Natural Resource Inventory
of the Richardson and Bald Mountain Units

Shoreline of Richardson Lake

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for the
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Richardson Lake Unit

Preface

Natural Resource Inventories were previously conducted for the Bald Mountain and Richardson Units in 1994 and 1998, respectively (Albright 1994; Publicover, Davis, and Scholl 1998). Previous ecological studies are limited to a survey of the Pepperpot Pond area by Albright (1985). Neither the Richardson nor Bald Mountain Units underwent field inventory as part of the mid-1990s investigation of public lands for Ecological Reserve potential; these lands was eliminated from consideration during the initial screening due to the widespread harvesting in the last 50 years.

While some forest management has occurred on the Richardson Unit in the last decade, there have been few other significant changes on either Richardson or Bald Mountain since those original reports were produced. Therefore, the intent of this Natural Resource Inventory is not to replicate the detailed information in the earlier reports, but to supplement it with additional updated information where relevant. Limited field surveys were conducted by MNAP staff (A. Cutko, G. Kozlowski, C. Cabot) in 2009 to re-visit some of the priority areas identified in the 1998 report.

Property Description

At 18,529 acres, the Richardson Unit contains about eleven miles of frontage (nearly the entire eastern shoreline) on Upper Richardson Lake and roughly eight miles of frontage on Mooselookmegunticook Lake. (In addition, the entire western shore of Upper and Lower Richardson Lakes is protected by a privately held conservation easement). Mooselookmegunticook and the Richardson lakes are popular destinations for fishing, boating, snowmobiling, and camping. Aside from the lakeshores and a scattering of leased camps, the Richardson Unit receives relatively little public use, with the exception dispersed hunters. However, the Bald Mountain trail is one of the more popular local destinations for hikers.

The interior forestland of the Richardson Unit has a long history of forest management and supports a mixture of mid-aged and mature forest types, with softwood dominant. The Bald Mountain Unit has a higher proportion of hardwood forest, particularly on the lower slopes.

The Physical Landscape

In contrast to the more rugged Mahoosucs and Four Ponds, the Richardson Unit is flat to rolling, with elevations ranging from 1450 feet (lake level) to 2100 feet; the 2470' Bald Mountain is a notable exception. Bedrock is primarily granitic, and soil deposits are generally deep, coarse textured, and moderate to low in fertility. The physical landscape

of the Richardson Unit is described in greater detail by Publicover, Davis, and Scholl (1998).

Hydrology and Water Quality

The Rangeley Lakes have been impounded for energy generation and log driving since the 1800s. The lake levels are drawn down in the fall and winter, creating extensive vegetated wetland flats and sandy beaches.

The lakes lie in the Upper Androscoggin River watershed. Mooselookmeguntic Lake drains through Upper Dam into Upper Richardson Lake, which and then drains through Middle Dam on Lower Richardson Lake into the Rapid River. The Rapid River flows into Lake Umbagog, which forms the headwaters of the Androscoggin River. Several mid-size meandering streams drain the Unit, including Mosquito Brook, Metallak Stream, and Metallak Brook.

In LURC's Wildlands Lake Assessment (1987), Lower Richardson Lake is listed as 'Class 1A' or statewide significance, based on a number of high resource values. Data sporadically collected since 1981 indicates that the water quality of Upper Richardson Lake is above average and the water quality of Mooselookmeguntic is average, based on measures of water clarity, total phosphorus, and chlorophyll-A. Recent dissolved oxygen profiles show no oxygen depletion (i.e., no risk to cold water fisheries) in deep areas of either lake, and water quality appears to be stable (University of Maine PEARL database).

In addition to these large lakes, three large ponds are entirely contained within the Unit: the 465-acre West Richardson Pond, the East Richardson Ponds (54 and 78 acres), and the 53-acre Pepperpot Pond. No water quality data are available for these smaller lakes. There are scattered seasonal camps on West Richardson Pond and one camp each on Pepperpot and East Richardson Ponds.

Wetlands

The Richardson Unit has 965 acres of wetlands, of which two-thirds are forested and one-third are open, according to the National Wetlands Inventory. At 5% of the land base, the proportion of wetlands here is lower than other parts of Maine but significantly higher than the rugged Mahoosuc Unit. Wetlands range in size from relatively small, isolated kettlehole basins (see photo at right) to larger complexes of beaver meadows. The

Kettlehole peatland near The Narrows

largest wetland on the unit is a ~250 acre complex of peatlands and beaver meadows along upper Mosquito Brook.

Ecological Processes

The open expanses of the Rangeley Lakes can deliver large gusts of channeled wind to the surrounding forests, resulting in sandy berms and overwash basins along the lakeshores (see photo at right). These overwash basins, though somewhat artificially enhanced by manipulated lake levels, support an uncommon and unique assemblage of plant species (including sedges, rushes, and swamp candles [*Lysimachia terrestris*]) that also occurs on natural lakeshores in northern and Downeast Maine.

Back berm basin along Upper Richardson Lake

In the interior forest, wind bursts and occasional ice damage create groups of toppled canopy trees that add both vertical and horizontal structure to the forest. The large downed woody debris creates denning sites for small mammals and contributes nutrients to the forest floor. The resulting openings in the canopy also allow suppressed trees and seedlings to take advantage of the sunlight and add younger trees to the canopy.

Beavers are active along some of the numerous small streams that feed into Lower Richardson Lake, including Mosquito Brook and Metallak Stream. When active, beaver ponds flood adjoining lowland forest, enlarging wetlands and creating new areas for wetland species to colonize. Once the food source (typically young hardwoods) within a safe distance of the pond are gone, beavers often abandon their dam and build a new dam in a different

Forest gap created by blowdowns near Upper Richardson Lake

location. These abandoned ponds 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.

The spruce budworm is one of the most destructive native insects of softwood forests in the eastern United States. Spruce budworms begin in treetops, invading buds and cones first. Then they parachute into the understory below, where they attack seedlings and saplings. Budworm populations cycle every 40-60 years, with Maine's most recent outbreaks in the 1920s and 1980s. Given the preponderance of softwood on the Richardson Unit, the impacts of spruce budworm have been significant. Outbreaks of the early1980s, coupled with periodic wind events, resulted in heavy damage to fir-dominated and mixed stands; stands dominated by mature spruce received less damage. Immediately prior to state acquisition, extensive salvage harvesting took place in the response to the budworm, with the heaviest harvesting south of Upper Dam.

Land Use and Harvest History

The majority of BPL acreage at Richardson Lake was acquired in the 1970s and early 1980s from the Brown Paper Company and Pingree heirs (Seven Islands Land Company). The Bald Mountain tract was acquired in 1993. Virtually all the forested land base shows evidence of harvesting during the prior industrial ownership. Since state acquisition in 1984, BPL has conducted harvests in most years, with a total of 105,000 cords removed from the Richardson portion (excluding Bald Mountain). On Bald Mountain, a BPL harvest from 2002 through 2005 removed approximately 7,500 cords.

