

# **Natural Resource Inventory of the Mahoosuc and Rangeley Region: Four Ponds Unit**



*Andy Mcleod (MNAP field staff) with old sugar maple along Appalachian Trail*

**Prepared by  
Andy Cutko  
Maine Natural Areas Program**

**For the  
Bureau of Parks and Lands**

**March 2010**

# Table of Contents

<b>Preface</b> .....	2
<b>Property Description</b> .....	2
<b>Geology and Soils</b> .....	3
<b>Hydrology and Water Quality</b> .....	3
<b>Wetlands</b> .....	4
<b>Ecological Processes</b> .....	4
<b>Land Use and Harvest History</b> .....	5
<b>Wildlife and Fisheries</b> .....	5
<b>Rare Animal and Plant Species</b> .....	6
<b>Natural Communities</b> .....	6
<b>References</b> .....	7
<b>Appendix 1: Exemplary Natural Communities and Rare Plant Species of the Four Ponds Unit</b> .....	8
<b>Appendix 2: Maps of the Four Ponds Unit</b> .....	9

# Four Ponds Unit

## Preface

This Natural Resource Inventory (NRI) was conducted for the Bureau of Parks and Lands (BPL) by the Maine Natural Areas Program (MNAP) as part of the Bureau's management plan development process for the Four Ponds. No previous NRIs have been completed for this unit.

The primary purpose of this NRI is to identify and describe important natural resources that should be considered in drafting the Bureau's management plan for the unit. Fieldwork has been completed by MNAP staff, including Andy Cutko and Andy McLeod in the summer of 2008. In all cases, fieldwork is preceded by landscape analysis performed using relevant GIS layers, aerial photos, and consultation with BPL staff.

## Property Description

The 5,800 acre Four Ponds Unit lies in a 'U' shape extending a high plateau between Rangeley and Rumford. The Unit is best known for its remote and scenic high elevation ponds. Elevation on the Unit ranges from 1740 feet to over 2900 feet. The entire Unit lies above 1700 feet and most is above 2000 feet. Four Ponds Mountain lies just north of the Unit, rising to 2,921 feet. Together with the Appalachian Trail corridor that bisects the property and provides the main foot access, the Unit encompasses the entire shorelines of three ponds (Long Pond, Sabbath Day Pond, Little Swift River Pond) and significant shorelines of three others (Swift River Pond, Beaver Mountain Pond, Moxie Pond, and Round Pond). Approximately thirty camp leases are scattered around lakeshores of the Unit, with most of them on Long Pond.

The disconnected tract on the west side along Route 17, referred to as the Rangeley section, consists mostly of the west and northwest facing slopes of Four Ponds and Spruce Mountains respectively. It also contains several small drainages including the headwaters of Toothaker Brook.

Letter E is the large rectangular section in the center of the Unit. Long Pond, the largest of the "Four Ponds," forms this section's western border and is adjacent to Round and Sabbath Day Ponds. The topography around these ponds is gently rolling. Heading east, the terrain becomes steeper and more rugged with the Appalachian Trail running along the peaks of 2600 to 2900 ft.

The Sandy River section is the eastern component of the Unit and lies within Sandy River Township. The southern part of the Sandy River section is a continuation of the steep terrain, featuring numerous seasonal drainages. These drainages come together into a flat, half-mile wide valley that flows into Beaver Mountain Pond, which forms the northern border of the unit.

