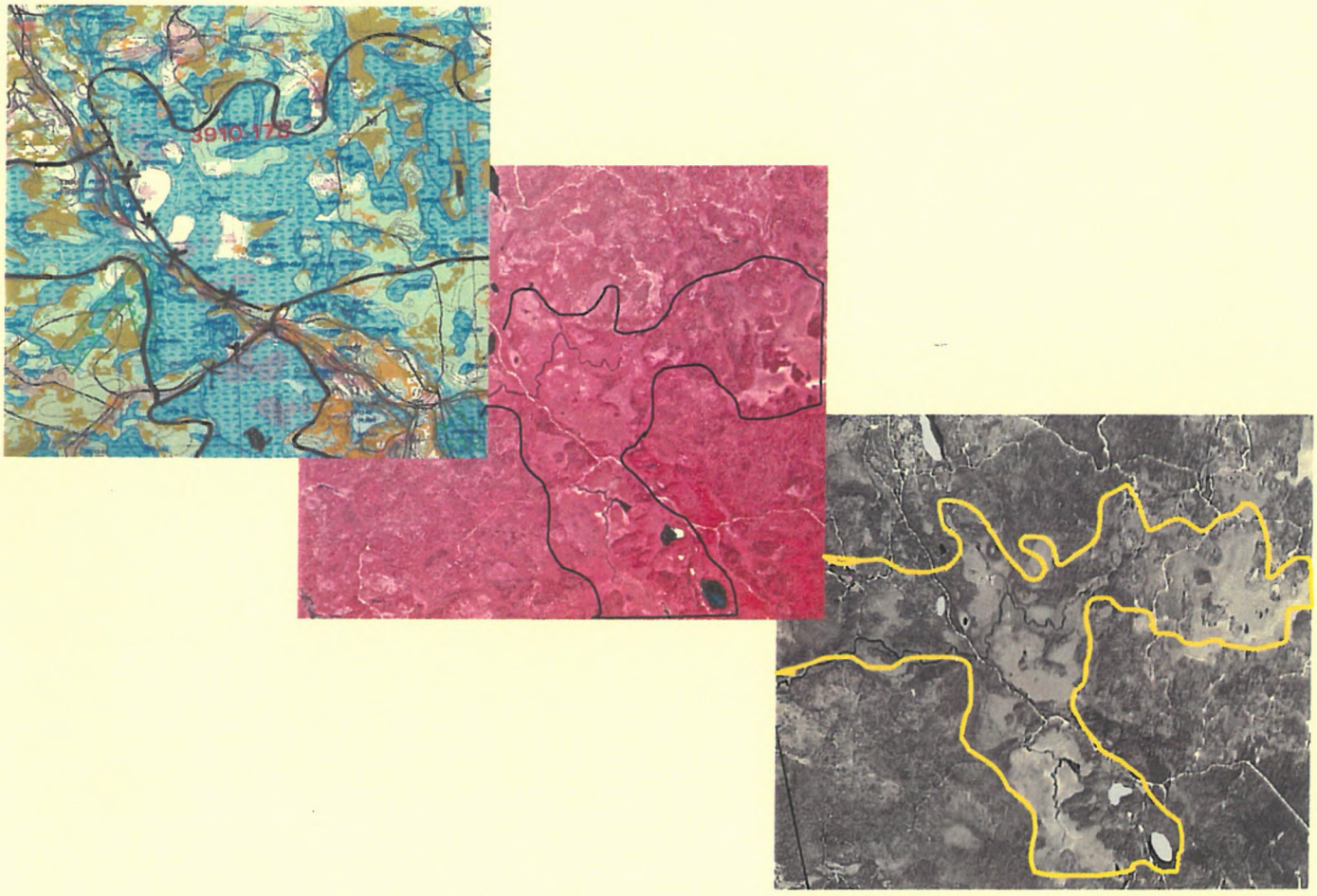
6-2002

A Landscape Analysis of the Eastern Lowlands

Maine Natural Areas Program

A Landscape Analysis of the Eastern Lowlands



a report to the
Maine Outdoor Heritage Fund
from the
Maine Natural Areas Program
Department of Conservation
June 2002

The Nature Conservancy

Department of Conservation Maine

Maine Outdoor Heritage

Acknowledgements

This project was made possible by core funding from the Maine Outdoor Heritage Fund and the Maine Chapter of The Nature Conservancy. In addition, the project was greatly assisted by contributions of funds and data from several major landowners in the region: Baskahegan Company, JD Irving, International Paper, and Wagner Forest Management. The Northern Forest Alliance also provided funding assistance.

This project was a collaborative effort of the staff of the Maine Natural Areas Program. Molly Docherty garnered funds for the project, developed cooperative relationships with landowners, and kept the project on time and within the budget. Andy Cutko oversaw most of the technical aspects of the project and prepared the final report. Dan Coker coordinated all of the data layers and created all of the working landscape analysis maps. Mark Ward and Mike Auger assisted with aerial photo interpretation. Mike Auger digitized polygons, reviewed satellite imagery and assisted with numerous other organizational tasks. Emily Pinkham provided administrative and financial oversight.

The area outlined on the cover air photo is the Guagus Stream peatland in T40 MD.

A Landscape Analysis of the Eastern Lowlands

Table of Contents

A Landscape Analysis of the Eastern Lowlands

Maine Natural Areas Program
Department of Conservation

Funded by the Maine Outdoor Heritage Fund
Project 002 – 3 - 2

Project Summary

"Landscape Analysis" is the process by which the Maine Natural Areas Program (MNAP) identifies areas likely to support rare natural communities, outstanding examples of common communities, and/or habitat for rare plants. Using a variety of electronic, map, and print information, MNAP has conducted a landscape analysis of the 2.2 million acre Eastern Lowlands ecoregion. Landowners of over half the region collaborated with MNAP by sharing natural resource data. One hundred forty-five areas, ranging from five to 16,000 acres, have been identified, delineated on 1:24,000 topographic maps, digitized, and assigned priorities for field verification. This product should be considered an intermediate step in a broader assessment that will subsequently involve field surveys of many of the 145 areas.

Introduction

The Eastern Lowlands geographic region, as defined by McMahon (1990), encompasses approximately 2.2 million acres in east-central Maine (see Figure 1).

Geologically, the region is underlain by mineral soils that are generally wet and dense. More specifically, glaciolacustrine deposits are extensive throughout the region, while glaciomarine clays are prominent in the St. Croix and Penobscot River basins. Glacial basins are often filled with organic soils. A variety of mucks, clays, and silts are also common in depressions and on broad flat lowlands. These soil conditions lead to the formation of some of the largest forested wetlands and open peatlands in the state.

