

Baxter State Park

Scientific *F*orest *M*anagement *A*rea

Boody Brook Natural Area Design and Management Plan Date: 2001



Executive Summary

This plan defines and guides the implementation of three strata of reserves to establish and maintain the 458 acre Boody Brook Natural Area within the 29, 537 acre Scientific Forest Management Area of Baxter State Park. The plan defines qualifying criteria, monumentation and management protocols for each strata of reserve, provides background and site descriptions for the strata, rationale for the management protocols and maps to graphically define the strata boundaries..

BBNA Reserve Design

This document is a plan detailing the design of a Forested Natural Area within the Scientific Forest Management Area of Baxter State Park. This plan is composed of 5 parts:

1. **Design Features**
2. **Background**
3. **Site Description**
4. **Rationale**
5. **Maps**
6. **Supporting Data**

1. Design Features:

To define and implement three strata of reserves to establish the Boody Brook Natural Area within the Scientific Forest Management Area of Baxter State Park.

Reference: Map #'s 1, 2, and 3 and 4

Primary Reserve (~ 458 acres)

Qualifying Criteria:

- Fully developed northern hardwood, mixed hardwood – conifer and spruce forests in good condition;
- No discernable evidence of recent fire history;
- Human disturbance history limited to eastern white pine harvest ca. 1900 and/or earlier.

Monumentation:

- Boundary GPS'd and flagged in orange. Flagging to be replaced with paint (red) and tags by 2001.

Management Protocol

- Protected from management disturbance.
- No foot trail construction into primary reserve
- Research subject to BSP research review process – destructive processes restrained within primary reserve.

Research and Monitoring

- Installation of permanent, re-measurable forest inventory plots – 10 plots by 2005
- Provide criteria and protocol for research proposals and when possible, in-kind assistance to accepted research projects

Secondary Reserve (~ 1,206 acres)

Qualifying Criteria:

- Adjacency to primary reserve – providing disturbance buffering to primary reserve.
- Intact forest with mixed disturbance history including logging and forest fire.

Monumentation:

- Administrative monumentation to topographic features such as ridgelines, drainage boundaries, streams and breaks in topography. Operational determination shall use maps and GPS to determine field boundaries.

Management Protocol

- Protected from management disturbance as appropriate to protect and maintain the primary reserve.
- Access limited to foot trail construction only.

- Research subject to BSP research review process – destructive sampling or activities discouraged within secondary reserve.

Tertiary Reserve (~1,567 acres)

Qualifying Criteria:

- Within entire watershed of Boody Brook (all three branches)– providing disturbance buffering to secondary reserve.

Monumentation:

- Administrative monumentation to entire Boody Brook drainage.

Management Protocol

- Road construction/harvesting and normal management activities permitted. Forest management roads constructed after 1999 restricted to 1,500' from the secondary reserve boundary.
- Restriction on use of non-native seeding/planting.
- Management disturbance feathered into secondary reserve boundary
- Management disturbance temporally graded into secondary reserve boundary

2. Background

Baxter State Park is the result of a dream of former Governor Percival P. Baxter who donated the first parcel of land to the people of Maine, IN TRUST, in 1931 and over the years added various parcels until his final acquisition in 1962 brought the Park's area to 201,018 acres. The Park is administered by a three-person board of Trustees, the Baxter State Park Authority, consisting of the Commissioner of Inland Fisheries and Wildlife, the Director of the Maine Forest Service, and the State Attorney General. The Authority has full power in the control and management of the Park and in the exercise of all Trust obligations.

While Baxter State Park bears the name "State" it is separately administered, free from any connection with the larger State Park system (Bureau of Parks and Lands/Dept. of Conservation).

Since Baxter's final gift in 1962, the Authority has purchased additional acreage to bring the Park to its current size of 204,733 acres. The purchase of additional lands is made possible by a trust fund left by Percival Baxter to provide funds for the purchase of lands to be used for scientific forestry, recreation, scenic value and as a sanctuary for wild life. In addition to the various gifts of land, Governor Baxter also left two sizeable trust funds to carry out the operation and maintenance of the Park without the need for state funding. Approximately 40% of the cost of Park operations is financed from a combination of use fees, entrance fees and wood products revenues with the remaining 60% provided by revenues from trusts established by Percival Baxter in 1945 and again through his will after his death in 1969

The 29,584 acre Scientific Forest Management Area (SFMA) is located in the northwestern corner of the Park and was included in the Trust Gifts to serve as an demonstration of exemplary forest management *in accordance with the Trust Communications left by Percival Baxter* (see Appendix ____).

