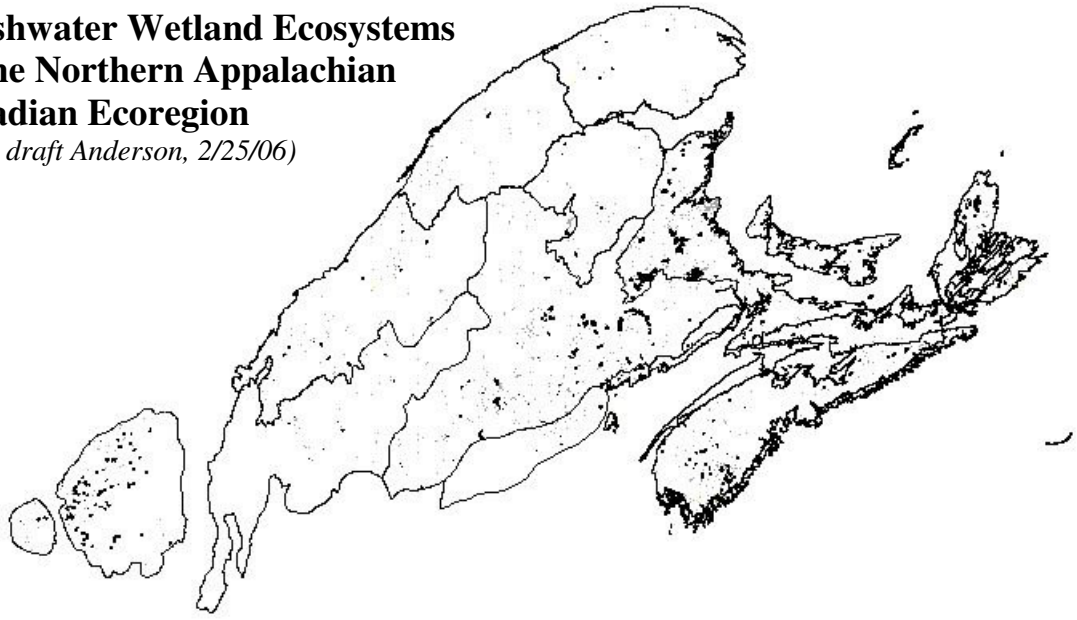
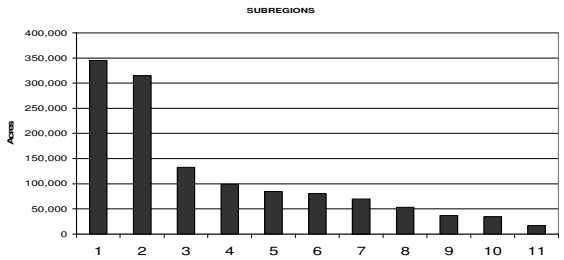
Freshwater Wetland Ecosystems in the Northern Appalachian /Acadian Ecoregion

(final draft Anderson, 2/25/06)



Much of the Northern Appalachian / Acadian region is soggy. Massive holocene glaciers left behind a legacy of deranged drainage patterns forming over a million acres of marshes, mudflats, seeps, swamps and spongy bogs. Wetlands constitute 2 percent of the ecoregion with over 29,000 discrete examples averaging 43 acres in size. They are unevenly distributed across subregions with the easternmost Acadian uplands and the Bras D'Or lowlands having more wetlands than the rest of the subregions combined (Table 1[1]). The largest wetland in the region is over 34,000 acres.

Table 1. The distribution of wetland occurrences by subregion. Chart insert shows the relative acreage by subregion.