In fact, water is a major feature of the Eastern Lowlands. The region supports over 140,000 acres of lakes and ponds, including the extensive Grand Lakes chain. In addition to open water systems, the region supports nearly 350,000 acres of wetlands classified by the National

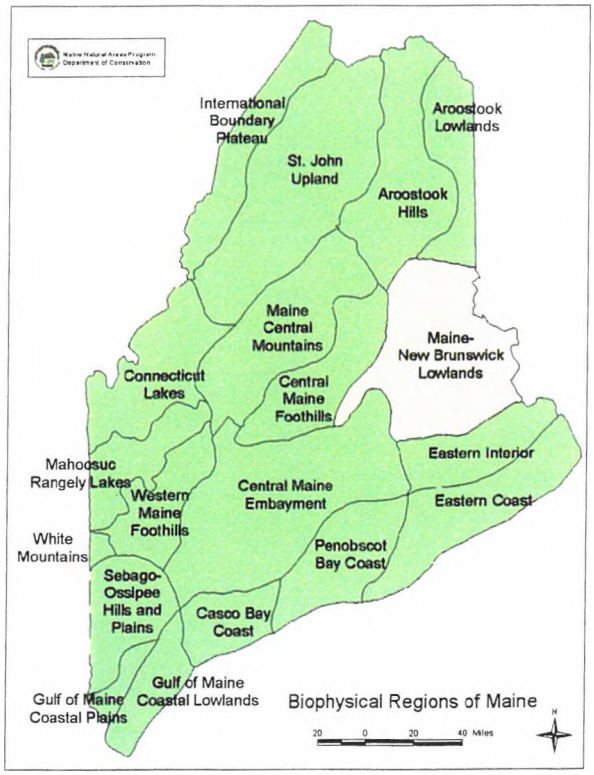


Figure 1. Location of the Eastern Lowlands Ecoregion.

Wetlands Inventory as palustrine or riverine – likely the largest proportion of wetlands of any region in the state.

The region's climate is transitional between that of the coastal zone and the more continental climate of regions to the north and west. As a result of the abundant glacial basins and transitional climate, the Eastern Lowlands support the greatest variety of peatland ecosystem types in the state. While both ribbed and eccentric bogs reach their southern limit in this region, many woody species (e.g., silky dogwood, buttonbush, bayberry, smooth sumac) reach the northern limits of their range.

Compared to southern Maine, the Eastern Lowlands remain sparsely populated. Close to 90% of the area is owned by corporate or family holdings (Baskahegan, Fraser, International Paper, and Wagner, among others) and Native American interests. Only 2% of the area is in public or private conservation ownership, with the bulk of this protected land in one tract – the state's Duck Lake unit. Although the Eastern Lowlands are clearly less threatened by development than other areas of the state, the recent flurry of real estate transactions in northern Maine suggests that long-term land tenure and management may be a feature of the past.

The Eastern Lowlands hold much promise for harboring significant components of plant diversity, but these regions have received comparatively little inventory effort. Peatland ecosystems are an obvious target for inventory because of their abundance, size, and diversity in the region. Upland natural communities targeted during this survey include uncommon small and large 'patch forest' types (e.g., northern white cedar swamps, hardwood floodplain forests, and red pine woodlands) in addition to more common 'matrix' forest types (e.g. spruce-fir flats, oak-pine forests, and red maple swamps).

MNAP data have become integral to sensitive area protection efforts of state, federal, and private conservation entities, as well as being used by some private landowners for land-use planning. However, MNAP does not embrace regulatory means to safeguard outstanding natural habitats. Instead, MNAP encourages conservation of important species and habitats by providing information and interpretive services to landowners. Its mission continues to be to seek additional affiliations and appropriate uses of expertise to maximize protection and conservation of important components of biodiversity.

It is important to note that this project has only identified which lands should be inventoried. Additional funds for later phases of the project including landowner notification and field inventory will be sought in collaboration with the Maine Department of Inland Fisheries and Wildlife

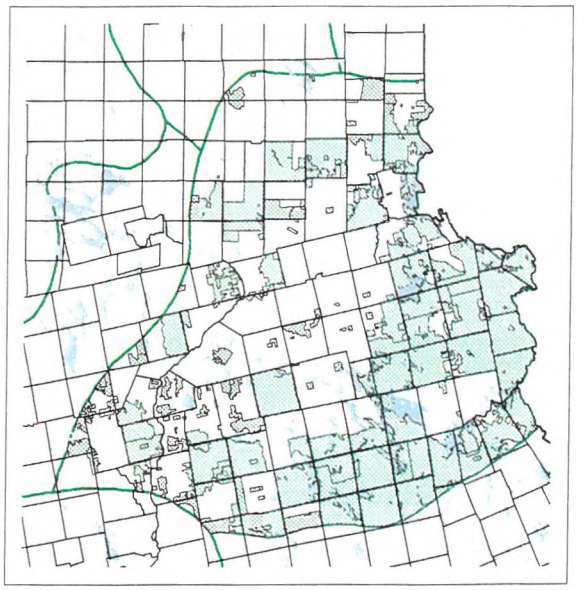


Figure 2: Landowner collaboration (shaded) in the Eastern Lowlands

Collaboration with Large Landowners

Several large landowners and managers were instrumental in sharing data and providing supplemental funding to assist in this effort: Baskahegan, J.D. Irving, International Paper, and

Wagner Forest Management. Each landowner will in turn be provided with lists and maps of potentially significant areas on their lands. Following the completion of this project, any proprietary information will be returned to the landowner. Together these cooperating land managers own just over 1 million acres, and coupled with other cooperating land managers (the state and The Nature Conservancy), these participating entities own 1.1 million acres, or over half the lands in the region (Figure 2).

Methods

The landscape analysis methods developed at MNAP are consistent with those used by state natural heritage programs throughout North America. These methods have been used to identify hundreds of priority sites in other regions of Maine. The following information sources were used in this landscape analysis project:

1. **Information from Large Landowners:** As noted above, corporate and family ownerships hold valuable natural resource information, such as stand types, timber cruise results, management plans, soil and timber productivity maps, and land use history information. MNAP makes the most effective use of this information in digital format. For example, queries can be run to locate large cedar, red pine, or high volume stands (Figure 3).

