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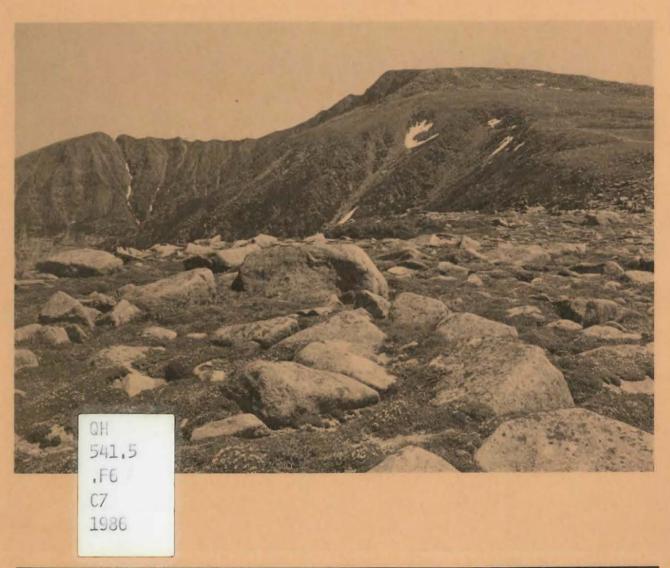
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Uncut Timber Stands and Unique Alpine Areas on State Lands



Executive Department

Maine State Planning Office April 1986



STATE OF MAINE EXECUTIVE DEPARTMENT

STATE PLANNING OFFICE

JOSEPH E. BRENNAN GOVERNOR

April 8, 1986

RICHARD E. BARRINGER DIRECTOR

The Honorable Members 112th Maine Legislature State House Augusta, Maine 04333

Dear Legislator,

I am very pleased to transmit to you this report on Uncut Timber Stands and Unique Alpine areas on State lands in Maine.

In 1983, the Maine Legislature directed the State Planning Office to inventory State-owned lands for forested areas that had never been harvested, as well as for unique alpine areas.

We have reviewed past studies and conducted additional field work in the Mahoosuc Mountains, the Bigelow Preserve, Baxter State Park, and T.15 R.9, those public lands with higher elevations. We conclude that the State of Maine owns and manages for conservation the best areas of alpine vegetation in the State of Maine, but owns very few of the truly "old-growth" forests.

More detailed studies of State-owned alpine and old-growth areas, upon which this report is based, are available upon request.

The staff of the State Planning Office and the Critical Areas Program are most grateful for this opportunity to be of service to you and to the people of Maine.

With very best wishes,

Sincerely,

Richard E. Barringer

Uncut Timber Stands and Unique Alpine Areas on State Lands

Prepared by

Maine State Planning Office Critical Areas Program 184 State Street Augusta, Maine 04333

with the assistance of the Bureau of Public Lands Department of Conservation and The Baxter State Park Authority

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Executive Summary

The 111th Legislature directed the State Planning Office to inventory uncut timber stands and unique alpine areas on State-owned lands.

To conduct this study, Critical Areas Program staff drew upon previous inventories and undertook additional studies in 1984 and 1985. Our review was limited to State-owned lands in T.15 R.9 WELS, Baxter State Park, Bigelow Mountain, and the Mahoosuc Mountains. All the background reports used are available from the Maine State Planning Office.

Our studies found that the State owns and manages the most significant alpine vegetation areas in Maine, with Mt. Katahdin being the most significant. Relatively few old-growth forests were found on State lands. In most cases, all the lower elevation forest lands had been commercially harvested. Only fifteen old-growth forest stands, totaling 1553 acres, were documented in this study. The largest old-growth forest areas were found in Baxter State Park and T.15 R.9 W.E.L.S.

Subalpine forests were also documented on 23,094 acres in Baxter State Park, 1334 acres in Bigelow Preserve, 332 acres on Baldpate, and 2444 in the Mahoosuc Mountains. Because subalpine forests have not been comprehensively inventoried in Maine, this study did not evaluate the relative significance of subalpine forests on State lands.