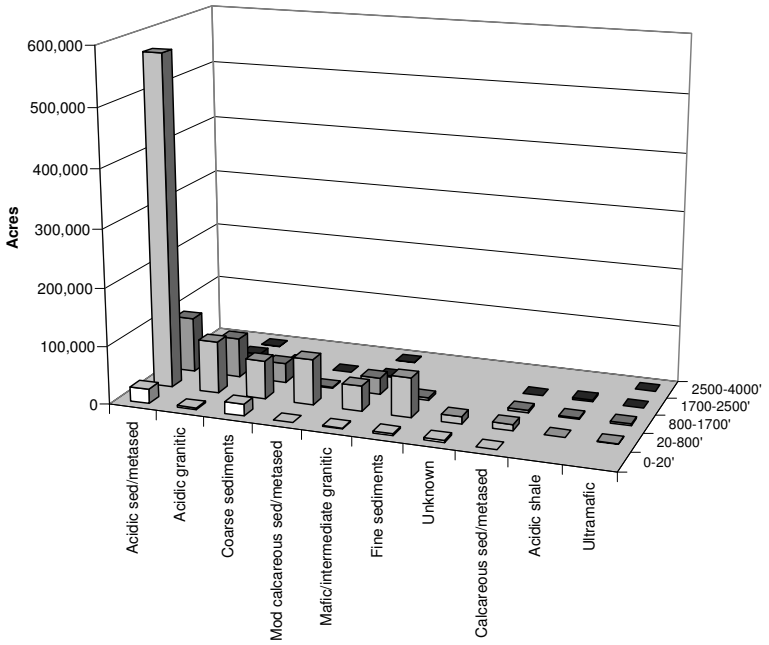
#	SUBREGION	Number of Wetlands	Total Acreage	Average Size	Maximum Size
1	Acadian 'Uplands'	6,790	345,536	51	10,910
2	Northumberland - Bras D'Or 'lowlands'	4,607	314,981	68	34,462
3	Nova Scotia Hills & Drumlins	3,683	132,938	36	2,566
4	Adirondacks & Tug Hill	2,334	99,127	42	1,843
5	Gulf of Maine, Bay of Fundy, Minas Basin	1,490	84,397	57	5,194
6	Estrie-Beauce Plateaus & Hills / St. John Uplands	3,356	80,360	24	2,386
7	Atlantic Coast	1,144	69,619	61	4,922
8	Acadian Highlands	1,467	53,430	36	2,610
9	Green & White Mountains	1,036	36,369	35	1,965
10	Temiscouata Hills - St. John Uplands - North	1,886	33,856	18	2,522
11	Gaspe Peninsula	1,311	16,626	13	1,327
	Grand Total	29,312	1,273,517	43	34,462

[1] Statistics exclude wetlands under 2 acres

Freshwater Wetland Biodiversity:

Individual wetlands occur on all substrate types and across all elevation zones however, they are six time more common at low elevations in acidic sedimentary bedrock than the next most common combination (Figure 1). Protecting examples from across the spectrum of environmental settings is important for conserving biodiversity as the species composition varies with physical factors (Table 2). Special attention was also given to representing all the variation in the common low sedimentary setting.

Figure 1. The distribution of open wetlands across elevation and bedrock gradients in the Northern Appalachian / Acadian ecoregion. Low elevation wetlands on acidic sedimentary or metasedimentary till are almost 6 times more common than any other type of wetland.



Ecologists recognize about 50 distinct wetland communities in the ecoregion based on species composition and structure. The dominant vegetation structure of the various wetland types tends to be correlated with the degree of permanent saturation and may be conveniently grouped into the broad categories listed below.

Swamp: a seasonally flooded wetland with more woody plants than a marsh and better drainage than a bog. (16 types).
Marsh: a frequently inundated wetland characterized by grassy or reedy (emergent herbaceous) vegetation adapted to saturated soils. (4 types)
Bog: a peat-accumulating wetland with no significant inflows or outflows, dominated by acid tolerant mosses (sphagnum) and characteristic shrubs and herbs. (12 types)
Fen: a peat-accumulating wetland that receives drainage from surrounding mineral soils and supports grassy marsh-like vegetation dominated by sedges. (10 types)
Wet meadow: a grassland with waterlogged soil near the surface but without standing water for most of the year. (1 types)
Other wetlands: seeps, flushes, seepage forest, floodplain, river-scour, pondshore and vernal pool systems – these wetland types are discussed in separate sections on floodplain and riparian ecosystems and small fluctuating wetlands..

Relationships between communities, rare species and the wetland occurrences.

The various types of wetlands develop in slightly different environs. Some are particularly faithful to certain bedrock types while others are tolerant of a broad range of conditions (Table 2 & 3).

Table 2. Relationships between bedrock setting and plants species in open wetlands. Based on 423 US Natural Heritage element occurrence data for the Northern Appalachians