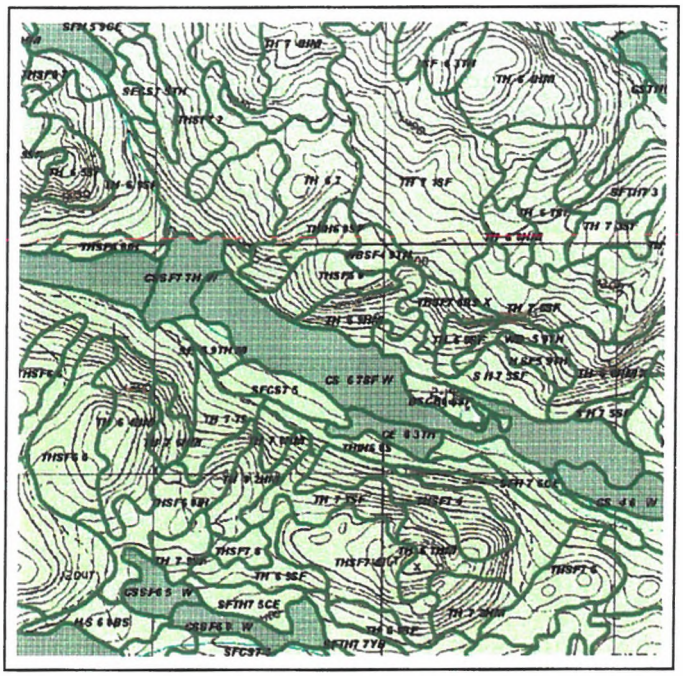


Figure 3: Stand types, with cedar stands highlighted (map is 1:40,000)

2. **USGS Topographic Maps:** Traditionally hard copy maps served as a baseline for initial mapping of areas. As MNAP has integrated Geographic Information Systems (GIS) into its daily operations, scanned USGS maps have been used to a greater extent. Topographic maps also indicate obvious landscape features that are correlated with certain community types, such as floodplain forests, mountain summits, ravines (with "cove forests"), and large wetland complexes. This data can be visually derived from paper or scanned maps or produced from GIS analysis of digital data.

3. **Digital Elevation Data:** GIS analysis of digital topographic information can help in the identification of areas that meet distinct topographic criteria. Analysis of this type of data serves as an efficient and systematic way to identify areas with certain slope, aspect, and elevation characteristics. It can also be used to derive general moisture characteristics across a study area. This digital information is available statewide at a coarse 90-meter resolution from the Maine Office of GIS. It is also available for most USGS quads at a more detailed 30m resolution from USGS.

4. **Digital Land Use/Land Cover Data:** GIS analysis of digital land use and land cover data derived from satellite imagery can help to identify unfragmented areas that should receive more focus

through aerial photograph analysis. When used in conjunction with other digital data such as elevation and soils data (where available), digital land cover data becomes a powerful tool for modeling the possible location for specific community types. MNAP uses 1:100,000 land cover data produced as part of the USFWS GAP analysis project. MNAP also uses SPOT black and white panchromatic 2000/2001 imagery, which are eight to ten years more recent than the National Aerial Photography Program (NAPP) color-infrared photos.

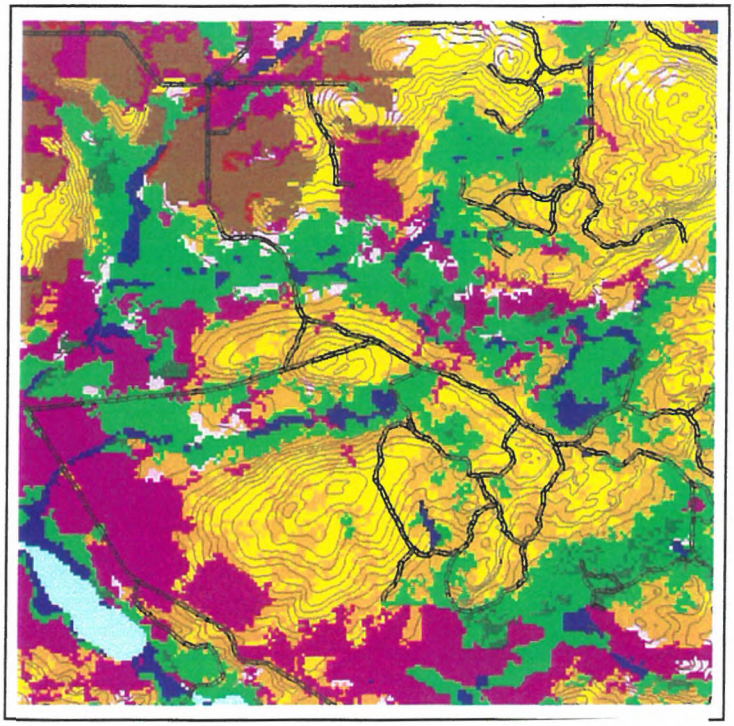


Figure 4: Example of Maine GAP land use/land cover map used for landscape analysis (map is 1:24,000). In this figure, greens are mature conifers, yellows are mature hardwoods, and purple is early regeneration.

5. **Digital Roads Data:** Roads information can be important in determining fragmentation and development activity in an area. It is used in conjunction with digital land cover data to identify high quality, unfragmented or roadless areas for further analysis. Both 1:24,000 and 1:100,000 road layers are available for the entire state from the Maine Office of GIS. If Baskahegan has an updated coverage, we would incorporate it into the landscape analysis.

6. **Aerial Photographs:** Depending on the scale and time of year of photography, air photos may be instrumental in identifying certain forest or wetland types. For large areas (several hundred thousand to millions of acres), MNAP staff use MNAP color infrared photos available from the US Geologic Survey. These photos, at a scale of 1:40,000, also provide useful information on the surrounding landscape (i.e., fragmentation, cutting history, development, etc.). The most recent statewide coverage is from 1991 to 1993.

7. **National Wetlands Inventory Maps:** These maps can be useful at delineating different wetland types within a larger wetland complex. Since NWI mapping was conducted using 1:58,000 air photos, however, use of 1:40,000 NAPP photos may yield just as much or more information. NWI hard copy maps are available from the Maine Geologic Survey (MGS), and digital maps for most of Maine are available on CD-ROM from the Maine Office of GIS.

8. **Geology Maps:** Bedrock and surficial geology maps of Maine are available from the MGS. Small-scale maps are available for the entire state and larger-scale quad maps are available for a number of quads. Bedrock maps are particularly useful at identifying areas of circumneutral bedrock (somewhat uncommon in Maine), and surficial geology maps can pinpoint areas of outwash plains, glacial marine soils, and other noteworthy features.

9. **MNAP Files:** Existing MNAP Element Occurrence Records (EORs), negative survey forms, and "leads" provide useful information if an area has been previously surveyed. The value of MNAP information depends heavily on the date and precision of the record.

