

APPLIED ECOLOGICAL SERVICES, INC.

17921 SMITH ROAD, P.O. BOX 256, BRODHEAD, WI 53520

PHONE: (608)897-8641 FAX: (608)897-8486

email: info@appliedeco.com

SPECIALISTS IN ENVIRONMENTAL MANAGEMENT AND RESEARCH

MEMO

TO: Steve Apfelbaum
FROM: Brad Herrick & John Larson
DATE: December 21, 2006
RE: Albany Landfill Vegetation Data Summary (AES# 06-0590)

Expansion Area Uplands (data sheet 1)

The understory of uplands are characterized by the native perennial *Eupatorium rugosum*, the aggressive non-native *Alliaria petiolata*, and the non-natives *Poa pratensis* and *Celastrus orbiculatus* with a combined 45% of the relative cover. *Prunus serotina* and *Rubus allegheniensis* dominated the shrub layer and *Prunus serotina*, *Quercus rubra*, and *Robinia pseudoacacia* were the most common tree species encountered. The total canopy intercept of 152% in the upland areas, indicates a dense canopy coverage with a shade suppressed ground story component. *Quercus rubra* is the dominant intercept species followed by *Acer rubrum* and *Prunus serotina*. Few trees have a DBH of greater than 12 inches indicative of a young woods.

Expansion Area Wetlands (data sheet 2)

Pilea pumila, *Phragmites australis*, *Osmunda cinnamomea*, and *Impatiens capensis* constitute almost 50% of the relative cover of the herbaceous vegetation in the wetland areas sampled. *Fraxinus pennsylvanica*, *Prunus serotina*, and the non-native *Berberis thunbergii* are dominant species in the shrub layer with *Acer rubrum* being the most common tree species. Similarly to the upland areas the wetlands display a close canopy system with a total intercept of 156%, with *Acer rubrum* constituting 40% of the relative percent intercept. *Prunus serotina* and *Vitis riparia* represent the second and third dominants in the canopy, respectively. Most trees are less than 12 inches DBH, with a few individuals of red maple, cottonwood and white pine achieving 20 inches DBH or greater. The red maple hardwood swamp community can be considered as a young woods.

Disturbed Areas & Trailer Park (data sheet 3)

The non-native species *Poa pratensis* and *Poa compressa* account for over 40% of the relative cover in the herbaceous layer, while *Celastrus orbiculatus*, *Vitis riparia*, and *Solidago canadensis* made up the next 20%. *Celastrus orbiculatus*, *Rubus strigosus* and to a lesser extent *Vitis riparia* are dominants in the shrub layer. Only four trees were observed within the sampling area, all being *Quercus coccinea*. These areas have an open canopy with only 43% total intercept and are comprised of *Acer rubrum* and the shrub/vine species *Vitis riparia* and *Rubus idaeus strigosus*.

Landfill Restoration and Weeds Transects (data sheet 4)

Panicum virgatum and *Poa pratensis* constitute 63% and 10% relative cover respectively in the prairie restoration plots on the landfill cap. *Poa pratensis*, *Festuca elatior*, and *Coronilla varia* equally account for over 85% combined relative cover in the landfill weed transects. No shrubs or trees were observed in these sampling areas.

Communities from this point forward are not in the expansion or restoration areas. These are reference sites.

Karner Blue Butterfly Prairie Habitat (data sheet 5)

The herbaceous plant community sampled in the Pine Bush prairie is dominated by *Andropogon scoparius* with over 53% relative cover. *Rubus flagellaris* and *Polygonum lapathifolium* account for an additional 28% relative cover. Few shrubs species and only a few individual trees were observed. *Prunus serotina* and *Quercus prinoides* were the most common shrub species. As would be expected, the prairie had a low canopy intercept (21%) with the dominant being *Prunus serotina*.

RECEIVED

JAN 08 2007

Clough, Harbour & Associates LLP

Lupines were only occasionally observed as most had died back and were dormant at the time of sampling and thus under represented in the data.

Pine Bush Scrub Oak Forest (data sheet 6)

Vaccinium pallidum, *Rubus* sp., *Quercus bicolor*, and *Pteridium aquilinum latiusculum* account for over 87% relative cover of the understory vegetation. The shrub community is comprised almost entirely of *Quercus illicifolia*. Although, only a few small individuals (<10 inch DBH) of *Pinus rigida* were observed along the transect, it is the dominant canopy species in a closed canopy forest (163% total absolute intercept). *Quercus illicifolia* is the second most dominant species, entirely in the shrub layer.