Bull moose at the mouth of Metallak Brook

Fisheries and Wildlife

Over 20 fish species have been documented in the Rangeley Lakes, including landlocked salmon, landlocked alewife, brook trout, brown trout, lake trout, creek chub, yellow perch, and fallfish. Brook trout, land-locked salmon, and lake trout have all been stocked in Richardson and Mooselookmeguntic lakes, and West Richardson Pond and Pepperpot Pond have been stocked with brook trout. Both West Richardson and Pepperpot also

support two common mussel species: Eastern elliptio and Eastern floater (University of Maine PEARL database).

Loon data for Richardson and Mooselookmeguntic Lakes indicate high counts in recent years, peaking at 46 individuals on Richardson in 2001 and 39 individuals on Mooselookmeguntic in 2004 (PEARL database).

The Richardson Unit has one 480 acre mapped Deer Wintering Area located along the mouth of Mosquito Brook. Part (160 acres) of another mapped DWA occurs south of Pepperpot Pond along Mill Brook, though relatively little winter deer has been observed in this area. The Unit also has about 200 acres of mapped Inland Waterfowl and Wading Bird habitat; the largest of these areas (165 acres) is Pepperpot Pond and the adjacent wetlands.

A number of potential vernal pools were identified during field work in 1998, 2008, and 2009, but none of these areas have been verified during the amphibian breeding season.

Rare Animal and Plant Species

No rare plants or animals have been documented in the Richardson Lake unit.

Noteworthy Natural Communities

The forests at Richardson Lake are predominantly mixed wood (46%), with lesser amounts of softwood (39%) and comparatively little hardwood (15%). Red spruce, balsam fir, and white pine are the dominant softwood species, and yellow birch, paper birch, aspen, red maple, and sugar maple are the dominant hardwoods. Average stocking is 21.5 cords per acre – higher than the average for the region as a whole, but somewhat lower than the average for BPL lands in this region.

Given its prior harvest history, a relatively small portion of the Unit would qualify as late successional forest. A number of older forest stands were identified in the 1998 report; among the older stands encountered in 2009 field work include:

- A ~40-acre White Pine – Mixed Conifer Forest east of the Narrows and Portland

42" white pine east of the Narrows

Point. A limited harvest was conducted in this area in the 1990s to salvage wind-damaged timber, but many large red spruce and white pine trees remain. With an estimate of 10-15 trees>16" per acre, this stand has an 'old growth component'. A steep slope of spruce and cedar just east of this stand may also support an old growth component (cored cedar trees were aged between 150 and 200 years old), but this stand is less than two acres.

- A ~25 acre stand of Low Elevation Spruce Fir Forest near the mouth of Mosquito Brook has limited signs of past harvest and supports numerous old trees (core ages for spruces were 145 and 163, and numerous trees are in the 20-26" diameter range). This natural community grades from a well drained stand on a small knoll to poorly drained spruce flats. A "late successional index" of 10 (42 trees >16" per acre) was obtained for one part of the stand using prism plots.

Note that while the two stands above exhibit late-successional characteristics, they are too small to meet MNAP's criteria for 'exemplary natural communities'.

In addition to these old stands, a Red Pine – White Pine Forest occurs on Pine Island, a ~20 acre island near the mouth of Metallak Brook. This is an uncommon forest type (i.e., ranked S3) in Maine and is typically more frequent in Downeast Maine. Average basal area is 125 square feet/acre, and most canopy trees are in the 16-24" diameter range, with some white pines approaching 32". The stand is apparently even-aged, possibly originating after a harvest and burn about 150 years ago (based on tree cores and charcoal in the soil). There has also been some more recent selective cutting. A series of prism plots indicate that the stand is 57% white pine and 36% red pine, with the remainder consisting of red spruce, cedar, and balsam fir. There is little to no red pine regeneration, and in the absence of fire or other disturbance, red pine may eventually be lost from the stand.

References

Albright. J. 1994. Landscape Analysis and Field Surveys for Significant Ecological Features, Bald Mountain Unit, Rangeley Maine. Report to the Maine Bureau of Public Lands. The Conservation Group, Brunswick ME. 10 pp. + appendixes.

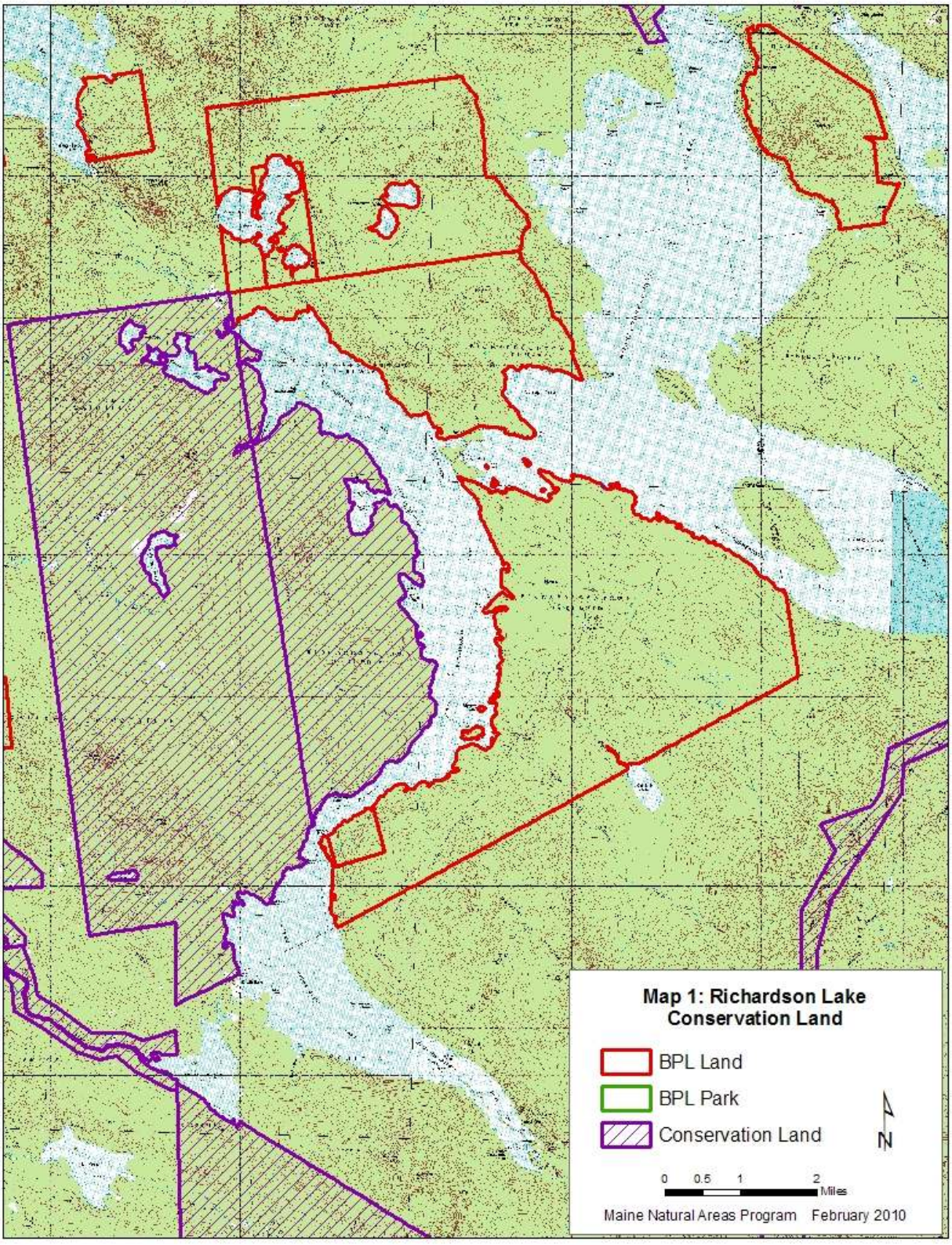
Publicover, D., Davis, S., and B. Sholl. 1998. Natural Resource Inventory of the Maine Bureau of Public Lands Richardson/Bald Mountain Unit. Appalachian Mountain Club. 29 pp. + appendices.

