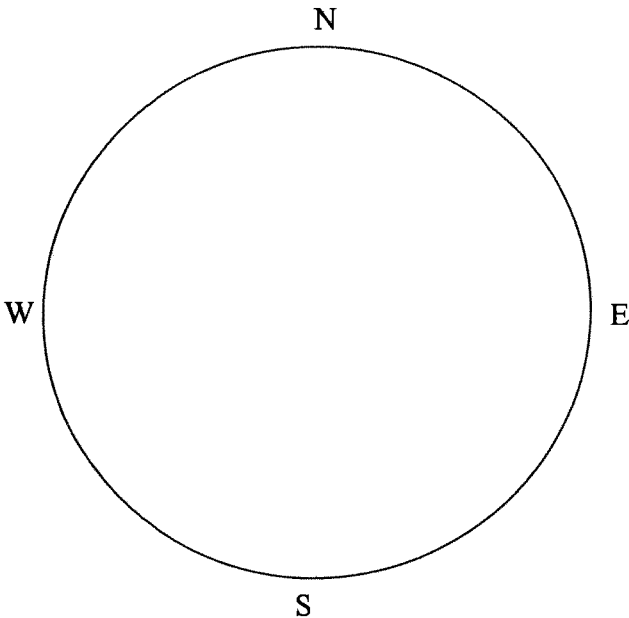
Wind Dir.

Sky

Temp

Dominant (>50%) AES Habitat Type

Other Habitats



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes: Mod. noise from Highway.

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
BANS	Fo	N	30			||||					
BAOR	F	N	50	N	10	|					
TUVU	P	S	50			||					
RWBL	F	N	120	W	2	|					
INBU	F	NE	100	S	3	||					
AMBO	F	E	100	E	15	|					
AMCR	C	SE	150			|					
RWBL	F	S	50	W	2	|					
RWBL	P	W	10			|					
RWBL	C	N	150			|					
RWBL	C	E	100			|					
EATO	C	NE	150				|				
INBU	C	N	100				|				
INBU	C	S	120				|				
CEBW	C	S	40				|				
BANS	F	E/SE	200	VAR	S		6				in and out of nesting colony
WAVI	C	W	150				|				
JOSP	C	N	150				|				
CSWA	C	E/NE	150				|				
CEBW	F	W	20	N	S		|				
SAVS	C	E	50				#	|			
TUVU	F	N	500	N	200			|			
COGR	F	N	50	S	100			||			
AMBO	C	W	75					|			
HOSP	F	S	60	SW	2			30			Flock foraging
SAVS	C	S	50								

AMBO

N/NE

50

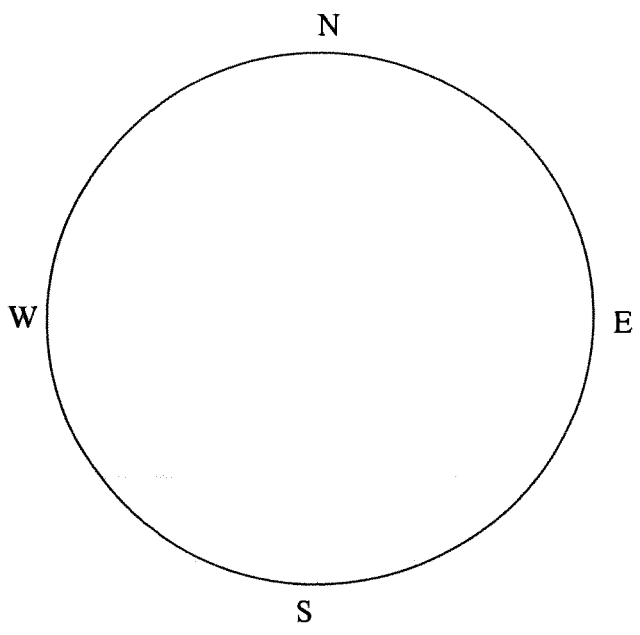
12

perched on L.F. fence

PASSERINE - Bird Point Count Data Sheet

(New TA#12) B-16

Project Name _____ Sample Point ID # & Name _____
 Date 6/26/13 Start Time 0759 Stop Time ~~0800~~ 0810
 Observer _____ Wind Spd. 0 Wind Dir. _____ Sky 3 Temp _____
 X coordinate, Y coordinate _____
 Dominant (>50%) AES Habitat Type _____
 Other Habitats _____



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes:

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
INBU	C	W	20			1					
NOMO	C	N/NE	60			1					
CEDW	C	S	100			1					
GRCA	C	N	20			1					
SOSP	C	S	75			1					
COYT	C	S	200			1					
BARS	F	S/SW	150	E	20	11					
BGEN	C	SE	40			1					
AMCR	F	E/SE	200	W	35		1				
BHCO	P	NW	20				1				
GRCA	P	NW	20				1				
BARS	F	N	20	SW	20		1				
RWBL	F	W	5	E	10			1			
RBWO	C	S	100					1			
CEDW	F	N	150	SW	40			4			
HOFI	P	E	20					1			Female
AMCR	F	SW	150	S	50			1			
SOSP	C	SW	30					1			

PASSERINE - Bird Point Count Data Sheet

B-17
(open sandy area near Rupp Rd.)

Project Name

Sample Point ID # & Name

6/26/13

0846

0854

Date

Start Time

Stop Time

X coordinate, Y coordinate

Observer

Wind Spd.

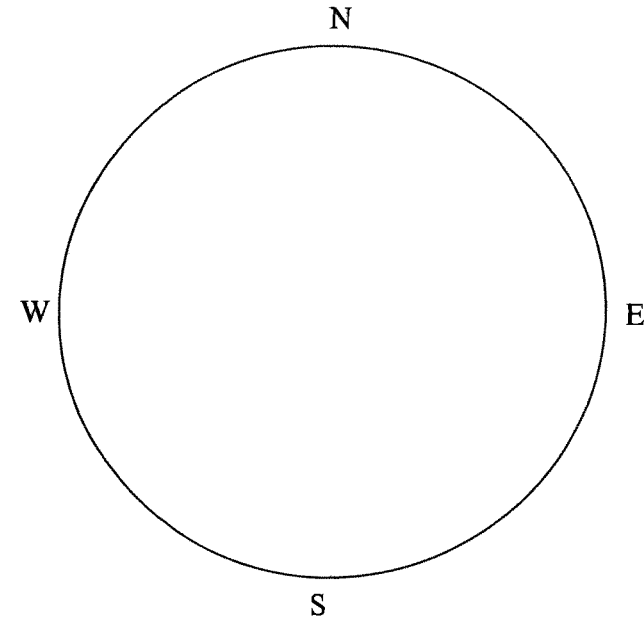
Wind Dir.

Sky

Temp

Dominant (>50%) AES Habitat Type

Other Habitats



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes: Lots of noise pollution from road.

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
AMRO	C	NE	25			|					
INBU	C	NE	40			|					
SOSP	C	NE	50			|					
AMRO	C	S	30			|					
BHCO	C	N	50			|					
WAVI	C	N	75			|					
COYT	C	E	40			|					
BCCD	C	S	70			|					
NOCA	C	SE	30			|					
BASW	P	S/SE	50			|||					
INBU	C	W	60			|					
GRCA	C	NW	75			|					
DOWP	C	N	75			|					
TUVU	F	W	150	W	150		|				
YSFL	C	E	150				|				
AMGO	C	NW	75				|				
EAWP	C	N/NE	80				|				
CHKP	C	E/SE	100				|				
BARS	FO	W	60	VAR	20		|||				
AMRO	F	W	15	E	3						
COYT	C	SE	80					|			
EAPH	C	E/NE	50					|			
EAPH	P/F	N	40	E	8						

08/22/13

Lehigh Gorge SP Trztl

overcast

71° (rain) humid

REVI
TUTU
BCTH
BUJA
NOCA

0854 - Agkistrodon c. MOKASEN
along retainer wall. Animal
was anteriorly exposed from
crease between stones
only head + 1/2" of neck
was visible

ENV. CONDITIONS - nozy, humid -
rained approx. 25 min prior
sun bright thru overcast
Amb - 73.8°F, 80% RH
NO WIND

- Fire lured skink 11/11
- Am. Toad "
- N copperhead 1
- N water snake 111 shed 1
- Black ratsnake 11 shed 11
- Chironidus shed 1
- Black RATER 1

overcast
mid

8/26/13

8/27

8/27
BANDING
BCHH
AMGO
PRAW
HOUR

EXTRACTED
PRAW XZ
COYE (w/ XISPT)

8/27 ON SITE

APBP

CORA NOFL 750 humid, wind 1-2
BUJA EAMP RSHN
AMGO BLUM ATWA Ptlly cloudy VF
TUNU COHA GBHE Caputo 15
BCHH F-EDW AMKE 11/1 Tselesjos 1
EATO MBOW CONT 11/11/14
NOMO DAWD MBW
EAKI MAMBA GARD (outlet) S-atc
MODO NOCA LEFL (outlet) S-atc
HEHU COYE EPIOP III S o occupant
PSTEN CEVI WSWW 1 T's sintals 1 month
GACA RTHU OROR BUWA 1 T's sintals 1 adult
CHSP REGR AMRE
EAPH EAST GHE
HOT (PANS HAND FROGS
AMPO TREES WAM N Spamp WFR ANATO
CHSW N J 17 treefy N Green

APBP 8/27/cont'd

Murch

amb whi

Susp

cop

resant

2 tanks blue

3.2m / 7.5pmp

ble count 1

5.0 sps skup

8/28/13

APBP 6 in open area again

RETURN - got PICS

BCKI

NAVES

MOMA

LOYE

BYE

MERC

N loop flag

#3 are up!

~~8/27~~

~~8/28~~

9/4/13 SMWR 1750-

cool 74° windy (-2) < 10% cc/dry

Cottontail 55 KOS

Underbills

Phalaropes

T Sirt 3 juvy (no vertebral stripes)

Beaver Pond IS

well established -

new supporting w/

birds

Boss

SOSP

GREY

DESO - 2001

SOSP

Amur! many in NW when by beaver pond

WIBNA

COYE

CAMP

CEBIN

AMKO

AMKE

POSS VEEEP

VIPA

KEGA

CABO

WOBW

WALL

AESB

PASSERINE - Bird Point Count Data Sheet

APB

B-1

Project Name

Sample Point ID # & Name

8/28/13

0718

0723

Date

Start Time

Stop Time

X coordinate, Y coordinate

JG, MJA

0

0

clear

63°F

Observer

Wind Spd.

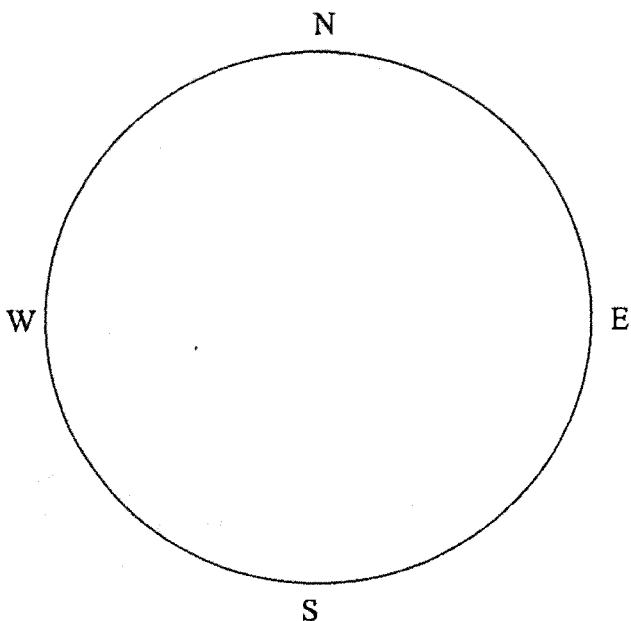
Wind Dir.

Sky

Temp

Dominant (>50%) AES Habitat Type

Other Habitats



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes:

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
GRCA	C	E	40			1					
SOSP	C	N	30			1					
AMGO	C	N	150			1					
MOBO	F	W	20	S	20		1				
CEEDW	C	NE	75				1				
MOBO	P	NE	125				111				

PASSERINE - Bird Point Count Data Sheet

APB

B-2

Project Name

Sample Point ID # & Name

8/28/13

0733

0754

Date

Start Time

Stop Time

X coordinate, Y coordinate

JG, MSM

0

0

overcast

63°F

Observer

Wind Spd.

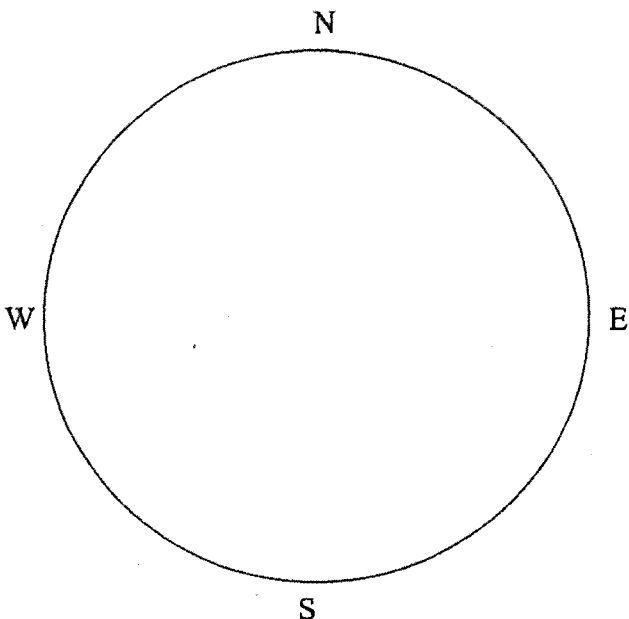
Wind Dir.

Sky

Temp

Dominant (>50%) AES Habitat Type

Other Habitats



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		AES Habitat Type
F = flying		Upland Coniferous Forest
S = soaring		Upland Mixed Forest
P = perching or on water		Wetland Forested
Fo = foraging		Wetland Shrub-Scrub
MD = mating display		Wetland Emergent
O = other		Open Water

Notes:

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
UBNU	C	SE	100			|					
BLJA	C	NE	100 75			|					
AMGO	C	N	75			|					
MAWA	Fo	SE	20			|	|				
COYE	Fo	SE	20			|	|				
RBGR	F	SE	50	S	30		|||				
KCRI	Fo	E	8					|			Typically <8m AGL
NAWA	Fo	E	8					|			" "
AMGO	F	N	15	S	40			|	|		
COYE	F	N	10					|			
BLJA	C	SE	100						|||		
AMCR	C	S	110						|		
AMKE	C	E	150						|		
AMKE	C	S	150						|		Redstart harassing the RTHA
RTHA	C	E	125						|		RTHA harassing the AMKE

PASSERINE - Bird Point Count Data Sheet

APB

B-3

Project Name

Sample Point ID # & Name

8/28/13

0708

0716

Date

Start Time

Stop Time

JG, MJM

0

0

clear

63°F

Observer

Wind Spd.

Wind Dir.

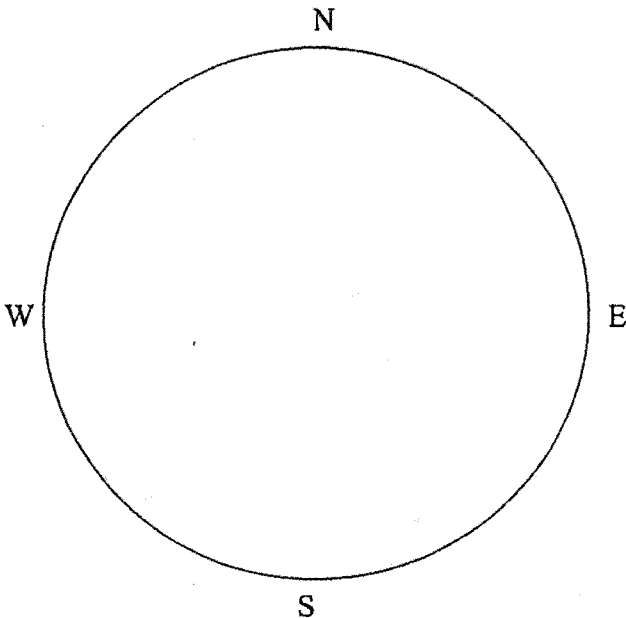
Sky

Temp

X coordinate, Y coordinate

Dominant (>50%) AES Habitat Type

Other Habitats



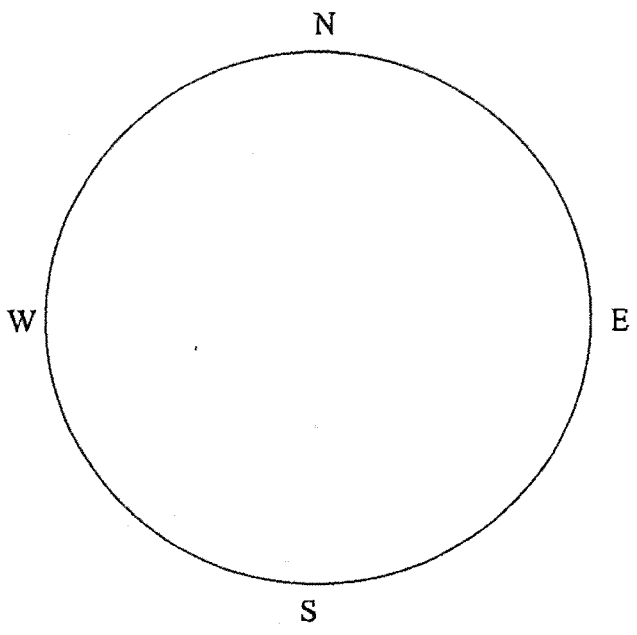
Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes:

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
BLTA	C	S	100			1					
AMCR	C	SW	75			1					
MODO	P	SE	35			1					
SOSP	C	NE	15			1					Counter chirping, one is further south.
MODO	P	NE	100			1	1				in oak tree
WPKP	F	EW	0	EW	20		1	1			Warbler. Melody chirp. White outer tail feathers faint streaking in flanks. Under tail coverts not observably yellow.

PASSERINE - Bird Point Count Data Sheet

Project Name: APP Sample Point ID # & Name: B-4
 Date: 8/28/13 Start Time: 1002 Stop Time: 1008
 Observer: JG, MJA Wind Spd.: 1 Wind Dir.: W Sky: 38% cloud cover Temp: 78° F
 X coordinate, Y coordinate: _____
 Dominant (>50%) AES Habitat Type: _____
 Other Habitats: _____



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		
F = flying		Upland Coniferous Forest
S = soaring		Upland Mixed Forest
P = perching or on water		Wetland Forested
Fo = foraging		Wetland Shrub-Scrub
MD = mating display		Wetland Emergent
O = other		Open Water

Notes:

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
TUVU	S	W	500	circle	100	|||					
AMGO	C	NE	75			|					
RTHA	P	W	120			|					
RBBU	F	W	110	VAR			|				over GAL
UNPA	F	N	50	W	20		||				
TUVU	S	N	200	circle	120	|		6			
AMKE	F	W	100					|			
GRCA	C	N	75					|			

PASSERINE - Bird Point Count Data Sheet

APB

B-5

Project Name

Sample Point ID # & Name

8/28/13

0937

0944

Date

Start Time

Stop Time

X coordinate, Y coordinate

JG, MSM

1

N

60%

78°F

Observer

Wind Spd.

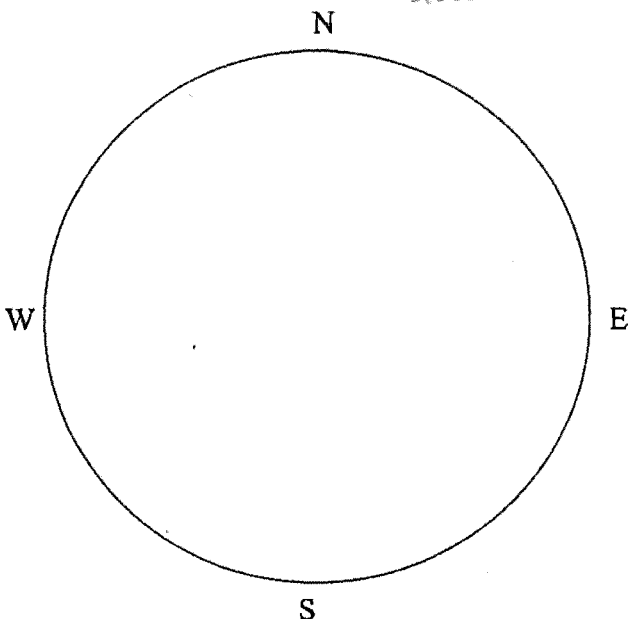
Wind Dir.

Sky

Temp

Dominant (>50%) AES Habitat Type

Other Habitats



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		
F = flying		Upland Coniferous Forest
S = soaring		Upland Mixed Forest
P = perching or on water		Wetland Forested
Fo = foraging		Wetland Shrub-Scrub
MD = mating display		Wetland Emergent
O = other		Open Water

Notes:

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
BARS	F	SW	20	N	VAR	1					
AMKE	P/Fo/Agg	SW	100			10					Group chasing & perching together. Ps. Family
CEWJ	F	N	25	S	20	1					
NOFL	C	W/SW	200			1					
GRCA	C	N	50			1					
MOO	P	NE	200				7				
AMGO	C	E	100				4				
BLJA	C	N	100				1				
RWBL	P	W	30				8				in barnyard grass
RBGU	F	NW	200	N	30	1					
TUVU	F	NW	500	N	30	1					
SOSP	P	NW	5				1				
MOO	F	NW	10	S	25	1					
TUVU	F	W	500	S			11				
MILL	F	W	35	W	8			1			

PASSERINE - Bird Point Count Data Sheet

APB

B-6

Project Name

Sample Point ID # & Name

8/28/13

1056

1105

Date

Start Time

Stop Time

X coordinate, Y coordinate

JG

1

N

clear/
hazy

81°F

Observer

Wind Spd.

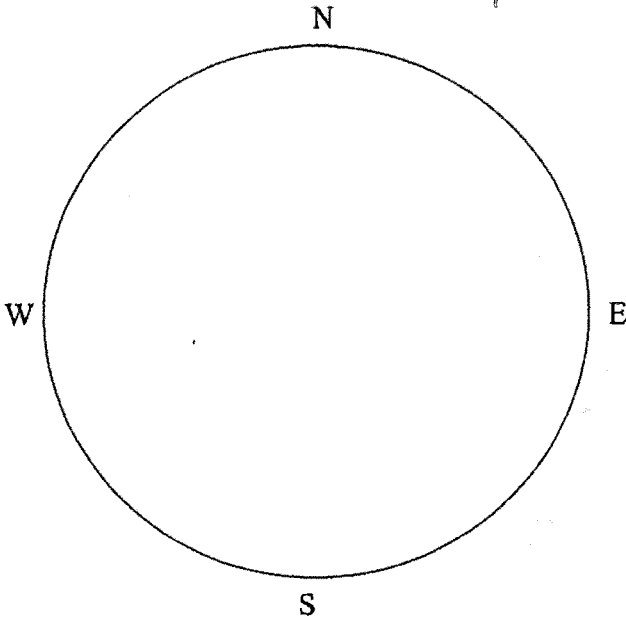
Wind Dir.

Sky

Temp

Dominant (>50%) AES Habitat Type

Other Habitats



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

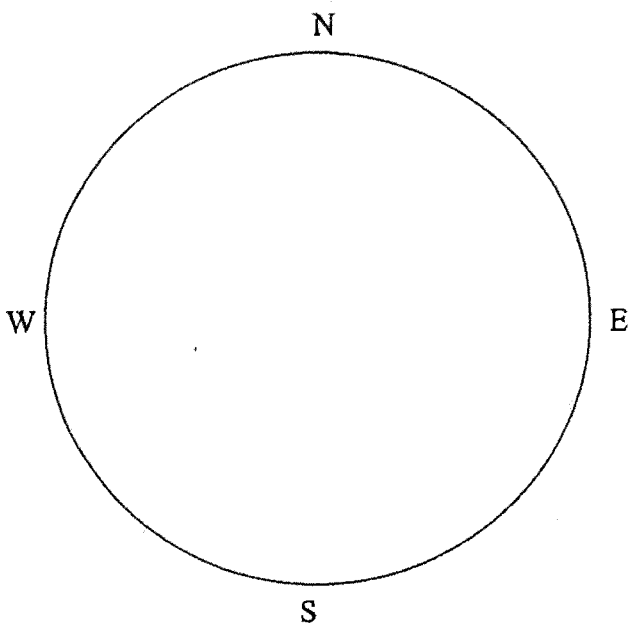
Notes:

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
RBWD	C	N	25			1					
BLJA	C	N	40			1	1				
ANRO	C	E	50			1					
GRCA	C	E	45			1					
MALL	C	SE	75				1				
NOFL	C	SW	200				1				
EAWP	C	N	90				1				
TUTM	C	NW	85					1			
EAWP	C	NW	75					1			counter calling w/other one
AMGO	C/F	N	40	NW	40			1			
SO SP	C	S	25					11			chip notes

PASSERINE - Bird Point Count Data Sheet

Project Name: APD Sample Point ID # & Name: B-7
 Date: 8/28/13 Start Time: 1027 Stop Time: 1032
 Observer: m2/j9 Wind Spd.: 0 Wind Dir.: 0 Sky: 0 Temp: 80°

X coordinate, Y coordinate _____
 Dominant (>50%) AES Habitat Type _____
 Other Habitats _____



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes: Hy/2 vesiculator
Pseudocercus carolinensis 7 in upland forest

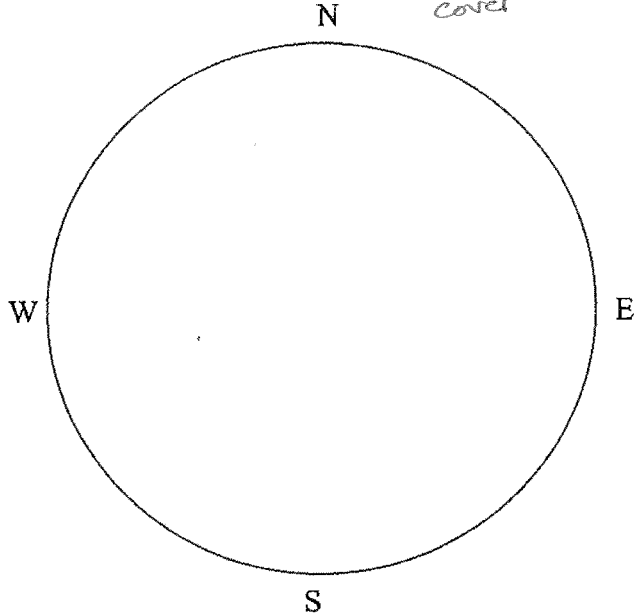
Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
ERCA	C	S	30			11					counter collis
AMRO	C	S-W	100			1					
EATD	C	W	40				1				
AMGO	C	S	10				111				
RBNU	C	W	75					1			
NOFL	C	E	50					1			
BLJA	C	E	150					1			
RODYL	F	N	5	S	7			(4+)			

PASSERINE - Bird Point Count Data Sheet

Project Name: APB
 Date: 8/28/13
 Observer: JG, MJM

Sample Point ID # & Name: B-8
 Start Time: 1014
 Stop Time: 1019
 Wind Spd.: 1
 Wind Dir.: N
 Sky: 30% cloud cover
 Temp: 76°F

X coordinate, Y coordinate _____
 Dominant (>50%) AES Habitat Type _____
 Other Habitats _____



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		
F = flying		Upland Coniferous Forest
S = soaring		Upland Mixed Forest
P = perching or on water		Wetland Forested
Fo = foraging		Wetland Shrub-Scrub
MD = mating display		Wetland Emergent
O = other		Open Water

Notes:

Giant Swallowtail butterfly
 N. Gray tree Frog
 Spring Peeper

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
AMKE	F	W	50	VAR	50	1					
ENBU	C	W	25			11					
AMCR	F	S	200	N	S	11					
GRCA	C	SW	40			1					
UNWO	O	N	30								tattoo heard only

PASSERINE - Bird Point Count Data Sheet

APB

B-9

Project Name

Sample Point ID # & Name

8/28/13

1134

1144

Date

Start Time

Stop Time

JK

0

0

clear

77°F

Observer

Wind Spd.

Wind Dir.

Sky

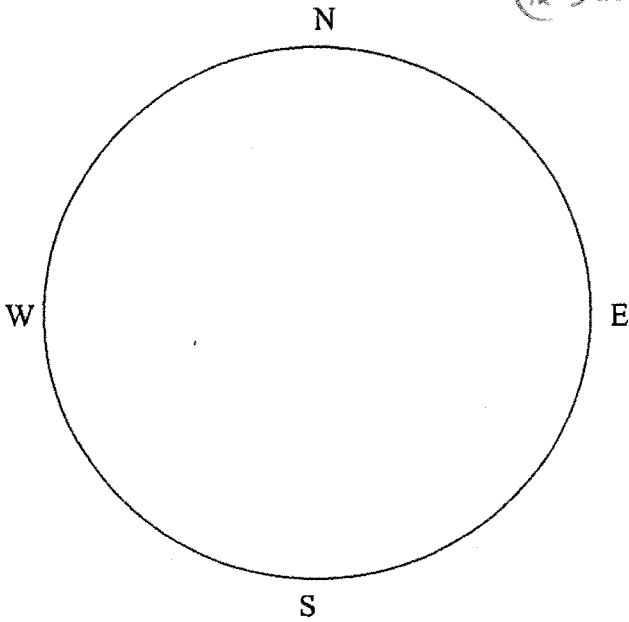
Temp

(in shade)

X coordinate, Y coordinate

Dominant (>50%) AES Habitat Type

Other Habitats



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		
F = flying		Upland Coniferous Forest
S = soaring		Upland Mixed Forest
P = perching or on water		Wetland Forested
Fo = foraging		Wetland Shrub-Scrub
MD = mating display		Wetland Emergent
O = other		Open Water

Notes:

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
EAWP	C	NE	75			1					
WBNU	C	E	50			1					
WBNU	C	W	25			1					
WBNU	Fo	W	15			1					
BLBWA	Fo	W	20				1				Blackburnian warbler
EAWP	C	SE	75					1			
BLJA	C	NE	150					1			
BLJA	C	E	60					1			

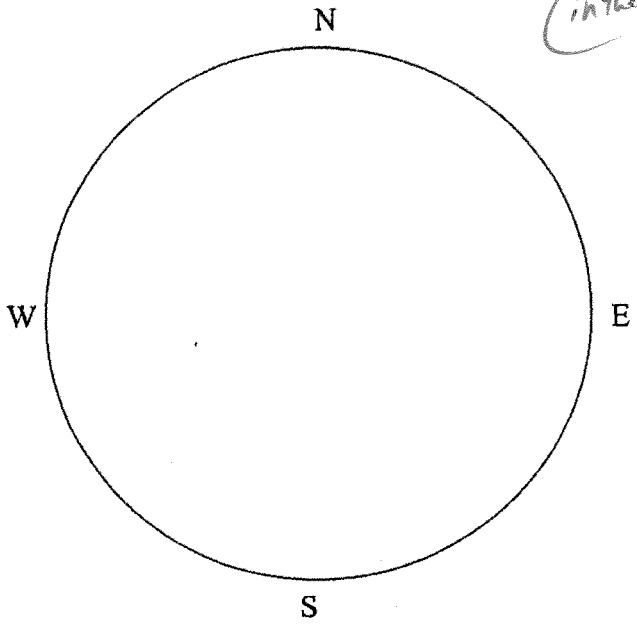
PASSERINE - Bird Point Count Data Sheet

Project Name APB Sample Point ID # & Name B-10

Date 8/28/13 Start Time 1123 Stop Time 1131 X coordinate, Y coordinate _____

Observer JG Wind Spd. 0 Wind Dir. 0 Sky clear Temp 79° F Dominant (>50%) AES Habitat Type _____

(in the shade)



Other Habitats _____

Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes:

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
NOCA	C	SW	70			1					
GRCA	C	W	50			1					
CAWP	C	N	150			1		1			
GRCA	C	E	50			1					
AMRO	C	NE	50			1					
AMRO	C	W	50			1					
AMRO	P	N	25			11					
HAWO	C	NW	40				1				
RTHU	P	N	30				1	11			Female
NOCA	F	S	S	W	S		1				Female

PASSERINE - Bird Point Count Data Sheet

APB

B-11

Project Name

Sample Point ID # & Name

8/28/13

0629

0640

Date

Start Time

Stop Time

X coordinate, Y coordinate

JG, MJM

0

0

clear

60°F

Observer

Wind Spd.

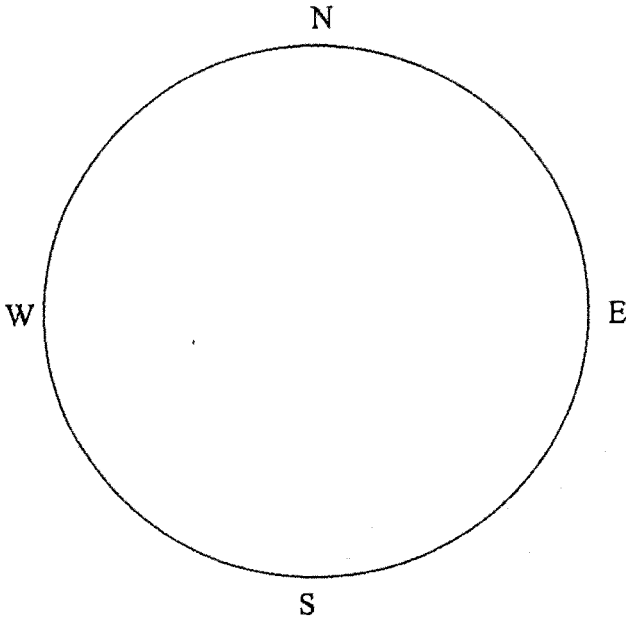
Wind Dir.

Sky

Temp

Dominant (>50%) AES Habitat Type

Other Habitats



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes:

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
SOSP	Fo	E/SE	50	-	-	||					YOY
AMGO	C	N/NW	200	-	-	|||					
AMRO	C	N	150	-	-	|					
CEWJ	C	N	100	-	-	||					
MODO	P	S	100	-	-	|					
UNPA	F	N	300	NW	75		|				
GRCA	C	N	200	-	-		|				
RWBL	F	E	200	S	50		||||				
MERL	F	N	150	SW	75		|				Direct flight, likely migrant
BLSA	C	NE	150	-	-			|			
EUST	F	SE	100	S	85			|			
AMKE	P	NW	150	-	-			||			Perched on tree island
MODO	F	E	25	NW	20			||	||		
DOWO	C	E	75	-	-				|		
RTHA	C	S	150	-	-				|		
NOCA	C	S	100	-	-				|		
AMCR	C	E	100	-	-				|		

PASSERINE - Bird Point Count Data Sheet

APB

B-12

Project Name

Sample Point ID # & Name

8/28/13

0658

0703

Date

Start Time

Stop Time

X coordinate, Y coordinate

JG, MJA

0

0

clear

61°F

Observer

Wind Spd.

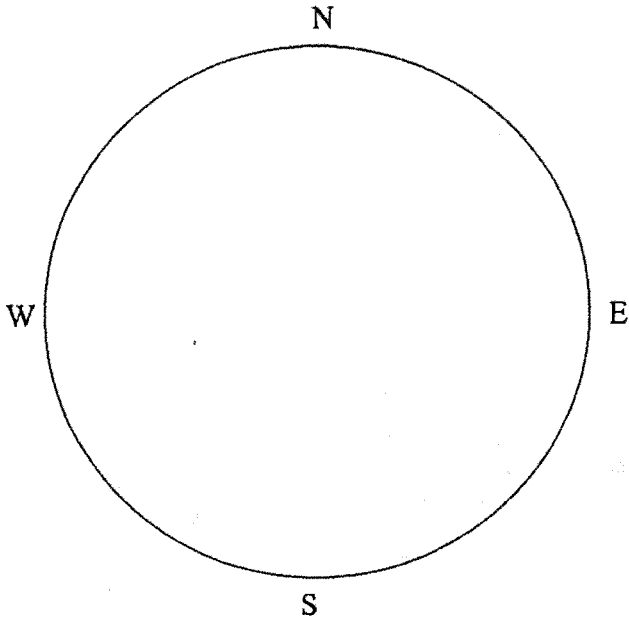
Wind Dir.