Nine specific recommendations are made to promote the conservation of exceptional forest areas and alpine vegetation. The major recommendations include:

- Existing management plans should be updated by the Bureau of Public Lands and Baxter State Park Authority to consider the exceptional values of old-growth forests and alpine vegetation.
- The topic of subalpine forests should be evaluated by the Critical Areas Advisory Board to determine whether subalpine forests merit inclusion on the Register of Critical Areas.
- Old-growth forest areas documented in this report should be considered for inclusion on the Register of Critical Areas.
- A Maine Forest Reserve System should be established, beginning on State-owned lands, to protect forest stands of exceptional value. Potential sites are identified in the Critical Areas Program's 1984 and 1985 inventories. All State land should be inventoried to identify other potential sites.

Introduction

In 1983 the Legislature directed the State Planning Office to inventory uncut timber stands and unique alpine habitats on State-owned lands. A copy of the legislative resolve calling for the study is on page 21 of this report.

The Critical Areas Program drew upon previous inventories of alpine areas and old-growth forests, as well as the results of special inventories of State-owned lands in 1984 and 1985 for the findings in this report. The new work focused on the mountainous areas of Baxter State Park in 1984 and the Bigelow Preserve, the Mahoosuc Mountains, and Baldpate Mountain in 1985 (Figure 1). Dr. Donald Hudson, Jr. of the Chewonki Foundation performed this work with funding provided by the Evelyn H. Murphy Fund of the Appalachian Mountain Club and the participating agencies. In addition, the high elevations of T.15 R.9 in Aroostook County were inventoried in 1984 in a joint project with the Bureau of Public Lands. Copies of Dr. Hudson's reports and the T.15 R.9 report are available from the State Planning Office.

The combined results of all these inventories documented a total of fifteen old-growth forests on 1553 acres; 23,094 acres of subalpine forest above 2500 feet in Baxter State Park, and 4110 acres of subalpine forest above 3000 feet on public land; and 1669 acres of alpine vegetation.

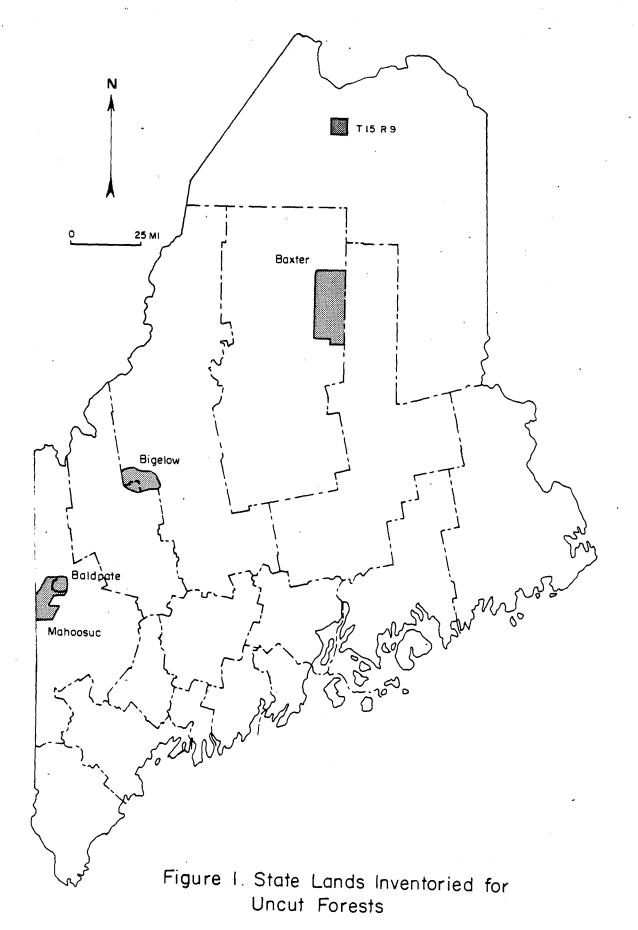
Method

Standard and accepted natural history inventory techniques were used throughout this study to document subalpine forests, old-growth forests and alpine areas. To identify and document old-growth forests, past cutting records were examined. Age determinations were made using increment cores from the trees. Because so few old-growth forest stands were discovered through this study, no comparative analysis was made among the fifteen stands.

Uncut Timber Stands

Forests that have never been cut are very rare in Maine. The State's forests have been harvested, most of them several times, since the early 1600's, and mountain slopes have been harvested to at least 2,700 feet and sometimes higher. Thus, only a few forests remain uncut and undisturbed, usually on remote and inaccessible areas such as mountain tops.