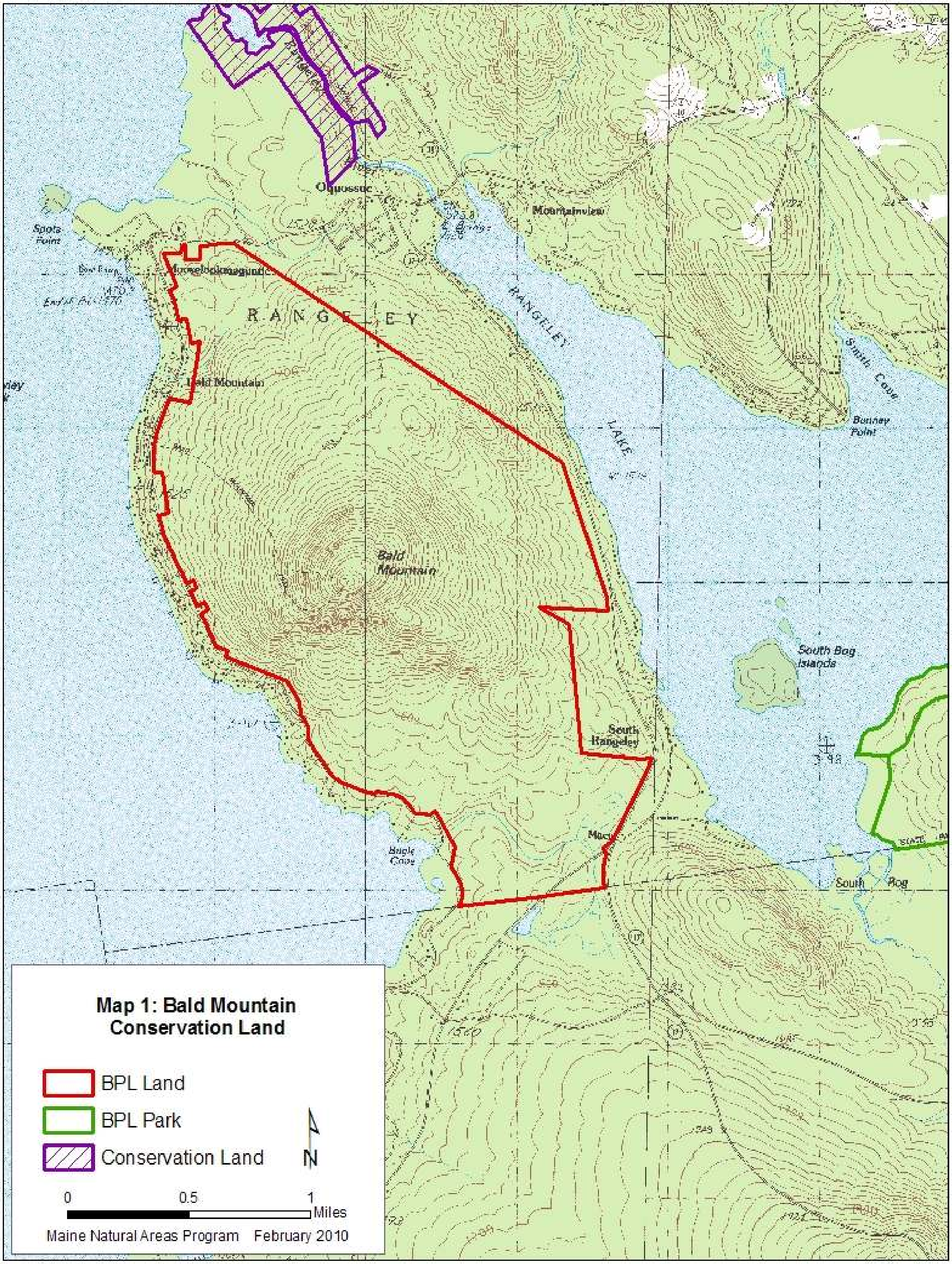
University of Maine PEARL database: pearl.spatial.maine.edu.

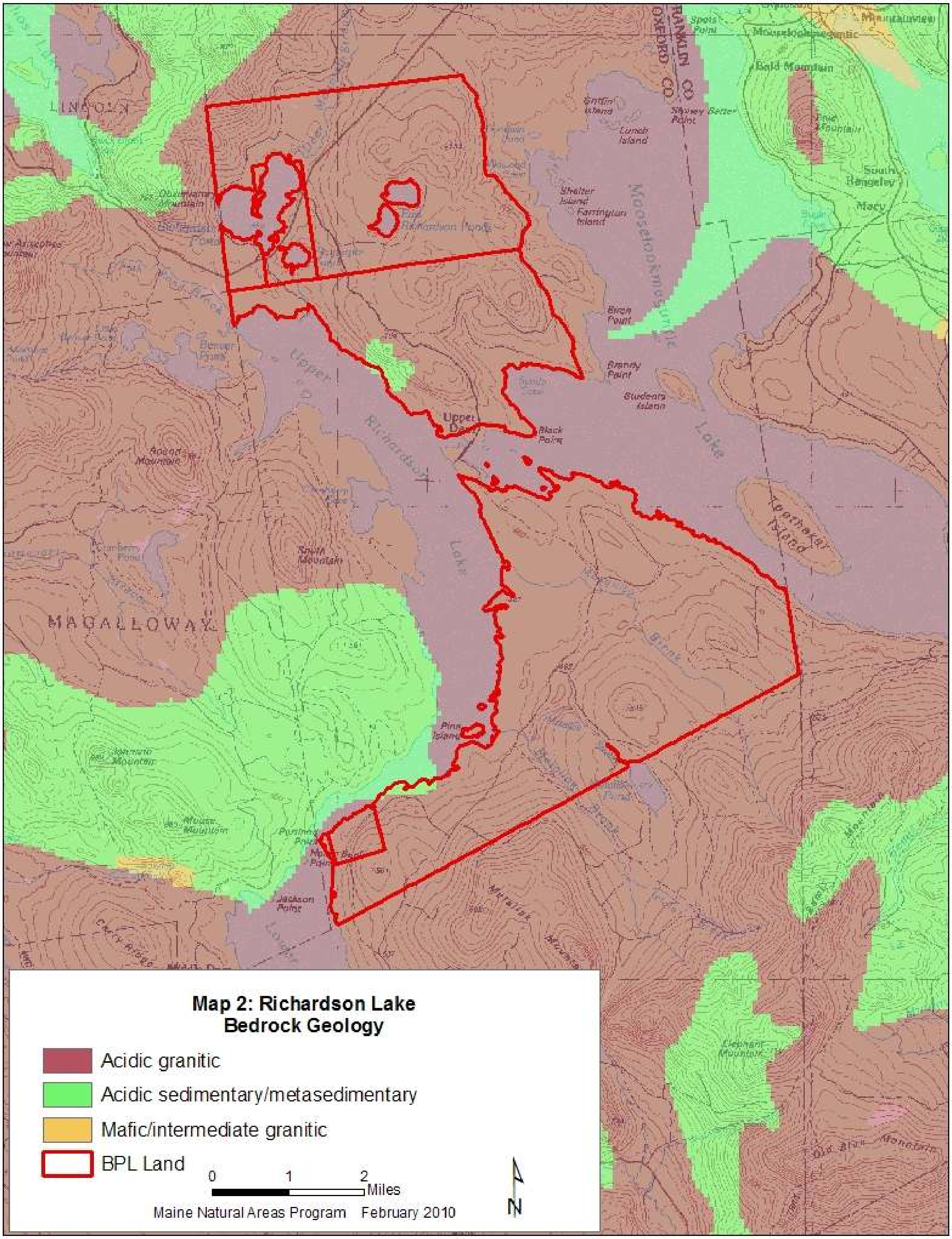
Appendix 1: Exemplary Natural Communities of the Richardson Lake Unit

