

# **Ecological Reserves in Maine: A Status Report on Designation, Monitoring, and Uses**



*Goose Eye Brook, Mahoosucs*

## **Maine Ecological Reserves Scientific Advisory Committee**



**July 2009**

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## Members of the Ecological Reserves Scientific Advisory Committee

Andy Cutko, DOC/MNAP (facilitator)  
David Courtemanch, DEP  
Phillip DeMaynadier, MDIFW  
Molly Docherty, MNAP  
Merry Gallagher, MDIFW  
Mac Hunter, UMaine  
George Jacobson. Jr., UMaine  
David Manski, Acadia National Park  
Janet McMahon, consultant  
David Publicover, AMC  
Sally Stockwell, Maine Audubon  
Barbara Vickery, TNC  
Andy Whitman, Manomet

## I. Executive Summary

In May 2008, as an outcome of the Task Force Regarding the Management of Public Lands and Publicly Held Easements, Governor Baldacci re-established an Ecological Reserves Scientific Advisory Committee that had begun in the mid 1990s. This Committee was asked to “*evaluate progress in establishing and monitoring the ecological reserve system in Maine, including a review of currently allowed uses of, and access to, existing reserves; and to develop clear guidelines for determining what types of recreational activities are compatible with existing reserves, both existing and future.*”

It has been nearly ten years since the Maine Bureau of Parks and Lands, under the authority of LD 477, designated 70,000 acres of public land as Ecological Reserves. Since that time, new additions to the system have brought the acreage total to 86,000. In addition, the Maine Department of Inland Fisheries and Wildlife now manages 11,000 acres as Ecological Reserves. Together with lands managed by federal agencies and conservation organizations, there are roughly 650,000 acres in Maine (or just over 3% of the state’s land) managed with compatible goals. While this report is primarily focused on the monitoring and recreational uses that have occurred on BPL Ecological Reserves, many of the issues have implications for other managers of Reserves.

The Scientific Advisory Committee sought feedback from Ecological Reserve stakeholders during two meetings in the fall of 2008. Key concerns focused on motorized access and included questions regarding the Reserve purposes and designation process, management policies, and implementation of those policies. Each of the concerns is listed in this report, followed by the Committee’s comments.

This report concludes with eight recommendations to improve the management, monitoring, and visibility of the Reserves. These are:

1. **Maintain the existing language and policies in the Integrated Resource Plan.**
2. **Formalize the role of the Scientific Advisory Committee in reviewing potential Ecological Reserve additions.**
3. **Create a summary form to document how new Reserve additions meet the established criteria.**
4. **Update the criteria for Ecological Reserve designation.**
5. **Update the analysis on representation of Ecological Reserves.**
6. **Maintain the Committee as an ongoing exchange forum for public and private land managers of Reserves across the state.**
7. **Continue to engage with stakeholders on recreational issues.**

8. **Increase the effort to publicize Ecological Reserves.**
9. **Develop a long term funding strategy for Ecological Reserve monitoring and management.**

## **II. Background**

### ***What is an Ecological Reserve?***

In general terms, an ecological reserve is a protected area managed to maintain a natural condition, where natural disturbance events are allowed to proceed without significant human interference. Within Maine, **State Ecological Reserves** exist on lands managed by the Department of Conservation and the Department of Inland Fisheries and Wildlife. Ecological Reserves on DOC lands are areas established by statute (LD 477, passed in 2000) to mean:

*"an area owned or leased by the State and under the jurisdiction of the Bureau, designated by the Director, for the purpose of maintaining one or more natural community types or native ecosystem types in a natural condition and range of variation and contributing to the protection of Maine's biological diversity, and managed:*

- A) as a benchmark against which biological and environmental change can be measured,*
- B) to protect sufficient habitat for those species whose habitat needs are unlikely to be met on lands managed for other purposes; or*
- C) as a site for ongoing scientific research, long-term environmental monitoring, and education.*

Ecological Reserves on MDFIW lands are managed with parallel goals and objectives through the MDIFW management planning process.

While there is no formal 'Ecological Reserve System' that extends across multiple land owners, s, a range of other public and private conservation lands in Maine are managed with compatible intents. Notable examples include all or parts of the following:

- State Parks (including Baxter State Park)
- Lands owned by The Nature Conservancy, Appalachian Mountain Club, and local land trusts
- White Mountain National Forest
- US Fish and Wildlife Refuges
- Acadia National Park