Species Name	Common name	Granitic	Sed/metary	Coarse sed.	Fine sed.	Calcareous / Mod. Calc.	Mafic
Aster nemoralis	Bog Aster	5				1	
Carex exilis	Bog Sedge	3				1	
Splachnum ampullaceum	Splachnum	2					
Carex adusta	Swarthy Sedge	2					
Betula pumila	Swamp Birch	2	11		1	1	1
Carex wiegandii	Wiegand Sedge	1	5			1	2
Juncus stygius	Moor Rush		5				
Hippuris vulgaris	Common Mare's-tail		2	1			1
Lonicera oblongifolia	Swamp Fly-honeysuckle		2				
Nymphaea leibergii	Pygmy Water-lily		2				
Carex tenuiflora	Sparse-flowered Sedge		2				
Scheuchzeria palustris	Pod Grass			2			1
Myriophyllum verticillatum	Whorled Water-milfoil			1			
Rosa nitida	Shining Rose			1			
Subularia aquatica	Water Awlwort			1			
Utricularia minor	Lesser Bladderwort			1			
Utricularia purpurea	Purple Bladderwort			1			
Calamagrostis stricta var. inexpansa	Neglected Reed Bent-grass			1			
Carex arcta	Contracted Sedge			1			
Platanthera blephariglottis	White-fringed Orchis			1			
Solidago purshii	Pursh's Goldenrod				1		
Carex chordorrhiza	Creeping Sedge				1		
Carex recta	Salt-marsh Sedge				2		
Eriophorum gracile	Slender Cotton-grass				1		
Carex oronensis	Orono Sedge					2	
Allium tricoccum	Wild Leek					1	
Oryzopsis canadensis	Canada Mountain-ricegrass					1	
Platanthera flava	Tubercled Orchis					1	
Trillium cernuum	Nodding Trillium				1	2	
Carex haydenii	Cloud Sedge			1			2
Salix pyrifolia	Balsam Willow						1
Senecio pauperculus	Dwarf Ragwort						1
Fimbristylis autumnalis	Fall Fimbry						1
Listera convallarioides	Lily-leaved Twayblade						1
Listera cordata	Heart-leaved Twayblade						1

Table3. Wetland community types occurring within the wetland models and sorted by bedrock settings. Chart shows the proportion of all occurrences that were found in each bedrock class. Based on 423 NHP inventory points

GROUP	COMMON NAME	Granitic	Sedimentary	Coarse sediments	Fine sediments	Mafic	Mod calc.	Calcareous
Swamp	Black spruce swamp	86%	14%					
Swamp	Spruce-fir-tamarack swamp	100%						
Bog	Atlantic white cedar bog	100%						
Bog	Black spruce woodland bog	100%						
Bog	Heath - crowberry maritime slope bog	100%						
Bog	Highbush blueberry bog thicket	100%						
Swamp	Spruce-fir swamp	50%						
Swamp	Red maple-tamarack peat swamp		100%					
Swamp	Hemlock-hardwood swamp		100%					
Swamp	Northern white cedar-balsam fir seepage swamp		50%	50%				
Swamp	Buttonbush swamp			100%				
Swamp	Acidic seepage swamp			100%				
Swamp	Red maple - sensitive fern swamp			100%				
Marsh	Cattail marsh			100%				
Marsh	Deep broadleaf marsh			50%				50%
Marsh	Deep bulrush marsh			50%	50%			
Bog	Moss lawn bog			83%	83%	33%		
Swamp	Calcareous seepage swamp			40%	40%	20%		
Swamp	Acidic northern white cedar swamp					100%		
Bog	Patterned peatland					100%		
Fen	Mixed tall sedge fen				50%		50%	
Fen	Northern white cedar woodland fen	50%						50%
Swamp	Alder shrub swamp	27%	27%	18%	9%	9%		
Swamp	Black spruce - larch swamp	17%	50%		17%		17%	
Fen	Low sedge - buckbean fen lawn		67%	11%			11%	11%
Bog	Eccentric bog ecosystem		40%	7%	13%		40%	
Marsh	Shallow emergent marsh	20%	40%			20%		
Fen	Sweetgale mixed shrub fen	33%	33%	33%				
Bog	Black spruce-tamarack bog	30%	10%	30%		30%		
Swamp	Sweet gale shoreline swamp	20%		40%			20%	20%
Swamp	Red maple-northern white cedar swamp	25%		50%	25%			
Bog	Huckleberry - crowberry bog	33%			33%	33%		
Bog	Coastal plateau bog ecosystem	33%			42%	25%		
Fen	Rich graminoid/shrub fen	33%	17%				17%	33%
Fen	Unpatterned fen ecosystem	5%	33%		14%	19%	24%	5%
Swamp	Northern white cedar swamp	35%	12%	12%		12%	12%	12%
Fen	Medium level fen system	25%	25%	17%	17%		8%	8%
Meadow	Tussock sedge meadow	14%	7%	43%	7%	14%	7%	
Bog	Raised level bog ecosystem	7%	7%	7%	14%	14%	50%	
Fen	Sedge - leatherleaf fen lawn	6%	50%	13%	13%	6%	6%	6%
Bog	Dwarf shrub bog	37%	9%	15%	19%	9%	6%	4%
Fen	Acidic fen	15%	33%	22%	7%	4%	4%	15%
Fen	Patterned fen ecosystem	12%	64%	2%	2%	8%	2%	4%

Further floristic differences between communities are correlated with physiognomy, pH, substrate, climate, elevation and degree of saturation. In the field, detailed discrimination of some wetland types requires a working knowledge of mosses and sedges that often exhibit habitat preferences correspond to water chemistry.