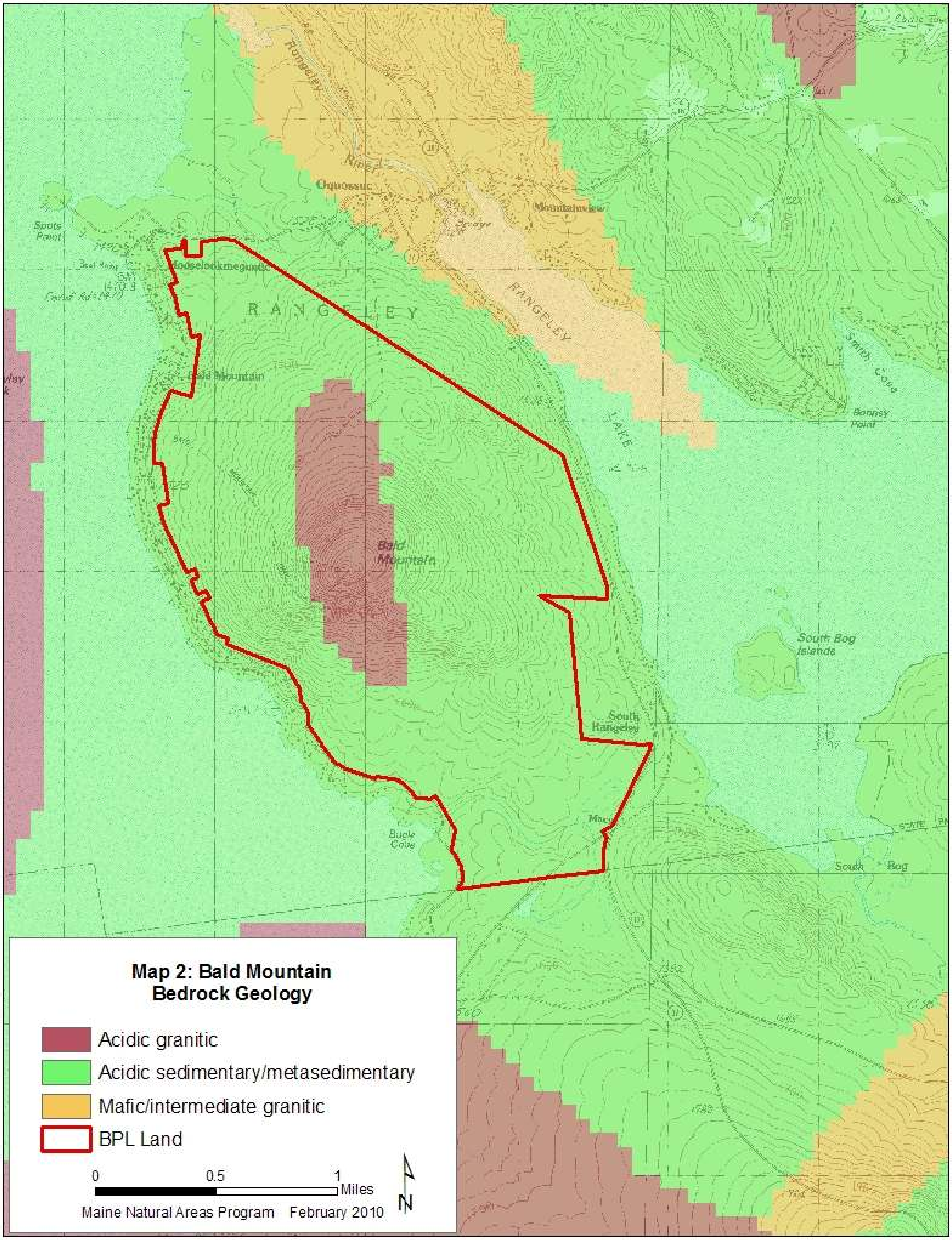
Feature Name	Location	S-rank/G-rank*	EO-Rank*	Last Obs.	Size (ac)
Richardson Lake					
Red Pine White Pine Forest	Pine Island	S3	C	2009	20