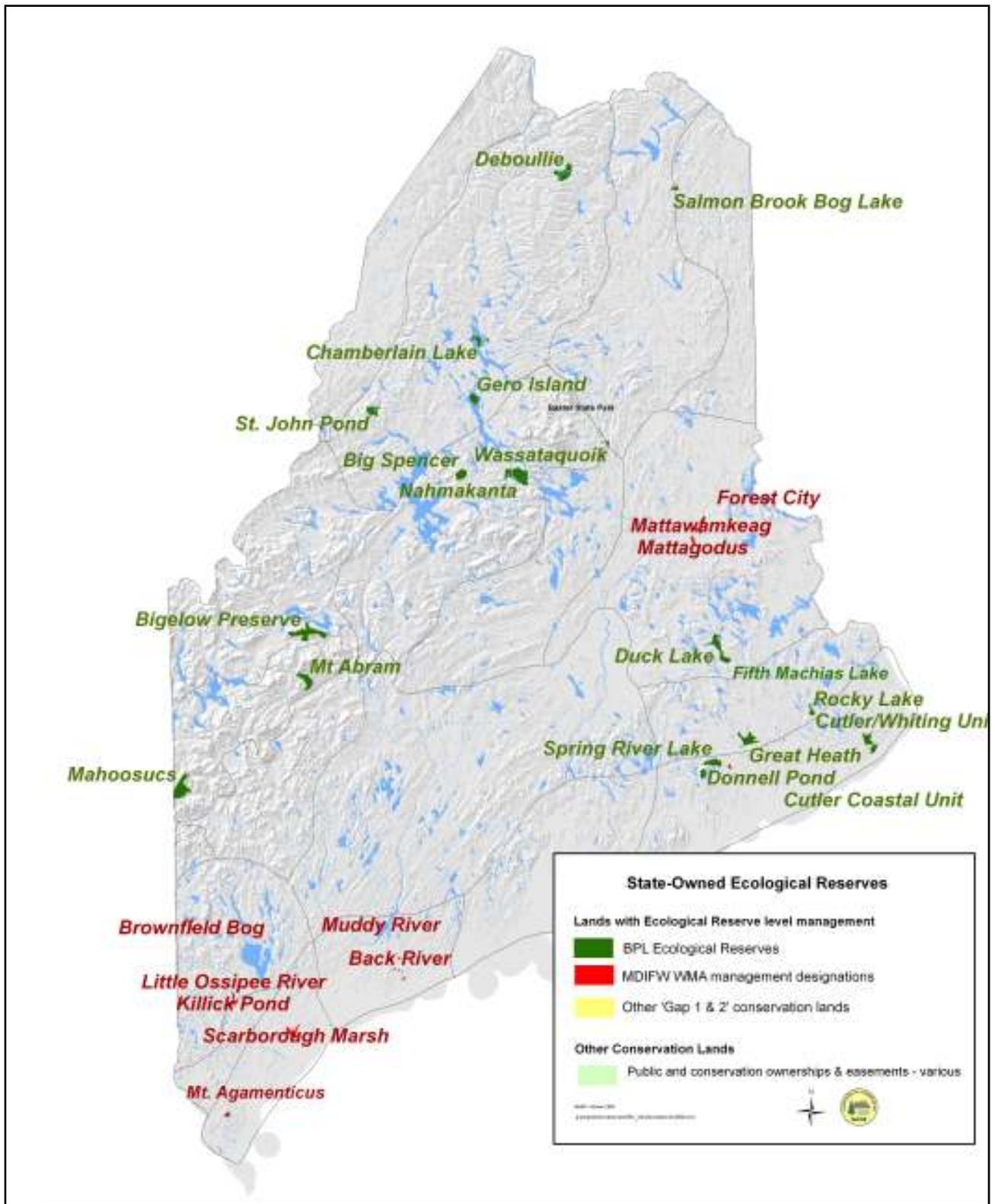


Figure 1: State Ecological Reserves, as of June 2009

As with ecological reserves throughout the world, it is important to note that habitat conservation, research, monitoring, and education are the primary uses of Ecological Reserves in Maine. Ecological Reserves were not created for outdoor recreation and should not be confused with parks or other recreational areas. All Maine Ecological Reserves, however, are open to the public for non-consumptive, low impact uses such as hiking, hunting, fishing, and trapping. Parks, managed public lands, and ecological reserves serve somewhat different purposes but complement one another. Together they provide a range of opportunities for people to experience and learn from Maine’s natural places.

***Why Are Ecological Reserves Important?***

While the 2000 legislation touched on the multiple reasons for Ecological Reserves, some further description of these reasons may be useful. For example, one of the leading principles of sustainable forest management is to reflect natural patterns of forest composition, structure, and disturbance patterns. Ecological Reserves serve as a vital reference for understanding how natural forests differ from managed forests. Moreover, in light of increasing concerns about the impact of climate change, Ecological Reserves serve as research controls to gauge long term changes in water quality, vegetation, and wildlife habitat. Reserves also provide a ‘genetic data bank’ which may hold the key to new discoveries in forestry, ecology, and medicine. Lastly, ecological Reserves are also important for the maintenance of biological diversity and may serve as refuges for species (some birds and mammals, lichens, mosses, invertebrates) that show a strong preference for intact, older forests.

***How Much Land in Maine is in Ecological Reserves, and is it Enough?***

The DOC manages about 86,000 acres of designated Ecological Reserves, shown in Table 1. The MDIFW manages approximately 11,000 acres of Ecological Reserves. Roughly a half million acres throughout the state are managed compatibly by the other entities noted above. As a result, State Ecological Reserves and other compatibly managed lands collectively cover approximately 3% of Maine’s land area.

<b>Reserve</b>	<b>Acreage</b>
Bigelow	10,561
Donnell/Spring River	6,223
Salmon Brook Lake	1,055
Deboullie	7,267
Duck Lake/5th Machias	6,815
Rocky Lake	1,519
Mt. Abraham	5,295
Cutler	5,188
Gero Island	3,180
Nahmakanta	11,100
Big Spencer	3,960
St, John Ponds	3,887
Great Heath	6,113
Wassataquoik	776
Mahoosucs	9,993
Chamberlain	2,895
<b>TOTAL</b>	<b>85,827</b>

*Table 1: Ecological Reserves Managed by the Maine Department of Conservation*

One of the key principles of Ecological Reserves is to conserve an effective representation of all habitat types in Maine. This principle involves assessment of forest and wetland types that *currently* occupy the landscape, as well as use of Ecological Land Units (combinations of slope, aspect, elevation, and geology) to account for what *may* occupy in the landscape in the

future. In 2005, the Maine Natural Areas Program examined the representation of habitat types and ELUs across all conservation lands in the state. The resulting report (*Saving All the Parts: A Conservation Vision for Maine Using Ecological Land Units*) concluded that fewer than half of the habitat and ELU types are adequately represented in geographic regions where they occur. In particular, southern Maine and the Aroostook Hills and Lowlands have poor representation of habitat and ELU types. Further analysis of Ecological Land Units is needed to determine how much acreage would be needed to effectively conserve all of the habitat and ELU types in the state.

### ***Origins of Maine's Ecological Reserves***

The impetus for Maine's Ecological Reserve system extends back nearly two decades. In 1993, Janet McMahon drew from her graduate studies at the University of Maine and worked in collaboration with the Maine State Planning Office to produce a report entitled, '*An Ecological Reserves System for Maine: Benchmarks in a Changing Landscape.*' The report described the potential for a series of reserves to protect biodiversity in Maine and included lessons from other states and countries, information on inventory and design criteria, and recommendations to establish a Maine Ecological Reserve system.

In 1994 the Maine Forest Biodiversity Project (MFBP), a collaboration of nearly 100 landowners, environmental advocates, sportsmen, property-rights activists, academics, state agencies, and educators, began work on three tasks: 1) an assessment of the status and trends of biodiversity in Maine; 2) identification of forest practices that help to maintain biodiversity, and 3) an assessment of the potential for an ecological reserve system on Maine's public and private conservation lands.

From 1995 to 1998 the MFBP commissioned an inventory of public and private conservation lands to determine the suitability of those lands as Ecological Reserves. An Ecological Reserve Scientific Advisory Committee, consisting of land managers, academics, foresters, and conservationists, was formed to provide guidance to the inventory effort. At the same time, MFBP participants continued discussions on the nature and purposes of Reserves, the assumptions on which the original report were based, appropriate Reserve uses, and guidelines for the inventory and Reserve design itself.

The goals of the inventory were to identify which of Maine's ecosystem types occur on existing conservation lands and the acreage potentially required to represent the range of ecosystem types in Maine. A key assumption was that both Reserve lands and managed forest lands contribute to the maintenance of biological diversity in Maine. For that reason, the potential reserves identified in the 1998 report were generally smaller than reserves that might be designed within a developed or fragmented landscape.

The 1998 Ecological Reserve Inventory report described potential reserves designed to work in concert with the surrounding managed forest to help maintain the state's biodiversity. However, this system of reserves by itself could not ensure the maintenance of viable populations of all species found in Maine, nor would it restore the biodiversity of Maine's past. The report concluded that only 25% of potential Reserves met the scientific advisory

committee's minimum acreage and less than half of Maine's ecosystem types would be adequately represented within a Reserve system on public lands (McMahon, 1998).