Pine Bush Scrub Oak Thicket (PBSOT 1&2) (data sheet 7)

The herbaceous layer in the scrub oak thicket that has been brushed and burned (PBSOT 1&2) is relatively evenly dominated by *Carex* sp., *Andropogon scoparius*, *Pteridium aquilinum latiusculum*, *Quercus prinoides*, and *Quercus illicifolia* with a combined relative cover of 77%. *Quercus illicifolia* and *Populus tremuloides* are dominants in the shrub layer. These two species along with *Pinus rigida* comprise the highest relative canopy intercepts. However overall, this community has a low total canopy intercept (29%) indicative of an open to semi-open system.

Pine Bush Scrub Oak Thicket (not burned or brushed) (data sheet 8)

The unburned and unbrushed oak thicket community is dominated by, *Quercus prinoides*, *Carex pensylvanica*, and *Quercus illicifolia* (77% relative cover) in the herbaceous layer and *Quercus illicifolia* and *Quercus prinoides* in the shrub layer. Although only a handful of trees were observed, the shrub layer primarily of *Quercus illicifolia*, *Quercus prinoides*, and *Quercus rubra* contributed the most to an overall very dense canopy cover (total intercept 163%), indicative of a closed/shady system.

Pine Bush Sedge Meadow (data sheet 9)

Carex stricta and *Rubus hispidus* account for over 56% of the herbaceous species relative cover in the sedge meadow. *Spiraea alba* is the dominant shrub species observed. The sedge meadow has a very low absolute canopy intercept (11%) and is comprised mostly of *Spiraea alba* in the interior and *Quercus prinoides* towards the periphery.

Pine Bush Hanging Fen (data sheet 10)

Five species, *Carex pellita*, *Andropogon scoparius*, *Carex stricta*, *Rubus allegheniensis*, and *Osmunda regalis spectabilis* account for almost 60% of the relative cover in the hanging fen herbaceous community. *Spiraea alba* and *Rubus idaeus strigosus* are dominant in the shrub layer. These species also have the highest percent intercept although overall the canopy intercept was very low (18%).

Vernal Pool 1 (data sheet 11)

Aralia sp., *Rubus* sp., *Vaccinium corymbosum*, and *Quercus prinoides*, account for almost 75% of the relative cover in the herbaceous layer. *Vaccinium corymbosum* is also dominant in the shrub layer and *Acer rubrum* is the dominant tree species. Vernal Pool 1 has a closed canopy (137% absolute intercept) that is dominated by *Acer rubrum* and *Betula populifolia*.

Vernal Pool Red Maple Swamp (data sheet 12)

Rubus sp. and *Osmunda regalis spectabilis* account for almost 50% of the herbaceous relative cover. While the shrub layer is minimal, there is a dense canopy (105% absolute intercept) dominated by *Vaccinium corymbosum*, *Acer rubrum*, and *Populus deltoides*.

Wetland (Pond) (data sheet 13)

With 30% relative cover, *Osmunda claytoniana* is the dominant herbaceous species present. Other important species include, *Vaccinium corymbosum* (10%), *Daucus carota* (7%) and *Carex stricta* (7%). *Alnus rugosa* is most common in the shrub layer, however the wetland is relatively void of shrubs. In addition, the canopy is relatively open (58% absolute intercept) with *Acer rubrum* and *Populus deltoides* the most common. Open water comprises over 60% of the transect.

Wetland (Button Bush Swamp) (data sheet 14)

The herbaceous relative cover in this wetland is dominated by *Lemna minor* (42%), *Lycopus americanus* (21%), and *Carex stricta* (17%). *Cephalanthus occidentalis* overwhelmingly dominates the shrub layer with almost the entire total intercept of 129% comprised of *Cephalanthus occidentalis*.

Wetland (Bog) (data sheet 15)

Dominant herbaceous species in the bog include Sphagnum moss (51%), *Dulichium arundinaceum* (19%), and *Carex stricta* (19%). *Vaccinium corymbosum* is the only species in the shrub layer. The total canopy intercept (83%) is dominated by trees of *Acer rubrum* and *Betula populifolia*.

Seed Bank Data

Sixteen known species and 60 unknowns (repotted and being grown to an identifiable age) were identified from 41 seed bank samples. As of 12/5/06, 1,075 seedlings were collected. The seed bank samples are being cold-stratified over winter and the greenhouse germination will continue in March.