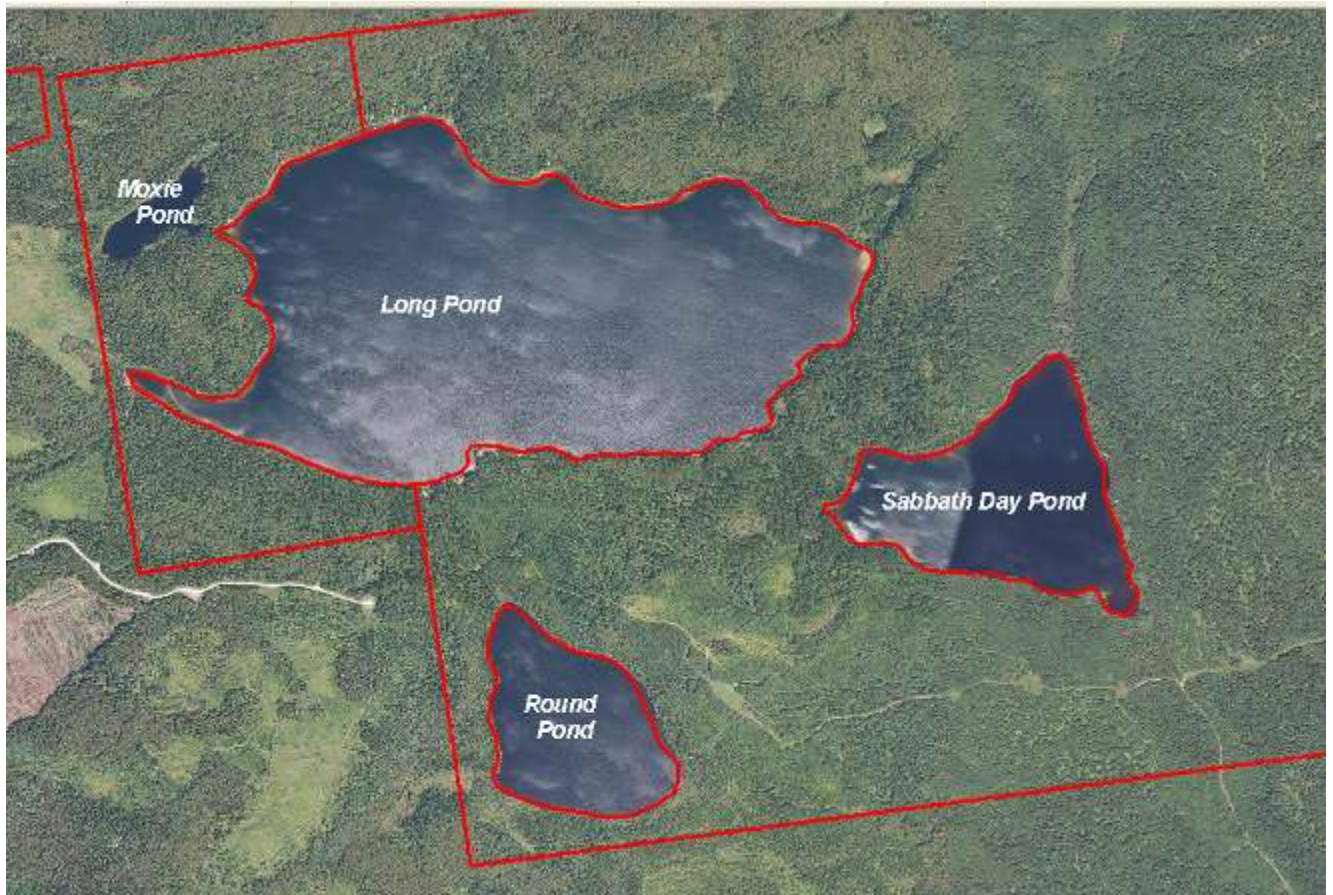
## Geology and Soils

The bedrock that underlies Four Ponds consists of sandstones and mudstones deposited during the Silurian period, 443 to 417 million years ago. At that time, an ancestral ocean basin was closing, and mountains were shedding large amounts of sediment into the ocean. These sediments were then subjected to pressure and heat and uplifted to form the Rangeley Formation, Perry Formation, and Greenville Cove Formation, depending on the various types of sediments (Maine Geologic Survey 1995). The surficial geology is dominated by ‘thin drift’ (till that is less than ten feet deep over bedrock).

Soils in the Four Ponds unit are the Ennchanted-Saddleback-Ricker, Telos-Monarda-Monson, and Colonel-Dixfield Lyman soil groups. These are comparatively poorly developed (inceptisol) and infertile (spodosol) soils typical of deep, dense till areas in northern and western Maine.

## Hydrology and Water Quality

The Four Ponds Unit encompasses parts or all of the shorelines of six ponds or lakes. All lie within the Richardson Lakes watershed, except Swift River Pond and Little Swift River Pond, which drain south to the Androscoggin.