Despite these shortcomings, the 1998 report recommended that approximately 170,000 acres of Reserves be established on DOC lands. Following further evaluation of the maps as well as financial considerations, the Legislature enacted LD 477, and the DOC moved forward with designation of 70,000 acres in 13 Reserves. The legislation 'capped' the acreage of Ecological Reserves by stipulating that the total acres designated may not exceed 15% of the total acres managed by the Bureau, or 100,000 acres, whichever is less, and that no more than 6% of the operable timberlands may be designated. The legislation also provides, however, that lands acquired or donated specifically as Ecological Reserves are not included in calculating acreage limits.

### ***How are State Ecological Reserves Managed?***

During the process of revising and updating the Bureau of Parks and Lands' *Integrated Resource Policy*, in 2000 the Natural and Geological Resources Technical Working Group (a broad stakeholder committee) developed an Ecological Reserve management policy that closely reflected the language in LD 477. This policy was reviewed and edited several times during the course of the planning process.

Key points of the policy are that:

- Ecological Reserves should be managed to allow natural ecological processes to proceed with minimal interference from human activity. Exceptions may occur where active management (e.g. prescribed fire) is necessary to replicate natural processes or where uncontrolled disturbance poses a significant risk to public safety or forest resources outside of the Reserve (e.g. wild fires).
- Allowed uses include non scientific research, public education, and non-motorized recreation activities such as hiking, primitive camping, hunting, fishing, and trapping.
- Activities that are generally incompatible with Ecological Reserve status include timber harvesting, salvage harvesting, commercial mining, and sand and gravel excavation.
- *Existing* snowmobile and all-terrain vehicle trails are allowed "where they are well designed and built, are situated in safe locations, have minimal adverse impact on the values for which the reserve was created, and cannot be reasonably relocated outside of the reserve."
- *New* snowmobile and all-terrain vehicle trails and roads are allowed in Ecological Reserves only if *all three* of the following criteria are met:
  1. no safe, cost effective alternatives exist;
  2. the impact on protected natural resource values is minimal; and
  3. the trail or road will provide a crucial link in a significant trail or road system.

However, “every effort should be made to relocate roads, motorized use trails and other incompatible activities outside of the Reserve, and to close and revegetate these areas.”

The entire text of LD 477 is attached as Appendix 2.

### ***Long Term Monitoring and Other Research***

Beginning in 2002, the Department of Conservation worked with a multi-disciplinary committee to draft an *Ecological Reserve Monitoring Plan* (2003) that guides periodic data collection at the landscape, stand, and species levels. The monitoring program ties closely to other state and national forest monitoring programs that use U.S. Forest Service Forest Inventory and Analysis (FIA) methods.

As of 2009, nearly all of the DOC Ecological Reserves had been subject to baseline monitoring. (Exceptions include wetlands at the Great Heath and new acreage added at Fifth Machias Lake – both areas are planned for baseline monitoring in the summer of 2009). To date, 462 permanent plots have been established on DOC Reserves and 29 permanent plots have been established on IFW Reserves. In addition, over 250 permanent plots have been established on lands owned by The Nature Conservancy, using the same sampling design and methodology as DOC reserves.

Information from the long-term monitoring effort has been assessed to suggest how forest structure and processes differ between forests managed for timber production and forests managed for natural processes. In 2005, initial analyses based on data from ten Reserves indicated that Ecological Reserves have higher basal areas (i.e., more timber), more large trees (Figure 2) and more coarse woody debris than the “average acre” of Maine woods according to Maine Forest Service data. Roughly one in three Ecological Reserve plots exhibited characteristics of ‘late successional forest’ -- characteristics that occur in only one of twenty plots throughout the rest of Maine’s forests. However, for these same metrics, Ecological Reserves fall well short of Big Reed Forest, the one well-studied example of old growth in Maine. (See DOC report, *Ecological Reserve Monitoring Project Update*, 2005). Current analyses with the updated dataset (2008) appear to confirm these initial assessments and will be summarized in a forthcoming report due July 1, 2009

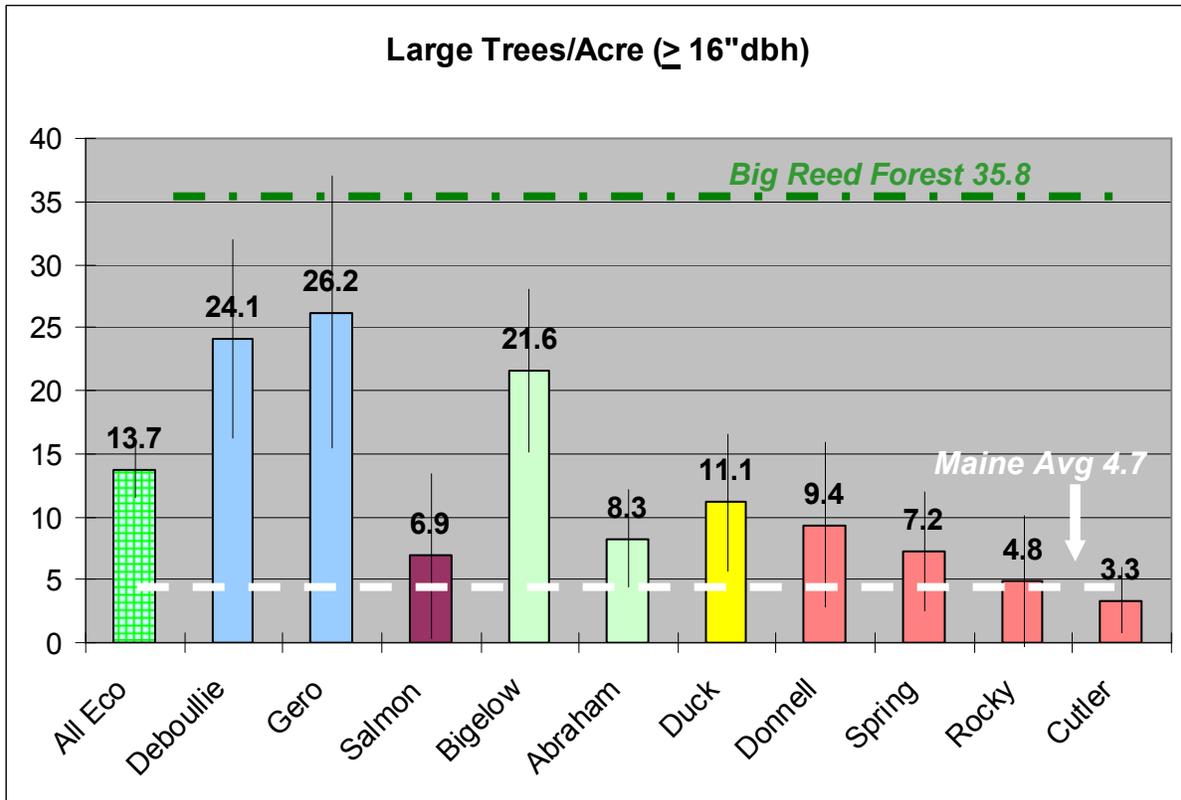


Figure 2: Large live trees per acre on Ecological Reserves compared to Big Reed Forest and the Maine average (from 2005 data).