Two types of uncut timber stands are discussed in this report: old-growth forests and subalpine forests.



Old-growth forests are composed of long-lived species such as red spruce, white pine, hemlock, sugar maple, beech, red oak and white oak. Mature trees of these species generally exceed 250 years in age, reach a tremendous height and girth, and are very rare since they have great commercial value. Today these remnant forests provide us with an historical glimpse of what Maine's presettlement forests were like and have important scientific and educational value. This study documented fifteen old-growth forests, totaling 1553 acres, on State-owned lands.

Subalpine forests, found from about 2,500 feet to treeline, are comprised almost entirely of balsam fir, a relatively short-lived species. Subalpine forests usually do not exceed 100 years in age. Because the trees have little commercial value (they do not grow exceptionally large) and the high-elevation timber is difficult to reach, subalpine forests usually have not been cut. These tracts of forest represent the largest areas of uncut and undisturbed forest in Maine, and they are a significant source of baseline information for understanding the development of high-elevation forests, the impact of spruce budworm on subalpine forests, and the impact of air pollution and acid rain on high-elevation forests. Subalpine forests, documented on 27,204 acres in this study, are well-represented on State-owned lands. The study did not evaluate which of the subalpine areas are most significant on State-owned lands or throughout the State.

In Baxter State Park there is good documentation that commercial cutting did not occur above 2500 feet. However, in western Maine in Bigelow, the Baldpates and the Mahoosucs it is much more difficult to determine the exact lower limits of the uncut forests. Depending upon the slope and terrain, commercial timber harvesting occurred to about the 3000 foot level. Due to the uncertainty of verifying the existance of forest areas that have never been cut in the Bigelow and Mahoosuc Mountains, it is proposed that 3000 foot contour be used as the lower limit of uncut subalpine forests. This will insure that only the highest quality areas are considered.

Because the topic of subalpine forests is a new research topic for the Critical Areas Program, an evaluation and ranking of the subalpine forest was not undertaken. This was due in part to the lack of statewide comprehensive data available on subalpine forests. There are a number of privately-owned subalpine forests in Maine that were not inventoried.

Uncut Timber Stands

Baxter State Park

Baxter State Park contains 201,018 acres and is well known as one of the wildest and most spectacular mountain areas in the eastern U.S. There are at least 46 mountain peaks in the Park, 18 of which exceed an elevation of 3,500 feet. Mt. Katahdin, Maine's highest mountain, rises 5,240 feet (Figure 2 and 3).

Most of the uncut forest areas in Baxter Park consist of the 23,094 acres of subalpine forests found on five mountains: Traveler, North Brother, The Owl, Mt. Katahdin, and Russell (Table 1). This is the most significant extent of subalpine forest in Maine. An unusual feature of Baxter's subalpine forest is the presence of "fir waves" -- alternating stands of dead and live balsam firs -- which occur on only a few peaks in the world.

Old-growth forests are rare in Baxter, because most of the land was commercially harvested before a Park was established. There are six small old-growth stands, ranging from one to 25 acres in size and one large stand of 832 acres for a grand total of 889 acres (Table 1). Five of the stands are 250 to 300 years old red spruce. The most exceptional stand is the 832-acre Klondike, a totally undisturbed area of black spruce located in a bowl at 2,500 to 2,800 feet elevation.

Bigelow

Bigelow Mountain is a dramatic range with a sharp ridge trending southeast to northwest for about 17 miles. A series of five peaks are found along the ridge, and the highest -- West Peak -- rises 4,150 feet. As one guidebook puts it, "Bigelow has the deserved reputation as one of Maine's premier mountains."

Little uncut forest remains in the 30,498-acre Bigelow Preserve, where past commercial timber harvesters have cut to an elevation between 2500 feet and 3000 feet. There are two old-growth forests totaling approximately 47 acres and 1,334 acres of subalpine forest above 3,000 feet.

The Mahoosuc Mountains

The Mahoosuc Mountains on the Maine-New Hampshire border extend more than 17 miles and contain a rich assortment of alpine habitats. Included in the range are the forested summit of Old Speck at 4,180 feet; Maine's highest lake, Speck Pond; a deep notch, Mahoosuc Notch, midway along the range; and extensive alpine vegetation, including several spectacular bogs. The Appalachian Trail passes through all of these features, and the trails here are known as the roughest section of the entire Appalachian Trail System.