Expansion Upland Summary

Sheet 1

HERBACEOUS SPECIES*	AF	RF	AC	RC	IV
Eupatorium rugosum	14	6.25	220.00	14.36	20.61
Alliaria petiolata	21	9.38	173.00	11.29	20.67
Poa pratensis	3	1.34	142.00	9.27	10.61
Celastrus orbiculatus	12	5.36	132.00	8.62	13.97
Osmunda cinnamomea	3	1.34	90.00	5.87	7.21
Fraxinus americana	9	4.02	79.00	5.16	9.17
Osmunda claytoniana	3	5.36	53.00	3.46	4.80
Prunus serotina	12	2.68	48.00	3.13	8.49
Athyrium filix-femina	6	0.45	38.00	2.48	5.16
Aster lateriflorus	1	2.27	30.00	1.96	2.40

*top ten species

Canopy Intercept**

Location & Species Expansion Area (E)	Total Absolute % Intercept	Relative % Intercept	Absolute % Intercept
Upland	152		
Quercus rubra		17	38
Acer rubrum		16	37
Prunus serotina		14	32

**top three species

Stem Density Species	Size Classes (DBH)					12-14in	14-16in	16-18in	18-20in	20in+	Total	Stems/ha
	<2in	2-4in	4-6in	6-8in	8-10in	10-12in						
Acer rubrum	7(3)	1(1)	2		1	1					12(4)	250(92)
Carpinus caroliniana		1	5								6	79
Celastrus orbiculatus	4										4	105
Cornus racemosa	7										7	184
Corylus americana	3										3	79
Crataegus sp.	3										3	79
Dead unknown	(2)	(1)	(2)								(5)	(92)
Fraxinus americana	5										5	132
Fraxinus pennsylvanica	1(4)	1	1								3(4)	52(105)
Hamamelis virginiana	32	1									33	855
Ilex verticillata	3(1)										3(1)	79(26)
Lindernia benzoin	6										6	156
Lonicera tatarica	4										4	105
Parthenocissus quinquefolia	5	6									11	211
Pinus rigida					1		1				2	26
Pinus strobus	3	8	1	2							14	224
Populus grandidentata					1						1	13
Prunus pennsylvanica	3										3	79
Prunus serotina	52(2)	8(1)	3	5	2						70(3)	1605(66)
Prunus virginiana	13										13	342
Quercus alba			1								1	13
Quercus coccinea				1							1	13
Quercus palustris		1									2	26
Quercus rubra	5(1)	4(2)	3		1	3		1		1	18(3)	303(52)
Quercus sp		1									1	13
Quercus velutina											1	13
Robinia pseudoacacia	1			1	1	1	1			1	8	118
Rubus allegheniensis	47										47	1237
Rubus occidentalis	1										1	26
Sambucus canadensis	1										1	26
Ulmus americana	1		1								2	39
Ulmus rubra	1	1(1)			1						3(1)	52(13)
Viburnum recognitum	1										1	26
Vitis riparia	1										1	26
Total	142(13)	20(6)	17(2)	10	8	5	2	1	0	2	250(21)	6588(131)
Total Stems/ ha	3737(342)	263(79)	224(26)	132	105	66	26	13	0	26		

Expansion Wetland Summary

Sheet 2

HERBACEOUS SPECIES*		AF	RF	AC	RC	IV
<i>Pilea pumila</i>		14	6.11	381.00	18.67	24.78
<i>Phragmites australis</i>		5	2.18	215.00	10.53	12.72
<i>Osmunda cinnamomea</i>		5	2.18	181.00	8.87	11.05
<i>Impatiens capensis</i>		15	6.55	166.00	8.13	14.68
<i>Onoclea sensibilis</i>		16	6.99	137.00	6.71	13.70
<i>Celastrus orbiculatus</i>		16	6.99	113.00	5.54	12.52
<i>Athyrium filix-femina</i>		6	2.62	108.00	5.29	7.91
<i>Alliaria petiolata</i>		10	4.37	68.00	3.33	7.70
<i>Solidago canadensis</i>		5	2.18	65.00	3.18	5.37
<i>Rubus allegheniensis</i>		6	2.62	58.00	2.84	5.46

*top ten species

Species	Stem Density	Size Classes (DBH)										Total	Stems/ha
		<2in	2-4in	4-6in	6-8in	8-10in	10-12in	12-14in	14-16in	16-18in	18-20in	20in+	
<i>Acer rubrum</i>	1			6	1	4	3						15
<i>Berberis thunbergii</i>	10												10
<i>Celastrus orbiculatus</i>	1												1
<i>Fraxinus americana</i>	3			1									4
<i>Fraxinus pennsylvanica</i>	18												18
<i>Lonicera tatarica</i>	2												2
<i>Pinus strobus</i>								1				2	3
<i>Populus deltoides</i>												2	2
<i>Prunus serotina</i>	6								2	1		1	10
<i>Quercus rubra</i>			1										1
<i>Ulmus americana</i>			1										1
<i>Viburnum recognitum</i>	4(2)												4
Total	38	547(29)	5	36	7	29	22	7	2	1	0	5	71(2)
Total Stems/ ha				50	7	29	22	7	14	7	0	22	813(29)

Canopy Intercept**

Location & Species	Total	
	Absolute % Intercept	Relative % Intercept
Expansion Area (E) Wetland	156	
<i>Acer rubrum</i>		40
<i>Prunus serotina</i>		13
<i>Vitis riparia</i>		7