Sky

Temp

Dominant (>50%) AES Habitat Type

Other Habitats



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes:

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
MDDO	F	N	75	W	20	11					
AMRO	C	N	250			11					
BLJA	C	N/NE	250			11					
AMBO	C	NW	100			1					
HEGU	Fo/F	S	300	S	10	1					AGL
AMBO	C	S/SE	125			1					
DOWO	C	E	250				1				

PASSERINE - Bird Point Count Data Sheet

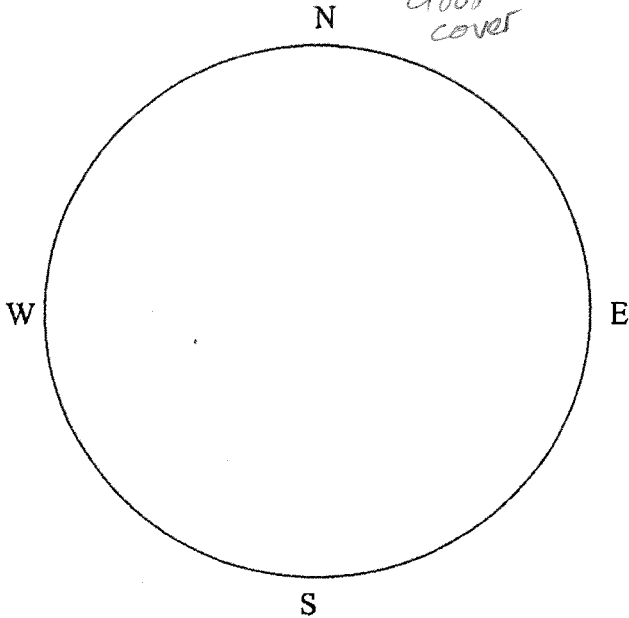
B-13

Project Name 8/28/13 1046 1052 Sample Point ID # & Name

Date 8/28/13 Start Time 1 Stop Time 20% X coordinate, Y coordinate

Observer JG Wind Spd. 1 Wind Dir. W Sky 20% Temp Hot Dominant (>50%) AES Habitat Type

Other Habitats _____



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		
F = flying		Upland Coniferous Forest
S = soaring		Upland Mixed Forest
P = perching or on water		Wetland Forested
Fo = foraging		Wetland Shrub-Scrub
MD = mating display		Wetland Emergent
O = other		Open Water

Notes:
 Green Frogs calling from created vernal pool.
 (few/in frequent)

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
GRCA	C	E	20			1					
EAWP	C	W	100			1					
BLJA	C	W	100			1					
EAWP	C	NW	120			1					
AMRO	C	NW	80				1				
BLJA	F	W	10	SE	5		1				
AMGO	C	N	75				1				
BLJA	C	N	120				11				

PASSERINE - Bird Point Count Data Sheet

Project Name APB Sample Point ID # & Name B-14

Date 8/28/13 Start Time 1035 Stop Time 1042

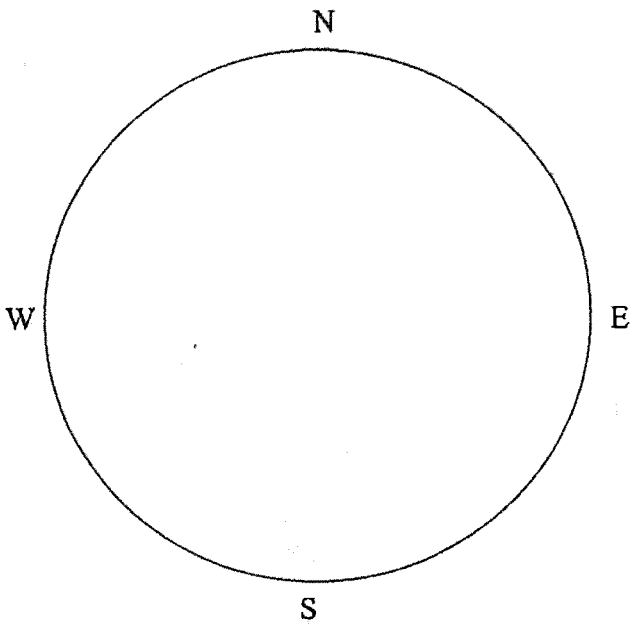
Observer Mary Jo Wind Spd. 0 Wind Dir. 0 Sky 0 Temp HOT

X coordinate, Y coordinate _____

Dominant (>50%) AES Habitat Type _____

Other Habitats _____

Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		
F = flying		Upland Coniferous Forest
S = soaring		Upland Mixed Forest
P = perching or on water		Wetland Forested
Fo = foraging		Wetland Shrub-Scrub
MD = mating display		Wetland Emergent
O = other		Open Water



Notes:

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
AMGO	F	W	20	E	5	11					
GRCA	C	NE	20			11					
JOSP	C	N	4			1					
MWBJ	F/P	N	10	N	2	11/11					flushed from ground
DDWD	C	E	75			1					
FISP	P/C	N	5				1				
AMGO	P	S	30				1				note on willow
GRCA	C	S	40				1				
EAUP	C	N	150					1			

PASSERINE - Bird Point Count Data Sheet

Project Name
APB

Sample Point ID # & Name
B-15

Date
8/29/13

Start Time
1202

Stop Time
1216

Observer
JG

Wind Spd.
2

Wind Dir.
NW

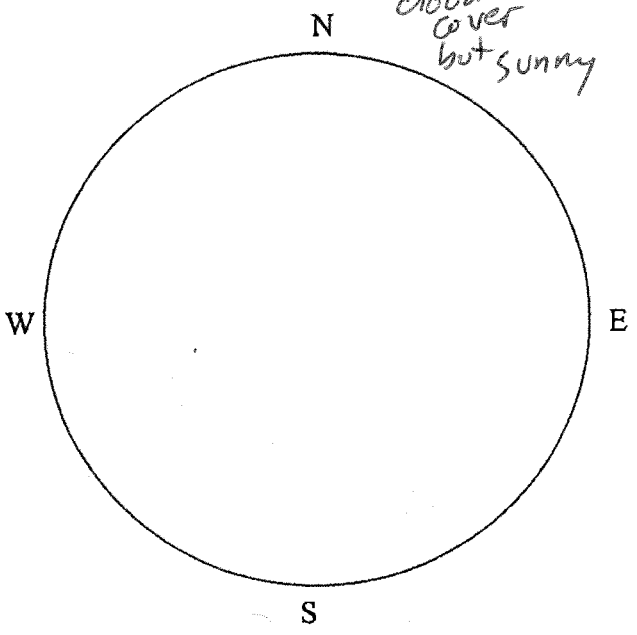
Sky
85%

Temp
80° F

X coordinate, Y coordinate

Dominant (>50%) AES Habitat Type

Other Habitats



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		Upland Coniferous Forest
F = flying		Upland Mixed Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes:

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
AMCR	F	W W	70	W	20	1					
AMCR	C	NE	150	NE		1					
RTHA	C	NE	200				1				
AMCR	C	N	200				11	11			
AMGO	F/C	W	30	NW	10		2	1			
AMGO	F/C	-	15	N	35			1			
AMCR	F	NW	100	W	50			1			
AMKE	F/S	NW	300	VAR	200				1		
UNPA	F	E	200	W	10				1		unknown passerine

PASSERINE - Bird Point Count Data Sheet

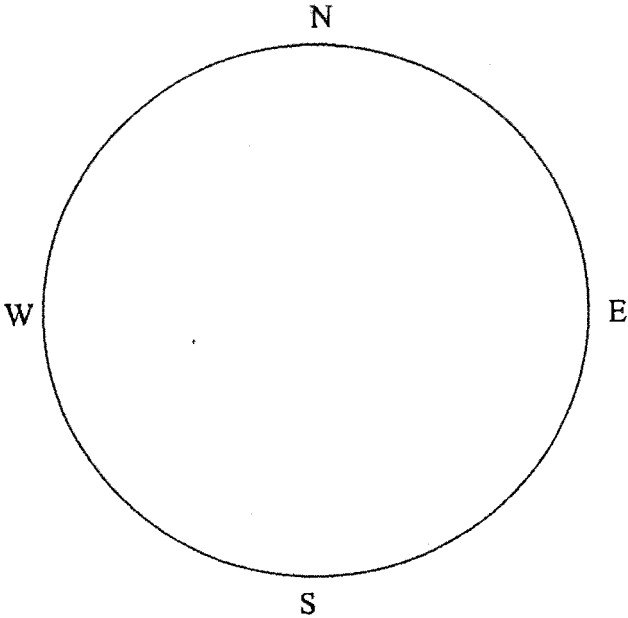
APB B-16
 Project Name Sample Point ID # & Name

8/28/13 0905 0922
 Date Start Time Stop Time
 JG, MJM 0 0 overcast 72°F
 Observer Wind Spd. Wind Dir. Sky Temp

X coordinate, Y coordinate

Dominant (>50%) AES Habitat Type

Other Habitats



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		AES Habitat Type
F = flying		Upland Coniferous Forest
S = soaring		Upland Mixed Forest
P = perching or on water		Wetland Forested
Fo = foraging		Wetland Shrub-Scrub
MD = mating display		Wetland Emergent
O = other		Open Water

Notes:

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
BCCH	C	E	25			1					
EAWP	C	E	75			1					
AMGO	Fy	N	75			11					Adult Feeding begging young
RTHU	P/F/c	SE	100			1					Flycatching atop snag
AMGO	F	E	75	N to S	15	111					
AMGO	C	S	250			1					
<i>Emp</i> id sp.	P	N	40		30		1		1		Trails. Pair observed
RTHU	P	N	40		30		1				
DLJA	C	NW	100					1			
AMGO	C	N	75					1			
UBNU	C	E	100					1			
HOWR	C	NW	80					1			
AMKE	F	E	75	S	30			1			male
BAOR	C	E	50						1		
<i>Em</i> id sp.	P	N	40						1		
NOFL	F	N	75	E-W	15				1		
AMRO	C	N	50						1		
BAOR	P	N	50						1		
RBWO	P	N	50						1		
GRCA	P	N	50						1		
MODO	P	W	50						1		
NOCA	C	NE	200						1	1	

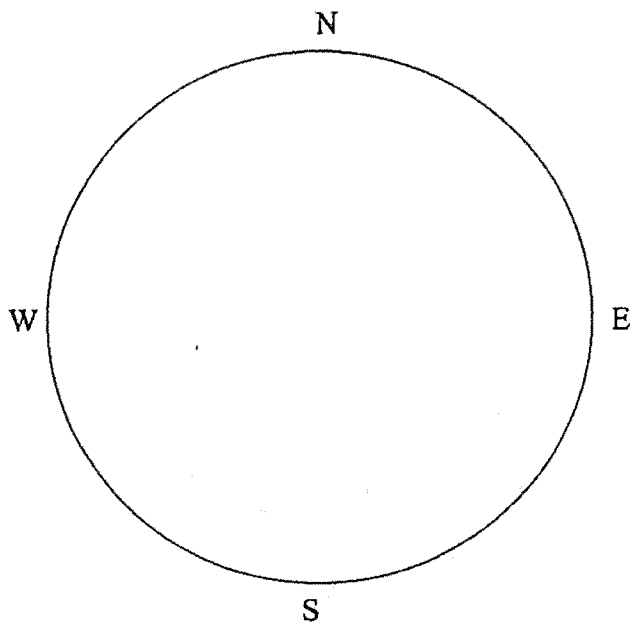
PASSERINE - Bird Point Count Data Sheet

APB
Project Name
8/28/13

B-17
Sample Point ID # & Name

Date: JG
Start Time: 1152
Stop Time: 1202
Wind Spd.: 1
Wind Dir.: W/W
Sky: clear
Temp: 81°F

X coordinate, Y coordinate
Dominant (>50%) AES Habitat Type
Other Habitats



Wind	Sky	AES Habitat Type
0 = none	0 = <10% clouds	Developed
1 = 1-3mph	1 = partly cloudy	Cropland
2 = 4-7 mph	2 = mostly cloudy	Barren Land
3 = 8-12 mph	3 = overcast	Grassland
4 >12 mph	4 = rain	Upland Shrub-Scrub
	5 = fog	Upland Broadleaf Forest
Behavior		
F = flying		Upland Coniferous Forest
S = soaring		Wetland Forested
P = perching or on water		Wetland Shrub-Scrub
Fo = foraging		Wetland Emergent
MD = mating display		Open Water
O = other		

Notes:

Alpha Code	Behav. Code	Dir. from Point	Dist. from Point (m)	Flight Dir.	Ht. (ft or m)	0-3 min	3-5 min	5-10 min	10-15 min	15+ min	Notes
AMGO	C	SW	100			11					
GEDW	C	S	75			1	1				
Empid. SA	C	W	75				seven				
BLJA	P	E	30				1				
MOD0	P	SW	30					11			

D3 833-0852

~~FAST~~
~~0850~~
~~FTVI~~
~~SOSP~~
~~WBNW~~
~~COYE~~
~~BLJO~~
~~ESAMP~~
~~CBWD~~
~~SWSP~~
~~REDI~~

0.00
 wind 0.1
 550
 sum

McGowan Field Notes



09/18/13 Albany start 0620
 FROM CAR (LOT AMER FOLLOWING) OVERCAST, Foggy
 TRANSFER TO DUNE 41°F, WINDS 0-11
 wild breezy dmp 87% RH
 stop 1630

Mammals
 MUSTHART (in bands)
 grey squirrel (in dune)
 red squirrel

FROM TAD
 SP5A
 AMCR

TO TAD 12
 BLJA
 SP5A
 AMCR
 SOSP (B in dunes)
 WBNW
 COYE
 CRTHA
 EUSTI
 TUITI
 DOWD
 NOEL

SAVANNAH
 W1WA
 W1WA
 COYE
 REVI
 BLBW
 MAWA (?)
 CMWA (?)
 CHSP
 DOWD
 BLJA
 BCCH
 EAMP

SAVANA
 S1P1H
 PHV1
 CANR
 BTNW
 TZWA
 RBEE
 AMEO
 RBWD
 YBSA

* high abundance of passerine in the savanna
 → MANY PASSERINE IN MIGRANT FLOCK
 foraging behavior (bad lighting)

Albany

09/18/13

cont'd

time 0845

Headline North + West from Nursery

CEBW
EWBL
ROPL
TAS

Herps

Neander T-sintalis

W1111

MALL (23)
FISP
HOWR
COYE
NAMA
CORF
NOCA
INBN
RBNU
AMOR
TRES

Field
by
GVP

SZ Words

HOSP
AMGO
GRECA
AMPO
NOFL (MAMP)
COYE
KILL
WBNW
NOCA

Out in Open (U1+U2+NEZ)

Other

NEWS - perched/flying above pines lot on wires

WTH - on LF, flushing into nets

end 1140

ROS for Buck Motws

09/18/13 1320 - 1630

Other Birds

WTSP
BLVU
SATO
YBEL
BLVU
NOMO

LEPS

orange sulphur
c. b. white
merulant chick
monarch
pied-billed grebe
~~american c. b. white~~

* finch
cay AZWE sp/E talked

Amphib

Waxwings
N spring peeper
N Leap frog
N green heron
American toad
N Gray tree frog

Other Insects

vicereon
american c. b. white
lacewing
yellow jacket
wasps
d. r. sulphur
m. r. fly
solitary bee

Reptiles

Painted turtle
red-bellied snake
e. garter snake

Butterfly & Moth Surveys

Frosted Elfin & Karner Blue Butterfly Surveys

Frosted Elfin Surveys

Frosted Elfin Survey Data Sheet

Date: 5/3/2013
Observer(s): JG, CE, MJM
Start Time: 10:01
Temp: 63°F
Start % Cloud Cover: 2 **End % cloud cover:**
Start Wind: Beaufort 1 **End Wind:** Beaufort
End Time: 13:00

Location	Time	Species (common name/ scientific name)	# Observed	Notes & Flowering Plants
Transect 9	10:01	No Frosted Elfin's		Violet (<i>Viola sp.</i>)
	10:14			
Transect 1	10:17	No Frosted Elfin's		Violet (<i>Viola sp.</i>), Wild lupine (<i>Lupinus perennis</i>) flower heads forming, marsh marigold (<i>Caltha palustris</i>), dandelion (<i>Taraxacum officinale</i>), Ground ivy (<i>Glechoma hederacea</i>), wild peppergrass (<i>Lepidium virginicum</i>)
	10:35			
Transect 2	10:37	No Frosted Elfin's		black mustard (<i>Brassica nigra</i>), serviceberry (<i>Amelanchier sp.</i>)
	10:42			
Nursery	10:42	No Frosted Elfin's		
	10:55			
Transect 2 (Cont.)	10:55	No Frosted Elfin's		
	11:23			
Transect 3	11:42	No Frosted Elfin's		
	11:59			
Transect 4	12:04	No Frosted Elfin's		
	12:14			

Location	Time	Species (common name/ scientific name)	# Observed	Notes & Flowering Plants
Transect 5	12:16	No Frosted Elfin's		strawberry (<i>Fragaria virginiana</i>)
	12:31			
Transect 6	12:33	No Frosted Elfin's		garlic mustard (<i>Allaria petiolata</i>)
	12:41			
Transect 7	12:44	No Frosted Elfin's		
	12:57			
Transect 8	12:58	No Frosted Elfin's		
	13:00			

Frosted Elfin Survey Data Sheet

Date: 5/10/2013
Observer(s): JG, CE
Start Time: 10:06
Temp: 80°F
Start % Cloud Cover: 30 **End % cloud cover:** 50
Start Wind: Beaufort _1 **End Wind:** Beaufort _
End Time: 12:51

Location	Time	Species (common name/ scientific name)	# Observed	Notes & Flowering Plants
Transect 9	10:08	No Frosted Elfin's		
	10:20			
Transect 1	10:23	No Frosted Elfin's		garlic mustard (<i>Allaria petiolata</i>), wild strawberry (<i>Fragaria virginiana</i>), wild lupine (<i>Lupinus perennis</i>), cinquefoil (<i>Potentilla sp.</i>), dandelion (<i>Taraxacum officinale</i>), apple (<i>Malus sp.</i>), yellow wood sorrel (<i>Oxalis stricta</i>), mustard (<i>Brassica sp.</i>)
	10:42			
Transect 2	10:43	No Frosted Elfin's		
	10:50			
Nursery	10:51	No Frosted Elfin's		
	11:00			
Transect 2 (Cont.)	11:00	No Frosted Elfin's		baneberry (<i>Actaea sp.</i>)
	11:28			
Transect 3	11:45	No Frosted Elfin's		
	11:54			
Transect 4	11:58	No Frosted Elfin's		

Location	Time	Species (common name/ scientific name)	# Observed	Notes & Flowering Plants
	12:08			
Transect 5	12:11	No Frosted Elfin's		Ground ivy (<i>Glechoma hederacea</i>)
	12:18			
Transect 6	12:21	No Frosted Elfin's		
	12:27			
off transect	~12:30	Frosted Elfin/ <i>Callophrys irus</i>	1	near TA 4 on wild lupine (<i>Lupinus perennis</i>)
Transect 7	12:35	No Frosted Elfin's		included occupied reference area
	12:46			
Transect 8	12:47	No Frosted Elfin's		
	12:51			

Frosted Elfin Survey Data Sheet

Date: 5/20/2013
Observer(s): JWG
Start Time: 12:38
Temp: 74°F --79°F
Start % Cloud Cover: 20 **End % cloud cover:** 30
Start Wind: Beaufort 1 **End Wind:** Beaufort 1
End Time: 15:50

Location	Time	Species (common name/ scientific name)	# Observed	Notes & Flowering Plants
Transect 9	12:38	No Frosted Elfin's		Honeysuckle (<i>Lonicera sp.</i>), spurge (<i>Euphorbia sp.</i>), wild lupine (<i>Lupinus perennis</i>), violet (<i>Viola sp.</i>) in forest, cinquefoil (<i>Potentilla sp.</i>), white mustard (<i>Sinapis alba</i>)
Transect 1	13:01	No Frosted Elfin's		mayapple (<i>Podophyllum peltatum</i>), garlic mustard (<i>Alliaria petiolata</i>), strawberry (<i>Fragaria virginiana</i>)
Transect 2	13:22			
	13:24	No Frosted Elfin's		
	13:30			
Nursery	13:30	No Frosted Elfin's		wild lupine (<i>Lupinus perennis</i>)
	13:40			
Transect 2 (Cont.)	13:41	No Frosted Elfin's		To allow more time to focus on open areas for the frosted elfin, the southern forested portion of this transect was not surveyed.
	13:50			white clover (<i>Trifolium repens</i>), yellow wood sorrell (<i>Oxalis stricta</i>)

Location	Time	Species (common name/ scientific name)	# Observed	Notes & Flowering Plants
Transect 3	13:52	No Frosted Elfin's		red clover (<i>Trifolium pratense</i>)
	14:02			
Transect 4	14:05	No Frosted Elfin's		
	14:16			
Transect 5	14:18	No Frosted Elfin's		ragged robin (<i>Lychnis flos-cuculi</i>), blue-eyed grass (<i>Sisyrinchium angustifolium</i>)
	14:30			
Transect 6	14:32	No Frosted Elfin's		As part of this transect, the TA 4 area was surveyed.
	14:52			
Transect 7	14:55	No Frosted Elfin's		The adjacent wild lupine (<i>Lupinus perennis</i>) patches in the Preserve were surveyed. The lupine was not flowering here but was starting to flower along the transect.
	15:17			
Transect 10	15:27	No Frosted Elfin's		wild lupine (<i>Lupinus perennis</i>), white clover (<i>Trifolium repens</i>), black mustard (<i>Brassica nigra</i>)
	15:40			
Transect 8	15:47	No Frosted Elfin's		wild lupine (<i>Lupinus perennis</i>)
	15:50			

First Brood Surveys

Karner Blue Butterfly Survey Data Sheet

Date: 5/30/2013
Observer(s): NF, SV
Start Time: 10:23
Start Temp: 81.3°F **End Temp:** 86°F
Start % Cloud Cover: 0 **End % cloud cover:**
Start Wind: Beaufort 0 **End Wind:** Beaufort 1
End Time: 13:01

Location	Time	Species (common name/ scientific name)	# Observed	Notes & Flowering Plants
Transect 1	10:26	No KBB's		
	10:40			
Transect 9	10:43	No KBB's		
	11:00			
Transect 1	11:02	No KBB's		Did not survey densely forested areas, concentrated on areas containing <i>Lupinus perennis</i> .
	11:08			
Transect 2	11:08	No KBB's		
	11:29			
Nursery	11:30	No KBB's		
	11:41			
Transect 2	11:42	No KBB's		
	11:45			
Transect 3	11:46	No KBB's		
	12:04			
Transect 4	12:06	No KBB's		
	12:20			
Transect 5	12:20	No KBB's		
	12:27			
Transect 6	12:30	No KBB's		
	12:37			
Transect 7	12:38	No KBB's		

Location	Time	Species (common name/ scientific name)	# Observed	Notes & Flowering Plants
Transect 8	12:52			
	12:52	No KBB's		
	13:01			
Notes: Species observed flowering include <i>Trifolium repens</i> , <i>Trifolium pratense</i> , <i>Trifolium campestre</i> , <i>Vicia cracca</i> , <i>Potentilla sp.</i> , <i>Leucanthemum vulgare</i> , <i>Erigeron strigosus</i> , <i>Geranium maculatum</i> , <i>Oxalis stricta</i> , <i>Rubus sp.</i> , <i>Ranunculus acris</i> , <i>Sisyrinchium angustifolium</i> , <i>Hieracium caespitosum</i> , <i>Arabis glabra</i> , <i>Lotus corniculatus</i> , and <i>Alliaria petiolata</i> .				
Some of the butterflies observed throughout the survey included cabbage white (<i>Pieris rapae</i>), American copper (<i>Lycaena phlaes</i>), common ringlet (<i>Coenonympha tullia</i>), wild indigo duskywing (<i>Erynnis baptisiae</i>), common sootywing (<i>Pholisora catullus</i>), clouded sulphur (<i>Colias philodice</i>), pearl crescent (<i>Phyciodes tharos</i>), orange sulphur (<i>Colias eurytheme</i>), northern pearly eye (<i>Enodia anthedon</i>) and viceroy (<i>Limenitis archippus</i>).				

Karner Blue Butterfly Survey Data Sheet

Date: 6/3/2013
Observer(s): JG, CE
Start Time: 14:38
Start Temp: 75°F **End Temp:** 75°F
Start % Cloud Cover: 25 **End % cloud cover:** 2
Start Wind: Beaufort 3 **End Wind:** Beaufort 3
End Time: 16:59

Location	Time	Species (common name/ scientific name)	# Observed	Notes & Flowering Plants
Transect 9	14:46	No KBB's		
	15:01			
Transect 1	15:04	No KBB's		
	15:19			
Transect 2	15:22	No KBB's		
	15:28			
Nursery	15:29	No KBB's		
	15:33			
Transect 2	15:34	No KBB's		Forested portion not surveyed.
	15:43			
Transect 3	15:45	No KBB's		
	15:54			
Transect 4	15:57	No KBB's		
	16:07			
Transect 5	16:09	No KBB's		
	16:15			
Transect 6	16:16	No KBB's		
	16:21			
Transect 7	16:26	No KBB's		
	16:35			

Location	Time	Species (common name/ scientific name)	# Observed	Notes & Flowering Plants
Transect 10	16:44	No KBB's		
	16:51			
Transect 8	16:56	No KBB's		
	16:59			
<p>Notes: Species observed flowering include <i>Trifolium repens</i>, <i>Melilotus officinalis</i>, <i>Gallium sp.</i>, <i>Trifolium pratense</i>, <i>Coronilla varia</i>, <i>Potentilla sp.</i>, <i>Leucanthemum vulgare</i>, <i>Silene vulgaris</i>, <i>Geranium maculatum</i>, <i>Lupinus perennis</i>, <i>Achillea millefolium</i>, <i>Rubus sp.</i>, <i>Hieracium caespitosum</i>, <i>Lotus corniculatus</i>, <i>Taraxacum officinale</i>, <i>Thalictrum sp.</i>, <i>Viburnum recognitum</i>, <i>Iris versicolor</i>, <i>Lespedeza capitata</i> and <i>Alliaria petiolata</i>.</p>				
<p>Butterflies observed throughout the survey include cabbage white (<i>Pieris rapae</i>), American copper (<i>Lycaena phlaes</i>), common ringlet (<i>Coenonympha tullia</i>), wild indigo duskywing (<i>Erynnis baptisiae</i>), common sootywing (<i>Pholisora catullus</i>), clouded sulphur (<i>Colias philodice</i>), pearl crescent (<i>Phyciodes tharos</i>), viceroy (<i>Limenitis archippus</i>), black swallowtail (<i>Papilio polyxenes</i>), eastern tailed blue (<i>Cupido comyntas</i>) and little wood satyr (<i>Megisto cymela</i>).</p>				

Karner Blue Butterfly Survey Data Sheet

Date: 6/5/2013
Observer(s): JG, JL
Start Time: 12:06
Start Temp: 71°F **End Temp:** 77°F
Start % Cloud Cover: 30 **End % cloud cover:** 70
Start Wind: Beaufort 0 **End Wind:** Beaufort 1
End Time: 14:50

Location	Time	Species (common name/ scientific name)	# Observed	Notes & Flowering Plants
Transect 9	12:06	No KBB's		
	12:23			
Transect 1	12:26	No KBB's		
	12:42			
Transect 2	12:44	No KBB's		
	12:49			
Nursery	12:50	No KBB's		
	12:58			
Transect 2	12:59	No KBB's		
	13:07			
Transect 3	13:09	No KBB's		
	13:24			
Transect 4	13:28	No KBB's		
	13:46			
Transect 5	13:49	No KBB's		
	13:59			
Transect 6	14:01	No KBB's		
	14:05			
Transect 7	14:11	No KBB's		The <i>Lupinus perennis</i> along transect is still flowering.
	14:26			
Transect 10	14:34	No KBB's		
	14:41			

Location	Time	Species (common name/ scientific name)	# Observed	Notes & Flowering Plants
Transect 8	14:48	No KBB's		
	14:50			
<p>Notes: Butterflies observed throughout the survey included cabbage white (<i>Pieris rapae</i>), American copper (<i>Lycaena phlaes</i>), common ringlet (<i>Coenonympha tullia</i>), wild indigo duskywing (<i>Erynnis baptisiae</i>), clouded sulphur (<i>Colias philodice</i>), pearl crescent (<i>Phyciodes tharos</i>), viceroy (<i>Limenitis archippus</i>), little wood satyr (<i>Megisto cymela</i>), silver spotted skipper (<i>Epargyreus clarus</i>) and eastern tiger swallowtail (<i>Papilio glaucus</i>).</p>				

Karner Blue Butterfly Survey Data Sheet

Date: 6/14/2013
Observer(s): JG, SV
Start Time: 11:05
Start Temp: 72°F **End Temp:** 71°F
Start % Cloud Cover: 20 **End % cloud cover:** 10
Start Wind: Beaufort 1 **End Wind:** Beaufort 1
End Time: 12:50

Location	Time	Species (common name/ scientific name)	# Observed	Notes & Flowering Plants
Transect 9	11:06	No KBB's		<i>Galium boreale</i> , <i>Hieracium caespitosum</i> , <i>Rosa sp.</i>
	11:16			
Transect 1	11:19	No KBB's		
	11:29			
Transect 2	11:34	No KBB's		
	11:37			
Nursery	11:38	No KBB's		<i>Asclepias tuberosa</i> was starting to flower and <i>Lupinus perennis</i> was flowering.
	11:45			
Transect 2	11:46	No KBB's		<i>Iris versicolor</i>
	11:52			
Transect 3	11:54	No KBB's		
	11:59			
Transect 4	12:01	No KBB's		
	12:06			
Transect 5	12:08	No KBB's		
	12:17			
Transect 6	12:18	No KBB's		
	12:22			
Transect 7	12:23	No KBB's		
	12:29			

Location	Time	Species (common name/ scientific name)	# Observed	Notes & Flowering Plants
Transect 10	12:37	No KBB's		<i>Helianthus sp.</i> , <i>Baptisia sp.</i>
	12:42			
Transect 8	12:48	No KBB's		
	12:49			
Notes: Species observed flowering include <i>Trifolium arvense</i> , <i>Erigeron strigosus</i> , <i>Dianthus armeria</i> , <i>Rudbeckia hirta</i> , <i>Oxalis stricta</i> , <i>Trifolium repens</i> , <i>Melilotus officinalis</i> , <i>Trifolium pratense</i> , <i>Leucanthemum vulgare</i> , <i>Geranium maculatum</i> , <i>Lupinus perennis</i> , <i>Achillea millefolium</i> , <i>Lotus corniculatus</i> , <i>Thalictrum sp.</i> and <i>Penstemon hirsutus</i> .				

Second Brood Surveys

2nd Brood Karner Blue Butterfly (KBB) Survey Data Sheet

Date: 7/8/2013

Observer(s): JG & NF

Start Time: 11:30

Start Temp: 76°F

End Temp: 82°F

Start % Cloud Cover: 100

End % cloud cover: 80

Start Wind: Beaufort 2

End Wind: Beaufort 2

End Time: 14:04

Note: Sunny at the end of survey - overcast throughout most of the survey.

Location	Time	Species (common name/ scientific name)	# Observed	Notes & Flowering Plants
Transect 9	11:31	No KBB's		<i>Saponaria officinalis</i> , <i>Spiraea</i>
	11:44			<i>alba</i> , <i>Lysimachia quadrifolia</i> ,
Transect 1	11:46	No KBB's		<i>Convolvulus arvensis</i> , <i>Achillea</i>
	12:02			<i>millefolium</i> , <i>Asclepias syriaca</i> ,
Transect 2	12:06	No KBB's		<i>Leucanthemum vulgare</i> , <i>Vicia</i>
	12:11			<i>cracca</i> , <i>Coronilla varia</i> ,
Nursery	12:11	No KBB's		<i>Centaurea maculosa</i> , <i>Daucus</i>
	12:22			<i>carota</i> , <i>Rudbeckia hirta</i> , <i>Oxalis</i>
Transect 2 cont.	12:23	No KBB's		<i>stricta</i> , <i>Erigeron strigosus</i> ,
	12:35			<i>Trifolium arvense</i> , <i>Verbena</i>
Transect 3	12:37	No KBB's		<i>hastata</i> , <i>Trifolium repens</i> ,
	12:48			<i>Trifolium campestre</i> , <i>Monarda</i>
Transect 4	12:52	No KBB's		<i>punctata</i> , <i>Lupinus perennis</i> ,
	13:02			<i>Verbascum thapsus</i> , <i>Polygonum</i>
Transect 5	13:04	No KBB's		<i>persicaria</i> , <i>Silene vulgaris</i> ,
	13:14			<i>Impatiens capensis</i> , (in nursery -
Transect 6	13:17	No KBB's		<i>Monarda fistulosa</i> , <i>Asclepias</i>
	13:23			<i>tuberosa</i>), <i>Potentilla norvegica</i> ,
Transect 7	13:27	No KBB's *included nearby lupine trail and woods outside of restoration area.		<i>Lobelia cardinalis</i> , <i>Asclepias</i>
	13:36			<i>incarnata</i> , <i>Conyza canadensis</i> ,

Location	Time	Species (common name/ scientific name)	# Observed	Notes & Flowering Plants
Transect 10	13:46	No KBB's		<i>Lilium superbum</i> , <i>Dianthus</i>
	13:54			<i>Armeria</i> , <i>Mimulus ringens</i> ,
Transect 8	14:01	No KBB's		<i>Desmodium canadense</i> ,
	14:04			<i>Melilotus officinalis</i> , <i>Chicorium</i>
				<i>intybus</i> , <i>Medicago sativa</i> .

Notes: Butterflies observed throughout the survey include gray hairstreak (*Strymon melinus*), cabbage white (*Pieris rapae*), American copper (*Lycaena phlaes*), common ringlet (*Coenonympha tullia*), wild indigo duskywing (*Erynnis baptisiae*), common sootywing (*Pholisora catullus*), black swallowtail (*Papilio polyxenes*), silver-spotted skipper (*Epargyreus clarus*), little wood-satyr (*Megisto cymela*), clouded sulphur (*Colias philodice*), monarch (*Danaus plexippus*), eastern tailed-blue (*Cupido comyntas*), common wood-nymph (*Cercyonis pegala*).

2nd Brood Karner Blue Butterfly (KBB) Survey Data Sheet

Date: 7/10/2013
Observer(s): NF, SV
Start Time: 10:17
Start Temp: 78°F **End Temp:** 82°F *
Start % Cloud Cover: 98 **End % cloud cover:**
Start Wind: Beaufort 1 **End Wind:** Beaufort 1
End Time: 14:02

Location	Time	Species (common name/ scientific name)	# Observed	Notes & Flowering Plants
Transect 9	10:24	No KBB's		
	10:45			
Transect 1	10:51	No KBB's		
	11:15			
Transect 2	11:26	No KBB's		
	11:28			
Nursery	11:28	No KBB's		
	11:42			
Transect 2	11:42	No KBB's		
	11:53			
Transect 3	11:55			
	12:20	Karner Blue Butterfly (<i>Lycaeides melissa samuelis</i>)	1	Male- captured just west of the nursery on <i>Monarda punctata</i>
	12:29			
Transect 4	12:33	No KBB's		
	12:53			
Transect 5	12:57	No KBB's		
	13:20			
Transect 6	13:22			
	13:36	Karner Blue Butterfly (<i>Lycaeides melissa samuelis</i>)	1	Assumed Male- near TA4 (east) flying in <i>Pycnanthemum virginianum</i> .
	13:42			

Location	Time	Species (common name/ scientific name)	# Observed	Notes & Flowering Plants
Transect 7	13:44	No KBB's		
	13:55			
Notes: Did not conduct survey of Transects 8 or 10 due to very heavy rain. Survey cancelled at 14:02.				
Only recorded flowering plants that were not recorded on 7/8/13: <i>Centaurea maculosa</i> , <i>Helianthus sp.</i> , <i>Euthamia graminifolia</i> , <i>Ceanothus americanus</i> , <i>Lotus corniculatus</i> , <i>Prunella vulgaris</i> , <i>Hypericum perforatum</i> , <i>Rudbeckia sp.</i> , <i>Oenothera biennis</i> , <i>Lupinus perennis</i> , <i>Pycnanthemum virginianum</i> .				
*end temperature taken from weather underground report 14:00 @ Cook Park weather station.				