At the scale of the whole ecoregion there is a measurable and predictable separation of types corresponding to the biophysical setting (Figures 2 and 3, Table 2).

Figure 2. Classification tree analysis of 423 ground inventory points illustrating the general relationship between broad wetland type and bedrock setting.Bars that fall equally acrossboth sides of the center point (Bogs and Swanps) show no preference. Floodplains, marshes and meadows are mostly on coarse and fine surficial deposits and moderately calcareous to mafic bedrock (Node 5 left side). Fens are largely found on granite, acidic sedimentary and calcareous bedrock settings (Node 31 right side).

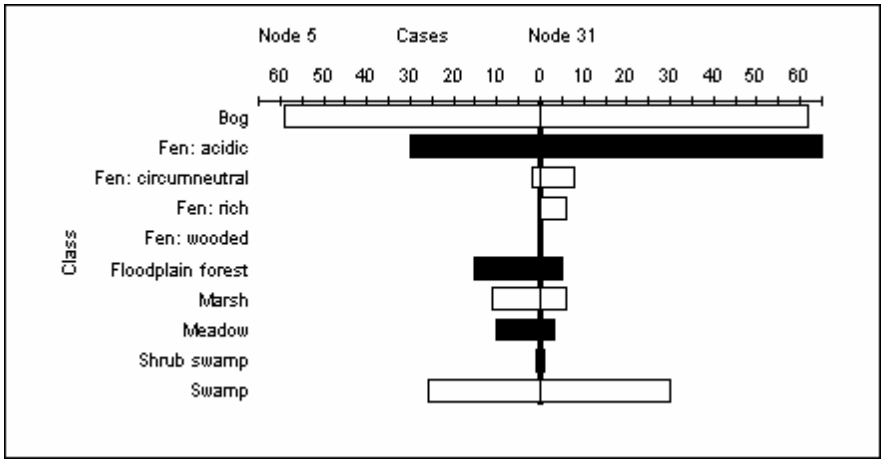
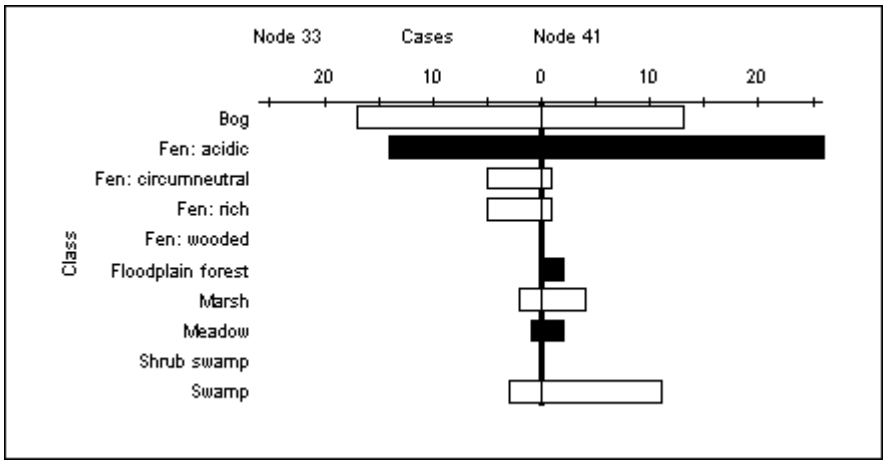


Figure 3. Classification tree analysis of 423 ground inventory points illustrating the relationship between elevation zone and wetland types. Floodplains, marshes, meadows and swamps tend to be at elevations below 800 ft. Node 41(right). Rich and circumneutral fens are mostly at higher elevations. Node 33 (left).



Freshwater Wetland Portfolio Summary

The screening criteria used to locate and identify the wetlands most critical to maintaining biodiversity required that each qualifying example:

- Was large and contiguous: over 50 acres
- Was in good landscape settings (Land Cover Index < 20)
- Was in good condition based on ground surveys and expert opinion (corroboration by at least one source)
- Contained other confirmed biodiversity features (verification by element occurrences)

Many species tracked by the Natural heritage programs and Canadian CDCs were associated with freshwater wetlands (Table 4). The 50 acre size criterion was determined by an analysis of over a thousand survey records for species occurring in wetlands supplemented by a literature analysis of breeding requirements. Of 284 species recorded for these wetlands, one third were found only in wetland occurrences over 50 acres and two thirds had the majority of their occurrences in the larger wetlands (Tables 5 and 6).