In addition to the long term forest monitoring overseen by the Maine Natural Areas Program, DOC Ecological Reserves have been subject of aquatic baseline monitoring studies by the Department of Environmental Protection. Several of the Reserves have been sampled for zooplankton, phytoplankton, surface sediment diatoms, and water chemistry. In this regard, water bodies within Reserves may be used as relatively pristine controls for comparison to impaired water bodies elsewhere in the state.

Researchers outside of state government have also used Ecological Reserves for multiple purposes over the past several years. Studies include:

- Assessment of selected old growth sites for development of Manomet’s ‘Late-Successional Index’.
- Long term assessments of acidification in small ponds within the Spring River Lake Reserve, by the University of Maine.
- Evaluations of trail impacts at several sites by the Manomet Center for Conservation Sciences.
- Long term change monitoring of the alpine habitat in the Bigelow Range by the University of Connecticut.

In 2003, the Ecological Reserve Monitoring Committee developed Criteria for Evaluating Research Projects on Ecological Reserves to ensure that research is compatible with the goals and allowable uses of the Reserves.

### ***Role of the Ecological Reserve Scientific Advisory Committee***

An Ecological Reserves Scientific Advisory Committee was first established in the mid 1990s to provide guidance regarding the inventory and assessment of a potential Ecological Reserve system in Maine. Following the designation of Reserves on DOC lands in 2000, an Ecological Reserves Monitoring Committee was assembled to work with the Maine Natural Areas Program to create the *Ecological Reserve Monitoring Plan* (2003). This Monitoring Plan guides data collection and analysis at the landscape, stand, and species levels. The Ecological Reserves Monitoring Committee met periodically to review monitoring progress and challenges, and its last meeting was in 2006.

In May 2008, as one outcome of the Task Force Regarding the Management of Public Lands and Publicly Held Easements, Governor Baldacci issued an invitation to establish an Ecological Reserves Scientific Advisory Committee. Effectively, this request re-established the committee that had originally been assembled over a decade earlier.

The Ecological Reserve Committee serves under a charter, agreed upon in August 2008, which outlines the roles and responsibilities of the Committee members (Appendix 1). The primary purpose of the Committee is to “*evaluate progress in establishing and monitoring the ecological reserve system in Maine, including a review of currently allowed uses of, and access to, existing reserves; and to develop clear guidelines for determining what types of recreational activities are compatible with existing reserves, both existing and future.*”

Specific duties of the Committee are to:

*(1) By July 1, 2009, the Committee will review and update management guidelines regarding allowed uses and access to Ecological Reserves. The intent of this review will be to ensure that guidelines support the stated Reserve purposes and are fairly and consistently applied. The Committee will provide a guidance document to the Department of Conservation and other interested parties on this issue.*

*(2) The Committee will develop a transparent assessment process and evaluate the scientific value (considering protection criteria, gaps, and needs) of significant potential additions, deletions or other changes to Ecological Reserves.*

*(3) While the Committee has no formal authority regarding Reserves on private lands, it will provide guidance to the Land for Maine’s Future, Forest Legacy, Maine Outdoor Heritage Fund, and other entities regarding establishment, monitoring, and management of Ecological Reserves on ownerships other than DOC.*

*(4) The Committee will play an ongoing role in guiding Ecological Reserve monitoring and analysis efforts with regard to a variety of issues such as climate*

*change, aquatic resources, and alignment with regional and national monitoring issues.*

*(5) The Committee will review and provide guidance to DOC on requests to conduct scientific research on DOC Ecological Reserves. The Committee will also promote the use of Reserves for research and help publicize the research and monitoring efforts underway.*

*(6) The Committee will solicit and consider the interests of other stakeholders outside the scientific community.*

The Committee has met five times since July 2008; minutes of each of the meetings are available upon request. This report constitutes fulfillment of tasks (1) and (2) above.

### **III. Issues and Concerns**

In the fall of 2008 two opportunities were provided to stakeholders to voice concerns about the designation and management of Ecological Reserves. The first was a September 26, 2008 meeting of the Ecological Reserves Scientific Advisory Committee, and the second was a meeting of the Conservation and Recreation Access Forum on October 15. Key concerns from these meetings are summarized below, followed by recommendations and comments from the Committee.

#### ***Reserve Acquisition and Designation***

##### **Concern**

There have been a few cases of Ecological Reserves entering state ownership (and associated restriction of trail use) without sufficient review or scientific reasoning. What is the review and approval process for acquiring new reserves?

##### ***Committee Comments***

*Some Ecological Reserves have been added to state ownership as part of new acquisition packages, where Ecological Reserve status was a requirement for project funding. While suitability for Ecological Reserve status was evaluated by the state in each of these cases, the Committee recognizes that the evaluation process has not been transparent to the public. For future acquisitions, the Committee will assess the subject property relative to criteria established in 1998 and recently updated by the Committee (see Appendix XX). As with all Committee deliberations, results of such evaluations will be available to the public.*

## ***Recreational Uses***

### **Concern**

There has been a perceived lack of clarity on purposes for reserves and justification for the motorized use policy. There needs to be a clearer scientific basis for limiting motorized trail use, particularly where public funds have been used for acquisition.

### ***Committee Comments***

*The Reserves were designed to “proceed with minimal interference or manipulation from human activity” (BPL Integrated Resource Policy). To some degree, any recreational use constitutes “interference or manipulation from human activity.”*

*The Manomet Center for Conservation Sciences is undertaking a study on the impacts of various types of recreational trails on surrounding ecosystems, including a number of sites within state Ecological Reserves. Manomet’s recent study confirms that all types of trails have some impact. However, Manomet also concluded that, “Motorized trails were significantly wider, and had significantly greater cross-sectional area, more rutted sections, and more trash than both non-motorized and non-mechanized trails.” This in part reflects the fact that motorized trails often use seasonal, current, and historic roads and right-of-ways (Wilkerson and Whitman, unpublished report, 2009). For similar reasons, preliminary Manomet data suggest a higher frequency of non-native plants along motorized trails than non-motorized trails. The Committee has been tracking this research and will consider its implications for Ecological Reserve policy as the results unfold.*

*While there are few studies assessing the impact of various recreational uses on wildlife, a number of studies have suggested that motorized trails can cause disturbance (flight or stress) population redistribution, and other impacts (Knight and Cole 1995; Maxell and Hokiit 1999; Hickman et al 1999; Harper and Eastman 2000; Wisdom et al 2004).*

*The Natural and Geological Resources Technical Working Group, assembled to review and Ecological Reserve issues for BPL’s Integrated Resource Policy (2000), determined that it was neither practical nor necessary to eliminate all public use of Reserves. Rather, the Working Group sought a balanced approach in which non-motorized uses (hiking, hunting, fishing, and trapping) would be allowed and motorized use would be permitted under certain circumstances, as stated in the enabling legislation. Currently 7 of 16 Reserves contain trails or roads for motorized use; decisions on allowing these motorized uses have been made on a case by case basis, using the criteria established in the IRP.*

### **Concern**

What level of documentation of impacts is needed to justify IRP policy on motorized use?

