Aroostook Hills Region Management Plan

Squapan Unit from Haystack Mountain

Maine Department of Conservation
Bureau of Parks and Lands

August 2009

ADOPTION CITATION

In accordance with the provisions of 12 M.R.S.A. § 1847(2) and consistent with the Bureau of Parks and Lands Planning Policy and Integrated Resource Policy for Public Reserved and Nonreserved Lands, State Parks, and State Historic Sites (revised December 18, 2000 and amended March 7, 2007), this Management Plan for the **Aroostook Hills Region** is hereby adopted.

RECOMMENDED: Willard R. Harris DATE: 8/11/09

Willard R. Harris
Director
Bureau of Parks and Lands

APPROVED: Patrick K. McGowan DATE: 8/11/09

Patrick K. McGowan
Commissioner
Department of Conservation

ADOPTED DATE: 8/11/09 REVISION DATE: 8/11/24

Table of Contents

Acknowledgments

The Aroostook Hills Region Management Plan was prepared through a collaborative effort involving contributions from the following Bureau of Parks and Lands staff:

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In addition, much of the material in the Plan related to natural resources, especially geology and soils, hydrology and water quality, natural communities, wetlands, ecological processes, and rare plant and animal species was provided by the Maine Natural Areas Program (MNAP). MNAP staff conducted natural resource inventories for the Bureau and provided a detailed report, written by Don Cameron, which is quoted from directly and paraphrased throughout the Plan.

Information about archaeological and historic resources was provided by Tom Desjardin of BPL and Art Spiess at the Maine Historic Preservation Commission.

The Bureau also acknowledges the helpful participation of the Aroostook Hills Region Management Plan Advisory Committee (Appendix A), and the many members of the public who participated in public meetings held during the preparation of this Plan.

I. Introduction

About This Document

This document constitutes a fifteen-year Management Plan for 36,717 acres of public land in the Aroostook Hills region of Maine managed by the Maine Bureau of Parks and Lands (the Bureau). The Plan summarizes the character of the region and the planning process, but its primary function is to 1) provide a description of the resources found on the properties addressed, 2) describe management issues identified by members of the public and Bureau staff, and 3) put forth management allocations and recommendations to be implemented over the next fifteen-year period.

One objective of the Plan is to provide a balanced spectrum of opportunities across the Bureau's Lands, keeping in mind the available opportunities in the Aroostook Hills Region as a whole. In developing the management recommendations for each parcel, the Bureau has considered this broader perspective.

The Aroostook Hills Management Plan is also a commitment to the public that these properties will be managed within prescribed legislative mandates and in accordance with the Bureau's *Integrated Resource Policy* and its stated mission and goals. Future revisions to these commitments will occur only after providing opportunities for public comment. The Plan provides guidance to Bureau staff with responsibility for managing these properties, including a degree of flexibility in achieving the stated objectives. This document is not, however, a plan of operations.

An important aspect of the management of public lands is monitoring and evaluation of proposed management activities in terms of stated objectives. This Plan describes monitoring and evaluation procedures for recreational use, wildlife management, management of ecological reserves, and timber management.

The fifteen-year duration for this Plan is a departure from previous plans prepared for these lands. In 2007, the Bureau amended its policy to increase the Plan interval from 10 to 15 years. This change brings the Plan interval into closer alignment with Bureau forest management plan prescriptions, and most other resource management concerns other than recreation. The Bureau recognizes that some resources and management issues, most notably recreation, may undergo more rapid or unanticipated change over time. Thus, in addition to the fifteen year scheduled Plan revision, a review of current issues and progress on implementing the Plan's recommendations will be undertaken every five years, with a status report issued at that time to the advisory committee. If amendments to the Plan are then proposed, there will be an opportunity for public review and comment prior to their adoption. At the fifteen year interval, the Bureau will undertake a full review and revision of the Plan. The Bureau recognizes that several of the stated objectives will require longer than the fifteen year Plan period to achieve.

What Lands are included in the Aroostook Hills Region?

The Aroostook Hills Plan area is comprised of lands in the North Central region of Maine, from the northeast corner of Baxter State park, east to Houlton and the New Brunswick border, and north to Caribou. This region is almost entirely forested with the exception of agricultural lands around Ashland, and population centers of Houlton and Presque Isle. The Bureau owns two large units and several small lots in this region:

Public Reserved Lands of the Aroostook Hills Region

	Acreage
Squapan Unit	19,936
Scraggly Lake Unit	9,092
Garfield Plantation Lot	1,040
Hammond Lot	960
Moro Plantation East Lot	160
Moro Plantation West Lot	134
Nashville Plantation North Lot	657
Nashville Plantation South Lot	319
Oxbow Plantation Lot	1,031
Sheridan Lot	1,053
T 9 R 5 Lot	375
T 12 R 8 Lot	1,000
T 13 R 5 Lot	960
Total	**36,717**

**Acre estimates based on original land surveys and deeds from new acquisitions.

These lands contain a variety of natural and recreational resources, including exemplary natural communities, abundant deer wintering areas, opportunities for hunting, fishing, boating, camping, ATV riding, snowmobiling, and other recreational activities, and abundant timber resources.

The key focus of this Plan will be management allocations and recommendations for the Bureau fee lands mentioned above. However, other private and public conservation projects and lands are important to the context of planning in this region and will be described in the Planning Context section.

II. The Planning Process and Guidance

This section describes the Bureau's planning process for development of its management plans and the statutes and policies that guide its management decisions. The planning process includes a robust public participation effort, intended to provide input to the Bureau's management. In addition, the Bureau is guided by statutes requiring and directing the Bureau to develop management plans, and authority directing the Bureau to also create a system of ecological reserves. Overall, management of Bureau lands is guided by the Integrated Resource Policy (IRP), which itself was developed with a significant public process. Finally, the Bureau's forest management, where allowed under the multiple purpose management system defined by the IRP, is conducted sustainably, and is third party certified under the Sustainable Forestry Initiative (SFI) and the Forestry Stewardship Council (FSC) programs. The following describes these important influences guiding the development of this Plan in further detail.

Public Participation and the Planning Process

Overall, the development of management plans includes a series of steps, each involving interdisciplinary review, as well as extensive efforts to solicit and consider public comment, in order to achieve a Plan that integrates the various perspectives and needs while protecting and conserving the resources of the public reserved lands in the Aroostook Hills Region.

Resource Assessments: The first phase of the planning process includes a thorough study of the resources and opportunities available on the Aroostook Hills Plan lands. Beginning in the winter of 2008, Bureau staff undertook an intensive review of the natural and geological, historic and cultural, fisheries and wildlife, recreation, and timber and renewable resources. Much of this information was obtained by conducting formal inventories of specific resource areas (Natural Resource Inventory, Cultural Resource Inventory, etc.). Resource professionals from within the agency provided information on wildlife, recreation, and timber resources. Mapping and GIS-related information was also obtained as part of this phase.

Staff also participated in two reconnaissance field trips to the Plan Area to inventory and characterize the land-based resources and recreational features. The first trip was a winter snowmobile trip in March 2008, followed by a June 2008 tour on foot and by ATV.

Issue Identification/Public Scoping Session: Another component of the planning process involved conducting a public meeting to determine and discuss management issues needing to be addressed by the Plan. This meeting was held in Ashland on June 4, 2008.

Advisory Committee Formation and Review of Preliminary Inventory and Assessment: A Public Advisory Committee was formed in the summer of 2008. Members of this Committee were selected on the basis of their resource expertise, and for their regional

and local knowledge in areas important to the management of the Aroostook Hills Region properties. On July 30, 2008 this committee met in Ashland to identify issues in the Aroostook Hills Region Lands, and to propose options to address these issues. Ideas from this meeting were incorporated into a First Draft Plan.

Advisory Committee Meeting on the First Draft Plan: This draft included proposed resource allocations and proposed management recommendations, and initiated the next step in the public review process – a meeting with the Advisory Committee and solicitation of public comments. The Advisory Committee met in Ashland on May 11, 2009 to review the draft. Comments from the Advisory Committee on this First Draft Plan, along with any comments from other members of the public and various resource professionals, were considered in developing the Final Draft of the Plan.

Public Meeting on the Final Draft Plan: The Final Draft Plan was presented and discussed at a public meeting on July 9, 2009. A final written comment period followed.

Commissioner's Review of the Proposed Plan, and Plan Adoption: Comments received on the Final Draft Plan were considered in preparing a Plan for review by the Director of the Bureau of Parks and Lands. Upon the Director's recommendation, the Plan was then subject to the review and approval of the Commissioner of the Department of Conservation before it was officially adopted by the Department.

Statutory and Policy Guidance

Multiple use management plans are statutorily required for Public Reserved Lands pursuant to Title 12 MRSA § 1847 (2), and must be prepared in accordance with the guidelines set forth in the Integrated Resource Policy revised and adopted in December 2000 by the Bureau. These laws and policies direct the Bureau to identify and protect important natural, ecological, and historic attributes; enhance important fisheries and wildlife habitat; provide opportunities for a variety of quality outdoor recreation experiences; and provide a sustained yield of forest products by utilizing forest management techniques and silvicultural practices that enhance the forest environment.

Summary of the Resource Allocation System

The Resource Allocation System is a land management-planning tool developed in the 1980s, and formalized in the *Integrated Resource Policy* (IRP), adopted in December 2000. The Resource Allocation System, which assigns appropriate management based on resource characteristics and values, is based on a *hierarchy* of natural and cultural resource attributes found on the land base. The hierarchy ranks resources along a scale from those that are scarce and/or most sensitive to management activities, to those that are less so. The resource attributes are aggregated into seven categories or "allocations," including (from most sensitive to least sensitive): special protection, backcountry recreation, wildlife management, remote recreation, visual consideration, developed recreation, and timber management.

This hierarchy defines the type of management that will be applied depending on the particular resource attributes present, with *dominant* and *secondary* use or management designations as appropriate to achieve an integrated, multi-use management.

The following is a description of the Resource Allocation System categories and the management direction defined for each category. Not all of these allocations are applied in this Plan.

Designation Criteria for Special Protection Areas

1. *Natural Areas*, or areas left in an undisturbed state as determined by deed, statute, or management plan; and areas containing rare and endangered species of wildlife and/or plants and their habitat, geological formations, or other notable natural features;

2. *Ecological Reserves*, established by Title 12, Section 1801: *"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*." Most ecological reserves will encompass more than 1,000 contiguous acres.

3. *Historic/Cultural Areas* (above or below ground) containing valuable or important prehistoric, historic, and cultural features.

Management Direction

In general, uses allowed in special protection areas are carefully managed and limited to protect the significant resources and values that qualify for this allocation. Because of their sensitivity, these areas can seldom accommodate active manipulation or intensive use of the resource. Recreation as a secondary use is allowed with emphasis on non-motorized, dispersed activities. Other direction provided in the IRP includes:

Vegetative Management on Ecological Reserves, including salvage harvesting, is also considered incompatible. Commercial timber harvesting is not allowed on either Ecological Reserves or Special Protection natural areas.

Wildlife management within these areas must not manipulate vegetation or waters to create or enhance wildlife habitat.

Management or public use roads are allowed under special circumstances, if the impact on the protected resources is minimal.

Trails for non-motorized activities must be well designed and constructed, be situated in safe locations, and have minimal adverse impact on the values for which the area is being protected. *Trail facilities and primitive campsites* must be rustic in design and accessible only by foot from trailheads located adjacent to public use roads, or by water.

Carry-in boat access sites are allowed on water bodies where boating activity does not negatively impact the purposes for which the Special Protection Area was established.
Hunting, fishing, and trapping are allowed where they do not conflict with the management of historic or cultural areas or the safety of other users.
Research, interpretive trails, habitat management for endangered or threatened species, are allowed in Special Protection natural areas unless limited by other management guidelines

Designation Criteria for Backcountry Recreation Areas

Relatively large areas (usually 1,000 acres or more) are allocated for Backcountry recreational use where a special combination of features are present, including:

- Superior scenic quality
- Remoteness
- Wild and pristine character
- Capacity to impart a sense of solitude

Backcountry Areas are comprised of two types:

Non-mechanized Backcountry Areas – roadless areas with outstanding opportunities for solitude and a primitive and unconfined type of dispersed recreation where trails for non-mechanized travel are provided and no timber harvesting occurs.

Motorized Backcountry Areas – multi-use areas with significant opportunities for dispersed recreation where trails for motorized activities and timber harvesting are allowed.

Management Direction

Trail facilities and campsites in all Backcountry Areas will be rustic in design and accessible from trailheads located outside the area, adjacent to management roads, or by water. All trails must be well designed and constructed, situated in safe locations, and have minimal adverse impact on the Backcountry values.
Management roads and service roads will be allowed as a secondary use in those Backcountry Areas where timber harvesting is allowed.
Timber management in Motorized Backcountry Areas will be an allowed secondary use, and will be designed to enhance vegetative and wildlife diversity. Salvage harvesting is allowed in Motorized Backcountry Areas only.
Wildlife management in Non-mechanized Backcountry Areas will be non-extractive in nature.

Designation Criteria for Wildlife Dominant Areas

1. *Essential habitats* are those regulated by law and currently consist of bald eagle, piping plover, and least tern nest sites (usually be categorized as Special Protection as well as Wildlife Dominant Areas).

2. *Significant habitats*, defined by Maine's Natural Resource Protection Act, include habitat for endangered and threatened species; deer wintering areas; seabird nesting islands; vernal pools; waterfowl and wading bird habitats; shorebird nesting, feeding, and staging areas; and Atlantic salmon habitat.

3. *Specialized habitat areas and features* include rare and exemplary natural communities; riparian areas; aquatic areas; wetlands; wildlife trees such as mast producing hardwood stands (oak and beech), snags and dead trees, den trees (live trees with cavities), large woody debris on the ground, apple trees, and raptor nest trees; seeps; old fields/grasslands; alpine areas; folist sites (a thick organic layer on sloping ground); and forest openings.

Management Direction

Recreation and timber management are secondary uses in most Wildlife Dominant Areas. Recreational use of Wildlife Dominant Areas typically includes hiking, camping, fishing, hunting, trapping, and sightseeing. Motorized trails for snowmobiling and ATV riding are allowed to cross these areas if they do not conflict with the primary wildlife use of the area and there is no other safe, cost-effective alternative (such as routing a trail around the wildlife area). Direction provided in the IRP includes:

Habitat management for wildlife, including commercial and noncommercial harvesting of trees, will be designed to maximize plant and animal diversity and to provide habitat conditions to enhance population levels where desirable.

Endangered or threatened plants and animals – The Bureau will cooperate with the US Fish and Wildlife Service, National Marine Fisheries Service, Maine Department if Inland Fisheries and Wildlife, and Maine Natural Areas Program in the delineation of critical habitat and development of protection or recovery plans by these agencies on Bureau lands.

Timber management as a secondary use in riparian buffers will employ the selection system, retaining all den trees and snags consistent with operational safety. In other wildlife-dominant areas it will be managed to enhance wildlife values.

Designation Criteria for Remote Recreation Areas

1. Allocated to protect natural/scenic values as well as recreation values. Often have significant opportunities for low-intensity, dispersed, non-motorized recreation.
2. Usually are relatively long corridors rather than broad, expansive areas.
3. May be a secondary allocation for Wildlife Dominant areas and Special Protection – Ecological Reserve areas.

4. Examples include trail corridors, shorelines, and remote ponds.

Management Direction

Remote Recreation areas are allocated to protect natural/scenic values as well as recreation values. The primary objective of this category is to provide non-motorized recreational opportunities; therefore, motorized recreation trails are allowed only under specific limited conditions, described below. Timber management is allowed as a secondary use. Direction provided in the IRP includes:

Trail facilities and remote campsites will be rustic in design and accessible by foot from trailheads, management and/or public roads, or by water.

Existing snowmobile and all-terrain vehicle activity may be continued on well-designed and constructed trails in locations that are safe, where the activity has minimal adverse impact on protected natural resource or remote recreation values, and where the trails cannot be reasonably relocated outside of the area.

New snowmobile or all-terrain vehicle trails are allowed only if all three of the following criteria are met:

(1) no safe, cost effective alternative exists;

(2) the impact on protected natural resource values or remote recreation values is minimal; and

(3) the designated trail will provide a crucial link in a significant trail system;

Access to Remote Recreation areas is primarily walk-in, or boat, but may include vehicle access over timber management roads while these roads are being maintained for timber management.

Designation Criteria for Visual Areas

Many Bureau-managed properties have natural settings in which visual attributes enhance the enjoyment of recreational users. Timber harvests which create large openings, stumps and slash, gravel pits, and new road construction, when viewed from roads or trails, may detract significantly from the visual enjoyment of the area. To protect the land's aesthetic character, the Bureau uses a two-tier classification system to guide management planning, based on the sensitivity of the visual resource to be protected.

Visual Class I Areas where the foreground views of natural features may directly affect enjoyment of the viewer. Applied throughout the system to shorelines of great ponds and other major watercourses, designated trails, and designated public use roads.

Visual Class II Include views of forest canopies from ridge lines, the forest interior as it fades from the foreground of the observer, background hillsides viewed from water or public use roads, or interior views beyond the Visual Class I area likely to be seen from a trail or road.

Visual Class I Management Direction:

Timber harvesting is permitted under stringent limitations directed at retaining the appearance of an essentially undisturbed forest.
Openings will be contoured to the lay of the land and limited to a size that will maintain a natural forested appearance.
Within trail corridors or along public use roads it may be necessary to cut trees at ground level or cover stumps.
Branches, tops, and other slash will be pulled well back from any trails.
Scenic vistas may be provided.

Visual Class II Management Direction:

Managed to avoid any obvious alterations to the landscape.
Openings will be of a size and orientation as to not draw undue attention.

Designation Criteria for Developed Recreation Areas

Developed Class I areas are low to medium density developed recreation areas, while *Developed Class II* areas have medium to high density facilities and use such as campgrounds with modern sanitary facilities. There are no developed class II areas in the Aroostook Hills public reserved lands (they are more typical of State Parks).

Class I Developed Recreation Areas
Typically include more intensely developed recreation facilities than found in Remote Recreation Areas such as: drive-to primitive campsites with minimal supporting facilities; gravel boat access facilities and parking areas; shared use roads and/or trails designated for motorized activities; and trailhead parking areas. These areas do not usually have full-time management staff.

Management Direction

Developed Recreation areas allow a broad range of recreational activities, with timber management and wildlife management allowed as secondary uses. Direction provided in the IRP includes:

*Timber management***,** allowed as compatible secondary use, is conducted in a way that is sensitive to visual, wildlife and user safety considerations**.** Single-age forest management is not allowed in these areas. Salvage and emergency harvests may occur where these do not significantly impact natural, historic, or cultural resources and features, or conflict with traditional recreational uses of the area.
Wildlife management may be a compatible secondary use. To the extent that such management occurs, it will be sensitive to visual, and user safety considerations.
Visual consideration areas are often designated in a buffer area surrounding the Developed Recreation area.

Designation Criteria for Timber Management Areas

1. Area meets Bureau guidelines as suitable for timber management, and is not prohibited by deed or statute.
2. Area is not dominated by another resource category. Where other uses are dominant, timber management may be a secondary use if conducted in a way that does not conflict with the dominant use.

Management Direction

The Bureau's timber management practices are governed by a combination of statute and Bureau policy, including but not limited to policies spelled out in the IRP. These general policies include:

Overall Objectives: The Bureau's overall timber management objectives are to demonstrate exemplary management on a large ownership, sustaining a forest rich in late successional character and producing high value products (chiefly sawlogs and veneer) that contribute to the local economy and support management of Public Reserved lands, while maintaining or enhancing non-timber values (secondary uses), including wildlife habitat and recreation.

Forest Certification: Timber management practices (whether as a dominant or secondary use) meet the sustainable forestry certification requirements of the Sustainable Forestry Initiative, and the Forest Stewardship Council.

Roads: Public use, management, and service roads are allowed. However, the Bureau seeks to minimize the number of roads that are needed for reasonable public vehicular access or timber harvesting.

Recreational Use: Most recreational uses are allowed but may be subject to temporary disruptions during management or harvesting operations. The Bureau has latitude within this allocation category to manage its timber lands with considerable deference to recreational opportunities. It may, through its decisions related to roads, provide varying recreational experiences. Opportunities for hiking, snowshoeing, back-country skiing, horseback riding, bicycling, vehicle touring and sightseeing, snowmobiling, and ATV riding all are possible within a timber management area, but may or may not be supported or feasible, depending on decisions related to creation of new trails, or management of existing roads and their accessibility to the public.

In addition, the IRP provides the following specific direction for timber management:

Site Suitability: The Bureau will manage to achieve a composition of timber types that best utilize each site.

Diversity: For both silvicultural and ecological purposes, the Bureau will maintain or enhance conditions of diversity on both a stand and wide-area (landscape) basis. The Bureau will manage for the full range of successional stages as well as forest types and tree species. The objective will be to provide good growing conditions, retain or enhance structural complexity, maintain connectivity of wildlife habitats, and create a vigorous forest more resistant to damage from insects and disease.

Silvicultural Systems: A stand will be considered single-aged when its tree ages are all relatively close together or it has a single canopy layer. Stands containing two or more age classes and multiple canopy layers will be considered multi-aged. The Bureau will manage both single- and multi-aged stands consistent with the objectives stated above for diversity; and on most acres will maintain a component of tall trees at all times. Silvicultural strategy will favor the least disturbing method appropriate, and will usually work through multi-aged management.

Location and Maintenance of Log Landings: Log landings will be set back from all roads designated as public use roads. Off-road yarding may be preferable along all gravel roads, but the visual intrusion of roadside yarding must be balanced with the increased soil disturbance and loss of timber producing acres resulting from off-road spurs and access spurs. All yard locations and sizes will be approved by Bureau staff prior to construction, with the intention of keeping the area dedicated to log landings as small as feasible. At the conclusion of operations, all log landings where there has been major soil disturbance will be seeded to herbaceous growth to stabilize soil, provide wildlife benefits, and retain sites for future management need.

Forest Certification

In 1999 the Bureau made the decision to demonstrate exemplary forest management through participation in two nationally recognized sustainable forestry certification programs. The Bureau was awarded certification of its forestlands under the Sustainable Forestry Initiative (SFI) and the Forest Stewardship Council (FSC) programs in 2002. These third-party audits were conducted to determine if these lands were being managed on a sustainable basis. Successful completion of the FSC/SFI systems also qualified the Bureau to enter into the "chain of custody" program to market its "green-certified" wood. The process for enrollment in this program was completed in 2003, with certified wood now being marketed from Bureau managed lands.

The process for conducting the SFI and FSC audits was rigorous and unique in that the Bureau underwent the two audit programs simultaneously. The audit was comprised of a field analysis of forest management practices at selected sites around the state, and an analysis of the Bureau's financial, personnel, policy development, and record-keeping systems. A Bureau-wide certification team was implemented to address "conditions" and "minor non-conformances" stipulated in the audit reports, including: significant enhancements to forest inventory data, development of a computerized forest-modeling program, a timeline for updating management plans for the entire land base, improvements in the use of Best Management Practices to protect water quality, and new commitments to public outreach and education programs. The Bureau is required to meet these conditions within certain timeframes in order to keep its certification status in good standing over the five-year certification period.

In 2006, the Bureau hosted its first full recertification by FSC, concurrently undergoing its first surveillance audit by SFI, the latter now required under SFI's updated standards. Although the field portion took place during and immediately after a heavy November rainstorm, Best Management Practices implemented on Bureau lands were working well, and certifiers for both systems were very pleased with Bureau silviculture at all sites visited. As is usually the case, there were several conditions (now called Corrective Action Requests, or CARs) made by each certification system, which the Bureau needed to satisfy as it continues to improve its forest management which has already been certified as being exemplary. Subsequent compliance audits took place in the summer of 2007 and 2008. The outcome of those compliance audits was to award unconditional certification to the Bureau, with no CARs indicated.

Ecological Reserves

The Maine Forest Biodiversity Project (MFBP) was formed in 1994 to explore and develop strategies to help maintain Maine's existing native species and the ecosystems that contain them. The MFBP was a consensus-based collaborative effort involving approximately one hundred individuals representing a diverse spectrum of interests and opinions: landowners, sportsmen, educators, advocates for property rights, foresters, wildlife and land conservation professionals, and representatives of the scientific community, state and federal agencies, and the business community. The inventory of potential ecological reserves conducted by the MFBP took place between January 1995 and October 1997, with guidance from a twenty-member scientific advisory panel.

To fulfill the legislative intent, these ecological reserves were established as 1) benchmarks against which biological and environmental change could be measured; 2) habitats adequate to maintain viable populations of species whose habitat needs are unlikely to be met on other lands; and 3) sites for scientific research, long-term environmental monitoring, and education. In addition, public access, hunting, and fishing are among the allowed uses on ecological reserves. The ecological reserves include many of Maine's best examples of alpine meadows, lakes and streams, and old growth forests.

Beginning in 2002, the Department of Conservation worked with a multi-disciplinary committee to draft an *Ecological Reserve Monitoring Plan* to guide periodic data collection at the landscape, stand, and species levels. The monitoring program is tied closely to other statewide and nationwide forest monitoring programs that use U.S. Forest Service Forest Inventory and Analysis (FIA) methods. To date, 387 permanent monitoring plots have been established on 12 Ecological Reserves, with ongoing monitoring work increasing the number of plots each year. The long-term monitoring program and the value of ecological reserves to this program have been recognized as models for public lands throughout the northeast.

Based on the work by the MFBP the Maine Legislature in 2000 authorized the designation of ecological reserves on Department of Conservation lands, and 68,974 acres were designated by the Bureau of Parks and Lands Director at that time. Currently

there are no designated ecological reserves in the Aroostook Hills region. However, there may be designation in the future.

III. Executive Summary of the Plan

Vision for Management of Aroostook Hills Public Reserved Lands

Vision for the Squapan Unit

The Vision for the Squapan Unit is to manage for recreational use in appropriate places, perform exemplary timber harvesting that maintains forest health and diversity, and protect important ecological features and wildlife habitat. Consistent with this overall Vision, the Bureau will seek to improve the extensive multi-use trail system to achieve an exemplary standard; and to add value to that system with associated camping and picnicking areas; while expanding boat access to Squapan Lake and exploring opportunities for compatible new uses such as hiking trails.

Vision for the Scraggly Lake Unit

The vision for the Scraggly Lake Unit is to provide a quiet and remote recreational setting supporting a variety of recreational activities, especially quality boating, fishing, hunting, camping, and hiking, to protect exemplary ecological features and wildlife habitat, and to perform timber management that enhances wildlife habitat and visual integrity and produces high quality timber products.

Vision for the Public Lots

The vision for the small public lots is to demonstrate exemplary forest management, sustaining a forest rich in late successional character and wildlife habitat diversity, and producing high value products that contribute to the local economy.