2nd Brood Karner Blue Butterfly (KBB) Survey Data Sheet

Date: 7/12/2013

JG, SV, AD,
CE

Observer(s):

Start Time: 11:00:00

Start Temp: 75°F **End Temp:** 82°F

Start % Cloud Cover: 30 **End % cloud cover:** 65

Start Wind: Beaufort 2 **End Wind:** Beaufort 2

End Time: 14:33:30

Location	Time	Species (common name/ scientific name)	# Observed	Notes & Flowering Plants
Transect 10	11:01:30	No KBB's		<i>Lupinus perennis</i> still flowering.
	11:14:00			
Transect 9	11:25:30	No KBB's		
	11:37:30			
Transect 1	11:41:00	No KBB's		
	11:58:30			
Transect 2	12:04:00	No KBB's		
	12:07:30			
Nursery	12:16:30	No KBB's		
	12:25:30			
Transect 2	12:24:00	No KBB's		
	12:39:30			
Transect 3	12:43:30	Karner Blue Butterfly (<i>Lycæides melissa samuelis</i>)	1	Male- found in the same location as the one on 7/10/13 (just west of the nursery)
	13:07:30			
Transect 4	13:10:30	No KBB's		
	13:23:30			
Transect 5	13:27:00	No KBB's		Did not survey northern half of this transect due to very recent spraying activities.
	13:48:00			

Location	Time	Species (common name/ scientific name)	# Observed	Notes & Flowering Plants
Transect 6	13:58:00	Karner Blue Butterfly (<i>Lycbaeides melissa samuelis</i>)	5	4 males, 1 female. Found in the same location as a previous survey- near TA-4.
	14:20:00			
Transect 7	14:21:00	No KBB's		
	14:30:30			
Transect 8	14:31:30	No KBB's		
	14:33:30			

2nd Brood Karner Blue Butterfly (KBB) Survey Data Sheet

Date: 7/15/2013
Observer(s): SV, NF
Start Time: 9:41
Start Temp: 88°F **End Temp:** 90°F
Start % Cloud Cover: 5 **End % cloud cover:**
Start Wind: Beaufort 1 **End Wind:** Beaufort 1
End Time: 12:29

Location	Time	Species (common name/ scientific name)	# Observed	Notes & Flowering Plants
Transect 10	9:43:30	No KBB's		
	9:51:30			
Transect 9	10:01:30	No KBB's		
	10:10:00			
Transect 1	10:13:30	No KBB's		
	10:28:00			
Transect 2	10:33:00	No KBB's		
	10:35:00			
Nursery	10:37:00	No KBB's		
	10:43:00			
Transect 2 (cont.)	10:46:30	No KBB's		
	10:54:00			
Transect 3	10:57:30	No KBB's		
	11:08:30			
Transect 4	11:15:30	No KBB's		
	11:29:00			
Transect 5	11:34:30	No KBB's		
	11:43:00			
Transect 6	11:46:00			
	11:56:30			

Location	Time	Species (common name/ scientific name)	# Observed	Notes & Flowering Plants
near TA-4	12:03:00	Karner Blue Butterfly (<i>Lycbaeides melissa samuelis</i>)	1	Female- found west of trap array TA-4. First observed in flight, landed on <i>Lupinus perennis</i> .
Transect 7	12:06:00	No KBB's		
	12:15:00			
Transect 8	12:16:30	No KBB's		
	12:21:00			
Notes: Some <i>Lupinus perennis</i> is still flowering.				

2nd Brood Karner Blue Butterfly (KBB) Survey Data Sheet

Date: 7/24/2013
Observer(s): JG, SV, NF
Start Time: 10:40:30
Start Temp: 71°F **End Temp:** 73°F
Start % Cloud Cover: 90 **End % cloud cover:** 50
Start Wind: Beaufort 2 **End Wind:** Beaufort 3
End Time: 13:40:00

Location	Time	Species (common name/ scientific name)	# Observed	Notes & Flowering Plants
Transect 9	10:40:30	No KBB's		In addition to the species previously listed:
	10:56:30			<i>Apocynum cannabinum</i> , <i>Phytolacca americana</i> , <i>Chicorium intybus</i> , <i>Eutrochium maculatum</i>
Transect 1	10:59:30	No KBB's		<i>Daucus carota</i> , <i>Aster divaricatus</i> , <i>Eupatorium perfoliatum</i> , <i>Lupinus perennis</i> still flowering on T1 (few)
	11:10:00			
Transect 1 (cont.)	11:16:00			
	11:21:30			
Transect 2	11:26:30	No KBB's		
	11:30:30			
Nursery	11:30:30	No KBB's		
	11:39:00			
Transect 2 (cont.)	11:41:30	No KBB's		
	11:52:00			

Location	Time	Species (common name/ scientific name)	# Observed	Notes & Flowering Plants
Transect 3	11:54:30	Karner Blue Butterfly (<i>Lycbaeides melissa samuelis</i>)	1	Female (beat up)- Found in same spot as past male location. <i>Lupinus perennis</i> flowering T3 (few)
	12:06:00			
Transect 4	12:12:00	No KBB's		
	12:22:30			
Transect 5	12:25:00	No KBB's		<i>Ceanothus americanus</i>
	12:37:00			
Transect 6	12:39:00	No KBB's		
	12:52:30			
Transect 7	12:53:30	No KBB's		
	13:04:30			
Transect 10	13:14:30	No KBB's		
	13:22:30			
Transect 8	13:30:00	No KBB's		
	13:31:30			

Greaves IV, John

From: Nathan D. Carlton <nathan.carlton@appliedeco.com>
Sent: Thursday, July 11, 2013 7:57 PM
To: Greaves IV, John; John D. Price
Subject: RE: KBB details

It was on June 4th and without a photo I think your wording is more appropriate. I like that you found one in the same spot though. It makes me feel more confident in my KBB skills. You must be super excited though finding so many all at once. That's pretty sweet man. Nice work!!

Nate

Nathan D. Carlton

Construction Manager/Restoration Ecologist

Applied Ecological Services

18 Walker Way, Sec. 4

Albany, NY 12205

m (315) 399-6741

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www.restorationnurseries.com

From: Greaves IV, John [<mailto:JGreavesIV@chacompanies.com>]

Sent: Thursday, July 11, 2013 4:15 PM

To: Nathan D. Carlton; John D. Price

Subject: KBB details

Guys, can you please either verify that the locations I have identified on the attached map are accurate or mark on there where they were?

Nate, do you know the date of your observation in June? Also, do you care if I call the observation likely or would you rather I say definite?

Thanks

John W. Greaves

Senior Scientist, CWS

CHA ~ *design/construction solutions*

518.453.8251

jgreavesiv@chacompanies.com

www.chacompanies.com



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Greaves IV, John

From: John D. Price <john.price@appliedeco.com>
Sent: Thursday, July 11, 2013 4:48 PM
To: Greaves IV, John
Cc: Nathan D. Carlton
Subject: RE: KBB details
Attachments: Karner Blue above 071113.JPG; Karner Blue below 071113.jpeg

John,

The spotting today was due east of Trap Array 1, midway between it and the vernal pond. Here are a couple photos - sorry for the blurriness. It was a male hovering around New Jersey Tea.

John D. Price

Construction Supervisor

Applied Ecological Services

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www.appliedeco.com<http://www.appliedeco.com/>

From: Greaves IV, John [JGreavesIV@chacompanies.com]
Sent: Thursday, July 11, 2013 4:14 PM
To: Nathan D. Carlton; John D. Price
Subject: KBB details

Guys, can you please either verify that the locations I have identified on the attached map are accurate or mark on there where they were?

Nate, do you know the date of your observation in June? Also, do you care if I call the observation likely or would you rather I say definite?

Thanks

John W. Greaves
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P Please consider the environment before you print this email.

Inland Barrens Buckmoth Surveys

Inland Barrens Buckmoth Survey Data Sheet

Date: 9/18/13

Observer(s): MJM

Start Time: 1320

Start temp 67°F ; End temp 69°F

Start % Cloud Cover: 50 End % Cloud Cover: 75

Start Wind: Beaufort 1 End Wind: Beaufort 1

End Time: 1630

Location	Time	# Buckmoths Observed	Notes
scrub oak patch and adjacent open space in northwestern portion of site	1320 - 1500	NONE	
scrub oak patch along access road and adjacent open space	1510-1630	NONE	

Inland Barrens Buckmoth Survey Data Sheet

Date: 9/19/13

Observer(s): MJM, JG, NF

Start Time: 1325

Start temp 68°F ; End temp 68°F

Start % Cloud Cover: 0 End % Cloud Cover: 0

Start Wind: Beaufort 1 End Wind: Beaufort 1

End Time: 1437

Location	Time	# Buckmoths Observed	Notes
scrub oak patch and adjacent open space in northwestern portion of site	1325 - 1437	NONE	

Inland Barrens Buckmoth Survey Data Sheet

Date: 9/25/13

Observer(s): NF, SV

Start Time: 12:46

Start temp 63°F ; End temp 68°F

Start % Cloud Cover: 0 End % Cloud Cover: _

Start Wind: Beaufort 0 End Wind: Beaufort 0

End Time: 15:19

Location	Time	# Buckmoths Observed	Notes
East of spadefoot pool on rise	12:49-13:01	0	
North of vernal pond	13:04-13:19	0	
South of vernal pond	13:22-13:35	0	
U-13 on Transect 9	15:03-15:19	0	

Inland Barrens Buckmoth Survey Data Sheet

Date: 10/8/13

Observer(s): JG, CE

Start Time: 10:40

Start temp 60°F ; End temp 68°F

Start % Cloud Cover: 0 End % Cloud Cover: 0

Start Wind: Beaufort 1 End Wind: Beaufort 2

End Time: 13:55

Location	Time	# Buckmoths Observed	Notes
Between TA1 and TA2	10:46- 11:03	0	Searched scrub oak area.
Transects 1- 10	10:40- 13:55	0	An insect and passive herp survey was also conducted today.

Herpetological Surveys

Total Herpetofaunal Diversity Observed During Time- and Area-Constrained Searches in 2013														
Common Name	Taxonomic Binomial	Dates Observed											Notes	
		2-May	3-May	12-Jun	13-Jun	25-Jun	26-Jun	26-Aug	27-Aug	28-Aug	18-Sep	19-Sep		
common snapping turtle	<i>Chelydra serpentina</i>				X						X			nesting on large sand mounds by Rapp Rd.
eastern painted turtle	<i>Chrysemys p. picta</i>	X	X	X	X	X	X	X	X	X	X	X	X	abundant in created vernal pool. nesting on large sand mounds by Rapp Rd. and margins of created vernal pool
red-eared slider	<i>Trachemys scripta elegans</i>			X						X				first season observed onsite. consider capturing and euthanizing
eastern redback salamander	<i>Plethodon cinereus</i>	X									X			northwest side of site
blue-spotted salamander	<i>Ambystoma laterale</i>	X												far less than previous years
American toad	<i>Anaxyrus americana</i>	X		X	X	X	X			X	X	X	X	greater abundance in 2013
wood frog	<i>Lithobates sylvatica</i>									X		X		less observed in 2013
northern leopard frog	<i>Lithobates pipiens</i>					X					X	X	X	significant increase in abundance
northern green frog	<i>Lithobates clamitans melanota</i>	X		X	X	X	X			X	X	X		greater abundance in 2013
northern spring peeper	<i>Pseudacris c. crucifer</i>	X		X	X		X			X	X	X	X	
northern gray treefrog	<i>Hyla versicolor</i>	X		X	X	X	X			X	X	X		
northern redbelly snake	<i>Storeria occipitomaculata</i>		X	X	X	X	X					X	X	more observations in 2013 than previous years
eastern garter snake	<i>Thamnophis s. sirtalis</i>		X	X	X	X	X	X	X	X	X	X	X	more observations in 2013 than previous years

March Trapping Event

Herp Survey Data Form

Date: 3/12/2013

Observer(s): JG

Start Time: 9:36

Start Temp: 49°F

End Time: 14:20

End Temp: 53°F

Weather: Raining throughout the survey

Start Wind (Beaufort): 4 Start % Cloud Cover: 100

End Wind (Beaufort): 4 End % Cloud Cover:

Moon Phase:

Trapping Array	Species (common name/ scientific name)	# Documented	Notes
TA 10	Nothing in traps		
TA 11	Nothing in traps		
TA 9	Nothing in traps		
TA 5	Nothing in traps		
TA 6	Nothing in traps		
TA 8	Nothing in traps		
TA 4	Nothing in traps		
TA 1	Wood frog / <i>Lithobates sylvatica</i>	1	north pitfall trap
TA 2	Nothing in traps		
TA 3	Nothing in traps		

Notes: Closed all pitfall traps. We trapped only one night because of good conditions for Ambystomatid migration. Above freezing at night. No precipitation before traps were checked.

April Trapping Event

Herp Survey Data Form

Date: 4/8/2013

Observer(s): SJV, JG

Start Time: 8:45

Start Temp: 44°F

End Time: 11:58

End Temp: 61°F

Weather:

Start Wind (Beaufort): 1 Start % Cloud Cover: 100

End Wind (Beaufort): End % Cloud Cover:

Moon Phase:

Trapping Array	Species (common name/ scientific name)	# Documented	Notes
TA-2	Jefferson / blue-spotted salamander complex (<i>Ambystoma jeffersonianum</i> x <i>Ambystoma laterale</i>)	1	west pitfall- mostly Jefferson characteristics. 2.75" Snout Vent Length
TA-1	Nothing in traps		
TA-4	Nothing in traps		
TA-3	Nothing in traps		
TA-9	Nothing in traps		
TA-6	Nothing in traps		
TA-5	Nothing in traps		
TA-12	Nothing in traps		
TA-11	Nothing in traps		
TA-10	Nothing in traps		

Notes: TA- 7 and 8 were not used this event due to their location within an area to be modified.

Herp Survey Data Form

Date: 4/9/2013

Observer(s): JG, SV

Start Time: 10:16

Start Temp: 53°F

End Time: 12:10

End Temp: 60°F

Weather:

Start Wind (Beaufort): 1 Start % Cloud Cover: 100

End Wind (Beaufort): 3 End % Cloud Cover: 70

Moon Phase:

Trapping Array	Species (common name/ scientific name)	# Documented	Notes
TA-12	Nothing in traps		
TA-5	Nothing in traps		
TA-6	Nothing in traps		A few spring peepers (<i>Pseudacris crucifer</i>) calling from adjacent forest.
TA-9	Nothing in traps		
TA-3	Nothing in traps		
TA-4	Deermouse / <i>Peromyscus sp.</i>	1	East funnel trap
TA-4	Spring peeper / <i>Pseudacris crucifer</i>	4	Center pitfall trap, 3 dead. A few spring peepers were calling from nearby forested areas to the south.
TA-1	Jefferson salamander / <i>Ambystoma jeffersonianum</i>	2	Center pitfall trap. Released to buttonbush swamp.
TA-2	Nothing in traps		
TA-11	Nothing in traps		
TA-10	Nothing in traps		
Notes:			

Herp Survey Data Form

Date: 4/11/2013

Observer(s): JG

Start Time: 10:34

Start Temp: 39°F

End Time: 12:12

End Temp: 40°F

Weather: Slight rain at the end of the survey.

Start Wind (Beaufort): 1

Start % Cloud Cover: 100

End Wind (Beaufort): 2

End % Cloud Cover:

Moon Phase:

Trapping Array	Species (common name/ scientific name)	# Documented	Notes
TA-11	American toad / <i>Anaxyrus americanus</i>	1	center pitfall trap
TA-10	Nothing in traps.		
TA-12	Nothing in traps.		
TA-5	Nothing in traps.		
TA-9	Nothing in traps.		
TA-6	Nothing in traps.		
TA-3	Spring peeper / <i>Pseudacris crucifer</i>	1	center pitfall trap, adult
TA-3	Spring peeper / <i>Pseudacris crucifer</i>	1	north pitfall trap, adult
TA-2	Nothing in traps.		
TA-1	Jefferson salamander / <i>Ambystoma jeffersonianum</i>	1	center pitfall trap, adult
TA-4	Jefferson / blue-spotted salamander complex (<i>Ambystoma jeffersonianum</i> x <i>Ambystoma laterale</i>)	1	Center pitfall trap. Released at P4 wetland.
Notes:			

Herp Survey Data Form

Date: 4/12/2013

Observer(s): JG

Start Time: 9:24

Start Temp: 34°F

End Time: 11:30

End Temp: 34°F

Weather: Light rain turned to moderate rain.

Start Wind (Beaufort): 0

Start % Cloud Cover: 100

End Wind (Beaufort): 1

End % Cloud Cover:

Moon Phase:

Trapping Array	Species (common name/ scientific name)	# Documented	Notes
TA-10	Nothing in traps		Traps deactivated.
TA-11	Nothing in traps		Traps deactivated.
TA-12	Nothing in traps		Traps deactivated.
TA-5	Nothing in traps		Traps deactivated.
TA-6	Nothing in traps		Traps deactivated.
TA-9	Nothing in traps		Traps deactivated.
TA-3	Nothing in traps		Traps deactivated.
TA-2	Nothing in traps		Traps deactivated.
TA-1	Nothing in traps		Traps deactivated.
TA-4	Nothing in traps		Traps deactivated.
Notes:			

June Trapping Event

Herp Survey Data Form

Date: 6/11/2013

Observer(s): JG, SV

Start Time: 8:56

Start Temp: 58°F

End Time: 11:07

End Temp: 61°F

Rained most of yesterday, all night and stopped just before the survey.

Start Wind (Beaufort): 1

End Wind (Beaufort): 1

Moon Phase:

Start % Cloud Cover: 100

End % Cloud Cover:

Trapping Array	Species (common name/ scientific name)	# Documented	Notes
TA-4	American toad / <i>Anaxyrus americanus</i>	1	juvenile near the north pitfall trap
TA-1	Nothing in traps		Water in the adjacent vernal pool. Vernal pool was searched for spadefoot toads (<i>Scaphiopus holbrookii</i>). Green frogs (<i>Lithobates clamitans melanota</i>) calling from nearby vernal pool.
TA-2	Cinereus shrew / <i>Sorex cinereus</i>	1	dead- center pitfall trap
TA-2	Meadow jumping mouse / <i>Zapus hudsonius</i>	2	1 dead- south funnel trap
TA-2	Garter snake / <i>Thamnophis sirtalis</i>	1	sub adult, under nearby cover board
TA-3	Cinereus shrew / <i>Sorex cinereus</i>	2	dead- center pitfall trap
TA-3	Meadow vole / <i>Microtus pennsylvanicus</i>	1	dead- east pitfall trap
TA-9	Deermouse / <i>Peromyscus</i> sp.	1	alive- center pitfall trap
TA-9	American toad / <i>Anaxyrus americanus</i>	1	alive juvenile- center pitfall trap
TA-9	American toad / <i>Anaxyrus americanus</i>	1	alive juvenile- west pitfall trap
TA-6	Eastern cottontail / <i>Sylvilagus floridanus</i>	1	dead- yoy-east pitfall trap (collected)
TA-6	Meadow jumping mouse / <i>Zapus hudsonius</i>	2	alive- north funnel trap
TA-6	Green frog / <i>Lithobates clamitans melanota</i>	1	alive-juvenile, center pitfall trap
TA-5	Nothing in traps		
TA-12	Cinereus shrew / <i>Sorex cinereus</i>	1	dead-center pitfall trap
TA-10	Nothing in traps		
TA-11	American toad / <i>Anaxyrus americanus</i>	1	alive adult- center pitfall trap
TA-11	Green frog / <i>Lithobates clamitans melanota</i>	1	alive adult- center pitfall trap
Notes:			

Herp Survey Data Form

Date: 6/12/2013

Observer(s): JG, MJM

Start Time: 7:59

Start Temp: 60°F

End Time: 10:37

End Temp: 65°F

Weather: Overcast, windy (intermittent sun)

Start Wind (Beaufort): 2-3

End Wind (Beaufort): 2

Moon Phase:

Start % Cloud Cover: 20

End % Cloud Cover:

Trapping Array	Species (common name/ scientific name)	# Documented	Notes
TA 10	Green frog / <i>Lithobates clamitans melanota</i>	1	young, west funnel trap
TA 11	Deermouse / <i>Peromyscus</i> sp.	1	alive, young, center pitfall trap
TA 12	Meadow jumping mouse / <i>Zapus hudsonius</i>	1	north funnel trap
TA 5	Nothing in traps		
TA 6	Meadow jumping mouse / <i>Zapus hudsonius</i>	1	alive, stressed, north funnel trap
TA 6	Green frog / <i>Lithobates clamitans melanota</i>	1	center pitfall trap
TA 9	Deermouse / <i>Peromyscus</i> sp.	1	alive, adult, east pitfall trap
TA 4	Deermouse / <i>Peromyscus</i> sp.	1	dead, south pitfall trap
TA 4	Meadow vole / <i>Microtus pennsylvanicus</i>	1	dead, south pitfall trap
TA 1	Nothing in traps		
	Red-bellied snake / <i>Storeria occipitomaculata</i>	1	Under cover board MK14, opaque/pre-egg laying shed. Gravid female.
	Red-eared slider / <i>Trachemys scripta elegans</i>	1	basking in created vernal pond
near TA 2	Garter snake / <i>Thamnophis sirtalis</i>	1	under cover board
TA 2	Nothing in traps		
TA 3	Cinereus shrew / <i>Sorex cinereus</i>	1	dead, north pitfall trap
TA 3	Green frog / <i>Lithobates clamitans melanota</i>	1	juvenile, alive, center pitfall trap
Notes:			

Herp Survey Data Form

Date: 6/13/2013
 Observer(s): MM, SV
 Start Time: 7:55
 Start Temp: 59°F
 End Time: 9:29
 End Temp: 59°F
 Weather: Light rain, overcast
 Start Wind (Beaufort): 0-1
 End Wind (Beaufort): 0-1
 Start % Cloud Cover: overcast
 End % Cloud Cover:
 Moon Phase:

Trapping Array	Species (common name/ scientific name)	# Documented	Notes
TA-5	Nothing in traps		
TA-6	Cinereus shrew / <i>Sorex cinereus</i>	1	dead- east pitfall trap
TA-9	Nothing in traps		
TA-4	Nothing in traps		
TA-1	Nothing in traps		
TA-2	Nothing in traps		Red-bellied snake/ <i>Storeria occipitomaculata</i> - adult with stump tail- unable to sex
TA-3	Green frog / <i>Lithobates clamitans melanota</i>	1	young- south pitfall trap
TA-12	Meadow jumping mouse / <i>Zapus hudsonius</i>	2	north funnel trap- 1 dead, 1 alive
TA-10	Nothing in traps		
TA-11	Eastern chipmunk / <i>Tamias striatus</i>	1	west funnel trap- lethargic
Notes:			

Herp Survey Data Form

Date: 6/14/2013

Observer(s): SV, JG

Start Time: 9:05

Start Temp: 62°F

End Time: 10:49

End Temp: 69°F

Weather:

Start Wind (Beaufort): 0

End Wind (Beaufort): 0

Moon Phase:

Start % Cloud Cover: 20

End % Cloud Cover:

Trapping Array	Species (common name/ scientific name)	# Documented	Notes
TA-4	Nothing in traps.		
TA-1	Nothing in traps.		
TA-2	Cinereus shrew / <i>Sorex cinereus</i>	1	dead- center pitfall trap
TA-2	Cinereus shrew / <i>Sorex cinereus</i>	1	dead- east pitfall trap
TA-3	Nothing in traps.		
TA-5	Nothing in traps.		
TA-9	Nothing in traps.		
TA-6	Meadow vole / <i>Microtus pennsylvanicus</i>	1	alive- north funnel trap
TA-12	Meadow jumping mouse / <i>Zapus hudsonius</i>	1	north funnel trap- lethargic, placed in sun
TA-12	Meadow vole / <i>Microtus pennsylvanicus</i>	1	dead- center pitfall trap
TA-10	Cinereus shrew / <i>Sorex cinereus</i>	1	dead- center pitfall trap
TA-11	Nothing in traps.		Eastern chipmunk / <i>Tamias striatus</i> from yesterday was dead

Notes: Traps were deactivated today.

August Trapping Event

Herp Survey Data Form

Date: 8/27/2013

Observer(s): JG, MJM

Start Time: 9:23

Start Temp: 68°F

End Time: 12:30

End Temp: 74°F

Weather: Humid

Start Wind (Beaufort): 1 Start % Cloud Cover: 100

End Wind (Beaufort): 1 End % Cloud Cover: 100

Moon Phase:

Trapping Array	Species (common name/ scientific name)	# Documented	Notes
TA 5	Green frog / <i>Lithobates clamitans melanota</i>	6	juvenile, center pitfall trap
TA 5	American toad / <i>Anaxyrus americanus</i>	1	juvenile, center pitfall trap
TA 9	Green frog / <i>Lithobates clamitans melanota</i>	1	juvenile, south pitfall trap
TA 9	American toad / <i>Anaxyrus americanus</i>	1	juvenile, south pitfall trap
TA 9	House mouse/ <i>Mus musculus</i>	1	center pitfall trap
TA 9	Green frog / <i>Lithobates clamitans melanota</i>	3	juveniles, center pitfall trap
TA 9	American toad / <i>Anaxyrus americanus</i>	3	juveniles, center pitfall trap
TA 6	Green frog / <i>Lithobates clamitans melanota</i>	2	juvenile and sub adult, south funnel trap
TA 6	Green frog / <i>Lithobates clamitans melanota</i>	13	dead, juvenile, center pitfall trap
TA 6	Meadow vole / <i>Microtus pennsylvanicus</i>	3	adult, 2 dead, center pitfall trap
TA 6	Cinereus shrew / <i>Sorex cinereus</i>	1	dead, center pitfall trap
TA 6	Cinereus shrew / <i>Sorex cinereus</i>	1	dead, east pitfall trap
TA 6	Vole / <i>Microtus</i> sp.	1	alive, east pitfall trap
TA 3	Meadow jumping mouse / <i>Zapus hudsonius</i>	2	alive, south funnel trap
TA 3	Green frog / <i>Lithobates clamitans melanota</i>	14	dead, juvenile, center pitfall trap
TA 3	Green frog / <i>Lithobates clamitans melanota</i>	4	alive, juvenile, center pitfall trap
TA 3	Gray treefrog / <i>Hyla versicolor</i>	1	calling from forest near TA 3
TA 3	Cinereus shrew / <i>Sorex cinereus</i>	1	dead, center pitfall trap
TA 3	Green frog / <i>Lithobates clamitans melanota</i>	1	alive, juvenile, west pitfall trap
TA 3	American toad / <i>Anaxyrus americanus</i>	1	alive, juvenile, west pitfall trap
TA 3	Green frog / <i>Lithobates clamitans melanota</i>	3	alive, north pitfall trap
TA 3	Green frog / <i>Lithobates clamitans melanota</i>	1	dead, north pitfall trap

Trapping Array	Species (common name/ scientific name)	# Documented	Notes
TA 3	Cinereus shrew / <i>Sorex cinereus</i>	1	dead, north pitfall trap
TA 3	Meadow vole / <i>Microtus sp.</i>	1	alive, north pitfall trap
TA 2	Red-bellied snake / <i>Storeria occipitomaculata</i>	1	alive, south funnel trap
TA 2	Meadow jumping mouse / <i>Zapus hudsonius</i>	3	alive, south funnel trap
TA 2	Garter snake / <i>Thamnophis sirtalis</i>	1	alive, adult, north funnel trap
TA 2	Green frog / <i>Lithobates clamitans melanota</i>	2	alive, yoy, east pitfall trap
TA 2	Garter snake / <i>Thamnophis sirtalis</i>	1	week old neonate under cover board
TA 2	Red-bellied snake / <i>Storeria occipitomaculata</i>	2	non- neonate under cover board
TA 2	Meadow jumping mouse / <i>Zapus hudsonius</i>	1	alive, young, west pitfall trap
TA 2	Green frog / <i>Lithobates clamitans melanota</i>	1	alive, young, west pitfall trap
TA 1	Cinereus shrew / <i>Sorex cinereus</i>	1	dead, center pitfall trap
TA 1	Green frog / <i>Lithobates clamitans melanota</i>	1	alive, center pitfall trap
TA 1	Meadow jumping mouse / <i>Zapus hudsonius</i>	1	dead, center pitfall trap
TA 1	Northern short-tailed shrew / <i>Blarina brevicauda</i>	1	dead, center pitfall trap
TA 1	Vole / <i>Microtus sp.</i>	1	dead, center pitfall trap
TA 1	Green frog / <i>Lithobates clamitans melanota</i>	1	alive, yoy, south pitfall trap
TA 4	Green frog / <i>Lithobates clamitans melanota</i>	2	alive, yoy, north pitfall trap
TA 4	Meadow vole / <i>Microtus pennsylvanicus</i>	1	alive, center pitfall trap
TA 4	Green frog / <i>Lithobates clamitans melanota</i>	11	dead, center pitfall trap
TA 4	Meadow vole / <i>Microtus pennsylvanicus</i>	1	dead, center pitfall trap
TA 4	Caterpillar sp.	2	dead, center pitfall trap - orange tipped oakworm moth caterpillar
TA 4	Meadow vole / <i>Microtus pennsylvanicus</i>	1	alive, south pitfall trap
TA 12	Meadow jumping mouse / <i>Zapus hudsonius</i>	1	alive, east pitfall trap
TA 10	Northern short-tailed shrew / <i>Blarina brevicauda</i>	1	dead, east funnel trap
TA 11	Deermouse / <i>Peromyscus sp.</i>	1	alive, north funnel trap
TA 11	Wood frog / <i>Lithobates sylvatica</i>	1	alive, adult, south funnel trap
TA 11	Cinereus shrew / <i>Sorex cinereus</i>	3	dead, center pitfall trap
TA 11	Northern short-tailed shrew / <i>Blarina brevicauda</i>	1	dead, center pitfall trap
TA 11	American toad / <i>Anaxyrus americanus</i>	1	dead,yoy, center pitfall trap

Herp Survey Data Form

Date: 8/28/2013

Observer(s): JG, MJM, NF

Start Time: 6:21

Start Temp: 60°F

End Time: 11:44

End Temp: 77°F (in shade)

Weather:

Start Wind (Beaufort): 0

Start % Cloud Cover: 0

End Wind (Beaufort): 1

End % Cloud Cover: 3

Moon Phase:

Trapping Array	Species (common name/ scientific name)	# Documented	Notes
TA 5	Green frog / <i>Lithobates clamitans melanota</i>	2	yoy- center pitfall trap
TA 9	American toad / <i>Anaxyrus americanus</i>	1	west pitfall trap
TA 9	American toad / <i>Anaxyrus americanus</i>	1	yoy- center pitfall trap
TA 9	Green frog / <i>Lithobates clamitans melanota</i>	2	yoy- center pitfall trap
TA 6	House mouse / <i>Mus musculus</i>	1	south funnel trap
TA 6	Garter snake / <i>Thamnophis sirtalis</i>	1	adult, small, south funnel trap
TA 6	Meadow vole / <i>Microtus sp.</i>	1	west pitfall trap
TA 6	American toad / <i>Anaxyrus americanus</i>	1	west pitfall trap
TA 6	Green frog / <i>Lithobates clamitans melanota</i>	4	yoy, 2 dead, 2 alive, center pitfall trap
TA 12	Cinereus shrew / <i>Sorex cinereus</i>	1	dead, west funnel trap
TA 3	Meadow jumping mouse / <i>Zapus hudsonius</i>	1	alive, north funnel trap
TA 3	Wood frog / <i>Lithobates sylvatica</i>	1	alive, north funnel trap
TA 3	White-footed mouse / <i>Peromyscus leucopus</i>	1	dead, center pitfall trap
TA 3	Green frog / <i>Lithobates clamitans melanota</i>	2	1 dead, 1 alive, west pitfall trap
TA 3	Star-nosed mole / <i>Condylura cristata</i>	2	dead, west pitfall trap
TA 4	Green frog / <i>Lithobates clamitans melanota</i>	1	dead, south pitfall trap
TA 4	Meadow vole / <i>Microtus pennsylvanicus</i>	1	alive, center pitfall trap
TA 4	Meadow jumping mouse / <i>Zapus hudsonius</i>	1	alive, center pitfall trap
created vernal pool	Green frog / <i>Lithobates clamitans melanota</i>	several	heard
created vernal pool	Painted turtle / <i>Chrysemys picta</i>	several	basking
TA 1	Green frog / <i>Lithobates clamitans melanota</i>	1	alive, south pitfall trap

Trapping Array	Species (common name/ scientific name)	# Documented	Notes
TA 1	Meadow jumping mouse / <i>Zapus hudsonius</i>	1	alive, south pitfall trap
TA 2	Garter snake / <i>Thamnophis sirtalis</i>	2	yoy, under cover boards
TA 2	Green frog / <i>Lithobates clamitans melanota</i>	3	alive, center pitfall trap
TA 2	American toad / <i>Anaxyrus americanus</i>	1	alive, center pitfall trap
TA 2	Cinereus shrew / <i>Sorex cinereus</i>	2	dead, east pitfall trap
TA 10	Cinereus shrew / <i>Sorex cinereus</i>	1	dead, center pitfall trap
TA 11	Nothing in traps		

Notes: Predated turtle nest on south side of dune located north of TA 9.

Herp Survey Data Form

Date: 8/29/2013

Observer(s): JG, CE, NF

Start Time: 10:13

Start Temp: 76°F

End Time: 11:46

End Temp: 80°F

Weather: Dry

Start Wind (Beaufort):

Start % Cloud Cover: >75

End Wind (Beaufort):

End % Cloud Cover:

Moon Phase:

Trapping Array	Species (common name/ scientific name)	# Documented	Notes
TA 5	Gray treefrog / <i>Hyla versicolor</i>	1	on north funnel trap
TA 5	Northern leopard frog / <i>Lithobates pipiens</i>	1	forested wetland east of TA 9
TA 9	American toad / <i>Anaxyrus americanus</i>	1	juvenile, east pitfall trap
TA 9	American toad / <i>Anaxyrus americanus</i>	1	juvenile, north funnel trap
TA 9	Gray treefrog / <i>Hyla versicolor</i>	1	adult, on silt fence above the center pitfall trap
Between TA 9 and TA 6	American toad / <i>Anaxyrus americanus</i>	1	adult
TA 6	Meadow jumping mouse / <i>Zapus hudsonius</i>	1	east funnel trap
TA 6	Green frog / <i>Lithobates clamitans melanota</i>	1	dead, center pitfall trap
TA 6	Meadow vole / <i>Microtus pennsylvanicus</i>	1	alive, center pitfall trap
TA 4	Green frog / <i>Lithobates clamitans melanota</i>	1	yoy, south pitfall trap
TA 4	Northern short-tailed shrew / <i>Blarina brevicauda</i>	1	alive, center pitfall trap
TA 4	Meadow jumping mouse / <i>Zapus hudsonius</i>	1	alive, north pitfall trap
TA 1	Red-bellied snake / <i>Storeria occipitomaculata</i>	1	juvenile
TA 1	Chipmunk / <i>Tamias striatus</i>	1	east funnel trap
TA 1	Garter snake / <i>Thamnophis sirtalis</i>	1	under cover board MK 14, between TA 1 and TA 2
TA 2	Meadow jumping mouse / <i>Zapus hudsonius</i>	1	alive, south funnel trap
TA 2	Garter snake / <i>Thamnophis sirtalis</i>	1	alive, adult; south funnel trap
TA 2	Cinereus shrew / <i>Sorex cinereus</i>	1	dead, east pitfall trap
TA 2	Green frog / <i>Lithobates clamitans melanota</i>	1	alive, yoy, center pitfall trap
TA 2	Gartersnake / <i>Thamnophis sirtalis</i>	1	juvenile, yoy, center pitfall trap
TA 2	Garter snake / <i>Thamnophis sirtalis</i>	2	yoy, under cover board

Trapping Array	Species (common name/ scientific name)	# Documented	Notes
TA 3	Meadow jumping mouse / <i>Zapus hudsonius</i>	1	alive, center pitfall trap
TA 3	Meadow jumping mouse / <i>Zapus hudsonius</i>	1	alive, east funnel trap
east of TA 3	Wood frog / <i>Lithobates sylvatica</i>	1	
west of TA 12	Northern leopard frog / <i>Lithobates pipiens</i>	1	
TA 12	Nothing in traps		
TA 10	Green frog / <i>Lithobates clamitans melanota</i>	1	dead, yoy, south funnel trap
TA 11	Northern short-tailed shrew / <i>Blarina brevicauda</i>	1	dead, center pitfall trap
Notes:			

Herp Survey Data Form

Date: 8/30/2013

Observer(s): JG, CE

Start Time: 8:28

Start Temp: 66°F

End Time: 10:10

End Temp: 70°F

Weather:

Start Wind (Beaufort): 0 Start % Cloud Cover: 100

End Wind (Beaufort): 1 End % Cloud Cover:

Moon Phase:

Trapping Array	Species (common name/ scientific name)	# Documented	Notes
TA 5	Nothing in traps		closed traps
TA 9	Green frog / <i>Lithobates clamitans melanota</i>	1	adult- west pitfall trap, closed traps
TA 6	Cinereus shrew / <i>Sorex cinereus</i>	1	center pitfall trap, closed traps
TA 6	Green frog / <i>Lithobates clamitans melanota</i>	1	yoy, dead, center pitfall trap
TA 4	Nothing in traps		closed traps
TA 1	Garter snake / <i>Thamnophis sirtalis</i>	1	yoy, north pitfall trap, closed traps
TA 1	Wood frog / <i>Lithobates sylvatica</i>	1	yoy, center pitfall trap
TA 2	Meadow jumping mouse / <i>Zapus hudsonius</i>	1	dead, south funnel trap, closed traps
TA 2	Northern short-tailed shrew / <i>Blarina brevicauda</i>	1	alive, south funnel trap
TA 2	Garter snake / <i>Thamnophis sirtalis</i>	3	yoy- under cover board
TA 2	Garter snake / <i>Thamnophis sirtalis</i>	1	yoy- east pitfall trap
TA 2	Meadow jumping mouse / <i>Zapus hudsonius</i>	1	dead, east pitfall trap
TA 2	House mouse / <i>Mus musculus</i>	1	alive, east pitfall trap
TA 3	Green frog / <i>Lithobates clamitans melanota</i>	1	alive, yoy, south pitfall trap, closed traps
TA 3	Meadow jumping mouse / <i>Zapus hudsonius</i>	1	alive, south pitfall trap
TA 3	Meadow vole / <i>Microtus pennsylvanicus</i>	1	alive, east funnel trap
TA 12	Northern short-tailed shrew / <i>Blarina brevicauda</i>	1	dead, center pitfall, closed traps
TA 10	Green frog / <i>Lithobates clamitans melanota</i>	1	yoy, center pitfall trap, closed traps
TA 11	Nothing in traps		closed traps

Notes: American carrion beetles(*Silpha americana*) observed in several pitfall traps.