### ***Committee Comments***

*Ultimately, the Committee follows a cautionary principle regarding trail impacts and does not believe it shoulders a comprehensive ‘burden of proof’ to demonstrate that there are significant impacts in order to restrict motorized trails. The cautionary principle acknowledges there will be impacts from any trail use, but that it is impractical to eliminate*

*all uses. In the view of the Committee, there remains insufficient scientific evidence on either side to alter the balanced approach BPL has taken thus far. This approach reflects the enabling legislation, and the Committee stands by the guidelines in the IRP.*

### **Concern**

There is a perception that motorized trail use has been limited in Reserves for ‘political’ purposes rather than scientific. If the goal is to manage an area for non-motorized recreation, that should be stated up front.

### **Committee Comments**

*On state lands, the intents of Ecological Reserves (scientific benchmarks, habitats for certain species, and sites for long term research and education) have been clear since discussion of Reserves began nearly 20 years ago, and these intents were codified in the enabling legislation in 2000. Some of the characteristics that make certain lands suitable as Ecological Reserves (e.g., areas with little recent logging activity) also render those lands appropriate for overlapping resource allocations, such as Back-Country Non-Mechanized use. In such cases, according to the hierarchy of uses within the Bureau’s Integrated Resource Policy, the Ecological Reserve designation is the dominant allocation and the Back-Country Non-Mechanized designation is secondary. The co-occurrence of these management allocations, and their associated management guidelines, is not ‘political’ but is based on the sensitivity of the land to human impacts.*

*The Committee recognizes that the intents of reserves on non-state ownerships may not resemble BPL’s management hierarchy, and for some ownerships, ecological and recreational goals may be equal priorities. The Committee agrees that if recreational goals are of equal or greater importance than ecological goals, those recreational goals should be made clear in the processes of property acquisition, funding, and development of a management plan.*

### **Concern**

Some decisions to limit or eliminate motorized trails have not been transparent, at places like Big Spencer Mountain, Deboullie, and Fifth St. John Ponds.

### **Committee Comments**

*Management decisions are made through a public process that engages all interests. Circumstances for each decision varied, and reasons for trail limitations or closure included safety, environmental impact, and feasibility of alternatives. Furthermore, in the case of Big Spencer and Fifth St. John Pond, management constraints were part of the deed restrictions when the state accepted the land. While there may not have been consistent agreement among stakeholders on the decisions, the final decisions were made according to the guidelines set forth in the IRP, and the Committee stands by the decisions. Stakeholders should contact BPL directly regarding questions about management decisions.*

### **Concern**

The IRP did not recognize the need for motorized ‘destination’ trails, such as the trail to the cabin at Big Spencer.

**Committee Comments**

*The language in the IRP states that existing trails are acceptable if they “are well designed and built, are situated in safe locations, have minimal adverse impact on the values for which the reserve was created, and cannot be reasonably relocated outside of the reserve”. The Committee believes this language is sufficient to address destination trails. In the case of Big Spencer, the Department will close the trail to motorized use because of the poor condition of the trail and safety concerns.*

**Concern**

There are cases of unauthorized snowmobile or ATV use (in addition to authorized uses) on Reserves, and a handful of ‘bad actors or bad apples’ can create a disproportionate amount of damage. Furthermore, unauthorized trails can attract more use – as recreational demands on public lands are likely to increase -- and it is much more difficult to close off a trail once it is used than to prohibit a trail before its footprint is established. The policies are fine, but BPL lacks the capacity to successfully monitor or enforce policies.

**Committee Comments**

*While comprehensive recreational monitoring of every Reserve is not possible, the Bureau is doing the best it can with finite staff and resources, and it has stepped up its efforts to curtail unauthorized trail use at places like Donnell Pond and work with local clubs on trail improvement at places like Cutler. Those who note unauthorized uses are encouraged to contact the Bureau so that problems may be addressed promptly.*

**Concern**

Motorized access may be needed for game retrieval.

**Committee Comments**

*Hunting and public access are allowed on all state Reserves, but motorized use is not. As in all hunting trips, hunters should consider access constraints while planning their outings. There are many other hunting areas in Maine that allow motorized access.*

**Concern**

How will the designation of future areas impact the state’s timber supply, particularly in light of increased demands for biofuel?

**Committee Comments**

*State ecological reserves currently account for roughly one half of one percent of the state’s forestland (and less than that for operable forestland), so the impact on the state’s current timber supply is negligible. The enabling legislation for DOC Ecological Reserves includes a limit on the total acreage of reserves as well as a limit on the acreage of operable forestland. Moreover, the law contains a provision that, “the designation of land as an ecological reserve may not result in a decline in the volume of timber harvested on land under the jurisdiction of the Bureau.”*

*With regard to biofuel, the Maine Forest Service recently noted that, “Absolute timber supply is not the issue...With improvements in forest utilization and silviculture, Maine’s forests are capable of producing substantially more wood than they do currently, while at the same time retaining the number of den trees, snags, large dead logs, and limbs and tops needed to maintain or improve site fertility, wildlife populations, and biodiversity.” Consequently, while the Committee is aware of the issue, we do not believe that Ecological Reserves are a threat to the state’s timber supply.*

**Concern**

‘Pre-existing’ trails and their conditions (including informal/seasonal trails used at the time of reserve designation) are not all accurately mapped, so BPL plans may not accurately account for them.

**Committee Comments**

*The Committee recognizes that not all existing trails are mapped. However, the lack of mapping does not condone existing or future unauthorized use. During the unit planning process, BPL makes every effort to seek input on recreational uses, map and document all used trails and assign an appropriate management class.*

**Outreach/Educational Needs**

**Concern**

There is a lack of awareness of the potential for and impact of illegal fisheries introductions, and there may be a correlation of introductions with motorized access.

**Committee Comments**

*The Committee agrees that this potential problem is not well recognized. The Committee acknowledges that although fisheries introductions may occur from a variety of pathways (both intentional and accidental), motorized recreational use may in fact facilitate the process by increasing access to remote ponds. This factor lends additional support to maintaining the current policy on recreational use.*

**Concern**

The state could do a better job of publicizing trails and uses of reserves, to engender public awareness and support.