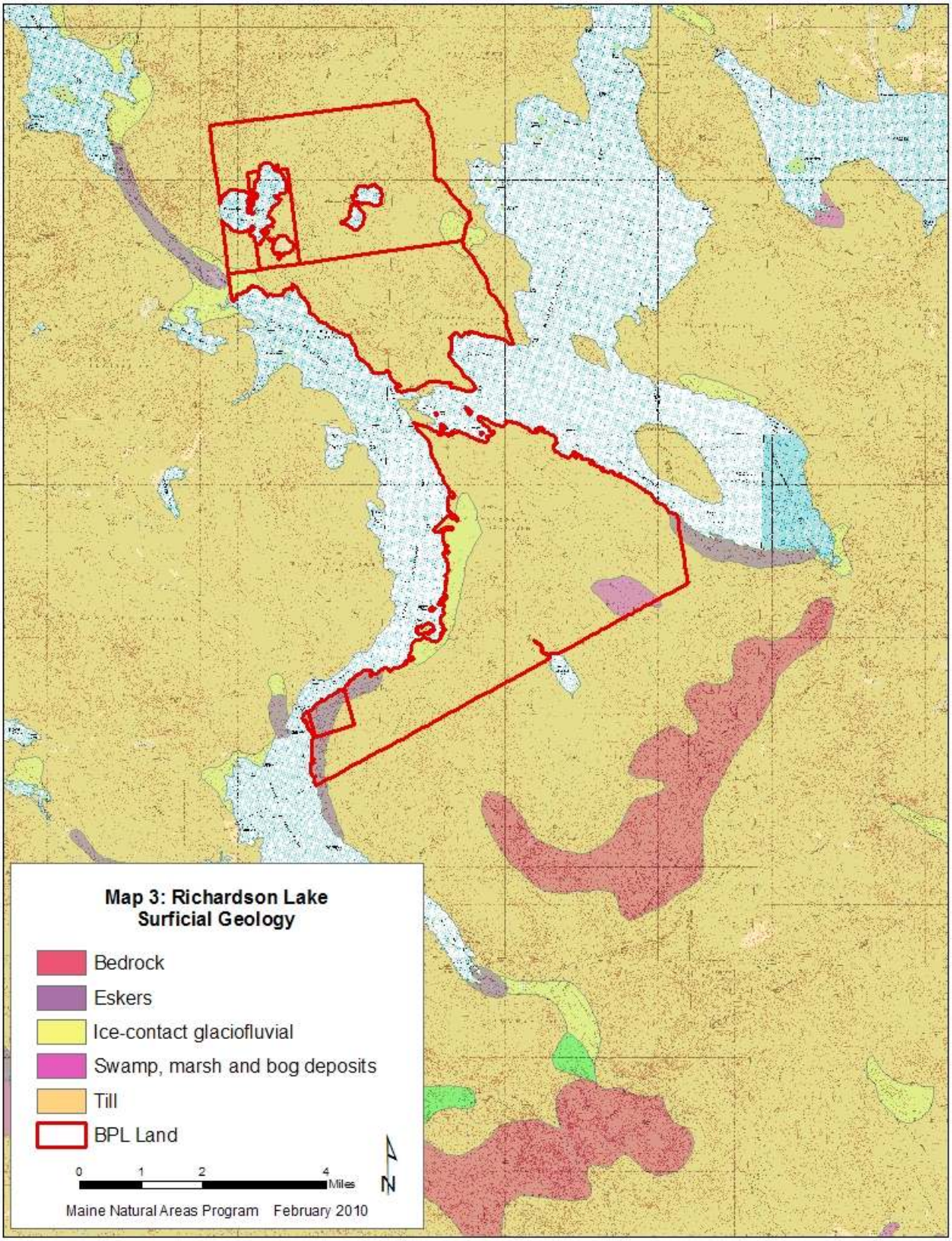
Appendix 2: Maps of the Richardson Lake and Bald Mountain Units

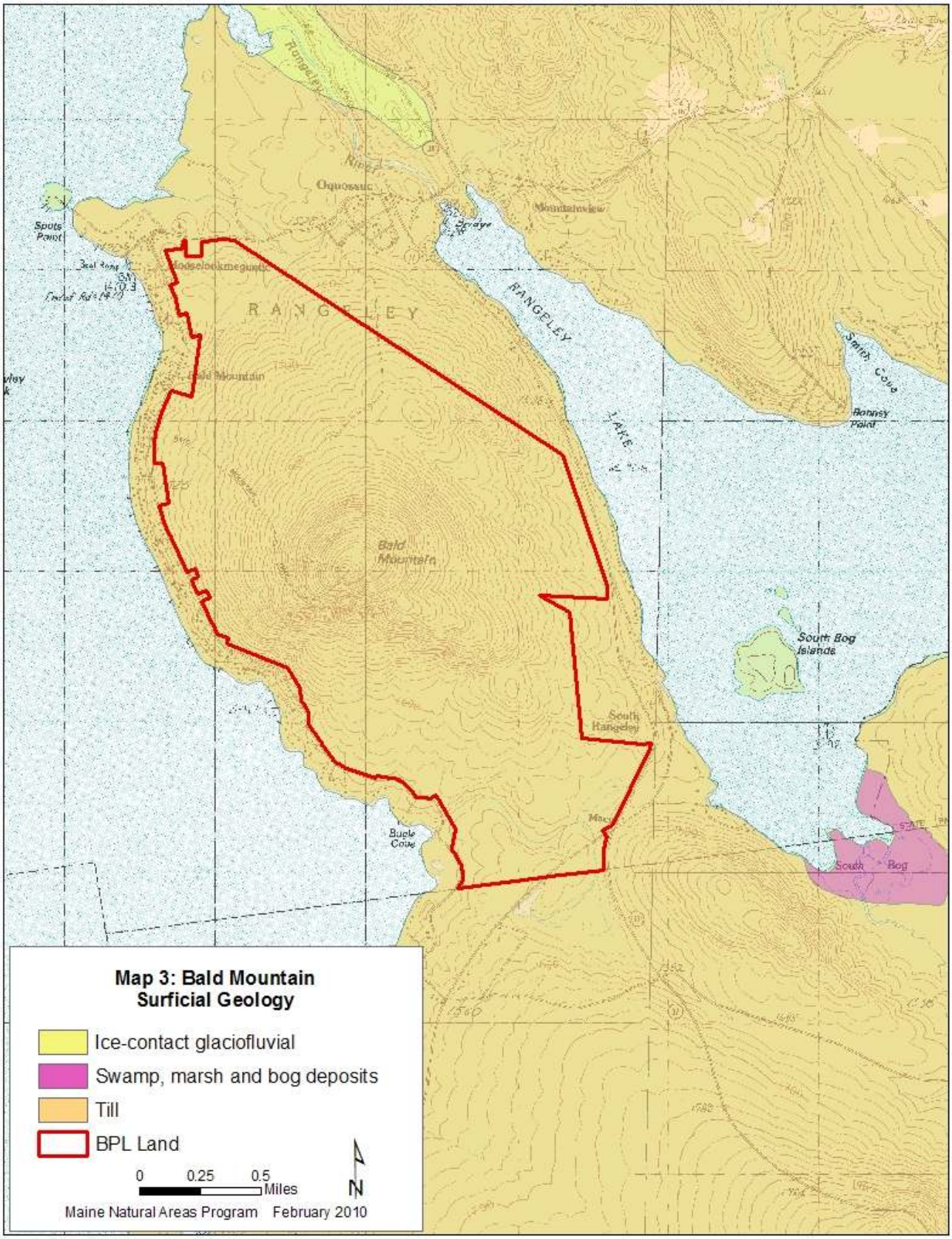

Map 1: Richardson Lake
Conservation Land
BPL Land
BPL Park
Conservation Land
N
0 0.5 1 2
Miles
Maine Natural Areas Program February 2010