Table 4. Species with over 10 tracked breeding populations in the Northern Appalachians and thier relationship to wetland size.. Bars show the proportional distribution of occurrences across wetland size classes. A random distribution would appear as roughly equal amount in class.

Standard name	Common name	2-50 acres	50- 250 acres	250-1000 acre	1000+ acres	Total
Chlidonias niger	**Black Tern**		20%	25%	55%	20
Calopogon tuberosus	Tuberous Grass-Pink		38%	38%	23%	13
Anas Americana	**American Wigeon**	12%	35%	24%	29%	17
Betula pumila	Swamp Birch	16%	32%	20%	32%	25
Ceratophyllum echinatum	Prickly Hornwort	25%	33%	8%	33%	12
Anas acuta	**Northern Pintail**	8%	17%	33%	42%	12
Schizaea pusilla	Curly-Grass Fern	17%	17%	17%	50%	12
Anas clypeata	Northern Shoveler	9%	27%	9%	55%	11
Lysimachia thyrsiflora	Water Loosestrife	9%	9%	9%	73%	11
Carex chordorrhiza	Creeping Sedge	13%	6%	6%	75%	16
Arethusa bulbosa	Swamp-Pink	19%	38%	38%	6%	16
Platanthera blephariglottis	White-fringed Orchis	29%	25%	39%	7%	21
Geocaulon lividum	Northern Comandra	15%	23%	54%	8%	13
Haliaeetus leucocephalus	**Bald Eagle**	45%	18%	27%	9%	11
Falcipennis canadensis	**Spruce Grouse**	8%	25%	54%	13%	24
Carex wiegandii	Wiegand's Sedge	17%	25%	42%	17%	12
Utricularia geminiscapa	Hidden-Fruited Bladderwort	36%	36%	7%	21%	14
Lophiola aurea	Golden Crest	64%	14%	7%	14%	14
Glyptemys insculpta	**Wood Turtle**	50%	19%	15%	15%	26
Pandion haliaetus	**Osprey**	12%	12%	76%		17
Emys blandingii	**Blanding's Turtle**	58%	17%	25%		12
Sterna hirundo	**Common Tern**	25%	58%		17%	12
Cypripedium reginae	Showy Lady's-Slipper	36%	55%		9%	11
Salix pedicellaris	Bog Willow	18%			82%	11
Rana palustris	**Pickerel frog**	87%	13%			23

Table 5. Species partial to larger wetlands with no occurrences in wetlands under 50 acres. Based on NHP & CDC data for species with >2 occurrences in the wetland models.

Standard Name	Common Name	2-50 acres	50 - 250 acres	250 - 1000 acres	> 1000+ acres	T#
Bromus latiglumis	Broad-Glumed Brome				100%	3
Carex tuckermanii	Tuckerman Sedge				100%	4
Gratiola neglecta	Hedge-Hyssop				100%	5
Laportea canadensis	Wood Nettle				100%	3
Zizania palustris	Indian Wild Rice				100%	3
Polygonum arifolium	Halbrd-Leaf Tearthumb			25%	75%	4
Brasenia schreberi	Watershield			33%	67%	3
Carex rariflora	Loose-Flwd Sedge			33%	67%	3
Drosera filiformis	Thread-Leaf Sundew			33%	67%	9
Eriophorum gracile	Slender Cotton-Grass			33%	67%	3
Euthamia galetorum	Fragrant Goldenrod			33%	67%	3
Lobelia kalmii	Kalm's Lobelia			67%	33%	3
Nehalennia gracilis	**Sphagnum Sprite**			67%	33%	3
Vaccinium boreale	Northern Blueberry			67%	33%	3
Eleocharis tenuis	Slender Spike-Rush			75%	25%	4
Chlidonias niger	**Black Tern**		20%	25%	55%	20
Rallus limicola	**Virginia Rail**		22%	22%	56%	9
Rubus chamaemorus	Cloudberry		22%	44%	33%	9
Bartonia virginica	Yellow Screwstem		25%	25%	50%	4
Coturnicops noveboracensis	**Yellow Rail**		25%	25%	50%	4
Aythya collaris	**Ring-necked Duck**		33%	33%	33%	3
Calidris maritima	**Purple Sandpiper**		33%	33%	33%	3
Nycticorax nycticorax	Blk-crowned Night-heron		33%	33%	33%	3
Calopogon tuberosus	Tuberous Grass-Pink		38%	38%	23%	13
Siphlonisca areodromia	**Tomah Mayfly**		43%	29%	29%	7
Carex diandra	Panicled Sedge		60%	20%	20%	5
Epilobium strictum	Downy Willow-Herb		60%	20%	20%	5
Sphagnum lindbergii	Lindberg's Bog Moss		33%	67%		3
Somatochlora forcipata	**Forcipate Emerald**		67%	33%		3
Triglochin gaspensis	Gaspe arrow-grass		67%	33%		6
Carex arcta	N. Clustered Sedge		17%		83%	6
Botrychium dissectum	Cutleaf Grape-Fern		25%		75%	4
Calidris melanotos	**Pectoral Sandpiper**		33%		67%	3
Fulica americana	**American Coot**		33%		67%	3
Quercus macrocarpa	Bur Oak		33%		67%	3
Symphyotrichum laurentianum	St. Lawrence Aster		33%		67%	3
Rhynchospora fusca	Brown Beakrush		40%		60%	5
Cladium mariscoides	Twig Rush		67%		33%	3
Drosera anglica	English Sundew		67%		33%	3
Lemna trisulca	Star Duckweed		67%		33%	3
Listera convallarioides	Broad-Lvd Twayblade		67%		33%	3
Mergus serrator	**Red-brstd Merganser**		67%		33%	3
Hemidactylium scutatum	**Four-toed Salamander**		100%			3
Listera cordata	Heart-lvd Twayblade		100%			3