10. **Miscellaneous Reports:** Depending on the area of interest, natural resource studies may be available from a wide variety of sources.

11. **Knowledgeable Individuals:** Contacts with local natural resource professionals, such as foresters, wildlife biologists, or wetland scientists, often yield worthwhile leads. In particular, foresters often have valuable local knowledge about specific stand types and habitats

12. **Air Surveys:** Once preliminary sites have been identified, a flight is instrumental in verifying that the assumptions made using information above are correct. An air survey will be conducted before any field work is initiated in the region.

Once materials were in place, a set of composite 1:24,000 GIS maps was produced, with the USGS topographic quadrangle as the base. Several information layers were superimposed: land use/land cover; digital elevation model; geologic features; MNAP file information; NWI polygons, and digital roads data.

MNAP ecologists systematically reviewed the master composite maps and the aerial photos, cross-referencing to other information available (e.g., harvesting records; details of particular sites in MNAP files). A stereoscope was used for air photo work. Areas flagged of potential interest included large blocks of apparently intact forest, both upland and wetland; rocky ridges and upper slopes; concentrations of known rare plant species (such as along river shores), and unusual open wetlands. As potentially interesting areas were identified, they were outlined on the master composite maps, and their location and interesting features recorded in the project database. At least two MNAP ecologists reviewed each aerial photo pair and composite map coverage. The selected areas were digitized into a GIS layer.

Each site was assigned a priority of 1 (highest) to 3 (lowest) for field work. Considerations in assigning priority were the rarity of the feature(s), the size (acreage) of the polygon, and the apparent degree of human-caused disturbance within or adjacent to the site. For example, a 150 acre peatland with evident patterns (i.e., strings and flarks) surrounded by intact forest would be ranked higher than a similar sized peatland with no patterns surrounded by development. For summarizing the results, sites were additionally categorized as upland vs. wetland and as forest vs. open. Of course, many sites that are mostly upland will contain some wetland areas, and vice versa; and many primarily forested sites will contain some areas that are non-forested. Likewise, an area further characterized as "hardwood" might include some areas of mixed wood or softwood: these assignments were generalized based on the primary character of the site, and are merely intended to give a general overview of the sites.

Results

One hundred-forty-five sites of potential interest have been identified: 25 first-priority, 69 second-priority, and 51 third-priority (Figure 5 and Table 1). The sites range in size from five-acre riverside seeps to a 16,000 acre block that includes multiple wetland and upland types. Most of the sites are several hundred acres in size: the median size of sites is 714 acres.

Notably, 79% of the total sites and 92% of the top priority sites are wetlands. The disproportionate composition of wetlands in the final results is explained by a few factors. First, as noted previously, the region has perhaps the highest wetland proportion of any region in the state. Second, the region supports several uncommon peatland types, including eccentric (i.e., sloping) bogs, patterned fens, and domed bogs. Third and perhaps most importantly, wetlands (particularly open wetlands) have experienced less human alteration than uplands.

Only two of the upland sites were assigned priorities of 1. Much of the region's uplands have been heavily harvested and are in various stages of regeneration. In addition, substantial areas have burned within the last 100 years, contributing further to the preponderance of early successional forests (aspen, birch, fir).

Detailed information on each of the sites is provided in Appendix 1.

Table 1:
Sites Selected in Landscape Analysis
Sorted by Type and Priority

Wetland Type	Priority			Total Sites
	1	**2**	**3**	
Cedar Swamp	2	8	8	18
Other Forested Wetland	2	1	6	9
Open Peatland	10	22	8	40
Multiple Wetland Types	8	18	18	44
Floodplain Forest	1	2	0	3
Total Wetlands	**23**	**51**	**40**	**114**
Upland Type	Priority			**Total Sites**
	1	**2**	**3**	
Mixed Forest	2	7	6	15
Softwood - Dominated Forest	0	9	2	11
Hardwood -Dominated Forest	0	2	3	5
Total Uplands	**2**	**18**	**11**	**31**
Total All Sites	**25**	**69**	**51**	**145**

Next Steps

The present project incorporated only landscape analysis. The assessment of which areas are most in need of conservation requires a great deal of additional work and funding.

Consult with large landowners. Prior to aerial reconnaissance and fieldwork, it is necessary refine our selections by reviewing results to date with corporate landowners for the lands they own. For example, some areas selected as apparently intact forest communities on the basis of 1991 or even

1997 air photos may have been harvested since the photos were flown. On the other hand, foresters may know of "old growth" sites or other hot spots with potential for inventory.

Air Surveys. Once preliminary sites have been identified, a flight is instrumental to look at the current condition and general composition of the selected areas. For instance, is an area identified as a northern white cedar swamp using air photos actually so, or is it a black spruce – fir wetland? The aerial view is also helpful in determining the best access to a site. Our preferred flight time is shortly after leaf-out but before the field season begins.

Contact all landowners of high priority sites to request permission for a field visit to each site.

Select areas for field surveys based on site priority and landowner permission.

Implement fieldwork, assess and process the data, and summarize the results.