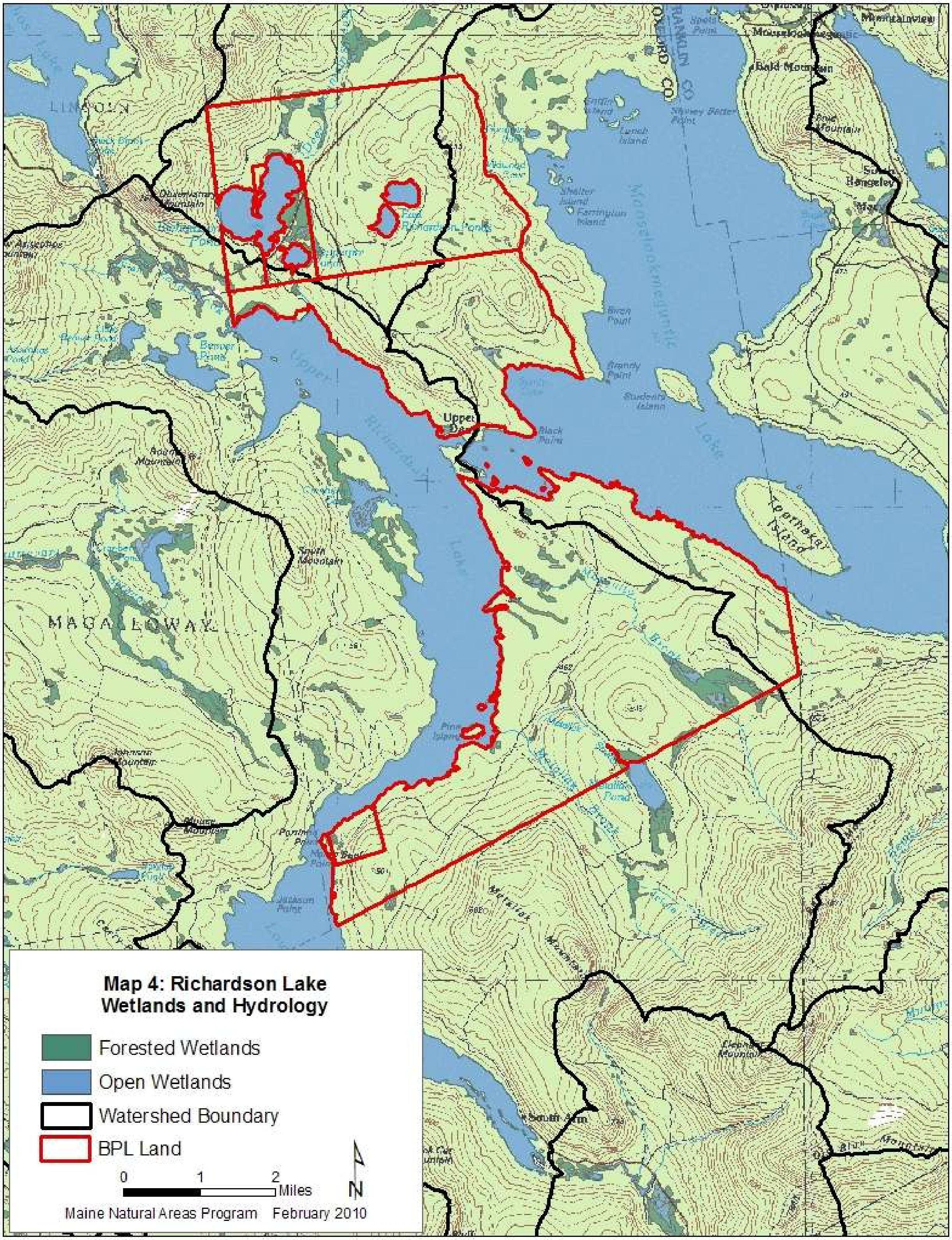

Map 1: Bald Mountain Conservation Land
BPL Land
BPL Park
Conservation Land
N
0
0.5
1
Miles
Maine Natural Areas Program February 2010
Oquossuc
Mountainview
Spots Point
RANGELEY
Bald Mountain
RANGELEY
LAKE
Smith Cove
Bonney Point
South Bog Islands
South Rangeley
Eagle Cove
South
Bog

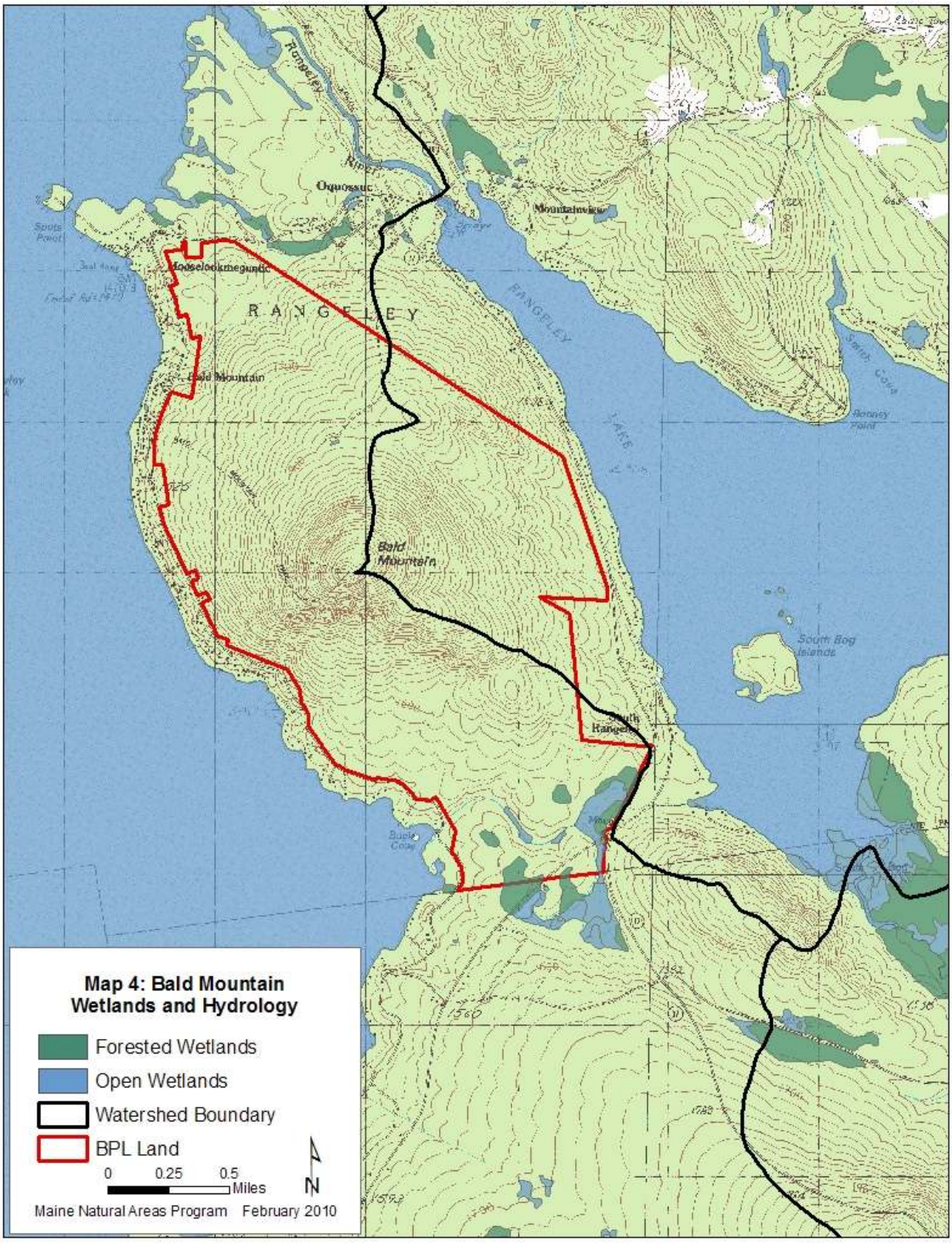

Map 2: Richardson Lake
Bedrock Geology
Acidic granitic
Acidic sedimentary/metasedimentary
Mafic/intermediate granitic
BPL Land
0
1
2
Miles
Maine Natural Areas Program February 2010
N
MAGALLOWAY
Upper Richardson Lake
Mooselookmeguntic Lake