Overview of Allocations in the Aroostook Hills Region

Dominant Allocations (in Acres) in the Aroostook Hills Region

	Squapan Unit	**Scraggly Lake Unit**	**Small Lots**	**Total**	**% of total plan acres in each allocation**
Special Protection—Natural Area	318	292	0	610	1.7%
Wildlife Management	3,468	2,584	829	6,881	19%
Remote Recreation	0	8	0	8	<1%
Visual Consideration	290	128	0	418	1%
Developed Recreation Class I	Unknown—roads/trails	23 plus roads/motorized trails	0	23 plus roads/motorized trails	<1%
Timber Management	14,274	6,941	6,867	28,082	78%
Total	18,350	9,976	7,696	36,022	

**Dominant acreages are representations based on GIS metrics and do not sum to total plan area acres due to measuring error and limits of GIS precision.*

***The following allocations from the IRP were not used in the Aroostook Hills Region Public Reserved Lands: Special Protection—Ecological Reserve, Special Protection—Historic/cultural, Backcountry Non-mechanized, Backcountry Motorized, Developed Recreation Class II.*

Summary of Issues and Management Recommendations

Squapan Unit Issues and Management Recommendations

Issue	**Recommendations**
Natural Resource Management Issues	
1. Potential Future Ecological Reserve on Squapan Mountain	1. The Bureau will not perform any timber management in this area, which will be temporarily designated as wildlife dominant until future decisions about ecological reserve additions are made. The current snowmobile Ridge Trail will be a "developed recreation class I" segment through the wildlife dominant area. Any future ecological

	reserve designation should exclude the motorized Ridge Trail from the ecological reserve boundary.
Recreation Management Issues	
2. Unauthorized ATV use of the snowmobile trail over Squapan Mountain causing erosion and drainage problems, as well as safety concerns for users.	2. Continue to work with ATV interests to curb the current unauthorized use of the Ridge Trail over Squapan Mountain.
3. Request by ATV community for authorization to use/upgrade the snowmobile trail over Squapan Mountain for ATV use; and potential impacts to the adjacent natural communities and their potential ecological reserve designation.	3. Designate the trail for ATV use when (a) ongoing cooperation from the ATV community has effectively curbed illegal use of existing trail; (b) an assessment of the trail and a detailed engineered plan for needed improvements is completed; (c) funding sources to accomplish needed improvements have been secured and (d) an improved, well-designed trail is in place.
4. Lack of non-motorized trails on the Squapan Unit; potential to build a system of trails to connect Haystack Mountain, the Squapan Unit, and Aroostook State Park to be used by hikers, cross-country skiers, and possibly mountain bikers.	4. Determine, as resources allow, if there would be sufficient demand for this trail, and if cooperation could be obtained from private landowners between the Unit and the State Park. Work with Aroostook State Park Manager, the Town of Castle Hill, and private landowners in this endeavor.
5. Potential to provided short, non-motorized trails that connect to the snowmobile "Ridge Trail" and provide access to the fire tower on the mountain.	5. Determine if there would be sufficient demand for non-motorized trails that connect to the snowmobile Ridge Trail, and continue to the fire tower. Before building a trail to the fire tower, determine the expense of improving the tower to make safe for public use, and improve the tower if funding can be obtained and demand can be demonstrated.
6. A second public boating launching facility is desired on Squapan Lake, since the Walker Siding facility has been closed to the public.	6. Continue communications with the owners of the Walker siding facility about the possibility of re-opening their facility to the public. If not possible, assess the feasibility of various sites in the Unit for providing boating access. A site will be chosen if it is: cost-effective, able to accommodate an ADA accessible facility, and can accommodate a full service motor boat facility without violating water quality or other environmental standards. If a suitable site can be located, and funding can be obtained, build a second public boat launching facility on Squapan Lake.
7. ATV/Vehicle Accessible Camping	7. Assess the possibility of providing one or more trails from the public use roads to existing lakeshore

There is interest in making some of the Unit campsites accessible by vehicle and ATV. There is also interest in a day use area at the "old camp yard" site along an existing ATV trail.	campsites, with parking areas near the road. Maintain the primitive nature of the lakeshore campsites. Work with the ATV community to consider a camping area near the ATV trails around Squapan Mountain that could be connected to a regional series of ATV camping shelters spaced about a day's drive apart. Provide a day use site at the "old camp yard" site, including a picnic table with a shelter and a privy.
Issue	**Recommendations**
Timber Management Recommendations	
8. Future Timber Management	8. Maintain the high proportion of large, high quality trees and size and species diversity. More specifically • Increase the spruce component in softwood stands and maintain fir at present levels. White pine, which currently makes up one percent of the softwood type volume, should be increased. • Maintain mixedwood stands in current species assemblages with the exception of beech which will be decreased when stems are diseased and have poor crowns. • Encourage high quality sugar maple, yellow birch and spruce on hardwood stands and retain red maple and beech of acceptable quality. • Beech should be retained for wildlife when crowns are good (even if bark is diseased) and when bark is smooth. • Designate areas as HCVF areas, which will in some cases correspond with special protection areas and other MNAP designated exemplary communities.
Transportation and Administrative Issues	
9. Road Access	9. Work with abutting landowners to facilitate Bureau staff access to portions of the Unit not easily accessed by public use roads. Seek deeded access over abutting lands.
10. Minority Ownership	10. Work cooperatively with minority owners to pursue full Bureau ownership of lands within the

	Unit.

Scraggly Lake Unit Issues and Management Recommendations

Issue	**Recommendations**
Natural Resource Management Issues	
1. Management of exemplary communities.	1. Manage exemplary communities in consultation with MNAP. The Hemlock Forest is allocated as a special protection area, and will not be subject to timber harvesting. The Leatherleaf Boggy Fen and Spruce Larch Wooded Bog are within wildlife dominant areas where harvesting will be minimal.
2. Protection for loons during nesting.	2. Monitor loon nests and place signage at boat launching facility to warn boaters about using caution during nesting season. Continue to work with guides that land float planes on Scraggly Lake and encourage them to continue to avoid landing on the lake near nests during nesting and fledging stages.
Recreation Management Issues	
3. Snowmobile trail grooming and deer use of the trail.	3. Continue to communicate with the local snowmobile club, the Maine Warden Service, and IF&W regarding any future grooming of the club trail through the Unit. Consider sledder safety and the trail's impact on wintering deer when making the decision to groom the trail from year to year.
4. ATV use of the Unit.	4. Maintain public use road open to ATV use, but do not connect it with a larger ATV trail system, in respect to the surrounding landowner's policy, and to maintain a quiet and remote recreational experience on the Unit.
5. Interest in more non-motorized trails on the Unit.	5. Assess the interest and feasibility of building three new trails on the Unit—one connecting the campground to the Owl's Head Peninsula, one from the Green Pond campsite to the Hemlock Forest, and one from Scraggly Lake to Ireland Pond. Seek funding for these trails if they are found to be feasible and have sufficient interest from the public.
6. The need for ADA accessible boating and camping.	6. When funding is obtained, make ADA improvements to the Scraggly Lake boating facility

	and a campsite near the facility.
Timber Management Recommendations	
7. Future Timber Management	7. Grow high value timber products while (chiefly sawlogs and veneer) while maintaining visual integrity and enhancing a diversity of wildlife habitat. More specifically • Favor high value and longer lived species such as white pine, spruce, hemlock, sugar maple, and yellow birch. • Maintain softwood stands in that type, with spruce the preferred species. Favor white pine where it grows and maintain hemlock on some sites, and retain fir as an important component of regeneration. Encourage a late successional character and continue to provide valuable deer wintering areas. • Maintain mixedwood type on current mixedwoods stands that are well stocked. Work toward a late successional character, and favor high quality spruce, maple, birch and hemlock. On less well stocked mixedwood sites, retain overstory if windfirm, and favor younger spruce, pine and hemlock (possibly returning some sites back to softwood). • Encourage high quality and diverse hardwood stands to remain in that condition. Rehabilitate low quality hardwood stands by reducing diseased beech with poor crowns and favoring higher quality sugar maple, yellow birch and spruce. • Retain beech for wildlife when crowns are good (even if bark is diseased) and when bark is smooth. • Designate some areas as High Conservation Value Forests (HCVF), a designation recognized by the certification programs the Bureau is enrolled in. Manage these areas to maintain key characteristics such as large, old trees.
Transportation and Administrative Issues	
8. Ireland Pond motorized barricade.	8. Continue to block motorized access to the pond 700 feet from the pond at the location where a spur

	trail leaves the public use road. (This is the location of the current barricade).
9. Boat storage at Ireland Pond.	9. Implement special use permits for boats stored on the property.

Garfield Plantation Lot Issues and Management Recommendations

Forest conditions are sparse in the overstory with a single-age understory. It will take time for the Bureau to achieve the desired multi-age conditions on this Lot.

Focus forest management on producing multiple age classes over time. Grow quality spruce, fir, hemlock and hardwoods and retain some large old hemlock for wildlife. The age diversity in the overstory will help in improving overall diversity and achieving these goals. Perform timber stand improvements if commercially feasible, and retain some old hemlock as wildlife legacy trees. Specifically, a harvest is scheduled for 2009 and 2010, which will improve stand health, quality, growth, and structure.

Hammond Lot Issues and Management Recommendations

Future timber management will only be feasible after sufficient time has elapsed since the heavy spruce budworm cuts of the 1980s.

Manage for quality sawtimber as species mix and fertility allows for this.

Moro Plantation East and West Lots Management Recommendations

Apply standard Bureau silviculture to produce high quality timber products and maintain and enhance conditions for a wide range of wildlife species. Younger aspen rich stands may warrant patchcut management for ruffed grouse.

Nashville Plantation North Lot Management Recommendations

Manage timber using exemplary silviculture, maintain and enhance deer wintering areas, take advantage of the site quality, and focus on visual concerns. Due to the Lot's easy access, it can serve as a showcase for good forest management.

Nashville Plantation South Lot Management Recommendations

Conduct silviculture to produce fine spruce, fir and hardwood sawtimber. A 1996 prescription called for possible harvests in 2015 on much of the Lot.

Oxbow Plantation Lot Management Recommendations

Consult with MHPC or the Bureau Historic Sites Specialist before conducting any recreational or road improvements along the shore of the Aroostook River.

Manage the forest to retain and enhance the multi-age character of most stands. The horizontal and vertical diversity which makes habitat for a variety of species should be maintained. Encourage sugar maple and spruce, maintain hemlock, and retain vigorous beech.

Sheridan Lot Management Recommendations

Manage the forest for decent hardwoods on the acres suitable for growing them, and quality softwood sawtimber on all other areas.

T 9 R 5 Wels Lot Management Recommendations

Manage forest resources to grow quality softwood on about half the acres, while the rest will grow cedar, spruce and pines at slow rates.

T 12 R 8 Wels Lot Issues and Management Recommendations

There are mining rights which may be exercised on the Lot for locating spoil from mining on Bald Mountain.

Manage forest resources to maintain or increase the high spruce component on softwood and mixedwood stands. Quality hardwoods, especially sugar maple, will also be encouraged on these sites. Hardwood stands will be encouraged to grow maple and birch sawlogs. Good beech will be maintained to produce mast for wildlife. Harvest to release young trees of desirable species.

Work to minimize the impact of mining spoil on the Lot, if rights are exercised.

T 13 R 5 Wels Lot Management Recommendations
Manage the forest to encourage deer wintering areas extensively where they have historically existed by increasing softwood type. Manage for quality softwood sawtimber on all other areas, except fertile upland areas now dominated by sugar maple and beech will be retained as such.

IV. The Planning Context

The major focus of the Aroostook Hills Region Management Plan is to plan for the Bureau's public reserve lands in the region. However, an overview of the region's culture and history, natural and wildlife resources, other public and private conservation lands, and other topics, gives important context to public lands management.

Culture and History of the Aroostook Hills Region

Culture

Aroostook County is Maine's largest county, and at 4.3 million acres is the largest county east of the Mississippi River - larger than the states of Connecticut and Rhode Island combined. Located at the northeastern corner of the state, Aroostook County borders the Canadian Provinces of Quebec and New Brunswick, with more than 2,000 lakes, streams, rivers, and ponds covering nearly 80,000 acres of water. Its vast natural resource base and strong agrarian heritage have fostered a regional economy reliant upon these resources.

The Aroostook Hills region is contained mostly within central Aroostook County. Presque Isle, a city of approximately 10,000 residents, is a commercial center and the largest city in Aroostook County. The Aroostook Center Mall attracts shoppers from the greater area. It is home to the University of Maine at Presque Isle, a small university affiliated with the University of Maine System, and Northern Maine Community College. Houlton is the county seat, and with a population of approximately 7,000, is also a population center of the County. A customs station/border crossing into Canada and the northern terminus of Interstate 95 are just east of Houlton.

Many of Aroostook County's residents are of French Acadian decent, and many of these Maine Acadians are bilingual in French and English and hold a strong cultural identity. Residents of Swedish decent are also common in this region, and festivals are held throughout the year to celebrate this culture. The Native American tribes of the Micmac and Maliseet have their tribal governments in Presque Isle and Houlton, respectively.

The economy of the Aroostook Hills area (as well as Aroostook County as a whole) is heavily reliant on forestry, agriculture, and tourism. Approximately 8% of Aroostook County's land area is used for agriculture. Potatoes are the major crop, with hay, barley, oats, peas and broccoli and some fuel crops also being important. Approximately 3,000 Aroostook County residents are employed in the agricultural sector. The majority of the landscape in the Aroostook Hills is owned by timber interests. Forestry is very important to the economy, with approximately 3,500 county residents employed in some aspect of the forest products industry. The industry faces challenges such as international competition and low demand for some products, and is working to produce more specialized products, among other things, to cope with these challenges. Tourism is also an important component to the economy, with winter snowmobiling as well as other

outdoor activities contributing greatly to the retail, lodging, dining and other businesses that rely heavily on tourism. Other important aspects of the economy include (but are not limited to): education, health care, social services, manufacturing, and transportation. (Planning Decisions, 2003). Important employers in the region include (but are not limited to): Fraser sawmills, Columbia Forest Products, JM Huber Corp., Louisiana Pacific, Maine Woods, Northeast Pellets, Boralex, McCain Foods, Cary Medical Center, The Aroostook Medical Center, and Houlton Regional Hospital.

History (Mcgrath, 1989 and Judd et al., 1995)

The earliest known period of human habitation in the region was from 11,500 to 10,000 years ago after the last glacier retreated. Fluted points have been found around Munsungan Lake, and points made from Munsungan chert have been discovered at other sites, indicating Native Americans traveled to this lake to collect the material. Archaic Period artifacts (9,000 to 2,500 years ago) have been discovered on waterways throughout Aroostook County. However, Ceramic Period (beginning 2,500 years ago) artifacts are the most ubiquitous and have been found throughout the County. The Maliseets were the primary occupants of the territory now known as Aroostook County before European arrival. They were somewhat nomadic, moving from winter hunting territories to summer villages where they planted corn and fished. Contact between Europeans and Native Americans in the area now known as Aroostook County was likely in the early 1500s with French and other European fisherman and merchants. Furs were traded extensively by Micmacs and Maliseets for metal goods and other items. Native American populations in the Aroostook Hills region, as throughout Maine and the Americas, were severely reduced as a result of European contact and subsequent disease, war and starvation. Today, the Houlton Band of Maliseets has land and a tribal office and is working to ensure the survival of their culture and language. The Aroostook Band of Micmacs maintains a presence and cultural identity in Aroostook County, however, no land has been reserved for them in Maine. Many French settled in Aroostook County, arriving first to interact and trade with the Maliseets and other tribes, and later arriving as Acadians displaced by the British from their established homelands in current New Brunswick, Nova Scotia, and other areas. Many of the descendants of the Acadians in the St. John Valley today maintain their French culture and language. “Loyalists” or supporters of England during the American Revolution also settled in the region, given land as a reward for their loyalty before the border dispute between Canada and the United States had been settled in Aroostook County.

Following the establishment of Aroostook as a county in 1839 and its borders being settled in the Webster-Ashburton Treaty of 1842, settlement in the region began increasing. Land was very inexpensive, and could be paid for by labor on the roads. Settlers came from southern and central Maine, and parts of Canada. Many were attracted by opportunities in the lumbering economy being formed. Agriculture also flourished in the region, not only potatoes, but also maple sugar, fruits, and other products. Lumber and agriculture led to a period of prosperity in Aroostook County in the middle 1800s. The arrival of the railroads to various parts of Aroostook in the late

1800s greatly increased the County's connection to other areas and markets, a boon to the agricultural and general economy.

Natural and Geologic Resources in the Region (MNAP, 2008)

The landscape of the Aroostook Hills region is almost entirely forested. The only exception is the greater Ashland area with its concentration of agricultural lands on some of the low lying hills and bottomlands. Calcareous bedrock, uncommon in Maine, is relatively common in the eastern portion of the region. This bedrock, rich in calcium carbonate, provides habitat for uncommon plant species and natural communities that require mineral rich soil or ground water to persist. The Bureau's ownership encompasses much of the range of the existing habitat types known from this region including a variety of upland and wetland forest types as well as marshes, bogs, shores, aquatic beds and others. While there is a good diversity of habitat types on these units, overall, the Bureau-managed lands in this region include a limited number of the important ecological features that are documented in this region. The majority of the acreage of documented exemplary habitats is upland forest.

The Aroostook Hills region is contained within the greater "Aroostook Hills Ecological region" extending from the Saint John River near Madawaska south to the Patten area. The western boundary is delineated by the 1,000' contour line and the eastern boundary is defined by the calcareous bedrock and tills that underlie the Aroostook Lowlands. The region is characterized by gently rolling terrain with elevations averaging between 800 and 1,000 feet. Scattered mountains occur in the Winterville area and north of Shin Pond. Topographic highs include Squapan Mountain (1470'), Pennington Mountain (1578'), Green Mountain (1687') and Mount Chase (2440'). Unlike the Saint John Uplands and the Aroostook Lowlands, lakes and peatlands are abundant in the Aroostook Hills region.

Squapan Mountain: Spruce - Fir - Northern Hardwoods Ecosystem

Except for maximum July temperature, which averages 78° F throughout the region, the climate of the Aroostook Hills region varies considerably from north to south. Average annual precipitation in the Aroostook Hills region varies from 35 inches in Squapan Lake to 43 inches in Patten. Snowfall is fairly high for the state, between 100 and 120 inches

per year. The average minimum January temperature ranges from 4° F near Patten to -5° F near Squapan Lake.

The Physical Landscape: Geology, Soils, and Hydrology

Bedrock Geology

Bedrock of the region is almost entirely composed of layers of pelites (sedimentary rock composed of clay or mud), sandstones, and some limestone. Calcareous bedrock, uncommon in Maine, is found in the southwest (Scraggly Lake) and in the northeast (Squapan Lake) of the region. The bedrock geology of the Aroostook Hills and Lowlands region is more varied than the Boundary Plateau and Saint John Uplands to the west, though the Central Mountains regions to the southwest also have varied bedrock geology. Deposits left by glaciers include till containing some amount of calcium carbonate, and sediments deposited in lakes.

Surficial Geology & Soils

The geology on the surface of the majority of the Aroostook Hills region is characterized by glacial till consisting of a mixture of sand, silt, clay, and stone that may contain boulders and that was deposited directly by glacial ice. Thin glacial tills of less than 10 feet thick are scattered throughout the region. Deposits of swamps, marshes, and bogs composed of peat, muck, clay, silt, and sand are also scattered throughout the area.

Hydrology and Wetlands

According to National Wetlands Inventory (NWI) maps, forested, shrub, and emergent wetlands cover approximately 11% of the northeast part of the state. Roughly three-quarters of this total wetland area is forested. Northern white cedar, cedar – black spruce, and black spruce swamps are the most common types. Scrub – shrub wetlands cover about one fifth of the wetland area, and emergent wetlands cover about 1/20th of the wetland area. Large peatlands, primarily unpatterned fens and eccentric bogs, are occasional throughout most of the Aroostook Hills section. There are several Nature Conservancy priority waterbodies in the region: Ireland Pond, Scraggly Lake, the Aroostook River, and the West Branch of Beaver Brook. The Nature Conservancy rates waterbodies as "high priority" if they are high value waters that best represent the ecosystems, natural communities, and species characteristics of the region.

The Biological Landscape: Forest Types, Plants, and Animals

Vegetation and Flora

In general, plant species richness in the Aroostook Hills region increases from west to east. The eastern portion of the region tends to have slightly more moderate climate and richer bedrock which leads to increased plant diversity. The calcareous bedrock in this region has only a limited influence on the habitats and species that occur on the Bureau managed lands. While other localities in this region include enriched features such as fens, cedar swamps, and forests, the majority of Bureau lands in the region are not enriched. Exceptions include some scattered areas on the Squapan Unit including two

examples of Maple - Basswood - Ash forest, and a small area of wetland adjacent to Sawtelle Stream on the eastern edge of the Scraggly Lake Unit.

The Forested Landscape within the Region

In the northern and western portion of the Aroostook Hills region, the vegetation is transitional between temperate northern hardwoods and boreal spruce-fir forests. Because of this transition and in part because of the region's geologic variability, forested habitats are more diverse in the Aroostook Hills region than in the western parts of Aroostook County.

Upland forests in this region are best described as a mosaic of spruce-fir and northern hardwoods. Northern hardwood forests are widespread on low to moderate size hills throughout the region. Red spruce is often mixed in with the northern hardwoods though it has been historically high graded out of some areas. On taller hills, generally 1000' or greater, and on some lower slopes, northern hardwoods transition to spruce – northern hardwoods and to spruce montane forests as elevation increases. Red spruce is dominant on the upper elevations (generally above 1600' - 1800') of the higher mountains. Red oak is occasional on some lower hill tops but is not abundant enough to characterize any forest type.

Lowland Spruce – Fir forests (spruce flats) are found along drainages and in flatter areas where there are poorly drained, low pH mineral soils. In areas with organic soils, northern white cedar is common in broad stream drainages and poorly drained basins that have relatively higher pH ground water. Cedar is mixed with black spruce and larch along some of the streams and in many swamps associated with large peatland ecosystems. Species richness is relatively higher in the forests with higher pH soils, both in uplands and wetlands.

Common natural communities on the Bureau units include matrix-forming uplands such as Spruce – Fir Broom-moss Forests, Spruce – Fir – Wood Sorrel – Feathermoss Forests, Beech – Birch – Maple Forests, and Spruce - Northern Hardwood Forests. Northern White Cedar Swamp is the only common forested wetland community type. Other wetland communities found less commonly include Sheep Laurel - Dwarf Shrub Bog, Spruce - Larch Wooded Bog , Leatherfeaf - Boggy Fen, Sweet Gale - Mixed Shrub Fen, and Bluejoint Meadow (a result of beaver activity). Most examples of these wetland types found on the units were not large enough to be considered exemplary.

Sheep Laurel - Dwarf Shrub Bog - T9 R5 Lot

Within the Bureau's forested lands in the region, 26% of the acres are hardwood, 34% of the acres are softwood, and 40% of the acres are mixed wood. Acres managed for timber in the region have been harvested at 63% of the

sustainable harvest level since 1985. The managed acres contain an average of 20.92 cords/acre.

Summary Acreage Information

Unit	Total Acreage	Forested Wetland Acreage	Open Wetland Acreage	Total Wetland Acreage	Open Water Acreage	Wading Bird Habitat	Deer Winter Areas
Garfield Plt	1024	4	0.3	4.3	0	0	0
Hammond	981	53	10	63	0	35	0
Moro Plt E	158	7	0	7	0	0	0
Moro Plt W	126	13	1	14	0	0	0
Nashville Plt N	660	23	0	23	0	0	54
Nashville Plt S	320	0	0	0	0	0	0
Oxbow Plt	1002	9.5	27	36.5	0	0	0
Scraggly Lake	9981	1052	363	1415	952	694	1680
Sheridan	1065	65	65	130	0	139	108
Squapan Lake	18340	1109	352	1461	5331	467	0
T9 R5 WELS	373	163	35	198	0	61	0
T12 R8 WELS	1024	12	10	22	0	28	0
T13 R5 WELS	967	78	0.4	78.4	0	0	76
TOTAL	36021	2588.5	863.7	3452.2	6283	1424	1918

********Acreages based on GIS metrics and may differ from unit/lot acres from deeds and old ground surveys*

Natural Disturbance Patterns

Fire has played a significant role in the Lowland Spruce – Fir forests. Fires typically produce even-aged, single storied stands; two-storied stands develop later. Although natural fires are generally perceived to be small in scale, with the spruce component of the forest being retained, a fire in 1934 spread over 60,000 acres in northern Maine following an accumulation of dead wood from spruce-budworm damage.

The naturally occurring spruce budworm has had a major impact on lowland spruce – fir forests. Large budworm outbreaks lasting up to a decade have occurred two to three times per century – most recently in the 1970s and early 1980s. While the scale of budworm damage covers millions of acres, the intensity varies considerably depending on the balsam fir component of each stand (balsam fir is the preferred food of the budworm). Consequently, budworm damage is often most severe in transitional areas

next to large openings of burned stands, and along wetland transitional zones. In mixed forests, budworm can produce a residual stand of scattered spruce survivors over dead and wind-topped fir. Large openings from budworm damage are uncommon, although timber salvage may increase the size of natural openings. Past high grading of white pine and red spruce is thought to have increased the severity of budworm outbreaks by promoting fir growth.

In northern hardwood stands, the dominant natural disturbance occurs from small gaps (ranging from 1/10 to 1/2 acre) resulting from ice, wind throw, or natural tree mortality. Such gaps are more common in mature stands, reflecting the large canopy size and susceptibility of these canopies to damage. The scale and frequency of gaps in these hardwood and mixed wood stands results in a multi-aged and multi-storied forest structure.

Beavers are a common influence in wetlands in the region. Beavers build dams to give them safe access to the hardwoods they prefer to eat. When active, beaver ponds flood adjoining uplands, enlarging wetlands and creating new areas for wetland species to colonize. Once the hardwoods within a safe distance of the pond are gone, beavers often abandon their dam and build a new dam in a different location. These abandoned ponds typically slowly fill with sediment and transition from marshy wetlands back to uplands. By creating and abandoning impoundments along the stream course, beavers create a mosaic of habitats for other plant and wildlife species, including the rusty blackbird, a bird in steep decline throughout much of its range.

Fisheries and Wildlife Resources

The location of the Aroostook Hills region in the transitional zone between mixed deciduous forest to the south and boreal forest to the north leads to a variety of mammal and other wildlife species. Similarly, the Aroostook Hills region provides habitat for boreal bird species such as spruce grouse and gray jay in addition to species more broadly associated with conifer forests such as northern parula, yellow-bellied fly catcher, and black-throated green warbler (MNAP, 2008).

The natural communities of the Aroostook Hills region provide habitat for a number of common wildlife species. In addition to mammals found in many areas of the state such as black bear, moose, and beaver, the region provides habitat for species with more boreal affinities such as American marten and lynx. The Aroostook Hills region provides habitat for the federally threatened Canada lynx, with forestry contributing to lynx success by providing early-successional conifer forest.

A significant number of wildlife species exist in northern Maine and the Aroostook Hills region that are considered a high priority for conservation action. Upland sandpiper, short-eared owl, and bicknell's thrush are a few examples of bird species of high conservation concern that occur in the region.

The common loon is an important wildlife species in the Aroostook Hills region as well as the rest of Maine and elsewhere. Maine Audubon and IF&W (among others) perform population counts and other studies on Maine loons. The population and productivity of loons in the northern portion of Maine is found to be lower than the southern portion of the state, particularly on larger lakes. Loons are vulnerable to human-induced stressors such as shoreline development and recreational boating and fishing, which can cause adult mortality and lower reproductive success (Evers, 2007).

Lake trout, eastern brook trout, landlocked salmon, rainbow smelt, and lake whitefish are important coldwater fish species found within some of the lakes and ponds of the Aroostook Hills region. The eastern brook trout has been designated by the state of Maine as a "heritage fish." With this designation comes recognition of the intrinsic value of those waters that contain native and wild brook trout populations supporting a principal sport fishery. The Aroostook Hills region contains many lakes, ponds, rivers, brooks and streams supporting native and wild brook trout populations.

Department of Inland Fisheries and Wildlife (IF&W) Wildlife Management Areas

There are two Wildlife Management Areas (WMA) managed by IF&W located within the Aroostook Hills plan area.

The 197 acre *Francis Dunn WMA* (Sawtelle Deadwater) is located south of Scraggly Lake adjacent to the west side of the American Thread Road (County Road) which is the public access to Scraggly Lake Unit. IF&W's management goal is to maximize waterfowl production and other aquatic wildlife species. An old mill dam was replaced with a low head dam that controls water levels in the freshwater marsh to maximize waterfowl production. The deadwater is about 2.7 miles long, and IF&W maintains dozens of nesting boxes on the flowage. This WMA was also a release site for Canada geese and a resident population is established here. There is a limited spring fishery for brook trout and yellow perch which are taken during the open water season.

The *Gordon Manuel WMA* is located in Hodgdon, Cary and Linneus and contains 6,488 acres. The centerpiece is the dam on the South Branch Meduxnekeag River in Hodgdon Mills. The dam provides stable water levels in a linear impoundment 2.5 miles long. This WMA is 85% uplands, 13% wetlands and 2% active and abandoned fields. It is managed primarily for waterfowl production and general wildlife diversity. The Meduxnekeag River and other smaller brooks on this WMA support brook trout populations. Yearling brown trout are stocked in the Hodgdon Mill Pond, a 156 acre impoundment on the South Branch Meduxnekeag River, to provide a sport fishery in the presence of chain pickerel, white sucker, and numerous minnow species. This impoundment is open to both ice and open water fishing. Brown trout and brook trout are occasionally stocked in the South Branch Meduxnekeag River and its tributaries.

Recreational Resources

The lands within the Aroostook Hills region represent a diverse spectrum of northern Maine. This diversity, ranging from large agricultural fields to small town settings to expansive timberlands, facilitates a number of recreational opportunities. A few of those opportunities are discussed below.

Hunting, Fishing, and Wildlife Watching

Wildlife-based recreational opportunities have long been a key element of the Aroostook Hills region. Hunting opportunities include large game, such as deer, bear and moose, small game like snowshoe hare, and bird hunting (including migratory and non-migratory species). Hunting is a permitted use on all but a few portions of the public lands within the region. Hiking trails, boat launching facility sites, and designated campsites are all examples of small areas on public lands off limits to hunting (though not off limits to hunting access).