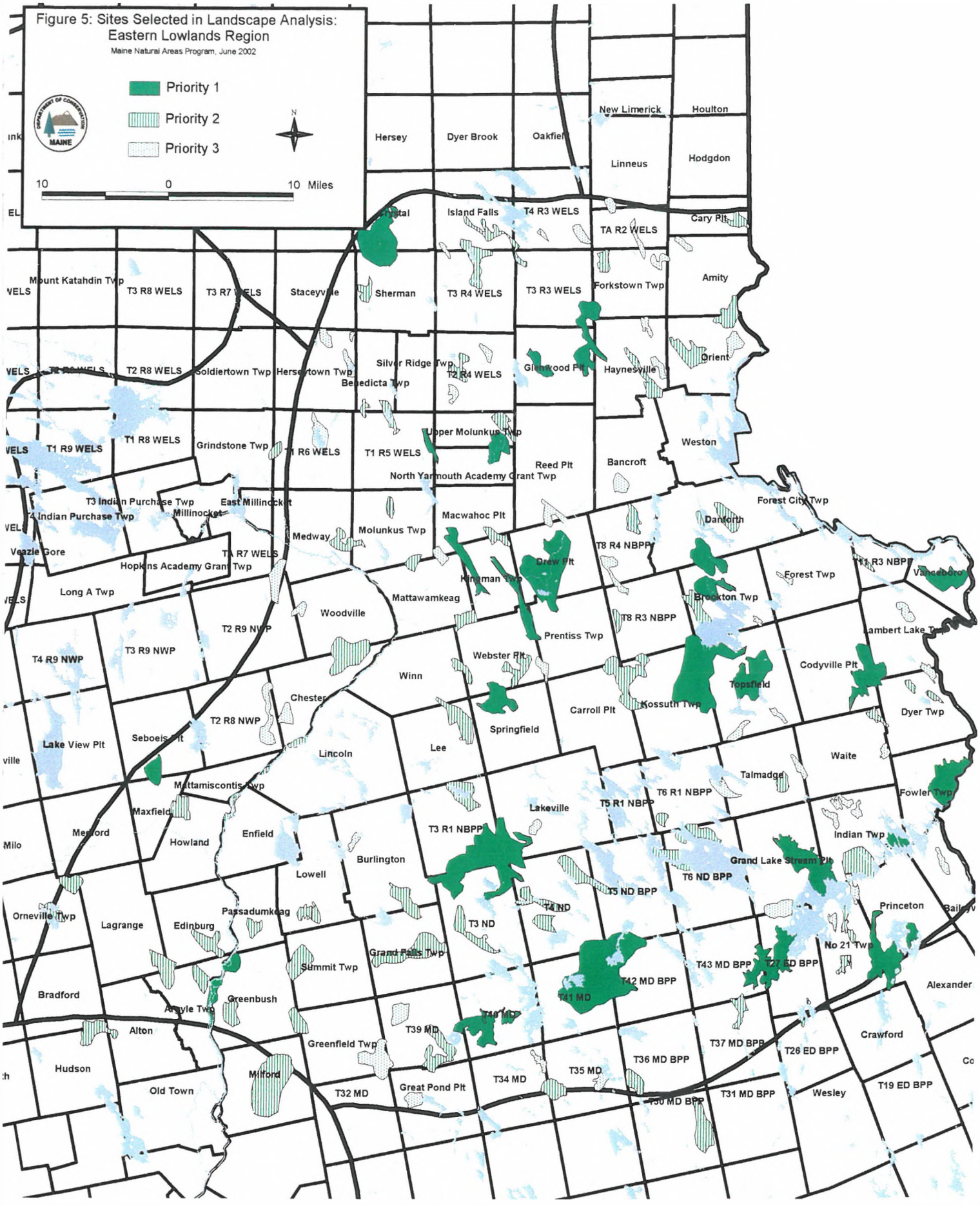


Figure 5: Sites Selected in Landscape Analysis:
Eastern Lowlands Region
Maine Natural Areas Program, June 2002
Priority 1
Priority 2
Priority 3
10 0 10 Miles
N
MAINE
New Limerick
Houlton
Hersey
Dyer Brook
Oakfield
Linneus
Hodgdon
Island Falls
T4 R3 WELS
Cary Plt
TA R2 WELS
Mount Katahdin Twp
T3 R8 WELS
T3 R7 WELS
Staceyville
Sherman
T3 R4 WELS
T3 R3 WELS
Forkstown Twp
Amity
T2 R8 WELS
Soldiertown Twp
Silver Ridge Twp
Benedicta Twp
T2 R4 WELS
Glenwood Plt
Haynesville
Orient
T1 R9 WELS
T1 R8 WELS
Grindstone Twp
T1 R6 WELS
T1 R5 WELS
Upper Molunkus Twp
Reed Plt
Bancroft
Weston
North Yarmouth Academy Grant Twp
T3 Indian Purchase Twp
T4 Indian Purchase Twp
East Millinocket
Millinocket
Macwahoc Plt
Forest City Twp
Danforth
Medway
Molunkus Twp
Veazie Gore
TA R7 WELS
Hopkins Academy Grant Twp
T8 R4 NBPP
Drew Plt
T11 R3 NBPP
Forest Twp
Kingman Twp
Long A Twp
Mattawamkeag
Brookton Twp
Woodville
T8 R3 NBPP
T2 R9 NWP
Prentiss Twp
Lambert Lake Twp
T4 R9 NWP
T3 R9 NWP
Webster Plt
Codyville Plt
Winn
Topsfield
Chester
Carroll Plt
Kossuth Twp
T2 R8 NWP
Springfield
Dyer Twp
Lake View Plt
Lincoln
Lee
Waite
Talmadge
Mattamiscontis Twp
T6 R1 NBPP
Fowler Twp
Maxfield
T5 R1 NBPP
Lakeville
Milford
Howland
Enfield
T3 R1 NBPP
Indian Twp
Burlington
Grand Lake Stream Plt
Lowell
T6 ND BPP
T5 ND BPP
Orneville Twp
Lagrange
Passadumkeag
Edinburg
T4 ND
T3 ND
Princeton
Grand Falls Twp
No 21 Twp
Summit Twp
T43 MD BPP
T27 ED BPP
T42 MD BPP
Alexander
Bradford
Greenbush
T41 MD
Argyle Twp
T40 MD
Alton
T39 MD
Crawford
Greenfield Twp
T37 MD BPP
T26 ED BPP
T36 MD BPP
Hudson
Milford
T35 MD
Old Town
T32 MD
Great Pond Plt
T34 MD
T31 MD BPP
Wesley
T19 ED BPP
T33 MD BPP

Appendix 1:
Eastern Lowland Potential Sites
MNAP June 2002

Site Name	*Town(s)*	*Why Chosen*	*Priority*
Alder Brook	Glenwood Plt, Haynesville	1,200 acre wetland complex includes streamside open wetlands and cedar stands.	1
Baskahegan Peatlands/ Big Bog	Kossuth Twp, T8 R3 NBPP, Topsfield, Brookton	10000+ acre wetland complex includes 700+ acre eccentric bog ecosystem and some mature coniferous uplands.	1
Big Musquash Stream	Grand Lake Stream, Indian Twp	900+ ac peatland includes ~1000+ ac domed bog ecosystem; mature forest (mixed) on Governor's Point.	1
Crane Ridge Brook	Webster Plt, Springfield	2400 acre forested wetland complex with cedar and some small parcels of intact upland forest.	1
Crystal Bog	Crystal, Sherman	6000 wetland complex including several MNAP exemplary communities (1983) and numerous rare plants. Includes ~200 ac Fish Stream peatland to the northeast	1
Eagle Pond Wetlands	Drew Plt	8200+ acre wetland complex along Mattawamkeag River includes 2 small MNAP exemplary communities(Hemlock Forest and Dwarf Shrub Bog--1996), a lead on a cedar swamp, and potentially a circumneutral riverside fen.	1
Fourth Machias Lake Matrix Block	T4 ND, T41 MD, T5 ND BPP, T42 ND BPP	~16,000+ acre block of that includes 4th Machias Lake Peatlands, Washington Bald Mt., and uplands within Duck Lake ecological reserve.	1
Grand Falls Narrows	Fowler Twp, Indian Twp	800 ac block, mostly forested wetland, 300+ ac cedar, two 75 ac dwarf shrub bogs	1