**top three species

Disturbed Areas & Trailer Park Summary

Sheet 3

HERBACEOUS SPECIES*

	AF	RF	AC	RC	IV
Poa pratensis	21	8.50	905.00	22.09	30.60
Poa compressa	12	4.86	785.00	19.17	24.02
Celastrus orbiculatus	7	2.83	268.00	6.54	9.38
Vitis riparia	18	7.29	245.00	5.98	13.27
Solidago canadensis	9	3.64	218.00	5.32	8.97
Phragmites australis	7	2.83	150.00	3.66	6.50
Rubus idaeus strigosus	4	1.62	137.00	3.34	4.96
Digitaria sanguinalis	7	2.83	111.00	2.71	5.54
Festuca elatior	8	3.24	106.00	2.59	5.83
Rubus allegheniensis	3	1.21	80.00	1.95	3.17

*top ten species

Stem Density	Size Classes (DBH)											Total	Stems/ha
Species	<2in	2-4in	4-6in	6-8in	8-10in	10-12in	12-14in	14-16in	16-18in	18-20in	20in+	Total	Stems/ha
Betula populifolia	1											1	25
Celastrus orbiculatus	96											96	2400
Cornus racemosa	24											24	600
Dead unknown	(1)											(1)	25
Elaeagnus sp	3											3	75
Ligustrum vulgare	13											13	325
Parthenocissus quinquefolia	7											7	175
Populus deltoides	2											2	50
Prunus virginiana	2											2	50
Quercus coccinea					1			2			1	4	50
Rhamnus cathartica	1											1	25
Rhus glabra	1											1	25
Rhus typhina	1											1	25
Rubus allegheniensis	3											3	75
Rubus strigosus	92											92	2300
Salix sp	2											2	50
Vitis riparia	19											19	475
Vitis sp.	27											27	675
Total	294(1)	0	0	0	1	0	0	2	0	0	1	298(1)	
Total Stems/ ha	7350(25)	0	0	0	13	0	0	25	0	0	13		7425

Canopy Intercept**

Location & Species	Total Absolute % Intercept	Relative % Intercept	Absolute % Intercept
DS and TP	48		
Acer rubrum		13	6
Vitis riparia		12	6
Rubus idaeus strigosus		11	6

**top three species

HERBACEOUS SPECIES*	AF	RF	AC	RC	IV
Panicum virgatum	10	16.67	720.00	63.44	80.10
Poa pratensis	5	8.33	115.00	10.13	18.47
Sorghastrum nutans	4	6.67	81.00	7.14	13.80
Andropogon gerardii	3	5.00	52.00	4.58	9.58
Ambrosia artemisiifolia elatior	4	6.67	28.00	2.47	9.13
*top five species					

Landfill Weeds Summary

HERBACEOUS SPECIES*	AF	RF	AC	RC	IV
Poa pratensis	8	15.69	32.40	31.67	47.36
Festuca elatior	7	13.73	29.70	29.03	42.76
Coronilla varia	5	9.80	25.40	24.83	34.63
Cirsium arvense	4	7.84	6.90	6.74	14.59
Ambrosia artemisiifolia elatior	2	3.92	5.00	4.89	8.87
*top five species					

HERBACEOUS SPECIES*					
	AF	RF	AC	RC	IV
Andropogon scoparius	20	20.41	815.00	53.51	73.92
Rubus flagellaris	5	5.10	229.00	15.04	20.14
Polygonum lapathifolium	5	5.10	206.00	13.53	18.63
Rubus hispidus	5	5.10	94.00	6.17	11.27
Digitaria sanguinalis	8	8.16	85.00	5.58	13.74

*top five species

Stem Density		Size Classes (DBH)											
Species	<2in	2-4in	4-6in	6-8in	8-10in	10-12in	12-14in	14-16in	16-18in	18-20in	20in+	Total	Stems/ha
Prunus serotina	8			1		(1)						9(1)	425
Quercus prinoides	13	2										15	350
Rubus idaeus strigosus	4											4	100
Vaccinium pallidum	3											3	75
Total	27	2	0	1	0	(1)	0	0	0	0	0	31(1)	
Total Stems/ ha	1350	50	0	25	0	25	0	0	0	0	0		950

Canopy Intercept**

Location & Species	Total Absolute %	Relative %	Absolute %
	Intercept	Intercept	Intercept
Prairie (PBKBH)	21		
Pinus rigida		30	6
Prunus serotina alive		42	9
Prunus serotina dead		16	3

***top three species

Pine Bush Scrub Oak Forest Summary

Sheet 6

HERBACEOUS SPECIES*	AF	RF	AC	RC	IV
Vaccinium pallidum	6	15.38	242.0	36.07	51.45
Rubus (dewberry)	7	17.95	160.0	23.85	41.79
Quercus bicolor	9	23.08	110.0	16.39	39.47
Pteridium aquilinum latiusculum	4	10.26	75	11.18	21.43
Carex sp	2	5.13	22	3.28	8.41