Table 6. Species partial to the smaller and medium sized wetlands. Based on NHP & CDC data for species with >2 occurrences in the wetland models.

Standard name	Common name	2-50 acres	50-250 acres	250-1000 acres	1000+ acres
Geum peckii	Mountain Avens	20%	80%		
Phalaropus tricolor	**Wilson's Phalarope**	25%	75%		
Picoides arcticus	**Black-backed Woodpecker**	25%	75%		
Carex lacustris	Lake-Bank Sedge	33%	67%		
Rosa nitida	Shining Rose	33%	67%		
Solidago gigantea	Smooth Goldenrod	33%	67%		
Spergularia canadensis	Canada Sand-Spurry	33%	67%		
Carex vaginata	Sheathed Sedge	40%	60%		
Decodon verticillatus	Hairy Swamp Loosestrife	40%	60%		
Monotropa hypopithys	American Pinesap	50%	50%		
Polygonum hydropiperoides	Mild Water-Pepper	50%	50%		
Stellaria humifusa	Creeping Sandwort	50%	50%		
Woodwardia areolata	Netted Chainfern	50%	50%		
Amerorchis rotundifolia	Round-Leaved Orchis	67%	33%		
Carex salina	Salt-Marsh Sedge	67%	33%		
LAMPSILIS CARIOSA	**Yellow lampmussel**	67%	33%		
Lilium canadense	Canada Lily	67%	33%		
Lycopodiella appressa	Southern Bog Clubmoss	67%	33%		
Salix pellita	Satin Willow	67%	33%		
Synaptomys cooperi	**Southern Bog Lemming**	67%	33%		
Wolffia columbiana	Watermeal	67%	33%		
Desmognathus fuscus	**Northern dusky salamander**	75%	25%		
Allium tricoccum	Wild Leek	80%	20%		
Rana palustris	**Pickerel frog**	87%	13%		
Coreopsis rosea	Rose Coreopsis	100%			
Dichanthelium spretum	Eaton's Witchgrass	100%			
Primula mistassinica	Bird's-Eye Primrose	100%			
Sabatia kennedyana	Plymouth Gentian	100%			

The correlation of many species with larger wetlands suggests these features were more likely to contain a full complement of associated species. Breeding populations of birds such as virginia rail, yellow rail, black-crowned night heron and ring-necked duck were found only in larger wetlands. In contrast to many other ecosystems however several herptiles such as pickerel frog, northern dusky salamander and Blanding's turtle were most abundant in small or medium sized wetland occurrences. Four plants (all coastal plain pond endemics) were restricted to small wetlands. **This pattern highlights a gap in our wetland analysis, namely that it did not encompass drawdown ponds and other small vernal wetland situations**. This needs to be accounted for in later iterations of this assessment.

Results

Our goal was to locate a minimum of **20 examples per 29 bedrock/elevation combination**. This goal of 580 individual occurrences totals to 2 % of all wetlands in the ecoregion or an estimated 11% of all wetlands by area (using the mean size of qualifying wetlands). After examining the distribution of large wetlands (>50acres) we redistributed

the goal of 580 across the bedrock/elevation classes in proportion with the number of possible occurrences (Table 7)

Our results identified 568 critical occurrences, 12 less than the number needed to meet our overall minimum goals. We were close to meeting the proportional goals for each bedrock/elevation setting with 17 of the target combinations meeting or surpassing the goal and 13 being below the goal (Table 7). Most of the deficits were in the common types and most of the surpluses were in the more unusual types – a distribution that may be acceptable given the conservation focus on some of the rarer examples.