Many private landowners in the region have historically allowed public access for hunters. Statewide, only 8% of hunters hunt *exclusively* on public lands (USFWS, 2008). Correspondingly, access to hunt on private lands is a critical issue to hunters in Maine, and such access is currently in somewhat stable condition in the plan area. The North Maine Woods system covers about a third of the Plan area. This is a system of private lands that allow public recreation, managed through fees collected at a series of checkpoints. Checkpoints within the plan area are located in Oxbow Plantation (Oxbow Checkpoint), Garfield Plantation (Six Mile Checkpoint), and in T13 R7 west of Portage Lake (Fish Checkpoint).

As with hunting, fishing retains an important role in the recreational lives of regional residents and visitors alike. Both the Squapan Unit and the Scraggly Lake Unit are symbolic of the region in that they serve as cold-water fisheries destinations. In Squapan Lake (4986 acres) anglers can seek brook trout, landlocked salmon, and splake (a hatchery-raised lake-trout x brook trout hybrid). Scraggly Lake (836 acres) contains non-game fish species, brook trout, lake trout, and landlocked salmon. These two water bodies wholly or partially within public lands units are but two of numerous coldwater fishing opportunities in the region. Public boat launching facilities provide access to lakes and rivers for fishing throughout the region, as do some boat launching facilities on private lands available to the public.

Wildlife interactions in the region are not confined to consumptive activities. According to Cordell (2008), “viewing or photographing other wildlife” and “viewing or photographing birds” are the 4th and 5th fastest growing outdoor recreation activities in the U.S. Birders can find several boreal forest species in the Aroostook Hills region that are rare in the United States, such as spruce grouse, black-backed woodpecker, and boreal chickadee. Other species found in the boreal forest that birders may enjoy include: gray jay, white-winged and red crossbills, mourning warbler, and bay-breasted warbler. Aroostook Hills also contains a diverse and abundant mix of waterfowl (Maine Birding

Trail, 2009). Robust populations of charismatic mammals such as moose (a popular species for wildlife watchers) provide rewarding wildlife watching experiences.

Motorized Recreation

Snowmobiling

Ample snow and a well-established network of ITS and local club snowmobile trails enable riding ranging from short outings to long-distance touring. The snowmobile network connects with and is part of a system of state-wide and regional significance. In fact, the system can be thought of as international, as it links with trails in New Brunswick, Canada. A vast majority of this system is on private lands. There are 35 snowmobile clubs and 32 municipalities that manage and maintain the 2,085-mile trail system (about 16% of the statewide total) throughout Aroostook County, many of which are located within the Aroostook Hills Plan area. In 2008 the Bureau Off-road vehicle (ORV) Division provided approximately $650,000 in grants to these organizations in support of this system.

ATV Riding

ATV riders find the region to be one of the more ATV friendly regions in the state, with an extended network of interconnected trails enabling significant touring opportunities. A mix of trails on public and private lands makes the region a destination for ATV enthusiasts.

Twenty-eight ATV clubs and eight municipalities manage and maintain approximately 1,200 miles of trails throughout Aroostook County (approximately 20% of the statewide total), many of which are located in the Aroostook Hills Plan area. In 2008 the Bureau's Off-road Vehicle Division (ORV) provided over $200,000 in grants to these organizations in support of this system.

Multi-use Trails

Approximately 152 miles of abandoned railroad corridor in Aroostook County have been acquired by the Bureau with assistance from the Lands for Maine's Future program, the Land and Water Conservation Fund, and the Recreational Trails Program, and converted the corridor to multi-use trails. These trails are generally gravel and open to ATV riders, snowmobilers, bicyclists, walkers, cross-country skiers, mushers, and horseback riders, among others. This trail system provides important connections and enhancements to other managed trail systems throughout the region. With assistance and funding from the Bureau's Off-road Vehicle Program, many area trail clubs and municipalities have helped to develop and manage this system. Trail clubs and municipalities also participate in grooming and maintaining the trail system. See description of individual trails below.

Bangor and Aroostook Trail

The Bangor and Aroostook Trail (BAT) is a 59-mile trail corridor located in the towns of Washburn, Perham, Mapleton, Woodland, Caribou, Westmanland, New Sweden, Stockholm, T17 R3, and Van Buren. The trail connects smaller communities to larger cities like Presque Isle and Caribou and to the Bureau's Squapan Unit. It provides several water access points to smaller streams as well as the Aroostook River.

Aroostook Valley Trail

The Aroostook Valley Trail (AVT) is a 28-mile recreational trail corridor located in the towns of Caribou, New Sweden, Washburn, and Presque Isle. This trail is located in proximity to the Bangor and Aroostook Trail, and is used in conjunction with it, often providing a narrower and more primitive alternative route. It also provides access to and views of the Aroostook River for several miles.

Southern Bangor and Aroostook Trail

The Southern Bangor and Aroostook Trail (SBAT) is a 44-mile trail corridor located in the towns of Houlton, Littleton, Monticello, Bridgewater, Blaine, Mars Hill, Westfield, and Presque Isle. The trail is a main artery north /south connection between Houlton and Presque Isle. Connections to other recreation facilities like the Big Rock Ski Area and Aroostook State Park can be made from the SBAT. It provides water access points to the Meduxnekeag River and Prestile Stream as well as several other smaller streams. A portion of the International Appalachian Trail runs along the SBAT and a shelter and ADA accessible privy are available in this section.

Patten and Sherman Trail

The Patten and Sherman Trail is a six mile corridor located in the towns of Sherman, Crystal, and Patten. It provides a direct north/south link between the towns of Patten and Sherman.

Snowmobiling in the Aroostook Hills Region

Paddling

Maine Department of Environmental Protection states that, "*the Aroostook River basin is the largest tributary of the St. John River and covers 2,301 square miles.…It follows a winding path to the northeast mostly through undeveloped areas prior to reaching the Presque Isle region in Aroostook County. It passes through the municipalities of Masardis, Ashland, Presque Isle, Caribou, and Fort Fairfield before emptying into the St. John River in New Brunswick. The total length of the mainstem, ending at the Maine/New Brunswick border is approximately 104 miles.*" This river and associated tributaries, such as Munsungan Stream, Millinocket Stream (centered in T8 R8 WELS), Mooseleuk Stream, Squapan Stream, Machias Stream, and the Little Machias River provide paddling opportunities ranging from flatwater to limited class V highly technical paddling (across the border in New Brunswick, but accessed in Fort Fairfield). Throughout the watershed, there are numerous mid-range sections of class I-III paddling opportunities, including opportunities for extended canoe touring/camping. North Maine Woods maintains over 20 campsites within the Aroostook Hills region that are along the water course of the Aroostook River watershed.

It should also be noted that a portion of the East Branch of the Penobscot, flowing out of Grand Lake Matagamon, is within the planning region and is part of a significant paddling resource. Furthermore, the region as a whole has many ponds and lakes providing opportunities for flatwater canoeing and kayaking.

Hiking

There are several short to moderate day hikes in the region. Examples include: Number Nine Mountain (elev. 1638'), Round Mountain (elev. 2174'), and Mount Chase (elev. 2440'). Additionally, Quaggy Jo Mountain (elev. 1213') is part of Aroostook State Park, and offers campers and day visitors three miles of hiking trails. Haystack Mountain lies just north of the Bureau's Squapan Unit and offers a short hike. Hikers in the region can still visit Mars Hill, though the mountain is now home to Maine's first large wind farm, operated by Mars Hill Wind. Hiking is also available on the multi-use trails mentioned above.

International Appalachian Trail

Running through the Aroostook Hills region is the International Appalachian Trail (IAT), a trail system envisioned to connect Mt. Katahdin (Maine's highest peak) with Mt. Carleton and Mt. Jacques Cartier (the highest peaks in New Brunswick and southern Quebec, respectively). This trail is still in development, and currently travels east from Mt. Katahdin toward Mt. Chase, to continue north across Mars Hill Mountain. The trail leaves Maine at the Customs Border Crossing in Fort Fairfield, Maine, and runs through New Brunswick and the Gaspe Peninsula in Quebec, ending at the northeast edge of the peninsula along the St. Lawrence River at a rock face called "La Vieille." If hikers want to continue their experience, they can take a ferry to Newfoundland and Labrador, where

a newly developed trail continues (International Appalachian Trail, 2009). The Maine portion of the trail uses many existing scenic roads, however, new foot paths are being developed on an on-going basis, and current and future expansions to footpaths have the potential to add significantly to hiking opportunities in the Aroostook Hills region.

Opportunities Close to the Aroostook Hills Region
In the broader northern Maine region, outside the boundary of this Plan are two destinations of note. First, the northern entry point to Baxter State Park is just south of the Plan boundary. Baxter State Park is a preeminent Maine hiking and backpacking destination. Additionally, the Deboullie Public Reserved Land Unit, north of the plan area, is an attractive destination for hikers.

Downhill and Cross-country Skiing

The Aroostook Hills region is rich in cross-country ski destinations. Aroostook State Park provides groomed ski trails throughout the winter season. The Nordic Heritage Center (Maine Winter Sports Center) in Presque Isle is a world-class venue for cross-country skiing and biathlons. Big Rock Skiway in Mars Hill also provides cross-country skiing (as well as downhill). Quoggy Jo Ski Club in Presque Isle is also a downhill ski provider. The Town of Portage Lake maintains 2.7 miles of cross-country ski trails.

Maine Winter Sports Center (MWSC, 2009)
The Maine Winter Sports Center (MWSC), since 1999, has worked around the state to re-establish skiing as a lifestyle in Maine. It operates by a model of community-run, non-profit ski areas that provide programs for all ages and serve as economic engines for communities. MWSC has established new ski centers and revived old ones, two of which are located in the Aroostook Hills region. It also works with schools in integrating skiing into their curriculum, and provides world class coaching in cross country and biathlon. MWSC ski areas host biathlon competitions and numerous other events.

Nordic Heritage Center
Owned and operated by MWSC, the Nordic Heritage Center, located in Presque Isle, is a community recreation center open to the public. It is a world class venue for cross-country skiing, biathlon and mountain biking. Facilities include a lodge, extensive ski trails and mountain bike trails, a biathlon range, visitor's center with ski rentals, and a terrain park. Use of trails is free to the public, and the Center hosts competitive events, including the 2006 Biathlon Junior World Championships.

Quoggy Jo Ski Club
Also under the MWSC umbrella, the Quoggy Jo Ski Club in Presque Isle caters to youth and families, offering alpine skiing for beginners.

Big Rock Ski Area
Located in Mars Hill, this alpine ski area was purchased by MWSC in 2000. The main focus is downhill skiing, however, a snow tube park and cross-country ski and snowshoe trails have been recently added.

Mountain Biking

Mountain biking is an opportunity on a variety of lands in the region, though not on lands within the North Maine Woods. The Nordic Heritage Center specifically provides mountain biking and it is an approved use on the multi-use trails mentioned in the "Motorized Recreation" section above, as well as on shared use roads within the Bureau's Squapan and Scraggly Lake Units.

Boating

In the Aroostook Hills region, there are 16 state owned or assisted boat ramps that can accommodate all types of boats, including boats on trailers, and two that can only accommodate hand carried boats. Many of the ramps that can accommodate trailers are described as "primitive", meaning that they do not meet all of the design standards for a full service trailer ramp. These sites may only be suitable for small motor boats due to shallowness of the ramp, or limited water depths of the water body at times. This is particularly true of many of the boat ramps serving rivers and streams. There are a number of other water bodies that have what are known as "traditional" boat access sites. Many of these are privately owned by large land owners who allow public use. The Bureau does not maintain a database of these sites as it is difficult to identify the owners and track the public's ability to use them.

State Owned or Assisted Boat Launching Facilities in the Aroostook Hills Region

Water Body	Location	Type	Owner
SquaPan Lake	Masardis	Trailer	WPS
Scraggly Lake	T7 R8 WELS	Primitive Trailer	DOC
Sawtelle Deadwater	T6 R7 WELS	Trailer	DIFW
Mooseleuk Lake	T10 R9 WELS	Primitive Trailer	DIFW
Millinocket Lake	T7 R9 WELS	Hand Carry	WPS
Rockabema Lake	Moro Pltn	Primitive Trailer	DIFW
No. Nine Lake	T9 R3 WELS	Primitive Trailer	DIFW
Echo Lake	Presque Isle	Trailer	DOC
Aroostook River	Oxbow Pltn	Primitive Trailer	Oxbow Pltn
Aroostook River	Masardis	Primitive Trailer	Masardis
Aroostook River	Ashland	Primitive Trailer	Ashland Rod & Gun
Aroostook River	Fort Fairfield	Trailer	DIFW
Arnold Brook Lake	Presque Isle	Trailer	Presque Isle
Presque Isle Stream	Presque Isle	Trailer	Presque Isle
Aroostook River	Presque Isle	Trailer	DIFW
Hanson Brook Lake	Presque Isle	Trailer	Presque Isle
Aroostook River	Washburn	Trailer	Washburn
Portage Lake	Portage	Trailer	Portage
Grand Lake Mattagaman	T6 R8 WELS	Hand Carry	Baxter State Park Auth.

Other Bureau of Parks and Lands Properties in the Plan Area

Aroostook State Park, established in 1939 as Maine's first state park, is located five miles south of Presque Isle and west of U.S. Route 1. The park encompasses Quaggy Jo Mountain and provides access to Echo Lake. Drive-to campsites, group camping areas, a showerhouse and a kitchen shelter are available. Hiking up Quaggy Jo's North and South Peaks, picnicking, and fishing and canoeing on Echo Lake are popular summer activities. In the winter, the Park offers 15 miles of groomed cross-country ski trails, snowshoeing and winter camping.

A portion of the *Penobscot River Corridor* is found in the Aroostook Hills Region, (the East Branch of the Penobscot River, just south of Scraggly Lake Unit). The Corridor, established through an easement, is managed by the Bureau in cooperation with several landowners, and provides water access recreation along more than 67 miles of river and 70 miles of lake frontage. Canoe trips are popular along the Corridor. Primitive campsites (including group sites) are provided along the Corridor as well as boat ramps and portages. A diversity of conditions from flat water to severe rapids is found along the Corridor (with portages available around many rapids).

Other Large Landowners in the Region

Much of the landscape in the Aroostook Hills region is owned in large tracts by industrial and timber management landowners. J.M. Huber, Seven Islands Land Co., Irving Woodlands, Dunn Timberlands, and Prentiss and Carlisle are some of the major landowners in the Aroostook Hills region. The Bureau interacts with large landowners and considers their various management styles in making decisions on Bureau lands. Access to many Bureau lands is by permission of these large landowners. The Bureau considers the condition of the surrounding landscape in determining the type of management appropriate on each unit and lot, especially in relation to wildlife habitat management.

The Seven Islands Land Co. has conservation easements on large tracts of their land within the plan area (as well as other parts of Maine). These easements restrict development and maintain the land in sustainable forestry use. Seven Islands also provides public access on these lands.

Planning Implications

Recreation facilities and opportunities in the Aroostook Hills Region serve a predominantly local population – those residing in Aroostook County and northern Penobscot County, and portions of neighboring New Brunswick. Exceptions include the draw of winter sports enthusiasts to the region who come from more distant points to snowmobile on the extensive system of snowmobile trails where snow conditions are more predictable than many other parts of the state; and to the variety of winter sports facilities operated by the Maine Winter Sports Center in this region, including the Nordic

Heritage Center in Presque Isle. The extensive network of multi-use trails and ATV trails in the region also draws recreationists from a broader area.

Use and opportunities at the Bureau's two major Public Reserved Lands Units – the Squapan and Scraggly Lake Units, have been influenced by their proximity to other major recreation opportunities. The Squapan Unit has become an integral part of the larger network of snowmobile and ATV trails in the region, and is used predominantly by those recreationists. In contrast, the Scraggly Lake Unit, which is not connected to these trail networks but is in close proximity to the northern entrance to Baxter State Park, and is within a cluster of natural lakes north and east of Baxter State Park, is primarily a destination for those looking for a quiet and remote recreation experience, including fishing, paddling, camping, and hunting. In this respect, the two major Reserved Lands Units in this Plan area are bookends for the range of recreation opportunities available in the Aroostook Hills Plan area.

Planning for recreation opportunities on the Bureau's Public Reserved Lands should recognize and enhance the defining experiences that are represented on these lands, and that add value and diversity to the recreation experiences in the broader region.

V. Resources, Issues and Management Recommendations for Public Reserved Lands within the Plan Area

Squapan Unit

Vision for the Squapan Unit

The Squapan Unit, at almost 20,000 acres, is the largest public reserved lands unit in the Aroostook Hills region. This Unit contains a multitude of recreational, ecological and timber resources. It is close to and easily accessible from Presque Isle, a city of approximately 10,000 people. The Unit provides an extensive system of motorized trails to meet the demands of the local population, as well as connecting with the larger ATV and snowmobile trail networks which draw recreationists to the region from a much wider area. It is this extensive system of ATV and snowmobile trails that is the hallmark recreation feature of the Squapan Unit. The Unit also provides opportunities for hunting, fishing and boating, and will likely see increased use with the addition of a second public boat launching facility on Squapan Lake. The Squapan Unit, with its breadth of recreational opportunities, contributes to the regional recreation and tourism economy. The Unit is also abundant in timber resources with good vertical and age diversity, affording a dependable income source from sustainable harvesting on the Unit, and contributing to the local timber economy. Exemplary natural communities exist in several locations on the Unit, and protection of these communities is integral to larger initiatives to conserve Maine biological diversity.

This plan contains many recommendations aimed at expanding traditional recreational opportunities and access on the Unit, continuing timber harvesting that produces high quality timber while promoting forest health and diversity, and protecting sensitive and important ecological and wildlife resources. The Squapan Unit is a great example of public reserved land that balances multiple uses and values, which is a central goal of Bureau land management. *The Vision for this Unit is to continue that balance of managing for recreational use in appropriate places, performing exemplary timber harvesting that maintains forest health and diversity, and protecting important ecological features and wildlife habitat. Consistent with this overall Vision, the Bureau will seek to improve the extensive multi-use trail system to achieve an exemplary standard; and to add value to that system with associated camping and picnicking areas; while expanding boat access to Squapan Lake and exploring opportunities for compatible new uses such as hiking trails.*

Character of the Landbase

The 19,936 acre Squapan Unit (the largest unit in the Aroostook Hills region) is located between the towns of Ashland and Presque Isle in central Aroostook County. The majority of the Unit is located just east of Squapan Lake, with the entire eastern shore of the lake contained within the Unit. Squapan Lake is an impounded lake, with a dam

owned by WPS New England Generation, Inc. creating the lake from tributaries of the Aroostook River. In addition to the lake, a defining natural feature of the Unit is Squapan Mountain, a ridgeline that runs north-south and reaches its high point of 1,470 feet elevation at both its north and south ends.

Acquisition History

The Squapan Unit began as original public lots set aside as Maine was being divided into townships in T11 R4 WELS (1,000 acres) and Squapan Township (970 acres). A series of trades and acquisitions from 1976 to 1999 with several landowners (including JM Huber, Dunn Heirs, and Pingree Assoc.) added to and subtracted from the original public lots, leading to the configuration of the Unit that exists today. Most of the Unit is under common/undivided ownership, meaning the Bureau shares ownership of multiple parcels of the Unit with other landowners. This leads to a complicated management and tracking system for the Bureau.

Natural Resources

Geology and Soils

In the early Devonian Period (between 360 and 408 million years ago) the modern day continents of North American and Europe were colliding, leading to volcanic activity and the building of the Appalachian Mountains. This included creation of Squapan Ridge. The various types of Devonian Formation bedrock that underlie the majority of the Squapan Unit are the result of these continental collisions. The majority of the Squapan Unit is therefore composed of mafic intermediate granite—a bedrock type that consists of dark igneous rocks mainly composed of iron and magnesium. A stretch of it follows along the ridges of Squapan Mountain and Garland Hill where it is either exposed or only has a small amount of soil and vegetation covering it.

Calcareous bedrock, containing at least fifty percent calcium carbonate, is found in the northwest corner of the Unit. The high levels of this mineral lead to a more basic soil type (pH 6.0-7.8) and calcium rich groundwater. These conditions may support plants and animals with different needs and usually produce an ecosystem that can be readily distinguished from the others around it.

Glacial till covers most of the surface of the Squapan Unit. Swamp deposits are fairly common around the lake, but they have merely covered the till that is now underneath them. Glacial till is deep in the Squapan Unit and soils in the area all show signs of being formed in this dense loamy material. Perham, Chesuncook, and Daigle are the most common of these soil types.

Hydrology and Wetlands

All water in the Squapan Unit flows north into the Aroostook River and eventually drains through New Brunswick to the St. John River. Squapan Lake is an impoundment created by a dam at the outlet of Squapan Lake and head of Squapan Stream, which flows into the Aroostook River. It is a narrow, horseshoe shaped lake 14 miles in length, 4,986 acres in size and reaches a maximum depth of 70 feet. WPS New England currently

owns the dam which generates power on-site, but also stores water for use at two downstream hydropower generation developments. The dam is operated to provide peak winter power, and water elevation fluctuates from 590.5 feet to 603 feet (FERC, 1991).

The Squapan Unit contains 1,461 acres of wetlands. Seventy-six percent of these wetlands are forested and 24 percent are open.

The following chart lists the hydrologic features for waterbodies in or partly in the Unit.

Waterbody	**Acres**	**Maximum Depth (ft)**	**Direct Drainage area (sq.mile)**	**Dam**	**Trophic Status**	**pH**
Squapan Lake	4,986	70	55.28	Yes	Mesotrophic	7.02
Alder Lake	120	3	3.55	No	Eutrophic	No records

Ecological Processes

Many natural disturbances have played a role in shaping the vegetation and communities of the Squapan Unit. The influence of fire is obvious in two locations—on the upper slopes of the west side of Squapan Mountain on the north and south ends. Fire typically produces even-aged, single storied stands, and this type of stand is evident in these two locations. These two post burn areas are predominately red spruce with a depauperate understory. Fire may have played a part in other stands on Squapan Unit, but its influence is most evident it these two areas.

In northern hardwood stands, the dominant natural disturbance occurs from small gaps (ranging from 1/10 to 1/2 acre) resulting from ice, wind throw, or natural tree mortality. Such gaps are more common in mature stands, reflecting the large canopy size and susceptibility of these canopies to damage. Regeneration in these gaps depends on the size of the gap and seed source. The scale and frequency of gaps in these hardwood and mixed wood stands results in a multi-aged and multi-storied forest structure. The Squapan Unit has some extensive areas with mature and late successional stands. Large snags, downed decaying logs, and subsequent gap regeneration are integral natural process in these stands. Snap offs from high winds are most prevalent along the ridge top of Squapan Mountain's long ridge line.

The naturally occurring spruce budworm has had a major impact on lowland spruce – fir forests. Budworm activity in the early 1980s led to some pre-salvage and salvage harvesting of the land particularly in T10 R4 (previous owners harvested), and less so in T11 R4 where harvesting was conducted by the Bureau. Presumably most of the budworm related harvest activity occurred on the lower elevations of the Unit where spruce stands with fir are more extensive.

Beavers have a significant impact on wetlands in the region. By creating and abandoning impoundments along the stream course, beavers create a mosaic of habitats for other plant and wildlife species. At the Squapan Unit, wetlands impacted by beaver activity occur north of the lake along Squapan Inlet Stream, in the southeast part of the Unit along the headwaters of Shields Brook, and in the northeast part of the Unit along the North Branch of Presque Isle Stream and one of its tributaries.

Goldie's woodfern

Rare Plant and Animal Species

The rare Goldie's woodfern (*Dryopteris goldiana*) occurs at three locations on the Unit. Goldie's woodfern typically grows in rich woods where soil pH is relatively high. A large stand of the fern occurs at the site known as the "Fern Grotto". This site is the upper portion of a hardwood dominated, seepy drainage. The other two locations are in the northeast corner of the Unit. One is associated with a small area of maple - basswood - ash forest, and the other is in mixed forest near and along the stream just north of the rail line at the eastern boundary.

No rare animal populations are known to occur on the Unit.

Natural Communities

Squapan Mountain: Spruce - Fir - Northern Hardwoods Ecosystem and Hemlock Forest

Squapan Mountain is the most prominent feature on the Squapan Unit. The mountain has a north to south oriented ridge that extends approximately five miles, nearly the entire length of the Unit. The mountain reaches high points of approximately 1470 feet at both the north and south ends. In general, the forest on the lower slopes and the adjacent landscape has been managed more intensively for timber than that of the upper slopes and the ridge. The upper slopes and the ridge have experienced only limited, mostly selective harvesting in the distant past, and some areas at present retain no signs of past activity. The majority of the ridge top and upper slopes are mapped as a Spruce - Fir - Northern Hardwood Forest Ecosystem. These areas have the least amount of evidence of past management and are characterized by late successional stands of northern hardwoods, mixed spruce - northern hardwoods, and spruce forest.

Along with the Spruce - Fir - Northern Hardwood Forest Ecosystem, the northern part of the mountain includes an exemplary Hemlock Forest. The Hemlock Forest is on the mid-slope on the west side of the mountain. Old growth and younger hemlock trees are mixed with mature red spruce, and small amounts of yellow birch and red maple. A larger hemlock cored at this site was aged to 345 years. The understory is relatively open with striped maple being common. The herb layer is relatively depauperate with wild sarsaparilla and wood fern most common. Slopes are moderate to steep and have scattered boulders.

The Spruce - Fir - Northern Hardwood Forest Ecosystem and the Hemlock Forest are part of an area described in a report prepared by the Maine Forest Biodiversity Project in the context of potential ecological reserves that could be designated on public conservation lands (McMahon, 1998). In the 1998 report, an area totaling 11,770 acres was identified as a candidate for ecological reserve designation (along with 68 other sites). The Maine Legislature in 2000 authorized the designation of ecological reserves on Department of Conservation lands, and 68,974 acres were designated by the Bureau of Parks and Lands Director at that time. The Squapan Unit site was not included in 2000, in part due to legislatively imposed limits on total ecological reserve acreage (acreage not to exceed 6% of operable timberland acres on public reserved and non-reserved lands). Due to new Bureau land acquisitions, however, the Bureau may designate 3,080 more acres of ecological reserves in the future. The Bureau and the Ecological Reserve Scientific Advisory Committee have decided to wait until the completion of updated management plans on all public reserved lands (due in 2012) before designating additional acreage. At that time, the Squapan ridgeline will be considered along with other areas for ecological reserve designation. Management of this area in the meantime will need to focus on preserving the current qualities of the ecosystems.

"Fern Grotto" Site This rich, seepy hardwood site is conspicuous for its abundance and diversity of ferns. The site includes a large population of the rare Goldie's wood fern along with several other species indicative of higher pH habitats including maidenhair fern, ostrich fern, Braun's hollyfern and silvery spleenwort. Most of the area was selectively harvested in 1985. Much of the hardwood forest in the Fern Grotto area has some herbaceous plants that are indicators of limited enrichment such as doll's eyes, however, it is clear that the richest areas follow the seeps and drainages in the forest. In addition to the numerous fern species, other plant species indicative of enriched soils that occur at the site include leatherwood and zig-zag goldenrod.

A wide diversity of ferns occur at the Fern Grotto site

Dudley Brook Small Cove Hardwood Site This small eight acre site near the northern border of the Unit has several diffuse flowages that feed into a more or less level rich hardwood site. It contains a significant percentage of basswood and cedar with many

large trees. Basswood is near the edge of its range in this location. This area also has a moderate size population of the rare Goldie's wood fern.

Squapan Lake Slope Forest: Spruce - Northern Hardwood Forest There is an exemplary Spruce - Northern Hardwood Forest on the slope immediately adjacent to the northeast shore of Squapan Lake. The survey of this forest and the determination of its exemplary qualities occurred after a Bureau harvest was performed. The stand is a nearly linear feature, following the shore of the lake for approximately two and a half miles and averaging about 1,000 feet in width. The total area is 336 acres.

This mature stand is a diverse mix of species with sugar maple, yellow birch, red spruce, beech, balsam fir, and hophornbeam all being common, and hemlock, red maple, white ash, and northern white cedar all being somewhat less common. Cedar is more common in some seepage areas on the lower part of the slope.