*top five species

Stem Density	Size Classes (DBH)												
Species	<2in	2-4in	4-6in	6-8in	8-10in	10-12in	12-14in	14-16in	16-18in	18-20in	20in+	Total	Stems/ha
Betula populifolia	1	1										2	150
Crataegus sp.	2											2	200
Pinus rigida				2	(1)							2(1)	100(50)
Populus tremuloides	5	1(1)	(1)			1						7(2)	600(200)
Quercus illicifolia	53(4)											53(4)	5300(200)
Quercus prinoides	2											2	200
Toxicodendrum radicum	1											1	100
Total	64(4)	2(1)	(1)	2	(1)	1	0	0	0	0	0	39(7)	
Total Stems/ ha	6400(400)	100(50)	0(50)	100	0(50)	50	0	0	0	0	0		6650(450)

Canopy Intercept**

Location & Species	Total Absolute % Intercept	Relative % Intercept	Absolute % Intercept
Scrub Oak Forest (PBSOF1)	163		
Pinus rigida		45	73
Quercus illicifolia		29	47
Betula populifolia		7	11

***top three species

Pine Bush Scrub Oak Thicket Summary

Sheet 7

HERBACEOUS SPECIES*	AF	RF	AC	RC	IV
Carex sp.	11	13.75	375.0	19.77	33.52
Andropogon scoparius	7	8.75	292.0	15.39	24.14
Pteridium aquilinum latiusculum	15	18.75	279.0	14.71	18.24
Quercus prinoides	10	12.5	274	14.44	26.94
Quercus ilicifolia	6	7.5	250	13.18	20.68

***top five species

Stem Density	Size Classes (DBH)												
Species	<2in	2-4in	4-6in	6-8in	8-10in	10-12in	12-14in	14-16in	16-18in	18-20in	20in+	Total	Stems/ha
Dead unknown	(1)											(1)	50
Populus tremuloides	63(6)	2										65(6)	3200(300)
Quercus illicifolia	140(7)											140(7)	7000(350)
Quercus prinoides	5											5	250
Vaccinium pallidum	31											31	1550
Total	239(14)	2	0	0	0	0	0	0	0	0	0	241(14)	
Total Stems/ ha	11950(700)	50	0	0	0	0	0	0	0	0	0		12050(650)

Canopy Intercept**

Location & Species	Total Absolute % Intercept	Relative % Intercept	Absolute % Intercept
Brushed Burned Scrub Oak (PPSOT 1&2)	29		
Quercus ilicifolia		50	15
Pinus rigida		21	6
Populus tremuloides		17	5

***top three species

Pine Bush Scrub Oak Thicket (not burned or brushed area) Summary

HERBACEOUS SPECIES*	AF	RF	AC	RC	IV
Quercus prinoides	4	8.00	145.0	30.21	38.21
Carex pennsylvanica	4	8.00	117.0	24.38	32.38
Quercus ilicifolia	8	16.00	109.0	22.71	38.71
Peridium aquilinum latiusculum	7	14	38	7.92	21.92
Andropogon scoparius	2	4	12	2.5	6.5

*top five species

Stem Density		Size Classes (DBH)											
Species	<2in	2-4in	4-6in	6-8in	8-10in	10-12in	12-14in	14-16in	16-18in	18-20in	20in+	Total	Stems/ha
Populus grandidentata	1	1(3)										2(3)	150(150)
Prunus serotina	4											4	400
Quercus ilicifolia	69(5)	3										72(5)	7050(500)
Quercus prinoides	33											33	3300
Vaccinium corymbosum	2											2	200
Total	109(5)	4(3)	0	0	0	0	0	0	0	0	0	113(8)	
Total Stems/ ha	10900(500)	200(150)	0	0	0	0	0	0	0	0	0		11100(650)

Canopy Intercept**

Location & Species	Total Absolute % Intercept	Relative % Intercept	Absolute % Intercept
Scrub Oak (PPSOT 3) Not burned or brushed	163		
Quercus ilicifolia		42	68
Quercus prinoides		12	19
Quercus rubra alive		11	18

**top three species

HERBACEOUS SPECIES*	AF	RF	AC	RC	IV
Carex stricta	9	16.07	48.36	44.52	60.59
Rubus hispidus	4	7.14	12.82	11.80	18.94
Spiraea alba	6	10.71	9.55	8.79	19.50
Thelyptris palustris	7	12.50	7.18	6.61	19.11
Vaccinium corymbosum	2	3.57	5.73	5.27	8.84