When measured by area, the critical sites account for 24 percent of all wetlands, more than the expected estimate of 11 % because the critical sites where consistently higher than the average size. The critical occurrences identified total to 226,713 acres of unprotected wetlands (Figure 9).

Defacto Candidate and Supporting Occurrences

In addition to the critical occurrences, this analysis encompassed a large number of less notable or poorly surveyed wetlands that did not meet our screening criteria for being a critical feature. We accounted for their potential contributions to biodiversity by sorting them into two categories and totaling the amounts of each.

- *Candidate occurrence:* A feature that met the criteria for size and landscape context but for which we had no verification or corroboration as to their condition and biodiversity contribution. These may be added to the portfolio after ground verification and are a logical place to focus inventory efforts.
- *Supporting occurrence:* A feature that did not meet the criteria for size and landscape context but may play a supporting role in supplementing the critical sites.

Many of the candidate and supporting occurrences already occur on protected reserves and thus are part of the *defacto* conservation picture for the region. Because conserved examples of these occurrences may serve to bolster biodiversity protection we included them for context in some of our analyses. However, c*andidate and supporting occurrences were not counted as contributing to the portfolio goals.*

Occurrences, Sites and Goals

Counting wetland occurrences was more straightforward than counting tightly networked or highly clustered ecosystems (e.g. floodplains or steep slopes). We used the numeric goal to hone our focus on the most critical sites, selecting the best from each environmental setting. Our assertion is that if we must protect all wetland biodiversity using only a quarter of the available wetlands then this is the set of sites that will have the greatest influence and the highest chances of success. The methods were designed to insure that conservation is focused on the most functional wetlands in the most intact landscapes possible. That the selected examples were scaled in size to work effectively as coarse filters for all wetland biodiversity and that the occurrences had verification as to quality by one to several sources. The latter step helped guarantee a focus on source habitat.

Table 7. Goals and Distribution for critical wetland occurrences. This table gives detail on the goals we set for locating critical sites and the adequacy of the portfolio in meeting those goals. Legend is shown below the table.

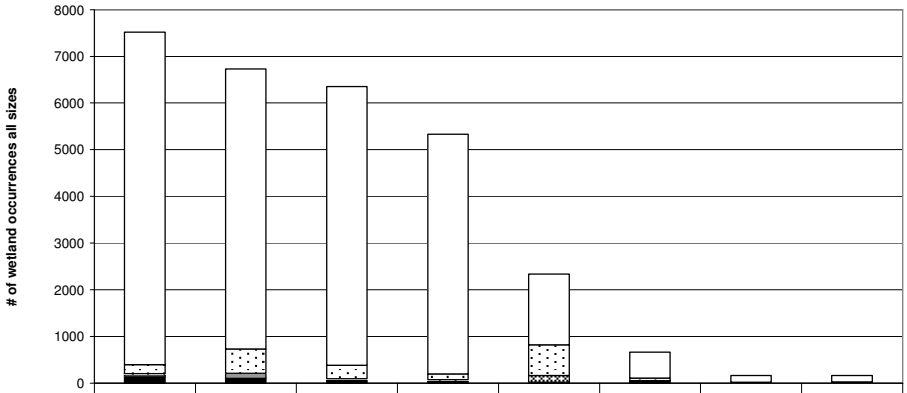
ELEV. ZONE	GEOLOGY	%Goal	CU	CP	PC	PS	OU	T	%	TC	S	D
0-20'	Sedimentary	8	10			1	43	54	0.01	10	Y	2
	Mod Calc	0					1	1	0.00	0	Y	0
	Granitic	1	4	2			4	10	0.00	6	Y	5
	Mafic	1	1				5	6	0.00	1	Y	0
	Coarse sed.	10	5	1		6	57	69	0.02	6	N	-4
	Fine sed.	2	6	2			8	16	0.00	8	Y	6
20-800'	Sedimentary	226	149	74	2	1	1,386	1,612	0.39	223	N	-3
	Calcareous	5	8				30	38	0.01	8	Y	3
	Mod Calc	34	21	4	2	1	217	245	0.06	25	N	-9
	Granitic	49	21	42	5	1	279	348	0.08	63	Y	14
	Mafic	23	20	7	1		138	166	0.04	27	Y	4
	Ultramafic	1	3				2	5	0.00	3	Y	2
	Coarse sed.	43	29	5	1	7	262	304	0.07	34	N	-9
	Fine sed.	28	22	1	3	2	174	202	0.05	23	N	-5
800-1700'	Sedimentary	52	36	6	4		327	373	0.09	42	N	-10
	Shale	1					9	9	0.00	0	N	-1
	Calcareous	3	6			1	12	19	0.00	6	Y	3
	Mod Calc	2	2				9	11	0.00	2	Y	0
	Granitic	35	24	21	44	2	156	247	0.06	45	Y	10
	Mafic	15	7	12	9	1	76	105	0.03	19	Y	4
	Ultramafic	1	1				8	9	0.00	1	Y	0
	Coarse sed.	18	8		28		94	130	0.03	8	N	-10
	Fine sed.	2			1		12	13	0.00	0	N	-2
1700-2500'	Sedimentary	3	1		9		13	23	0.01	1	N	-2
	Shale	2	3	1	1		6	11	0.00	4	Y	2
	Granitic	9	2		34		25	61	0.0cv` x1	2	N	-7
	Mafic	2			5		6	11	0.00	0	N	-2
	Coarse sediments	5			17		17	34	0.01	0	N	-5
2500-4000'	Granitic	0		1			1	2	0.00	1	Y	1
	Mafic	0					2	2	0.00	0	Y	0
	TOTAL	580	389	179	166	23	3,379	4,136	1.00	568		-12