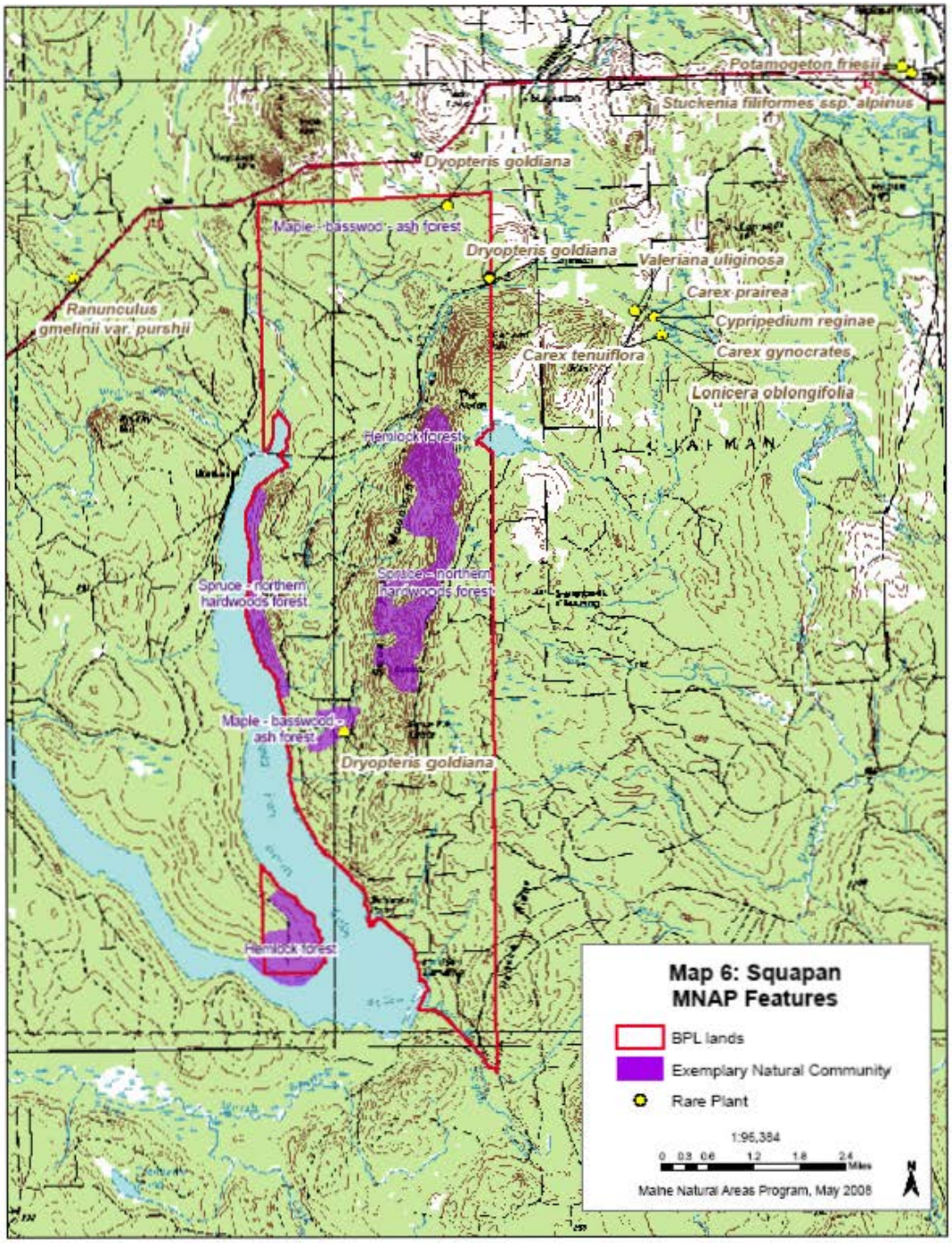
The shrub layer is primarily tree regeneration with balsam fir and beech saplings being most common. The herb layer is a mix of herbs, ferns, and tree seedlings with tree seedlings being most common. Large amounts of coarse, downed woody debris are also present.

Mature Spruce - Northern Hardwood Forest on west facing slope adjacent to Squapan Lake

Squapan Peninsula (Big Cove) Hemlock Forest Squapan peninsula is a forested upland with gentle to moderate slopes that is on the west side of the lake and bordered by Squapan Lake on the south and east sides. The peninsula area supports a mature Hemlock Forest community. The forest composition varies with some areas being dominated by hemlock with red spruce, sugar maple, and balsam fir as frequent associates, and other areas dominated by a mix of northern hardwoods with a smaller percentage of softwoods. Larger hemlock trees are greater than 32 inches in diameter at breast height and over 300 years old. A larger red spruce at the site was recorded with a diameter of 26 inches. In the understory there is yellow birch, beech, and striped maple. The herb layer is thin with wild sarsaparilla, Canada mayflower, common wood sorrel, wood fern, and starflower common. There is a significant amount of large downed woody debris and some low, damp pockets where northern white cedar occurs.

In the northern hardwoods area, sugar maple is dominant with largest trees up to 30 inches in diameter. Smaller trees are common with some scattered red spruce and northern white cedar. Tree regeneration is dominant in the herb layer with striped maple and beech common. Shrub and sapling layers are dominated by beech. Otherwise, the herb layer is depauperate. There is a thick duff layer, and soils are rocky loam. The lower-lying areas adjacent to the lake support a mix of northern white cedar, balsam fir,

and red spruce. There is some evidence of historic cutting in the near shore area of the forest. Herb cover and diversity is relatively higher on the lower slopes in comparison to the upper slopes. In the lower slope areas there are also mature red maples, a higher cover of shrubs, and more tree regeneration.



Fish and Wildlife Resources

Wildlife

The Squapan Unit has 467 acres of wading bird and waterfowl habitat, mostly located around the northern part of Squapan Lake and adjacent to Alder Lake. Mussels in Squapan Lake include eastern elliptio and eastern floater. The virile crayfish is also present. Mammals in the area include: coyote, fisher, marten, weasel, snowshoe hare, whitetail deer, moose, black bear, red fox, striped skunk, meadow mouse, and short tail shrew. Squapan Lake riparian areas support river otter, raccoon, muskrat and beaver. Birds that occur on Squapan Lake or associated wetlands include: great blue heron, osprey, goldeneye, mallard, American bittern, black duck, hooded merganser, and common merganser, among others. Great horned owl, screech owl and bald eagle occur on or near the Unit.

Much about the common loon population on Squapan Lake is known thanks to studies done as part of the 1991 dam licensing process undertaken by Maine Public Service Company (MPSCo). (The Squapan Dam has since come under the control of WPS New England, who must follow the terms of the license). In 1992, a loon survey revealed a possible maximum of 13 territorial loon pairs on Squapan Lake, with six pairs observed nesting, and two chicks surviving to fledge. Loons did not complete nesting in 1992 until the end of July (a later than usual nesting season). Consequently MPSCo proposed maintaining stable water levels from May 15 until July 31, to accommodate the longer nesting season. MPSCo maintained water levels to fluctuate no more than one foot so that loon eggs would not be washed off the nests and loon adults would not be stranded. In 1997 they performed a follow-up study, and found six nesting pairs, with five chicks surviving to fledge. The May 15 to July 31 stable water level plan, contained within a larger common loon management plan, was approved by the Federal Energy Regulation Commission for Squapan Lake (MPSCo., 1997).

Fisheries

Principle sport fisheries in Squapan Lake include landlocked salmon, brook trout, splake and rainbow smelt. Fisheries in the lake have been somewhat limited due to the dam blockage of fish passage from Squapan Stream. IF&W stocks the lake annually with fall yearling splake, and periodically with landlocked salmon and trout. The littoral areas of the lake contain warm-water species such as yellow perch, fallfish and white suckers, which compete with cold-water species. The West Inlet to Squapan Lake was determined to be particularly important for salmon spawning, as well as trout and smelt spawning. Smelt provide an important early-winter fishery (with ice fishing shacks dotting the lake by December) and spring dip net fishery, as well as a food source for salmonids.

The dam license dictates that the current dam owner (WPS New England) perform certain activities to benefit fisheries. Water levels are kept higher in late spring and fall for spawning of cold-water species. Inactive beaver dams and driki are removed from the mouths of several tributary streams to aid fish in traveling upstream to spawn. Structural habitat improvements were made to Squapan Stream. However, the construction of fish passage facilities to allow passage from the stream to Squapan Lake was considered not economically justified by the Federal Energy Regulation Commission. (FERC, 1991)

Alder Lake, which is partially contained within the Unit, has yellow perch and minnow species. Low oxygen levels in winter have caused periodic fish dieoffs. Heavy silt loads from agricultural fields limit game fish habitat in Alder Lake.

Natural Resources Management Issues

- Potential Future Ecological Reserve on Squapan Mountain: The Spruce – Fir – Northern Hardwood Forest Ecosystem and the exemplary Hemlock Forest on Squapan Ridge are candidates for inclusion in the Maine Ecological Reserve System authorized by the legislature for Bureau of Parks and Lands properties. This area was a candidate in 2000, and could be included in the system when the Bureau reviews all potential candidate properties at the end of its current planning cycle (2012-13). The issue is how to manage this area to maintain the qualities that qualify it for ecological reserve designation, and how the motorized trail system passing through this area should be managed.

- Fern Grotto Site: This area is conspicuous for its abundance and diversity of ferns, probably caused by rich seeps in the area. The issue is how to maintain the site to protect the unusual plant community there.

Historic and Cultural Resources

The Maine Historic Preservation Commission (MHPC) has identified the east slope of Squapan Lake as having a high probability of containing Native American sites. However, any sites would be on the banks of the original stream, prior to dam installation, which created Squapan Lake. In the case that the dam was ever removed, or the lake level significantly lowered, MHPC would seek to do an archeological survey of the banks.

Recreation and Visual Resources

The Squapan Unit is host to a variety of recreational activities, including fishing, hunting, hiking, camping, boating, ATV riding and snowmobile riding. The Unit's proximity to Presque Isle, Caribou, and other smaller Aroostook County towns increases its popularity as a recreation destination.

Motorized Trails

ATV use

The Unit contains approximately 20 miles of shared use roads which are open to ATV use, and another 20 miles of approved ATV trail. ATV trails connect with the Bangor and Aroostook Multi Use Trail and Aroostook Valley Multi Use Trail to the north. Unit trails also connect with club trails to the east and west. The Squapan Unit was the first public reserved land unit in the Bureau to host an officially sanctioned ATV trail.

ATV riding in the Squapan Unit

Snowmobile Use

There are approximately 35 miles of main artery snowmobile trails within the Unit, all funded by grants from the Bureau to municipalities. Trails serve as both destinations and connectors to other trails. The Ridge Trail (Trail 75c) is used by many families as it is less crowded than the ITS trails. Trail 75 is a local trail that traverses the Unit from north to south, and is used by some to make loops with other trails. Two ITS trails traverse the Unit. ITS 81 travels east/west for a short distance across the south end of the Unit, and ITS 105 is a major north/south connection in the ITS system, which crosses the Squapan Township section of the Unit. Squapan Unit snowmobile trails can also be used to connect with the Bangor and Aroostook Multi Use Trail and Aroostook Valley Multi Use Trail to the north. The Bureau contracts with snowmobile clubs in the area to maintain trails.

Non-motorized Trails

There are currently no non-motorized trails on the Unit. However, there is some interest in creating a non-motorized trail that would connect Haystack Mountain (a parks property with a short hiking trail), the Squapan Unit, and Aroostook State Park. Another potential non-motorized trail could begin at the snowmobile "Ridge Trail" and then branch off onto another section of the Ridge and reconnect to the snowmobile trail later. The non-motorized trail could possibly travel to the fire tower on the mountain for a view of the region, provided that the fire tower could be made safe for the public.

Boating Access

There are currently no boat launching facilities on the Unit. Squapan Lake has a concrete, ADA accessible public boat ramp on the western end of the lake, at the site of the dam. This site is owned and operated by WPS New England Generation and will continue to be available to the public as part of the FERC license for the dam. A private ramp is located at Walker Siding on the northwest portion of the lake.

Camping

There are currently five campsites available in the Unit, on the east shore of Squapan Lake accessible by water. Camping is permitted anywhere on the Unit, but campfires are only permitted at the five designated sites.

Hunting and Fishing
Principle sport fisheries in Squapan Lake include landlocked salmon, brook trout, splake and rainbow smelt. Fishing is most popular in the north end of the lake, and Unit boat access would greatly enhance this use. WPS New England Generation performs enhancements for fisheries as part of their dam license requirements, and IF&W maintains a stocking program on Squapan Lake. Hunting for waterfowl, upland game birds, bear, moose, and deer occurs on the Unit. Hunting is permitted on the large majority of the Unit—currently in all areas except for a 300 foot buffer around the five campsites. Temporary signage is placed around active logging operations to indicate the area as temporarily off-limits to hunting. Hunters are encouraged to contact the Ashland Bureau office for the most up-to-date information on hunting access.

Recreation Issues

- ATV Use over Squapan Ridge: ATV interests have requested the Bureau to designate the existing snowmobile trail over Squapan Mountain (Trail 75c) for ATV use. Currently ATV trails travel around the base of the mountain, but not over the ridge as the snowmobile trail does. Access to the Ridge Trail would provide ATV riders with views of the region if vistas were provided. There is some unauthorized use of the snowmobile ridge trail by ATVs, and the trail is in poor condition with drainage problems and erosion in some areas. In addition, the ATV use of the current trail poses safety concerns, due to the steepness and erosion problems. Local ATV clubs have shown cooperation with Bureau staff in addressing unauthorized use with some success. An additional complicating factor is that a portion of the trail is within the Spruce – Fir – Northern Hardwoods Ecosystem considered as a potential future ecological reserve. (Future decisions regarding new ecological reserves will be made upon completion of updates to all management plans in Bureau Public Reserved Lands, due in 2012).

- Non-motorized Trails: There are no non-motorized trails on the Squapan Unit. There is potential to build a system of trails to connect Haystack Mountain, the Squapan Unit, and Aroostook State Park. This trail could be used by hikers, cross-country skiers, and possibly mountain bikers. The issue is whether there is sufficient demand for this trail, and if cooperation could be obtained from private landowners between the Unit and the State Park. Shorter non-motorized loop trails could be built off of the snowmobile Ridge Trail as well. A non-motorized trail could travel to the fire tower on the mountain, however, improvements would need to be made to the fire tower to make it safe for public use. The expense of this may be prohibitive.

- Boating Access on Squapan Lake: There has been interest for some time in the Bureau's providing a boat launching facility on the Unit. Currently there are two boating access facilities on Squapan Lake. There is a private boat launch at Walker Siding that is closed to the public, and a public boat launch owned by WPS New England at the site of the dam which is far from the Unit's campsites and desirable fishing locations at the north end of the lake. An issue is whether the Bureau can make an arrangement with the owners of the Walker Siding private launch to re-open their facility to the public, to minimize the number of facilities on the lake. If this is not possible, the Bureau must attempt to find a suitable site on the Unit that meets Bureau standards (including environmental standards, ability to build the site to ADA accessibility standards, and ability to provide legal public right of way to the site). Another issue is finding the funding to acquire legal public right of way, and to build the facility.

- ATV/Vehicle Accessible Camping: There is interest in providing opportunities for camping that are more accessible by vehicle or ATV on the Unit. Currently the campsites on the Unit are all on the lakeshore, and are water accessible only. Connector trails could be made from the public use roads to one or more of the campsites, with parking near the road. This would retain the primitive nature of the campsites, yet make them more accessible for those traveling by car rather than by boat. Another option is providing a day use and camping area along the ATV trail surrounding Squapan Mountain. Upgrades have been made to this trail recently. A camping area along this trail could be made to connect with a larger system of ATV camping areas in the region spaced about a day's drive apart. An ATV camping shelter already exists in Bridgewater, and more shelters could be built in cooperation with other ATV interests and landowners.

Timber Resources

Harvest History

The Unit was harvested extensively in response to the spruce budworm outbreak in the 1970s and 1980s. The southern portion of the Unit (in T10 R4) was mostly acquired by the Bureau after the budworm salvage operations had been performed by previous landowners. These harvests were quite extensive, with subsequent blowdowns occurring. As a result, very little overstory remained and it contained abundant hardwood regeneration. The northern portion of the Unit (in T11 R4) was mostly acquired by the Bureau in the 1970s, and budworm salvage was performed by the Bureau in the late 70s and early 80s. Harvesting was heavy (though not as heavy as the southern portion of the Unit) and targeted mature, high risk fir and spruce. Mature, high risk aspen was also salvaged at that time.

After the spruce budworm harvests, the Bureau performed light selection and improvement cuttings of softwoods and hardwoods. From 1990-2001, an average of 1,200 cords per year were taken from the Unit. From 2002-2008 harvests have averaged

Forest on the Squapan Unit

about 5,000 cords a year. This is somewhat above the sustainable harvest level, compensating for the low harvests in the 1990s.

Current Conditions

Timber volumes in the Squapan Unit are close to Bureau and regional averages. The proportion of hardwoods on the Unit is 47 percent, which is the highest for any large parcel in the northern region. Many acres hold a considerable amount of large, healthy sugar maple, yellow birch, red spruce and eastern hemlock. Some large trees are low quality hardwoods and oversize hemlock. In general, most of the Unit has considerable vertical and age diversity, allowing for ongoing harvests without the need for the Bureau to perform adjustments in stand characteristics.

Softwood Type

Softwood type stands cover about 39 percent of the regulated acres on the Unit (about 6,000 acres). These softwood stands are made up of approximately 28 percent spruce, 16 percent cedar, 13 percent hemlock, 11 percent fir, and three hardwood species (sugar maple, yellow birch, red maple) that total 18 percent. Volume on these stands is an average of 24 cords/acre. Most species are of good quality, although, some of the larger hemlock and cedar have defects. Hardwoods within the softwood stands contribute to the volume and quality of the stand.

Mixedwood Type

Mixedwood type stands cover about 35 percent of the regulated acres on the Unit. Volume on these stands averages 20 cords/acre. Mixedwood stands range from softwood sites preferentially cut for spruce and fir in the past, to stands with deep and fertile soils where hardwoods and softwoods grow well. Mixedwood stands are composed of: 22 percent spruce, 14 percent sugar maple, 12 percent beech, 11 percent hemlock, 8 percent each of fir, yellow birch and red maple, 6 percent cedar, and 5 percent aspen. Most mixedwood stands are well stocked with quality trees, though some have sparse overstories from budworm era salvage cuts.

Hardwood Type

Hardwood type stands cover about 26 percent of the regulated acres on the Unit (about 4,000 acres). While some of the hardwood acres lie on shallow, rocky soils on Squapan Mountain, most are on very fertile soils, including enriched “cove” soils. Hardwood stands are composed of: 37 percent sugar maple, 19 percent beech, 13 percent red maple, 10 percent spruce, and 9 percent yellow birch. Hardwoods on Squapan Unit are very high

quality. The exceptions are beech, which is heavily infected with the beech bark disease, and some older trees, purposely retained for wildlife.

Timber Management Issues

- Several areas within the Squapan Unit could be considered "High Conservation Value Forests" (HCVF) by the forestry certification programs the Bureau is certified through. Some of these areas correspond with sites the Maine Natural Areas Program has termed "exemplary communities" (see "natural communities" section above). The Squapan Mountain Spruce - Fir - Northern Hardwoods Ecosystem and Hemlock Forest, the Squapan Peninsula (Big Cove) Hemlock Forest, and the Dudley Brook Small Cove Hardwood Site are sites that may be designated as HCVFs. Management of a HCVF should maintain key characteristics such as large, old trees, and the Bureau could further designate these areas as "no-cut" zones or special protection areas.

Transportation and Administrative Considerations

Due to the central feature of Squapan Ridge running from north to south, the Unit is accessed by separate road systems. The western portion of the Unit is accessible from Route 163 near Haystack Mountain, turning south and traveling one mile over private gravel road to the Squapan Unit gravel access road. Once inside the Unit, this gravel public use road extends six miles south, and vehicular access ends at a gate. The road becomes a trail used by ATVs and snowmobiles, and access by other motorized vehicles is blocked in certain areas to maintain trails for ORVs.

Access to the eastern side of the Unit is from Mapleton, traveling south on the West Chapman Road. Two miles of private road must be crossed before entering the Unit on the east side. Once inside the Unit, the public access road turns west toward Squapan Lake and then heads north, where it ends at a gate and becomes ATV and snowmobile trail.

Other access points to the Unit have been provided to Bureau staff for forest management by private landowners, and these access points depend on the good will of the landowners.

In other administrative matters, much of the Unit, particularly in T 10 R 4 (Squapan Township), is under common/undivided ownership, meaning the Bureau shares ownership of multiple parcels of the Unit with other landowners.

Transportation and Administrative Issues

- Road Access The Bureau would like to obtain deeded right-of-way to portions of the Unit now only accessible through private roads. The Bureau has worked cooperatively with surrounding landowners, obtaining permission to cross roads

for management in the Unit. As lands change ownership, however, such permission cannot be assured over time.

- Minority Ownerships To simplify management, the Bureau would need to purchase minority interests in the Unit, so that the Unit is owned by the State in full.

Squapan Unit Allocations

Special Protection Dominant

- The Fern "Grotto" site Goldies Wood Fern found here is the primary reason for designating this site as a special protection area, as it has a state rarity rank of S2 – which is imperiled in Maine because of extreme rarity. This rich, seepy hardwood site is conspicuous for its abundance and diversity of ferns. The site includes a large population of the rare Goldie's wood fern. MNAP recommends the following for this site: Since the enrichment seems to follow the seeps in the area, it makes sense to focus a set aside on the seeps. Maintain a no harvest buffer of five chains from the edge of the seeps as previously proposed. This distance is an appropriate way to ensure that the special features of the area are set aside without restricting other management options for the area surrounding the special features.

- Dudley Brook Small Cove Hardwood Site This small eight acre site in the north most part of the Unit, has several diffuse flowages that feed into a more or less level rich hardwood site. It contains a significant percentage of basswood with many large trees. Basswood is near the edge of its range in this location. This area also has a moderate size population of the rare Goldie's wood fern in a cedar stand. The Bureau is designating this site as a natural area.

- A small population of Goldie's Wood Fern in mixed forest near and along the stream just north of the rail line at the eastern boundary.

- Squapan Peninsula (Big Cove) Hemlock Forest Squapan peninsula is a forested upland with gentle to moderate slopes that is on the west side of the lake and bordered by Squapan Lake on the south and east sides. The peninsula area supports a mature example of a Hemlock Forest community. A portion of this community will be allocated as a natural area.

Wildlife Dominant

- Ridgeline of Squapan Mountain encompassing the MNAP defined Spruce -Fir - Northern Hardwoods Ecosystem and Hemlock Forest exemplary community. Wildlife dominant will be used as a temporary allocation pending review of this area in the future (as a separate process from this management plan) as a potential ecological reserve. In the meantime, the Bureau will not perform any timber management in this area. The existing snowmobile ridge trail (which may later be

designated for ATV use) will not be part of this wildlife allocation, but will be a developed recreation class I corridor through it.

- Squapan Lake Slope Forest (336 acres): Spruce - Northern Hardwood Forest exemplary community on the slope immediately adjacent to the northeast shore of Squapan Lake. The stand is a nearly linear feature, following the shore of the lake for approximately two and a half miles and averaging about 1,000 feet in width.

- Squapan Peninsula (Big Cove) Hemlock Forest A portion of this mature Hemlock Forest community (the portion that is not designated as a special protection natural area) will be wildlife dominant. Timber management will be a secondary use, and will maintain the late successional character of the forest.

- Other riparian shoreline areas: Wading bird and waterfowl habitat and riparian areas (330 foot buffer along lakes and rivers, 75 foot buffer along secondary streams).

Note that the shoreline of Squapan Lake is designated as remote recreation as a secondary use to the dominant wildlife management allocation.

Developed Recreation Class I Dominant

- Designated public use roads, snowmobile trails, and ATV trails as shown on the Recreation Allocation map.
- A new boat launching facility (if built) on Squapan Lake.
- Any new drive-to campsites including any campsite areas developed for ATV access.

Visual Consideration Areas (secondary allocations)

- A 100 foot buffer around Squapan Lake and Alder Lake (Class I).
- Public access roads (Class I).
- Areas seen from a scenic viewpoint (if developed) on Squapan Mountain (Class II)
- Areas of Squapan Mountain and Garland Hill that can be seen from the west side of Squapan Lake, the West Chapman Road, and Haystack Mountain (Class II).

Timber Management Areas

- All other areas are timber dominant. Timber is a secondary use in wildlife dominant areas, remote recreation areas, visual consideration areas and developed recreation areas.