**Committee Comments**

*The Committee agrees that since the inception of DOC Ecological Reserves, the Reserves have not been widely publicized. DOC Reserves are not distinguished from other DOC public lands on the ground, so a recreational user would not know they are on an Ecological Reserve. In addition, the DOC Reserves are in sparsely populated or remote parts of Maine, so there is an effort required to get to them.*

*The DOC Ecological Reserves are better known within the conservation and scientific community, in part because MNAP has presented the results of monitoring to various*

*professional audiences over the past several years. In addition, MNAP has recently upgraded its web site to include more detailed information on Reserves. (See <http://www.maine.gov/doc/nrimc/mnap/reservesys/index.htm>.) Nonetheless, the Committee recognizes the need to make the public more aware of Ecological Reserves through its web site, and the Committee also seeks to more broadly publicize the utility of Reserves for scientific research and monitoring.*

## **IV. Recommendations**

- 1. Maintain the existing policies in the Integrated Resource Plan.** The Integrated Resource Plan will be due for a 10 year update in 2010. Following much discussion, the Committee agreed that the existing approach to recreational uses in Ecological Reserves is appropriate and does not need to be significantly modified. Concerns have arisen over the *implementation* of the policy in a few cases, but the intent of the IRP reflects the enabling legislation and is generally appropriate. The Committee does recognize that further guidance is needed for certain language, such as determining if a trail impact is ‘minimal’, what determines if an alternative is ‘cost-effective’, and what constitutes a ‘well designed and constructed’ trail. In addition, the Committee will continue to track Manomet’s development of a recreational scorecard and other research and determine if modifications to the existing policy are warranted.
- 2. Update the criteria for Ecological Reserve designation.** Recognizing increasing concerns about the robustness of a reserve system with regard to the impacts of climate change, the Committee agreed that the use of Ecological Land Units (combinations of landform, geology, and elevation) would be a useful component to assess the added value of new Ecological Reserves (See Appendix 3). Moreover, there are new data available on aquatic systems, and a review of potential Reserves should incorporate data on aquatic systems in protected lands.
- 3. Create a summary form to document how new Reserve additions meet the established criteria.** This brief form (1-2 page), which would be available to the public (e.g., posted on the MNAP web site) should explain which features of the subject parcel meet which criteria. A documentation form should also include a reference to one of the three original Reserve system goals (benchmark, unique habitat, science/education).
- 4. Formalize the role of the Scientific Advisory Committee in reviewing potential Ecological Reserve additions.** New ecological reserves have been added to the state system through a variety of funding and acquisition pathways. While some inter-agency and inter-organization consultation has occurred, this process has not been systematic or publicly transparent. It is important that any process outlined by the Committee has traction with those making the land deals so that new state Reserves are appropriately vetted before entering the system. While the Committee’s purview is technically only DOC Reserves, Committee members represent other conservation

groups which may acquire Reserves in the future, so those members recognize the value of a review process.

5. **Update the analysis on representation of Ecological Reserves.** Using the data on Ecological Land Units and aquatic systems noted above, the state should update its representational analysis to clearly define the gaps in system coverage. As an additional analysis, the state should take into consideration all lands managed with compatible goals (e.g., ‘Gap 1 and 2’ status lands), not just state Ecological Reserves.
6. **Maintain the Committee as an ongoing exchange forum for public and private land managers of Reserves across the state.** Because lands managed by the Maine Department of Conservation, Maine Department of Inland Fisheries and Wildlife, Appalachian Mountain Club, The Nature Conservancy, National Park Service, and others have similar but not identical goals and constraints, the formation of a formal, multi-owner Ecological Reserve System is somewhat problematic. However, the Scientific Advisory Committee may serve as a central source for discussing emerging issues, challenges, and solutions that are common to all.
7. **Continue to engage with stakeholders on recreational issues.** As new lands are acquired and new concerns arise, managers of Ecological Reserves should maintain an active dialogue with recreational users so that management decisions are informed and not misunderstood. One possible venue for discussion and exchange on such issues is the Conservation and Recreation Access Forum – a stakeholder group of conservation and recreation groups initiated in 2008.
8. **Increase the effort to publicize Ecological Reserves.** Ecological Reserves are reasonably well known in the conservation community but not among the general public. While web site improvements have information more accessible, the DOC should create additional outreach materials on the potential scientific and recreational uses of Ecological Reserves.
9. **Develop a long term funding strategy for Ecological Reserve monitoring and management.** To date, funding for Ecological Reserve monitoring has been obtained from variety of public and private sources, including the Bureau of Parks and Lands, Maine Department of Inland Fisheries and Wildlife, Maine Outdoor Heritage Fund, The Nature Conservancy, and Sweetwater Trust. However, there is no dedicated long term funding source for this monitoring. Moreover, management of state Reserves is conducted by BPL or MDIFW staff whose other responsibilities significantly limit the amount of time they spend on Reserves. Without a long term funding strategy, the considerable value of management and monitoring that has occurred thus far, and the overall importance of the Reserves as ‘benchmarks’ for ‘long term monitoring and education’ will be severely compromised.

## Appendix 1:

# Ecological Reserves Scientific Advisory Committee Committee Charter August 2008

### Background

In 2000 the Maine Legislature passed an act that enabled the Department of Conservation to designate ~70,000 acres of Ecological Reserves on DOC lands, culminating over a decade of research and advocacy on this issue. Reserves were established for the dual purposes of protecting biodiversity and serving as benchmarks for comparison with the state's managed forests. The Reserves include many of Maine's best examples of alpine meadows, lakes and streams, and old growth forests. Shortly after the creation of Ecological Reserves, DOC identified compatible uses as part of its Integrated Resource Plan.

Since 2000, several new Ecological Reserves have been added to the state system, bringing the total acreage to over 80,000. In addition to the formally designated Ecological Reserves on DOC lands, other private and public ownerships have designated lands to be managed under similar objectives, including MDIFW, The Nature Conservancy, and Appalachian Mountain Club.

An Ecological Reserves Scientific Advisory Committee was established in the mid 1990s to provide guidance regarding the inventory and assessment of a potential Ecological Reserve system in Maine. Following the designation of Reserves on DOC lands in 2000, an Ecological Reserves Monitoring Committee (consisting of many of the same representatives as the original 'Sci-Ad' committee) was assembled to work with the Maine Natural Areas Program to create an *Ecological Reserve Monitoring Plan* (2003). This Monitoring Plan guides data collection and analysis at the landscape, stand, and species levels. The Ecological Reserves Monitoring Committee met periodically to review monitoring progress and challenges, and its last meeting was in 2006.

In May 2008, as one outcome of the Task Force Regarding the Management of Public Lands and Publicly Held Easements, Governor Baldacci issued an invitation to establish an Ecological Reserves Advisory Committee. Many of the invited members (see list below) have served on the prior committees referenced above.