*top five species

Stem Density		Size Classes (DBH)											
Species	<2in	2-4in	4-6in	6-8in	8-10in	10-12in	12-14in	14-16in	16-18in	18-20in	20in+	Total	Stems/ha
Spiraea alba	35(9)											35(9)	7000(1800)
Vaccinium corymbosum	6											6	1200
Vaccinium pallidum	6											6	1200
Total	47(9)	0	0	0	0	0	0	0	0	0	0	47(9)	
Total Stems/ ha	9400(1800)	0	0	0	0	0	0	0	0	0	0		9400(1800)

Canopy Intercept**

Location & Species	Total Absolute % Intercept	Relative % Intercept	Absolute % Intercept
Sedge Meadow (PBSM)	11		
Spiraea alba		57	6
Quercus prinoides		30	3
Vaccinium sp.		11	1

***top three species

Sloping Fen Summary

Sheet 10

HERBACEOUS SPECIES*

	AF	RF	AC	RC	IV
Carex pellita	3	8.82	165.0	17.90	26.72
Andropogon scoparius	2	5.88	160.0	17.35	23.24
Carex stricta	2	5.88	110.0	11.93	17.81
Rubus allegheniensis	4	11.76	102	11.06	22.83
Osmunda regalis spectabilis	1	2.94	80	8.68	11.62

*top five species

Stem Density	Size Classes (DBH)											Total	Stems/ha
Species	<2in	2-4in	4-6in	6-8in	8-10in	10-12in	12-14in	14-16in	16-18in	18-20in	20in+	Total	Stems/ha
Acer rubrum	1											1	200
Rubus allegheniensis	5(1)											5(1)	1000(200)
Rubus strigosus	31(4)											31(4)	6200(800)
Spiraea alba	53											53	10600
Total	90(5)	0	0	0	0	0	0	0	0	0	0	90(5)	
Total Stems/ ha	18000(1000)	0	0	0	0	0	0	0	0	0	0		18000(1000)

Canopy Intercept*

Location & Species	Total Absolute % Intercept	Relative % Intercept	Absolute % Intercept
Hanging Fen	18		
Rubus idaeus strigosus		47	8
Spiraea alba		33	6
Rubus allegheniensis		13	2

*top three species

Vernal Pool 1 Summary

Sheet 11

HERBACEOUS SPECIES*	AF	RF	AC	RC	IV
Aralia sp.	1	7.69	10.0	22.73	30.42
Rubus sp.	1	7.69	10.0	22.73	30.42
Vaccinium corymbosum	3	23.08	7.0	15.91	38.99
Quercus prinoides	1	7.69	5	11.36	19.06
Carex stricta	1	7.69	3	6.82	14.51

*top five species

Stem Density	Size Classes (DBH)									
Species	<2in	2-4in	4-6in	6-8in	8-10in	10-12in	12-14in	14-16in	16-18in	18-20in
Acer rubrum	1(5)	6(5)	5	6	4					
Betula populifolia	(3)									
Vaccinium corymbosum	17(7)									
Total	18(15)	6(5)	5	6	4	0	0	0	0	0
Total Stems/ ha	3600(3000)	600(500)	500	600	400	0	0	0	0	0

	Total	20in+	18-20in	16-18in	14-16in	12-14in	10-12in	8-10in	6-8in	4-6in	2-4in	1-2in	Stems/ha
	22(10)												2300(1500)
	(3)												600
	17(7)												3400(1400)
	39(20)												6300(2900)

Canopy Intercept**

Location & Species	Total Absolute % Intercept	Relative % Intercept	Absolute % Intercept
Vernal Pool 1	137		
Acer rubrum		58	79
Betula populifolia		25	34
Populus grandidentata		9	12

**top three species

Vernal Pool-Red Maple Swamp Summary

Sheet 12

HERBACEOUS SPECIES*	AF	RF	AC	RC	IV
Rubus (dewberry)	1	5.26	40.0	28.70	33.43
Osmunda regalis	1	5.26	25.0	17.61	22.87
Prunus serotina	2	10.53	13.0	9.15	19.68
Lonicera tatarica	1	5.26	10	7.04	12.31
Vaccinium angustifolium	1	5.26	10	7.04	12.31

*top five species

Stem Density	Size Classes (DBH)											Total	Stems/ha
Species	<2in	2-4in	4-6in	6-8in	8-10in	10-12in	12-14in	14-16in	16-18in	18-20in	20in+	Total	Stems/ha
Acer rubrum	2(1)	2										4(1)	600(200)
Betula populifolia	(3)	7(1)										7(4)	700(700)
Lonicera tatarica	8(1)											8(1)	1600(200)
Prunus serotina	4(1)											4(1)	800(200)
Rubus sp.	3											3	600
Total	17(6)	9(1)	0	0	0	0	0	0	0	0	0	26(7)	4300(1300)
Total Stems/ ha	3400(1200)	900(100)	0	0	0	0	0	0	0	0	0		

