

Nomination for Addition to Bureau of Parks and Lands Ecological Reserves

Project: Bigelow Ecological Reserve
Location: Wyman Township
Biophysical Section: Central and Western Mountains
Approximate Size: ~1,440 acre addition to existing ~10,600-acre Reserve
Applicant: Maine Bureau of Parks and Lands
Date: July 14, 2022

I. Project Area Description

The Bigelow Ecological Reserve contains iconic recreational resources, examples of northern hardwood, spruce fir forest, subalpine and alpine habitats. The majority of the existing Ecological Reserve is primarily high elevation habitat. The potential Ecological Reserve addition includes mature and late successional forest at lower elevations and provides connectivity to lands managed by the National Park Service along the Appalachian Trail Corridor.

II. By which ecological criteria does this area qualify as an Ecological Reserve? (see Evaluation Criteria for Potential Ecological Reserves)

This is a potential expansion of an existing ecological reserve.

Matrix forest communities:

Beech – birch – maple forest: The potential addition to the Bigelow Ecological Reserve contains a 870 acre, B-ranked (from MNAP natural heritage methodology) example of Beech-Birch-Maple Forest. Most of this forest occurrence has no evidence of timber management in the last 80 years. Signs of history maple sugaring (i.e. old sap buckets) and old tote roads are sporadic. Portions of this forest occurrence contains forest over 200 years old, with numerous old growth structural characteristics.

III. What is the current condition of the land?

Most areas of the potential reserve addition have not been managed by BPL for timber since the Bigelow Preserve was acquired by the state in 1976. The potential reserve addition does not currently have management roads and contains pockets of old forest with stand age at 150-200 years.

IV. Are these natural features and Ecological Land Units already represented on Ecological Reserves elsewhere in this biophysical section or in the state?

Proportionally, mid-elevation habitats and settings are well represented in the Central- Western and White Mountains. At Bigelow, however, the majority of the Ecological Reserve occurs at high elevations. The expansion would increase the proportion of lower elevation forest within the Ecological Reserve.

V. For which Ecological Reserve purposes is this area well suited? (benchmark, unique habitat, educational and scientific purposes). How natural are the features of this area?

This expansion of the Bigelow ecological reserve enhances its contribution to all three of the following purposes.

1. "to maintain one or more natural community types or native ecosystem types in a natural condition and range of variation and contribute to the protection of Maine's biological diversity,"
 - o The ecological reserve expansion would maintain an exemplary northern hardwoods forest occurrence in natural condition.
2. "as a benchmark against which biological and environmental change may be measured, as a site for ongoing scientific research, long-term environmental monitoring and education,"
 - o The ecological reserve expansion would be measured following Maine's ecological reserve protocol and could provide useful information on carbon sequestration
 - o The ecological reserve expansion area is highly accessible for independent research. The Bigelow Preserve is already among the most requested research locations on public lands.
3. "to protect sufficient habitat for those species whose habitat needs are unlikely to be met on lands managed for other purposes".
 - o Old forests are rare in Maine and provide habitat for numerous dispersal limited plant and lichen species.

VI. Do any of the features of the reserve require active management for their perpetuation?

No needs for active management are foreseen.

VII. What recreational uses currently exist within the area?

A heavily used portion of the Appalachian Trail bisects the potential reserve expansion area. Additionally, the Cranberry Stream Campsite is within the potential reserve expansion area.

VIII. Are there any designated and maintained snowmobile or ATV trails on the property? If so are these part of a large organized trail network?

No.

IX. How many acres of operable timber are there within the area? What would be the impact on the region's timber supply of inclusion of these acres within Ecological Reserve status?

Most (~85%) of the approximately 1,440 acre expansion area is likely operable timberland. These lands are not a significant portion of the region's timber supply.

X. What are the surrounding land uses? Are they compatible as landscape context for a Reserve in this area?

This Ecological Reserve addition would bring the total Ecological Reserve acreage to over 12,000 acres. The Ecological Reserve addition is adjacent to the 233-acre Jones Pond tract managed as a reserve by the National Park Service.