### Committee Purpose and Objectives

The primary purpose of the Ecological Reserves Scientific Advisory Committee is to “*evaluate progress in establishing and monitoring the ecological reserve system in Maine, including a review of currently allowed uses of, and access to, existing reserves; and to develop clear guidelines for determining what types of recreational activities are compatible with existing reserves, both existing and future.*” (from the Task Force Regarding the Management of Public Lands and Publicly Held Easements).

Specific objectives include the following:

(1) By July 1, 2009, the Committee will review and update management guidelines regarding allowed uses and access to Ecological Reserves. The intent of this review will be to ensure that guidelines support the stated Reserve purposes and are fairly and consistently applied. The Committee will provide a guidance document to the Department of Conservation and other interested parties on this issue.

(2) The Committee will develop a transparent assessment process and evaluate the scientific value (considering protection criteria, gaps, and needs) of significant potential additions, deletions or other changes to Ecological Reserves.

(3) While the Committee has no formal authority regarding Reserves on private lands, it will provide guidance to the Land for Maine's Future, Forest Legacy, Maine Outdoor Heritage Fund, and other entities regarding establishment, monitoring, and management of ecological reserves on ownerships other than DOC.

(4) The Committee will play an ongoing role in guiding Ecological Reserve monitoring and analysis efforts with regard to a variety of issues such as climate change, aquatic resources, and alignment with regional and national monitoring issues.

(5) The Committee will review and provide guidance to DOC on requests to conduct scientific research on DOC Ecological Reserves. The Committee will also promote the use of Reserves for research and help publicize the research and monitoring efforts underway.

(6) The Committee will solicit and consider the interests of other stakeholders outside the scientific community.

### **Committee Duration**

This Committee will have ongoing responsibilities, with no pre-defined termination date. Committee members serve as volunteers at their discretion and at the discretion of the Department of Conservation (i.e., there are no terms or term limits for Committee participants).

### **Committee Composition**

The Ecological Reserves Scientific Advisory Committee was re-established by invitation from Governor John Baldacci in May 2008 and consists of the following individuals.

David Courtemanch, DEP  
Phillip DeMaynadier, MDIFW  
Molly Docherty, MNAP  
Merry Gallagher, MDIFW  
Mac Hunter, UMaine  
George Jacobson, Jr., UMaine  
David Manski, Acadia National Park  
Janet McMahan, consultant  
David Publicover, AMC

Sally Stockwell, Maine Audubon  
Barbara Vickery, TNC  
Andy Whitman, Manomet

Andy Cutko, MNAP Ecologist, serves as DOC staff and facilitates the Committee meetings. If a Committee member chooses to depart the Committee, the DOC may appoint a new member, ideally replacing the area of expertise lost with the departing member.

### **Committee Meetings and Communications**

The Committee will convene meetings at least annually (i.e., once a year). However, because of the need for alignment with the Task Force Regarding the Management of Public Lands and Publicly Held Easements, it is expected that that the Committee will meet three or four times between July 2008 and June 2009. Electronic communication (e-mail, web based etc.) will be used as needed between meetings.

All Committee documents (agendas, minute, etc.) will be available to the public upon request.

### **Roles, Responsibilities, and Expectations**

The Department of Conservation (as staff to the Committee) will:

- prepare and communicate periodic updates on the status of Ecological Reserves, including questions regarding research, monitoring, and management,
- provide agendas and minutes for meetings and telephone conferences,
- share relevant background documents with the Committee, distinguishing between those that are informational, those that call for discussion and advice, and ones that call for decision making by the Committee,
- communicate to other colleagues and stakeholders beyond the Ecological Reserves Advisory Committee when issues require wider consideration,
- provide leadership and guidance to the Committee on issues related to Ecological Reserves.
- Staff time required to facilitate Committee initiatives is expected to range from 2-8 days per year.

The Ecological Reserves Advisory Committee will:

- review and provide feedback and advice on documents and issues that have been presented by DOC staff,
- communicate the work of the Committee and the Ecological Reserves system to colleagues, solicit input on related issues stakeholders as needed, and convey those views to the Committee through the Department of Conservation,
- strive for consensus on issues that may affect the Ecological Reserves system. When consensus is not reached, the matter will be referred to the Department of Conservation senior management team.
- The expected time commitment from Committee members is 1-4 days per year.

Appendix 2:

**PUBLIC LAWS OF MAINE**  
**Second Regular Session of the 119th**

**CHAPTER 592**  
**S.P. 157 - L.D. 477**

**An Act to Establish Standards and Conditions for Designation of  
Ecological Reserves on Lands Managed by the Bureau of Parks and  
Lands**

Be it enacted by the People of the State of Maine as follows:

Sec. 1. 5 MRSA §13076, sub-§3, ¶F is enacted to read:

F. The Natural Resources Information and Mapping Center shall maintain a database of areas designated as ecological reserves as defined in Title 12, section 1801, subsection 4-A and other public lands designated and managed for equivalent purposes and shall provide scientific review of areas on state land proposed as ecological reserves.

Sec. 2. 12 MRSA §1801, sub-§4-A is enacted to read:

4-A. Ecological reserve. "Ecological reserve" means an area owned or leased by the State, under the jurisdiction of the bureau, designated by the director for the purpose of maintaining one or more natural community types or native ecosystem types in a natural condition and range of variation and contributing to the protection of Maine's biological diversity and managed:

A. As a benchmark against which biological and environmental change may be measured;

B. To protect sufficient habitat for those species whose habitat needs are unlikely to be met on lands managed for other purposes; or

C. As a site for ongoing scientific research, long-term environmental monitoring and education.

Sec. 3. 12 MRSA §1805 is enacted to read:

**§1805. Designation of ecological reserve**

The director may designate ecological reserves on parcels of land under the jurisdiction of the bureau that were included in the inventory of potential ecological reserves published in the

July 1998 report of the Maine Forest Biodiversity Project, "An Ecological Reserves System Inventory: Potential Ecological Reserves on Maine's Existing Public and Private Conservation Lands." The director may designate additional ecological reserves only in conjunction with the adoption of a management plan for a particular parcel of land and the process for adoption of that management plan must provide for public review and comment on the plan. When a proposed management plan includes designation of an ecological reserve, the director shall notify the joint standing committee of the Legislature having jurisdiction over matters pertaining to public lands of the proposal.

**1. Allowed uses.** Allowed uses within an ecological reserve must be compatible with the purpose of the ecological reserve and may not cause significant impact on natural community composition or ecosystem processes. Allowed uses include nonmanipulative scientific research, public education and nonmotorized recreation activities such as hiking, cross-country skiing, primitive camping, hunting, fishing and trapping. For the purposes of this subsection, "primitive camping" means camping in a location without facilities or where facilities are limited to a privy, fire ring, tent pad, 3-sided shelter and picnic table. The removal of trees and construction of facilities associated with these allowed uses are allowed. The director may allow other uses when their impact remains low and does not compromise the purpose of the ecological reserve. Recreational use of surface waters is under the jurisdiction of the Department of Inland Fisheries and Wildlife.