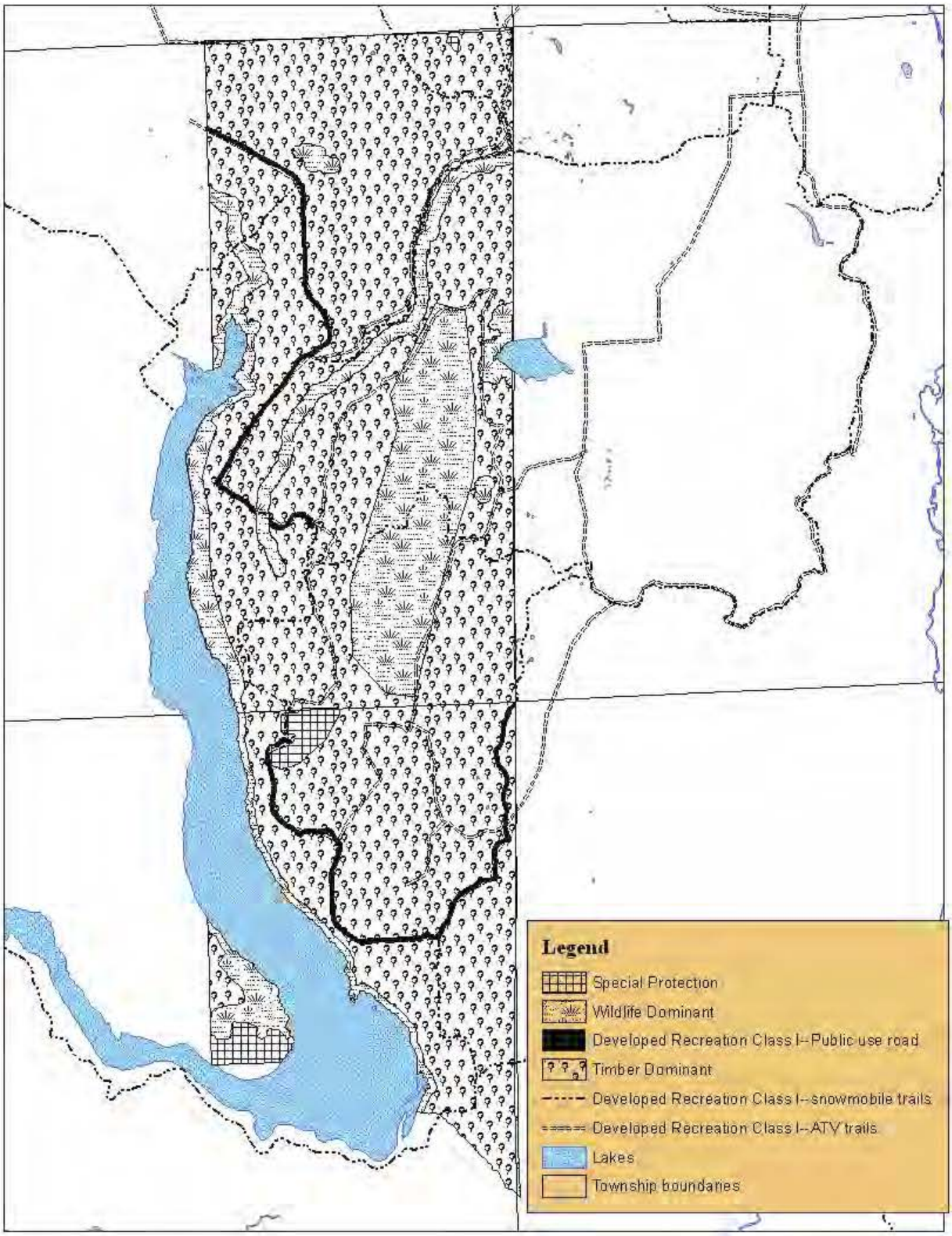
Squapan Unit Allocations (acres)

	Dominant Acres	Secondary Acres
Special Protection—Natural Area	318	
Wildlife	3,468	

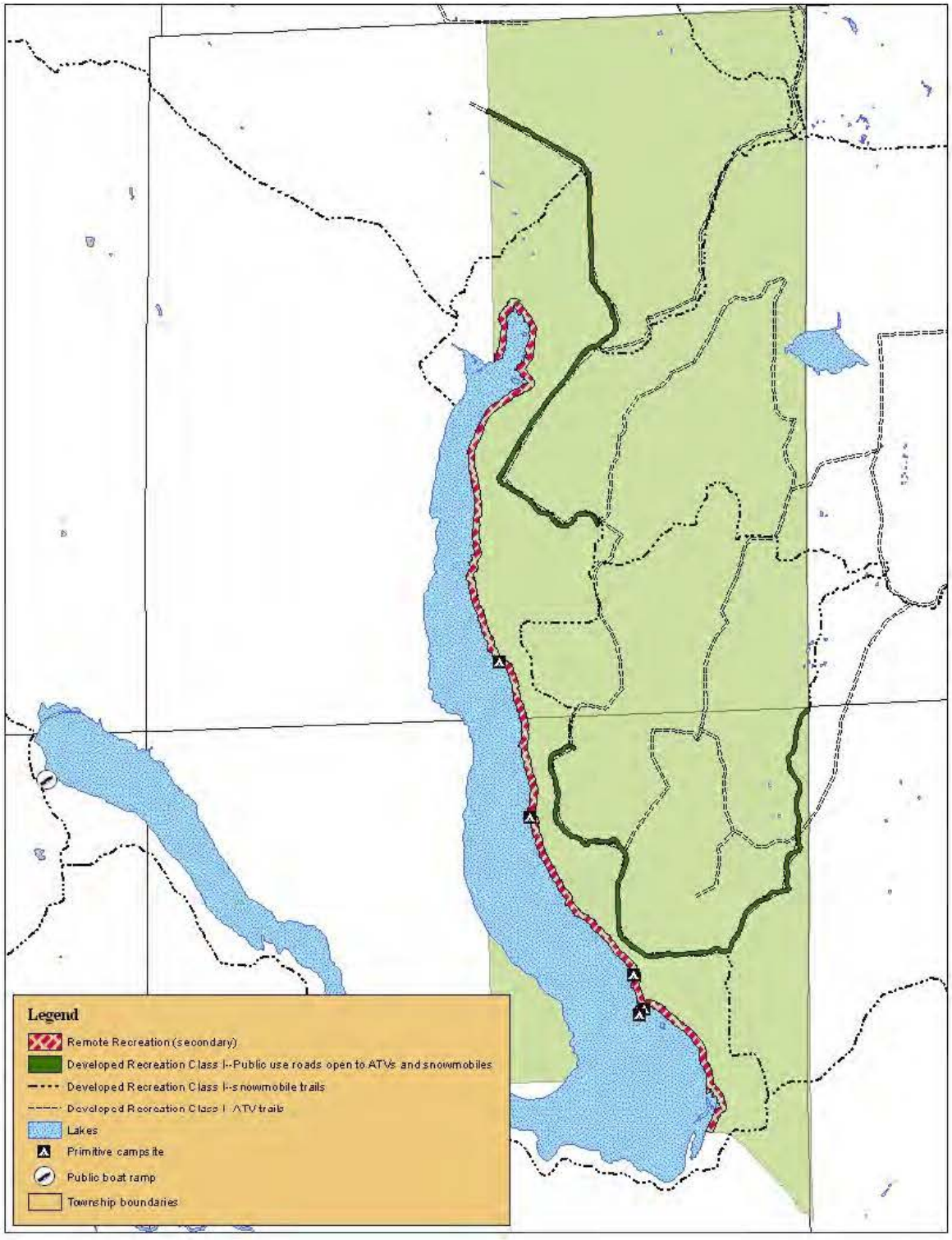
Visual Class I	290	
Developed Recreation Class I	Unknown—roads/trails	
Timber Management	14,274	

***Dominant acreages are representations based on GIS metrics and do not sum to total unit acres due to measuring error and limits of GIS precision.*

Squapan Unit Dominant Resource Allocations



Squapan Unit Recreation Allocations, Facilities and Infrastructure



Squapan Unit Management Issues and Recommendations

Issue	Recommendations
Natural Resource Management Issues	
1. Potential Future Ecological Reserve on Squapan Mountain	1. The Bureau will not perform any timber management in this area, which will be temporarily designated as wildlife dominant until future decisions about ecological reserve additions are made. The current snowmobile Ridge Trail will be a "developed recreation class I" segment through the wildlife dominant area. Any future ecological reserve designation should exclude the motorized Ridge Trail from the ecological reserve boundary.
Recreation Management Issues	
2. Unauthorized ATV use of the snowmobile trail over Squapan Mountain causing erosion and drainage problems, as well as safety concerns for users.	2. Continue to work with ATV interests to curb the current unauthorized use of the Ridge Trail over Squapan Mountain.
3. Request by ATV community for authorization to use/upgrade the snowmobile trail over Squapan Mountain for ATV use; and potential impacts to the adjacent natural communities and their potential ecological reserve designation.	3. Designate the trail for ATV use when (a) ongoing cooperation from the ATV community has effectively curbed illegal use of existing trail; (b) an assessment of the trail and a detailed engineered plan for needed improvements is completed; (c) funding sources to accomplish needed improvements have been secured and (d) an improved, well-designed trail is in place.
4. Lack of non-motorized trails on the Squapan Unit; potential to build a system of trails to connect Haystack Mountain, the Squapan Unit, and Aroostook State Park to be used by hikers, cross-country skiers, and possibly mountain bikers.	4. Determine, as resources allow, if there would be sufficient demand for this trail, and if cooperation could be obtained from private landowners between the Unit and the State Park. Work with Aroostook State Park Manager, the Town of Castle Hill, and private landowners in this endeavor.
5. Potential to provided short, non-motorized trails that connect to the snowmobile "Ridge Trail" and provide access to the fire tower on the mountain.	5. Determine if there would be sufficient demand for non-motorized trails that connect to the snowmobile Ridge Trail, and continue to the fire tower. Before building a trail to the fire tower, determine the expense of improving the tower to make safe for public use, and improve the tower if funding can be obtained and demand can be demonstrated.

6. A second public boating launching facility is desired on Squapan Lake, since the Walker Siding facility has been closed to the public.	6. Continue communications with the owners of the Walker siding facility about the possibility of re-opening their facility to the public. If not possible, assess the feasibility of various sites in the Unit for providing boating access. A site will be chosen if it is: cost-effective, able to accommodate an ADA accessible facility, and can accommodate a full service motor boat facility without violating water quality or other environmental standards. If a suitable site can be located, and funding can be obtained, build a second public boat launching facility on Squapan Lake.
7. ATV/Vehicle Accessible Camping There is interest in making some of the Unit campsites accessible by vehicle and ATV. There is also interest in a day use area at the "old camp yard" site along an existing ATV trail.	7. Assess the possibility of providing one or more trails from the public use roads to existing lakeshore campsites, with parking areas near the road. Maintain the primitive nature of the lakeshore campsites. Work with the ATV community to consider a camping area near the ATV trails around Squapan Mountain that could be connected to a regional series of ATV camping shelters spaced about a day's drive apart. Provide a day use site at the "old camp yard" site, including a picnic table with a shelter and a privy.
Issue	**Recommendations**
Timber Management Recommendations	
8. Future Timber Management	8. Maintain the high proportion of large, high quality trees and size and species diversity. More specifically • Increase the spruce component in softwood stands and maintain fir at present levels. White pine, which currently makes up one percent of the softwood type volume, should be increased. • Maintain mixedwood stands in current species assemblages with the exception of beech which will be decreased when stems are diseased and have poor crowns. • Encourage high quality sugar maple, yellow birch and spruce on hardwood stands and retain red maple and beech of acceptable quality. • Beech should be retained for wildlife when crowns are good (even if bark is diseased) and when bark is smooth. • Designate areas as HCVF areas, which will

	in some cases correspond with special protection areas and other MNAP designated exemplary communities.
Transportation and Administrative Issues	
9. Road Access	9. Work with abutting landowners to facilitate Bureau staff access to portions of the Unit not easily accessed by public use roads. Seek deeded access over abutting lands.
10. Minority Ownership	10. Work cooperatively with minority owners to pursue full State ownership of lands within the Unit.

Scraggly Lake Unit

Vision for the Scraggly Lake Unit

The Scraggly Lake Unit is located in a remote portion of Maine's North Woods, almost adjacent to Baxter State Park, and surrounded by other land in forest management use. This approximately 9,000 acre unit is distant from population centers, yet accessible from a public use gravel road leading into the Unit. Recreational opportunities are abundant, with boating, fishing, camping and hiking popular uses of the Unit. The Unit contains extensive deer wintering areas and important wetland complexes along tributaries and brooks. A remote pond provides a walk-to, quiet fishing experience, and there is a small old growth hemlock forest on the Unit. A local snowmobile trail traverses the public use road when conditions allow. Timber harvesting is performed in much of the Unit to enhance deer wintering areas, provide revenue, and improve the condition of the forest.

Management goals on the Scraggly Lake Unit are in large part defined by the location, natural features, and character of the Unit. Key wetlands, deer wintering areas and old growth forest require special protection and management. Proximity to Baxter State Park and distance from population centers serve to define the Unit as a remote and quiet, yet accessible recreational setting. Management goals provide for the continuation of motorized access into and within the Unit along the public use road, yet promote the continuation of the quiet and remote recreational experience provided within the Unit. Timber management will promote high value and long lived species, and seek to enhance wildlife habitat and visual integrity in appropriate areas. *The vision for the Scraggly Lake Unit, therefore, is to provide a quiet and remote recreational setting supporting a variety of recreational activities, especially quality boating, fishing, hunting, camping, and hiking, to protect exemplary ecological features and wildlife habitat, and to perform timber management that enhances wildlife habitat and visual integrity and produces high quality timber products.*

Character of the Landbase

The Scraggly Lake Unit is located in the southern half of T7 R8, a township just northeast of the northeast corner of Baxter State Park. It is in a remote part of Maine, with the nearest town of Patten (pop. 1,100) located approximately 30 miles to the southeast. The Unit's central feature is Scraggly Lake, an 836 acre lake that provides for the Unit's most popular recreational activities of camping, boating and coldwater fishing. The Unit has many brooks that run through it, and wetlands that support wading birds and waterfowl are abundant. There are extensive active deer wintering areas in the Unit.

Acquisition History

The Scraggly Lake Unit began as a 750 acre area that was set aside as a public lot when Maine was first being divided into townships. In 1976, 500 of these acres were traded to J.M Huber for a right-of-way relocation. The following year, 10,054 acres were acquired as part of a major land trade with International Paper Company. Another 1,212 acres

were traded to J.M Huber in 1989 leaving the acreage that makes up the Unit today. The Scraggly Lake Unit now consists of 9,092 acres in T7 R8.

Natural Resources

Geology and Soils
The southern half of the Unit is composed of the marine sedimentary rocks of sandstone and slate (of the Devonian Seboomook Formation originating 360-408 million years ago). It is also composed of sediments that were shed from the steep hillsides of young mountains to the southeast. Adjacent to the oceanic derived terrain of the southern part of the Unit is a strip of volcanic derived terrain that stretches across the northwest corner and makes up nearly 35 percent of the bedrock in the Unit. Both terrain types are similar in that they were formed by major plate collisions that eventually formed major mountains in Maine. On the surface, the Scraggly Lake Unit is covered in a glacial till layer of unsorted sand, silt, clay, and stones. These deposits are common in northern Maine and were left behind by the multiple expansions and retractions of glaciers over the last 2.5 million years.

Hydrology and Wetlands
The Scraggly Lake Unit includes parts of two major watersheds. Most of the Unit, including the waters of Scraggly Brook, Scraggly Lake, Ireland Pond, and the West Branch of Sawtelle Brook, flow south to the Penobscot River. A small part of the Unit, the Beaver Brook drainage, however, flows north to the Aroostook River.

Scraggly Lake encompasses 836 acres, has a maximum depth of 70 feet, and is considered mesotrophic. Ireland Pond is 43 acres, with a maximum depth of 35 feet. Because of its depth, as well as its cold, low nutrient waters, Ireland Pond is considered oligotrophic and has limited aquatic plant growth. Scraggly Lake and Ireland Pond are both considered priority waterbodies based on aquatic biodiversity modeling coordinated by The Nature Conservancy.

According to the National Wetlands Inventory, there are 1,415 acres of wetlands in the Scraggly Lake Unit. These include 1,052 acres of forested wetlands and 363 acres of open wetlands. At Scraggly Lake, beaver have historically influenced the development of wetlands, mostly marshes, along many of the streams, especially in the wetland complex to the southwest of the lake.

Ecological Processes
The naturally occurring spruce budworm has had a major impact on lowland spruce – fir forests. Budworm activity in the early 1980s led to wide spread harvesting of lands in the Scraggly Lake area.

Peatlands, such as the small, stream-side bogs along the Scraggly Lake southwest inlet stream and the forested bog along the West Branch of Sawtelle Brook, are formed in wetlands where plant growth exceeds decomposition. The decay of plant material is impeded by a lack of oxygen due to saturated conditions and little to no input of aerated

water. Sphagnum moss is a primary component in more acidic peatlands such as those at Scraggly Lake. Some of the plants capable of surviving in the stressful environment of peatlands have specialized means of surviving the lack of oxygen, low nutrient levels, and acidified water, such as leathery leaves that slow water evaporation from the plant and shallow roots that allow the plant to get oxygen near the surface of the water table.

Rare Plant and Animal Species

Livid Sedge - *Carex livida*
Swamp-fly honeysuckle - *Lonicera oblongifolia*
Water stargrass - *Zosterella dubia* - located in the northwest corner of Scraggly Lake.

No rare animal populations are known to occur on the Unit.

Natural Communities
West Branch Sawtelle Brook - The site is a moderately sized wetland mosaic associated with the confluence of Sawtelle Brook, the West Branch of Sawtelle Brook, and a small unnamed tributary with a small pond. Broad wetlands extend along and in some places between both larger streams. Cover types in the wetlands include large areas of spruce - larch wooded bog along with smaller areas of dwarf shrub bog, northern white cedar swamp, shrub fen, and mixed graminoid - shrub fen. The Spruce - Larch Wooded Bog is considered exemplary and is dominated by stunted black spruce with a thick shrub layer dominated by Rhodora and carpeted with Sphagnum mosses. In some areas of the wooded bog, larch and northern white cedar are co-dominant with black spruce. Larch is more dominant in a broad zone bordering the stream.

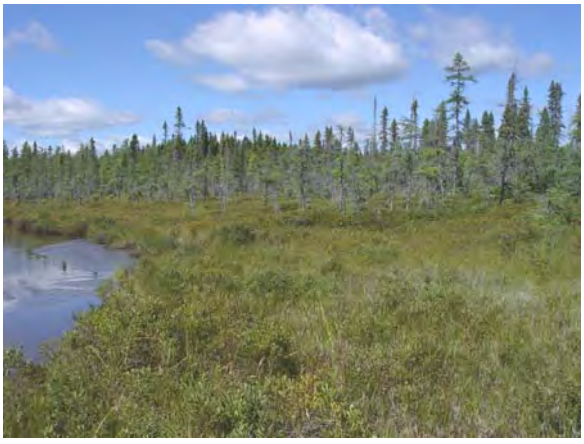
Spruce - Larch Wooded Bog - West Branch Sawtelle Brook

Swamp-fly honeysuckle (*Lonicera oblongifoila*)

Livid Sedge (*Carex livida*)

Embedded in the Spruce - Larch Wooded Bog is a small sheep laurel - dwarf shrub bog with a sparse cover of stunted black spruce and scattered larch. Shrub and herb species in the open canopy bog are typical for this type and include leatherleaf, sheep laurel, Labrador tea, bog rosemary, bog laurel, wild raisin, alder, coast sedge, three-leaved solomon's seal, bog cranberry, low rough aster, and gold thread.

An unnamed tributary to the West Branch of Sawtelle Brook includes a small silt/muck bottom pond. The northeast margin of the pond supports a small area of shrub - sedge fen. The rare livid sedge (*Carex livida*), an indicator of enriched fens, is found in this area as are a few stems of shrubby cinquefoil (*Pentaphylloides floribunda*). The low growing, open fen is limited to the area closest to the small pond (image - right). Away from the pond, the shrubs and saplings are more dominant and the habitat gradually transitions into the spruce - larch wooded bog.



Small shrub-sedge fen-West Branch Sawtelle Brook

Just upstream of the little pond, on an unnamed tributary, is a small area of northern white cedar swamp. A small population of the rare swamp-fly honeysuckle is found here on both sides of the stream.

Scraggly Lake - Southwest Inlet Stream The site includes an exemplary Leatherleaf Boggy Fen that occurs along the broad inlet stream into the southwest side of Scraggly Lake. The majority of the bog is a relatively open canopy, low shrub dominated community. Trees are sparse on the fen and include stunted northern white cedar and

larch. Larch, cedar, and black spruce make up the relatively open tall shrub layer. Low growing shrubs are common and include leatherleaf (dominant), sheep laurel, bog rosemary, and Labrador tea. Lower growing, mostly non-woody plants, including three-leaved solomon's seal, bog cranberry, few-seeded sedge, and three seeded sedge, are also common in this layer. Soils are composed of deep peat and the site is flat but composed of rolling hummocks interspersed with broad low areas as well as small hollows.

Scraggly Lake Hemlock Forest

There is an exemplary Hemlock Forest on the mid and upper southwest facing slopes of a hill in the northwest corner of the Unit. Much of the site is dominated by mature hemlock with lesser amounts of red spruce and northern white cedar. Some areas are a mix of northern hardwoods with hemlock and red spruce and some areas are dominated by northern hardwoods. Many of the hemlock trees observed ranged from 20 to 35 inches diameter at breast height with larger trees over 300 years old. Larger sugar maples at the site are between 30 and 35 inches in diameter. The understory is relatively open, with the exception of widely scattered gaps where hemlock and fir regeneration are thick. Sugar maple seedlings and saplings are additional prominent understory components. The herb layer is very sparse, with scattered patches of wood fern, sedges, red raspberry, mayflower, and wild sarsaparilla. Large woody debris is common. Selective harvesting had occurred at the base of the slope and on other adjacent lands. The majority of the stand had little evidence of past management.

Fisheries and Wildlife

Fisheries

Scraggly Lake and Ireland Pond provide habitat for a number of fish species. The chart below shows fish species of the respective waterbodies as well as species that have been stocked since 1989 (PEARL database, 2007).

Waterbody	**Lake Fish Species Inventory**	**Stocked Fish (since 1989)**
Scraggly Lake	American eel, banded killifish, blacknose dace, blacknose shiner, brook trout, common shiner, creek chub, cusk, fallfish, lake trout, lake whitefish, landlocked salmon, rainbow smelt, redbreast sunfish, slimy sculpin, threespine stickleback, white sucker, yellow perch	Brook trout and landlocked salmon
Ireland Pond	Blacknose dace, brook trout, finescale dace	Brook trout

The lake has two distinct basins and supports a landlocked salmon fishery. The west basin is deficient in dissolved oxygen below 25 feet in late summer. Landlocked salmon are no longer stocked in Scraggly Lake as it was discovered from 2003 and 2008 IF&W studies that the wild population of salmon was doing quite well. In some years fish stockpile in the lake adversely affecting the size and quality of the fish. In response, IF&W liberalized the size limit to 12 inches and the bag limit to three fish a day.

Mussels in Scraggly Lake include common elliptio and eastern floater.

Wildlife

Scraggly Lake has 694 acres of wading bird and waterfowl habitat and 1,680 acres of deer wintering areas. Large portions of both of these significant wildlife habitats are concentrated off the southwest edge of Scraggly Lake along an unnamed tributary of the lake. Both habitat types are also found along the margins of Sawtelle Brook, the West Branch of Sawtelle Brook, and Beaver Brook. Ireland Pond and the western edges of Scraggly Lake have wading bird and waterfowl habitat.

Deer wintering areas are managed by the Bureau to retain the best softwood cover and establish new softwood stands.

Duck nesting boxes have been maintained since 1988 on Green Pond, Ireland Pond, Lost Pond, Mitchell Brook Inlet and an un-named pond. Common goldeneye and hooded merganser are the predominant species using the boxes.

Loons nest extensively on Scraggly Lake and have been monitored at times by Bureau staff. Loons are sensitive to disturbance from recreationists as their nests occur near the water and are vulnerable to wave action that can wash eggs away. Signage is placed at the boat launching facility cautioning boaters to avoid actions that may disturb or harm loons.

A staff bird survey in May 2009 identified the following species in the Unit: common loon, ruffed grouse, least flycatcher, yellow-rumped warbler, pileated woodpecker, downy woodpecker, winter wren, black-throated blue warbler, black-throated green warbler, blackburnian warbler, golden-crowned kinglet, osprey, common raven, dark-eyed junco, black-capped chickadee, American robin, red-breasted nuthatch, common merganser and Canada goose.

Natural Resource Management Issues

- The Unit contains three natural communities considered exemplary by the Maine Natural Areas Program. They must be managed with care when managed at all. Continued communication between MNAP and the Bureau can facilitate this management.

- Loon nests on Scraggly Lake should be protected from wave action and other disturbances from recreationists during nesting season. Education through signage and communication with boaters and guides who land float planes on the lake are potential methods of controlling loon nest disturbance.

Recreation and Visual Resources

The Scraggly Lake Unit offers excellent opportunities for recreation in a large, undeveloped, forested landscape, embedded in a matrix of other conservation and forest

industry owned lands. It is almost adjacent to Baxter State Park. It provides a valuable opportunity for quiet, remote recreation.

Motorized Trails

ATV use

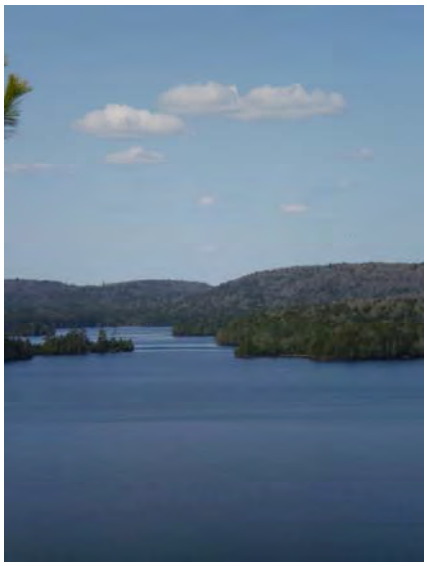
There are approximately eight miles of shared use roads in the Scraggly Lake Unit open to ATV use. Use is generally from campers traveling from one part of the Unit to another.

Snowmobile Use

There is a club snowmobile trail that has traversed the Unit (on the public use road) that connects with other club trails to the north and south. This was groomed by the Shin Pond/Matagamon snowmobile club, and offers a less-crowded alternative to the more heavily used ITS trails in the area. The trail grooming was suspended in 2008 and 2009 when the Maine Warden Service recommended this due to high deer use of the packed trail. Snow was particularly deep in these years, and the trail grooming was suspended for safety purposes, and to reduce stress on the deer. The public use road remained open for un-groomed snowmobiling.

Non-motorized Trails

The Owls Head Peninsula, on the eastern side of Scraggly Lake, contains a half mile hiking trail with views of Scraggly Lake and surrounding hills. This trail is accessed by water.



View of Scraggly Lake from Owl's Head

Boating Access

A primitive trailer boat launching facility, capable of handling small trailered boats, is available on Scraggly Lake on the south shore next to the campground. Visitors can also carry boats into Ireland Pond for a more remote experience. Boats must be carried in approximately 700 feet along an old spur road which has been discontinued for vehicular use.

Boat ramp at Scraggly Lake

Camping

The Scraggly Lake Unit offers many opportunities for remote primitive camping. A campground with 11 sites is available on the south shore of Scraggly Lake near the boat launching facility and includes three privies. A drive-to site is also available on Green Pond. Across the road from the Green Pond site, there is a Scraggly Lake campsite with a short walk in. Three sites accessed by water only are available on Scraggly Lake as well.

Hunting and Fishing

Fishing is a common recreational use of the Scraggly Lake Unit, with visitors enjoying Scraggly Lake's coldwater fishery (especially salmon and brook trout). Ireland Pond offers the experience of fishing for brook trout in a remote pond. There is some fishing on the smaller ponds and brooks as well. Hunting for bear, deer, and ruffed grouse are popular on the Unit. Hunting is currently allowed on the Unit everywhere except for within 300 feet of campsites, the boat ramp, and hiking trails (currently the Owl's Head trail is the only hiking trail on the Unit). Active logging operations are signed as temporarily closed to hunting. Hunters are encouraged to stop by the kiosk at the boat ramp, and to check with the Ashland Bureau office for the most recent information on hunting in the Unit.

Recreation and Visual Resource Management Issues

- Continued communication between the Maine Warden Service, the local snowmobile club and the Bureau will be necessary to determine when it is appropriate to groom the snowmobile trail on the Unit. Safety to sledders and minimizing disturbance to deer populations need to be considered each winter.

- There is some interest in building a non-motorized trail that begins at the Scraggly Lake campground at the southwestern part of the lake by the boat launching facility and connects to the Owl's Head Trail. This would allow campers to hike from the campground to the knob on Owls Head Peninsula (an approximately two and a half mile hike one way). There is also interest in providing a non-motorized trail from the public use road (near the Green Pond campsite) to the mature hemlock forest. In addition, guides that land float planes would like a trail connecting Scraggly Lake with Ireland Pond.

- ADA accessibility upgrades are needed at the boat launching facility on Scraggly Lake. One of the campsites closest to the ramp could be made ADA accessible as well.

Timber Resources

Harvest History

Bureau harvests on the Scraggly Lake Unit began in 1981 in the southwest portion of the Unit. The Bureau has performed the majority of its harvests to date on this Unit in the mid 1980s. The majority of the mid 1980s harvests consisted of softwood removal, as the market for hardwood pulp was limited at the time. In addition, the spruce budworm outbreak influenced these harvests, with Mitchell Brook deer wintering area receiving patchcuts centered on groups of badly damaged fir, and mature eastern hemlock and spruce/fir harvested in other areas.

Harvests from 2000 onward have included more hardwoods as markets have improved over the last two decades. Low value hardwoods have been harvested as well as high risk softwoods, while releasing regeneration established by the 1980s harvests.

Current Conditions

The Scraggly Lake Unit regulated acres consists of over 50 percent softwood types, approximately 38 percent mixedwood, and approximately 5 percent hardwood. Softwood types contain high inventories, while mixedwood and hardwood hold lower stocking. Many of the stands that were cut heavily in the past by the Bureau and the previous landowner are now classified as mixedwood because the stand composition changed due to heavy softwood removals and/or mixedwood regeneration.

Softwood Types

These cover almost 4,900 acres (over 50 percent of the regulated acres of the Unit). Softwood types occur on all soil drainage classes, but are least common on well drained sites. Stocking is generally good, consisting of about 26 cords per acre. Volume consists of the following: 42 percent spruce (mostly red), 25 percent cedar, and 26 percent a combination of balsam fir, yellow birch, white pine, red maple, and eastern hemlock. Most of the softwoods are of good quality, except the cedar (which is often old and defective) and the very large hemlock (which has ring-shake).

Mixedwood Types

These cover about 3,300 acres (38 percent of the regulated acres on the Unit). Mixedwood volume consists of the following: 25 percent spruce, 15 percent beech, 13 percent sugar maple, 13 percent eastern hemlock, 10 percent red maple, 8 percent yellow birch, and 6 percent fir. Mixedwood types on the Unit consist of two different stand conditions. The first and more common mixedwood stand condition was created from heavy harvests in the 1970s and 1980s. These stands were converted to modestly stocked mixedwood as a result of the softwood removal of those previous harvests. The second and less common mixedwood stand condition holds higher volumes and exists on sites good enough to support a significant hardwood component. Yellow birch and sugar maple of good quality and size occur on these stands, as well as large spruce and hemlock.

Hardwood Types

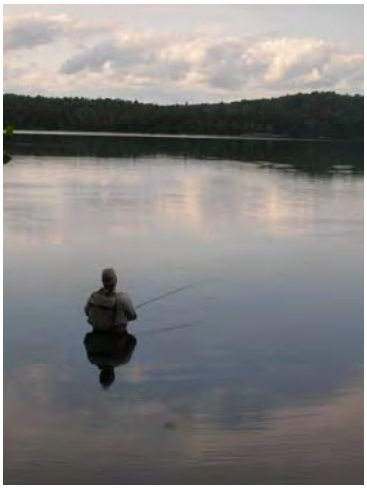
These cover about 400 acres (5 percent of the regulated acres on the Unit). The Unit contains limited acreage of well drained, fertile soils conducive to growing hardwoods. Beech-birch-maple forest predominates hardwood stands and is fairly well stocked on most sites. Hardwood composition consists of the following: 26 percent American beech, 24 percent sugar maple, 22 percent spruce, 8 percent yellow birch, and about 4 percent a combination of hemlock, cedar, red maple and striped maple. Some hardwood areas were gleaned for the best sawlogs and veneer prior to state ownership, with a lowering of stand quality resulting. Other stands contain a variety of size classes and high quality maple, birch and spruce. Beech tends to be of poor form and vigor.