Site Name	*Town(s)*	*Why Chosen*	*Priority*
Guagus Stream Wetlands	T40 MD	~1300 acre peatland complex with secondary pools, lead kettlehole bog/pond system associated with eskers.	1
Hays Bog	Danforth, Brookton	5000+ acre area that includes wetlands and uplands and several open peatlands along Baskahegan Stream with cedar.	1
Little Musquash Stream/ South Br	T27 ED BPP	1700 acre wetland/esker complex; unpatterned stream drainage fen; mostly open emergent wetland, 1000 acres of forested wetland including cedar swamp	1
Macwahoc Bog	North Yarmouth Academy Grant, Upper Molunkus	1900 acre block of wetlands that includes domed bog ecosystem (1982) and eccentric bog ecosystem (1987).	1
Maine River Heaths	Princeton, Plt. No. 21	4800+ ac complex with several peatland and other wetland types	1
Mattagodus Stream	Kingman Twp, Webster Plt	2700 acre wetland complex along Mattagodus Stream that includes 400 acres of MNAP exemplary communities Red Maple-Sensitive Fern Fen & Circumneutral Fen (1995), Northern White Cedar Fen (1989) and several rare plants (1989).	1
Middle Ground Peatlands	Princeton	700 ac fen/bog/woodland complex on peninsula into Pocomoonshine Lake	1
Molunkus Stream	Kingman Twp, Macwahoc Plt	1300 acre block of wetlands along meandering stream with numerous oxbow pools	1
Mud Brook	T1 R6 WELS, Herseytown Twp	600 acre block of primarily open wetlands and small block of intact forested upland near confluence of Mud Brook and Salmon Stream.	1
Orcutt Brook Bog	Glenwood Plt	700 acre open peatland with numerous secondary pools.	1

Site Name	*Town(s)*	*Why Chosen*	*Priority*
Penobscot River Islands - Greenb	Greenbush	2400 ac Several Floodplain Islands, Including Sugar (1992 EO)	1
Sweat Bog	Seboeis Plt, Maxfield	400+ acre domed bog ecosystem.	1
Thousand Acre Heath Wetland Bl	T3 R1 NBPP, Lakeville	14000 ac contiguous wetland complex that includes 1000+ acre domed bog ecosystem (1982) and stretches of the Passadumkeag River.	1
Tomah Stream Bog	Codyville Plt, Lambert Lake Twp	4200 ac unpatterned stream drainage fen: most is open. Also includes 100 ac bog with patterning	1
Topsfield Lowlands and Farrow M	Topsfield	4500 acre block with 2000 acre conifer dominated lowland and 700 acre upland ridge with ledges and steep slopes.	1
Upper Molunkus Stream Wetland	T1 R5 WELS	700 acre streamside forested wetlands.	1
Vanceboro Bog	Vanceboro	200 ac 1987 eccentric big and domed bog ecosystem. Adjacent lowlands include some mature cedar.	1
West Branch Brook	Fowler Twp	4000 acre block, mostly forested wetland. 300+ acre cedar, two 75 acre dwarf shrub bogs.	1
Anderson Bog	Cary Plt	~1,000 acre wetland complex -- appears to be mostly cedar swamp on air photo	2
Beaver Brook Wetland	Forkstown	900 acre wetland complex along lower Beaver Brook. Includes cedar in wetlands and small patches of apparently mature uplands.	2

Site Name	*Town(s)*	*Why Chosen*	*Priority*
Boyd Lake Bog and Peninsula	Orneville Twp	650 ac level bog and 100 ac lakeshore fen and 75 ac undisturbed peninsula/island	2
Buffalo Stream	T39 MD, Great Pond Plt	1800+ acre block of wetlands along Buffalo and Man Streams.	2
Call Bog	Hudson, Bradford, Alton	2000 acre unpatterned fen ecosystem last documented in 1984; needs updating	2
Cardville Bog	Greenbush	1500 acre peatland ecosystem that includes two adjacent open shrub bogs	2
Caribou Lake Wetlands	T3 R4 WELS, Island Falls	2,400 acre wetland complex including open fen, cedar, dwarf shrub bog	2
Carlson Brook	Molunkus Twp	500+ acre fen along Carlson Brook.	2
Clifford Lake Bogs	T26 ED BPP	100 ac Lakeshore Beach Strands and bogs, one of the bogs is north of study region	2
Contrary Brook Bog	Winn, Webster Plt	500 acre wetland includes 200 acre open peatland with numerous secondary pools.	2
Cowan Cove Cedar	Danforth	250 acre cedar swamp adjacent to Grand Lake	2
Daggett Brook	Amity, Orient	800 acre cedar and spruce forested and wooded wetland and lowland.	2

Site Name	*Town(s)*	*Why Chosen*	*Priority*
Dead Brook Wetlands	Brookton Twp, T8 R3 NBPP	1500+ acre wetland complex includes 60 acre open peatland with numerous secondary pools and possible lakeside fen with cedar.	2
Duck Lake Uplands	T4 ND	1100+ acre intact block of mixed wood uplands with steep slopes.	2
East Branch Birch Stream	Lagrange, Argyle, Edinburg	2000 ac 1982 Domed Bog Ecosystem needs to be updated	2
East Branch Mattakeunk	Lee, Winn	1850+ acre wetland complex includes 2 MNAP exemplary natural communities (circumneutral fen and dwarf shrub bog) documented in 1995.	2
Ebhorse Stream Bog	Woodville, Chester	4,000 acre wetland complex including ~100 acre cedar stand	2
Elija Brown Heath	Plt. No. 21	500 ac peatland complex including ~150 ac. of cedar, open bog	2
Ephraim Brook Heath	Argyle	1,100+ acre peatland complex, most appears to be shrub bog	2
Flinn Pond Bog	T1 R5 WELS, Benedicta Twp	750 acre wetland block includes 300 acre eccentric bog ecosystem documented in 1987.	2
Freese Bog	Orneville Twp, Lagrange	~1200 acre wetland system including two open bogs -- 250 ac and 100 ac	2
Hardwood Ridge	T8 R4 NBPP	800 acre block of apparently mature hardwood forest including some steep slopes	2