The State owns 27,253 acres in the Mahoosuc Mountains. Some evidence of lumbering can be found between 2,700 feet and 3,000 feet. Only one old-growth forest, on Mahoosuc Mountain, was documented in this area. This 10-acre stand consists of balsam fir and red spruce which reaches a maximum age of 245 years. The subalpine forest above 3,000 in the Mahoosucs is quite extensive and covers approximately 2,444 acres.

Baldpate Mountain

Baldpate Mountain rises to the east of the Mahoosucs and has two main summits, the highest of which -- East Peak -- is 3,812 feet high. This treeless summit provides spectacular panoramas of the surrounding countryside.

The East and West Peaks of the Baldpates have been lumbered in the recent past to an elevation of at least 2,700 feet. The subalpine forest above 3,000 feet remains undisturbed and covers approximately 332 acres. There are no old-growth forests on the Baldpates.

T.15 R.9 Aroostook County

The Gardner and Deboullie Mountain areas in northern Aroostook County rise up to 1800-1900 feet. However, because of the steep slopes and isolated ridges, there are a number of areas that have never been cut on the slopes of Gardner Mountain, Deboullie Mountain, and Black Mountain. Five areas that were never cut were documented in this low mountainous area covering 607 acres (Figure 4). Because the trees are growing under marginal conditions, trees were not very old or that large in size.

Alpine Vegetation

Alpine plant species and communities are one of the rarest types of natural areas found in eastern North America. The 1669 acres of alpine vegetation on State land in Maine contain a number of Maine's rarest native plant species. The 595 acres of alpine vegetation on Mt. Katahdin alone provide the habitat for over 50 rare plant species. Thus, considerable attention has been given to their conservation. Many alpine species or species of arctic origin reach the southern limit of their distribution on Maine mountains.

The most significant alpine vegetation in Maine is found in Baxter State Park, Bigelow Preserve, and the Mahoosuc Mountains (Table 2). These three state-owned areas have 1669 acres of alpine vegetation. All are open to the public through hiking trails (including the Appalachian Trail) and so are vulnerable to human disturbance. Foot traffic and over-collecting are probably the greatest threats.

Significant alpine areas on all mountains were documented by May and Davis in 1978. Detailed studies of Bigelow were undertaken on Bigelow by Caljouw and Roeske in 1981, and The Mahoosucs in 1982. Additional significant alpine areas were documented on Mahoosuc Arm and Fulling Mill Mountain in 1985.

Baxter Park

Baxter State Park supports the greatest diversity of alpine plant species in Maine and has been well-known among botanists for over a century. Ten mountain summits support 800 acres of alpine vegetation and over 50 alpine plant species. Twenty-two of these species occur in Maine only on Mt. Katahdin. (Figures 2 & 3).

Bigelow Preserve

The size of the alpine area on the summit of the Bigelow Mountain is limited to about 135 acres. This is much smaller than that of Mt. Katahdin, which is more than 1,000 feet higher. Bigelow's Avery Peak supports 24 species of alpine plants. (Figure 5)

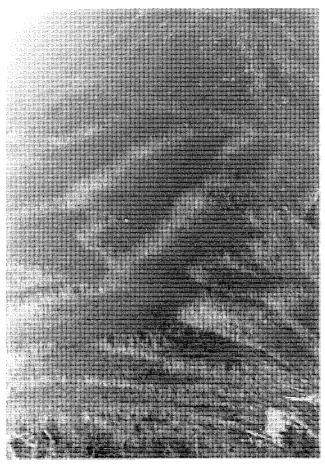
The Mahoosuc Mountains

The Mahoosuc Mountains contain a rich diversity of alpine areas, covering a total of 566 acres. Thirty-one species of alpine plants occur in the Mahoosuc Mountains. Of special interest is the extensive alpine vegetation of Goose Eye,

Mahoosuc Arm, Fulling Mill, and South Peak. Several outstanding bogs are found on Mt. Carlo, Goose Eye, Fulling Mill, and South Peak. (Figure 6)

Baldpate Mountain

A small 168-acre alpine summit is found on Baldpate Mountain. Six alpine species are found here, and two small alpine bogs are of special note. (Figure 6)



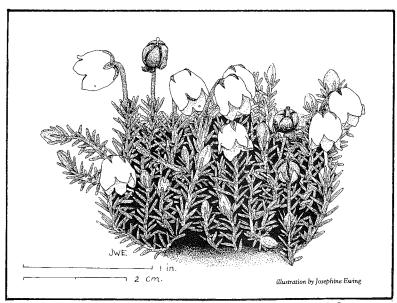
Fir waves in Baxter State Park on The Owl, T2 RlO WELS. This unique forest feature occurs in Maine only in Baxter State Park.