XI. Other considerations: Carbon sequestration and climate resilience

Mature and late successional forest provides important carbon storage and sequestration benefits.

Timber stocking generally correlates with carbon storage. At a regional level, the Bigelow Preserve maintains timber stocking well above the regional average. According to a regional LiDAR based Enhanced Forest Inventory, the potential reserve expansion area is among the highest stocked area within the Bigelow Preserve, with likely the greatest carbon storage potential.

Names of Individuals Knowledgeable about the Area

Justin Schlawin, Maine Natural Areas Program

Frank Henry, Will Jeffries, Tim Post, Andy Cutko, Bill Patterson, Maine Bureau of Parks and Lands.

Draft findings:

The proposed Bigelow Ecological Reserve addition qualifies for designation based on the following criteria:

- Matrix-forming ecosystems: The proposed addition contains a 'B' ranked matrix forming ecosystem, and would increase acreage of the Bigelow Ecological Reserve to over 12,000 acres.

EVALUATION CRITERIA FOR POTENTIAL ECOLOGICAL RESERVES

CONSERVATION TARGET				
	MATRIX-FORMING ECOSYSTEMS	LARGE PATCH COMMUNITIES/ECOSYSTEM COMPLEX	SMALL PATCH COMMUNITIES	ENDURING FEATURES (ECOLOGICAL LAND UNITS)
QUALIFIES	<p>A-B ranked matrix-forming ecosystems <i>and</i> ~5,000 acre minimum size <i>and</i> -for mountainous areas, all aspects and elevations included</p> <p style="text-align: center;">OR</p> <p>A-B ranked matrix-forming ecosystems present <i>and</i> 1,000 to ~5,000 acres, but surrounding landscape is in a <u>compatible land use</u></p> <p style="text-align: center;">OR</p> <p>includes entire watershed of third order or higher stream system</p>	<p>A-B ranked large patch ecosystem/ecosystem complex present <i>and</i> 100% of conservation target is within unit (<i>for lakes and wetlands, entire watershed is included</i>)</p> <p style="text-align: center;">OR</p> <p>A-B ranked large patch ecosystem/ecosystem complex present <i>and</i> >50% of conservation target is within unit <i>and</i> surrounding landscape is in a <u>compatible land use</u></p> <p style="text-align: center;">OR</p> <p>A-B ranked matrix-forming ecosystems on geographically isolated land masses (such as islands and peninsulas)</p>	<p>A-B ranked small patch ecosystem(s) present <i>and</i> 100% of conservation target is within unit (for lakes/wetlands, entire watershed is included)</p> <p style="text-align: center;">OR</p> <p>A-B ranked small patch ecosystems present <i>and</i> >50% of conservation target is within unit; surrounding landscape is in a <u>compatible land use</u></p>	<p>Includes an Ecological Land Unit or ELU group type (or surrogate) that is not adequately protected within the section <i>and</i> intact vegetation (e.g., mature forest) <i>and</i> sufficient acreage to conserve the conservation targets.</p> <p style="text-align: center;">OR</p> <p>Includes intact aquatic systems* <i>and</i> their entire watersheds</p>
CONDITIONAL	<p>A-B ranked matrix-forming ecosystems present <i>and</i> 1,000 to ~5,000 acres in size but surrounding landscape is in an <u>incompatible land use</u></p> <p><i>Qualifies if:</i> this type is not already adequately protected (2 A/B examples) in this biophysical section</p>	<p>A-B ranked large patch ecosystem(s)/ecosystem complex present <i>and</i> <50% within unit, but remainder is apparently intact <i>and</i> surrounding landscape is in a <u>compatible land use</u></p> <p><i>Qualifies if:</i> this type is not already adequately protected (2 A/B examples) in this biophysical section (including old growth remnants with >50% forest interior)</p>	<p>A-B ranked small patch ecosystem(s) present <i>and</i> <50% of conservation target is within unit, but remainder is intact <i>and</i> surrounding landscape is in a <u>compatible land use</u></p> <p><i>Qualifies if:</i> this type is not already adequately protected (2 A/B examples) in this biophysical section</p>	<p>Includes an ELU or ELU group type (or surrogate) that is not adequately protected within the section <i>and</i> sufficient acreage to protect the conservation targets.</p> <p style="text-align: center;">OR</p> <p>Includes intact aquatic systems (needs refinement) <i>and</i> sufficient portions of their watersheds</p> <p><i>Qualifies if:</i> Restoration of condition is possible</p>
DOES NOT QUALIFY	<p>No A-B ranked matrix-forming ecosystems present</p> <p style="text-align: center;">OR</p> <p><1,000 acres in size</p> <p style="text-align: center;">OR</p> <p>1,000 to ~5,000 acres in size, but surrounding landscape is in an incompatible land use</p>	<p><50% A-B ranked large patch ecosystem is within unit and surrounding landscape is in an incompatible land use</p> <p style="text-align: center;">OR</p> <p>No A-B ranked large patch ecosystem(s) present</p> <p style="text-align: center;">OR</p> <p>No rare or restricted C-D ranked large patch ecosystem(s) present</p>	<p><50% A-B ranked small patch ecosystem is within unit and surrounding landscape is in an incompatible land use</p> <p style="text-align: center;">OR</p> <p>No A-B ranked small patch ecosystem(s) present</p> <p style="text-align: center;">OR</p> <p>No rare or restricted C-D ranked small patch ecosystem(s) present</p>	<p>Contains ELUs or ELU groups that are redundant or sufficiently protected in the section.</p>