*Western side of the Four Ponds Unit, 2009 imagery*

BPL land covers roughly one mile of the south shoreline of the 499-acre Beaver Mountain Lake (also known as Long Pond), the largest of the lakes on the Unit. Water quality monitoring data for Beaver Mountain Lake has been collected sporadically since 1984, and the Lake's water quality is considered slightly above average, based on various chemical and physical measures. It is considered moderate in nutrients ('mesotrophic'), in contrast to other lakes on the Unit. Dissolved oxygen profiles from as recent as 2006 show moderate depletion in deep areas of the lake, and oxygen levels below 5 parts per million may stress certain cold water fish, and a persistent loss of oxygen may eliminate or reduce habitat for sensitive cold water species. (PEARL Database).

The 264-acre Long Pond has a maximum depth of 114 feet and has been classified as 'oligotrophic' (clear and low in nutrients and aquatic vegetation). Sabbath Day Pond is a 65-acre lake with a maximum depth of 73 feet (PEARL database).

The 43-acre Round Pond is a shallow (8 feet maximum depth), oligotrophic lake that is somewhat more acidic (pH 5.3) than other lakes.

## **Wetlands**

Only 125 acres, or just over 3% of the Unit, is classified as wetland according to the National Wetlands Inventory. These wetlands, divided evenly between forested and open types, are scattered throughout the unit along beaver meadows and drainages. The largest single wetland is a 60-acre alder and sedge meadow where an un-named brook enters Beaver Mountain Lake.

## **Ecological Processes**

In the upland forests of Four Ponds, there is variable evidence of spruce budworm, wind and weather damage, and moose browse. These processes particularly overlap at higher elevations, creating a patchy mosaic of stand structures.

In addition, field work in 2008 revealed evidence of some fires long ago, including even-aged softwood stands and charcoal remnants in the soil. Small fires, such as those caused by



*Hayscented fern inhibits regeneration in a high elevation area of Four Ponds with heavy moose browse*

lightning strikes, open up patches of forest that are typically re-colonized by spruce, aspen, or birch, depending on the seed source and intensity of fire. This patchy disturbance contributes to an uneven and diverse forest canopy.

Beaver activity is evident in some of the small tributaries in the Four Ponds unit, including a small stream entering Long Pond from the northeast and a tributary to Swift River Pond. Beavers build dams to give them safe access to the hardwoods they prefer to eat. When active, beaver ponds flood adjoining uplands, enlarging wetlands and creating new areas for wetland species to colonize. Once the hardwoods within a safe distance of the pond are gone, beavers often abandon their dam and build a new dam in a different location. These abandoned ponds typically slowly fill with sediment and transition from marshy wetlands back to uplands. By creating and abandoning impoundments along the stream course, beavers create a mosaic of habitats for other plant and wildlife species.

### **Land Use and Harvest History**

Lands in Township E were acquired from International Paper BPL in 1978, and lands in Township D were acquired from the Brown Company in the same year. Prior to state acquisition, these lands had been managed as commercial working forest, with virtually all the lands periodically harvested except small portions of the Appalachian Trail corridor. Since BPL acquired the lands, harvests have occurred from 1984 through 1995 and resumed in 2009. The remaining parcels in Rangeley Plantation and Sandy River Plantation were original public lots that have also been managed for timber, with the most recent harvests occurring from 2004-2006.

### **Wildlife and Fisheries**

The mid and high elevation, closed canopy forest provides habitat for a number of mammals, including black bear, fisher, bobcat, snowshoe hare, pine marten, and moose. Frequent songbirds in this coniferous forest type include black-throated green warbler, magnolia warbler, blackburnian warbler, northern parula, white-throated sparrow, and ruby-crowned kinglet.

At least one small wetland serves as a vernal pool (wood frog egg masses were noted in late April), and a number of ruts in a logging road/ATV trail also supported wood frog egg masses.



*Wood frog egg masses in small wetland north of Sabbath Day Pond*

Parts of three mapped Significant Habitats are known from the Four Ponds Unit. A 50 acres wetland at the south end of Beaver Mountain Pond is mapped as a moderate value

Inland Waterfowl and Wading Bird Habitat. Part of another IWWH lies in a basin around Swift River Pond in the southeast corner of the Unit. No Deer Wintering Areas are mapped from the Unit.