D. Hudson, photo



Old-Growth Balsam Fir and Red Spruce on Mahoosuc Mountain. trees in this ten acre area reach a maximum age of 245 years.

D. Hudson, photo



Moss plant, Cassiope hypnoides a species of alpine plant which is only found in Maine in the alpine zone of Mt. Katahdin.

Table 1 UNCUT FORESTS

BAXTER STATE PARK

Locality & Forest Type	Elevation (ft.)	Size (acres)	Range or Average Ages	Year Documented
Old-growth Forests				
**Traveler Mt. red spruce **North Traveler Mt. red spruce *Center Mountain red spruce **Wassataquoik Mt. red spruce *The Klondike black spruce **Basin Ponds red spruce **Cathedral Trail black spruce	1900' - 2400' 2000' - 2450' 2775' 1900' - 2400' 2500' - 2800' 2700' - 2800' 3030'	7 25 2 20+ 832 1.5 1.5 889	250-300 230-300 340-390 200-250 120-150 300-360 200-250	1983 1983 1984 1983 1984 1983
Subalpine Forests				
Black Cat Mountain North Pogy Mountain North Traveler Mountain The Traveler South Traveler Mountain Center Mountain Wassataquoik Mountain Mullen Mountain *Fort Mountain *North Brother *South Brother *Mt. Coe *OJI *Barren Mountain *The Owl *The Klondike *Mt. Katahdin (including):	2500' - 2585' 2500' - 2830' 2500' - 3144' 2500' - 3541' 2200' - 2316' 2500' - 2902' 2500' - 2965' 2500' - 3861' 2500' - 3764' 2500' - 3410' 2500' - 3681' 2500' - 3736' 2400' - 2900' 2500' - 5267'	18 620 2,120 34 90 385 4,263 5,012	96 49 52 38 117	1984 1984 1984 1984 1984 1984 1984 1984
North Peaks Northwest Basin Harvey Ridge Hunt's Spur Keep Ridge Great Basin *Russell Mountain *North Turner *South Turner	2500' - 2801' 2500' - 3323' 2500' - 3122'	985 2,600 665 23,094	75 63 107	1984 1984 1984 1984 1984 1984 1984

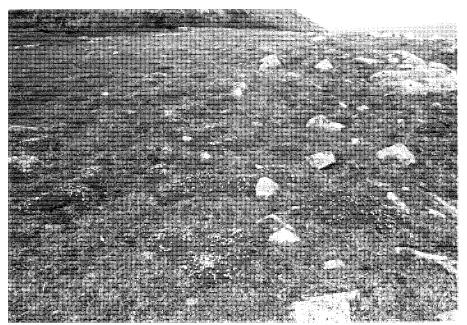
^{*} Recommended to be evaluated as a Critical Area
** Already on the Register of Critical Areas

Table 1 (continued)

Locality & Forest Type	Elevation (ft.)	Size (acres)	Range or Average Ages	Year Documented
BIGELOW PRESERVE				
Old-Growth Forest				
*Little Bigelow sugar maple *East Nubble red spruce	1800' - 1900' 2100' - 2442'	20 + 25. 47	150 120 – 250	1981) 1985
Subalpine Forest				
*Avery Peak-Horn *Cranberry Peaks	3000' - 3900' 3000' - 3213'	1,322 12 1,334	70	1985 1985
BALDPATE				
Subalpine Forest				
*Baldpate	3000' - 3400'	332	60	1985
MAHOOSUC				
Old-Growth Forest				
*Mahoosuc Mt. red spruce	3420 '	10	245	1985
Subalpine Forest				
*Old Speck *Mahoosuc Arm *Fulling Mill & South Peck *Goose-Eye *Mt. Carlo	3000' - 4180' 3000' - 3777' 3000' - 3400' 3000' - 3700' 3000' - 3565'	1,089 1,355 2,444	64 104 69 71 76	1985 1985 1985 1985 1985
T.15 R.9				
Old-Growth Forest				-
*Black Mountain *Deboullie Mountain *Gardner Mountain *Pushineer Pond *Crater-Denny-Galilee	1300' - 1900' 1200' - 1980' 1134' - 1800' 1127' - 1600' 1167' - 1800'	130 75 212 50 140 607	90-130 90-130 90-130 90-130	1984 1984 1984