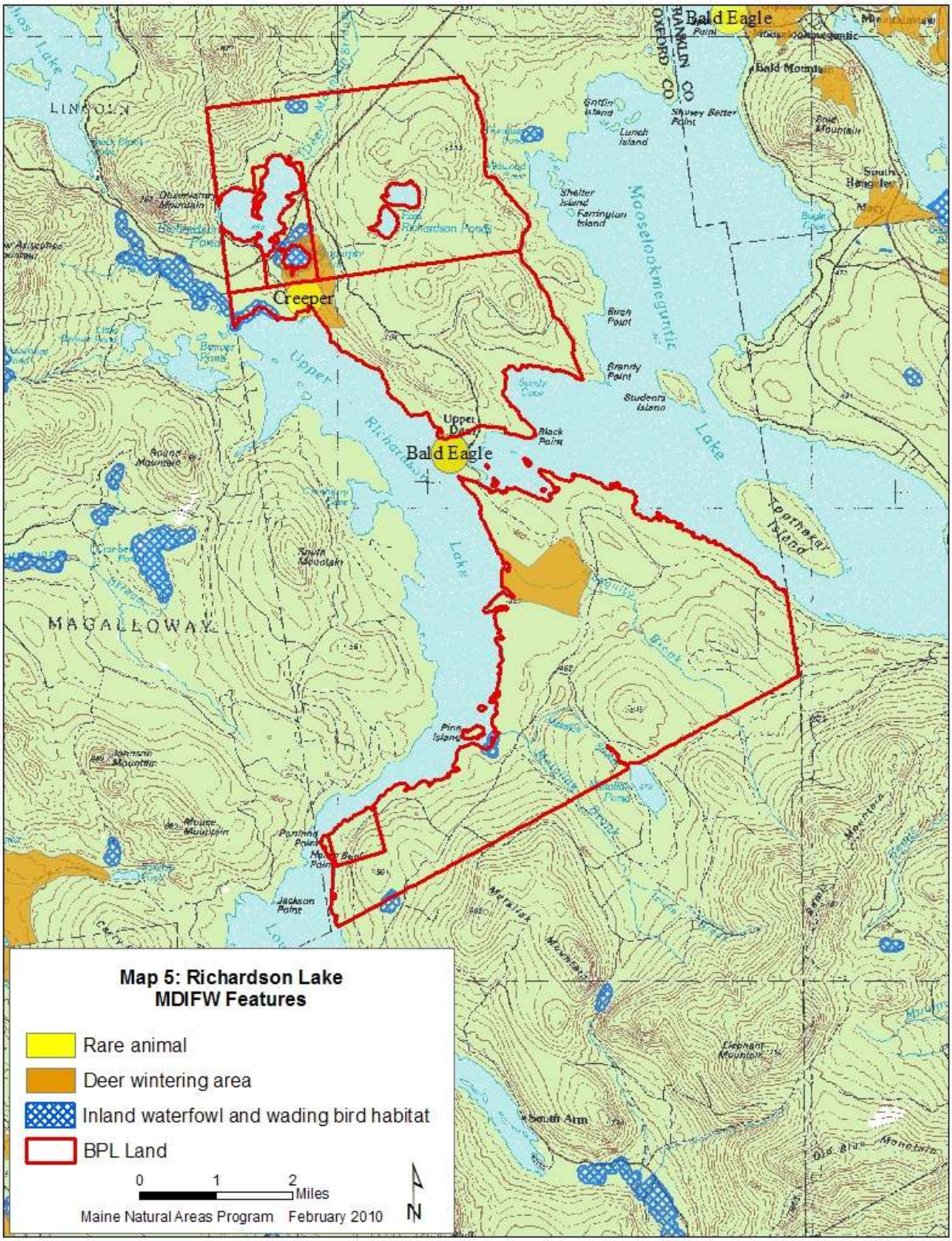

Map 2: Bald Mountain
Bedrock Geology
Acidic granitic
Acidic sedimentary/metasedimentary
Mafic/intermediate granitic
BPL Land
0
0.5
1
Miles
N
Maine Natural Areas Program February 2010
RANGELEY
Bald Mountain
Oquossuc
Mooselookmeguntic
South Bog Islands
South Rangeley
South Bog
Bonney Point
Bugle Cove
Spots Point
LAKE