Site Name	*Town(s)*	*Why Chosen*	*Priority*
Hatham Bog	T1 R6 WELS, Grindstone Twp	600 acre peatland includes eccentric bog ecosystem (1987) and domed bog ecosystem (1987).	2
Haycock Bog	Dyer Twp	400 ac of lowland conifer forest, ~150 ac of forested bog to the northwest	2
Hound Brook Bog	Dyer Twp	350 ac peatland with numerous seconday pools. Domed bog?	2
Hoyt Brook Bog	Edinburg	1700 acre peatland system with three separate open bogs; along Hoyt Stream	2
Huntley Brook Bog	No 21 Plt	600 ac forested wetland, mostly cedar according to type maps, but appears low volume.	2
Kingman Eccentric Bog	Kingman Twp, Macwahoc	950 acre wetland complex which includes eccentric bog ecosystem last visited in 1987.	2
Little Gordon Brook	Winn, Mattawamkeag	500 acre block of post-burn hardwood uplands and coniferous wetlands along brook.	2
Lower Macwahoc Wetland	T2 R4 WELS	~1200 ac wetland complex including open peatland and 200+ ac of cedar	2
Machias River Red Pine & Kettleh	T30 MD BPP	2200 acres primarily red pine dominated -- one of largest aggregations of red pine in the region. Several kettleholes	2
Macwahoc Stream Wetlands	Upper Molunkus	300+ acre wetland bock including two 100+ acre open peatlands.	2

Site Name	*Town(s)*	*Why Chosen*	*Priority*
Madagascal Stream	Burlington	2000 acre block along Madagascal Stream. Surrounding uplands include large red pine stand.	2
Martin Bog	Mattawam-keag, Molunkus	700 acre wetland block which includes 100 acre bog with secondary pools.	2
Mattamkeag River Wetlands	Haynesville	1900 acre riverside forest with numerous oxbow pools -- possibly floodplain forest	2
McAvoy Pond Cedar	Benedicta Twp	300 ac wetland with open cedar (cedar fen)	2
Middle and Lower Chain Lakes	T4 ND	2500 acre relatively intact mix of uplands and wetlands including two lakes with conservation protection.	2
Molunkus Stream Confluence	Sherman	800 acre wetland complex includes mix of open and forested wetland and 75 acre mature upland parcel.	2
Narrows Uplands	T5 ND BPP, T6 ND BPP	1200 ac of high volume stands, on either side of The Narrows, including Bear Island	2
Nicatous Stream	T3 ND	1000 acre block of predominantly wetlands along Nicatous Stream that includes 100 acre streamside fen on glacial outwash.	2
North Branch Wetlands	T37 MD	1000 acre of cedar in basin along esker complex of Little Musquash Stream	2
Number 3 Pond	T3 R1 NBPP	2200 acre undeveloped pond (except for one small arm) with intact forested uplands and wetlands surrounding it. Includes small exemplary community of Hemlock Forest (1995) on northern shore.	2

Site Name	*Town(s)*	*Why Chosen*	*Priority*
Olamon Stream Red Pine	Greenbush, Greenfield	1200 ac block of uplands and wetland along Olamon Stream;	2
Passadumkeag Mountain	Grand Falls Twp	1200 acre block includes acres of post-burn uplands with steep slopes	2
Passadumkeag Peatland	Lowell	1100 acre open peatland rimmed by cedar (possibly some small secndary pools).	2
Peter Dana Point	Indian Twp	2200 ac block of mixed uplands. Appears mature on photos. Includes 400 ac Huntley Brook Flowage	2
Pike Cove Inlet Bog	T11 R3 NBPP	400 acre eccentric bog with numerous secondary pools.	2
Pond Farm State Wildlife Manage	Maxfield, Howland	1400 acre block of wetlands including open peatlands.	2
Rofford Brook Wetland Complex	T36 MD BPP	1200 acre wetland ecosystem, including several bogs, NE one with concentric zonation; south one more forested	2
Salmon Stream Uplands	Medway, Molunkus	1500 acre block consisting primarily of post-burn uplands on alkaline bedrock	2
SE Talmadge Cedar	Talmadge	800 ac of mixed coniferous forest, some high volume stands	2
Sly Brook Wetland	Island Falls	1800 acre wetland complex including open peatlands and cedar swamps	2

Site Name	*Town(s)*	*Why Chosen*	*Priority*
Stetson Mountain Peatland	T8 R3 NBPP	550 acEccentric Bog 1987; need to be updated	2
Stiles Lake Red Pine	T35 MD	~500 ac of red pine stands;	2
Summit Bog	Summit Twp	1200+ acre domed bog and surrounding uplands.	2
Sunkhaze Meadows	Milford	Several thousand acre peatland complex, lower part documented as exemplary natural community (some parts 1982, some parts 1995);	2
The Oxbow	T34 MD, T35 MD	1400 acre peatland complex consisting of two large open peatlands; no obvious patterning or secondary pools	2
Thousand Acre Bog	Passadumkeag	800 acre batman-shaped peatland -- mostly surub bog and forested bog	2
Timber Brook Swamp	Osborn	1400 acre peatland/forested wetland with 100+ ac of cedar	2
Tolman Deadwater	Prentiss Plt Kossuth Twp	4400 acre wetland including eccentric bog ecosystem in southwest and open bog in northeast with some cedar.	2
Tunk Mountain	T10 SD	Open ledges and steep north slope of Tunk Mountain	2
Upper Penobscot River Islands	Mattamiscontis Twp, Howland	3000 ac Mature hardwood forest on series of islands on Penobscot River	2

Site Name	*Town(s)*	*Why Chosen*	*Priority*
Upper Skagrock Brook Wetland	Orient	2200 acre wetland with open peatlands and mature cedar including small high volume stand.	2
Upper-Middle Pistol Lakes	T4 ND	1000 acre wetland block includes 200 acres of peatlands with significant cedar stands.	2
Waite NE Peatland	Waite	600 ac peatland. Northern part appears to be open dwarf shrub bog. Southern part includes high volume softwood	2
West Branch Mattagodus Stream	Webster Plt	1700 acre block of wetlands including several small (~20-30 acres) open peatlands rimmed by cedar stands.	2
Whitney Cove Uplands	T6 R1 NBPP T6 ND BPP	1500 ac spruce woodland on west side; mature mixed woods on east side	2
Whitney Mtn	T6 R1 NBPP, T5 R1 NBPP	500 acre spruce woodland on summit and some steep slopes.	2
Witcher Brook Swamp	Danforth	1500 acre peatland with several community types, including possibly some patterned fen. Surrounded by softwood stands.	2
Bancroft Railroad Wetland	Bancroft	900+ acre wetland including 100 acre open peatland.	3
Beaver Brook Confluence	TA R2 WELS, Linneus	500 acre block of mixed forested and open wetlands at confluence of two streams. Some cedar.	3
Big Island	T5 ND BPP	500 ac island, no obvious signs of cutting. Also small steep slope on mainland with alkaline bedrock.	3