September Trapping Event

Herp Survey Data Form

Date: 9/17/2013

Observer(s): JG

Start Time: 8:38

Start Temp: 49°F

End Time: 10:04

End Temp: 52°F

Weather: no precipitation

Start Wind (Beaufort): 1

Start % Cloud Cover: clear

End Wind (Beaufort): 1

End % Cloud Cover: clear

Moon Phase:

Trapping Array	Species (common name/ scientific name)	# Documented	Notes
TA 11	House mouse / <i>Mus musculus</i>	1	dead- center pitfall trap
TA 10	Cinereus shrew / <i>Sorex cinereus</i>	3	dead- center pitfall trap
TA 5	Nothing in traps		
TA 9	Nothing in traps		
TA 6	Cinereus shrew / <i>Sorex cinereus</i>	3	2 dead- south funnel trap
TA 6	Cinereus shrew / <i>Sorex cinereus</i>	1	dead- center pitfall trap
TA 6	Meadow vole / <i>Microtus pennsylvanicus</i>	1	dead center pitfall trap
TA 4	Meadow vole / <i>Microtus pennsylvanicus</i>	1	alive- center pitfall trap
TA 1	Nothing in traps		
TA 2	Meadow jumping mouse / <i>Zapus hudsonius</i>	2	almost dead- south funnel trap
TA 2	Cinereus shrew / <i>Sorex cinereus</i>	1	dead- east pitfall trap
TA 2	Garter snake / <i>Thamnophis sirtalis</i>	5	neonate- under cover boards
TA3	House mouse / <i>Mus musculus</i>	1	alive juvenile- north pitfall trap
TA 12	Nothing in traps		

Notes:

Herp Survey Data Form

Date: 9/18/2013

Observer(s): JG, MJM

Start Time: 6:40

Start Wind (Beaufort): 1
from the south

Start % Cloud Cover: >75

Start Temp: 43°F

End Time: 11:15

End Temp: 56°F

End % Cloud Cover: 0

Weather: fog at the beginning of survey

End Wind (Beaufort): 1

Moon Phase: almost full

Trapping Array	Species (common name/ scientific name)	# Documented	Notes
TA 5	Nothing in traps		
TA 9	Nothing in traps		
TA 6	Meadow jumping mouse / <i>Zapus hudsonius</i>	1	alive-south funnel trap
TA 12	House wren / <i>Troglodytes aedon</i>	1	dead- north funnel trap. Predated by an animal that escaped the trap.
TA 3	Mouse / <i>Peromyscus</i> sp.	1	alive- north pitfall trap. Potential (resembled a) North American deer mouse (<i>P. maniculatus</i>) based on compressed/shorter legs & tail.
TA 2	Garter snake / <i>Thamnophis sirtalis</i>	6	neonates under cover board
TA 2	Garter snake / <i>Thamnophis sirtalis</i>	1	adult male- south funnel trap
TA 2	Meadow jumping mouse / <i>Zapus hudsonius</i>	2	1 alive, 1 euthanized (it was paralyzed) and collected- south funnel trap
TA 2	Gartersnake / <i>Thamnophis sirtalis</i>	1	neonate under cover board MK 20 located between TA 1 and TA 2
TA 1	Nothing in traps		
TA 4	Nothing in traps		
TA 10	Nothing in traps		
TA 11	Nothing in traps		
Notes:			

Herp Survey Data Form

Date: 9/19/2013

Observer(s): JG, MJM

Start Time: 6:45

Start Temp: mid-upper 40's°F

End Time: 12:15

End Temp: 70°F

Weather: no precipitation

Start Wind (Beaufort): 0/1

Start % Cloud Cover: >75, low clouds

End Wind (Beaufort): 1

End % Cloud Cover: 0

Moon Phase: full

Trapping Array	Species (common name/ scientific name)	# Documented	Notes
TA 4	Meadow jumping mouse / <i>Zapus hudsonius</i>	1	Alive- center pitfall trap. Hypothermic-left in sun to recover.
TA 1	Meadow vole/ <i>Microtus pennsylvanicus</i>	1	Alive- center pitfall trap. 45mm tail length, 106 mm body length
TA 2	Chipmunk/ <i>Tamias striatus</i>	1	Alive- center pitfall trap. Visibly not moving- expect hypothermia- left in sun to recover. A small stick that a snake could use to climb out of the trap was removed.
TA 3	Woodland vole / <i>Microtus pinetorum</i>	1	Dead (collected)- center pitfall trap. Tail length = 21 mm; body length = 90 mm; total length = 111 mm. Reddish-colored fur.
TA 12	Cinereus shrew / <i>Sorex cinereus</i>	1	Alive-north funnel trap.
TA 12	Deermouse/ <i>Peromyscus</i> sp.	1	Dead with large hole eaten out of side by <i>Sorex cinereus</i> (collected)- north funnel trap. 61 mm body length; 66.5 mm tail length; sharply-bicolored tail - all suggest <i>P. maniculatus</i> .
TA 6	Meadow vole/ <i>Microtus pennsylvanicus</i>	3	Alive- west funnel trap.
TA 6	American toad / <i>Anaxyrus americanus</i>	1	Alive- juvenile- south pitfall trap.
TA 6	Meadow vole/ <i>Microtus pennsylvanicus</i>	1	Dead- center pitfall trap.
TA 9	Nothing in traps.		
TA 5	Nothing in traps.		Northern leopard frog (<i>Lithobates pipiens</i>) just north of the trapping array.
TA 10	Nothing in traps.		
TA 11	Nothing in traps.		
Notes: 54.8°F and 77% relative humidity mid survey at 9:55.			

Herp Survey Data Form

Date: 9/20/2013

Observer(s): JG, CE

Start Time: 9:53

Start Temp: 62°F

End Time: 12:00

End Temp: 70°F

Weather: clear, no precipitation

Start Wind (Beaufort): 1

Start % Cloud Cover: <25

End Wind (Beaufort):1

End % Cloud Cover: <25

Moon Phase: full

Trapping Array	Species (common name/ scientific name)	# Documented	Notes
TA 4	Meadow jumping mouse / <i>Zapus hudsonius</i>	2	Alive-east funnel trap. Closed traps.
TA 1	Meadow jumping mouse / <i>Zapus hudsonius</i>	1	Alive- east funnel trap. Closed traps.
TA 1	Garter snake / <i>Thamnophis sirtalis</i>	1	Alive- adult- east funnel trap.
TA 2	Garter snake / <i>Thamnophis sirtalis</i>	3	Alive- adults- south funnel trap. Closed traps.
TA 2	Meadow jumping mouse / <i>Zapus hudsonius</i>	1	Lethargic- south funnel trap.
TA 2	Chipmunk / <i>Tamias striatus</i>	1	Alive- north funnel trap.
TA 2	Garter snake / <i>Thamnophis sirtalis</i>	1	Alive- adult- north funnel trap.
TA 2	Red-bellied snake / <i>Storeria occipitomaculata</i>	1	Alive- neonate under cover board.
TA 2	Cinereus shrew / <i>Sorex cinereus</i>	1	Alive-center pitfall trap.
TA 2	Garter snake / <i>Thamnophis sirtalis</i>	6	Neonates under cover board.
TA 2	Deermouse / <i>Peromyscus</i> sp.		Nest under cover board.
TA 3	Meadow jumping mouse / <i>Zapus hudsonius</i>	1	East funnel trap. Closed traps.
TA 3	Cinereus shrew / <i>Sorex cinereus</i>	1	Dead-south pitfall trap. Collected.
TA 5	Nothing in traps.		Closed traps.
TA 9	Nothing in traps.		Closed traps.
TA 6	Meadow vole / <i>Microtus pennsylvanicus</i>	2	1 alive, 1 dead (collected)- south funnel trap. Closed traps.
TA 6	Meadow vole / <i>Microtus pennsylvanicus</i>	1	Alive- center pitfall trap.
TA 6	Snapping turtle / <i>Chelydra serpentina</i>	1	Alive-baby- center pitfall trap.
TA 12	Deermouse / <i>Peromyscus</i> sp.	2	1 dead (collected), north funnel trap. Closed traps.
TA 10	Nothing in traps.		Closed traps.
TA 11	Nothing in traps.		Closed traps.

Eastern Spadefoot Toad Surveys

Eastern Spadefoot Toad Survey Data Form

Date: 5/24/13

Observer (s): SJV

Start Time: 9:00 AM

End Time: 9:05AM

Start Temp: 50°F

End Temp: 50°F

Start Wind: Beaufort ___

End Wind: Beaufort ___

% Cloud Cover: cloudy with light rain

The gray birch vernal pool area was damp with no standing water.

Rain total over the past 4 days was just over 2".

American toads (*Anaxyrus americanus*) were heard calling from the biofilter ponds adjacent to the landfill.

No spadefoot toads (*Scaphiopus holbrookii*) observed or heard during this survey.

Survey Data Form - Passive Herp Surveys

Date: 6/20/13

Observer (s): JWG

Start Time: 19:43 **Start Temp:** 78°F

Start Wind: Beaufort 1

End Time: 20:55 **End Temp:** ~77°F

End Wind: Beaufort 1

Weather:

Location	Time	Species (common name/ scientific name)	Notes
		Gray treefrog / <i>Hyla versicolor</i>	calling from several areas, calling elevated after sunset 20:36
		Green frog / <i>Lithobates clamitans melanota</i>	calling from inundated areas, continued after sunset 20:36 but was not elevated
		Assuming Painted turtle/ <i>Chrysemys picta</i>	nest on north side of created vernal pond, with good sized claw marks, nest area ~10" wide.

Notes: The spadefoot toad vernal pool inundated and teeming with mosquito larvae. Searched sandy soils near spadefoot vernal pool for Eastern hog-nosed snake (*Heterodon platirhinos*) - none found. Walked around the created vernal pond looking for turtle nests and spotted turtles (*Clemmys guttata*) and signs of other nesting activity. Walked the sandy areas on the dune between the created vernal pond and TA 4 then walked areas near TA 4 and toward the created forested wetland with mounds.

Eastern Spadefoot Toad Survey Data Form

Date: 7/23/13

Observer (s): John Greaves

Start Time: 11:36 AM

End Time: 12:08 PM

Start Temp: 72°F

End Temp: 72°F

Start Wind: Beaufort 1

End Wind: Beaufort 1

% Cloud Cover: 100%

Recent heavy rains (0.47") within the past 24 hours warranted a search of the site for spadefoot toad emergence. The survey focused on the gray birch vernal pool because of previous detections at that location. This vernal pool was observed to have only one small area with shallow (~1") inundation. The inundated area and its surrounding areas were searched. No spadefoot toads or tadpoles were observed.

On the way to and from the gray birch vernal pool the edges of the created vernal pool were searched for spadefoot toads. No spadefoot toads were detected.

Insect and Passive Herpetological Surveys

Survey Data Form - Insect & Passive Herp Survey

Date: 5/3/13

Observer(s): JG, CE, MJM

Start Time: 10:01 End Time: 13:00

Start temp: 63°F End temp: _°F

Start % Cloud Cover: 2 End % Cloud Cover: _

Start Wind: Beaufort 1 End Wind: Beaufort _

Location	Time	Species (common name/ scientific name)	# Observed	Notes
Transect 9	10:01	Gray treefrog / <i>Hyla versicolor</i>	1	
	10:14			
Transect 1	10:17	Tiger beetle / <i>Cincindela sp.</i>		
	10:35			
Transect 2	10:37	Cabbage white / <i>Pieris rapae</i>	5	
	10:42			
Nursery	10:42	Mottled duskywing / <i>Erynnis martialis</i>	1	
	10:55			
Transect 2 (Cont.)	10:55	Cabbage white / <i>Pieris rapae</i>	1	
	11:23	White-striped black moth / <i>Trichodezia albovittata</i>		
Transect 3	11:42	Cabbage white / <i>Pieris rapae</i>	4	
		Clouded sulphur / <i>Colias philodice</i>	1	
	11:59	Mourning cloak / <i>Nymphalis antiopa</i>	1	
Transect 4	12:04	Cabbage white / <i>Pieris rapae</i>	2	
	12:14			
Transect 5	12:16	Cabbage white / <i>Pieris rapae</i>	3	
		Wild indigo duskywing / <i>Erynnis baptisiae</i>	1	
	12:31	Eastern tailed blue / <i>Cupido comyntas</i>	1	
Transect 6	12:33	Cabbage white / <i>Pieris rapae</i>	5	
		Sulphur / <i>Colias sp.</i>	1	
	12:41	Eastern tailed blue / <i>Cupido comyntas</i>	1	
Transect 7	12:44	Cabbage white / <i>Pieris rapae</i>	1	
		Green frog / <i>Lithobates clamitans melanota</i>		calling
	12:57	Brown elfin / <i>Callophrys augustinus</i>	1	
Transect 8	12:58	Crane fly (Tipulomorpha)	1	
	13:00	Cabbage white / <i>Pieris rapae</i>	1	
Notes:				

Survey Data Form - Insect & Passive Herp Survey

Date: 5/10/13

Observer(s): JG, CE

Start Time: 10:06 **End Time:** 12:51

Start temp: °F **End temp:** 80°F

Start % Cloud Cover: 30 **End % Cloud Cover:** 50

Start Wind: Beaufort 1 **End Wind:** Beaufort _

Location	Time	Species (common name/ scientific name)	# Observed	Notes
Transect 9	10:08	Cabbage white / <i>Pieris rapae</i>	4	
		Green frog / <i>Lithobates clamitans melanota</i>	1	in pond
		Lithobatid tadpoles		
	10:20	Eastern tailed blue / <i>Cupido comyntas</i>	1	
Transect 1	10:23	White-striped black moth / <i>Trichodezia albovittata</i>		
	10:42	Pearl crescent / <i>Phyciodes tharos</i>	1	
Transect 2	10:43	Honeybee / <i>Apis sp.</i>		
		Cabbage white / <i>Pieris rapae</i>	1	
		Clouded sulphur / <i>Colias philodice</i>	1	
	10:50	Wild indigo duskywing / <i>Erynnis baptisiae</i>	1	
Nursery	10:51	Tiger beetle / <i>Cincindela sp.</i>		
	11:00			
Transect 2 (Cont.)	11:00	Cabbage white / <i>Pieris rapae</i>	3	
		Clouded sulphur / <i>Colias philodice</i>	6	
		Green frog / <i>Lithobates clamitans melanota</i>		calling
		Mayfly species / Ephemeroptera sp.	1	
		White-striped black moth / <i>Trichodezia albovittata</i>	4	
		Hairstreak / <i>Strymon sp.</i>	1	in forest
	11:28	Lithobatid frog		in stream
Transect 3	11:45	Clouded sulphur / <i>Colias philodice</i>	2	
		Cabbage white / <i>Pieris rapae</i>	2	
		Yellow jacket / <i>Vespula maculifrons</i>		
		Wasp sp.		
	11:54	Hairstreak / <i>Strymon sp.</i>	1	
Transect 4	11:58	Gypsy moth / <i>Lymantria dispar</i>	1	
		Mourning cloak / <i>Nymphalis antiopa</i>	1	
		Clouded sulphur / <i>Colias philodice</i>	1	
		Cabbage white / <i>Pieris rapae</i>	1	
	12:08	American bird grasshopper / <i>Schistocerca americana</i>	2	
Transect 5	12:11	Green frog / <i>Lithobates clamitans melanota</i>		calling
		Cabbage white / <i>Pieris rapae</i>	4	
	12:18	Clouded sulphur / <i>Colias philodice</i>	1	
Transect 6	12:21	Wild indigo duskywing / <i>Erynnis baptisiae</i>	5	

Location	Time	Species (common name/ scientific name)	# Observed	Notes
		Cabbage white / <i>Pieris rapae</i>	2	
	12:27	Pearl crescent / <i>Phyciodes tharos</i>	1	
off transect	~12:30	Frosted Elfin / <i>Callophrys irus</i>	1	near TA 4 on wild lupine (<i>Lupinus perennis</i>)
		Cabbage white / <i>Pieris rapae</i>	1	
Transect 7	12:35	Cabbage white / <i>Pieris rapae</i>	1	
		Crane fly (Tipulomorpha)	1	
	12:46	Wild indigo duskywing / <i>Erynnis baptisiae</i>	3	survey included occupied reference area
Transect 8	12:47	Juvenal's duskywing / <i>Erynnis juvenalis</i>	1	
		American bird grasshopper / <i>Schistocerca americana</i>	numerous	
	12:51	Cabbage white / <i>Pieris rapae</i>	1	
Notes:				

Survey Data Form - Insect & Passive Herp Survey

Date: 5/20/13

Observer(s): JWG

Start Time: 12:38 **End Time:** 15:50

Start temp: 74°F **End temp:** ~79°F

Start % Cloud Cover: 20 **End % Cloud Cover:** 30

Start Wind: Beaufort 1 **End Wind:** Beaufort 1

Location	Time	Species (common name/ scientific name)	# Observed	Notes
Transect 9	12:38	Wild indigo duskywing / <i>Erynnis baptisiae</i>	2	
		Black swallowtail / <i>Papilio polyxenes</i>	1	
		Clouded sulphur / <i>Colias philodice</i>	1	
		Green frog / <i>Lithobates clamitans melanota</i>	1	farm pond
		Cabbage white / <i>Pieris rapae</i>	1	
Transect 1	13:01	Gray treefrog / <i>Hyla versicolor</i>	1	calling from forest
		American copper / <i>Lycaena phlaeas</i>	2	
		Wild indigo duskywing / <i>Erynnis baptisiae</i>	4	
		Pearl crescent / <i>Phyciodes tharos</i>	1	
	13:22	Common ringlet / <i>Coenonympha tullia</i>	1	
Transect 2	13:24	American copper / <i>Lycaena phlaeas</i>	4	
		Common ringlet / <i>Coenonympha tullia</i>	3	
		Black swallowtail / <i>Papilio polyxenes</i>	1	
		Cabbage white / <i>Pieris rapae</i>	1	
		Pearl crescent / <i>Phyciodes tharos</i>	1	
Nursery	13:30	Wild indigo duskywing / <i>Erynnis baptisiae</i>	1	
		Cabbage white / <i>Pieris rapae</i>	1	
		Bumble bee / <i>Bombus sp.</i>	8	
		Clouded sulphur / <i>Colias philodice</i>	3	
	13:40	Tiger beetle / <i>Cincindela sp.</i>	10	
Transect 2 (Cont.)	13:41			To allow more time to focus on the open areas for the Frosted elfin, the forested southern portion of this transect was not surveyed.
		Cabbage white / <i>Pieris rapae</i>	3	
	13:50	Gray treefrog / <i>Hyla versicolor</i>	2	calling
Transect 3	13:52	Clouded sulphur / <i>Colias philodice</i>	3	
		Cabbage white / <i>Pieris rapae</i>	1	
		Common ringlet / <i>Coenonympha tullia</i>	1	
	14:02	Gray treefrog / <i>Hyla versicolor</i>	1	calling from north end forest
Transect 4	14:05	Tent caterpillar / <i>Malacosoma sp.</i>		nest
		Common sootywing / <i>Pholisora catullus</i>	3	
		Eastern tiger swallowtail / <i>Papilio glaucus</i>	1	

Location	Time	Species (common name/ scientific name)	# Observed	Notes
	14:16	Cabbage white / <i>Pieris rapae</i>	1	
Transect 5	14:18	Green frog / <i>Lithobates clamitans melanota</i>		calling from wet areas
		Gray treefrog / <i>Hyla versicolor</i>		calling from treed area
		Common sootywing / <i>Pholisora catullus</i>	1	
		Cabbage white / <i>Pieris rapae</i>	2	
		Gray treefrog / <i>Hyla versicolor</i>	3-4	calling from vernal pool
	14:30	American toad / <i>Anaxyrus americanus</i>	1	under cover board in north sandy area
Transect 6	14:32			As part of this transect the TA 4 area was surveyed for Frosted elfin's.
		Cabbage white / <i>Pieris rapae</i>	2	
		Gray treefrog / <i>Hyla versicolor</i>	1	
		American copper / <i>Lycaena phlaeas</i>	1	
	14:52	Pearl crescent / <i>Phyciodes tharos</i>	2	
Transect 7	14:55	Gray treefrog / <i>Hyla versicolor</i>	2	calling from forest
				The adjacent wild lupine (<i>Lupinus perennis</i>) patches in the Preserve were suveyed for Frostin elfin.
		Wild indigo duskywing / <i>Erynnis baptisiae</i>	1	
		Black swallowtail / <i>Papilio polyxenes</i>	1	
		Eastern tiger swallowtail / <i>Papilio glaucus</i>	1	
	15:17	Juvenal's duskywing / <i>Erynnis juvenalis</i>	4	
Transect 10	15:27	Black swallowtail / <i>Papilio polyxenes</i>	2	
		Clouded sulphur / <i>Colias philodice</i>	20	
		Tiger beetle / <i>Cincindela sp.</i>	many	
		Gray treefrog / <i>Hyla versicolor</i>	1	calling from woods to the north
		Cabbage white / <i>Pieris rapae</i>	5	
	15:40	Eastern tailed blue / <i>Cupido comyntas</i>	1	
Transect 8	15:47	Cabbage white / <i>Pieris rapae</i>	3	
		Common sootywing / <i>Pholisora catullus</i>	2	
	15:50	American bird grasshopper / <i>Schistocerca americana</i>	1	
Notes:				

Survey Data Form - Insect & Passive Herp Survey

Date: 6/12/13

Observer(s): JG, MJM

Start Time: 13:09 End Time: 15:57

Start temp: 66°F End temp: 72°F

Start % Cloud Cover: 90 End % Cloud Cover: 75

Start Wind: Beaufort 1 End Wind: Beaufort 2-3

Location	Time	Species (common name/ scientific name)	# Observed	Notes
Transect 9	12:09	Virginia ctenucha / <i>Ctenucha virginica</i>	1	
		Hobomok skipper / <i>Poanes hobomok</i>	2	male
		Little wood-satyr / <i>Megisto cymela</i>	1	
		Wild indigo duskywing / <i>Erynnis baptisiae</i>	1	female
		Cabbage white / <i>Pieris rapae</i>	6	
		Common ringlet / <i>Coenonympha tullia</i>	1	
		Skipper sp.	1	
	12:42	Common sootywing / <i>Pholisora catullus</i>	1	
Transect 1	12:45	Pearl crescent / <i>Phyciodes tharos</i>	1	
		American copper / <i>Lycaena phlaeas</i>	1	
		Wild indigo duskywing / <i>Erynnis baptisiae</i>	1	
	13:05	Common ringlet / <i>Coenonympha tullia</i>	3	
Transect 2	13:08	Pearl crescent / <i>Phyciodes tharos</i>	1	Male
		Skipper sp.	1	
	13:13	Silver spotted skipper / <i>Epargyreus clarus</i>	1	
Nursery	13:13	No butterflies found		
	13:19			
Transect 2 (Cont.)	13:20	Wild indigo duskywing / <i>Erynnis baptisiae</i>	1	
		Clouded sulphur / <i>Colias philodice</i>	1	
		Common sootywing / <i>Pholisora catullus</i>	1	
		Cabbage white / <i>Pieris rapae</i>	2	
	13:35	Banded hairstreak / <i>Satyrium calanus</i>	1	
Transect 3	13:39	Cabbage white / <i>Pieris rapae</i>	3	
	13:49	Clouded sulphur / <i>Colias philodice</i>	1	
Transect 4	13:51	Eight-spotted forester / <i>Alypia octomaculata</i>	1	
		Viceroy / <i>Limenitis archippus</i>	1	
	14:13	Common sootywing / <i>Pholisora catullus</i>	2	
Transect 5	14:15	Least skipper / <i>Ancyloxypha numitor</i>	1	
		Cabbage white / <i>Pieris rapae</i>	1	
		Clouded sulphur / <i>Colias philodice</i>	2	
		Viceroy / <i>Limenitis archippus</i>	3	
		Common sootywing / <i>Pholisora catullus</i>	2	
	14:33	Dreamy duskywing / <i>Erynnis icelus</i>	1	
Transect 6	14:36	Clouded sulphur / <i>Colias philodice</i>	1	

Location	Time	Species (common name/ scientific name)	# Observed	Notes
		American toad / <i>Anaxyrus americanus</i>	2	
	14:42	Silver spotted skipper / <i>Epargyreus clarus</i>	1	
Transect 7	14:48	Cabbage white / <i>Pieris rapae</i>	2	
		Common sootywing / <i>Pholisora catullus</i>	1	
		Pearl crescent / <i>Phyciodes tharos</i>	1	
		Common ringlet / <i>Coenonympha tullia</i>	1	
		Virginia ctenucha/ <i>Ctenucha virginica</i>	1	
		Little wood-satyr / <i>Megisto cymela</i>	23	
		Pearl crescent / <i>Phyciodes tharos</i>	2	
		Gray treefrog / <i>Hyla versicolor</i>	1	
		Common gartersnake / <i>Thamnophis sirtalis</i>	1	large
		Black swallowtail / <i>Papilio polyxenes</i>	1	
	15:17	Hesperia skipper sp. / <i>Hesperia sp.</i>	2	
Transect 8	15:18	Cabbage white / <i>Pieris rapae</i>	1	
	15:21			
Transect 10	15:42	Common ringlet / <i>Coenonympha tullia</i>	2	
		American lady / <i>Vanessa virginiensis</i>	1	
		Cabbage white / <i>Pieris rapae</i>	1	
		Eastern tiger swallowtail / <i>Papilio glaucus</i>	1	
	15:57	Black swallowtail / <i>Papilio polyxenes</i>	1	
Notes:				

Survey Data Form - Insect & Passive Herp Survey

Date: 7/10/13

Observer(s): JG

Start Time: 10:20 **End Time:** 13:57

Start temp: 78°F **End temp:** 83°F

Start % Cloud Cover: 98 (85% at 11:30) **End % Cloud Cover:**

Start Wind: Beaufort 1 **End Wind:** Beaufort 3

Location	Time	Species (common name/ scientific name)	# Observed	Notes
Transect 9	10:24	Cabbage white / <i>Pieris rapae</i>	1	
		Bumble bee / <i>Bombus sp.</i>	1	
		Bluet / <i>Enallagma sp.</i>	1	damselfly
		Clouded sulphur / <i>Colias philodice</i>	1	
		Northern Pearly-eye / <i>Enodia anthedon</i>	1	
		American toad / <i>Anaxyrus americanus</i>	2	babies
		Cicada sp.		calling
		Common whitetail / <i>Plathemis lydia</i>	1	
		Eastern tailed blue / <i>Cupido comyntas</i>	1	
	10:48	Common sootywing / <i>Pholisora catullus</i>		
Transect 1	10:51	Green frog / <i>Lithobates clamitans melanota</i>	1	adult in ephemeral pool
		Water strider / <i>Gerris remigis</i>	1	in ephemeral pool
		Green frog / <i>Lithobates clamitans melanota</i>	2	tadpoles- in forested wetland outlet/stream
		Green frog / <i>Lithobates clamitans melanota</i>	1	adult- in forested wetland outlet/stream
		American copper / <i>Lycaena phlaeas</i>	1	
		Orange sulphur / <i>Colias eurytheme</i>	1	
		American toad / <i>Anaxyrus americanus</i>		babies in various locations along the transect
		Common sootywing / <i>Pholisora catullus</i>	1	
		Cabbage white / <i>Pieris rapae</i>	1	
		Clouded sulphur / <i>Colias philodice</i>	1	
		Little wood-satyr / <i>Megisto cymela</i>	1	
		Pearl crescent / <i>Phyciodes tharos</i>	1	
		Bluet / <i>Enallagma sp.</i>	1	
	11:15	Hairstreak / <i>Strymon sp.</i>	1	
Transect 2	11:21	Hickory hairstreak / <i>Satyrrium caryaevorus</i>	1	
		Common wood nymph / <i>Cercyonis pegala</i>	1	Beaufort 2/3
		Cabbage white / <i>Pieris rapae</i>	1	
Nursery	11:28	Clouded sulphur / <i>Colias philodice</i>	1	
		Honeybee / <i>Apis sp.</i>		
		Cabbage white / <i>Pieris rapae</i>	1	
		Bumble bee / <i>Bombus sp.</i>		
	11:42	Silver spotted skipper / <i>Epargyreus clarus</i>	1	
Transect 2 (Cont.)	11:42	Clouded sulphur / <i>Colias philodice</i>	1	

Location	Time	Species (common name/ scientific name)	# Observed	Notes
		Eastern tailed blue / <i>Cupido comyntas</i>	1	
		American copper / <i>Lycaena phlaeas</i>	1	
		Bluet / <i>Enallagma sp.</i>	1	
	11:53	Cabbage white / <i>Pieris rapae</i>	1	
Transect 3	11:55	Green frog / <i>Lithobates clamitans melanota</i>	1	Calling from stream
		Cabbage white / <i>Pieris rapae</i>	1	
		Common whitetail / <i>Plathemis lydia</i>	1	
		Green frog / <i>Lithobates clamitans melanota</i>		Calling from forested wetland with pools
		Wild indigo duskywing / <i>Erynnis baptisiae</i>	1	
		Virginia ctenucha / <i>Ctenucha virginica</i>	1	
	12:29	American toad / <i>Anaxyrus americanus</i>	1	baby
Transect 4	12:33	Wood frog / <i>Lithobates sylvatica</i>	3	young- in forest at the north end of the transect
		Cabbage white / <i>Pieris rapae</i>	1	
		Pink-edged sulphur / <i>Colias interior</i>	1	
		Eastern tailed blue / <i>Cupido comyntas</i>	1	
		Gray hairstreak / <i>Strymon melinus</i>	2	open field
		American bird grasshopper / <i>Schistocerca americana</i>		
		American toad / <i>Anaxyrus americanus</i>	several	YOY-in small remnant forest of patchy maples near the south end of the transect
	12:53	Wild indigo duskywing / <i>Erynnis baptisiae</i>	1	
Transect 5	12:57	Green frog / <i>Lithobates clamitans melanota</i>		Calling from wetland at south end
		Cabbage white / <i>Pieris rapae</i>	1	
		Pink-edged sulphur / <i>Colias interior</i>	1	
		Painted turtle / <i>Chrysemys picta</i>	1	basking on stump in created vernal pool
		Green frog / <i>Lithobates clamitans melanota</i>		calling from created vernal pool
		American bird grasshopper / <i>Schistocerca americana</i>	1	
		American copper / <i>Lycaena phlaeas</i>	1	
		Common sootywing / <i>Pholisora catullus</i>	1	
		Common ringlet / <i>Coenonympha tullia</i>	1	
		American toad / <i>Anaxyrus americanus</i>	2	adult and baby on edge of gray birch vernal pool
		Northern Pearly-eye / <i>Enodia anthedon</i>	1	
	13:20	Summer azure / <i>Celastrina neglecta</i>	1	
Transect 6	13:22	Orange sulphur / <i>Colias eurytheme</i>	1	
		Wild indigo duskywing / <i>Erynnis baptisiae</i>	1	
		Eastern tailed blue / <i>Cupido comyntas</i>	1	
		Pearl crescent / <i>Phyciodes tharos</i>	1	
		Gray hairstreak / <i>Strymon melinus</i>	1	
	13:43	Silver spotted skipper / <i>Epargyreus clarus</i>	1	

Location	Time	Species (common name/ scientific name)	# Observed	Notes
Transect 7	13:44	Cabbage white / <i>Pieris rapae</i>	1	
		Eastern tailed blue / <i>Cupido comyntas</i>	1	
		Northern Pearly-eye / <i>Enodia anhedon</i>	1	
		Green frog / <i>Lithobates clamitans melanota</i>		calling from P-4 pond
		Common wood nymph / <i>Cercyonis pegala</i>	1	
	13:56	Silver spotted skipper / <i>Epargyreus clarus</i>	1	
	13:57			ended survey due to heavy rains
Notes: Transect 5- gray birch vernal pool with much standing water.				