***Game Fish Species at Four Ponds (from MDIFW)***

<b>Pond Name</b>	<b>Size (acres)</b>	<b>Mean Depth (feet)</b>	<b>Maximum Depth (feet)</b>	<b>Fish Species</b>
Long Pond	264	40	114	Arctic Char, Brook Trout, Lake Chub, Rainbow Smelt
Sabbath day Pond	65	21	73	Brook Trout, Lake Chub, Rainbow Smelt
Round Pond	43	5	8	Brook Trout
Moxie Pond	7	7	19	Brook Trout
Swift River Pond	10	5	21	Brook Trout
Little Swift River Pond	7	10	22	Brook Trout

Loons have been documented on a number of the ponds by Maine Audubon, but nesting status is not known.

LURC’s *Maine Wildlands Lake Assessment* (1989) lists all of the ponds as having significant or outstanding fisheries. Round Pond, Long Pond, and Swift River Pond have been stocked with brook trout by IFW since 1989. Long Pond also supports a population of landlocked arctic char – a Special Concern species that occurs in only a handful of lakes in northern Maine.

Other aquatic species known from the Unit include eastern elliptio and eastern floater (two species of freshwater mussels) -- both in Beaver Mountain Pond. Loons have been documented as nesting on the Lake since 1983.

**Rare Animal and Plant Species**

Only one rare plant species, boreal bedstraw (*Galium kamtchaticum*) is known from the Unit. A small population of this rare plant was found in a mountain seep north of Long Pond in 2008. Aside from the arctic char in Long Pond, no other rare animals are known from the Unit.

**Natural Communities**

Four Ponds supports mix of northern hardwood, mixed wood, and softwood forest that is characteristic of the region. Reflecting the relatively high elevation of the Unit, only 15% is mapped as hardwood forest (primarily the lower slopes of the Rangeley section), while 46% is mixed wood and 39% is softwood.

In terms of natural community types, the ‘matrix’ forest on much of the Unit is Montane Spruce – Fir Forest, which in places grades into the mixed Spruce – Fir Northern Hardwood Forest type, with smaller patches of Beech Birch Maple Forest and Fir – Heartleaved Birch Sub-alpine Forest. As noted previously, many areas show signs of past wind/weather events, with frequent but small (>1 acre) patches of blowdowns. Most areas show some signs of previous forest management, including current (2009/2010) harvesting north of the Appalachian trail in the central portion of the Unit.

Along the Appalachian Trail east of Sabbath Day Pond, lower slopes support an exemplary Beech-Birch-Maple forests dominated by large (70-90 cm DBH), somewhat stunted yellow birch and sugar maple. The forest is relatively open, with basal area ~80 sq. ft/acre. A ~25 acre patch along the trail exhibits little or no evidence of harvest or other prior human disturbance. The understory is well developed and characteristic of this type, dominated by wood sorrel hobblebush with heavy moose browse. Three “late-successional index” index plots averaged a score of 7 -- suggesting late-successional but not old growth status. Our tree corer was not large enough for any of the large yellow birch trees.

On the south slope of Four Ponds Mountain, a stand of even-aged paper birch with chunks of charcoal in the soil indicates a fire occurred in this area ~40-50 years ago.

## **References**

University of Maine PEARL database website: <http://www.pearl.maine.edu/>.



# Appendix 1: Exemplary Natural Communities and Rare Plant Species of the Four Ponds Unit

## Exemplary Natural Communities

Feature Name	Location	S-Rank/G-rank	EO Rank	Last Obs.	Size (ac)
Northern Hardwoods Forest	Appalachian Trail	S4/G3G5	B	2008	2.7
Subalpine Fir Forest	Appalachian Trail	S3/GNR	B	2008	16.0

## Rare Animals

Arctic char	Long Pond	S1/G5		N/A
-------------	-----------	-------	--	-----

## Rare Plants

Feature Name	Location	S-Rank/G-rank	EO Rank	Last Obs.	Size (ac)
Boreal Bedstraw	North of Appalachian Trail	S2/G5	C	2008	Point

\*For rare plant or animal fact sheets, see .

<http://www.maine.gov/doc/nrimc/mnap/features/index.htm>.

## **Appendix 2: Maps of the Four Ponds Unit**