Transportation and Administrative Considerations

The Scraggly Lake Road enters the Unit from the southeast corner and travels west along the lake and then north to Ireland Pond. This is the only public use road in the Unit, the remainder being management roads (including an upgraded management road on the east side of Scraggly Lake). Management roads are open to public use when posted as "shared use". The public use road—called the Scraggly Lake Road—is open to vehicles, ATVs, snowmobiles, bicycles, horses, and pedestrians.

Ireland Pond

Ireland Pond was zoned as a remote pond by the Land Use Regulation Commission (LURC) in 1979. LURC regulations for remote ponds include the provision that there is no access to motorized vehicles from within a half mile of the pond. At the time of the zoning, the Scraggly Lake Road and the management road that extends beyond it were already closer than a half mile from Ireland Pond. In a 1987 LURC ruling, it was determined that the road pre-existed the remote pond designation, and the Bureau could use its discretion in determining how far vehicles could travel on this road. Currently, the Bureau has a boulder barricade located at the head of a spur trail that branches off from the road and leads to Ireland Pond. This trail is approximately 700 feet, and



Fishing in Ireland Pond

this is the distance which people must walk in to access Ireland Pond. This barricade effectively creates a remote feeling and reduces erosion problems at the pond.

Transportation and Administrative Issues

- There is a problem with boats being stored at Ireland Pond without Bureau authorization or any identification of the owners. Sometimes these boats are abandoned. A system is needed to track these boats and be able to identify the owners in case of problems.

Scraggly Lake Unit Allocations

Special Protection Dominant
An area surrounding Ireland Pond, and the islands in the pond are special protection areas (natural areas). These areas were allocated in the 1988 Scraggly Lake Unit Management Plan as special protection due to the occurrence of many mature trees, its scenic quality, and Ireland Pond's zoning as a remote pond by the Land Use Regulation Commission.

The Hemlock Forest on the west side of the Unit will be a special protection area (natural area). This area is designated due to the presence of mature hemlock trees and the absence of evidence of a past timber management. The forest is considered exemplary by the Maine Natural Areas Program.

Remote Recreation Dominant
The section of Owl's Head Peninsula beyond the 330 foot lake buffer (which will be wildlife dominant) will be remote recreation dominant. Remote recreation will be a secondary allocation in the wildlife dominant buffer around Scraggly Lake (with the exception of areas near loon nests). Remote recreation will also be a secondary allocation in the two special protection areas around Ireland Pond and the Hemlock Forest.

Developed Recreation Dominant
The area surrounding the boat launching facility and campground on the south shore of Scraggly Lake, and an area westward along the shore up to the last drive-to campsite will be developed recreation class I. A small area around the Green Pond campsite will be developed recreation class I. The public use road is also developed recreation class I.

Wildlife Dominant

Currently mapped deer wintering areas, wading bird and waterfowl habitat, the riparian buffers (330 feet around lakes, streams, 75 feet along some secondary streams) and the exemplary Spruce Larch Wooded Bog will be wildlife dominant. Areas around loon nests will be managed with care as wildlife areas.

Visual Consideration Areas

Approximately a 100 foot buffer along Scraggly Lake Road from southeast unit boundary to Green Pond will be visual class I. One hundred foot buffers along Scraggly Lake, Green Pond, Ireland Pond will be visual class I as a secondary allocation to wildlife dominant. View from Owl's Head Knob will be visual class II.

Timber Management Areas

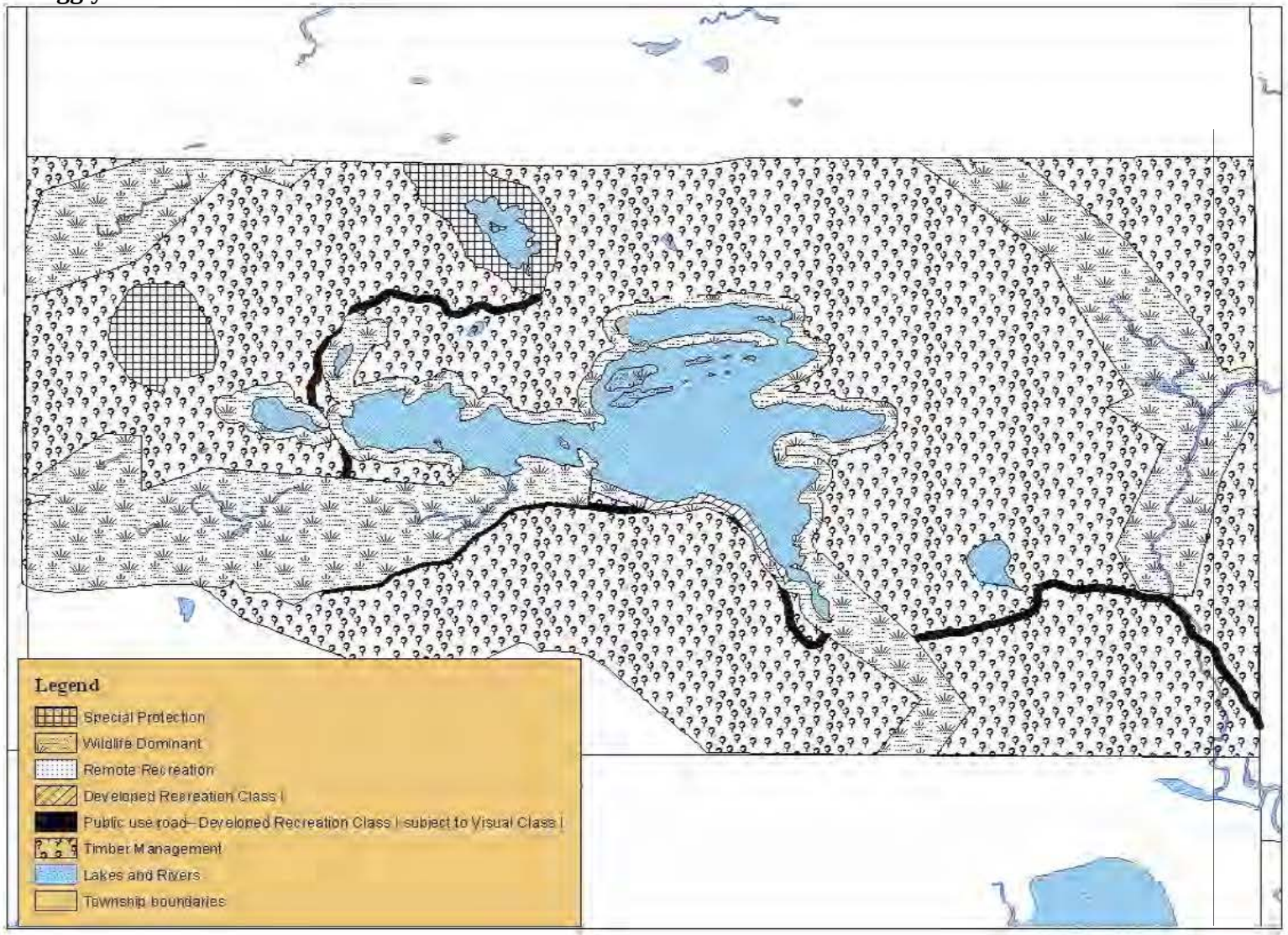
All other areas will be timber dominant. Timber will be a secondary allocation in wildlife dominant areas, developed recreation areas and visual consideration areas.

Scraggly Lake Unit Allocations (acres)

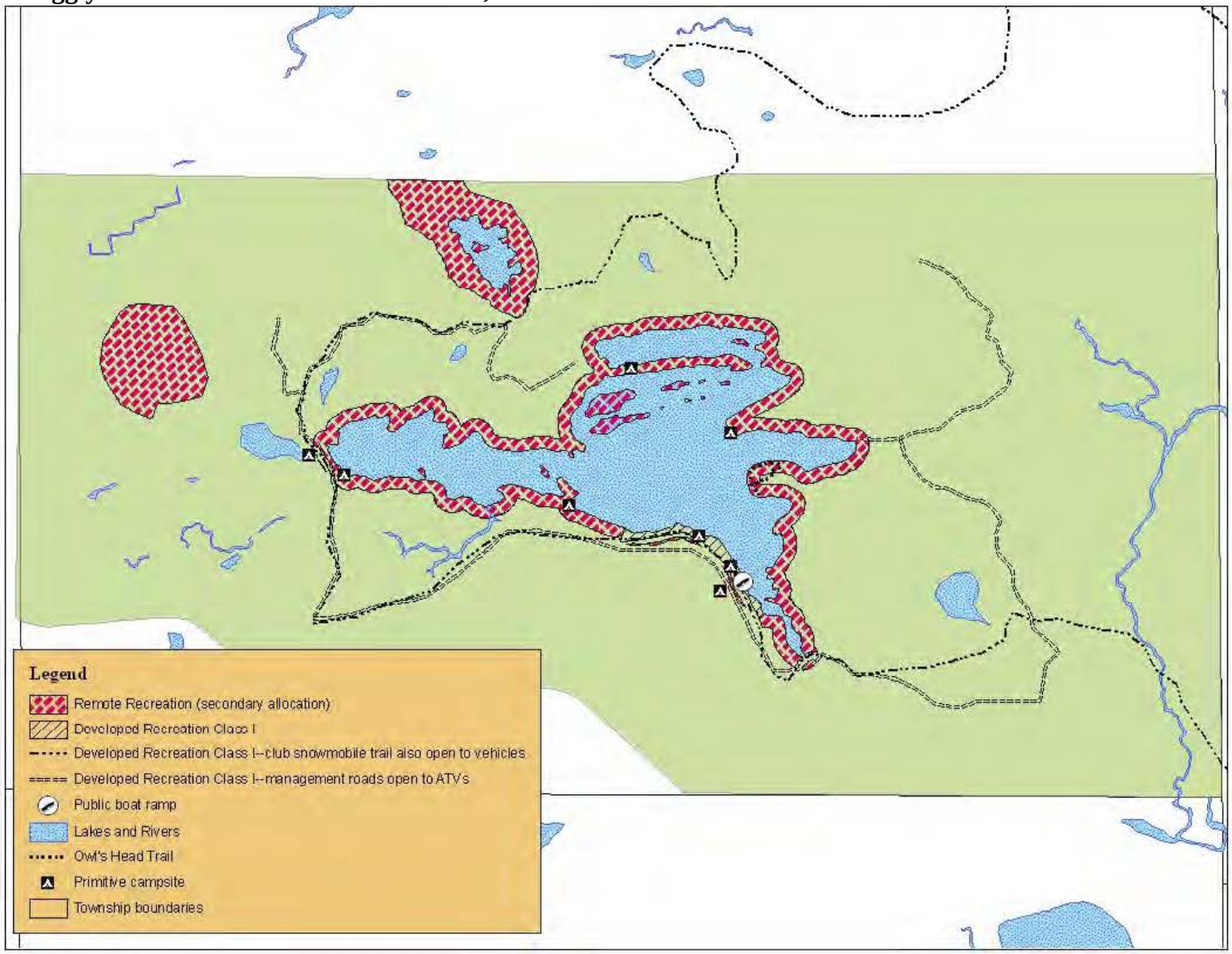
	Dominant Acres	Secondary Acres
Special Protection—Natural Area	292	
Wildlife	2,584	
Remote Recreation	7.6	702
Visual Class I	128	
Developed Recreation Class I	23 plus roads/trails	
Timber Management	6,941	

***Dominant acreages are representations based on GIS metrics and do not sum to total unit acres due to measuring error and limits of GIS precision.*

Scraggly Lake Unit Dominant Resource Allocations



Scraggly Lake Unit Recreation Allocations, Facilities and Infrastructure



Scraggly Lake Unit Issues and Management Recommendations

Issue	Recommendations
Natural Resource Management Issues	
1. Management of exemplary communities.	1. Manage exemplary communities in consultation with MNAP. The Hemlock Forest is allocated as a special protection area, and will not be subject to timber harvesting. The Leatherleaf Boggy Fen and Spruce Larch Wooded Bog are within wildlife dominant areas where harvesting will be minimal.
2. Protection for loons during nesting.	2. Monitor loon nests and place signage at boat launching facility to warn boaters about using caution during nesting season. Continue to work with guides that land float planes on Scraggly Lake and encourage them to continue to avoid landing on the lake near nests during nesting and fledging stages.
Recreation Management Issues	
3. Snowmobile trail grooming and deer use of the trail.	3. Continue to communicate with the local snowmobile club, the Maine Warden Service, and IF&W regarding any future grooming of the club trail through the Unit. Consider sledder safety and the trail's impact on wintering deer when making the decision to groom the trail from year to year.
4. ATV use of the Unit.	4. Maintain public use road open to ATV use, but do not connect it with a larger ATV trail system, in respect to the surrounding landowner's policy, and to maintain a quiet and remote recreational experience on the Unit.
5. Interest in more non-motorized trails on the Unit.	5. Assess the interest and feasibility of building three new trails on the Unit—one connecting the campground to the Owl's Head Peninsula, one from the Green Pond campsite to the Hemlock Forest, and one from Scraggly Lake to Ireland Pond. Seek funding for these trails if they are found to be feasible and have sufficient interest from the public.
6. The need for ADA accessible boating and camping.	6. When funding is obtained, make ADA improvements to the Scraggly Lake boating facility

	and a campsite near the facility.
Timber Management Recommendations	
7. Future Timber Management	7. Grow high value timber products (chiefly sawlogs and veneer) while maintaining visual integrity and enhancing a diversity of wildlife habitat. More specifically • Favor high value and longer lived species such as white pine, spruce, hemlock, sugar maple, and yellow birch. • Maintain softwood stands in that type, with spruce the preferred species. Favor white pine where it grows and maintain hemlock on some sites, and retain fir as an important component of regeneration. Encourage a late successional character and continue to provide valuable deer wintering areas. • Maintain mixedwood type on current mixedwoods stands that are well stocked. Work toward a late successional character, and favor high quality spruce, maple, birch and hemlock. On less well stocked mixedwood sites, retain overstory if windfirm, and favor younger spruce, pine and hemlock (possibly returning some sites back to softwood). • Encourage high quality and diverse hardwood stands to remain in that condition. Rehabilitate low quality hardwood stands by reducing diseased beech with poor crowns and favoring higher quality sugar maple, yellow birch and spruce. • Retain beech for wildlife when crowns are good (even if bark is diseased) and when bark is smooth. • Designate some areas as High Conservation Value Forests (HCVF), a designation recognized by the certification programs the Bureau is enrolled in. Manage these areas to maintain key characteristics such as large, old trees.
Transportation and Administrative Issues	
8. Ireland Pond motorized barricade.	8. Continue to block motorized access to the pond 700 feet from the pond at the location where a spur

	trail leaves the public use road. (This is the location of the current barricade).
9. Boat storage at Ireland Pond.	9. Implement special use permits for boats stored on the property.

Garfield Plantation Lot

The 1,040 acre Garfield Plantation Lot was an original public lot dating back to 1841. It is located in Garfield Plantation about eight miles west of the town of Ashland. A moderately steep hill covers the southwest portion of the Lot.

Natural Resources

Bedrock of the Lot is composed of acidic sedimentary and metasedimentary rock, with surficial geology composed of glacial till. Soils include a large amount of Perham-Daigle-Chesuncook and are generally deep and well drained with reasonable fertility. Water in the Lot drains to the Machias River, Aroostook River, and finally the St. John River. The Lot contains no open water and only four acres of wetlands, all forested.

Timber Resources

The Bureau conducted extensive harvests on Garfield Plantation Lot between 1980-84 in response to spruce budworm damage. Approximately 90 percent of the Lot was treated, and as a result the current overstory is variable and the understory is single-aged. One area in the northwest part of the Lot was likely not harvested in the 1980s resulting in a higher density and was harvested in 1996. In the summer of 2008, 118 acres were cut, with about one third of the volume harvested being low quality beech for firewood.

Current composition on the Lot is approximately 50 percent mixedwood, 41 percent softwood and 9 percent hardwood. Spruce is the most abundant species, however, hemlock is quite prominent, with many large (20 to 30" diameter) and old (200-400 years) trees. Old hemlock is especially prevalent in the west part of the Lot. Sugar maple is well distributed throughout the Lot and often of good form. American beech dominates the hardwood stand on the top of the hill on southwest part of the Lot, but is of poor form and vigor. The overall nature of the Lot is a two storied stand, however, the overstory has several age classes, with mid-age spruce and fir, young to mature classes of hardwoods, and old hemlock.

Transportation and Administrative Considerations

Access to the Lot is by permission of abutting landowners on summer roads that parallel both the northern and eastern boundaries. Internal access established in the 1980s harvest will need rehabilitation for future harvest activity.

Resource Allocations

Timber dominant on entire Lot (with the exception of minor riparian buffers of 75' on most small brooks).

Garfield Plantation Lot Allocation (acres)

	Dominant Acres	Secondary Acres
Wildlife	31	
Timber Management	993	

***Dominant acreages are representations based on GIS metrics and do not sum to total unit acres due to measuring error and limits of GIS precision.*

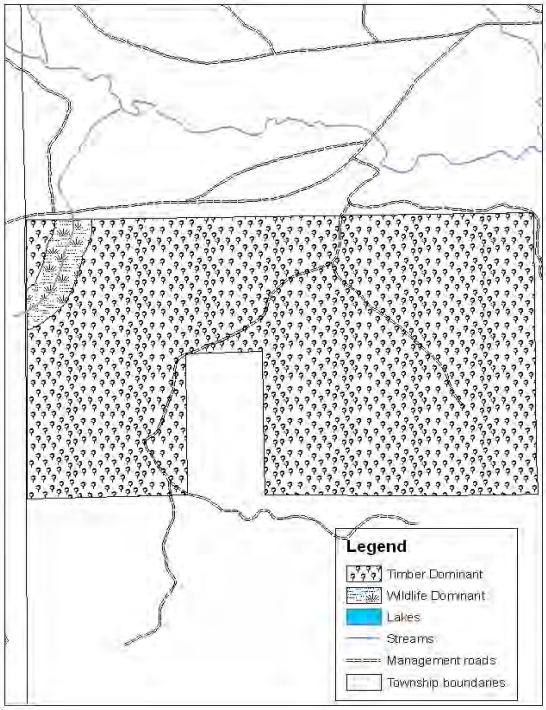
Garfield Plantation Lot Management Issues

Forest conditions where sparse in the overstory, have a single-age understory that is fairly well stocked. It will take time for the Bureau to achieve the desired multi-age conditions on this Lot.

Garfield Plantation Lot Management Recommendations

Focus forest management on producing multiple age classes over time. Grow quality spruce, fir, hemlock and hardwoods and retain some large old hemlock for wildlife. The age diversity in the overstory will help in improving overall diversity and achieving these goals. Perform timber stand improvements if commercially feasible, and retain some old hemlock as wildlife legacy trees. Specifically, a harvest is scheduled for 2009 and 2010, which will improve stand health, quality, growth, and structure.

Garfield Plantation Lot Dominant Resource Allocations



Hammond Lot

The 960 acre Hammond Lot was an original public lot reserved to the state and located in 1906. It is located approximately 10 miles northwest of Houlton. Terrain is hilly to gently rolling.

Natural Resources

Bedrock on the Lot is mostly composed of Silurian Smyrna Mills Formation, the Silurian Period dating back 408 to 438 million years ago. The surficial geologic layer on the Lot is glacial till. Soils of the Lot are Telos-Monarda-Monson association, and are moderately well drained. Webster Brook crosses the Lot from the northwest corner to the east. Water drains eventually to the St. John River. Sixty three percent of the Lot's acres are wetlands, including 35 acres of wading bird and waterfowl habitat. Spruce-northern hardwoods forest dominates the Lot, and a population of the state endangered northern gentian (*Gentianella amarella*) occurs here. The gentian is located on the main access road in the middle of the Lot, in between tire tracks. Normally the species occurs on river shores in northern Aroostook County, and this population is not considered a conservation concern according to the Maine Natural Areas Program.

Timber Resources

The Bureau conducted a harvest on over 900 acres on the Lot from 1984-86, targeting fir damaged by the spruce budworm as well as dying beech. Most stands had a significant overstory left after harvest. Currently, the forest is approximately 31 percent hardwood, 44 percent mixedwood, and 25 percent softwood. Timber volume on the Lot's regulated acres is composed of: 25 percent spruce, 24 percent sugar maple, 15 percent red maple, 11 percent hemlock, beech and cedar at about 6 percent each, and yellow birch and aspen at about 4 percent each. Horizontal diversity is good, with two or three height classes on most acres.

Transportation and Administrative Considerations

Access to the Lot is via the Twin Brook Road from the north or from the B Road from the south. Internal roads created during the 1980s harvest will need upgrading prior to any further harvests, including repair of beaver damage and bridge replacement.

Resource Allocations

Wildlife Dominant
A 330' riparian buffer along Webster Brook and a section of wading bird and waterfowl habitat on the eastern side of the Lot where Webster Brook crosses the border.

Timber Dominant
The remainder of the Lot.

Hammond Lot Allocation (acres)

	Dominant Acres	Secondary Acres
Wildlife	121	
Timber Management	859	

***Dominant acreages are representations based on GIS metrics and do not sum to total unit acres due to measuring error and limits of GIS precision.*

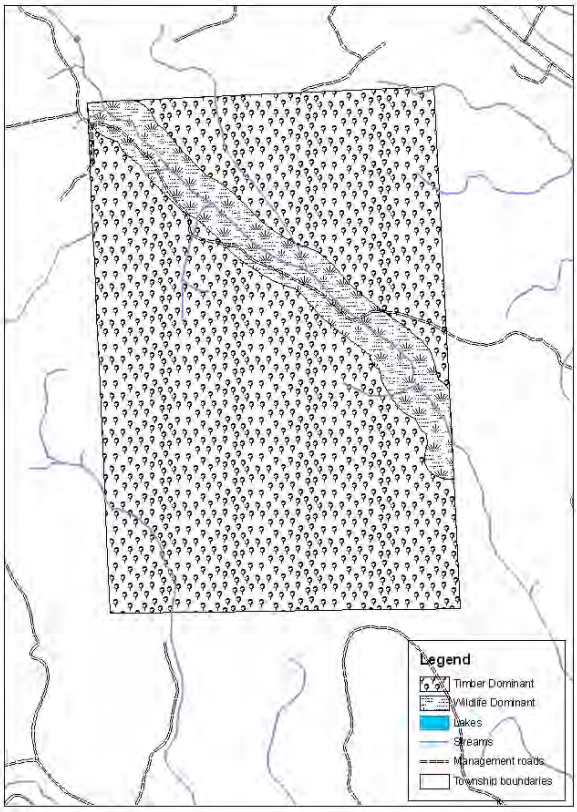
Hammond Lot Management Issues

Future timber management will only be feasible after sufficient time has elapsed since the heavy spruce budworm cuts of the 1980s.

Hammond Lot Management Recommendations

Manage for quality sawtimber as species mix and fertility allows for this. Issue firewood permits in accessible areas and target low quality and high risk trees.

Hammond Lot Dominant Resource Allocations



Moro Plantation East and West Lots

Moro Plantation East and West Lots are 160 and 133 acres respectively, and are located east of Route 11 on the south portion of Moro Plantation. Both were original public lots conveyed in 1834 to the state and the two lots are separated by only one half mile.

Natural Resources

Bedrock originated in the Silurian Period 408-438 million years ago, and consists of sandstones and sedimentary rock composed of fine particles. The surficial geology of the Lot is glacial till, and soils are till-produced Telos-Monarda-Monson. The watershed drains south toward the Penobscot River. There are seven acres of forested wetland and no open wetland on the East Lot. The Mill Brook runs through the West Lot, and there are 13 acres of forested wetlands and one acre of open wetland.

Timber Resources

Moro Plantation East Lot
Most stands were harvested in 1975-76, targeting spruce budworm damaged fir and spruce. A more recent smaller harvest in 1999 covered about half the Lot acres and targeted high risk spruce and fir and low quality hardwoods. Currently, forest stand types are approximately 32 percent hardwood, 53 percent mixedwood, and 15 percent softwood. Volume is made up of: 35 percent red maple, 35 percent spruce, 16 percent yellow birch, and 7 percent sugar maple.

Moro Plantation West Lot
The Bureau conducted a small harvest in 1988-89 targeting fir, aspen and dying sugar maple, and generally thinning the Lot. Approximately half of the Lot was previously a working farm, and has considerable old field stands established in the 1960s and 70's. A six acre plantation of European larch, red pine and Norway spruce was established in 1954. Most of the Lot is well drained, with the exception of area near the North Branch of the Mill Brook. Timber volume on the Lot is composed of: approximately 66 percent a combination of aspen and sugar maple, 7 percent European larch, and six other species making up 3-5 percent each. Young aspen, alders, and a three acre apple tree stand make this Lot particularly attractive to many wildlife species.

Transportation and Administrative Considerations

Access to both lots is dependent on permission from abutting landowners. The Mill Road runs through the northwest corner of the West Lot.

Resource Allocations

Wildlife Dominant
A 330 foot riparian buffer along Mill Brook and the open wetlands on the West Lot will be wildlife dominant.

Timber Dominant
The remainder of the West Lot and the entire East Lot will be timber dominant.

Moro Plantation Lots Allocation (acres)

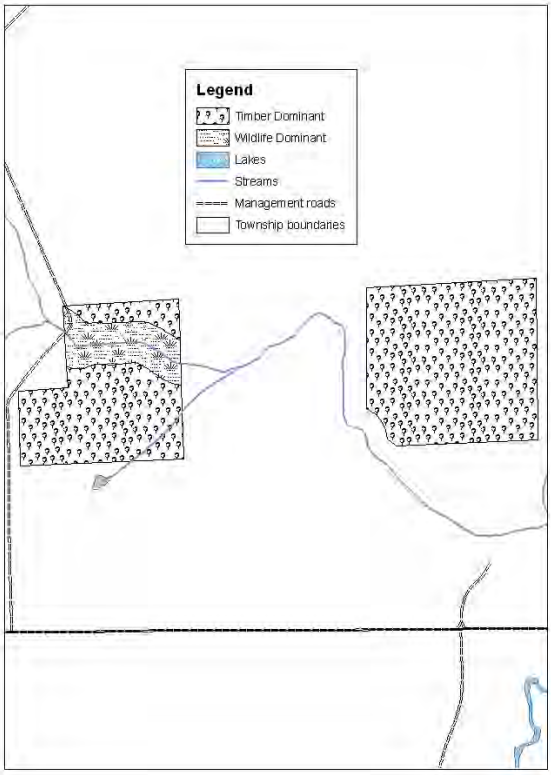
	Dominant Acres	Secondary Acres
Wildlife	31	
Timber Management	250	

***Dominant acreages are representations based on GIS metrics and do not sum to total unit acres due to measuring error and limits of GIS precision.*

Moro Plantation East and West Lots Management Recommendations

Apply standard Bureau silviculture to produce high quality timber products and maintain and enhance conditions for a wide range of wildlife species. Younger aspen rich stands may warrant patchcut management for ruffed grouse.

Moro Plantation East and West Lots Dominant Resource Allocations



Nashville Plantation North Lot

This 657 acre lot was an original public lot conveyed to the state and located in 1849. It is located northwest of the town of Ashland.

Natural Resources

Bedrock on the Lot is mostly mafic intermediate granite covered by glacial till. Loamy Perham-Daigle-Chesuncook soils result as these glacial remnants have broken down, and soils are mostly to moderately well-drained. All water in the Lot eventually flows into the Aroostook River and there are 23 acres of forested wetland. The northwest corner of the Lot has 54 acres of zoned deer wintering area, connected to a much larger system of deer wintering area.

Timber Resources

The southwest half of the Lot was harvested in 1990-92, removing 1,800 cords. In 2004-06, 3,350 cords were harvested in an area covering most of the remainder of the Lot, and re-entering some areas harvested in the 1990s. Both harvests were designed to maintain and promote deer wintering areas in the Lot. A new road went into the Lot from the southeast corner through the north-central section, involving a cut of 560 cords for the 17 acres of road right-of-way.