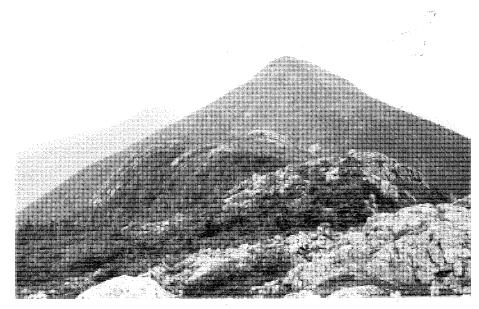
Figure 2. Northern Baxter State Park FREEZEOUT ROAD LEGEND Old-growth Forest Subalpine Forest Alpine Area (clear area surrounded Little Peaked ^k Mt. by subalpine forest) Burnt Mt. LOCATION MAP Block Spruce Bog

Figure 3. Southern Baxter State Park LEGEND Old-growth Forest Subalpine Forest Alpine Area (clear area surrounded by subalpine forest)



Alpine vegetation on the Tablelands of Mt. Katahdin. The alpine plant species Diapensia lapponica, which grows in clumps, is shown. This alpine species also occurs on the Bigelow and Mahoosuc Mountains.

H. Tyler, photo



West Peak on Bigelow Mountain. Small areas of alpine vegetation are surrounded by uncut subalpine forests.

L. M. Eastman, photo

Table 2 ALPINE VEGETATION AREAS ON STATE-OWNED LANDS

Alpine Vegetation

Locality	Elevation (ft.)	Size (acres)	<u>Year</u>
Mt. Katahdin **Mt. Katahdin *The Owl *Mt. Coe *S. Brother *N. Brother *Fort Mountain Wassataquoik N. Traveler **Traveler **S. Turner	3000 - 5267 3600 - 3736 3260 - 3764 3800 - 3951 4050 - 4143 3700 - 3861 2500 - 2965 3050 - 3144 3200 - 3541 3075 - 3122	595 8 15 5 23 15 1 15 122 1	1978 1984 1984 1984 1984 1984 1978 1978
Bigelow Mountain **Avery Peak **West Peak	3700' - 4150'	135	1978, 81, 85
**The Baldpates	3812'	168	1978, 85
Mahousucs Old Speck **Goose Eye **Mt. Carlo *Mahoosuc Arm **Mahoosuc Mt. *Fulling Mill Mt.	4180' 3500' - 3794' 3500' - 3562' 3500' - 3777' 3300' - 3480' 3500' - 3445'	2 224 25 145 32 138 566	1985 1978, 82, 85 1982, 85 1985 1985

^{*} New alpine areas recommended as Critical Areas.
** Already on the Register of Critical Areas.