Survey Data Form - Insect & Passive Herp Survey

Date: 7/25/13

Observer(s): NF, JG, SV

Start Time: 8:53 End Time: 13:23

Start temp: 59°F End temp: 68°F

Start % Cloud Cover: 15 End % Cloud Cover: 20

Start Wind: Beaufort 1 End Wind: Beaufort 1

Location	Time	Species (common name/ scientific name)	# Observed	Notes
Transect 9	8:53	Cabbage white / <i>Pieris rapae</i>	7	
		Viceroy / <i>Limenitis archippus</i>	3	
		Wood frog / <i>Lithobates sylvatica</i>	1	
		Bumble bee / <i>Bombus sp.</i>	many	
		Mosquitos	many	
		Common ringlet / <i>Coenonympha tullia</i>	4	
		Bluet / <i>Enallagma sp.</i>	3	
		Green frog / <i>Lithobates clamitans melanota</i>	2	calling in pond
		Snowberry clearwing moth / <i>Hemaris diffinis</i>	1	
		Honeybee/ <i>Apis sp.</i>	many	
		American copper / <i>Lycaena phlaeas</i>	2	
		Common sootywing / <i>Pholisora catullus</i>	1	
		Clouded sulphur / <i>Colias philodice</i>	1	
		Grasshopper sp.	1	
		American bird grasshopper / <i>Schistocerca americana</i>	1	
		Wild indigo duskywing / <i>Erynnis baptisiae</i>	1	
		Pearl crescent / <i>Phyciodes tharos</i>	2	
		Eastern tailed blue / <i>Cupido comyntas</i>	2	
		Least skipper / <i>Ancyloxypha numitor</i>	1	
Transect 1	9:24	Earthworms		
		Water strider / <i>Gerris remigis</i>	1	
		Bumble bee / <i>Bombus sp.</i>	2	
		Black swallowtail / <i>Papilio polyxenes</i>	1	
		Eastern tiger swallowtail / <i>Papilio glaucus</i>	1	
		Bluet sp. / <i>Enallagma sp.</i>	3	
		Slugs		
		Green frog / <i>Lithobates clamitans melanota</i>	1	
		Japanese beetle / <i>Popillia japonica</i>	2	
		American copper / <i>Lycaena phlaeas</i>	4	
		Pearl crescent / <i>Phyciodes tharos</i>	9	
		Viceroy / <i>Limenitis archippus</i>	3	
		Fly / <i>Musca sp.</i>	1	
		Ladybug / <i>Coccinella sp.</i>	1	
		Clouded sulphur / <i>Colias philodice</i>	1	

Location	Time	Species (common name/ scientific name)	# Observed	Notes
		Common ringlet / <i>Coenonympha tullia</i>	5	
		American copper / <i>Lycaena phlaeas</i>	2	
		Cabbage white / <i>Pieris rapae</i>	8	
		Eastern tailed blue / <i>Cupido comyntas</i>	1	
		Bumble bee / <i>Bombus sp.</i>	many	
		Little wood satyr / <i>Megisto cymela</i>	1	
		Black swallowtail / <i>Papilio polyxenes</i>	1	
		Common wood nymph / <i>Cercyonis pegala</i>	1	
		Red milk weed beetle / <i>Tetraopes tetraophthalmus</i>	1	
Transect 2	10:06	Cabbage white / <i>Pieris rapae</i>	1	
Nursery	10:10	Bumble bee/ <i>Bombus sp.</i>	many	
		Orange sulphur / <i>Colias eurytheme</i>	1	
		Honeybee/ <i>Apis sp.</i>	many	
Transect 2	10:16	Eastern tailed blue / <i>Cupido comyntas</i>	3	
		Wolf spider / <i>Lycosidae sp.</i>	1	
		Japanese beetle / <i>Popillia japonica</i>	1	
		Bumble bee / <i>Bombus sp.</i>	several	
		Common ringlet / <i>Coenonympha tullia</i>	2	
		Cabbage white / <i>Pieris rapae</i>	28	
		American bird grasshopper / <i>Schistocerca americana</i>	1	
		Least skipper / <i>Ancyloxypha numitor</i>	1	
		Green frog / <i>Lithobates clamitans melanota</i>	2	in stream and calling
		Virginia ctenucha / <i>Ctenucha virginica</i>	1	
		Viceroy / <i>Limenitis archippus</i>	1	
		Northern crescent / <i>Phyciodes selenis</i>	4	
		Clouded sulphur / <i>Colias philodice</i>	3	
		American copper / <i>Lycaena phlaeas</i>	2	
		American horse fly / <i>Tabanus americanus</i>	1	
		Ebony jewelwing / <i>Calopteryx maculata</i>	1	
		Mosquitos	many	
		Cicada sp.	1	heard
		Wild indigo duskywing / <i>Erynnis baptisiae</i>	1	
		Common whitetail dragonfly / <i>Plathemis lydia</i>	1	
		Eastern tiger swallowtail / <i>Papilio glaucus</i>		
Transect 3	11:17	Bluet sp. / <i>Enallagma sp.</i>	4	
		Honeybee / <i>Apis sp.</i>	several	
		Bumble bee / <i>Bombus sp.</i>	several	
		American bird grasshopper / <i>Schistocerca americana</i>	1	
		Eastern tailed blue / <i>Cupido comyntas</i>	3	
		American copper / <i>Lycaena phlaeas</i>	1	
		Green frog / <i>Lithobates clamitans melanota</i>	few	heard near stream and created forested wetland
		Viceroy / <i>Limenitis archippus</i>	1	

Location	Time	Species (common name/ scientific name)	# Observed	Notes
		Pearl crescent / <i>Phyciodes tharos</i>	1	
		Common ringlet / <i>Coenonympha tullia</i>	1	
		Cabbage white / <i>Pieris rapae</i>	2	
		Spring azure / <i>Celastrina ladon</i>	1	
		Common garter snake / <i>Thamnophis sirtalis</i>	1	Found on pine bush trail north of Transects 3 and 4.
Transect 4	11:35	Mosquitos		
		Snail sp.	1	
		Green frog / <i>Lithobates clamitans melanota</i>	few	heard
		Cabbage white / <i>Pieris rapae</i>	11	
		Bumble bee / <i>Bombus sp.</i>	many	
		Eastern tailed blue / <i>Cupido comyntas</i>	3	
		Black swallowtail / <i>Papilio polyxenes</i>	1	
		Virginia ctenucha / <i>Ctenucha virginica</i>	1	
		American bird grasshopper / <i>Schistocerca americana</i>	4	
		Common ringlet / <i>Coenonympha tullia</i>	1	
		Steel-blue cricket hunter / <i>Chlorion aerarium</i>		
		Honeybee / <i>Apis sp.</i>	many	
Transect 5	11:51	Bluet / <i>Enallagma sp.</i>	4	
		Least skipper / <i>Ancyloxypha numitor</i>	1	
		Cabbage white / <i>Pieris rapae</i>	13	
		Honeybee / <i>Apis sp.</i>	many	
		Eastern tailed blue / <i>Cupido comyntas</i>	2	
		Bumble bee/ <i>Bombus sp.</i>	many	
		American bird grasshopper / <i>Schistocerca americana</i>	3	
		Crossline skipper / <i>Polites origenes</i>	1	
		Pearl crescent / <i>Phyciodes tharos</i>	1	
		Boxelder bug / <i>Boisea trivittatus</i>	many	
		Painted turtle / <i>Chrysemys picta</i>	8	In pond and on stumps within the pond. 1 had a ~4" carapace
		Eastern tiger swallowtail / <i>Papilio glaucus</i>	2	
		Green frog / <i>Lithobates clamitans melanota</i>		heard
		Monarch / <i>Danaus plexippus</i>	1	
		Japanese beetle / <i>Popillia japonica</i>	1	
		American copper / <i>Lycaena phlaeas</i>	5	
		Common sootywing / <i>Pholisora catullus</i>	1	
		American toad / <i>Bufo americanus</i>	1	Very young
		Mottled duskywing / <i>Erynnis martialis</i>	1	see photos
		American toad / <i>Anaxyrus americanus</i>	2	under cover board
Transect 6	12:23	Cabbage white / <i>Pieris rapae</i>	18	
		Common sootywing / <i>Pholisora catullus</i>	2	
		Common ringlet / <i>Coenonympha tullia</i>	1	
		American copper / <i>Lycaena phlaeas</i>	1	

Location	Time	Species (common name/ scientific name)	# Observed	Notes
		Viceroy / <i>Limenitis archippus</i>	3	
		Eastern tiger swallowtail / <i>Papilio glaucus</i>	1	
		Eastern tailed blue / <i>Cupido comyntas</i>	11	
		White admiral / <i>Limenitis arthemis</i>	1	
		Honeybee / <i>Apis sp.</i>	many	
		Bumble bee/ <i>Bombus sp.</i>	many	
		Pearl crescent / <i>Phyciodes tharos</i>	4	
		Wild indigo duskywing / <i>Erynnis baptisiae</i>	3	
	12:30	Karner Blue Butterfly / <i>Lycaeides melissa samuelis</i>	1	Female- very good condition. Found near TA-4- first spotted on <i>Lupinus perennis</i> then moved to <i>Pycnanthemum virginianum</i> .
		American bird grasshopper / <i>Schistocerca americana</i>	2	
		Silver spotted skipper / <i>Epargyreus clarus</i>	1	
Transect 7	12:42	Cabbage white / <i>Pieris rapae</i>	7	
		Pearl crescent / <i>Phyciodes tharos</i>	1	
		Eastern tailed blue / <i>Cupido comyntas</i>	1	
		Crossline skipper / <i>Polites origenes</i>	1	
		Common wood nymph / <i>Cercyonis pegala</i>	1	
		Wild indigo duskywing / <i>Erynnis baptisiae</i>	1	
		Summer azure / <i>Celastrina neglecta</i>	1	
Transect 10	13:03	Cabbage white / <i>Pieris rapae</i>	24	
		Clouded sulphur / <i>Colias philodice</i>	3	
		American bird grasshopper / <i>Schistocerca americana</i>	5	
		Eastern tiger swallowtail / <i>Papilio glaucus</i>	1	
		Common sootywing / <i>Pholisora catullus</i>	4	
		Orange sulphur / <i>Colias eurytheme</i>	2	
		Viceroy / <i>Limenitis archippus</i>	1	
		Wild indigo duskywing / <i>Erynnis baptisiae</i>	6	
		Pink-edged sulphur / <i>Colias interior</i>	2	
Transect 8	13:20	Wild indigo duskywing / <i>Erynnis baptisiae</i>	2	
		Cabbage white / <i>Pieris rapae</i>	8	
		Viceroy / <i>Limenitis archippus</i>	1	
		Green frog / <i>Lithobates clamitans melanota</i>		heard
Notes:				

Survey Data Form - Insect & Passive Herp Survey

Date: 8/15/13

Observer(s): JG, NF

Start Time: 10:46 End Time: 14:42

Start temp: 70°F End temp: 75°F

Start % Cloud Cover: 25 End % Cloud Cover: 45

Start Wind: Beaufort 2 End Wind: Beaufort 3 @ T10

Location	Time	Species (common name/ scientific name)	# Observed	Notes
Transect 9	10:51	Cabbage white / <i>Pieris rapae</i>	many	
		Least skipper / <i>Ancyloxypha numitor</i>	1	
		Silver spotted skipper / <i>Epargyreus clarus</i>	1	
		American bird grasshopper / <i>Schistocerca americana</i>	4	
		Bumble bee / <i>Bombus sp.</i>		
		Honeybee / <i>Apis sp.</i>		
		Bald faced hornet / <i>Vespula maculata</i>	1	
		American toad / <i>Anaxyrus americanus</i>	1	
		Clouded sulphur / <i>Colias philodice</i>	3	
		Bluet / <i>Enallagma sp.</i>	3	
		Eastern tiger swallowtail / <i>Papilio glaucus</i>	1	intermediate female
		Cicada sp.	several	calling
		Snapping turtle / <i>Chelydra serpentina</i>	1	juvenile- basking on log in farm pond near barn, 3-4" carapace
		Minnnows	~100	in farm pond near barn
		Common sootywing / <i>Pholisora catullus</i>	2	
		Common ringlet / <i>Coenonympha tullia</i>	1	
	11:19	Eastern tailed blue / <i>Cupido comyntas</i>	2	
Transect 1	11:20	Water strider / <i>Gerris remigis</i>		4 small ephemeral pools, inundated near south end of the transect.
		Cabbage white / <i>Pieris rapae</i>	10	
		Bluet sp. / <i>Enallagma sp.</i>	4	
		American bird grasshopper / <i>Schistocerca americana</i>	1	
		Mayfly sp. / Ephemoptera sp.	1	small
		Pearl crescent / <i>Phyciodes tharos</i>	1	
		Clouded sulphur / <i>Colias philodice</i>	2	
		Eastern tailed blue / <i>Cupido comyntas</i>	1	
		Bumble bee / <i>Bombus sp.</i>	1	
		Honeybee / <i>Apis sp.</i>		
		Silver spotted skipper / <i>Epargyreus clarus</i>	3	
	11:45	Wolf spider / <i>Lycosidae sp.</i>	1	
Transect 2	11:55	Common wood nymph / <i>Cercyonis pegala</i>	1	

Location	Time	Species (common name/ scientific name)	# Observed	Notes
		Bumble bees / <i>Bombus sp.</i>		
		Cabbage white / <i>Pieris rapae</i>	5	
		Honeybees / <i>Apis sp.</i>		
		Common ringlet / <i>Coenonympha tullia</i>	2	
		Clouded sulphur / <i>Colias philodice</i>	2	
		Summer azure / <i>Celastrina neglecta</i>	1	
Nursery	12:00	Tiger beetle / <i>Cincindela sp.</i>	many	
		Deer fly / <i>Chrysops sp.</i>	1	
		Cabbage white / <i>Pieris rapae</i>	4	
		Wild indigo duskywing / <i>Erynnis baptisiae</i>	1	
		Eastern tiger swallowtail / <i>Papilio glaucus</i>	1	
		Monarch / <i>Danaus plexippus</i>	1	
		Clouded sulphur / <i>Colias philodice</i>	2	
		Bumble bees / <i>Bombus sp.</i>		
	12:08	Honeybees / <i>Apis sp.</i>		
Transect 2 (cont.)	12:09	Eastern tailed blue / <i>Cupido comyntas</i>	2	
		Wild indigo duskywing / <i>Erynnis baptisiae</i>	1	
		American bird grasshopper / <i>Schistocerca americana</i>	5	
		Cabbage white / <i>Pieris rapae</i>	13	
		Orange sulphur / <i>Colias eurytheme</i>	1	
		Pearl crescent / <i>Phyciodes tharos</i>	1	
		Green frog / <i>Lithobates clamitans melanota</i>	few	calling from bioswale at landfill expansion
		Clouded sulphur / <i>Colias philodice</i>	4	
		Eastern tiger swallowtail / <i>Papilio glaucus</i>	1	intermediate female
		Green frog / <i>Lithobates clamitans melanota</i>	1	adult in stream
		Cabbage white / <i>Pieris rapae</i>	many	in southern (cleared) end of Transect 2
		Silver spotted skipper / <i>Epargyreus clarus</i>	1	
		American bird grasshopper / <i>Schistocerca americana</i>	1	
	12:58	Common sootywing / <i>Pholisora catullus</i>	2	
Transect 3	13:02	Green frog / <i>Lithobates clamitans melanota</i>	few	in stream at south end of Transect 3
		Honeybees / <i>Apis sp.</i>		
		Cabbage white / <i>Pieris rapae</i>	7	
		Ladybug / <i>Coccinella sp.</i>	1	
		Eastern tailed blue / <i>Cupido comyntas</i>	3	
		Bumble bees / <i>Bombus sp.</i>		
		Orange sulphur / <i>Colias eurytheme</i>	3	
		Viceroy / <i>Limenitis archippus</i>	1	
	13:14	Tiger beetle / <i>Cincindela sp.</i>	many	
		Common garter snake / <i>Thamnophis sirtalis</i>	1	large- on path between Transects 3 and 4, near the right-of-way

Location	Time	Species (common name/ scientific name)	# Observed	Notes	
Transect 4	13:18	Summer azure / <i>Celastrina neglecta</i>	1		
		Cabbage white / <i>Pieris rapae</i>	37		
		Pearl crescent / <i>Phyciodes tharos</i>	1		
		Bumble bee / <i>Bombus sp.</i>	many		
		Viceroy / <i>Limenitis archippus</i>	1		
		Least skipper / <i>Ancyloxypha numitor</i>	1		
		Orange sulphur / <i>Colias eurytheme</i>	3		
		American bird grasshopper / <i>Schistocerca americana</i>	2		
		Black swallowtail / <i>Papilio polyxenes</i>	1		
			13:38	Clouded sulphur / <i>Colias philodice</i>	1
Transect 5	13:41	Cabbage white / <i>Pieris rapae</i>	16		
		Clouded sulphur / <i>Colias philodice</i>	1		
		American bird grasshopper / <i>Schistocerca americana</i>	1		
		Gray hairstreak / <i>Strymon melinus</i>	1		
					basking on rootball in created vernal pool, 1 with 4-5" carapace and 1 with 2" carapace
		Painted turtle / <i>Chrysemys picta</i>	2		
		Green frog / <i>Lithobates clamitans melanota</i>	1	adult- basking on rootball in created vernal pool	
		Green frog / <i>Lithobates clamitans melanota</i>	few	calling from created vernal pool	
		Fritillary / <i>Speyeria sp.</i>	1		
		Eastern tailed blue / <i>Cupido comyntas</i>	2		
		Common whitetail dragonfly / <i>Plathemis lydia</i>	1		
		Bumble bees / <i>Bombus sp.</i>			
		American copper / <i>Lycaena phlaeas</i>	1		
	13:59	American toad / <i>Anaxyrus americanus</i>	1	Juvenile under cover board at north end	
Transect 6	14:01	Cabbage white / <i>Pieris rapae</i>	21		
		American bird grasshopper / <i>Schistocerca americana</i>	1		
		Orange sulphur / <i>Colias eurytheme</i>	6		
		Common sootywing / <i>Pholisora catullus</i>	1		
		Eastern tailed blue / <i>Cupido comyntas</i>	3		
		Bumble bees / <i>Bombus sp.</i>			
		Honeybees / <i>Apis sp.</i>			
		Wasps / <i>Vespidae</i>			
		Gray hairstreak / <i>Strymon melinus</i>	3		
		Silver spotted skipper / <i>Epargyreus clarus</i>	1		
			14:12	Pearl crescent / <i>Phyciodes tharos</i>	1
Transect 7	14:13	Cabbage white / <i>Pieris rapae</i>	11		
		Clouded sulphur / <i>Colias philodice</i>	4		
		Orange sulphur / <i>Colias eurytheme</i>	2		
		Gray hairstreak / <i>Strymon melinus</i>	1		

Location	Time	Species (common name/ scientific name)	# Observed	Notes
		Eastern tailed blue / <i>Cupido comyntas</i>	3	
		Pearl crescent / <i>Phyciodes tharos</i>	1	
	14:20	Eastern tiger swallowtail / <i>Papilio glaucus</i>	1	intermediate female
Transect 8	14:21	Cabbage white / <i>Pieris rapae</i>	2	
		American bird grasshopper / <i>Schistocerca americana</i>	1	
		Bumble bees / <i>Bombus sp.</i>		
	14:23	Monarch / <i>Danaus plexippus</i>	1	
Transect 10	14:35	Silver spotted skipper / <i>Epargyreus clarus</i>	1	
		Field cricket / <i>Gryllus pennsylvanicus</i>	many	
		Bumble bees / <i>Bombus sp.</i>		
		American bird grasshopper / <i>Schistocerca americana</i>		
		Moths		
		Orange sulphur / <i>Colias eurytheme</i>	2	
		Cabbage white / <i>Pieris rapae</i>	6	
		Dragonflies		
		Eastern tailed blue / <i>Cupido comyntas</i>	2	
		American bird grasshopper / <i>Schistocerca americana</i>	many	
		Gray hairstreak / <i>Strymon melinus</i>	1	
		Clouded sulphur / <i>Colias philodice</i>	1	
	14:42	Tiger beetle / <i>Cincindela sp.</i>		
Notes:				

Survey Data Form - Insect & Passive Herp Survey

Date: 8/29/13

Observer(s): NF, JG, CE

Start Time: 12:03 End Time: 15:06

Start temp: 80°F End temp: 77°F

Start % Cloud Cover: 75 End % Cloud Cover: 65

Start Wind: Beaufort 2 End Wind: Beaufort 1

Location	Time	Species (common name/ scientific name)	# Observed	Notes
Transect 10	12:03	Cabbage white / <i>Pieris rapae</i>	21	
		Orange sulphur / <i>Colias eurytheme</i>	9	
		Clouded sulphur / <i>Colias philodice</i>	5	
		Eastern tailed blue / <i>Cupido comyntas</i>	2	
		American bird grasshopper / <i>Schistocerca americana</i>	numerous	
		Bumble bee / <i>Bombus sp.</i>	numerous	
		Field cricket / <i>Gryllus pennsylvanicus</i>	numerous	
		Silver spotted skipper / <i>Epargyreus clarus</i>	1	
		Common sootywing / <i>Pholisora catullus</i>	2	
		Wild indigo duskywing / <i>Erynnis baptisiae</i>	3	
	12:20	Bluet sp. / <i>Enallagma sp.</i>	1	
Transect 9	12:41	Cabbage white / <i>Pieris rapae</i>	many	
		Silver spotted skipper / <i>Epargyreus clarus</i>	1	
		Clouded sulphur / <i>Colias philodice</i>	3	
		Eastern tailed blue / <i>Cupido comyntas</i>	3	
		American copper / <i>Lycaena phlaeas</i>	1	
		American toad / <i>Anaxyrus americanus</i>	1	juvenile
		Green frog / <i>Lithobates clamitans melanota</i>	1	farm pond
		Summer azure / <i>Celastrina neglecta</i>	1	
		Hobomok skipper / <i>Poanes hobomok</i>	1	
	12:58	Common checkered skipper / <i>Pyrgus communis</i>	1	
Transect 1	13:02	Clouded sulphur / <i>Colias philodice</i>	2	
		Spring peeper / <i>Pseudacris crucifer</i>	1	calling near TA 12
		Virginia ctenucha / <i>Ctenucha virginica</i>	1	
		Eastern tailed blue / <i>Cupido comyntas</i>	3	
		Cabbage white / <i>Pieris rapae</i>	1	
		American copper / <i>Lycaena phlaeas</i>	1	
	13:18	Bluet sp. / <i>Enallagma sp.</i>	1	
Transect 2	13:23	American copper / <i>Lycaena phlaeas</i>	2	
		Virginia ctenucha / <i>Ctenucha virginica</i>	1	
		Silver spotted skipper / <i>Epargyreus clarus</i>	1	
		Bumble bee / <i>Bombus sp.</i>	many	
	13:24	Honeybees / <i>Apis sp.</i>	many	
Nursery	13:24	Viceroy / <i>Limenitis archippus</i>	1	

Location	Time	Species (common name/ scientific name)	# Observed	Notes
		Cabbage white / <i>Pieris rapae</i>	2	
		Tiger beetle / <i>Cincindela sp.</i>	many	
		Bumble bee / <i>Bombus sp.</i>	many	
		Honeybees / <i>Apis sp.</i>	many	
		Bald faced hornet / <i>Vespula maculata</i>	many	
		Virginia ctenucha / <i>Ctenucha virginica</i>	1	
	13:34	19-spotted ladybug / <i>Harmonia axyridis</i>	1	
Transect 2 (cont.)	13:34	19-spotted ladybug / <i>Harmonia axyridis</i>	1	
		Cabbage white / <i>Pieris rapae</i>	7	
		Eastern tailed blue / <i>Cupido comyntas</i>	4	
		Clouded sulphur / <i>Colias philodice</i>	3	
		Viceroy / <i>Limenitis archippus</i>	1	
		Orange sulphur / <i>Colias eurytheme</i>	2	
		Bluet sp. / <i>Enallagma sp.</i>	1	
		Japanese beetle / <i>Popillia japonica</i>	1	
		Praying mantis / <i>Mantis religiosa</i>	1	
		Silver spotted skipper / <i>Epargyreus clarus</i>	1	
	13:47	Northern leopard frog / <i>Lithobates pipiens</i>	1	near stream
Transect 3	13:51	Cabbage white / <i>Pieris rapae</i>	10	
		Summer azure / <i>Celastrina neglecta</i>	3	
		Eastern tailed blue / <i>Cupido comyntas</i>	3	
		Clouded sulphur / <i>Colias philodice</i>	2	
		Orange sulphur / <i>Colias eurytheme</i>	3	
		Pearl crescent / <i>Phyciodes tharos</i>	2	
		American copper / <i>Lycaena phlaeas</i>	1	
		Least skipper / <i>Ancyloxypha numitor</i>	2	
		Tiger beetle / <i>Cincindela sp.</i>	many	
		American bird grasshopper / <i>Schistocerca americana</i>	1	
		Wasp / <i>Vespidae</i>		
		Bumble bee / <i>Bombus sp.</i>		
	14:04	Honeybee / <i>Apis sp.</i>		
Transect 4	14:08	Cabbage white / <i>Pieris rapae</i>	8	
		Clouded sulphur / <i>Colias philodice</i>	2	
		Northern leopard frog / <i>Lithobates pipiens</i>	1	sedge meadow
		Least skipper / <i>Ancyloxypha numitor</i>	1	
		Bluet sp. / <i>Enallagma sp.</i>	1	
		American toad / <i>Anaxyrus americanus</i>	1	YOY- edge of wet meadow
		Monarch / <i>Danaus plexippus</i>	1	caterpillar on swamp milkweed/ <i>Asclepias syriaca</i>
		Pink-edged sulphur / <i>Colias interior</i>	1	
		Orange sulphur / <i>Colias eurytheme</i>	1	
		Silver spotted skipper / <i>Epargyreus clarus</i>	1	
		Northern leopard frog / <i>Lithobates pipiens</i>	2	adults

Location	Time	Species (common name/ scientific name)	# Observed	Notes
	14:23	Gray treefrog / <i>Hyla versicolor</i>	1	calling- forested island
Transect 5	14:28	Cabbage white / <i>Pieris rapae</i>	13	
		Virginia ctenucha / <i>Ctenucha virginica</i>	1	
		Orange sulphur / <i>Colias eurytheme</i>	2	
		Clouded sulphur / <i>Colias philodice</i>	1	
		Painted turtle / <i>Chrysemys picta</i>	2	on logs in vernal pool, 1 large, 1 small
		Pearl crescent / <i>Phyciodes tharos</i>	1	
		Bluet sp. / <i>Enallagma sp.</i>	3	
		Common whitetail dragonfly / <i>Plathemis lydia</i>	2	
		Eastern tailed blue / <i>Cupido comyntas</i>	4	
		Red-bellied snake / <i>Storeria occipitomaculata</i>	1	under cover board at north end
	14:41	19-spotted ladybug / <i>Harmonia axyridis</i>	1	
Transect 6	14:45	Cabbage white / <i>Pieris rapae</i>	9	
		American bird grasshopper / <i>Schistocerca americana</i>	2	
		American toad / <i>Anaxyrus americanus</i>	2	adult- open field north end
		Bluet sp. / <i>Enallagma sp.</i>	1	
		Eastern tailed blue / <i>Cupido comyntas</i>	6	
		Wild indigo duskywing / <i>Erynnis baptisiae</i>	1	
		Summer azure / <i>Celastrina neglecta</i>	1	
		Least skipper / <i>Ancyloxypha numitor</i>	1	
	14:56	Spring peeper / <i>Pseudacris crucifer</i>	1	calling from woods- south end of transect
Transect 7	14:56	Eastern tailed blue / <i>Cupido comyntas</i>	8	
		American bird grasshopper / <i>Schistocerca americana</i>	1	
		Cabbage white / <i>Pieris rapae</i>	5	
		Orange sulphur / <i>Colias eurytheme</i>	1	
	15:03	Least skipper / <i>Ancyloxypha numitor</i>	1	
Transect 8	15:04	American bird grasshopper / <i>Schistocerca americana</i>	many	
		Cabbage white / <i>Pieris rapae</i>	2	
	15:06	Bumble bee / <i>Bombus sp.</i>	many	
Notes:				

Survey Data Form - Insect & Passive Herp Survey

Date: 9/13/13

Observer(s): JG & NF

Start Time: 1147 End Time: 1306

Start temp: 64°F End temp: ~63°F

Start % Cloud Cover: 75 End % Cloud Cover: 100

Start Wind: Beaufort 3 End Wind: Beaufort 2

Location	Time	Species (common name/ scientific name)	# Observed	Notes
Transect 10	1147	Cabbage white / <i>Pieris rapae</i>	5	
		Clouded sulphur / <i>Colias philodice</i>	2	
		Field cricket / <i>Gryllus pennsylvanicus</i>	1	
		American bird grasshopper / <i>Schistocerca americana</i>	1	
	1159	Orange sulphur / <i>Colias eurytheme</i>	1	
Transect 9	1208	Field cricket / <i>Gryllus pennsylvanicus</i>		Beaufort 2
		American bird grasshopper / <i>Schistocerca americana</i>		
		Cabbage white / <i>Pieris rapae</i>	2	
		Yellow jacket / <i>Vespula maculifrons</i>		
		Bald-faced hornet / <i>Vespula maculata</i>		
	1216	Bumble bee / <i>Bombus sp.</i>		
Transect 10	1218	American bird grasshopper / <i>Schistocerca americana</i>		
		Tiger beetle - possibly twelve-spotted / <i>Cincindela duodecimguttata</i>		Several on bare sands of access road (also observed on access road that traverses the restoration area)
		Green frog / <i>Lithobates clamitans</i>	1	Several juveniles observed using the vernal pools near the south end of the transect.
		Bluet sp.		
		Northern crescent / <i>Phyciodes cocyta</i>	1	
		Clouded sulphur / <i>Colias philodice</i>	2	
		Cabbage white / <i>Pieris rapae</i>	4	
		Crane fly / <i>Tipulidae</i>	several	
	1231	White-striped black moth / <i>Trichodezia albovittata</i>		
Transect 2	1233	American copper / <i>Lycaena phlaeas</i>	4	
		Cabbage white / <i>Pieris rapae</i>	2	
		Bumble bee / <i>Bombus sp.</i>		
		Wild indigo duskywing / <i>Erynnis baptisiae</i>	1	

Location	Time	Species (common name/ scientific name)	# Observed	Notes
Nursery	1238	Orange sulphur / <i>Colias eurytheme</i>	1	
		Honey bee / <i>Apis mellifera</i>		
		Cabbage white / <i>Pieris rapae</i>	1	
		Monarch / <i>Danaus plexippus</i>	1	
	1246	Hoverfly / <i>Helophilus fasciatus</i>	1	
Transect 2 cont.	1247	Cabbage white / <i>Pieris rapae</i>	2	
		Clouded sulphur / <i>Colias philodice</i>	4	
		Orange sulphur / <i>Colias eurytheme</i>	1	
		Great spangled fritillary / <i>Speyeria cybele</i>	1	
		American copper / <i>Lycaena phlaeas</i>	3	
		Crane fly / <i>Tipulidae</i>	several	
		Yellow jacket / <i>Vespula maculifrons</i>		
Transect 2 cont.		Virginia ctenucha / <i>Ctenucha virginica</i>	1	Survey ended at 1306 due to heavy rain.
Notes:				

Survey Data Form - Insect & Passive Herp Survey

Date: 9/16/13

Observer(s): JG, NF

Start Time: 1057 End Time: 1208

Start temp: 61°F End temp: 63°F

Start % Cloud Cover: 80 End % Cloud Cover: 95

Start Wind: Beaufort 2 End Wind: Beaufort 3

Location	Time	Species (common name/ scientific name)	# Observed	Notes
Transect 3	1057	Wild indigo duskywing / <i>Erynnis baptisiae</i>	1	Continued from 9/13/13
		Bumble bee / <i>Bombus sp.</i>	several	
		Honeybees / <i>Apis sp.</i>	several	
		Cabbage white / <i>Pieris rapae</i>	8	
		Clouded sulphur / <i>Colias philodice</i>	2	
		Orange sulphur / <i>Colias eurytheme</i>	6	
		Bluet sp.		
		Common garter snake / <i>Thamnophis sirtalis</i>	1	Large, with bulge in stomach. On north side of dune near TA # 9.
		American bird grasshoppers / <i>Schistocerca americana</i>	several	
		Field crickets / <i>Gryllus pennsylvanicus</i>	several	"calling"
		Lithobatid frogs		On edge of created forested wetland.
		Green frogs / <i>Lithobates clamitans melanota</i>		On edge of created forested wetland.
	1110	Great golden digger wasp / <i>Sphex ichneumoneus</i>)	1	
Transect 4	1112	Yellow jacket / <i>Vespula maculifrons</i>		
		Bumble bee / <i>Bombus sp.</i>		
		Cabbage white / <i>Pieris rapae</i>	13	
		Common garter snake / <i>Thamnophis sirtalis</i>	5	Neonates under cover board @ TA # 2.
		Clouded sulphur / <i>Colias philodice</i>	5	
		American bird grasshoppers / <i>Schistocerca americana</i>	many	
		Field crickets / <i>Gryllus pennsylvanicus</i>	many	
		Orange sulphur / <i>Colias eurytheme</i>	3	
		Viceroy / <i>Limenitis archippus</i>	1	
		Northern leopard frog / <i>Lithobates pipiens</i>	1	Near gravel road.
		Pink-edged sulphur / <i>Colias interior</i>	1	
	1125	Northern leopard frog / <i>Lithobates pipiens</i>	1	Adult

Location	Time	Species (common name/ scientific name)	# Observed	Notes
Transect 5	1128	Cabbage white / <i>Pieris rapae</i>	15	
		Orange sulphur / <i>Colias eurytheme</i>	3	
		Bluet sp.		
		Clouded sulphur / <i>Colias philodice</i>	3	
		Common ringlet / <i>Coenonympha tullia</i>	1	
		Eastern tailed-blue / <i>Cupido comyntas</i>	3	
		American bird grasshoppers / <i>Schistocerca americana</i>	several	
		Northern paper wasp / <i>Polistes fuscatus</i>		
		Honeybees / <i>Apis sp.</i>		
		Bumble bee / <i>Bombus sp.</i>		
		Virginia ctenucha / <i>Ctenucha virginica</i>	1	
		Monarch / <i>Danaus plexippus</i>	1	
		Northern leopard frog / <i>Lithobates pipiens</i>	1	Adult near created vernal pool.
		Wild indigo duskywing / <i>Erynnis baptisiae</i>	1	
		Bluet sp.		
		Painted turtle / <i>Chrysemys picta picta</i>	1	Small. Basking on log in created vernal pool.
		Viceroy / <i>Limenitis archippus</i>	1	
		American copper / <i>Lycaena phlaeas</i>	4	
		Common garter snake / <i>Thamnophis sirtalis</i>	1	Adult on open sandy area @ north end of transect.
		Millipede / <i>Diploda sp.</i>		
Common whitetail dragonfly / <i>Plathemis lydia</i>				
	1144	Northern crescent / <i>Phyciodes cocyta</i>	1	
Transect 6	1146	Spring peeper / <i>Pseudacris crucifer</i>	1	Calling from woods north of the transect.
		Cabbage white / <i>Pieris rapae</i>	10	
		American bird grasshoppers / <i>Schistocerca americana</i>	many	
		Clouded sulphur / <i>Colias philodice</i>	1	
		Bluet sp.		
		Orange sulphur / <i>Colias eurytheme</i>	3	
		Wild indigo duskywing / <i>Erynnis baptisiae</i>	1	
Transect 7	1154	Brown stink bug / <i>Pentatomidae</i>	1	
		Cabbage white / <i>Pieris rapae</i>	4	
		Bumble bee / <i>Bombus sp.</i>	1	
		Pearl crescent / <i>Phyciodes tharos</i>	1	
		Orange sulphur / <i>Colias eurytheme</i>	2	
			1200	Virginia ctenucha / <i>Ctenucha virginica</i>	1

Location	Time	Species (common name/ scientific name)	# Observed	Notes
Transect 8	1201	Cabbage white / <i>Pieris rapae</i>	14	
		American bird grasshoppers / <i>Schistocerca americana</i>	1	
		Clouded sulphur / <i>Colias philodice</i>	2	
		Orange sulphur / <i>Colias eurytheme</i>	2	
		Field crickets / <i>Gryllus pennsylvanicus</i>		
	1204	Common snapping turtle / <i>Chelydra serpentina</i>	1	Dead on gravel landfill road near north end of Transect 8.