Site Name	*Town(s)*	*Why Chosen*	*Priority*
Big Lake Stream Uplands	Grand Lake Stream Plt, T27 ED BPP	~1200 ac mixed woods and forested wetland drainages. No roads or recent cutting on air photos.	3
Bog North of Patten Pond	Talmadge, Waite	600 ac peatland- two open ~75 ac dwarf shrub bogs, ~100 ac of cedar at north end	3
Bonney Swamp	No. 21 Twp	200 ac forested wetland/basin swamp	3
Bradley Brook Peatland	T2 R4 WELS	450 ac Fen along Bradley Brook shows some patterning, secondary pools	3
Butterfield Cove Cedar	Brookton Twp	~200 ac forested wetland, 100 ac cedar swamp	3
Cold Brook Cedar	Island Falls	300 ac cedar swamp along Cold Brook	3
Davis Brook Bog	Amity	500 ac Shrub bog and forested bog	3
Dead Stream Drainage	Great Pond Plt	~850 ac flowage with spotty sedge/grass areas	3
Eagle Lake Bog	T34 MD	~500 ac level bog, bisected by road	3
East Musquash Lake Uplands	Topsfield	700 acre block of mixed hardwood-softwood forest with some steep slopes. Most appears relatively young -- past burn & clearcutting	3

Site Name	*Town(s)*	*Why Chosen*	*Priority*
East Waite Cedar	Waite	~400 ac stand of mixed conifer and cedar, appears mature on photos	3
Eskutassis Pond Wetland	Burlington	400 acre wetland along stream connecting Eskutassis Pond and Little Eskutassis Pond. Includes open fen and some cedar.	3
Flipper Brook Bog	Indian Twp	500 ac peatland, about 1/2 is forested. Also ~ 300 acre possibly mature upland-wetland mix.	3
George Brook Bog	Indian Twp	400 ac peatland with secondary pools, some zonation	3
Gulliver Brook Wetlands	T2 R4 WELS	500 acre block of open wetlands along Gulliver Brook.	3
Hawkins Ridge Bog	T8 R4 NBPP	~1200 acre peatland and adjoining stream, some patterning	3
Haynesville Bog	Haynesville	500 acre block of wetlands that includes an 80 acre (domed?) bog with cedar.	3
Hoctor Pond Cedar	Herseytown	125 acre cedar swamp	3
Horse Mountain	Herseytown Twp	600 acre block of hardwoods with some steep slopes and no cutting apparent in 1991 air photos.	3
Huntley Brook Peatland	Indian Twp	~1200ac mostly forested wetland	3

Site Name	*Town(s)*	*Why Chosen*	*Priority*
Inman Bog	Woodville	500 acre MNAP eccentric bog ecosystem last visited in 1987.	3
Island Falls EO's	Island Falls	30 ac--Several rare plants near Fish Stream,	3
Jim Libby Cove Wetland	T43 MD	200 acre wetland, half cedar and half shrub/scrub bog.	3
Jimmy Brook Bog	Forkstown Twp	650 ac mostly shrub bog, some forested bog	3
Keene Bog	Chester	900 acre wetland complex including 150 acre open peatland.	3
Lambert Bog	Lambert Lake Twp	800+ acre block includes 70 acre open bog with high volume soft and mixed wood upland stands.	3
Lathrop Heath	Topsfield	350 ac wetland including 100 ac cedar swamp and 50 ac of high volume M3	3
Little Buffalo Wetland	T39 MD	1200 acre block includes 150 acre wetland and apparently intact upland forest.	3
Lower Crooked Brook Cedar	Forest Twp	~300ac forested wetland, 150 ac cedar swamp	3
Lower Sabao Lake Cedar Stand	T35 MD	700 ac small but mature cedar stand; possibly old growth.	3

Site Name	*Town(s)*	*Why Chosen*	*Priority*
Lower Skagrock Brook Wetland	Haynesville	600 acre wetland with cedar stands	3
Marsh Creek	T2 R8 NWP	1900 acre wetland complex along Marsh Creek includes 150 acre cedar swamp.	3
Mattagodus Stream Bog	Springfield	600 acre block that includes 80 acre open peatland and surrounding forested wetlands.	3
Medunkeunk Lake Hardwoods	T2 R9 NWP, Medway	1800 acre block of primarily young hardwoods (possibly post-burn).	3
Monument Brook Wetlands	T4 R3 WELS	200 acre mostly forested wetland.	3
Orient Mixed Woods	Orient	1000 acre block of mixed upland and wetland that includes upland mixed woods and wetland cedar stands. ~300 acres of high volume stands.	3
Patterson Bog	Lakeville	500 acre bog and fen at the head of Little Taylor Brook. Ringed by cedar.	3
Pleasant Lake Peninsula	T6 R1 NBPP	200 ac peninsula lead hemlock slope forest 1983 and steep south-facing slopes on alkaline bedrock.	3
Rush Pond	Herseytown Twp	600 acre block of wetlands around Rush Pond includes 50 acres of apparently mature cedar.	3
Salmon Stream Lake Bog	T1 R6 WELS	1700+ acre block includes 750 acre upland forest with no evidence of recent cutting and 300 acre open peatland.	3

Site Name	*Town(s)*	*Why Chosen*	*Priority*
Simsquish Brook Wetlands	Dyer Twp, Lambert Lake	850 ac mostly forested wetland	3
Skiticook Stream Cedar Swamp	T4 R3 WELS	700 acre forested wetland appears to be a cedar swamp.	3
Skunk Pond Woodlands	Greenfield	2800 acre post burn early successional hardwoods and small scattered peatlands	3
Snake Brook Upland	Macwahoc Plt, Mattawamkeag	650 acre block of mixed upland and wetland	3
Sprague Meadow Peatland	Baileyville	600 ac peatland, most is forested wetland, about 2/3 typed as cedar	3
Tenmile Lake Peatlands	TA R2 WELS	700 acxShrub scrub and forested wetland. Enriched bedrock at north end of site	3
West Musquash Softwoods	T6 R1 NBPP	1000 acre stand of mature, high volume softwoods including small stands of cedar.	3
Wyopitlock Stream	Reed Plt	1200 acre block of wetlands including 40 acre open peatland and streamside wetlands with lots of oxbow pools and 50 acre fen.	3