Canopy Intercept**

Location & Species	Total Absolute % Intercept	Relative % Intercept	Absolute % Intercept
Vernal Pool 1 - Red Maple Swamp	105		
Vaccinium corymbosum		27	28
Acer rubrum		24	25
Populus deltoides		16	17

**top three species

Wetland (Pond) Summary

Sheet 13

HERBACEOUS SPECIES*	AF	RF	AC	RC	IV
<i>Osmunda claytoniana</i>	1	3.57	90.0	29.90	33.47
<i>Vaccinium corymbosum</i>	1	3.57	30.0	9.97	13.54
<i>Daucus carota</i>	1	3.57	20.0	6.64	10.22
<i>Carex stricta</i>	1	3.57	20.0	6.64	10.22
<i>Desmodium canadense</i>	1	3.57	15	4.98	8.55
<i>Onoclea sensibilis</i>	1	3.57	15	4.98	8.55

*top six species

Stem Density		Size Classes (DBH)											
Species	<2in	2-4in	4-6in	6-8in	8-10in	10-12in	12-14in	14-16in	16-18in	18-20in	20in+	Total	Stems/ha
Acer rubrum	2	2				2						6	400
Alnus rugosa	24											24	2400
Betula populifolia		3										3	150
Populus tremuloides		1										1	50
Rubus allegheniensis	15											15	1500
Total	41	6	0	0	0	2	0	0	0	0	0	45	
Total Stems/ ha	4100	300	0	0	0	100	0	0	0	0	0	4100	4500

Canopy Intercept**

Location & Species	Total Absolute % Intercept	Relative % Intercept	Absolute % Intercept
Wetland 1 (Pond)	58		
<i>Acer rubrum</i>		35	20
<i>Populus deltoides</i>		22	13
<i>Salix nigra</i>		7	4

**top three species

Wetland (Button Bush) Summary

Sheet 14

HERBACEOUS SPECIES*

	AF	RF	AC	RC	IV
<i>Lemna minor</i>	6	17.14	285.0	41.67	58.81
<i>Lycopus americanus</i>	6	17.14	145.0	21.20	38.34
<i>Carex stricta</i>	3	8.57	115.0	16.81	25.38
<i>Quercus velutina</i>	1	2.86	20.0	2.92	5.78
<i>Galium sp.</i>	3	8.57	16	2.34	10.91

*top five species

Stem Density	Size Classes (DBH)										Total	Stems/ha
Species	<2in	2-4in	4-6in	6-8in	8-10in	10-12in	12-14in	14-16in	16-18in	18-20in	20in+	
<i>Betula populifolia</i>		1										63
<i>Cephalanthus occidentalis</i>	602											602
<i>Corylus americana</i>	6											6
<i>Pinus resinosa</i>										1		1
<i>Quercus alba</i>						1						63
<i>Quercus coccinea</i>					1							63
<i>Quercus illicifolia</i>	1											1
<i>Quercus velutina</i>		1										1
<i>Vaccinium corymbosum</i>	24											24
Total	633	2	0	0	1	1	0	0	0	0	1	638
Total Stems/ ha	79125	125	0	0	63	63	0	0	0	0	63	79440

Canopy Intercept**

Location & Species	Total Absolute % Intercept	Relative % Intercept	Absolute % Intercept
Wetland 2 (Button bush)	129		
<i>Cephalanthus occidentalis</i>		52	67
<i>Quercus alba</i>		15	19
<i>Pinus resinosa</i>		8	11

**top three species

HERBACEOUS SPECIES*	AF	RF	AC	RC	IV
Sphagnum moss	11	26.19	1005.0	50.83	77.03
Dulichium arundinaceum	5	11.36	405.0	18.60	29.97
Carex stricta	9	21.43	385.0	19.47	40.9
Scirpus cyperinus	5	11.36	185.0	8.50	19.86
Chamaedaphne calyculata	3	6.82	55	2.53	9.34