Survey Data Form - Insect & Passive Herp Survey

Date: 9/25/13

Observer(s): NF, SV

Start Time: 10:08 End Time: 14:53

Start temp: 55°F End temp: 68°F

Start % Cloud Cover: 0 End % Cloud Cover: _

Start Wind: Beaufort 0 End Wind: Beaufort 0

Location	Time	Species (common name/ scientific name)	# Observed	Notes
Transect 9	10:11	Cabbage white / <i>Pieris rapae</i>	2	
		American copper / <i>Lycaena phlaeas</i>	1	
		Clouded sulphur / <i>Colias philodice</i>	2	
		Bumble bees / <i>Bombus sp.</i>		
		American bird grasshoppers / <i>Schistocerca americana</i>		
		Orange sulphur / <i>Colias eurytheme</i>	1	
	10:22	Viceroy / <i>Limenitis archippus</i>	1	
Transect 1	10:30	Cabbage white / <i>Pieris rapae</i>	4	
		Pearl crescent / <i>Phyciodes tharos</i>	1	
		Bumble bees / <i>Bombus sp.</i>		
		Honeybees / <i>Apis sp.</i>		
		Clouded sulphur / <i>Colias philodice</i>	2	
	10:44	American copper / <i>Lycaena phlaeas</i>	1	
Transect 2	10:49	Orange sulphur / <i>Colias eurytheme</i>	1	
		Cabbage white / <i>Pieris rapae</i>	3	
		Common ringlet / <i>Coenonympha tullia</i>	1	
		American copper / <i>Lycaena phlaeas</i>	1	
	10:55	Monarch / <i>Danaus plexippus</i>	1	
Nursery	10:55	Cabbage white / <i>Pieris rapae</i>	3	
		Clouded sulphur / <i>Colias philodice</i>	1	
		Honeybees / <i>Apis sp.</i>	2	
	11:03	Monarch / <i>Danaus plexippus</i>	1	
Transect 2 (cont.)	11:03	Wild indigo duskywing / <i>Erynnis baptisiae</i>	2	
		Orange sulphur / <i>Colias eurytheme</i>	5	
		Clouded sulphur / <i>Colias philodice</i>	5	
		Cabbage white / <i>Pieris rapae</i>	10	
		Common gartersnake / <i>Thamnophis sirtalis</i>	1	
		American bird grasshoppers / <i>Schistocerca americana</i>		
		Bumble bees / <i>Bombus sp.</i>		
		Field crickets / <i>Gryllus pennsylvanicus</i>		heard
		Virginia ctenucha / <i>Ctenucha virginica</i>	1	
	11:36	Crane fly / <i>Tipulidae</i>	1	
Transect 3	11:56	Green frog / <i>Lithobates clamitans melanota</i>	2	

Location	Time	Species (common name/ scientific name)	# Observed	Notes
		Virginia ctenucha / <i>Ctenucha virginica</i>	2	
	11:56	Cabbage white / <i>Pieris rapae</i>	14	
		American bird grasshoppers / <i>Schistocerca americana</i>		
		Clouded sulphur / <i>Colias philodice</i>	4	
		Orange sulphur / <i>Colias eurytheme</i>	3	
	12:04	Bumble bees / <i>Bombus sp.</i>		
Transect 4	12:10	Cabbage white / <i>Pieris rapae</i>	13	
		Bumble bees / <i>Bombus sp.</i>		
		Clouded sulphur / <i>Colias philodice</i>	5	
		Chinese mantid / <i>Tenodera sinensis</i>	1	
		Orange sulphur / <i>Colias eurytheme</i>	2	
		American bird grasshopper / <i>Schistocerca americana</i>	1	
		Frog sp.	3	jumped into stream before they could be identified
	12:25	Least skipper / <i>Ancyloxypha numitor</i>	1	
Transect 5	12:28	Clouded sulphur / <i>Colias philodice</i>	6	
		Cabbage white / <i>Pieris rapae</i>	5	
		Pearl crescent / <i>Phyciodes tharos</i>	1	
		Orange sulphur / <i>Colias eurytheme</i>	1	
		Bumble bee / <i>Bombus sp.</i>	1	
		Painted turtle / <i>Chrysemys picta</i>	9	on stumps in vernal pond, various sizes
		Viceroy / <i>Limenitis archippus</i>	1	
		American copper / <i>Lycaena phlaeas</i>	1	
	12:45	Common gartersnake / <i>Thamnophis sirtalis</i>	1	small
Transect 6	13:37	Cabbage white / <i>Pieris rapae</i>	15	
		Clouded sulphur / <i>Colias philodice</i>	4	
		Pearl crescent / <i>Phyciodes tharos</i>	1	
		American bird grasshopper / <i>Schistocerca americana</i>	1	
	13:41	Wild indigo duskywing / <i>Erynnis baptisiae</i>	1	
Transect 7	13:47	Common garter snake / <i>Thamnophis sirtalis</i>	1	large
		Cabbage white / <i>Pieris rapae</i>	3	
	13:52	Crane fly / <i>Tipulidae</i>	1	
Transect 10	14:02	Cabbage white / <i>Pieris rapae</i>	17	
		Clouded sulphur / <i>Colias philodice</i>	5	
		American bird grasshoppers / <i>Schistocerca americana</i>		
		Wild indigo duskywing / <i>Erynnis baptisiae</i>	1	
	14:10	Orange sulphur / <i>Colias eurytheme</i>	3	
Transect 8	14:18	Cabbage white / <i>Pieris rapae</i>	7	
		Orange sulphur / <i>Colias eurytheme</i>	1	
	14:44	Clouded sulphur / <i>Colias philodice</i>	3	

Survey Data Form - Insect & Passive Herp Survey

Date: 10/8/13

Observer(s): JG, CE, SV

Start Time: 10:40 **End Time:** 13:55

Start temp: 60°F **End temp:** 68°F

Start % Cloud Cover: 0 **End % Cloud Cover:** 0

Start Wind: Beaufort 1 **End Wind:** Beaufort 2

Location	Time	Species (common name/ scientific name)	# Observed	Notes
Transect 5	11:04	Red-bellied snake / <i>Storeria occipitomaculata</i>	1	adult- under cover board between TA 1 and TA 2
		American bird grasshoppers / <i>Schistocerca americana</i>	many	
		Bumble bee / <i>Bombus sp.</i>	many	
		Honeybee / <i>Apis sp.</i>	many	
		a red dragonfly sp.	1	
		Cabbage white / <i>Pieris rapae</i>	3	
	11:14	Northern leopard frog / <i>Lithobates pipiens</i>	1	adult- north end in wetland
Transect 6	11:16	Northern leopard frog / <i>Lithobates pipiens</i>	1	adult- north end of Transect 6
		Orange sulphur / <i>Colias eurytheme</i>	3	
		Cabbage white / <i>Pieris rapae</i>	4	
		19-spotted ladybug / <i>Harmonia axyridis</i>	1	
	11:25	Bumble bee / <i>Bombus sp.</i>	1	
Transect 7	11:27	Orange sulphur / <i>Colias eurytheme</i>	1	
	11:33	Field crickets / <i>Gryllus pennsylvanicus</i>	many	
Transect 8	11:34	Cabbage white / <i>Pieris rapae</i>	3	
		Clouded sulphur / <i>Colias philodice</i>	3	
		Orange sulphur / <i>Colias eurytheme</i>	1	
	11:37	American bird grasshopper / <i>Schistocerca americana</i>	2	
Transect 4	11:41	Clouded sulphur / <i>Colias philodice</i>	1	
		Orange sulphur / <i>Colias eurytheme</i>	2	
		Cabbage white / <i>Pieris rapae</i>	2	
	11:48	Bumble bees / <i>Bombus sp.</i>	many	
Transect 3	11:49	American bird grasshopper / <i>Schistocerca americana</i>	1	
		Clouded sulphur / <i>Colias philodice</i>	4	
	12:00	Cabbage white / <i>Pieris rapae</i>	1	
Nursery	12:15	Cabbage white / <i>Pieris rapae</i>	2	
	12:22	Clouded sulphur / <i>Colias philodice</i>	2	
Transect 2	12:25	Cabbage white / <i>Pieris rapae</i>	9	
		American bird grasshopper / <i>Schistocerca americana</i>	many	
		Bumble bee / <i>Bombus sp.</i>	many	
		Orange sulphur / <i>Colias eurytheme</i>	3	

Location	Time	Species (common name/ scientific name)	# Observed	Notes
		Common ringlet / <i>Coenonympha tullia</i>	1	
		Clouded sulphur / <i>Colias philodice</i>	3	
	12:54	American bird grasshopper / <i>Schistocerca americana</i>	1	
Transect 1	13:05	Clouded sulphur / <i>Colias philodice</i>	1	
	13:14	Gartersnake / <i>Thamnophis sirtalis</i>	1	adult- south end
Transect 9	13:25	American bird grasshopper / <i>Schistocerca americana</i>	1	
		dragonfly sp.	several	
		Cabbage white / <i>Pieris rapae</i>	1	
	13:34	Bald-faced hornet / <i>Vespula maculata</i>		nest
east of nursery		Red-bellied snake / <i>Storeria occipitomaculata</i>	1	yoy- dead on road
Transect 10	13:46	Clouded sulphur / <i>Colias philodice</i>	6	
		Bumble bee / <i>Bombus sp.</i>	1	
		hornet sp.	1	
		American bird grasshopper / <i>Schistocerca americana</i>	1	
		Cabbage white / <i>Pieris rapae</i>	1	
	13:55	Eastern tailed blue / <i>Cupido comyntas</i>	1	
Notes:				

Survey Data Form - Insect & Passive Herp Survey

Date: 10/24/13

Observer(s): NF & JG

Start Time: 1102 **End Time:** 1442

Start temp: 54°F **End temp:** 50°F

Start % Cloud Cover: 100 **End % Cloud Cover:** 98

Start Wind: Beaufort 1 **End Wind:** Beaufort 1

Location	Time	Species (common name/ scientific name)	# Observed	Notes
Transect 9	1106	Deer ticks / Ixodes scapularis	many	In 4 hrs on-site JG pulled 77 off of his pant legs. NF also had dozens.
	1119	Bald-faced hornet / Vespula maculata	2 large nests	2 large (basketball-size) paper nests were present in the meadow between TA#12 and B-16. Both were on 3' tall red maple seedlings and the nest entrances were ~18" above the soil surface. Nests were ~100' apart.
Transect 1	1123	Yellow jacket / Vespula maculifrons	2	
	1135			
Transect 2	1156	No insects, reptiles or amphibians observed.		
	1200			
Nursery	1200	No insects, reptiles or amphibians observed.		Observed 2 Lupinus perennis plants flowering and seeding.
	1208			
Transect 2 cont.	1210	Bumble bee / Bombus sp.	3	
		American bird grasshopper / Schistocerca americana	1	
		Yellow jacket / Vespula maculifrons	many	At partially predated/dug up ground nest.
		Field cricket / Gryllus pennsylvanicus	2	Under piece of plastic siding
		Pillbug / Armadillidium vulgare	1	Under piece of plastic siding
		Deer ticks / Ixodes scapularis	many	
		Clouded sulphur / Colias philodice	2	

Location	Time	Species (common name/ scientific name)	# Observed	Notes
		American bird grasshopper / <i>Schistocerca americana</i>	4	
		Orange sulphur / <i>Colias eurytheme</i>	1	
	1305	Cabbage white / <i>Pieris rapae</i>	2	
Transect 3	1306	American bird grasshopper / <i>Schistocerca americana</i>	1	
		Frog sp. / <i>Lithobates</i> sp.	1	In stream
		Field cricket / <i>Gryllus pennsylvanicus</i>	1	Heard chirping. Also, several observed under cover objects.
		Clouded sulphur / <i>Colias philodice</i>	2	
		Orange sulphur / <i>Colias eurytheme</i>	1	
	1315	Woolly bear caterpillar / <i>Pyrrharctia isabella</i>	1	
Transect 4	1320	Deer tick / <i>Ixodes scapularis</i>	1	
		Dragonfly sp. / <i>Anisoptera</i> sp.	1	
		Bumble bee / <i>Bombus</i> sp.	3	
		Virescent green metallic bee / <i>Agapostemon virescens</i>	1	
		American bird grasshopper / <i>Schistocerca americana</i>	3	
		Crab spider / <i>Thomisidae</i> sp.	1	
	1338	Clouded sulphur / <i>Colias philodice</i>	1	
Transect 5	1341	Bumble bee / <i>Bombus</i> sp.	1	
		American bird grasshopper / <i>Schistocerca americana</i>	4	
		Field cricket / <i>Gryllus pennsylvanicus</i>	several	Under cover board.
		Woolly bear caterpillar / <i>Pyrrharctia isabella</i>	1	
		Cockroach / <i>Blattodea</i> sp.	1	Under cover board. Uniformly orangey-red color. 1/2" long.
		Wolf spider / <i>Lycosidae</i> sp.	1	Under cover board
		Autumn meadowhawk / <i>Sympetrum vicinum</i>	3	
		Yellow jacket / <i>Vespula maculifrons</i>	many	On pitch pine tree.
	1358	Deer ticks / <i>Ixodes scapularis</i>	few	
Transect 6	1401	American bird grasshopper / <i>Schistocerca americana</i>	5	
		Clouded sulphur / <i>Colias philodice</i>	1	
		Deer ticks / <i>Ixodes scapularis</i>	2	
		House fly / <i>Musca domestica</i>	1	
	1410	Bumble bee / <i>Bombus</i> sp.	1	

Location	Time	Species (common name/ scientific name)	# Observed	Notes
Transect 7	1413	No insects, reptiles or amphibians observed.		
	1416			
Transect 10	1426	American bird grasshopper / <i>Schistocerca americana</i>	1	
		Wooly bear caterpillar / <i>Pyrrharctia isabella</i>	1	
	1435	Orange sulphur / <i>Colias eurytheme</i>	1	
Transect 8	1440	No insects, reptiles or amphibians observed.		
	1442			
Notes:				

Incidental Sightings

Survey Data Form - Incidental Sightings

Date: 12/10/12

Observer (s): SV

Observed during: tree cutting

Start Time: **Start Temp:** _°F

Start Wind: Beaufort _

End Time: **End Temp:** _°F

End Wind: Beaufort _

Weather:

Location	Time	Species (common name/ scientific name)	Notes
Area U-5 near the road		Northern flying squirrel (<i>Glaucomys sabrinus</i>)	Observed while observing tree cutting activities. The squirrel was running up a red oak tree that was being cut. When the tree started to fall the squirrel jumped and glided to another tree. It ran up that tree then jumped and glided to a nearby white pine tree.
Notes:			

Survey Data Form - Incidental Sightings

Date: 3/12/13

Observer (s): JG

Observed during: March Herp Trapping

Start Time: 9:36

Start Temp: 49°F

Start Wind: Beaufort 4

End Time: 10:43

End Temp: 53°F

End Wind: Beaufort 4

Weather: Raining throughout survey

Location	Time	Species (common name/ scientific name)	Notes
		Northern cardinal / <i>Cardinalis cardinalis</i>	
		Blue jay / <i>Cyanocitta cristata</i>	
		Common merganser / <i>Mergus merganser</i>	male/female pair in vernal pond
		Mallard / <i>Anas platyrhynchos</i>	2 male/female pairs in vernal pond
		Red-tailed hawk / <i>Buteo jamaicensis</i>	2 or 3
		American crow / <i>Corvus brachyrhynchos</i>	
		Dark-eyed junco / <i>Junco hyemalis</i>	large flock
Notes:			

Survey Data Form - Incidental Sightings

Date: 4/9/13

Observer (s): JG, SV

Observed during: April Herp Trapping

Start Time: 10:16 **Start Temp:** 53°F

Start Wind: Beaufort 1

End Time: 12:10 **End Temp:** 60°F

End Wind: Beaufort 3

Weather:

Location	Time	Species (common name/ scientific name)	Notes
near TA 1	~11:13	Mourning cloak / <i>Nymphalis antiopa</i>	
Notes:			

Survey Data Form - Incidental Sightings

Date: 5/2/13

Observer (s): MJM

Observed during: Time and Area Constrained Search

Start Time: 1630

Start Temp: 86°F

Start Wind: South 1 (BWS)

End Time: 2020

End Temp: 82°F

End Wind: South 1 (BWS)

Weather: Dry (17% relative humidity), Warm, Sunny (0% cloud cover)

Location	Time	Species (common name/ scientific name)	Notes
Open/Restored Areas in Center and Northern Portions of Site	1725	grasshopper sparrow/ <i>Ammodramus savannarum</i>	observed foraging in meadow south of TA-2. This is a new species for the site. Breeding habitat is marginal, likely a migrant
	Notes: 33 bird species, 6 amphibian species, 5 mammal species, and 7 butterfly species observed		

Survey Data Form - Incidental Sightings

Date: 5/3/13

Observer (s): JG, CE, MJM

Observed during: Insect/ Passive Herp/ Frosted Elfin Survey

Start Time: 10:01

Start Temp: 63°F

Start Wind: Beaufort 1

End Time: 13:00

End Temp: _°F

End Wind: Beaufort _

Weather: 31 % relative humidity

Location	Time	Species (common name/ scientific name)	Notes
Transect 9	10:01	Green Heron / <i>Butorides virescens</i>	on pond spillway
Notes:			

Survey Data Form - Incidental Sightings

Date: 5/10/13

Observer (s): JG, CE

Observed during: Insect/ Passive Herp/ Frosted Elfin

Start Time: 10:06 **Start Temp:** _°F

Start Wind: Beaufort 1

End Time: 12:51 **End Temp:** 80°F

End Wind: Beaufort _

Weather:

Location	Time	Species (common name/ scientific name)	Notes
Transect 9		Belted kingfisher / <i>Ceryle alcyon</i>	near pond
Transect 3		Killdeer / <i>Charadrius vociferus</i>	nest at base of tree
Notes:			

Survey Data Form - Incidental Sightings

Date: 6/3/13

Observer (s): JG, CE

Observed during: 1st Brood Karner Blue Butterfly Survey

Start Time: 14:38 **Start Temp:** 75°F

Start Wind: Beaufort 3

End Time: 16:59 **End Temp:** 75°F

End Wind: Beaufort 3

Weather:

Location	Time	Species (common name/ scientific name)	Notes
Transect 2	15:43	Green frog / <i>Lithobates clamitans melanota</i>	calling
Notes:			

Survey Data Form - Incidental Sightings

Date: 6/5/13

Observer (s): JG, JL

Observed during: 1st Brood Karner Blue Survey

Start Time: 12:06

Start Temp: 71°F

Start Wind: Beaufort 0

End Time: 14:50

End Temp: 77°F

End Wind: Beaufort 1

Weather:

Location	Time	Species (common name/ scientific name)	Notes
Transect 9	~12:06	Snapping turtle / <i>Chelydra serpentina</i>	Large snapping turtle in farm pond
		Rabbit bot fly / <i>Cuterebra buccata</i>	On grass near north end of Transect 4.
Notes:			

Survey Data Form - Incidental Sightings

Date: 6/12/13

Observer (s): JG, MJM

Observed during: Insect and Passive Herp Survey

Start Time: 13:09 **Start Temp:** 66°F

Start Wind: Beaufort 1

End Time: 15:57 **End Temp:** 72°F

End Wind: Beaufort 2-3

Weather:

Location	Time	Species (common name/ scientific name)	Notes
Transect 9	~12:09	bald eagle / <i>Haliaeetus leucocephalus</i>	
Transect 2	~13:08	common raven / <i>Corvus corax</i>	
Transect 3	~13:39	spotted sandpiper / <i>Actitis macularia</i>	possible nest
Transect 5	~14:15	woodchuck / <i>Marmota monax</i>	
Transect 7	~14:48	yellow-billed cuckoo / <i>Coccyzus americanus</i>	
Transect 7	~14:48	scarlet tanager / <i>Piranga olivacea</i>	
Notes:			

Survey Data Form - Incidental Sightings

Date: 6/20/13

Observer (s): JWG

Observed during: Passive Herp Survey

Start Time: 19:43 **Start Temp:** 78°F

Start Wind: Beaufort 1

End Time: 20:55 **End Temp:** ~77°F

End Wind: Beaufort 1

Weather:

Location	Time	Species (common name/ scientific name)	Notes
Nursery		Turkey vulture / <i>Cathartes aura</i>	on road in nursery
Near created vernal pond		Mallard / <i>Anas platyrhynchos</i>	14- males and females feeding on recently hydro-mulched area on the west end of the created vernal pond
Near created vernal pond		White-tailed deer / <i>Odocoileus virginianus</i>	3 (1 doe and 2 button bucks), feeding in the same areas as the mallards
Notes:			

Survey Data Form - Incidental Sightings

Date: 7/10/13

Observer (s): JG

Observed during: Insect and Passive Herp Survey

Start Time: 10:20

Start Temp: 78°F

Start Wind: Beaufort 1

End Time: 13:57

End Temp: 83°F

End Wind: Beaufort 3

Weather:

Location	Time	Species (common name/ scientific name)	Notes
Transect 9	~10:40	Belted Kingfisher / <i>Ceryle alcyon</i>	on limb over farm pond
Transect 1	~11:10	White-tailed deer / <i>Odocoileus virginianus</i>	fawn
Transect 1	~11:10	Wild turkey / <i>Meleagris gallopavo</i>	
Transect 2	11:21	Purple finch / <i>Carpodacus purpureus</i>	adult male singing from tree near National Grid right-of-way
Transect 7	~13:44	Woodchuck / <i>Marmota monax</i>	
Notes:			

Survey Data Form - Incidental Sightings

Date: 8/15/13

Observer (s): JG, NF

Observed during: Insect and Passive Herp Survey

Start Time: 10:46

Start Temp: 70°F

Start Wind: Beaufort 2

End Time: 14:42

End Temp: 75°F

End Wind: Beaufort 3 @
Transect 10

Weather:

Location	Time	Species (common name/ scientific name)	Notes
Transect 9	11:20	Red-headed woodpecker / <i>Melanerpes erythrocephalus</i>	1 on snag west of the south end of the transect
Transect 5	~13:41	Wood duck / <i>Aix sponsa</i>	3 in the forested wetland at the south end of Transect 5
Transect 5	~13:41	Great Blue Heron / <i>Ardea herodias</i>	1 in the forested wetland at the south end of Transect 5

Notes:

Survey Data Form - Incidental Sightings

Date: 8/28/13

Observer (s): JWG, MJM

Observed during: Migratory bird survey

Start Time: 1015

Start Temp: 76°F

Start Wind: Beaufort 1

End Time:

End Temp: _°F

End Wind: Beaufort _

Weather: 30% cloud cover

Location	Time	Species (common name/ scientific name)	Notes
Observed at bird survey location B-8	1015	Giant swallowtail / <i>Papilio cresphontes</i>	
Notes:			

Survey Data Form - Incidental Sightings

Date: 8/29/13

Observer (s): NF, JG, CE

Observed during: Insect and Passive Herp Survey

Start Time: 12:03

Start Temp: 80°F

Start Wind: Beaufort 2

End Time: 15:06

End Temp: 77°F

End Wind: Beaufort 1

Weather:

Location	Time	Species (common name/ scientific name)	Notes
Transect 9	~ 12:41	Red-headed woodpecker / <i>Melanerpes erythrocephalus</i>	calling

Notes:

Survey Data Form - Incidental Sightings

Date: 8/29/13

Observer (s): NF, JG, CE

Observed during: Herp Trapping

Start Time: 10:13

Start Temp: 76°F

Start Wind: Beaufort

End Time: 11:46

End Temp: 80°F

End Wind: Beaufort

Weather:

Location	Time	Species (common name/ scientific name)	Notes
TA 1	~10:56	Orange tipped oakworm moth caterpillar / <i>Anisota senatoria</i>	~ 30 on one scrub oak
		Monarch caterpillar / <i>Danaus plexippus</i>	South end of Transect 5

Notes:

Survey Data Form - Incidental Sightings

Date: 8/30/13

Observer (s): JG, CE

Observed during: August Herp Trapping

Start Time: 8:28

Start Temp: 66°F

Start Wind: Beaufort 0

End Time: 10:10

End Temp: 70°F

End Wind: Beaufort 1

Weather:

Location	Time	Species (common name/ scientific name)	Notes
several pitfall traps		American carrion beetles / <i>Silpha americana</i>	
Notes:			

Survey Data Form - Incidental Sightings

Date: 9/18/13 & 9/19/13

Observer (s): JG, MJM

Observed during: September Herp Trapping Event

Start Time: 6:40 **Start Temp:** 43°F

Start Wind: Beaufort 1 from the south

End Time: 11:15 **End Temp:** 56°F

End Wind: Beaufort 1

Weather: foggy at the start, no precipitation

Location	Time	Species (common name/ scientific name)	Notes
TA 12	8:27	House wren/ <i>Troglodytes aedon</i>	Found dead in the north funnel trap. Predated by an animal that escaped the trap.
TA 2	9:29	Wooly bear/ <i>Pyrrhactia Isabella</i>	Found in the east pitfall trap.
TA 4	10:01	Thread-waisted wasp / <i>Ammophila procera</i>	
TA1		Caterpillar - possibly a salt marsh caterpillar / <i>Estigmene acrea</i>	On wooden silt fence post
Notes:			

Survey Data Form - Incidental Sightings

Date: 10/8/13

Observer (s): JWG, CE

Observed during: Insect and passive herp survey

Time: 1040

Temp: 60°F

Wind: Beaufort 1

Cloud cover: 0%

Location	Time	Species (common name/ scientific name)	Notes
	1040	Bald eagle / <i>Haliaeetus leucocephalus</i>	Observed on-site near B-4 flying west toward then along the north side of the landfill.
Notes:			

Attachment 4

Cumulative Species Lists

Cumulative Bird List

#	2009	2010	2011	2012	2013	2009 - 2013 Combined
1	AMCR	AMCR	ACFL	ABDU	ACFL	ABDU - American black duck / <i>Anas rubripes</i>
2	AMGO	AMGO	ALFL	ALFL	ALFL	ACFL - Acadian flycatcher / <i>Empidonax acadia</i>
3	AMRO	AMRE	ABDU	AMCR	AMKE	ALFL - alder flycatcher / <i>Empidonax alnorum</i>
4	ATSP	AMRO	AMCR	AMGO	AMCR	AMCR - American crow / <i>Corvus brachyrhynchos</i>
5	AMWO	ATSP	AMGO	AMKE	AMGO	AMGO - American goldfinch / <i>Caerduelis tristis</i>
6	BBCU	BAOR	AMKE	AMRE	AMRE	AMKE - American kestrel / <i>Falco sparverius</i>
7	BCCH	BARS	AMRE	AMRO	AMRO	AMRE - American redstart / <i>Setophaga ruticilla</i>
8	BLJA	BBWA	AMRO	AMWO	BAEA	AMRO - American robin / <i>Turdus migratorius</i>
9	BRWA	BLPW	ATSP	ATSP	BANS	AMWO - American woodcock / <i>Scolopax minor</i>
10	BWHA	BLVU	AMWO	BAEA	BAOR	ATSP - American tree sparrow / <i>Spizella arborea</i>
11	CAGO	BAWW	BAEA	BANS	BARS	BAEA - bald eagle / <i>Haliaeetus leucocephalus</i>
12	CEDW	BBCU	BAOR	BAOR	BAWW	BANS - bank swallow / <i>Riparia riparia</i>
13	CHSP	BCCH	BANS	BARS	BBCU	BAOR - Baltimore oriole / <i>Icterus galbula</i>
14	CORA	BTGW	BARS	BAWW	BBWA	BARS - barn swallow / <i>Hirundo rustica</i>
15	COYE	BLJA	BBWA	BBCU	BCCH	BAWW - black-and-white warbler / <i>Mniotilta varia</i>
16	DOWO	BGGN	BEKI	BBWA	BEKI	BBCU - black-billed cuckoo/ <i>Coccyzus erythrophthalmus</i>
17	EAKI	BHVI	BITH (unconfirmed, but potential)	BCCH	BGGN	BBWA - bay-breasted warbler / <i>Dendroica castanea</i>
18	EATO	BHCO	BLVU	BEKI	BHCO	BCCH - black-capped chickadee / <i>Poecile atricapilla</i>
19	EAWP	CAGO	BAWW	BGGN	BHVI	BEKI - belted kingfisher / <i>Ceryle alcyon</i>
20	EUST	CEDW	BBCU	BHCO	BLJA	BGGN - blue-gray gnatcatcher / <i>Poliopitila caerulea</i>
21	FISP	CSWA	BLWA	BHVI	BLPW	BHCO - brown-headed cowbird / <i>Molothrus ater</i>
22	FICR	CHSP	BCCH	BITH	BLVU	BHVI - blue-headed vireo / <i>Vireo solitarius</i>
23	GRCA	COGR	BLPW	BLJA	BLWA	BITH - Bicknell's thrush / <i>Catharus bicknelli</i> (unconfirmed, but potential)
24	HAWO	CORA	BTBW	BLPW	BRCR	BLJA - blue jay / <i>Cyanocitta cristata</i>
25	HOSP	COYE	BTGW	BLVU	BRTH	BLPW - blackpoll warbler / <i>Dendroica striata</i>
26	INBU	DEJU	BLJA	BLWA	BTBW	BLVU - black vulture / <i>Caragyps atratus</i>
27	MODO	DOWO	BGGN	BOBO	BTGW	BLWA - blackburnian warbler / <i>Dendroica fusca</i>
28	NOCA	EAKI	BHVI	BOGU	BWHA	BOBO - bobolink / <i>Dolichonyx oryzivorus</i>
29	NOFL	EATO	BWWA	BRCR	CAGO	BOGU - Bonaparte's gull / <i>Larus philadelphia</i>
30	NOMO	EAWP	BOBO	BRTH	CAWR	BRCR - brown creeper / <i>Certhia americana</i>
31	PIWO	EUST	BOGU	BTBW	CEDW	BRTH - brown thrasher / <i>Toxostoma rufum</i>
32	RBWO	FICR	BWHA	BTGW	CHSP	BRWA - Brewster's warbler / <i>Vermivora chrysoptera x cyanoptera</i>
33	RTHA	GWWA	BRCR	BWHA	CHSW	BTBW - black-throated blue warbler / <i>Dendroica caerulescens</i>
34	RTHU	GRCA	BRTH	BWTE	CMWA	BTGW - black-throated green warbler / <i>Dendroica virens</i>
35	SOSP	GBHE	BHCO	BWWA	COGR	BWHA - broad-winged hawk / <i>Buteo platypterus</i>
36	TUVU	GCFL	CAGO	CAGO	COHA	BWTE - blue-winged teal / <i>Anas dicors</i>
37	UNLG	GRHE	CAWA	CAWA	CONI	BWWA - blue-winged warbler / <i>Vermivora pinus</i>
38	UNWA	HAWO	CMWA	CEDW	CORA	CAGO - Canada goose / <i>Branta canadensis</i>
39	WITU	HEGU	CAWR	CHSP	COSN	CAWA - Canada warbler / <i>Wilsonia canadensis</i>
40	WIFL	HOFI	CEDW	CHSW	COYE	CAWR - Carolina wren / <i>Thryothorus ludovicianus</i>
41	YWAR	HOSP	CERW	CMWA	CSWA	CEDW - cedar waxwing / <i>Bombycilla cedrorum</i>
42		HOWR	CSWA	COGR	DEJU	CERW - Cerulean warbler / <i>Dendroica cerulea</i>
43		INBU	CHSW	COHA	DOWO	CHSP - chipping sparrow / <i>Spizella passerina</i>
44		KILL	CHSP	COLO	EABL	CHSW - chinmey swift / <i>Chaetura pelagica</i>
45		MAWA	COGR	COMO	EAKI	CMWA - Cape May warbler / <i>Dendroica tigrina</i>
46		MALL	COLO (migrant, very high overhead)	CONI	EAPH	COGR - common grackle / <i>Quiscalus quiscula</i>
47		MODO	COMO (one bird. flyover migrant)	CORA	EATO	COHA - Cooper's hawk / <i>Accipiter cooperii</i>
48		MOWA	CONI	COSN	EAWP	COLO - common loon / <i>Gavia immer</i> (migrant, very high overhead)
49		NAWA	CORA	COYE	ETTI	COMO - common merganser / <i>Mergus merganser</i> (one bird. flyover migrant)
50		NOCA	COYE	CSWA	EUST	CONI - common nighthawk / <i>Chordeiles minor</i>
51		NOFL	COHA	DCCO	FICR	CORA - common raven / <i>Corvus corax</i>
52		NOMO	DEJU	DEJU	FISP	COSN - common snipe / <i>Gallinago gallinago</i>
53		NOPA	DCCO (flyover migrants)	DOWO	GBHE	COYE - common yellowthroat / <i>Geothlypis trichas</i>
54		OROR	DOWO	EABL	GCFL	CSWA - chestnut-sided warbler / <i>Dendroica pennsylvanica</i>
55		PAWA	EABL	EAKI	GCKI	DCCO - double crested cormorant / <i>Phalacrocorax auritus</i> (flyover migrants)
56		PIWA	EAKI	EAPH	GHOW	DEJU - dark-eyed junco / <i>Junco hyemalis</i>
57	S:090636:111	1391	EAPH	EATO	GRCA	DOWO - downy woodpecker / <i>Picoides pubescens</i>
58		RBWO	EATO	EAWP	GRHE	EABL - eastern bluebird / <i>Sialia sialis</i>

Cumulative Bird List Continued

#	2009	2010	2011	2012	2013	2009 - 2013 Combined
59		REVI	EAWP	ETTI	GRSP	EAKI - eastern kingbird / <i>Tyrannus tyrannus</i>
60		RTHA	EUST	EUST	GRYE	EAPH - eastern phoebe / <i>Sayornis phoebe</i>
61		RWBL	FISP	FICR	HAWO	EATO - eastern towhee / <i>Pipilo erythrophthalmus</i>
62		ROPI	FICR	FISP	HEGU	EAWP - eastern wood-pewee / <i>Contopus virens</i>
63		RBGR	FOSP	GBBG	HETH	ETTI - tufted titmouse / <i>Baeolophus bicolor</i>
64		RTHU	GCKI	GBHE	HOFI	EUST - European starling / <i>Sturnus vulgaris</i>
65		SCTA	GRCA	GCFL	HOSP	FICR - fish crow / <i>Corvus ossifragus</i>
66		SOSA	GBHE	GCKI	HOWR	FISP - field sparrow / <i>Spizella pusilla</i>
67		SOSP	GCFL	GHOW	INBU	FOSP - fox sparrow / <i>Passerella iliaca</i>
68		TEWA	GBBG	GRCA	KILL	GBBG - greater black-backed gull / <i>Larus marinus</i>
69		ETTI	GRHE	GREG	LAGU	GBHE - great blue heron / <i>Ardea herodias</i> (flyover)
70		TUVU	GWTE (three different flocks, all flyovers)	GRHE	LEFL	GCFL - great crested flycatcher / <i>Myiarchus crinitus</i>
71		VEER	HAWO	GRYE	LESA	GCKI - golden-crowned kinglet / <i>Regulus satrapa</i>
72		WAVI	HETH	GWTE	LEYE	GHOW - great horned owl / <i>Bubo virginiana</i>
73		WBNU	HEGU	HAWO	LISP	GRCA - gray catbird / <i>Dumetella carolinensis</i>
74		WITU	HOFI	HEGU	MALL	GREG - great egret / <i>Ardea alba</i>
75		WIWA	HOSP	HETH	MAWA	GRHE - green heron / <i>Butorides virescens</i>
76		WODU	HOWR	HOFI	MERL	GRYE - greater yellowlegs / <i>Tringa melanoleuca</i>
77		WOTH	INBU	HOLA	MODO	GRSP - Grasshopper sparrow / <i>Ammodramus savannarum</i>
78		YWAR	KILL	HOME	NAWA	GWTE - green-winged teal / <i>Anas crecca</i> (three different flocks, all flyovers)
79		YBCU	LAGU	HOSP	NOCA	GWWA - golden-winged warbler / <i>Vermivora chrysoptera</i>
80			LEFL	HOWA	NOFL	HAWO - hairy woodpecker / <i>Picoides villosus</i>
81			LEYE	HOWR	NOMO	HEGU - herring gull / <i>Larus argentatus</i>
82			LISP	INBU	NOPA	HETH - hermit thrush / <i>Catharus guttatus</i>
83			MAWA	KILL	NRWS	HOFI - house finch / <i>Carpodacus mexicanus</i>
84			MALL	LAGU	OROR	HOLA - horned lark / <i>Eremophila alpestris</i>
85			MERL	LEFL	OVEN	HOME - hooded merganser / <i>Lophodytes cucullatus</i>
86			MODO	LESA	PAWA	HOSP - house sparrow / <i>Passer domesticus</i>
87			NAWA	LEYE	PHVI	HOWA - hooded warbler / <i>Setophaga citrina</i>
88			NOCA	LISP	PIWA	HOWR - house wren / <i>Troglodytes aedon</i>
89			NOFL	MALL	PIWO	INBU - indigo bunting / <i>Passerina cyanea</i>
90			NOHA	MAWA	PRAW	KILL - killdeer / <i>Charadrius vociferus</i>
91			NOMO	MERL	PUFI	LAGU - laughing gull / <i>Larus atricilla</i>
92			NOPA	MODO	PUMA	LEFL - least flycatcher / <i>Empidonax minimus</i>
93			NOPI (small flock flyover)	NAWA	RBGR	LESA - least sandpiper / <i>Calidris minutilla</i>
94			NRWS	NOCA	RBGU	LEYE - lesser yellowlegs / <i>Tringa flavipes</i>
95			NSHO	NOFL	RBNU	LISP - Lincoln's sparrow / <i>Melospiza lincolnii</i>
96			NOWA	NOHA	RBWO	MALL - mallard / <i>Anas platyrhynchos</i>
97			OSPR (in migration)	NOMO	RCKI	MAWA - magnolia warbler / <i>Dendroica magnolia</i>
98			OVEN	NOPA	REVI	MERL - merlin / <i>Falco columbarius</i>
99			PAWA	NOPI	RHWO	MODO - mourning dove / <i>Zenaidura macroura</i>
100			PEFA	NOWA	ROPI	MOWA - mourning warbler / <i>Oporornis philadelphia</i>
101			PHVI	NRWS	RSHA	NAWA - Nashville warbler / <i>Vermivora ruficapilla</i>
102			PIWA	OCWA	RTHA	NOCA - northern cardinal / <i>Cardinalis cardinalis</i>
103			PIWO	OSPR	RTHU	NOFL - northern flicker / <i>Colaptes auratus</i>
104			PRAW	OVEN	RWBL	NOHA - northern harrier / <i>Circus cyaneus</i>
105			RBWO	PAWA	SAVS	NOMO - northern mockingbird / <i>Mimus polyglottus</i>
106			RBNU	PBGR	SCTA	NOPA - northern parula / <i>Parula americana</i>
107			REVI	PHVI	SOSA	NOPI - northern pintail / <i>Anas acuta</i> (small flock flyover)
108			RSHA	PIWA	SOSP	NOWA - northern waterthrush / <i>Seiurus noveboracensis</i> (offsite near vernal pool)
109			RTHA	PIWO	SPSA	NRWS - northern rough-winged swallow / <i>Stelgidopteryx serripennis</i>
110			RWBL	PRAW	SSHA	NSHO - northern shoveler / <i>Anas clypeata</i>
111			RBGU	PUFI	SWSP	OCWA - orange-crowned warbler / <i>Oreothlypis celata</i>
112			ROPI	PUMA	SWTH	OROR - orchard oriole / <i>Icterus spurius</i>
113			RBGR	RBGR	TEWA	OSPR - osprey / <i>Pandion haliaetus</i> (in migration)
114			RCKI	RBGU	TRSW	OVEN - ovenbird / <i>Seiurus aurocapillus</i>
115	S:090636:111	13914	RTHU	RBNU	TUVU	PAWA - palm warbler / <i>Dendroica palmarum</i>
116			RUBL	RBWO	UNFL	PBGR - pied-billed grebe / <i>Podylimbus podiceps</i>

Cumulative Bird List Continued

#	2009	2010	2011	2012	2013	2009 - 2013 Combined
117			SAVS	RCKI	VEER	PEFA - peregrine falcon / <i>Falco peregrinus</i>
118			SCTA	REVI	VESP	PHVI - Philadelphia vireo / <i>Vireo philadelphicus</i>
119			SSHA (mainly in migration)	ROPI	WAVI	PIWA - pine warbler / <i>Dendroica pinus</i>
120			SNGO (flyover in migration)	RSHA	WBNU	PIWO - pileated woodpecker / <i>Dryocopus pileatus</i>
121			SOSA	RTHA	WCSP	PRAW - prairie warbler / <i>Dendroica discolor</i>
122			SOSP	RTHU	WIFL	PUFI - purple finch / <i>Carpodacus purpureus</i>
123			SORA	RWBL	WITU	PUMA - purple martin / <i>Pronge subis</i>
124			SPSA	SAVS	WIWA	RBGR - rose-breasted grosbeak / <i>Phueticus ludovicianus</i>
125			SWTH	SCTA	WODU	RBGU - ring-billed gull / <i>Larus delawarensis</i>
126			SWSP	SESA	WOTH	RBNU - red-breasted nuthatch / <i>Sitta canadensis</i>
127			TEWA	SNGO	WTSP	RBWO - red-bellied woodpecker / <i>Melanerpes carolinus</i>
128			TRSW	SORA	YBCU	RCKI - ruby crowned kinglet / <i>Regulus calendula</i>
129			ETTI	SOSA	YBSA	REVI - red-eyed vireo / <i>Vireo olivaceus</i>
130			TUVU	SOSP	YRWA	RHOW - Red-headed woodpecker / <i>Melanerpes erythrocephalus</i>
131			UNLG (possible GLGU)	SPSA	YTVI	ROPI - rock pigeon / <i>Columba livia</i>
132			unidentified flycatcher sp.	SSHA	YWAR	RSHA - red-shouldered hawk / <i>Buteo lineatus</i> (likely migrant)
133			VEER	SWSP		RTHA - red-tailed hawk / <i>Buteo jamaicensis</i>
134			WAVI	SWTH		RTHU - ruby-throated hummingbird / <i>Archilochus colubris</i>
135			WBNU	TEWA		RUBL - rusty blackbird / <i>Euphagus carolinus</i>
136			WCSP	TRSW		RWBL - red-winged blackbird / <i>Agelaius phoeniceus</i>
137			WTSP	TUVU		SAVS - savannah sparrow / <i>Passerculus sandwichensis</i>
138			WITU	UNFL		SCTA - scarlet tanager / <i>Piranga olivacea</i>
139			WIFL	VEER		SESA - semi-palmated sandpiper / <i>Calidris pusilla</i>
140			WIWR	VESP		SNGO - snow goose / <i>Chen caerulescens</i> (flyover in migration)
141			WODU	WAVI		SORA - sora / <i>Porzana carolina</i>
142			WOTH	WBNU		SOSA - solitary sandpiper / <i>Tringa solitaria</i>
143			YWAR	WCSP		SOSP - song sparrow / <i>Melospiza melodia</i>
144			YBFL	WIFL		SPSA - spotted sandpiper / <i>Actitis macularia</i>
145			YBSA	WITU		SSHA - sharp-shinned hawk / <i>Accipiter striatus</i> (mainly in migration)
146			YBCU	WIWA		SWSP - swamp sparrow / <i>Melospiza georgiana</i>
147			YRWA	WIWR		SWTH - Swainson's thrush / <i>Catharus ustulatus</i>
148				WODU		TEWA - Tennessee warbler / <i>Vermivora peregrina</i>
149				WOTH		TRSW - tree swallow / <i>Tachycineta bicolor</i>
150				WTSP		TUVU - turkey vulture / <i>Cathartes aura</i>
151				YBCU		UNFL - unidentified flycatcher sp.
152				YBSA		UNLG - unidentified Larus gull (possible GLGU)
153				YRWA		UNWA - unknown warbler
154				YTVI		VEER - veery / <i>Catharus fuscescens</i>
155				YWAR		VESP - vesper sparrow / <i>Poecetes gramineus</i>
156						WAVI - warbling vireo / <i>Vireo gilvus</i>
157						WBNU - white-breasted nuthatch / <i>Sitta carolinensis</i>
158						WCSP - white-crowned sparrow / <i>Zonotrichia leucophrys</i>
159						WIFL - willow flycatcher / <i>Empidonax traillii</i>
160						WITU - wild turkey / <i>Meleagris gallopavo</i>
161						WIWA - Wilsons warbler / <i>Wilsonia pusilla</i>
162						WIWR - winter wren / <i>Troglodytes troglodytes</i>
163						WODU - wood duck / <i>Aix sponsa</i>
164						WOTH - wood thrush / <i>Hylocichla mustelina</i>
165						WTSP - white-throated sparrow / <i>Zonotrichia albicollis</i>
166						YBCU - yellow-billed cuckoo / <i>Coccyzus americanus</i>
167						YBFL - yellow-bellied flycatcher / <i>Empidonax flaviventris</i>
168						YBSA - yellow-bellied sapsucker / <i>Sphyrapicus varius</i>
169						YRWA - yellow-rumped warbler / <i>Dendroica coronata</i>
170						YTVI - yellow-throated vireo / <i>Vireo flavifrons</i>
171						YWAR - yellow warbler / <i>Dendroica petechia</i>

* Four-letter codes are according to: American Ornithological Union (AOU) Bird Species List.