Currently, the Lot is composed of 31 percent hardwoods, 41 percent mixedwoods, and 28 percent softwoods. Species composition includes: 23 percent sugar maple, 23 percent hemlock, 10 percent cedar, 10 percent red maple, 10 percent yellow birch, 6 percent spruce, and 6 percent fir. Quality is very good, and sawlog volumes are high. Recent harvests have fully regenerated, with sugar maple seedlings carpeting many mixedwood and hardwood stands.

Wildlife Resources

Deer wintering areas are abundant on this Lot, both zoned and un-zoned. The zoned area occurs on the northwest portion of the Lot, and deer use is common in other portions, especially in mixedwood and softwood stands. Most of the mixedwood and softwood stands are being managed as un-zoned deer wintering area. Most of the hemlock has been retained for cover. Deer have been located along the new road in the middle of the Lot in recent winters.

Transportation and Administrative Considerations

A private road goes through a small portion of the southwest corner of the Lot. A new road, the Pinkham Mill Access Road, goes through the Lot from the southeast corner to the north central Lot border. The northwestern corner of the Lot is bisected by a rail line.

Resource Allocations

Wildlife Dominant
The zoned deer wintering area will be wildlife dominant.

Visual Consideration Area
The area along the Pinkham Mill Access Road will be managed as Visual Class I.

Timber Dominant
The remainder of the Lot will be timber dominant.

Nashville Plantation North Lot Management Recommendations

Manage timber using exemplary silviculture, maintain and enhance deer wintering areas, take advantage of the site quality, and focus on visual concerns. Due to the Lot's easy access and close proximity to Route 11, it can serve as a showcase for good forest management.

Nashville Plantation South Lot

This 319 acre Lot abuts the southern Nashville Plantation boundary and is a short distance west of the town of Ashland. It was an original public lot located on the ground in 1849.

Natural Resources

The entire Lot is underlain by Devonian Seboomook Formation bedrock dating back to 360 to 408 million years ago. Glacial till lies above the bedrock and formed the Perham-Daigle-Chesuncook soil in the region. Water on the Lot drains east to the Aroostook River.

Timber Resources

Most of the Lot was cut heavily in 1980 in response to the spruce budworm outbreak. A small harvest in 1998 targeted some dying spruce and low quality hardwoods. Currently, the Lot is 41 percent hardwood, 8 percent mixedwood, and 51 percent softwood. Current stocking is about 15 cords per acre. Volume is composed of 30 percent red maple, 18 percent spruce, 13 percent sugar maple, 12 percent beech, and 9 percent hemlock. Quality is average for the softwoods and below average for hardwoods. The Lot has regenerated well, and is two-storied, with the overstory containing multiple age classes. It is capable of producing quality timber over time.

Transportation and Administrative Considerations

An unimproved road enters the Lot from the southwest corner and ends in the center of the Lot.

Resource Allocations

Timber Dominant
The entire Lot will be timber dominant, except for minor riparian buffers.

Nashville Plantation South Lot Management Recommendations

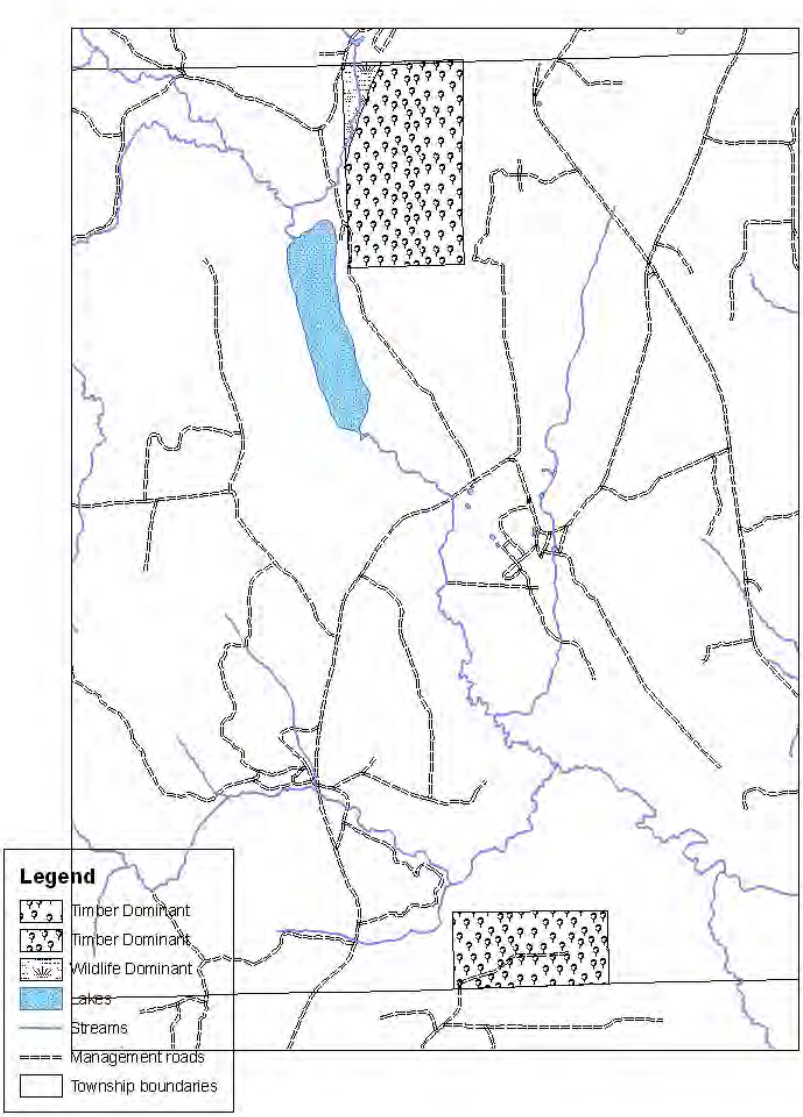
Conduct silviculture to produce fine spruce, fir and hardwood sawtimber. The 1996 prescription called for possible harvests in 2015 on much of the Lot.

Nashville Plantation North and South Lots Allocations (acres)

	Dominant Acres	Secondary Acres
Wildlife	51	
Timber Management	929	

***Dominant acreages are representations based on GIS metrics and do not sum to total unit acres due to measuring error and limits of GIS precision.*

Nashville Plantation North and South Lots Dominant Resource Allocations



Oxbow Plantation Lot

This 1,031 acre Lot is an original public lot located on the ground in 1841. It is adjacent to the western boundary of Oxbow Plantation and bordered on the north by the Aroostook River.

Natural Resources

Bedrock in the Lot is acidic sedimentary and metasedimentary rock, with till and till derived soils above. Water drains into the Aroostook River, and there are 27 acres of open wetland and seven acres of forested wetland on the Lot. Most of the open wetland is along Smith Brook, which runs through the center of the Lot from west to east. Much of these wetlands are a product of beaver activity. A mature, mixed conifer forest exists on a steep, north facing slope near the Aroostook River. A hemlock was found to be 180 years old. The maturity of the trees at this site may be due to the difficulty of harvesting on the steep slope.

Historic Resources

The MHPC has identified the south shore of the Aroostook River within this Lot as having a high probability of containing Native American sites. MHPC may perform an archeological survey in the future on this site.

Timber Resources

The Bureau harvested on this Lot from 1986-90 and removed a total of 4,900 cords, consisting mostly of mature fir and low quality hardwoods and hemlock. A small harvest in 1997 removed 500 cords of fir and hardwoods. The acreage of these combined harvests covered approximately 800 acres, and currently, these harvested stands have abundant regeneration. Forested acres on this Lot currently contain 79 percent mixedwood, 14 percent softwood, and 7 percent hardwood. Fertility is sufficient for quality hardwoods on all but the wettest and steepest sites, and most acres have several age classes. Mixedwood stands are composed of Northern Hardwoods (beech, birch and maple) as well as spruce, fir and hemlock. Softwood stands contain either spruce and fir or spruce and hemlock, while hardwood sites contain mostly beech, birch and maple. There are considerable large, old hemlocks and hardwoods on certain sites constituting late successional forest.

Transportation and Administrative Considerations

The Oxbow Road runs along the south shore of the Aroostook River, in the northern portion of the Lot. The road is on a narrow flat between the river and the steep slope to the south and provides summer access only. In addition, summer access to the south end of the Lot has been provided on recently built gravel roads on private land. There are four camplot leases on the Oxbow Plantation Lot, all along the Aroostook River.

Resource Allocations

Wildlife Dominant
A 330 foot buffer along the Aroostook River, the Smith Brook and the associated open wetlands will be wildlife dominant.

Visual Class I and II
A 100 foot strip along the Oxbow Road will be visual class I. Some of the steep slope south of the Oxbow Road will be visual class II.

Timber Dominant
The remainder of the Lot will be timber dominant.

Oxbow Plantation Lot Allocation (acres)

	Dominant Acres	Secondary Acres
Wildlife	123	
Timber Management	879	

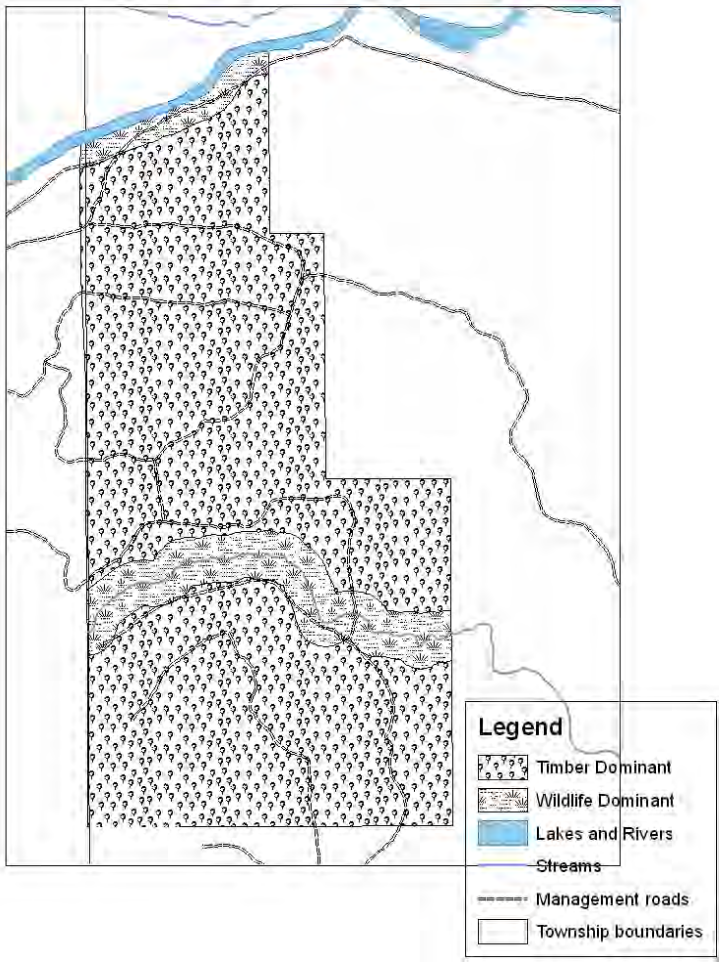
***Dominant acreages are representations based on GIS metrics and do not sum to total unit acres due to measuring error and limits of GIS precision.*

Oxbow Plantation Lot Management Recommendations

Consult with MHPC or the Bureau Historic Sites Specialist before conducting any recreational or road improvements along the shore of the Aroostook River.

Manage the forest to retain and enhance the multi-age character of most stands. The horizontal and vertical diversity which makes habitat for a variety of species should be maintained. Encourage sugar maple and spruce, maintain hemlock, and retain vigorous beech. Improve deer habitat by favoring softwoods, especially along Smith Brook.

Oxbow Plantation Lot Dominant Resource Allocations



Sheridan Lot

This 1,053 acre Lot was an original public lot that has been under Bureau management since 1973. It is located in the town of Ashland, north of the Aroostook River, with Blake Brook running through it.

Natural Resources

Bedrock in the Lot is acidic sedimentary and metasedimentary rock, with deposits above either till or swamp deposits. Soils include Aurelie-Burnham-Daigle and Perham-Daigle-Chesuncook associations. The watershed flows into the Aroostook River, and Blake Brook runs through the Lot, with associated open wetlands and forest wetlands each consisting of 65 acres. Deer wintering areas and wading bird and waterfowl habitat are also associated with Blake Brook in the center portion of the Lot. Some of the open wetlands were historically associated with beaver activity and consist of a series of open sedge and grass dominated marshes with stands of alder below abandoned beaver dams. The most downstream marsh in the Lot is a cedar seepage forest with rich plant diversity.

Timber Resources

The Bureau conducted a harvest in 1986-87 yielding over 5,000 cords. This was largely in response to the spruce budworm outbreak, so primarily mature fir was taken, although a significant amount of aspen and high risk spruce were also targeted. A harvest in 1996 removed mostly hardwoods (aspen and other species) from mixedwood acres bypassed in the 1980s harvest. Much of the Lot is two aged or multi aged as a result of the 1980s harvest. The Lot is dominated by mixedwood type at 84 percent of the regulated acres, with 12 percent softwood and 4 percent hardwood. Aspen, fir and red maple are the most common species, with many others being represented. A minority of acres are well drained enough to produce quality hardwoods, with the majority capable of growing good quality softwoods.

Resource Allocations

Wildlife Dominant
A 330 foot buffer along Blake Brook, as well as deer wintering area and wading bird and waterfowl habitat (which extend beyond the above mentioned riparian buffer) will be wildlife dominant. There is some deer wintering area on the south end of the Lot which will also be wildlife dominant. Deer activity in the south end has increased dramatically in the past few years, and much of this area will be treated as un-zoned deer wintering area.

Timber Dominant
The remainder of the Lot will be timber dominant.

Sheridan Lot Allocations (acres)

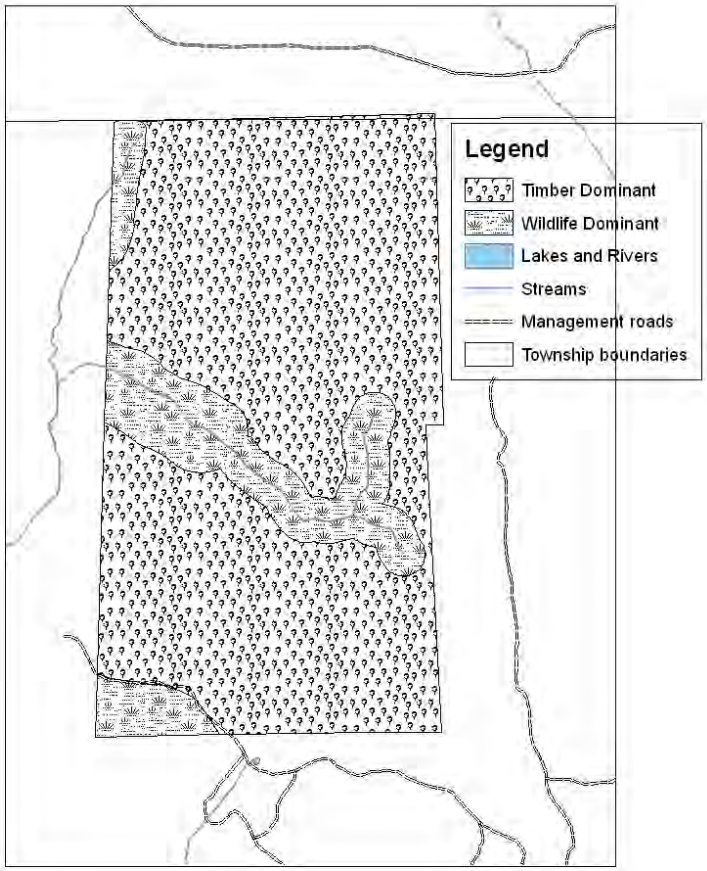
	Dominant Acres	Secondary Acres
Wildlife	186	
Timber Management	880	

***Dominant acreages are representations based on GIS metrics and do not sum to total unit acres due to measuring error and limits of GIS precision.*

Sheridan Lot Management Recommendations

Manage the forest for quality softwood sawtimber and manage many areas as un-zoned deer wintering areas.

Sheridan Lot Dominant Resource Allocations



T 9 R 5 Wels Lot

This Lot was acquired by the state in 1923, and consists of 375 acres in the southwest corner of the township. It is west of Route 11 and is distant from population centers.

Natural Resources

Bedrock on the Lot is acidic sedimentary and metasedimentary rock, with till and swamp deposits above. Aurelie-Burnham-Daigle soils compose the top layer. This Lot has a high percentage of wetlands (53 percent). Thirty five acres are open wetlands, and 163 acres are forested wetlands. The watershed drains to the Aroostook River, and there are 61 acres of wading bird and waterfowl habitat. The majority of the forested wetland consists of northern white cedar swamp. There is a small amount of sheep laurel-dwarf shrub bog on the Lot which is part of a larger peatland system that extends west.

Timber Resources

In 1984, the Bureau conducted salvage and pre-salvage harvesting targeting mainly spruce budworm damaged fir and spruce and overmature aspen. This harvest regenerated all of the non-cedar softwood acres and left many with low stocking. A small harvest of 300 cords in 1998 removed high risk fir and some spruce and hardwood for pulp. A winter harvest in 2007 removed 1,100 cords, and will be completed when markets for low quality cedar improve. This harvest has been 41 percent spruce and fir, 27 percent tamarack, 19 percent cedar and the remainder hardwood pulp.

Currently, the Lot is 96 percent softwood and 4 percent mixedwood. Spruce is dominant at 57 percent of tract volume, with cedar at 19 percent, white pine at 11 percent, tamarack at 4 percent and fir at 4 percent. Soil fertility is limited on T 9 R 5 Lot.

Transportation and Administrative Considerations

Access is difficult to this Lot, available over a wet winter road on an abutter's property. This is also a snowmobile trail, so the Bureau must coordinate with the local snowmobile club when performing forestry operations on this Lot.

Resource Allocations

Wildlife Dominant
Wading bird and waterfowl habitat, wetlands and associated riparian buffers will be wildlife dominant.

Timber Dominant
The remainder of the Lot will be timber dominant.

T9 R5 Lot

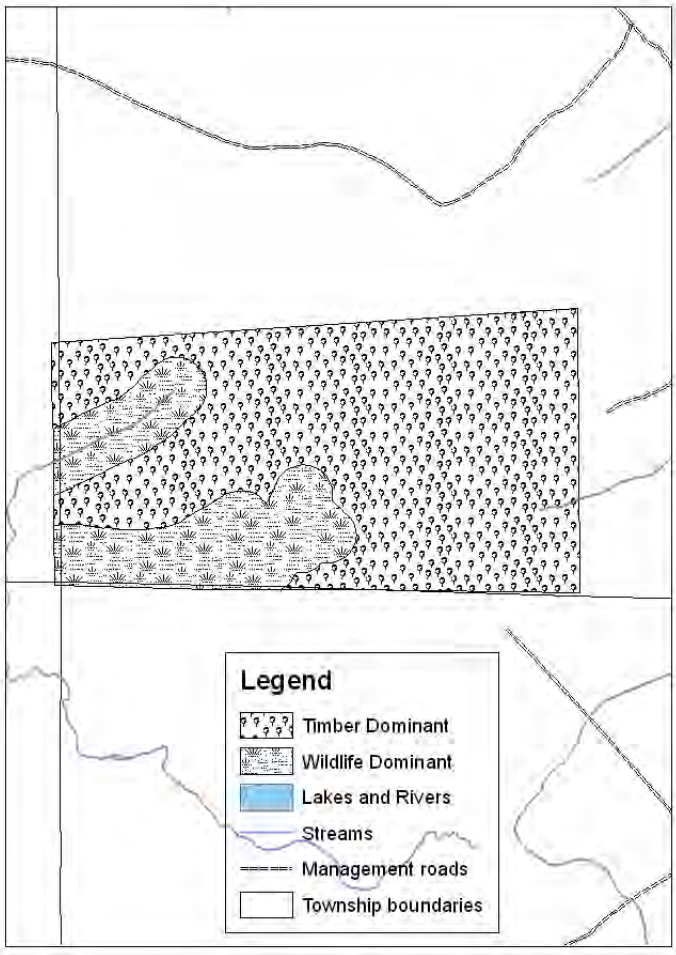
	Dominant Acres	Secondary Acres
Wildlife	89	
Timber Management	284	

***Dominant acreages are representations based on GIS metrics and do not sum to total unit acres due to measuring error and limits of GIS precision.*

T 9 R 5 Wels Lot Management Recommendations

Manage forest resources to grow quality softwood on about half the acres. The remaining sites are poorly drained and will grow cedar, spruce and pine at slow rates.

T 9 R 5 Wels Lot Dominant Resource Allocations



T 12 R 8 Lot

This 1,000 acre Lot was an original public lot located in 1850. It is about 20 miles west of Ashland and lies immediately northeast of Bald Mountain. Five separate hilltops are on the Lot, and Moose Pond Stream begins in the western part of the Lot.

Natural Resources

Bedrock is composed of mafic intermediate granite, with glacial till and Telos-Monarda-Monson soil above. All water in the Lot eventually drains to the St. John River, some by way of the Aroostook River, and some by the Fish River. There are 28 acres of wading bird and waterfowl habitat on the western side of the Lot adjacent to Moose Pond Stream. There is a record from 1981 of an observation of the 21 individuals of the giant rattlesnake plantain (*Goodyera oblongifolia*) on the northwest portion of the Lot. MNAP recommends a general survey of the area if intensive harvesting is planned.

Timber Resources

Over 700 acres were treated in 1989-91, yielding 6,600 cords. About 70 percent of the harvest was softwoods, as markets for hardwoods were not good at the time. The harvest released and established seedlings and saplings, improving the regeneration on many acres. The Lot consists of 10 percent softwood, 55 percent mixedwood, and 35 percent hardwood. The Lot consists of: 33 percent spruce, 26 percent sugar maple, 12 percent beech, 10 percent red maple, 8 percent yellow birch, and 6 percent hemlock. The Lot has fine stocking of red spruce of sawtimber size. Hardwoods are of variable quality: the beech is poor, the red maple and yellow birch are fair to good, the sugar maple is good. The sugar maple contains a higher than average percentage of sawlogs.

Transportation and Administrative Considerations

Access to the Lot is mainly on winter roads. In the mid 1970s, a significant deposit of heavy metals, mainly copper, was discovered on Bald Mountain. Planning for an extensive open pit mine were underway when the price of copper crashed. Currently, the price of copper has risen, and interest in the mine has rekindled. Though the mine location would be southwest of the Lot, there has been interest in locating spoil/overburden on the Lot (there are mining rights which exist on the Lot).

Resource Allocations

Wildlife Dominant
Areas of riparian buffer and wading bird and waterfowl habitat surrounding Moose Pond Stream will be wildlife dominant.

Timber Dominant
All other areas will be timber dominant.

T12 R8 Lot Allocations (acres)

	Dominant Acres	Secondary Acres
Wildlife	42	
Timber Management	981	

***Dominant acreages are representations based on GIS metrics and do not sum to total unit acres due to measuring error and limits of GIS precision.*

T 12 R 8 Wels Lot Management Issues

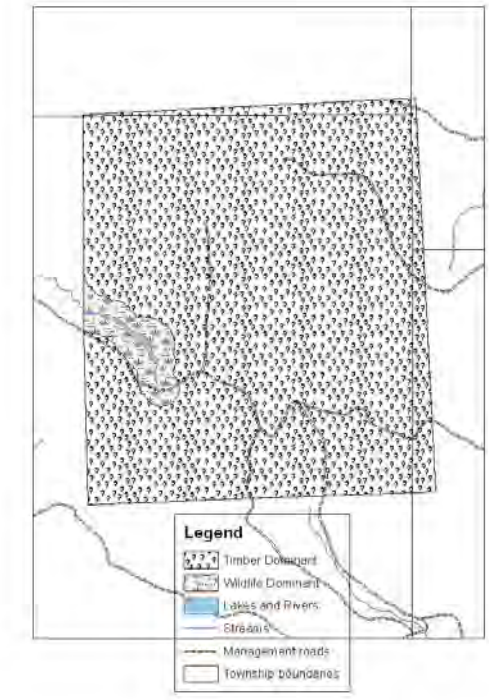
There are mining rights which may be exercised on the Lot for locating spoil from mining on Bald Mountain.

T 12 R 8 Wels Lot Management Recommendations

Manage forest resources to maintain or increase the high spruce component on softwood and mixedwood stands. Quality hardwoods, especially sugar maple, will also be encouraged on these sites. Hardwood stands will be encouraged to grow maple and birch sawlogs. Good beech will be maintained to produce mast for wildlife. Harvest to release young trees of desirable species.

Work to minimize the impact of mining spoil on the Lot, if rights are exercised.

T 12 R 8 Lot Dominant Resource Allocations



T 13 R 5 Lot

This 960 acre Lot was an original public lot located on the ground in 1849. It is on the west township line and is east of Portage Lake. The West Branch Beaver Brook runs through the Lot and Three Burnt Mountain sits in the west of the Lot.

Natural Resources

Bedrock consists of mostly acidic sedimentary and metasedimentary rock, with surficial geology of till and swamp deposits. Soils are mostly Perham-Daigle-Chesuncook association. Beaver Brook, part of which runs through the Lot, is considered a portfolio stream by The Nature Conservancy. It contains American eel and Atlantic salmon, and only 0.1 percent of its shores are developed. There are 78 acres of forested wetland on the Lot surrounding the brook, and a very small, less than an acre open wetland. The watershed flows to the Aroostook River. There are 76 acres of deer wintering area on the northern edge of the Lot, part of a larger DWA managed in coordination with IF&W.

Timber Resources

An extensive harvest in the 1970s in response to spruce budworm was performed by an abutting landowner who owned timber and grass rights on the Lot. This harvest established softwood regeneration over most acres and shifted many softwood acres to mixedwood or hardwood. Most acres remaining in softwood type were left with low overstory density. The Bureau harvested over 4,000 cords between 1988-95, covering over half the Lot's acres. Declining spruce and fir and low quality hardwoods were targeted, with hardwoods selling for pulp and firewood.

Soils through most of the Lot are moderately to well drained and fertile, supportive of quality timber of all species. Currently the Lot's regulated acres are 39 percent softwood, 20 percent mixedwood, and 41 percent hardwood. Species composition includes: 28 percent sugar maple, 16 percent spruce, 13 percent fir, 9 percent cedar and 9 percent hemlock.

There are 63 acres of the Lot formally zoned as deer wintering area, but this area is part of a historical DWA that is much larger. Budworm-caused mortality and the 1970s harvest diminished some of the good cover. However, prior to the spruce budworm epidemic, up to 60 percent of the Lot may have been good deer wintering cover, and those acres currently hold tall sapling regeneration with good softwood proportions.

Transportation and Administrative Considerations

The Lot is close to Route 11 and Beaver Brook Road, with access into the Lot by an improved management road.

Resource Allocations

Wildlife Dominant
Zoned deer wintering area and a 330 foot riparian buffer along the West Branch Beaver Brook will be wildlife dominant.

Timber Dominant
The remainder of the Lot will be timber dominant, with a focus on deer wintering cover in certain areas. Timber will be a secondary allocation in zoned deer wintering areas that are wildlife dominant.

T13 R5 Lot Allocations (acres)

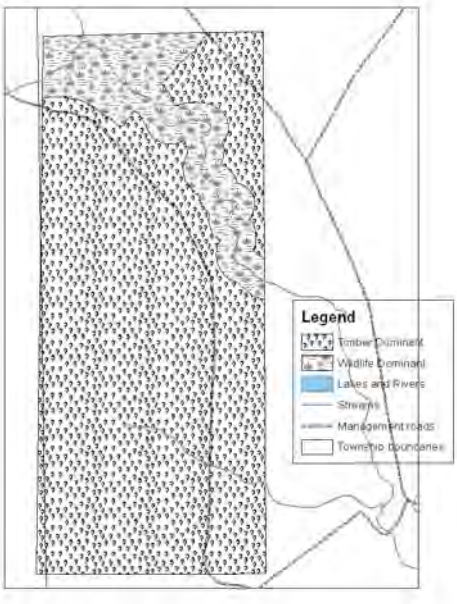
	Dominant Acres	Secondary Acres
Wildlife	155	
Timber Management	812	

***Dominant acreages are representations based on GIS metrics and do not sum to total unit acres due to measuring error and limits of GIS precision.*

T 13 R 5 Wels Lot Management Recommendations

Manage the forest to encourage deer wintering areas extensively where they have historically existed by increasing softwood type. Manage for quality softwood sawtimber on all other areas, except fertile upland areas now dominated by sugar maple and beech will be retained as such.