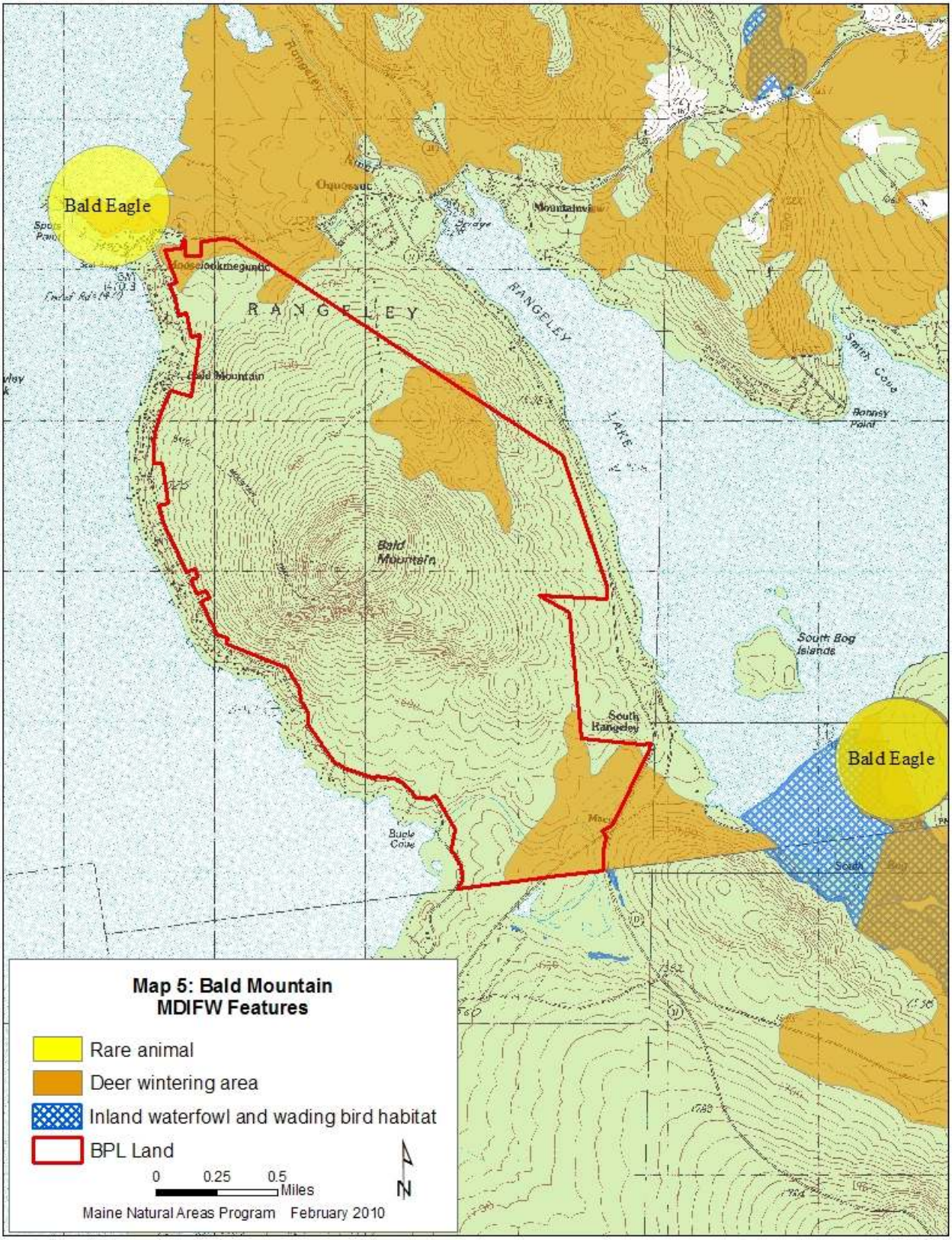

Map 3: Richardson Lake
Surficial Geology
Bedrock
Eskers
Ice-contact glaciofluvial
Swamp, marsh and bog deposits
Till
BPL Land
0
1
2
4
Miles
N
Maine Natural Areas Program February 2010

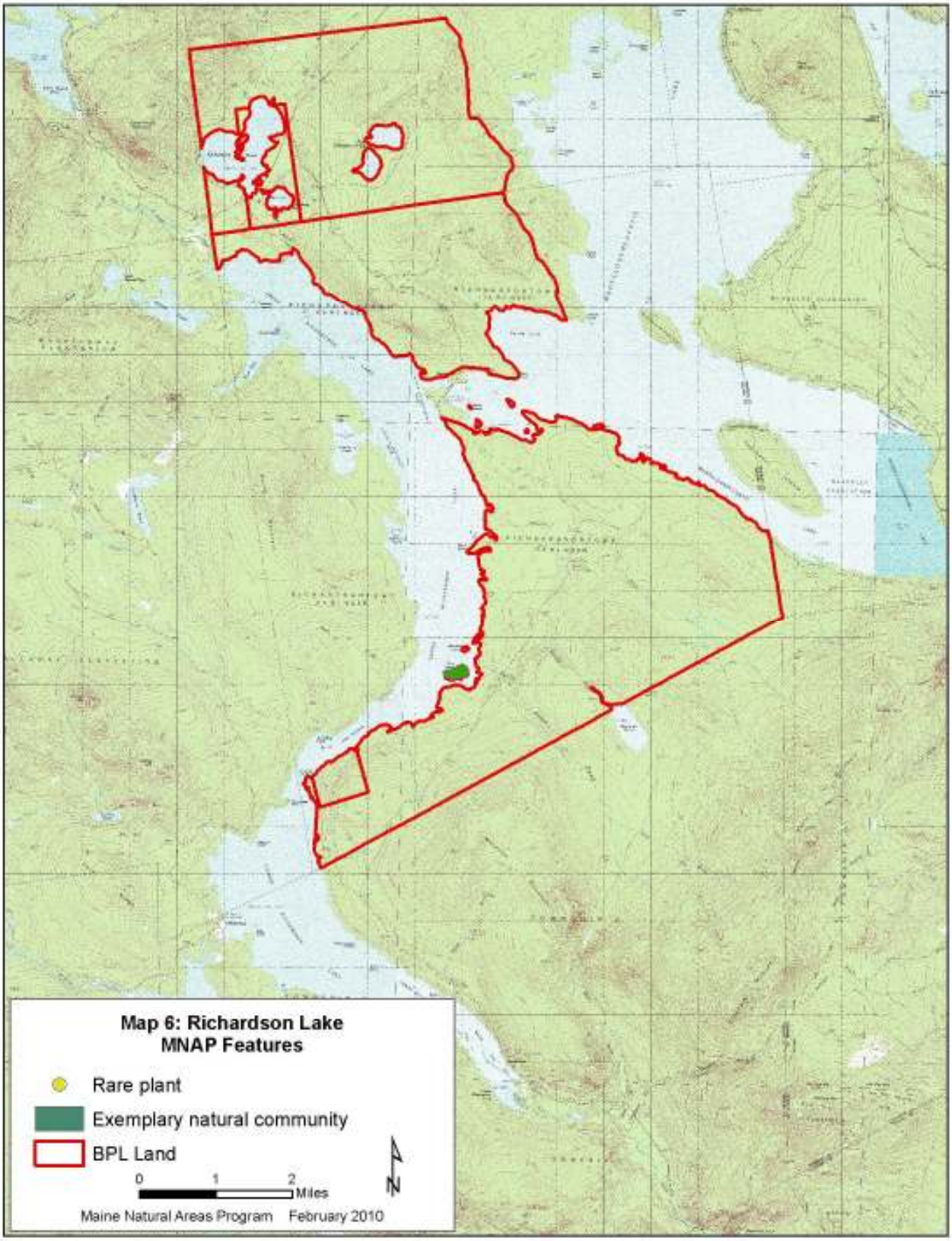

Map 3: Bald Mountain
Surficial Geology
Ice-contact glaciofluvial
Swamp, marsh and bog deposits
Till
BPL Land
0 0.25 0.5
Miles
N
Maine Natural Areas Program February 2010
RANGELEY
LAKE
Bald Mountain
Spots Point
Oquossuc
Mountainview
Smith Cove
Bonney Point
South Bog Islands
South Rangeley
Bugle Cove
South Bog


Map 4: Richardson Lake
Wetlands and Hydrology
Forested Wetlands
Open Wetlands
Watershed Boundary
BPL Land
0
1
2
Miles
N
Maine Natural Areas Program February 2010


Rangeley
Oquossuc
Mountainview
Moosehookmeguntic
RANGELEY
Bald Mountain
Bald Mountain
South Bog Islands
Map 4: Bald Mountain
Wetlands and Hydrology
Forested Wetlands
Open Wetlands
Watershed Boundary
BPL Land
0 0.25 0.5
Miles
N
Maine Natural Areas Program February 2010


Bald Eagle
Creeper
Bald Eagle
Map 5: Richardson Lake
MDIFW Features
Rare animal
Deer wintering area
Inland waterfowl and wading bird habitat
BPL Land
0 1 2 Miles
Maine Natural Areas Program February 2010
N


Bald Eagle
RANGELEY
Bald Mountain
Bald Mountain
South Bog Islands
South Rangeley
Bald Eagle
Map 5: Bald Mountain
MDIFW Features
Rare animal
Deer wintering area
Inland waterfowl and wading bird habitat
BPL Land
0 0.25 0.5
Miles
N
Maine Natural Areas Program February 2010


Map 6: Richardson Lake
MNAP Features
Rare plant
Exemplary natural community
BPL Land
0
1
2
Miles
N
Maine Natural Areas Program February 2010