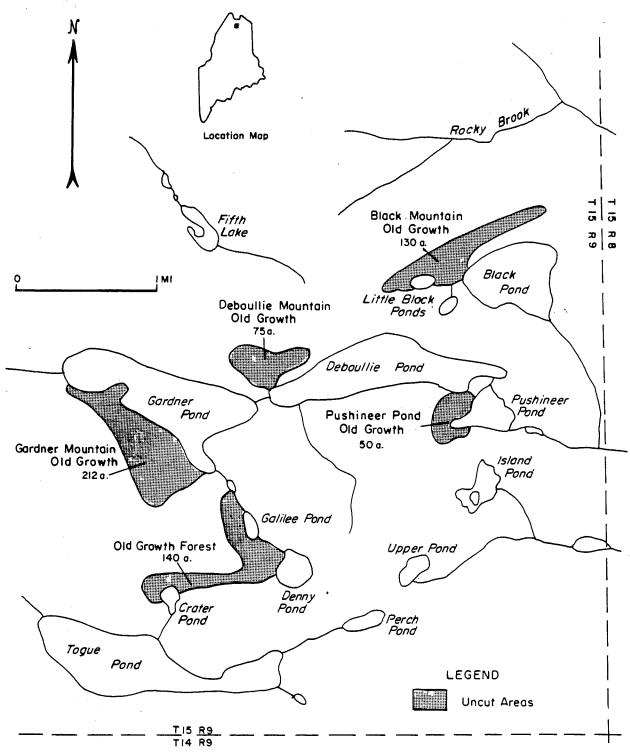
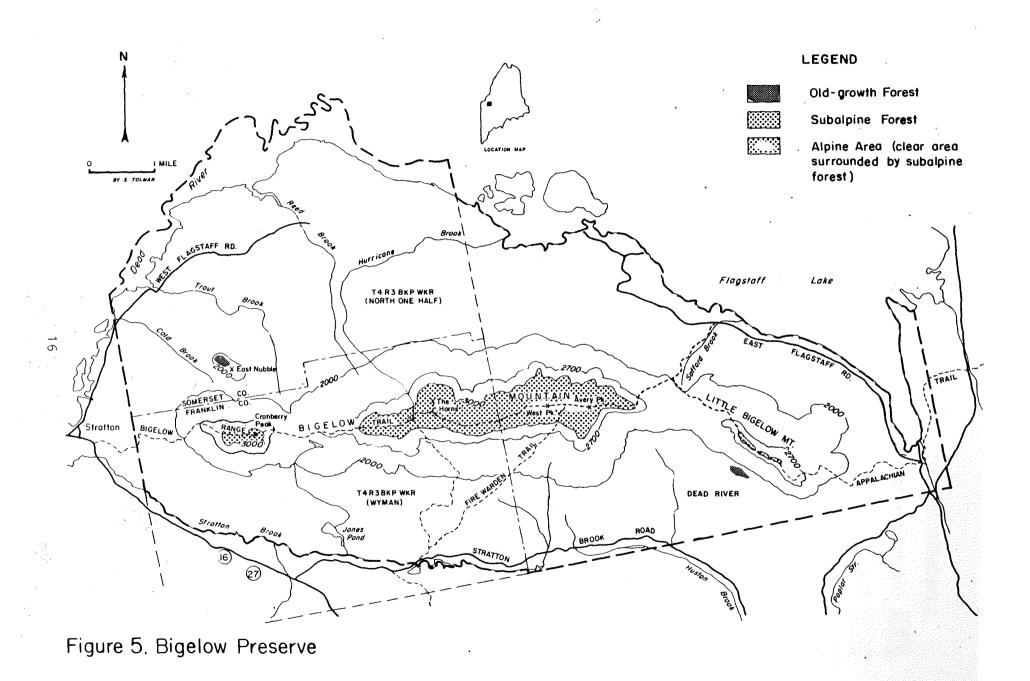


Figure 4. Spruce-fir areas which have never been cut - SE corner of TI5 R9 (from Kern, 1984)