%Goal = the portfolio goal adjusted by the percentage,
CU = Critical occurrences that occur on lands managed for extraction or are unprotected.
CP = Critical occurrences that occur on lands explicitly protected for biodiversity.
PC = Candidate occurrences that occur on lands explicitly protected for biodiversity.
PS = Supporting occurrences that occur on lands explicitly protected for biodiversity.
OU = Other occurrences that occur on lands managed for extraction or are unprotected.
T = total # of occurrences larger than 50 acres,
% = percent of the total occurrences in this bedrock/elevation combination,
TC = the total # of Critical sites (protected + unprotected)
S = portfolio sufficiency in finding occurrences to represent this element
D = the difference between the amount identified for the portfolio and the goal,

Current Protection Levels of Critical Features.

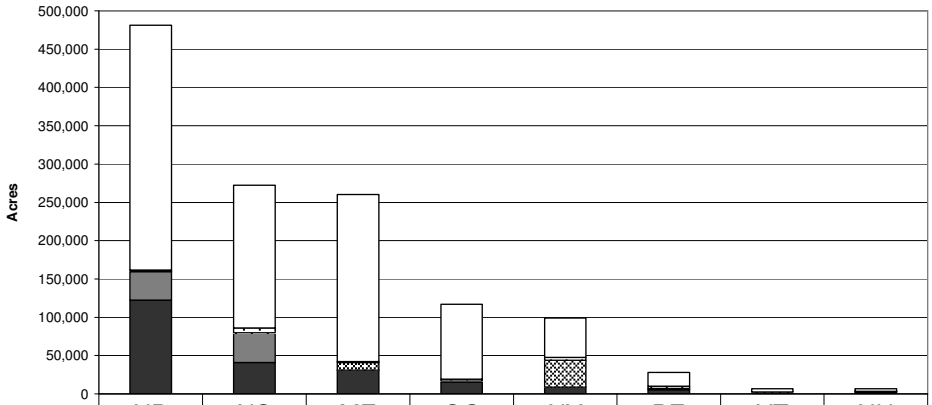
One quarter (26%) of the critical sites are currently protected on reserves with a GAP status of 1 or 2. Another 30% occur on land that is managed as GAP 3 and have restrictions on development (Figure 8). New Brunswick leads the region in number of wetlands and in acreage of protected wetlands.

Figure 8. The number of wetlands and their portfolio status across Provinces and States. Legend as for Table 7 (with slight modification DC = PC, DS = PS).



	NB	NS	QC	ME	NY	PE	NH	VT
O	7119	5998	5971	5134	1513	555	147	137
DS	192	517	290	122	656	51	6	12
DC	2	1		16	145		1	1
CP	53	114	12	2	1	14	1	
C	148	98	82	55	19	41	9	10

Figure 9. Acreage of all portfolio wetlands by protected status and Province or State. Legend as for Table 7 (with slight modification DC = PC, DS = PS).



	NB	NS	ME	QC	NY	PE	VT	NH
OU	319,615	186,341	218,242	97,643	51,374	18,083	4,110	3,756
DS	1,464	6,296	980	2,402	4,146	2,759	80	110
DC	318	236	10,152		35,048		60	224
CP	37,252	38,544	98	1,388	60	1,594		38
CU	122,360	40,848	30,800	15,304	8,499	5,536	2,517	2,609