T 13 R 5 Lot Dominant Resource Allocations



VI. Monitoring and Evaluation

Monitoring and evaluation are needed to track progress in achieving the management goals and objectives for the Plan area and the effectiveness of particular approaches to resource management. Monitoring and evaluation will be conducted on wildlife, ecological, timber, and recreational management efforts throughout the Aroostook Hills Plan Region.

Implementation of Plan Recommendations

The Bureau will develop, within two years of Plan adoption, an action plan for implementing and monitoring the management recommendations in this Plan. This will include an assignment of priorities and timeframes for accomplishment that will be utilized to determine work priorities and budgets on an annual basis. The Bureau will document annually its progress in implementing the recommendations, plans for the coming year, and adjustments to the priorities and timeframes as needed.

Recreation

Data on recreational use is helpful in allocating staff and monetary resources for management of the properties throughout the Plan area, and in determining the public's response to the opportunities being provided.

In addition to gathering data on use, the Bureau will monitor public use to determine:

(1) whether improvements to existing facilities or additional facilities might be needed and compatible with general objectives;
(2) whether additional measures are needed to ensure that recreational users have a high quality experience (which could be affected by the numbers of users, and interactions among users with conflicting interests);
(3) whether use is adversely affecting sensitive natural resources or the ecology of the area;
(4) whether measures are needed to address unforeseen safety issues;
(5) whether changing recreational uses and demands present the need or opportunity for adjustments to existing facilities and management; and
(6) whether any changes are needed in the management of recreation in relation to other management objectives, including protection or enhancement of wildlife habitat and forest management.

Wildlife

The Bureau, through its Wildlife Biologist and Technician, routinely conducts a variety of species monitoring activities statewide. The following are monitoring activities that are ongoing or anticipated for the Aroostook Hills Region:

(1) The Bureau will cooperate with IF&W in the monitoring of game species, including deer, moose, grouse, and black bear;
(2) The Bureau will monitor loon nests on Scraggly Lake and look for impacts of recreation;
(3) The Bureau will identify and map significant wildlife habitat such as vernal pools and den trees in the process of developing its detailed forest management prescriptions. The boundaries of any sensitive natural communities will also be delineated on the ground at this time. Any significant natural areas or wildlife habitat will then be subject to appropriate protections.

Timber Management

Local work plans, called prescriptions, are prepared by professional foresters in accordance with Bureau policies specified in its *Integrated Resource Policy,* with input from other staff. These documents are then peer-reviewed prior to approval. Preparation and layout of all timber sales involve field staff looking at every acre to be treated. Trees to be harvested are generally hand marked on a majority of these acres. Regional field staff provide regular on-site supervision of harvest activities, with senior staff visiting these sites on a less frequent basis. After the harvest is completed, roads, trails, and water crossings are discontinued as appropriate, although some management roads may remain open to vehicle travel. Changes in stand type resulting from the harvest are then recorded so that the Bureau's GIS system can be updated.

The Bureau is currently developing a post-harvest monitoring plan to assist forest managers in assessing harvest outcomes on all managed lands. The monitoring plan will also address water quality and Best Management Practices (BMPs) utilized during harvest activities.

Third party monitoring is done mainly through the forest certification programs of the Forest Stewardship Council (FSC) and the Sustainable Forestry Initiative (SFI). Each program conducts rigorous investigations of both planning and on-ground practices. An initial audit by both programs was completed in 2001, with certification awarded in 2002. A full re-audit of both programs was conducted in the fall of 2006 with certification granted in 2007. The Bureau is also subject to compliance audits during the 5-year certification period.

VII. Appendices

A. Advisory Committee Members
B. Summary of the Public Process and Response to Public Comments
C. Glossary
D. References
E. MNAP Natural Resources Inventory (a separate report available from the Bureau upon request)
F. Timber and Renewable Resource Documents (available from the Bureau on request):
    - *Compartment Examination Manual*
    - *Prescription Manual and prescriptions for the Eastern Interior Region lands*
    - *Timber Sale Manual*
    - *Forest Inventory data*
    - *Forest Certification Reports from Sustainable Forestry Initiative, Forest Stewardship Council (March 2002 and 2007).*
    - *Maine Bureau of Parks and Lands Forest Certification Manual*
    - *Soil surveys*
    - *Forest Laws of Maine*
    - *Best Management Practices Manual*

Appendix A. Advisory Committee Members

Charlie Beck, Sportsman's Alliance of Maine
Jensen Bissell, Baxter State Park Authority
Dan Bridgham, Maine Snowmobile Association
Don Cameron, Maine Natural Areas Program
Kenny Fergusson, Huber Resources Corp.
Bill Greaves, Maine Forest Service
Harry Hafford
Rocky Hill, Mapleton ATV club
Terry Hill, Bowlin-Matagamon Snowmobile Club
Matt Libby, Maine Professional Guides Association
Fred Moreau, Walker Siding at Squapan
Bob Sawyer, Dunn Timberlands
Scott Thompson, Aroostook State Park
Bob Vigue, Seven Island Land Co.

Appendix B. Summary of Public Process and Responses to Public Comments

Summary of Public Process

Public Scoping Session	June 4, 2008 in Ashland	16 members of the public attended
Advisory Committee Meeting	July 30, 2008 in Ashland	5 advisory committee members attended
Advisory Committee Meeting on First Draft	May 11, 2009 in Ashland	7 advisory committee members attended
Public Meeting on Final Draft	July 9, 2009 in Ashland	10 members of the public attended

Responses to Comments

Summary of Written Comments on the First Draft of the Aroostook Hills Region Management Plan
April 28 – May 21, 2009
(Does not include typographical, grammatical, or formatting comments that have been corrected where possible.)

Comment	Response
From: Rocky Hill Sr and Clayton Craig, Mapleton ATV Club, and Dan Bridgham, Maine Snowmobile Association (MSA)	
• Squapan Unit--The ATV club would like to begin work right away to upgrade the snowmobile ridge trail for ATV use. They feel they have been denied use of this trail for too long, that erosion is not bad, and safety is not a serious concern. They have already built water bars and worked to stop unauthorized ATV use of this trail and feel the time is right to make the final upgrades and start using this trail. The MSA also supports upgrading this trail soon for ATV use and believes the trail does not have a significant impact on the surrounding ecosystem.	• ATV riding is an important component of the Squapan Unit, which contains a dense network of ATV trails connected with a regional ATV trail system. The ridge trail, however, has only been authorized for snowmobile use up to this point because its steepness led to safety and erosion concerns for ATV use. In addition, the MNAP identified an area surrounding this trail as an important Spruce-Fir-Northern Hardwoods Ecosystem and have recommended special management of this area. The Bureau's Integrated Resource Policy directs staff to: follow best management practices to protect soil when building trails, manage carefully natural communities identified as important by MNAP, and consider safety when evaluating lands for trail use. The IRP relies on staff expertise to evaluate whether an area or trail is suitable for ATV use due to environmental and safety standards. Bureau

	staff has determined that in order for the Ridge Trail to accommodate ATV use safely and with minimal environmental impact to soils and surrounding natural communities, the trail must be significantly improved. As soon as possible, considering staff time and funding constraints, a detailed, engineered plan will be made and the trail will be upgraded and authorized for ATV use.
From: Rocky Hill Sr and Clayton Craig, Mapleton ATV Club	
• Squapan Unit--The ATV club would like to use the "old camp yard" site along the ATV lower loop trail for picnicking and camping. They would obtain a fire permit, put in a fire place, and maintain the area for picnicking and camping. They would like to develop this site immediately. BPL staff told them this site is not appropriate for this use due to fire danger, but they do not agree with this assessment.	• The Bureau agrees a day use area is an appropriate use of the "old camp yard". Once this management plan has been adopted, the Bureau will be able to work with the Mapleton ATV club to obtain the necessary funding, permits and materials to develop this site. However, this recreational development will need to be balanced with many other demands on Bureau staff time and funds. As a result, the site may not be able to be developed as rapidly as the ATV club has requested. The Bureau also will consider camping at this site if it can be connected to a network of similar ATV camping opportunities along the regional trail system. The Bureau has committed in this plan to assessing the demand for this type of camping area and cooperating in a regional ATV camping system if one is initiated.
From: Rocky Hill Sr and Clayton Craig, Mapleton ATV Club	
• Squapan Unit--The ATV club would like a boat ramp to be built near Sylvester Point. This location is appropriate due to its deep water cove, views, and the possibility of upgrading an old winter road in order to extend the North Road to Sylvester Point.	• If arrangements cannot be made to open the Walker Siding boat ramp to the public, the Bureau has committed to building a boat launching facility on the Squapan Unit when a suitable site can be located and funding can be obtained. The Bureau appreciates public input into the siting of a boat launching facility, but cannot commit to a specific location in this plan. A full evaluation of sites will need to be made. Criteria in choosing a site will include: cost-effectiveness, ability to accommodate an ADA accessible facility, ability to obtain legal public right-of-way, and ability to

	accommodate a full-service motor boat facility without violating environmental standards.
From: Dan Bridgham, Maine Snowmobile Association	
• Squapan Unit—Trails on the Unit should be developed for horseback riders, hikers and bird-watchers. A single multiple use trail system could be developed more on the Unit to include ATVs, horseback riders, hikers and birdwatchers.	• Currently all public use roads, management roads, snowmobile trails and ATV trails are open to hikers. The Bureau has committed in this plan to determine if there is sufficient demand for a non-motorized trail that connected Haystack Mountain and Squapan Ridge. Anyone interested in this or other non-motorized trails in the Unit should contact the regional staff in Ashland and express support. As stated in the IRP, the Bureau will use the following criteria when evaluating lands for trail establishment: documented need and demand for use, safety, environmental and wildlife impacts, compatibility with other uses, local ordinances or deed restrictions, trail maintenance issues, and enforcement issues. • The IRP states that horseback riders are welcomed on those public access and management roads signed as shared use. Such signage exists in the Squapan Unit. Trails designated as ATV and/or snowmobile trails located off of the roads may not be suitable for horseback riding without significant upgrades. However, the Bureau is open to building relationships with user groups and establishing new trails and new uses on existing trails when the criteria mentioned above are met. Horseback riders interested in expanding opportunities are encouraged to contact the regional staff in Ashland to discuss possibilities.
From: Dan Bridgham, Maine Snowmobile Association	
• Squapan Unit—The existing fire tower is a hazard and should be upgraded so the public could safely climb about 20 feet and a view should be cleared. An ATV and snowmobile trail should be built to the last pitch, and a foot trail should be built from the last pitch to the tower.	• This plan commits to determining demand for a non-motorized trail to the fire tower and obtaining information on the cost of improving the fire tower and building the trail. If funding can be obtained and demand can be demonstrated, these improvements will be made.
From: Dan Bridgham, Maine Snowmobile Association	

• Squapan Unit—The top of the ridge would be an excellent location for windmills. The plan should mention future intentions for wind power on the Unit.	• The Squapan Ridge has been identified as containing an important Spruce-Fir-Northern Hardwoods Ecosystem and exemplary Hemlock Forest. It has been identified by MNAP as a potential addition to the state's Ecological Reserve system. This plan allocates much of the ridgeline as "wildlife dominant" which provides for special management of its exemplary communities. The Bureau has further specified in this Plan that there will be no development or timber management in the area until decisions on ecological reserve additions have been completed at the completion of the Bureau's current management plan cycle, expected sometime in 2013. The Squapan Ridge will not be considered for wind power development in this interim period. If the Squapan Ridge is not included in future ecological reserve additions, and demand for wind power on the ridge were to arise, the Bureau would consider the ecological values of the area, determined by MNAP and the Ecological Reserves Scientific Advisory Committee to be of statewide significance, in addition to other factors in making a decision.
From: Dan Bridgham, Maine Snowmobile Association	
• Squapan Unit—Obtaining deeded access to the Unit is important for getting funding for the boat access facility. There should be three access routes into the Unit—the two current public access roads and the ATV trail that enters the Unit from the east.	• The Bureau agrees expanding legal right-of-way into the Unit is a priority; a management recommendation to do so included in this plan. The willingness of the landowners of the existing roads into the Unit will determine where such a right-of-way could be located.
From: Dan Bridgham, Maine Snowmobile Association	
• All of the allocations should contain acreage estimates.	• Acreage estimates for allocations have been added to the plan.

Summary of Comments on the Final Draft of the Aroostook Hills Management Plan From Public Meeting on July 9, 2009 (Does not include typographical, grammatical, or formatting comments that have been corrected where possible.)	
Comment	**Response**
From: Charlie Beck, Sportsman's Alliance of Maine	
• The Bureau should make clearer its policies on hunting on the Squapan Unit and throughout the system. In particular, there needs to be more awareness of where hunting is not allowed, through information in the plan, on kiosks, and/or through public service announcements.	• Hunting is permitted widely throughout lands in the plan region. Bureau rules state that firearms are not to be discharged within 300 feet of a campsite, marked hiking trail, boat launch or picnic site. On the Squapan Unit, areas off limits to hunting include the five water access campsites on Squapan Lake. The Bureau makes efforts to inform the public of hunting policies through brochures and maps that are also posted on kiosks in most of the major units. The Bureau can temporarily close areas with active logging operations to hunting, and places signage around the operation to inform the public. The IRP gives the option of closing to hunting certain areas allocated to other recreation uses when hunting impacts the safety of other users. When this occurs, notification is placed on kiosks in the affected unit.
From: Aaron Buzza, Squapan Outing Club	
• Squapan Unit--The Squapan Outing Club is opposed to the Bureau building a public boat ramp on the north end of the lake across from their camps. Underage parties and lack of policing would be problems. There would be a great increase in use of the Unit, and many members of the public would enter the Squapan Outing Club area and leave trash and cause other problems.	• The Bureau would like to work with the Squapan Outing Club to consider re-opening their boat ramp to the public. If this is not possible, the Bureau has committed to building a public ramp on the Unit if funding can be obtained and an appropriate site can be identified. A full evaluation of sites on the Unit will need to be made. Criteria in choosing a site will include: cost-effectiveness, ability to accommodate an ADA accessible facility, ability to obtain legal public right-of-way, and ability to accommodate a full-service motor boat facility without violating environmental standards.
From: David Basley, IF&W	

• Scraggly Lake Unit—The Unit should be opened to un-groomed snowmobiling even in winters when the club trail is not groomed due to heavy deer use.	• This is the status quo in the Scraggly Lake Unit, and it is the Bureau's intention to continue allowing this use.
From: Arlen Lovewell, IF&W	
• IF&W would like to coordinate with Bureau foresters on increasing deer habitat in the Squapan Unit, and the following lots: Nashville North, Sheridan, Oxbow, and T13 R5. Increasing the hemlock component is particularly important in Nashville North and Oxbow.	• The Bureau manages deer habitat on formally zoned deer wintering areas as well as in many other areas throughout its public reserved lands. Bureau foresters regularly communicate with IF&W regional staff and IF&W has a full-time Wildlife Biologist assigned to the Bureau to assist in wildlife management. IF&W staff are always encouraged to contact Bureau staff with information relating to deer habitat and thanks IF&W for bringing to the foreground these opportunities to improve deer habitat in the Aroostook Hills region.

Appendix C. Glossary

"Age Class": the biological age of a stand of timber; in single-aged stands, age classes are generally separated by 10-year intervals.

"ATV Trails": designated trail**s** of varying length with a variety of trail surfaces and grades, designed primarily for the use of all-terrain vehicles.

"All-Terrain Vehicles": motor driven, off-road recreational vehicles capable of cross-country travel on land, snow, ice, marsh, swampland, or other natural terrain. For the purposes of this document an all-terrain vehicle includes a multi-track, multi-wheel or low pressure tire vehicle; a motorcycle or related 2-wheel vehicle; and 3- or 4-wheel or belt-driven vehicles. It does not include an automobile or motor truck; a snowmobile; an airmobile; a construction or logging vehicle used in performance of its common functions; a farm vehicle used for farming purposes; or a vehicle used exclusively for emergency, military, law enforcement, or fire control purposes (Title 12, Chapter 715, Section 7851.2).

"Bicycling/ Recreation Biking Trails": designated trails of short to moderate length located on hard-packed or paved trail surfaces with slight to moderate grades, designed primarily for the use of groups or individuals seeking a more leisurely experience.

"Boat Access - Improved": vehicle-accessible hard-surfaced launch site**s** with gravel or hard-surface parking areas. May also contain one or more picnic tables, an outhouse, and floats or docks.

"Boat Access - Unimproved": vehicle-accessible launch sites with dirt or gravel ramps to the water and parking areas, and where no other facilities are normally provided.

"Boat Ramp – Primitive Trailer Accessible": ramp that is suitable for small, trailered boats. The ramp may not meet national standards for one or more criteria. Owners of large boats should use discretion when deciding to use these facilities.

"Boat Ramp – Trailer Accessible": ramp that is suitable for use by most recreational boats, and which meets national standards for slope, surfacing and water depth.

"Campgrounds": areas designed for transient occupancy by camping in tents, camp trailers, travel trailers, motor homes, or similar facilities or vehicles designed for temporary shelter. Developed campgrounds usually provide toilet buildings, drinking water, picnic tables, and fireplaces, and may provide disposal areas for RVs, showers, boat access to water, walking trails, and swimming opportunities.

"Carry-In Boat Access": dirt or gravel launch site**s** accessible by foot over a short to moderate length trail, that generally accommodates the use of only small watercraft. Includes a trailhead with parking and a designated trail to the access site.

"Clear-cut": an single-age harvesting method in which all trees or all merchantable trees are removed from a site in a single operation.

"Commercial Forest Land": the portion of the landbase that is both available and capable of producing at least 20 cubic feet of wood or fiber per acre per year.

"Commercial Harvest": any harvest from which forest products are sold. By contrast, in a pre-commercial harvest, no products are sold, and it is designed principally to improve stand quality and conditions.

"Community": an assemblage of interacting plants and animals and their common environment, recurring across the landscape, in which the effects of recent human intervention are minimal ("Natural Landscapes Of Maine: A Classification Of Ecosystems and Natural Communities" Maine Natural Heritage Program. April, 1991).

"Cross-Country Ski Trails": designated winter-use trails primarily available for the activity of cross-country skiing. Trails may be short to long for day or overnight use.

"Ecosystem Type": a group of communities and their environment, occurring together over a particular portion of the landscape, and held together by some common physical or biotic feature.
("Natural Landscapes Of Maine: A Classification Of Ecosystems and Natural Communities." Maine Natural Heritage Program, April, 1991).

"Folist Site": areas where thick mats of organic matter overlay bedrock, commonly found at high elevations.

"Forest Certification": A process in which a third party "independent" entity audits the policies and practices of a forest management organization against a set of standards or principles related to sustainable management. It may be limited to either land/forest management or product chain-of-custody, or may include both.

"Forest Condition (or condition of the forest)": the state of the forest, including the age, size, height, species, and spatial arrangement of plants, and the functioning as an ecosystem of the combined plant and animal life of the forest.

"Forest Stewardship Council (FSC) Certification": A third-party sustainable forestry certification program that was developed by the Forest Stewardship Council, an independent, non-profit, non-governmental organization founded in 1993. The FSC is comprised of representatives from environmental and conservation groups, the timber industry, the forestry profession, indigenous peoples' organizations, community forestry groups, and forest product certification organizations from 25 countries. For information about FSC standards see http://www.fscus.org/standards_criteria/ and www fsc.org.

“Forest Type”: a descriptive title for an area of forest growth based on similarities of species and size characteristics.

“Group Camping Areas”: vehicle or foot-accessible area**s** designated for overnight camping by large groups. These may include one or more outhouses, several fire rings or fire grills, a minimum of one water source, and several picnic tables.

“Horseback Ride/Pack Stock Trails”: generally moderate to long-distance trails designated for use by horses, other ride, or pack stock.

“Invasive Species”: generally nonnative species which invade native ecosystems and successfully compete with and displace native species due to the absence of natural controls. Examples are purple loosestrife and the zebra mussel.

“Late successional”: The condition in the natural progression of forest ecosystems where long-lived tree species dominate, large stems or trunks are common, and the rate of ecosystem change becomes much more gradual. Late successional forest are also mature forests that, because of their age and stand characteristics, harbor certain habitat not found elsewhere in the landscape.

“Log Landings”: areas, generally close to haul roads, where forest products may be hauled to and stored prior to being trucked to markets.

“Management Roads”: roads designed for timber management and/or administrative use that may be used by the public as long as they remain in service. Management roads may be closed in areas containing special resources, where there are issues of public safety or environmental protection.

“Mature Tree”: a tree which has reached the age at which its height growth has significantly slowed or ceased, though its diameter growth may still be substantial. When its annual growth no longer exceeds its internal decay and/or crown loss (net growth is negative), the tree is over-mature.

“Motorized”: a mode of travel across the landbase which utilizes internal combustion or electric powered conveyances; which in itself constitutes a recreational activity, or facilitates participation in a recreational activity.

“Mountain Bike Trails”: designated trail**s** generally located on rough trail surfaces with moderate to steep grades, designed primarily for the use of mountain bicycles with all-terrain tires by individuals seeking a challenging experience.

“Multi-aged Management": management which is designed to retain two or more age classes and canopy layers at all times. Its harvest methods imitate natural disturbance regimes which cause partial stand replacement (shelterwood with reserves) or small gap disturbances (selection).

"Natural Resource Values": described in Maine's Natural Resource Protection Act to include coastal sand dunes, coastal wetlands, significant wildlife habitat, fragile mountain areas, freshwater wetlands, great ponds and rivers, streams, and brooks. For the purposes of this plan they also include unique or unusual plant communities.

"Non-motorized": a mode of travel across the landbase which does not utilize internal combustion, or electric powered conveyances; which in itself constitutes a recreational activity, or facilitates participation in a recreational activity.

"Non-native (Exotic)": a species that enters or is deliberately introduced into an ecosystem beyond its historic range, except through natural expansion, including organisms transferred from other countries into the state, unnaturally occurring hybrids, cultivars, genetically altered or engineered species or strains, or species or subspecies with nonnative genetic lineage.

"Old Growth Stand": a stand in which the majority of the main crown canopy consists of long-lived or late successional species usually 150 to 200 years old or older, often with characteristics such as large snags, large downed woody material, and multiple age classes, and in which evidence of human-caused disturbance is absent or old and faint.

"Old Growth Tree": for the purposes of this document, a tree which is in the latter stages of maturity or is over-mature.

"Pesticide": a chemical agent or substance employed to kill or suppress pests (such as insects, weeds, fungi, rodents, nematodes, or other organism) or intended for use as a plant regulator, defoliant, or desiccant. (from LURC Regulations, Ch. 10)

"Primitive Campsites": campsites that are rustic in nature, have one outhouse, and may include tent pads, Adirondack-type shelters, and rustic picnic tables. Campsites may be accessed by vehicle, foot, or water.

"Public Road or Roadway": any roadway which is owned, leased. or otherwise operated by a government body or public entity. (from LURC Regulations, Ch. 10)

"Public Use Roads": all-weather gravel or paved roads designed for two-way travel to facilitate both public and administrative access to recreation facilities. Includes parking facilities provided for the public. Management will include roadside aesthetic values normally associated with travel influenced zones.

"Recreation Values": the values associated with participation in outdoor recreation activities.

"Regeneration": both the process of establishing new growth and the new growth itself, occurring naturally through seeding or sprouting, and artificially by planting seeds or seedlings.

"Regulated Acres": On Bureau lands, regulated acreage is the portion of the commercial forest landbase on which the sustainable harvest will be calculated at or near maximum sustainable levels.

"Remote Ponds": As defined by the Maine Land Use Regulation Commission: ponds having no existing road access by two-wheel drive motor vehicles during summer months within ½ mile of the normal high water mark of the body of water with no more than one noncommercial remote camp and its accessory structures within ½ mile of the normal high water mark of the body of water, that support cold water game fisheries.

"Riparian": an area of land or water that includes stream channels, lakes, floodplains and wetlands, and their adjacent upland ecosystems.

"Salvage": a harvest operation designed to remove dead and dying timber in order to remove whatever value the stand may have before it becomes unmerchantable.

"Selection": related to multi-aged management, the cutting of individual or small groups of trees; generally limited in area to patches of one acre or less.

"Service Roads": summer or winter roads located to provide access to Bureau-owned lodging, maintenance structures, and utilities. Some service roads will be gated or plugged to prevent public access for safety, security, and other management objectives.

"Silviculture": the branch of forestry which deals with the application of forest management principles to achieve specific objectives with respect to the production of forest products and services.

"Single-aged Management": management which is designed to manage single age, single canopy layer stands. Its harvest methods imitate natural disturbance regimes which result in full stand replacement. A simple two-step (seed cut/removal cut) shelterwood is an example of a single-aged system.

"Snowmobile Trails": designated winter-use trails of varying length located on a groomed trail surface**s** with flat to moderate grades, designed primarily for the use of snowmobiles.

"Stand": a group of trees, the characteristics of which are sufficiently alike to allow uniform classification.

"Succession/ successional": progressive changes in species composition and forest community structure caused by natural processes over time.

"Sustainable Forestry/ Harvest": that level of timber harvesting, expressed as treated acres and/or volume removals, which can be conducted on a perpetual basis while providing for non-forest values. Ideally this harvest level would be "even-flow," that is, the same quantity each year. In practice, the current condition of the different properties

under Bureau timber management, and the ever-changing situation in markets, will dictate a somewhat cyclical harvest which will approach even-flow only over time periods of a decade or more.

"Sustainable Forestry Initiative (SFI)": A third party sustainable forestry certification program that was developed in 1994 by the American Forest and Paper Association, which defines its program as "a comprehensive system of principles, objectives and performance measures that integrates the perpetual growing and harvesting of trees with the protection of wildlife, plants, soil and water quality." To review SFI standards see http://www.afandpa.org/Content/NavigationMenu/Environment_and_Recycling/SFI/The_SFI_Standard/The_SFI_Standard.htm

Appendix D. References

Cordell, H. Ken. 2008. "The Latest on Trends in Nature Based Outdoor Recreation." *Forest History Today*: Spring 2008.

Evers, David. 2007. Pre-filed testimony on behalf of Maine Audubon and Natural Resources Council of Maine commenting on the application of Zoning Petition ZP 707 submitted to the Land Use Regulation Commission. Downloaded from: http://www.maine.gov/doc/lurc/review/PlumCreek/ReceivedFromParties/2007-08-31%20Filings_PrefiledDirectTestimony/NRCM-MA/2007-08-31_NRCM-MA_Testimony.pdf on 01/15/2009.

Federal Energy Regulatory Commission (FERC). 1991. "Order Issuing New License." License issued to Maine Public Service Company for Project No. 2368 (Squapan Dam).

International Appalachian Trail. 2009. "Route/Trail Guides" page. Online resource accessed 02/03/2009 from: http://www.internationalat.org/Pages/SIAIAT_Pages/route

Judd, Richard, Edwin Churchill, and Joel Eastman. 1995. "Maine: The Pine Tree State from Prehistory to the Present." The University of Maine Press, Orono, ME.

Maine Birding Trail. 2009. "Maine Birding Trail." Online resource accessed 02/03/2009 from: http://www.mainebirdingtrail.com/index.htm

Maine Department of Inland Fisheries and Wildlife (IF&W). 2005. Maine's Comprehensive Wildlife Conservation Strategy." Downloaded from http://maine.gov/ifw/wildlife/groups_programs/comprehensive_strategy/ on 01/14/2009.

Maine Natural Areas Program (MNAP). 2008. "Natural Resources Inventory of the Aroostook Hills Region." Prepared for the Bureau of Parks and Lands by Don Cameron of MNAP.

Maine Public Service Company (MPSCo). 1997. "1997 Common Loon Population Assessment." Report to Federal Energy Regulatory Commission to fulfill license requirement.

Maine Winter Sports Center (MWSC). 2009. Online resource accessed on 02/03/2009 from: http://www.mainewsc.org/index.html

Mcgrath, Anna Fields. 1989. "The County: Land of Promise." For Friends of Aroostook County Historical Center. The Donning Company, Norfolk, Virginia.

McMahon, Janet. 1998. "An Inventory of Potential Ecological Reserves on Maine's Public Lands and Private Conservation Lands." Report prepared for the Maine Forest Biodiversity Project, Rockland, ME.

Planning Decisions. 2003. "Aroostook County Economic Cluster Report Part I: Analysis." For Northern Maine Development Commission, Caribou, ME. Online resource accessed on 01/14/2008 from: http://www.nmdc.org/WebReports/AroostookIndustryclusters-Analysis-8-03.pdf.

PEARL database. 2008. http://pearl.spatial.maine.edu/.

U.S. Fish and Wildlife Service (USFWS). 2008. "2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation." Online resource accessed on 01/20/2009 from: http://library.fws.gov/nat_survey2006.pdf