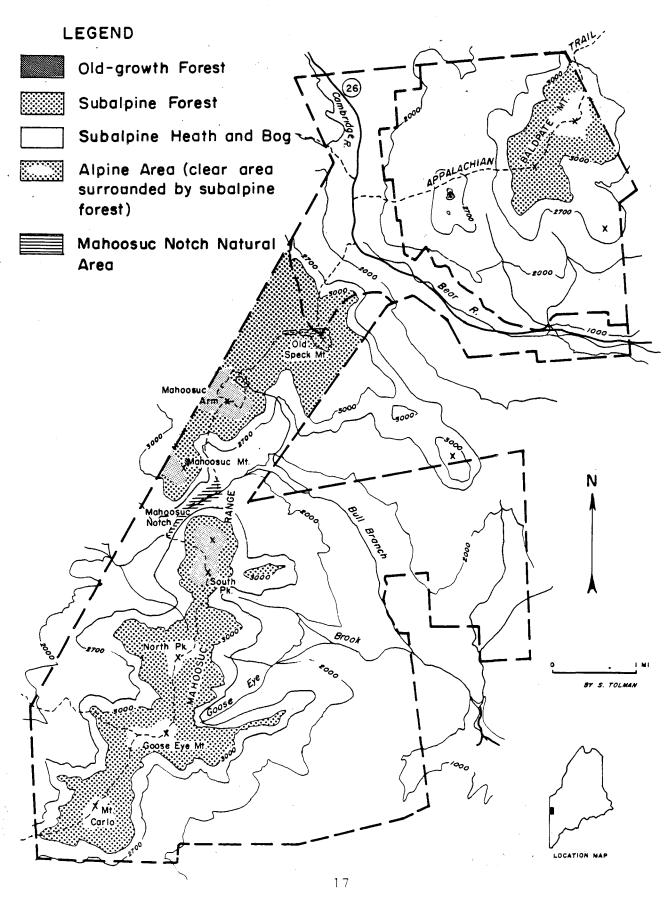


Figure 6. Mahoosuc Mountains and Baldpate Mountains
Public Reserved Lands

Management Considerations and Recommendations

Old-growth forests and alpine vegetation are rare natural features in Maine that merit special management considerations. The management plans of Baxter State Park, the Bureau of Public Lands, and the Bureau of Parks & Recreation currently recognize the general biological values of these features.

The State Planning Office, in consultation with Baxter State Park and the Bureau of Public Lands, recommends that the following actions be undertaken:

- 1. Existing management plans should be updated by the Bureau of Public Lands and Baxter State Park to consider the exceptional value of old-growth forests and alpine vegetation.
- 2. As management plans are developed for newly acquired public land by the Bureau of Public Lands, the special management requirements for old-growth forests, subalpine forests, and alpine areas should be given consideration.
- 3. The topic of subalpine forest should be evaluated by the Critical Areas Advisory Board, to determine whether subalpine forests merit inclusion on the Register of Critical Areas.
- 4. If subalpine forests merit inclusion, each area listed in Table 1 should be evaluated on its own merit for inclusion on the Register, in coordination with the preparation of the management plan for each land unit.
- 5. The eight listed old-growth forest areas listed in Table 1 with a single asterisk should be evaluated for inclusion on the Register of Critical Areas. Each area should be considered on its own merit.
- 6. The alpine vegetation areas on Mahoosuc Arm and Fulling Mill Mountain should be evaluated for inclusion on the Register of Critical Areas.
- 7. All alpine vegetation sites should be monitored, particularly those in the Mahoosuc Mountains and on Baldpate Mountain, where foot-traffic is heaviest.
- 8. A Forest Reserve System should be established, beginning on State-owned lands, to protect exceptional forests. Potential sites are identified in the Critical Areas Program's 1984 and 1985 inventories. All State land should be inventoried to identify other potential sites.

9. The State of Maine should encourage scientific research on unique forest lands. Permanent study plots should be established in old-growth and subalpine forests in the Forest Reserve System, and on selected mountain tops with alpine vegetation.

References

Old-Growth Forests, Subalpine Forests, and Alpine Areas in the Mahoosucs, Baldpates, and the Bigelow Preserve, by W. Donald Hudson, Jr., 1986, 62 pages.

Old-Growth Forest, Subalpine Forest, and Alpine Areas in Baxter State Park, by W. Donald Hudson, Jr., Ronald Cannarella, Leah Garnett, and Katherine Huntington. May, 1985, 88 pages.

A Natural Resource Inventory and Critical Areas Survey of Bigelow Preserve by Caren Caljouw and Sarah Roeske. September, 1981, 127 pages.

The Mahoosuc Mountains - A Natural Areas Inventory by Ingrid Burke, November, 1982, 57 pages.

Alpine Tundra Vegetation on Maine Mountains and Its Relevance to the Critical Areas Program by Diane Ebert May and Ronald B. Davis, January 1978, 67 pages.

T.15 R.9 Aroostook County - A Natural Resources Inventory by Mark J. Kern, May, 1985, 169 pages.

RESOLVES



STATE OF MAINE

IN THE YEAR OF OUR LORD NINETEEN HUNDRED AND EIGHTY-THREE

H.P. 1193 - L.D. 1579

RESOLVE, Directing the State Planning Office to Inventory Virgin Timber Stands on State Lands.

Director of State Planning Office to inventory virgin timber stands on state lands. Resolved: That the Director of the State Planning Office is directed to conduct an inventory of virgin timber stands and unique alpine habitats on state-owned lands; and be it further

Resolved: That the Director of Public Lands shall cooperate and participate in this study; and be it further

Resolved: That the Director of the State Planning Office shall submit this inventory and recommendations for management of these areas to the Second Regular Session of the 112th Legislature.