Notes:

- (1) **Reserve Purpose:** Reserve review should recognize which of the three primary purposes (benchmark, science/education, unique habitat) are most relevant to designation of a particular Reserve. One or more of the purposes may be relevant for any given Reserve.
- ‘*Benchmark*’ is intended to indicate that the Reserve is of sufficient size, configuration, condition, and composition (including enduring features) to serve as a standard or ‘research control’ area for the purposes of long-term monitoring. The reserve need not be ‘pristine’ or ‘old growth’ to meet this criterion, but the effects of human activities should be minimal enough such that natural patterns of growth and disturbances predominate (e.g., harvesting 100 years ago at Chamberlain Lake).
 - Reserves particularly suited for ‘*science and education*’ include those that have terrestrial or aquatic systems that have been used, or could be used, by researchers to study specific ecological processes or conditions. These Reserves may be proximal to universities (e.g., Spring River Lake and water quality sampling by the University of Maine, Bigelow alpine pond sampling by the University of Maine at Farmington) or have a track record or suitability for long-term studies on a particular topic.
 - Reserves may be designated because of ‘*unique habitat*’, including uncommon natural communities, rarer representative enduring features, or other characteristics that are under-represented on the landscape. Examples of this criterion include the floodplain forest system at Wassataquoik Stream and the concentration of rare plants and extensive cedar stands at Salmon Brook Lake Bog,
- (2) **MNAP Ranking System:** Maine Natural Areas Program A, B, C, or D ranks for natural communities ecosystems are a summary of the following criteria and are drawn from regional and national criteria developed by NatureServe. More specific ranking criteria are available from MNAP. In general, A= Excellent; B=Good; C=Marginal; D=Poor. A and B examples are considered ‘viable’, C examples are considered marginally viable, and D examples are considered viable.
- Size/Quality:* Does this occurrence have sufficient size to be a viable example of this type?.
- Condition:* Is the ecosystem occurrence degraded by human activities, does it represent the natural variation of disturbance, composition, and structure?
- Landscape Context:* Can this occurrence be protected from extrinsic human factors emanating from outside the Reserve?
- (3) **Compatible Land Use:** While there is no hard and fast rule for determining thresholds for compatible land use, the Committee recognizes a gradient between incompatible (e.g., industrial development) and compatible (e.g., national park). As a guide, any land use scoring higher than a 0.5 in the Land Use Coefficient Table (Hauer et al 2002) would be considered compatible. In general, managed forestlands in central and northern Maine are considered compatible land use.

Bigelow PRL Proposed Ecological Reserve

- BPL Management
- Proposed Ecological Reserve Additions
- Hiking trails
- Ecological Reserve
- BPL Management Roads
- Other conserved lands
- ATV Trails