**2. Trails and roads for motorized vehicle use.** The director shall allow the continuing use of an existing snowmobile trail, all-terrain vehicle trail or a road if the director determines the trail or road is well designed and built and situated in a safe location and its use has minimal adverse impact on the ecological value of an ecological reserve and it cannot be reasonably relocated outside the ecological reserve.

A new snowmobile or all-terrain vehicle trail or a new road is allowed only if the director determines all of the following criteria are met:

- A. No safe, cost-effective alternative exists;
- B. The impact on protected natural resource values is minimal; and
- C. The trail or road will provide a crucial link in a significant trail or road system.

**3. Incompatible uses.** Uses that are incompatible with the purpose of an ecological reserve are not allowed. Incompatible uses include timber harvesting, salvage harvesting, commercial mining and commercial sand and gravel excavation. For the purposes of this subsection, "salvage harvesting" means the removal of dead or damaged trees to recover economic value that would otherwise be lost.

**4. Resource protection measures.** The director shall take action to control a wildfire occurring on an ecological reserve or spreading to bureau lands. The director may authorize a prescribed burn in an ecological reserve if necessary to replicate natural processes that maintain specific natural communities or rare species populations.

The director may use pesticides, including herbicides, and sanitation harvests to control insect and disease outbreaks only in response to:

- A. A specific threat to the functioning of a native ecosystem or managed wildlife habitat;
- B. A specific threat to human health or safety; or
- C. A condition that is likely to result in significant damage to adjacent lands if control is not exercised.

For the purposes of this subsection, "sanitation harvest" means the removal of trees that have been attacked or are in imminent danger of attack by insects or disease in order to prevent these insects or diseases from spreading to other trees.

**5. Limits on total land acreage designated as ecological reserves.** The total land acreage designated as ecological reserves may not exceed 15% of the total land acreage under the jurisdiction of the bureau or 100,000 acres, whichever is less. No more than 6% of the operable timberland acres on public reserved lands and nonreserved public lands may be designated as ecological reserves. For the purposes of this subsection, "operable timberland" means land the bureau considers viable for commercial timber harvest operations. Lands donated or acquired after the effective date of this section with the condition that the donated or acquired land be designated an ecological reserve are not included when calculating acreage limits under this subsection.

The designation of land as an ecological reserve may not result in a decline in the volume of timber harvested on land under the jurisdiction of the bureau. For the purposes of this subsection, "a decline in the volume of timber harvested" means an annual harvest volume of less than the average annual harvest volume for the preceding 10 years.

**6. Reporting requirements.** The bureau shall report the status of ecological reserves under the reporting requirements of subchapters III and IV.

**Sec. 4. 12 MRSA §1839, sub-§1, ¶¶D and E,** as enacted by PL 1997, c. 678, §13, are amended to read:

- D. A summary of any campsite or recreation facility fees charged under section 1832, subsection 5; ~~and~~
- E. A description of the proposed budget, including allocations for the bureau's dedicated funds and any revenues of the bureau from permits, leases, fees and sales, for the following fiscal year beginning on July 1st; ~~and~~

**Sec. 5. 12 MRSA §1839, sub-§1, ¶F** is enacted to read:

F. The status of ecological reserves including the acreage of nonreserved public land designated as ecological reserves, results of monitoring, scientific research and other activities related to ecological reserves.

**Sec. 6. 12 MRSA §1853, sub-§1, ¶¶D and E**, as enacted by PL 1997, c. 678, §13, are amended to read:

D. A summary of any campsite or recreation facility fees charged under section 1846, subsection 5; ~~and~~

E. A description of the proposed budget, including allocations for the bureau's dedicated funds and any revenues of the bureau from permits, leases, fees and sales for the following fiscal year beginning on July 1st; and

**Sec. 7. 12 MRSA §1853, sub-§1, ¶F** is enacted to read:

F. The status of ecological reserves including the acreage of reserved public land designated as ecological reserves, results of monitoring, scientific research and other activities related to the bureau's ecological reserves.

Effective August 11, 2000, unless otherwise indicated.

### Appendix 3: Evaluation Criteria for Potential Ecological Reserves

<b>CONSERVATION TARGET</b>				
	<b>MATRIX-FORMING ECOSYSTEMS</b>	<b>LARGE PATCH COMMUNITIES/ECOSYSTEM COMPLEX</b>	<b>SMALL PATCH COMMUNITIES</b>	<b>ENDURING FEATURES (ECOLOGICAL LAND UNITS)</b>
<b>QUALIFIES</b>	<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;"><b>OR</b></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><b>compatible land use</b></u></p> <p style="text-align: center;"><b>OR</b></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;"><b>OR</b></p> <p>A-B ranked large patch ecosystem/ecosystem complex present <i>and</i> &gt;50% of conservation target is within unit <i>and</i> surrounding landscape is in a <u><b>compatible land use</b></u></p> <p style="text-align: center;"><b>OR</b></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;"><b>OR</b></p> <p>A-B ranked small patch ecosystems present <i>and</i> &gt;50% of conservation target is within unit; surrounding landscape is in a <u><b>compatible land use</b></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;"><b>OR</b></p> <p>Includes intact aquatic systems* <i>and</i> their entire watersheds</p>
<b>CONDITIONAL</b>	<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><b>incompatible land use</b></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> &lt;50% within unit, but remainder is apparently intact <i>and</i> surrounding landscape is in a <u><b>compatible land use</b></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 &gt;50% forest interior)</p>	<p>A-B ranked small patch ecosystem(s) present <i>and</i> &lt;50% of conservation target is within unit, but remainder is intact <i>and</i> surrounding landscape is in a <u><b>compatible land use</b></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;"><b>OR</b></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>
<b>DOES NOT QUALIFY</b>	<p>No A-B ranked matrix-forming ecosystems present</p> <p style="text-align: center;"><b>OR</b></p> <p>&lt;1,000 acres in size</p> <p style="text-align: center;"><b>OR</b></p> <p>1,000 to ~5,000 acres in size, but surrounding landscape is in an incompatible land use</p>	<p>&lt;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;"><b>OR</b></p> <p>No A-B ranked large patch ecosystem(s) present</p> <p style="text-align: center;"><b>OR</b></p> <p>No rare or restricted C-D ranked large patch ecosystem(s) present</p>	<p>&lt;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;"><b>OR</b></p> <p>No A-B ranked small patch ecosystem(s) present</p> <p style="text-align: center;"><b>OR</b></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 Chamblertain 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.