** Blue shaded boxes indicate species that were observed from the site but they were not documented on-site.

*** Codes identified in **bold red** are new to the site this year.

Reptiles & Amphibians List						
Reptiles						
	2009	2010	2011	2012	2013	2009-2013 Combined
1	common garter snake (<i>Thamnophis sirtalis</i>)	common garter snake (<i>Thamnophis sirtalis</i>)	common garter snake (<i>Thamnophis sirtalis</i>)	common garter snake (<i>Thamnophis sirtalis</i>)	common garter snake (<i>Thamnophis sirtalis</i>)	common garter snake (<i>Thamnophis sirtalis</i>)
2	red-bellied snake (<i>Storeria occipitomaculata occipitomaculata</i>) (brown and gray phases)	redbelly snake (<i>Storeria occipitomaculata occipitomaculata</i>) (brown phase)	redbelly snake (<i>Storeria occipitomaculata occipitomaculata</i>) (brown and gray phases)	eastern hognose snake (<i>Heterodon platirincos</i>) (Found at OFFSITE/control location actively nesting. No hognose snakes found onsite)	redbelly snake (<i>Storeria occipitomaculata occipitomaculata</i>) (brown and gray phases)	eastern hognose snake (<i>Heterodon platirincos</i>)
3	...	ribbon snake (<i>Thamnophis sauritus septentrionalis</i>)	spotted turtle (<i>Glyptemys guttata</i>) (off-site in buttonbush swamp)	eastern worm snake (<i>Carphophis a. amoenus</i>) (Found at OFFSITE/control location. No worm snakes found onsite)	spotted turtle (<i>Glyptemys guttata</i>)	eastern worm snake (<i>Carphophis a. amoenus</i>)
4	...	snapping turtle (<i>Chelydra serpentina</i>)	spotted turtle (<i>Glyptemys guttata</i>) (off-site in buttonbush swamp)	spotted turtle (<i>Glyptemys guttata</i>)	snapping turtle (<i>Chelydra serpentina</i>)	spotted turtle (<i>Glyptemys guttata</i>)
5	...	spotted turtle (<i>Glyptemys guttata</i>)	snapping turtle (<i>Chelydra serpentina</i>)	redbelly snake (<i>Storeria occipitomaculata occipitomaculata</i>) (brown and gray phases)	Red-eared slider (<i>Trachemys scripta elegans</i>)	Red-eared slider (<i>Trachemys scripta elegans</i>)
6	...	...	...	snapping turtle (<i>Chelydra serpentina</i>)	...	redbelly snake (<i>Storeria occipitomaculata occipitomaculata</i>) (brown phase)
7	...	...	...	spotted turtle (<i>Glyptemys guttata</i>)	...	ribbon snake (<i>Thamnophis sauritus septentrionalis</i>)
8	...	...	...	...	...	snapping turtle (<i>Chelydra serpentina</i>)
	...	...	...	...	...	spotted turtle (<i>Glyptemys guttata</i>)

Amphibians						
	2009	2010	2011	2012	2013	2009-2013 Combined
1	American toad (<i>Anaxyrus americana</i>)	American toad (<i>Anaxyrus americana</i>)	American toad (<i>Anaxyrus americana</i>)	American toad (<i>Anaxyrus americana</i>)	American toad (<i>Anaxyrus americana</i>)	American toad (<i>Anaxyrus americana</i>)
2	gray treefrog (<i>Hyla versicolor</i>)	gray treefrog (<i>Hyla versicolor</i>)	Fowler's toad (<i>Anaxyrus fowleri</i>)	* blue-spotted salamander (<i>Ambystoma laterale</i>)	* blue-spotted salamander (<i>Ambystoma laterale</i>)	* blue-spotted salamander (<i>Ambystoma laterale</i>)
3	spring peeper (<i>Pseudacris crucifer crucifer</i>)	spring peeper (<i>Pseudacris crucifer</i>)	Possible Fowler's toad (<i>Anaxyrus fowleri</i>)/American toad hybrid	bull frog (<i>Lithobates catesbeiana</i>)	Frog sp. / <i>Lithobates sp.</i>	bull frog (<i>Lithobates catesbeiana</i>)
4	unidentified frog (Ranidae)	unidentified frog (Ranidae)	eastern spadefoot toad (<i>Scaphiopus h. holbrookii</i>)	gray treefrog (<i>Hyla versicolor</i>)	gray treefrog (<i>Hyla versicolor</i>)	eastern spadefoot toad (<i>Scaphiopus h. holbrookii</i>)
5	northern green frog (<i>Lithobates clamitans</i>)	northern green frog (<i>Lithobates clamitans</i>)	gray treefrog (<i>Hyla versicolor</i>)	Jefferson/blue-spotted salamander hybrid (<i>Ambystoma jeffersonianum x laterale</i>)	* Jefferson salamander (<i>Ambystoma jeffersonianum</i>)	Fowler's toad (<i>Anaxyrus fowleri</i>)
6	*blue-spotted salamander (<i>Ambystoma laterale</i>)	northern leopard frog (<i>Lithobates pipiens</i>)	spring peeper (<i>Pseudacris crucifer</i>)	northern green frog (<i>Lithobates clamitans</i>)	Jefferson/blue-spotted salamander hybrid (<i>Ambystoma jeffersonianum x laterale</i>)	gray treefrog (<i>Hyla versicolor</i>)
7	...	wood frog (<i>Lithobates sylvatica</i>)	unidentified frog (Ranidae)	northern leopard frog (<i>Lithobates pipiens</i>)	northern green frog (<i>Lithobates clamitans</i>)	* Jefferson salamander (<i>Ambystoma jeffersonianum</i>)
8	...	*Jefferson salamander (<i>Ambystoma jeffersonianum</i>)	bull frog (<i>Lithobates catesbeiana</i>)	redback salamander (<i>Plethodon cinereus</i>)	northern leopard frog (<i>Lithobates pipiens</i>)	Jefferson/blue-spotted salamander hybrid (<i>Ambystoma jeffersonianum x laterale</i>)
9	...	* blue-spotted salamander (<i>Ambystoma laterale</i>)	northern green frog (<i>Lithobates clamitans</i>)	spring peeper (<i>Pseudacris crucifer</i>)	redback salamander (<i>Plethodon cinereus</i>)	northern green frog (<i>Lithobates clamitans</i>)
10	...	...	northern leopard frog (<i>Lithobates pipiens</i>)	wood frog (<i>Lithobates sylvatica</i>)	wood frog (<i>Lithobates sylvatica</i>)	northern leopard frog (<i>Lithobates pipiens</i>)
11	...	...	wood frog (<i>Lithobates sylvatica</i>)	...	spring peeper (<i>Pseudacris crucifer</i>)	possible Fowler's toad (<i>Anaxyrus fowleri</i>)/American toad hybrid
12	...	...	* Jefferson salamander (<i>Ambystoma jeffersonianum</i>)	...	...	redback salamander (<i>Plethodon cinereus</i>)
13	...	...	* blue-spotted salamander (<i>Ambystoma laterale</i>)	...	...	* spotted salamander (<i>Ambystoma maculatum</i>)
14	...	...	Jefferson/blue-spotted salamander hybrid (<i>Ambystoma jeffersonianum x laterale</i>)	...	...	spring peeper (<i>Pseudacris crucifer</i>)
15	...	...	* spotted salamander (<i>Ambystoma maculatum</i>)	...	...	wood frog (<i>Lithobates sylvatica</i>)
16	...	...	redback salamander (<i>Plethodon cinereus</i>)	...	...	...

Notes: blue shaded boxed indicate species that were detected off-site but nearby.

* Animals considered to be 'pure' species within this distinction are based on morphological observations which suggested no influence from another species.

Insects Lists

#	2009	2010	2011	2012	2013	2009-2013 Combined
1	American copper / <i>Lycaena phlaeas</i>	American copper / <i>Lycaena phlaeas</i>	<i>Adelphocoris</i> sp. / possibly <i>A. lineolatus</i>	12 spotted skimmer / <i>Libellula pulchella</i>	19-spotted ladybug / <i>Harmonia axyridis</i>	19-spotted ladybug / <i>Harmonia axyridis</i>
2	Aphrodite fritillary / <i>Speyeria aphrodite</i>	Black swallowtail / <i>Papilio polyxenes</i>	American copper / <i>Lycaena phlaeas</i>	American bird grasshopper / <i>Schistocerca americana</i>	a red dragonfly sp.	5-spot dragonfly
3	Cabbage white / <i>Pieris rapae</i>	Bronze copper / <i>Lycaena hyllus</i>	Auchenorrhyncha / a planthopper (possibly)	American copper / <i>Lycaena phlaeas</i>	American bird grasshopper / <i>Schistocerca americana</i>	7 spot dragonfly
4	Clouded sulphur / <i>Colias philodice</i>	Bumblebee moth / <i>Hemaris diffinis</i>	Banded hairstreak / <i>Satyrium calanus</i>	American dog tick / <i>Dermacentor variabilis</i>	American carrion beetle / <i>Silpha americana</i>	a red dragonfly sp.
5	Common ringlet / <i>Coenonympha tullia</i>	Cabbage white / <i>Pieris rapae</i>	Beetle (Coleoptera) possibly <i>Phalacrus</i> genus	American lady / <i>Vanessa virginiensis</i>	American copper / <i>Lycaena phlaeas</i>	<i>Adelphocoris</i> sp. / possibly <i>A. lineolatus</i>
6	Common sootywing / <i>Pholisora catullus</i>	Common ringlet / <i>Coenonympha tullia</i>	Bent-winged owlet / <i>Beptina caradrinalis</i> (Possibly)	Bald-faced hornet / <i>Vespula maculata</i>	American horse fly / <i>Tabanus americanus</i>	American bird grasshopper / <i>Schistocerca americana</i>
7	Common wood nymph / <i>Cercyonis pegala</i>	Common sootywing / <i>Pholisora catullus</i>	Black swallowtail / <i>Papilio polyxenes</i>	Banded hairstreak / <i>Satyrium calanus</i>	American lady / <i>Vanessa virginiensis</i>	American carrion beetle / <i>Silpha americana</i>
8	Eastern tailed-blue / <i>Cupido comyntas</i>	Common wood-nymph / <i>Cercyonis pegala</i>	Bronze copper / <i>Lycaena hyllus</i>	Black swallowtail / <i>Papilio polyxenes</i>	Autumn meadowhawk / <i>Sympetrum vicinum</i>	American copper / <i>Lycaena phlaeas</i>
9	Eastern tiger swallowtail / <i>Papilio glaucus</i>	Coral hairstreak / <i>Satyrium titus</i>	Bumblebee clearwing / <i>Hemaris diffinis</i>	Bluet sp.	Bald faced hornet / <i>Vespula maculata</i>	American dog tick / <i>Dermacentor variabilis</i>
10	False crocus geometer / <i>Xanthotype urticaria</i>	Dusted skipper / <i>Atrytonopsis hianna</i>	Cabbage white / <i>Pieris rapae</i>	Cabbage white / <i>Pieris rapae</i>	Banded hairstreak / <i>Satyrium calanus</i>	American horse fly / <i>Tabanus americanus</i>
11	Fruitworm moth / <i>Sparganothis sulfureana</i>	Eastern tiger swallowtail / <i>Papilio glaucus</i>	caddis	Caddisfly / Trichoptera sp.	Black swallowtail / <i>Papilio polyxenes</i>	American lady / <i>Vanessa virginiensis</i>
12	Least skipper / <i>Ancyloxypha numitor</i>	Eastern black swallowtail / <i>Papilio polyxenes</i>	<i>Chlorochlamys</i> Genus / possibly blackberry looper moth <i>C. chloroleucaria</i>	Cicada / <i>Magicicada</i> sp.	Bluet sp. / <i>Enallagma</i> sp.	Aphrodite fritillary / <i>Speyeria aphrodite</i>
13	Monarch / <i>Danaus plexippus</i>	Eastern tailed blue / <i>Cupido comyntas</i>	Clouded sulphur / <i>Colias philodice</i>	Clouded sulphur / <i>Colias philodice</i>	Boxelder bug / <i>Boisea trivittatus</i>	Auchenorrhyncha / a planthopper (possibly)
14	Northern pearly-eye / <i>Enodia anthedon</i>	Frosted elfin / <i>Callophrys irus</i>	Common buckeye / <i>Junonia coenia</i>	Common buckeye / <i>Junonia coenia</i>	Brown elfin / <i>Callophrys augustinus</i>	Autumn meadowhawk / <i>Sympetrum vicinum</i>
15	Orange sulphur / <i>Colias eurytheme</i>	Giant swallowtail / <i>Papilio cresphontes</i>	Common ringlet / <i>Coenonympha tullia</i>	Common eastern bumble bee / <i>Bombus impatiens</i>	Brown stink bug / Pentatomidae	Bald faced hornet / <i>Vespula maculata</i>
16	Painted lady / <i>Vanessa cardui</i>	Great spangled fritillary / <i>Speyeria cybele</i>	Common sootywing / <i>Pholisora catullus</i>	Common ringlet / <i>Coenonympha tullia</i>	Bumble bee / <i>Bombus</i> sp.	Banded hairstreak / <i>Satyrium calanus</i>
17	Pearl crescent / <i>Phyciodes tharos</i>	Hobomok skipper / <i>Poanes hobomok</i>	Common wood-nymph / <i>Cercyonis pegala</i>	Common sootywing / <i>Pholisora catullus</i>	Cabbage white / <i>Pieris rapae</i>	Beetle (Coleoptera) possibly <i>Phalacrus</i> genus
18	Silver-spotted skipper / <i>Epargyreus clarus</i>	Least skipper / <i>Ancyloxypha numitor</i>	Crambidae - snout moth (unknown/possibly)	Common white-tail dragonfly / <i>Plathemis lydia</i>	Caterpillar - possibly a salt marsh caterpillar / <i>Estigmene acrea</i>	Bent-winged owlet / <i>Beptina caradrinalis</i> (Possibly)
19	Skipper sp.	Little wood satyr / <i>Megisto cymela</i>	Crane fly (Tipulomorpha) possibly <i>Tipula furca</i>	Common wood nymph / <i>Cercyonis pegala</i>	Chinese mantid / <i>Tenodera sinensis</i>	Black swallowtail / <i>Papilio polyxenes</i>
20	unknown moth	Monarch / <i>Danaus plexippus</i>	Crossline skipper / <i>Polites origenes</i>	Crane fly / Tipulomorpha sp.	Cicada sp.	Bluet sp. / <i>Enallagma</i> sp.
21	Viceroy / <i>Limenitis archippus</i>	Mourning cloak / <i>Nymphalis antiopa</i>	Dark-spotted palthis / <i>Palthis angulalis</i>	Crayfish	Clouded sulphur / <i>Colias philodice</i>	Boxelder bug / <i>Boisea trivittatus</i>
22	White admiral and red spotted purple admiral intergrade / <i>Limenitis arthemis</i>	Northern crescent / <i>Phyciodes cocyta</i>	Delaware skipper / <i>Anatrytone logan</i>	Crossline skipper / <i>Polites origenes</i>	Cockroach / <i>Blattodea</i> sp.	Bronze copper / <i>Lycaena hyllus</i>
23	White admiral / <i>Limenitis arthemis</i>	Northern pearly eye / <i>Enodia anthedon</i>	Dusted skipper / <i>Atrytonopsis hianna</i>	Deer tick / <i>Ixodes scapularis</i>	Common checkered skipper / <i>Pyrgus communis</i>	Brown elfin / <i>Callophrys augustinus</i>
24	Wild indigo duskywing / <i>Erynnis baptisiae</i>	Orange sulfur / <i>Colias eurytheme</i>	Eastern tailed blue / <i>Cupido comyntas</i>	Dreamy duskywing / <i>Erynnis icelus</i>	Common ringlet / <i>Coenonympha tullia</i>	Brown stink bug / Pentatomidae
25	—	Painted lady / <i>Vanessa cardui</i>	Eastern tiger swallowtail / <i>Papilio glaucus</i>	Duskywing sp.	Common sootywing / <i>Pholisora catullus</i>	Bumble bee / <i>Bombus</i> sp.
26	S:090636:111113917	Pearl crescent / <i>Phyciodes tharos</i>	False crocus geometer / <i>Xanthotype urticaria</i>	Eastern comma / <i>Polygonia comma</i> 917	Common whitetail dragonfly / <i>Plathemis lydia</i>	Bumblebee clearwing / <i>Hemaris diffinis</i>

Insects Lists Continued

#	2009	2010	2011	2012	2013	2009-2013 Combined
27	—	Peck's skipper / <i>Polites peckius</i>	Geometridae moths	Eastern tailed blue / <i>Cupido comyntas</i>	Common wood nymph / <i>Cercyonis pegala</i>	Cabbage white / <i>Pieris rapae</i>
28	—	Pink-edged sulfur / <i>Colias interior</i>	Geometridae - <i>Pero</i> genus - possibly <i>P. hubneraria</i>	Eastern tiger swallowtail / <i>Papilio glaucus</i>	Crab spider / <i>Thomisidae sp.</i>	Caddisfly / Trichoptera sp.
29	—	Question mark / <i>Polygonia interrogationis</i>	Geometridae - possibly <i>Xanthorhoe lacustrata</i>	Eastern yellow jacket / <i>Vespula maculifrons</i>	Crane fly / <i>Tipulidae</i>	Caterpillar - possibly a salt marsh caterpillar / <i>Estigmene acrea</i>
30	—	Red admiral / <i>Vanessa atalanta</i>	Giant leopard moth / <i>Hypercompe scribonia</i> caterpillar	Ebony jewelwing / <i>Calopteryx maculata</i>	Crossline skipper / <i>Polites origenes</i>	Chinese mantid / <i>Tenodera sinensis</i>
31	—	Silver spotted skipper / <i>Epargyreus clarus</i>	grape leaf folder moth / <i>Desmia funeralis</i>	Eyed brown / <i>Satyrodes eurydice</i>	Deer fly / <i>Chrysops sp.</i>	<i>Chlorochlamys</i> genus / possibly blackberry looper moth <i>C. chloroleucaria</i>
32	—	Silvery blue / <i>Glaucopsyche lygdamus</i>	Grapevine looper - possibly greater grapevine looper / <i>Eulithis gracilineata</i>	False crocus geometer / <i>Xanthotype urticaria</i>	Deer tick / <i>Ixodes scapularis</i>	Cicada / <i>Magicicada sp.</i>
33	—	Skipper sp.	Gray hairstreak / <i>Strymon melinus</i>	Field cricket / <i>Gryllus pennsylvanicus</i>	Dragonfly sp. / <i>Anisoptera sp.</i>	Clouded sulphur / <i>Colias philodice</i>
34	—	Spicebush swallowtail / <i>Papilio troilus</i>	Greater black letter dart / <i>Xestia dolosa</i> (possibly)	Fiery skipper / <i>Hylephila phyleus</i>	Dreamy duskywing / <i>Erynnis icelus</i>	Cockroach / <i>Blattodea sp.</i>
35	—	Spring azure / <i>Celastrina ladon</i>	Green lacewing / <i>Chrysopa sp.</i>	Fishfly / <i>Chauliodes sp.</i>	Earthworms	Common buckeye / <i>Junonia coenia</i>
36	—	Sulphur sp.	Hickory hairstreak / <i>Satyrium caryaevorus</i>	Giant swallowtail / <i>Papilio cresphontes</i>	Eastern tailed-blue / <i>Cupido comyntas</i>	Common checkered skipper / <i>Pyrgus communis</i>
37	—	Tawny-edged skipper / <i>Polites themistocles</i>	Hobomok skipper / <i>Poanes hobomok</i>	Grape plume moth / <i>Geina periscelidactylus</i>	Eastern tiger swallowtail / <i>Papilio glaucus</i>	Common eastern bumble bee / <i>Bombus impatiens</i>
38	—	Unknown moth	Hummingbird clearwing / <i>Hemaris thysbe</i>	Grapevine looper moth (possibly greater grapevine looper / <i>Eulithis gracilineata</i>)	Ebony jewelwing / <i>Calopteryx maculata</i>	Common ringlet / <i>Coenonympha tullia</i>
39	—	Viceroy / <i>Limenitis archippus</i>	Inland barrens buckmoth / <i>Hemileuca maia maia</i> (possible sighting)	Gray hairstreak / <i>Strymon melinus</i>	Eight-spotted forester / <i>Alypia octomaculata</i>	Common sootywing / <i>Pholisora catullus</i>
40	—	Virginia ctenucha / <i>Ctenucha virginica</i>	Katydid	Great golden digger wasp / <i>Sphex ichneumoneus</i>	Field cricket / <i>Gryllus pennsylvanicus</i>	Common whitetail dragonfly / <i>Plathemis lydia</i>
41	—	White admiral / <i>Limenitis arthemis</i>	Least skipper / <i>Ancyloxypha numitor</i>	Great spangled fritillary / <i>Speyeria cybele</i>	Fly / <i>Musca sp.</i>	Common wood nymph / <i>Cercyonis pegala</i>
42	—	Wild indigo duskywing / <i>Erynnis baptisiae</i>	Litter moth (Herminiinae), possibly a <i>Zanclognatha sp.</i>	Green grasshopper	Fritillary / <i>Speyeria sp.</i>	Coral hairstreak / <i>Satyrium titus</i>
43	—	Wood nymph / <i>Cercyonis pegala</i>	Little wood satyr / <i>Megisto cymela</i>	Green lacewing / <i>Chrysopidae sp.</i>	Frosted Elfin / <i>Callophrys irus</i>	Crab spider / <i>Thomisidae sp.</i>
44	—	5-spot dragonfly	Long dash skipper / <i>Polites mystic</i>	Ground beetle / <i>Chaenius sp.</i>	Giant swallowtail / <i>Papilio cresphontes</i>	Crambidae - snout moth (unknown/possibly)
45	—	7 spot dragonfly	Meadow katydid / <i>Conocephalini sp.</i>	Harvester / <i>Fenisecta tarqinius</i>	Grasshopper sp.	Crane fly / <i>Tipulomorpha sp.</i>
46	—	Common whitetail dragonfly / <i>Plathemis lydia</i>	Micro moth / <i>Micropterigidae</i>	Hickory tussock moth caterpillar / <i>Lophocampa caryae</i>	Gray hairstreak / <i>Strymon melinus</i>	Crayfish
47	—	Meadowhawk dragonfly	Noctuid moth / <i>Chytonix sensilis</i>	Hoary edged skipper / <i>Achalarus lyciades</i>	Great golden digger wasp / <i>Sphex ichneumoneus</i>	Crossline skipper / <i>Polites origenes</i>
48	—	Noctuidae/micro moth	Noctuidae/possibly bent-line dart / <i>Choephora fungorum</i>	Hobomok skipper / <i>Poanes hobomok</i>	Great spangled fritillary / <i>Speyeria cybele</i>	Dark-spotted palthis / <i>Palthis angulalis</i>
49	—	Noctuidae/fat noctuids	Northern crescent / <i>Phyciodes cocyta</i>	Honey bee / <i>Apis mellifera</i>	Gypsy moth / <i>Lymantria dispar</i>	Deer fly / <i>Chrysops sp.</i>
50	—	Pine moth	Northern pearly-eye / <i>Enodia anthedon</i>	Horace's dusky wing / <i>Erynnis horatius</i>	Hairstreak / <i>Strymon sp.</i>	Deer tick / <i>Ixodes scapularis</i>
51	—	Sapturidae moth	Orange sulphur / <i>Colias eurytheme</i>	Hummingbird clearwing / <i>Hemaris thysbe</i>	Hesperia skipper sp. / <i>Hesperia sp.</i>	Delaware skipper / <i>Anatrytone logan</i>

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Insects Lists Continued

#	2009	2010	2011	2012	2013	2009-2013 Combined
52	—	—	Owlet moth / Noctuidae (unknown sp.)	Inland barrens buckmoth / <i>Hemileuca maia</i>	Hickory hairstreak / <i>Satyrium caryaevorus</i>	Dragonfly sp. / <i>Anisoptera sp.</i>
53	—	—	Pearl crescent / <i>Phyciodes tharos</i>	Ladybug / <i>Coccinella septempunctata</i>	Hobomok skipper / <i>Poanes hobomok</i>	Dreamy duskywing / <i>Erynnis icelus</i>
54	—	—	Peck's skipper / <i>Polites peckius</i>	Large blue and green dragonfly	Honey bee / <i>Apis mellifera</i>	Duskywing sp.
55	—	—	Pennsylvania leather-wing / <i>Chauliognathus pennsylvanicus</i>	Large brown dragonfly	hornet sp.	Dusted skipper / <i>Atrytonopsis hianna</i>
56	—	—	Plume moth / Pterophoridae	Large Maple Spanworm / <i>Prochoerodes lineola</i>	House fly / <i>Musca domestica</i>	Earthworms
57	—	—	Praying mantis / <i>Mantidae</i>	Least skipper / <i>Ancyloxypha numitor</i>	Hoverfly / <i>Helophilus fasciatus</i>	Easten tiger swallowtail / <i>Papilio glaucus</i>
58	—	—	Question mark / <i>Polygonia interrogationis</i>	Little wood satyr / <i>Megisto cymela</i>	Japanese beetle / <i>Popillia japonica</i>	Eastern black swallowtail / <i>Papilio polyxenes</i>
59	—	—	Red admiral / <i>Vanessa atalanta</i>	Little yellow / <i>Eurema lisa</i>	Juvenal's duskywing / <i>Erynnis juvenalis</i>	Eastern comma / <i>Polygonia comma</i>
60	—	—	Red-spotted purple / <i>Limenitis arthemis</i>	Long-horned beetle / Cerambycidae sp.	Karner Blue Butterfly / <i>Lycaeides melissa samuelis</i>	Eastern tailed-blue / <i>Cupido comyntas</i>
61	—	—	Silver-spotted skipper / <i>Epargyreus clarus</i>	Longlegged fly / Dolichopodidae sp.	Ladybug / <i>Coccinella sp.</i>	Eastern tiger swallowtail / <i>Papilio glaucus</i>
62	—	—	Sleepy duskywing / <i>Erynnis brizo</i>	Mayfly species / Ephemeroptera sp.	Least skipper / <i>Ancyloxypha numitor</i>	Eastern yellow jacket / <i>Vespula maculifrons</i>
63	—	—	Snout moth / Pyralidae	Millipede	Little wood satyr / <i>Megisto cymela</i>	Ebony jewelwing / <i>Calopteryx maculata</i>
64	—	—	Southern cloudywing / <i>Thorybes pylades</i>	Monarch / <i>Danaus plexippus</i>	Mayfly sp. / Ephemeroptera sp.	Eight-spotted forester / <i>Alypia octomaculata</i>
65	—	—	Spicebush swallowtail / <i>Papilio troilus</i>	Mosquito	Millipede / <i>Diploda sp.</i>	Eyed brown / <i>Satyrodes eurydice</i>
66	—	—	Spring azure / <i>Celastrina ladon</i>	Mourning cloak / <i>Nymphalis antiopa</i>	Monarch butterfly / <i>Danaus plexippus</i>	False crocus geometer / <i>Xanthotype urticaria</i>
67	—	—	Striped lynx spider / <i>Oxyopes salticus</i>	Northern broken-dash / <i>Wallengrenia egeremet</i>	Monarch caterpillar / <i>Danaus plexippus</i>	Field cricket / <i>Gryllus pennsylvanicus</i>
68	—	—	Summer azure / <i>Celastrina neglecta</i>	Northern cloudywing / <i>Thorybes pylades</i>	Mosquitos	Fiery skipper / <i>Hylephila phyleus</i>
69	—	—	Syrphid fly/Syrphidae / <i>Toxomerus sp.</i>	Northern crescent / <i>Phyciodes cocyta</i>	Moths	Fishfly / <i>Chauliodes sp.</i>
70	—	—	Tawny-edged skipper / <i>Polites themistocles</i>	Northern pearly eye / <i>Enodia anthedon</i>	Mottled duskywing / <i>Erynnis martialis</i>	Fly / <i>Musca sp.</i>
71	—	—	Micro moth / possibly a Tortricid moth (Tortricidae)	Nursery web spider / <i>Pisaurina sp.</i>	Mourning cloak / <i>Nymphalis antiopa</i>	Fritillary / <i>Speyeria sp.</i>
72	—	—	Tortricid moth (Tortricidae) possibly <i>Olethreutes versicolorana</i>	Orange sulphur / <i>Colias eurytheme</i>	Northern crescent / <i>Phyciodes selenis</i>	Frosted Elfin / <i>Callophrys irus</i>
73	—	—	Two-striped snout-moth / <i>Macrochilo bivittata</i>	Painted lady / <i>Vanessa cardui</i>	Northern paper wasp / <i>Polistes fuscatus</i>	Fruitworm moth / <i>Sparganothis sulfureana</i>
74	—	—	Underwing moth / <i>Catocala sp.</i>	Pearl crescent / <i>Phyciodes tharos</i>	Northern Pearly-eye / <i>Enodia anthedon</i>	Geometridae - <i>Pero</i> genus - possibly <i>P. hubneraria</i>
75	—	—	unknown moth	Peck's skipper / <i>Polites peckius</i>	Orange sulphur / <i>Colias eurytheme</i>	Geometridae - possibly <i>Xanthorhoe lacustrata</i>
76	—	—	Variable antepione / <i>Antepione thisoaria</i>	Praying mantis / <i>Mantis religiosa</i>	Orange tipped oakworm moth caterpillar / <i>Anisota senatoria</i>	Geometridae moths
77	—	—	Variiegated Fritillary / <i>Euptoieta claudia</i>	Question mark / <i>Polygonia interrogationis</i>	Pale beauty / <i>Campaea perlata</i>	Giant leopard moth / <i>Hypercompe scribonia</i> caterpillar
78	—	—	Viceroy / <i>Limenitis archippus</i>	Red admiral / <i>Vanessa atalanta</i>	Pearl crescent / <i>Phyciodes tharos</i>	Giant swallowtail / <i>Papilio cressphontes</i>
79	S:090636:111113919 —	—	Virginia ctenucha / <i>Ctenucha virginica</i>	Red spotted purple / <i>Limenitis arthemis</i>	Pennsylvania firefly / <i>Photuris pennsylvanicus</i>	Grape leaf folder moth / <i>Desmia funeralis</i>

Insects Lists Continued

#	2009	2010	2011	2012	2013	2009-2013 Combined
80	—	—	White admiral/red-spotted purple integrate / <i>Limenitis arthemis</i>	Salt marsh moth / <i>Estigmene acrea</i>	Pillbug / <i>Armadillidium vulgare</i>	Grape plume moth / <i>Geina periscelidactylus</i>
81	—	—	Wild indigo duskywing / <i>Erynnis baptisiae</i>	Sexton beetle / <i>Nicrophorus orbicollis</i>	Pink-edged sulphur / <i>Colias interior</i>	Grapevine looper moth (possibly greater grapevine looper / <i>Eulithis gracilineata</i>)
82	—	—	Wood-nymph / <i>Cercyonis pegala</i>	Shadow Darner / <i>Aeshna umbrosa</i>	Praying mantis / <i>Mantis religiosa</i>	Grasshopper sp.
83	—	—	<i>Zanclognatha</i> sp. / possibly <i>Z. laevigata</i>	Silver spotted skipper / <i>Epargyreus clarus</i>	Rabbit bot fly / <i>Cuterebra buccata</i>	Gray hairstreak / <i>Strymon melinus</i>
84	—	—	—	Silvery checkerspot / <i>Chlosyne nycteis</i>	Red milkweed beetle / <i>Tetraopes tetraophthalmus</i>	Great golden digger wasp / <i>Sphex ichneumoneus</i>
85	—	—	—	Skipper sp.	Silver spotted skipper / <i>Epargyreus clarus</i>	Great spangled fritillary / <i>Speyeria cybele</i>
86	—	—	—	Slug	Skipper sp.	Greater black letter dart / <i>Xestia dolosa</i> (possibly)
87	—	—	—	Small red dragonfly	Slugs	Green grasshopper
88	—	—	—	Snails	Snail sp.	Green lacewing / Chrysopidae sp.
89	—	—	—	Spicebush swallowtail / <i>Papilio troilus</i>	Snowberry clearwing moth / <i>Hemaris diffinis</i>	Ground beetle / <i>Chlaenius</i> sp.
90	—	—	—	Spring azure / <i>Celastrina ladon</i>	Spring azure / <i>Celastrina ladon</i>	Gypsy moth / <i>Lymantria dispar</i>
91	—	—	—	Stink bug / <i>Podisus</i> sp.	Steel-blue cricket hunter / <i>Chlorion aerarium</i>	Hairstreak / <i>Strymon</i> sp.
92	—	—	—	Stink Bug / <i>Stiretrus anchorago</i>	Sulphur / <i>Colias</i> sp.	Harvester / <i>Fenisecta tarqinius</i>
93	—	—	—	Tawny-edged skipper / <i>Polites themistocles</i>	Summer azure / <i>Celastrina neglecta</i>	Hesperia skipper sp. / <i>Hesperia</i> sp.
94	—	—	—	Termites / Isoptera	Tent caterpillar / <i>Malacosoma</i> sp.	Hickory hairstreak / <i>Satyrrium caryaevorus</i>
95	—	—	—	Tiger beetle / <i>Cincindela</i> sp.	Thread-waisted wasp / <i>Ammophilia procera</i>	Hickory tussock moth caterpillar / <i>Lophocampa caryae</i>
96	—	—	—	Twelve-spotted skimmer / <i>Libellula pulchella</i>	Tiger beetle - possibly twelve-spotted / <i>Cincindela duodecimguttata</i>	Hoary edged skipper / <i>Achalarus lyciades</i>
97	—	—	—	Viceroy / <i>Limenitis archippus</i>	Tiger beetle / <i>Cincindela</i> sp.	Hobomok skipper / <i>Poanes hobomok</i>
98	—	—	—	Virginia ctenucha / <i>Ctenucha virginica</i>	Viceroy / <i>Limenitis archippus</i>	Honey bee / <i>Apis mellifera</i>
99	—	—	—	Wasp	Virescent green metallic bee / <i>Agapostemon virescens</i>	Horace's dusky wing / <i>Erynnis horatius</i>
100	—	—	—	Water boatman / <i>Corixa</i> sp.	Virginia ctenucha/ <i>Ctenucha virginica</i>	hornet sp.
101	—	—	—	Water strider / <i>Gerris remigis</i>	Wasp / Vespidae	House fly / <i>Musca domestica</i>
102	—	—	—	White M hairstreak / <i>Parrhasius m-album</i>	Water strider / <i>Gerris remigis</i>	Hoverfly / <i>Helophilus fasciatus</i>
103	—	—	—	White-striped black moth / <i>Trichodezia albovittata</i>	White admiral / <i>Limenitis arthemis</i>	Hummingbird clearwing / <i>Hemaris thysbe</i>
104	—	—	—	Widow skimmer / <i>Libellula luctuosa</i>	White-striped black moth / <i>Trichodezia albovittata</i>	Inland barrens buckmoth / <i>Hemileuca maia</i>
105	—	—	—	Wild indigo duskywing / <i>Erynnis baptisiae</i>	Wild indigo duskywing / <i>Erynnis baptisiae</i>	Japanese beetle / <i>Popillia japonica</i>
106	—	—	—	Wolf spider / Lycosidae sp.	Wolf spider / <i>Lycosidae</i> sp.	Juvenal's duskywing / <i>Erynnis juvenalis</i>
107	—	—	—	Woolly bear caterpillar / <i>Pyrrharctia isabella</i>	Woolly bear caterpillar / <i>Pyrrharctia isabella</i>	Karner Blue Butterfly / <i>Lycaeides melissa samuelis</i>
108	—	—	—	—	Yellow jacket / <i>Vespa maculifrons</i>	Katydid
109	—	—	—	—	—	Ladybug / <i>Coccinella</i> sp.
110	—	—	—	—	—	Ladybug / <i>Coccinella septempunctata</i>
111	S:090636:111113920	—	—	—	920	Large blue and green dragonfly