*top five species

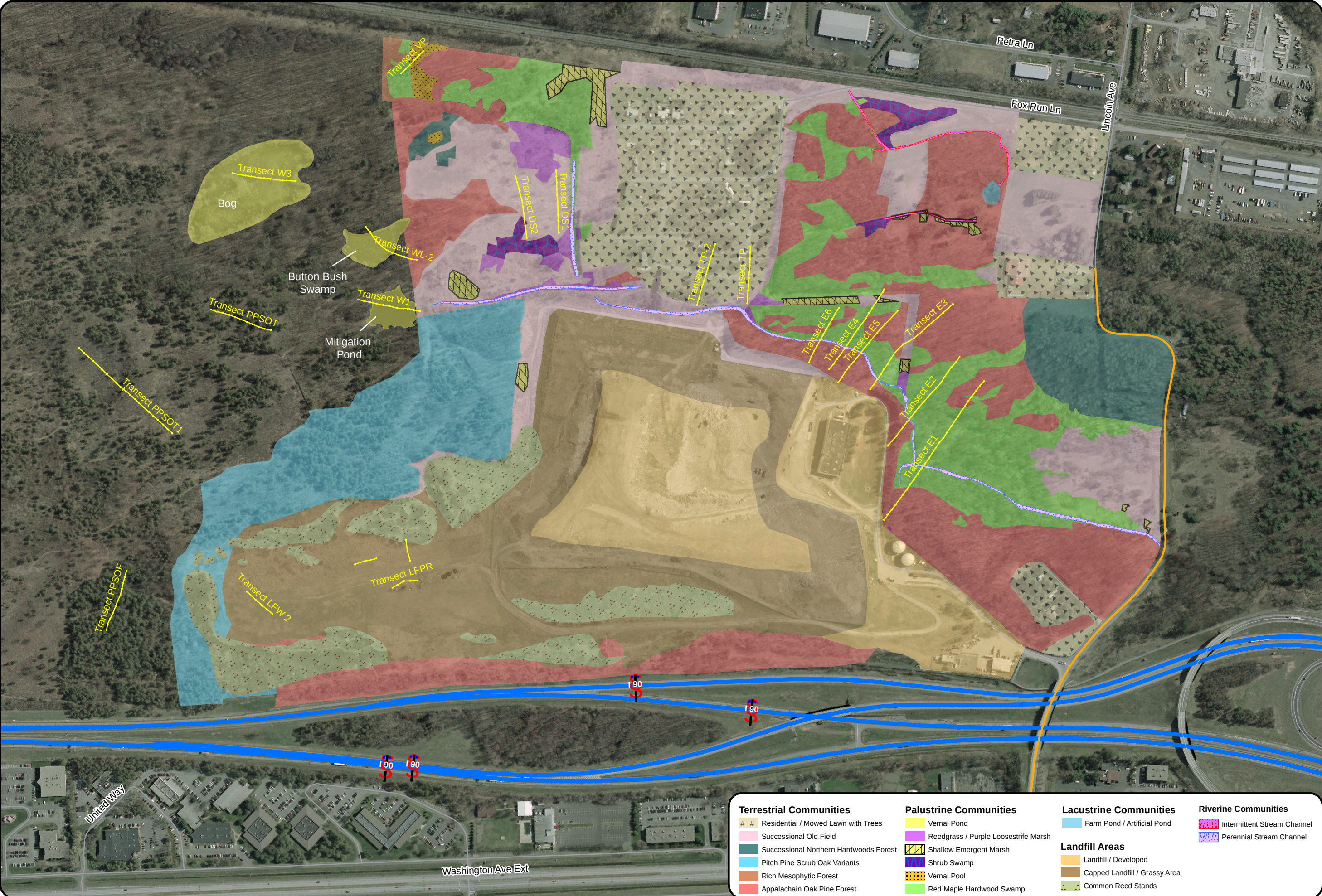
Stem Density		Size Classes (DBH)											
Species	<2in	2-4in	4-6in	6-8in	8-10in	10-12in	12-14in	14-16in	16-18in	18-20in	20in+	Total	Stems/ha
Betula populifolia		4										4	133
Nyssa sylvatica			1	1								2	67
Populus tremuloides			1									1	33
Vaccinium corymbosum	49											49	3267
Total	49	4	2	1	0	0	0	0	0	0	0	56	
Total Stems/ ha	3267	133	67	33	0	0	0	0	0	0	0		3500

Canopy Intercept**

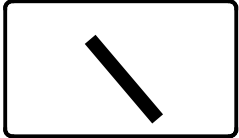
Location & Species	Total Absolute % Intercept	Relative % Intercept	Absolute % Intercept
Wetland 3 (Bog)	83		
<i>Acer rubrum</i>		28	23
<i>Betula populifolia</i>		16	14
<i>Quercus coccinea</i>		14	12

**top three species

ATTACHMENT 2
VEGETATION DATA SUMMARY



No.	Submittal / Revision	App'd	By	Date



City of Albany
Department
of General Services
One Connors Boulevard
Albany, New York

CIA

CLOUGH HARBOUR & ASSOCIATES LLP

III Winners Circle, P.O. Box 5269 • Albany, NY 12205-0269

Main: (518)453-4500 • www.cloughharbour.com

Drawing Copyright © 2007 Clough Harbour and Associates LLP

Rapp Road Landfill
Eastern Expansion

Vegitative Communities Map

Issue Date: 04/07

Project Number: 12260

Scale: 1" equals 450'

Figure 3.3-1