Insects Lists Continued

#	2009	2010	2011	2012	2013	2009-2013 Combined
112	—	—	—	—	—	Large brown dragonfly
113	—	—	—	—	—	Large Maple Spanworm / <i>Prochoerodes lineola</i>
114	—	—	—	—	—	Least skipper / <i>Ancyloxypha numitor</i>
115	—	—	—	—	—	Litter moth (Herminiinae), possibly a <i>Zanclognatha sp.</i>
116	—	—	—	—	—	Little wood satyr / <i>Megisto cymela</i>
117	—	—	—	—	—	Little yellow / <i>Eurema lisa</i>
118	—	—	—	—	—	Long dash skipper / <i>Polites mystic</i>
119	—	—	—	—	—	Long-horned beetle / Cerambycidae sp.
120	—	—	—	—	—	Longlegged fly / Dolichopodidae sp.
121	—	—	—	—	—	Mayfly sp. / Ephemeroptera sp.
122	—	—	—	—	—	Meadow katydid / <i>Conocephalini sp.</i>
123	—	—	—	—	—	Meadowhawk dragonfly sp.
124	—	—	—	—	—	Micro moth / Micropterigidae
125	—	—	—	—	—	Micro moth / possibly a Tortricid moth (Tortricidae)
126	—	—	—	—	—	Millipede / <i>Diploda sp.</i>
127	—	—	—	—	—	Monarch / <i>Danaus plexippus</i>
128	—	—	—	—	—	Mosquitos
129	—	—	—	—	—	Moths
130	—	—	—	—	—	Mottled duskywing / <i>Erynnis martialis</i>
131	—	—	—	—	—	Mourning cloak / <i>Nymphalis antiopa</i>
132	—	—	—	—	—	Noctuid moth / <i>Chytonix sensilis</i>
133	—	—	—	—	—	Noctuidae - possibly bent-line dart / <i>Choephora fungorum</i>
134	—	—	—	—	—	Noctuidae / fat noctuids
135	—	—	—	—	—	Noctuidae / micro moth
136	—	—	—	—	—	Northern broken-dash / <i>Wallengrenia egeremet</i>
137	—	—	—	—	—	Northern cloudywing / <i>Thorybes pylades</i>
138	—	—	—	—	—	Northern crescent / <i>Phyciodes selenis</i>
139	—	—	—	—	—	Northern paper wasp / <i>Polistes fuscatus</i>
140	—	—	—	—	—	Northern Pearly-eye / <i>Enodia anthedon</i>
141	—	—	—	—	—	Nursery web spider / <i>Pisaurina sp.</i>
142	—	—	—	—	—	Orange sulphur / <i>Colias eurytheme</i>
143	—	—	—	—	—	Orange tipped oakworm moth caterpillar / <i>Anisota senatoria</i>
144	—	—	—	—	—	Owlet moth / Noctuidae (unknown sp.)
145	—	—	—	—	—	Painted lady / <i>Vanessa cardui</i>
146	—	—	—	—	—	Pale beauty / <i>Campaea perlata</i>
147	—	—	—	—	—	Pearl crescent / <i>Phyciodes tharos</i>
148	—	—	—	—	—	Peck's skipper / <i>Polites peckius</i>
149	—	—	—	—	—	Pennsylvania firefly / <i>Photuris pennsylvanicus</i>
150	—	—	—	—	—	Pennsylvania leather-wing / <i>Chauliognathus pennsylvanicus</i>
151	—	—	—	—	—	Pillbug / <i>Armadillidium vulgare</i>
152	—	—	—	—	—	Pine moth
153	—	—	—	—	—	Pink-edged sulphur / <i>Colias interior</i>
154	—	—	—	—	—	Plume moth / Pterophoridae
155	S:090636:111113921	—	—	921	—	Praying mantis / <i>Mantidae</i>

Insects Lists Continued

#	2009	2010	2011	2012	2013	2009-2013 Combined
156	—	—	—	—	—	Praying mantis / <i>Mantis religiosa</i>
157	—	—	—	—	—	Question mark / <i>Polygonia interrogationis</i>
158	—	—	—	—	—	Rabbit bot fly / <i>Cuterebra buccata</i>
159	—	—	—	—	—	Red admiral / <i>Vanessa atalanta</i>
160	—	—	—	—	—	Red milkweed beetle / <i>Tetraopes tetraophthalmus</i>
161	—	—	—	—	—	Red spotted purple / <i>Limenitis arthemis</i>
162	—	—	—	—	—	Salt marsh moth / <i>Estigmene acrea</i>
163	—	—	—	—	—	Sapturidae moth
164	—	—	—	—	—	Sexton beetle / <i>Nicrophorus orbicollis</i>
165	—	—	—	—	—	Shadow Darner / <i>Aeshna umbrosa</i>
166	—	—	—	—	—	Silver spotted skipper / <i>Epargyreus clarus</i>
167	—	—	—	—	—	Silvery blue / <i>Glaucopsyche lygdamus</i>
168	—	—	—	—	—	Silvery checkerspot / <i>Chlosyne nycteis</i>
169	—	—	—	—	—	Skipper sp.
170	—	—	—	—	—	Sleepy duskywing / <i>Erynnis brizo</i>
171	—	—	—	—	—	Slug
172	—	—	—	—	—	Small red dragonfly
173	—	—	—	—	—	Snail sp.
174	—	—	—	—	—	Snout moth / Pyralidae
175	—	—	—	—	—	Snowberry clearwing moth / <i>Hemaris diffinis</i>
176	—	—	—	—	—	Southern Cloudywing / <i>Thorybes pylades</i>
177	—	—	—	—	—	Spicebush swallowtail / <i>Papilio troilus</i>
178	—	—	—	—	—	Spring azure / <i>Celastrina ladon</i>
179	—	—	—	—	—	Steel-blue cricket hunter / <i>Chlorion aerarium</i>
180	—	—	—	—	—	Stink bug / <i>Podisus</i> sp.
181	—	—	—	—	—	Stink Bug / <i>Stiretrus anchorago</i>
182	—	—	—	—	—	Striped lynx spider / <i>Oxyopes salticus</i>
183	—	—	—	—	—	Sulphur / <i>Colias</i> sp.
184	—	—	—	—	—	Summer azure / <i>Celastrina neglecta</i>
185	—	—	—	—	—	Syrphid fly - Syrphidae / <i>Toxomerus</i> sp.
186	—	—	—	—	—	Tawny-edged skipper / <i>Polites themistocles</i>
187	—	—	—	—	—	Tent caterpillar / <i>Malacosoma</i> sp.
188	—	—	—	—	—	Termites / Isoptera
189	—	—	—	—	—	Thread-waisted wasp / <i>Ammophila procera</i>
190	—	—	—	—	—	Tiger beetle - possibly twelve-spotted / <i>Cincindela duodecimguttata</i>
191	—	—	—	—	—	Tiger beetle / <i>Cincindela</i> sp.
192	—	—	—	—	—	Tortricid moth (Tortricidae) possibly <i>Olethreutes versicolorana</i>
193	—	—	—	—	—	Twelve-spotted skimmer / <i>Libellula pulchella</i>
194	—	—	—	—	—	Two-striped snout-moth / <i>Macrochilo bivittata</i>
195	—	—	—	—	—	Underwing moth / <i>Catocala</i> sp.
196	S:090636:111113922	—	—	922	—	unknown moth

Insects Lists Continued

#	2009	2010	2011	2012	2013	2009-2013 Combined
197	—	—	—	—	—	Variable antepione / <i>Antepione thisoaria</i>
198	—	—	—	—	—	Variegated fritillary / <i>Euptoieta claudia</i>
199	—	—	—	—	—	Viceroy / <i>Limenitis archippus</i>
200	—	—	—	—	—	Virescent green metallic bee / <i>Agapostemon virescens</i>
201	—	—	—	—	—	Virginia ctenucha/ <i>Ctenucha virginica</i>
202	—	—	—	—	—	Wasp / Vespidae
203	—	—	—	—	—	Water boatman / <i>Corixa sp.</i>
204	—	—	—	—	—	Water strider / <i>Gerris remigis</i>
205	—	—	—	—	—	White admiral / <i>Limenitis arthemis</i>
206	—	—	—	—	—	White admiral and red spotted purple admiral intergrade / <i>Limenitis arthemis</i>
207	—	—	—	—	—	White M hairstreak / <i>Parrhasius m-album</i>
208	—	—	—	—	—	White-striped black moth / <i>Trichodezia albovittata</i>
209	—	—	—	—	—	Widow skimmer / <i>Libellula luctuosa</i>
210	—	—	—	—	—	Wild indigo duskywing / <i>Erynnis baptisiae</i>
211	—	—	—	—	—	Wolf spider / Lycosidae sp.
212	—	—	—	—	—	Wood-nymph / <i>Cercyonis pegala</i>
213	—	—	—	—	—	Wooly bear caterpillar / <i>Pyrrharctia isabella</i>
214	—	—	—	—	—	Yellow jacket / <i>Vespula maculifrons</i>
215	—	—	—	—	—	<i>Zanclognatha sp.</i> / possibly <i>Z. laevigata</i>

Mammals Lists						
	2009	2010	2011	2012	2013	2009-2013 Combined
1	chipmunk (<i>Tamias striatus</i>)	chipmunk (<i>Tamias striatus</i>)	chipmunk (<i>Tamias striatus</i>)	chipmunk (<i>Tamias striatus</i>)	chipmunk (<i>Tamias striatus</i>)	chipmunk (<i>Tamias striatus</i>)
2	coyote (<i>Canis latrans</i>)	coyote (<i>Canis latrans</i>)	coyote (<i>Canis latrans</i>)	deer mouse (<i>Peromyscus</i> sp.) (either <i>P. leucopus</i> or <i>maniculatus</i> - according to Dr. Roland Kays, you cannot differentiate without examining the teeth)	coyote (<i>Canis latrans</i>)	coyote (<i>Canis latrans</i>)
3	eastern cottontail (<i>Sylvilagus floridanus</i>)	eastern cottontail (<i>Sylvilagus floridanus</i>)	dog (<i>Canis lupus familiaris</i>)	dog (<i>Canis lupus familiaris</i>)	deer mouse (<i>Peromyscus</i> sp.) (either <i>P. leucopus</i> or <i>maniculatus</i> - according to Dr. Roland Kays, you cannot differentiate without examining the teeth)	deer mouse (<i>Peromyscus</i> sp.) (either <i>P. leucopus</i> or <i>maniculatus</i> - according to Dr. Roland Kays, you cannot differentiate without examining the teeth)
4	eastern mole (<i>Scalopus aquaticus</i>)	eastern mole (<i>Scalopus aquaticus</i>)	eastern cottontail (<i>Sylvilagus floridanus</i>)	eastern cottontail (<i>Sylvilagus floridanus</i>)	dog (<i>Canis lupus familiaris</i>)	dog (<i>Canis lupus familiaris</i>)
5	gray squirrel (<i>Sciurus carolinensis</i>)	gray squirrel (<i>Sciurus carolinensis</i>)	eastern red bat (<i>Lasiurus borealis</i>)	eastern red bat (<i>Lasiurus borealis</i>)	eastern cottontail (<i>Sylvilagus floridanus</i>)	eastern cottontail (<i>Sylvilagus floridanus</i>)
6	least shrew (<i>Cryptotis parva</i>)	masked (Cinereus) shrew (<i>Sorex cinereus</i>)	fisher (<i>Martes pennanti</i>)	gray fox (<i>Urocyon cinereoargenteus</i>)	gray squirrel (<i>Sciurus carolinensis</i>)	eastern mole (<i>Scalopus aquaticus</i>)
7	masked (Cinereus) shrew (<i>Sorex cinereus</i>)	meadow jumping mouse (<i>Zapus hudsonicus</i>)	gray squirrel (<i>Sciurus carolinensis</i>)	gray squirrel (<i>Sciurus carolinensis</i>)	house cat (<i>Felis catus</i>)	eastern red bat (<i>Lasiurus borealis</i>)
8	meadow vole (<i>Microtus pennsylvanicus</i>)	meadow vole (<i>Microtus pennsylvanicus</i>)	hairy-tailed mole (<i>Parascalops breweri</i>)	house cat (<i>Felis catus</i>)	house mouse (<i>Mus musculus</i>)	fisher (<i>Martes pennanti</i>)
9	northern short-tailed shrew (<i>Blarina brevicauda</i>)	northern short-tailed shrew (<i>Blarina brevicauda</i>)	house cat (<i>Felis catus</i>)	house mouse (<i>Mus musculus</i>)	masked (Cinereus) shrew (<i>Sorex cinereus</i>)	gray fox (<i>Urocyon cinereoargenteus</i>)
10	raccoon (<i>Procyon lotor</i>)	raccoon (<i>Procyon lotor</i>)	masked (Cinereus) shrew (<i>Sorex cinereus</i>)	masked (Cinereus) shrew (<i>Sorex cinereus</i>)	meadow jumping mouse (<i>Zapus hudsonicus</i>)	gray squirrel (<i>Sciurus carolinensis</i>)
11	Virginia opossum (<i>Didelphis virginiana</i>)	red fox (<i>Vulpes vulpes</i>)	meadow jumping mouse (<i>Zapus hudsonicus</i>)	meadow jumping mouse (<i>Zapus hudsonicus</i>)	meadow vole (<i>Microtus pennsylvanicus</i>)	hairy-tailed mole (<i>Parascalops breweri</i>)
12	white-footed mouse (<i>Peromyscus leucopus</i>)	Virginia opossum (<i>Didelphis virginiana</i>)	meadow vole (<i>Microtus pennsylvanicus</i>)	meadow vole (<i>Microtus pennsylvanicus</i>)	muskrat (<i>Ondatra zibethicus</i>) (in catfish pond)	house cat (<i>Felis catus</i>)
13	white-tailed deer (<i>Odocoileus virginianus</i>)	Deer mouse (<i>Peromyscus</i> sp.)	northern short-tailed shrew (<i>Blarina brevicauda</i>)	northern short-tailed shrew (<i>Blarina brevicauda</i>)	northern flying squirrel (<i>Glaucomys sabrinus</i>)	house mouse (<i>Mus musculus</i>)
14	woodchuck (<i>Marmota monax</i>)	white-tailed deer (<i>Odocoileus virginianus</i>)	raccoon (<i>Procyon lotor</i>)	raccoon (<i>Procyon lotor</i>)	northern short-tailed shrew (<i>Blarina brevicauda</i>)	least shrew (<i>Cryptotis parva</i>)
15	...	...	red fox (<i>Vulpes vulpes</i>)	red fox (<i>Vulpes vulpes</i>)	raccoon (<i>Procyon lotor</i>)	masked (Cinereus) shrew (<i>Sorex cinereus</i>)
16	...	...	striped skunk (<i>Mephitis mephitis</i>)	star-nosed mole (<i>Condylura cristata</i>)	red squirrel (<i>Tamiasciurus hudsonicus</i>) (in pines)	meadow jumping mouse (<i>Zapus hudsonicus</i>)
17	...	...	unknown bat species	unknown bat species	star-nosed mole (<i>Condylura cristata</i>)	meadow vole (<i>Microtus pennsylvanicus</i>)
18	...	...	Virginia opossum (<i>Didelphis virginiana</i>)	white-tailed deer (<i>Odocoileus virginianus</i>)	striped skunk (<i>Mephitis mephitis</i>) (new burrow near CVP)	muskrat (<i>Ondatra zibethicus</i>)
19	...	...	white-footed mouse (<i>Peromyscus leucopus</i>)	woodchuck (<i>Marmota monax</i>)	white-tailed deer (<i>Odocoileus virginianus</i>)	northern flying squirrel (<i>Glaucomys sabrinus</i>)
20	...	...	white-tailed deer (<i>Odocoileus virginianus</i>)	...	woodchuck (<i>Marmota monax</i>)	northern short-tailed shrew (<i>Blarina brevicauda</i>)
21	...	...	woodchuck (<i>Marmota monax</i>)	...	woodland vole (<i>Microtus pinetorum</i>)	raccoon (<i>Procyon lotor</i>)
22	...	...	...	...	...	red fox (<i>Vulpes vulpes</i>)
23	...	...	...	...	...	red squirrel (<i>Tamiasciurus hudsonicus</i>)
24	...	...	...	...	...	star-nosed mole (<i>Condylura cristata</i>)
25	...	...	...	...	...	striped skunk (<i>Mephitis mephitis</i>)
26	...	...	...	...	...	unknown bat species
27	...	...	...	...	...	Virginia opossum (<i>Didelphis virginiana</i>)
28	...	...	...	...	...	white-footed mouse (<i>Peromyscus leucopus</i>)
29	...	...	...	...	...	white-tailed deer (<i>Odocoileus virginianus</i>)
30	...	...	...	...	...	woodchuck (<i>Marmota monax</i>)
31	S:090636:11113924...	...	...	... 924	...	woodland vole (<i>Microtus pinetorum</i>)

Attachment 5

Photographs



Photo 1 – Site conditions during the March 12 herp trapping survey.



Photo 2 – What appears to be a pure blue-spotted salamander (*Ambystoma laterale*).



PHOTOGRAPHS FROM THE 2013 SURVEYS

**City of Albany Rapp Road Landfill Eastern Expansion
2013 Faunal Surveys Report
Albany Co., NY**



Photo 3 – Salamanders captured during the April herp trapping survey. Some showed characteristics suggesting potentially pure Jefferson salamander (*Ambystoma jeffersonianum*).



Photo 4 – A salamander captured during the April herp trapping event with characteristics suggesting the polyploidy complex of Jefferson/blue-spotted salamander.



PHOTOGRAPHS FROM THE 2013 SURVEYS

City of Albany Rapp Road Landfill Eastern Expansion
2013 Faunal Surveys Report
Albany Co., NY



Photo 5 - Adult northern leopard frog (*Lithobates pipiens*) – more abundant in 2013 than in years-past.



Photo 6 – Common garter snake (*Thamnophis sirtalis*) observed in May.



PHOTOGRAPHS FROM THE 2013 SURVEYS

City of Albany Rapp Road Landfill Eastern Expansion
2013 Faunal Surveys Report
Albany Co., NY



Photo 7 – A gravid/opaque red-bellied snake (*Storeria occipitomaculata*).



Photo 8 – Neonate common garter snakes that were under cover board near Trapping Array # 2.



PHOTOGRAPHS FROM THE 2013 SURVEYS

**City of Albany Rapp Road Landfill Eastern Expansion
2013 Faunal Surveys Report
Albany Co., NY**



Photo 9 – Site conditions during (just before) the June 20 whip-poor-will (*Antrostomus vociferus*) survey.



Photo 10 – A fresh turtle nest observed on June 20.



PHOTOGRAPHS FROM THE 2013 SURVEYS

**City of Albany Rapp Road Landfill Eastern Expansion
2013 Faunal Surveys Report
Albany Co., NY**



Photo 11 – A predated turtle nest.



Photo 12 – Site conditions during the second brood Karner blue butterfly (*Lycaeides melissa samuelis*) surveys.



PHOTOGRAPHS FROM THE 2013 SURVEYS

**City of Albany Rapp Road Landfill Eastern Expansion
2013 Faunal Surveys Report
Albany Co., NY**



Photo 13 - Common green darner (*Anax junius*).



Photo 14 - Monarch (*Danaus plexippus*) caterpillar.



PHOTOGRAPHS FROM THE 2013 SURVEYS

City of Albany Rapp Road Landfill Eastern Expansion
2013 Faunal Surveys Report
Albany Co., NY



Photo 15 - Orange-tipped oakworm moth (*Anisota senatoria*) caterpillar.



Photo 16 - Orange-tipped oakworm moth caterpillars feeding on a scrub oak.



PHOTOGRAPHS FROM THE 2013 SURVEYS

**City of Albany Rapp Road Landfill Eastern Expansion
2013 Faunal Surveys Report
Albany Co., NY**



Photo 17 – Mottled duskywing (*Erynnis martialis*) observed on July 25 in the open sandy area between Trapping Arrays 1 and 2.



Photo 18 - Rabbit bot fly (*Cuterebra buccata*).



PHOTOGRAPHS FROM THE 2013 SURVEYS

**City of Albany Rapp Road Landfill Eastern Expansion
2013 Faunal Surveys Report
Albany Co., NY**



Photo 19 – Gray birch vernal pool (near Trapping Array # 1) inundated following a major storm event.



Photo 20 – Meadow jumping mouse (*Zapus hudsonius*).



PHOTOGRAPHS FROM THE 2013 SURVEYS

**City of Albany Rapp Road Landfill Eastern Expansion
2013 Faunal Surveys Report
Albany Co., NY**



Photo 21 – Turkey vultures (*Cathartes aura*) on the test plots.



Photo 22 – Created wetland.



PHOTOGRAPHS FROM THE 2013 SURVEYS

**City of Albany Rapp Road Landfill Eastern Expansion
2013 Faunal Surveys Report
Albany Co., NY**



Photo 23 – Restoration site savanna.



Photo 24 – Restoration site.



PHOTOGRAPHS FROM THE 2013 SURVEYS

**City of Albany Rapp Road Landfill Eastern Expansion
2013 Faunal Surveys Report
Albany Co., NY**



Photo 25 – One of the red-headed woodpeckers (*Melanerpes erythrocephalus*) observed on-site.



Photo 26 - One of the red-headed woodpeckers observed on-site.



PHOTOGRAPHS FROM THE 2013 SURVEYS

**City of Albany Rapp Road Landfill Eastern Expansion
2013 Faunal Surveys Report
Albany Co., NY**



Photo 27 – Savannah sparrow (*Passerculus sandwichensis*).



Photo 28 – Lincoln's sparrow (*Melospiza lincolnii*).



PHOTOGRAPHS FROM THE 2013 SURVEYS

**City of Albany Rapp Road Landfill Eastern Expansion
2013 Faunal Surveys Report
Albany Co., NY**



Photo 1 – Frosted elfin (*Callophrys irus*) temporarily detained near Trapping Array # 4 on May 10, 2013.



Photo 2 – Site conditions during the second brood Karner blue butterfly (*Lycaeides melissa samuelis*) surveys.



PHOTOGRAPHS FROM 2013 FE/KBB SURVEYS

City of Albany Rapp Road Landfill Eastern Expansion
2013 Post Construction Wildlife Surveys Report
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Photo 3 – Karner blue butterfly observed near Trapping Array # 4 during the July 10, 2013 survey.



Photo 4 – Karner blue butterfly observed on *Monarda punctata* west of the nursery on July 10, 2013.



PHOTOGRAPHS FROM 2013 FE/KBB SURVEYS

**City of Albany Rapp Road Landfill Eastern Expansion
2013 Post Construction Wildlife Surveys Report
Albany Co., NY**

Sheet 2

CHA # 20398



Photo 5 – Karner blue butterfly observed by an AES biologist on July 11, 2013.



Photo 6 – Karner blue butterfly observed west of the nursery on July 12, 2013.



PHOTOGRAPHS FROM 2013 FE/KBB SURVEYS

**City of Albany Rapp Road Landfill Eastern Expansion
2013 Post Construction Wildlife Surveys Report
Albany Co., NY**

Sheet 3

CHA # 20398



Photo 7 – One of the five Karner blue butterflies observed near Trapping Array # 4 on July 12, 2013.



Photo 8 – Female Karner blue butterfly observed near Trapping Array # 4 on July 15, 2013.



PHOTOGRAPHS FROM 2013 FE/KBB SURVEYS

**City of Albany Rapp Road Landfill Eastern Expansion
2013 Post Construction Wildlife Surveys Report
Albany Co., NY**

Sheet 4

CHA # 20398



Photo 9 – Female Karner blue butterfly observed west of the nursery on July 24, 2013.



Photo 10 – Female Karner blue butterfly observed near Trapping Array # 4 on July 25, 2013.



PHOTOGRAPHS FROM 2013 FE/KBB SURVEYS

**City of Albany Rapp Road Landfill Eastern Expansion
2013 Post Construction Wildlife Surveys Report
Albany Co., NY**

Sheet 5

CHA # 20398

S:090636:111113944

944

2013 Albany Compliance Report

Attachment K. Stream Stability Assessment
Albany Rapp Road Landfill
Ecosystem Mitigation, Restoration & Enhancement Plan
City of Albany, New York Phase II

In accordance with Special Condition (I)6 of the U.S. Army Corps of Engineers permit No. NAN-2005-01137, the following provides a discussion of the relocated and new stream features constructed as part of the Albany Rapp Road Landfill Ecosystem Mitigation, Restoration & Enhancement Plan. Since the streams were constructed in 2011, CHA, on behalf of the City of Albany, has been monitoring stream stability and soil erosion and sedimentation throughout the year, each year during active construction. These monitoring events or inspections occur after each major rainfall event (one inch or greater) or once per week until such time that the site is considered fully stabilized. Wetland modifications were undertaken this spring to improve the conditions for forested wetland and vernal pond function. This work, as well as grading in the vicinity of the pump station has extended the need for site inspections on a regular basis. Both the north and south streams are connected to these areas and therefore have been inspected in accordance with both the USACE permit and the SPDES General Construction Permit.

The two stream corridors (newly created stream to the north and relocated perennial stream to the south) that were constructed in 2011 have stabilized with little additional manipulation. Plug plantings installed in 2012 provided a quick cover of perennial vegetation that helped to stabilize the soils while the prior year's seeding germinated. By spring of this year, the stream corridors have become heavily vegetated and stable. It should be noted that the streams remained stable through tropical storms Irene and Lee, prior to becoming fully vegetated.

Two culverts still remain, providing access to areas of the restoration site where previous approved wetland modifications were carried out. It is intended to keep the access road in place until it is determined that the modified wetlands are functioning appropriately. Once this occurs, new connecting sections of the stream corridors will be established.

The following photos document the site conditions during the growing season.



Photo 1- North Stream looking east from culvert in April.

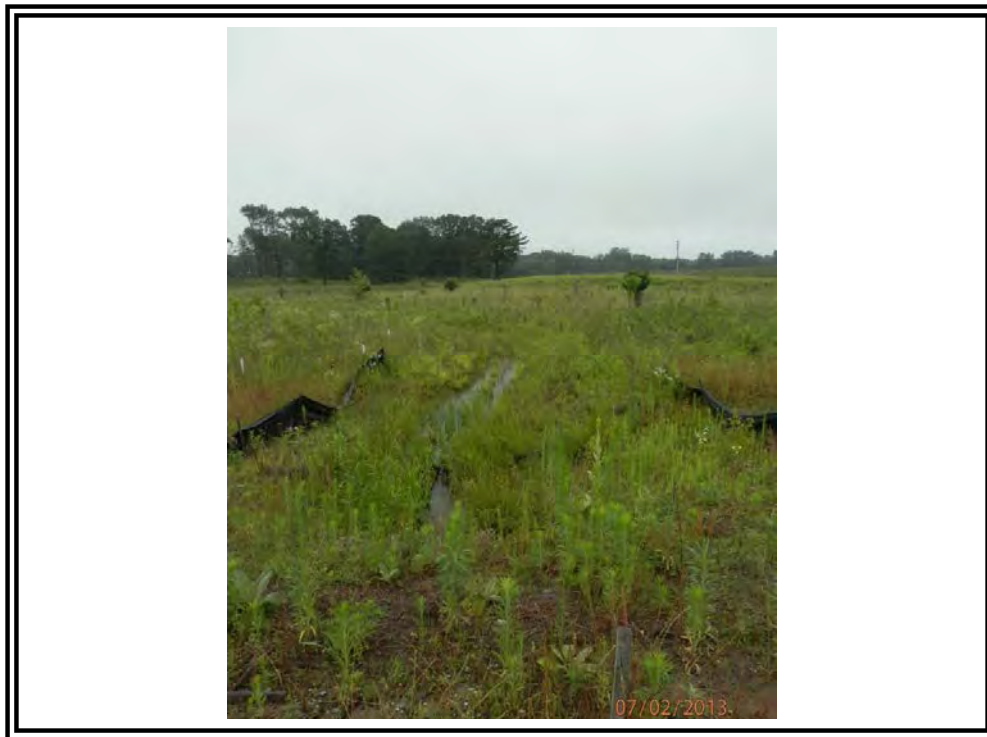


Photo 2 – North Stream looking east from culvert in July.



SITE PHOTOGRAPHS

**Albany DGS Pine Bush Ecological Restoration
Rapp Road Landfill
City of Albany, Albany, New York**

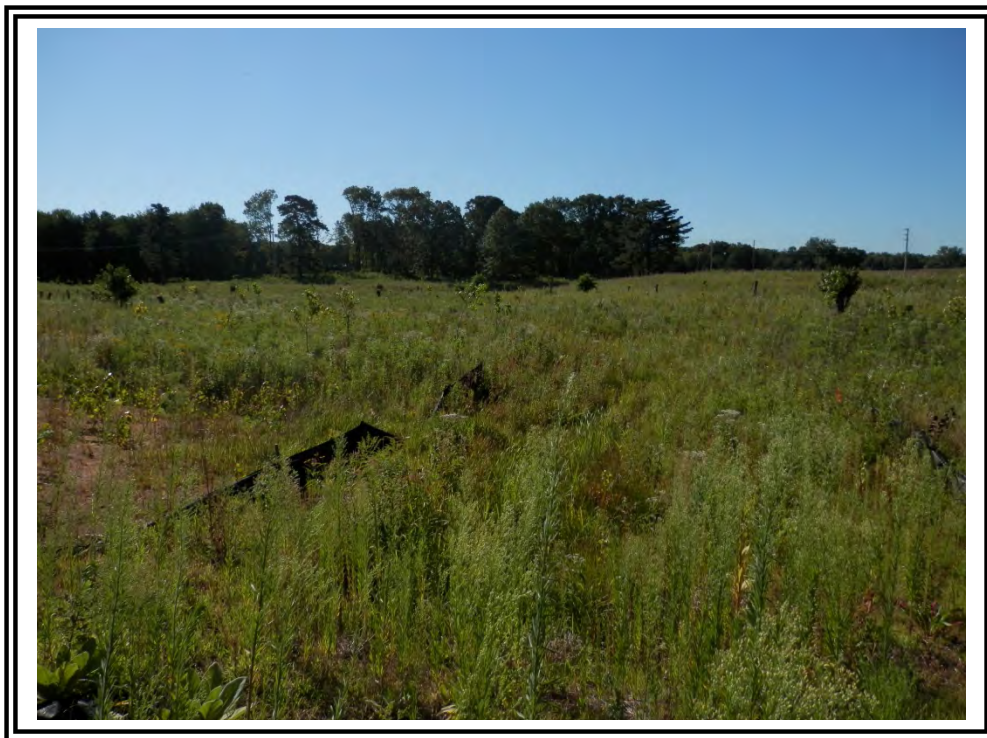


Photo 3- North stream looking east in August



Photo 4 – North stream looking east in October.



SITE PHOTOGRAPHS

**Albany DGS Pine Bush Ecological Restoration
Rapp Road Landfill
City of Albany, Albany, New York**



Photo 5- North stream looking west in April.



Photo 6 – North Stream looking towards west in June.



SITE PHOTOGRAPHS

**Albany DGS Pine Bush Ecological Restoration
Rapp Road Landfill
City of Albany, Albany, New York**



Photo 7- North stream looking towards west in August.



Photo 8 – North stream looking west in October.



SITE PHOTOGRAPHS

**Albany DGS Pine Bush Ecological Restoration
Rapp Road Landfill
City of Albany, Albany, New York**



Photo 9- South stream looking east in April.

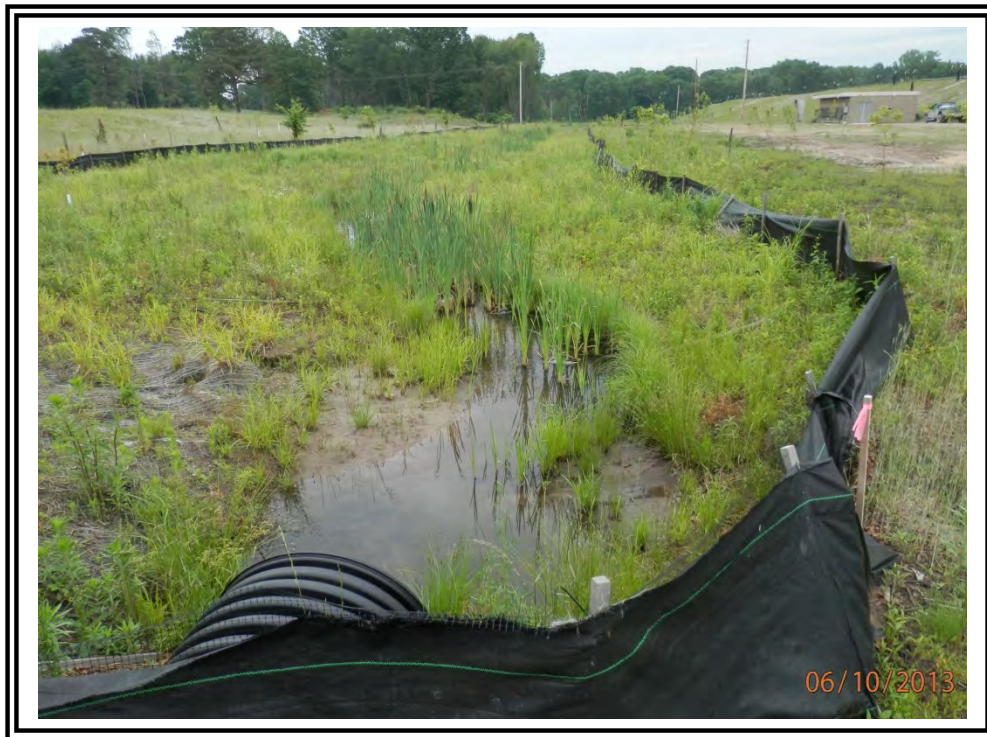


Photo 10 – South stream looking east in June.



SITE PHOTOGRAPHS

**Albany DGS Pine Bush Ecological Restoration
Phase 3 Construction – SWPPP Inspection
Rapp Road Landfill
City of Albany, Albany, New York**



Photo 11- South stream looking east in August.



Photo 12 – South stream looking east in October.



SITE PHOTOGRAPHS

**Albany DGS Pine Bush Ecological Restoration
Rapp Road Landfill
City of Albany, Albany, New York**



Photo 13- South stream looking west in April.



Photo 14 – South stream looking west in June.



SITE PHOTOGRAPHS

**Albany DGS Pine Bush Ecological Restoration
Rapp Road Landfill
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Photo 15 - South stream looking west in August.



Photo 16 – South stream looking west in October.



SITE PHOTOGRAPHS

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