Ca. 1993, Dr. Ray Owen reported in personal communication to Jensen Bissell, BSP Resource Manager, that he had observed unusual forest structures and features while hunting in a favorite area of the SFMA in a small, easterly flowing 1st order branch of Boody Brook. Owen described an apparent lack of evidence of previous logging or large scale natural disturbance, and the occurrence of trees with large diameters and heights. The SFMA, while under active management, is currently 8-10 years from completing road access over the entire management area, and the area Owen described was several years from access. In response to SFMA management's request, Owen led a small group of Park staff and interested individuals into the area in 1993. This visit was followed by another visit to the area in 1993 by Bissell and Dr. Robert Seymour. This visit included the extraction of a small number of tree cores.

Larger visits with mixed groups of interested individuals and researchers followed from 1994 to 1998, including a visit by the SFMA Advisory Committee in 1997.

All visits confirmed an apparent uniqueness to the area regarding the advanced development of forest structures, an unusually (for Maine forests) high stocking of large diameter trees, and the apparent lack of significant recent disturbance from logging, fire or wind. These observations were supported by lichen survey work done by Steve Selva in 1998 and quantified by Dibble et al, 1999 (see appendix). The area appeared to be between 300 and 500 acres. Over this period, management designated the area as the Boody Brook Natural Area or “BBNA”.

In response to numerous requests from individuals to visit the area, the Park authorized and constructed trail access to the approximate southwest edge of the BBNA in 1997. Prior to trail construction, access to the BBNA from within BSPA required a 1 to 2 mile bushwhack to reach the edge of the area and then an additional 1-2 miles to fully explore the area. Park experience was that such an attraction in large and featureless terrain would result in a higher likelihood of repeated search and rescue efforts over time. The trail access was provided to reduce the likelihood of search and rescue efforts developing around individuals becoming lost in the area.

In 1999, forest management road construction extended the Wadleigh Mountain Road to a point about 2000’ west of the west edge of the BBNA.

Historic and current data on the BBNA are limited and unorganized in approach. In 1942, the Eastern Company employed the Sewall Company to perform a timber inventory on T.6, R.10. and the portion of T6., R9 which included the BBNA. The cruise map and accompanying report are on file at Park Headquarters. Current data includes chronographed tree cores taken by Seymour and Bissell in 1993, natural areas survey work done by J. Royte and P. DeMaynadier in 1996, selected cruise data taken by Lansky in 1998, spruce regeneration study work done by Dibble, 1994, and lichen survey work done by Selva in 1998.

3. Site Description

Terrain

Reference: Map #3.

The BBNA is located in the southeastern portion of the SFMA, and is centered on a southerly branch of Boody Brook (see Map 5) which runs northeast toward a junction with the main branch of Boody Brook and eventually Second Lake Matagamon. The Boody Brook system is composed of a south, middle and north branch. For the purposes of this discussion, the term “Boody Brook” refers to the south branch of Boody Brook unless otherwise noted. Boody Brook is a pleasant 1st order perennial stream with significant beaver activity on the upper 1/3 of the stream within the primary reserve. The primary reserve straddles Boody Brook and extends southward up to a ridge of Wadleigh Mountain and northward to a point between Boody Brook and a more central branch of Boody Brook. Boody Brook marks a distinct change in landforms and forest characteristics. South of the brook, (approximately 68% of the primary reserve) the terrain maintains a consistent northerly aspect and slopes steadily upward towards the Wadleigh Ridge at an average of 10 to 11% with a pocket of steeper, more broken terrain in the south east corner of the primary reserve. North of the brook (approximately 32% of the primary reserve) the terrain is characterized by gently rolling ledge knolls interspersed with shallow, narrow wet valleys. The primary reserve averages about 2,400 feet in width and 7,500 feet in length with an area of about 450 acres.

Soils

Reference: Map #4.

South of Boody Brook soils are approximately 75% Telos-Chesuncook associations and 25% Ellitsville-Monson associations. These soil associations are characterized by moderate to good drainage capacities and are among the most productive of the soil associations found on the SFMA. These soil

associations typically support northern hardwood or mixed wood stands. North of Boody Brook, soils are characterized by approximately 45% Telos-Monarda-Monson and 55% Telos-Monarda associations. These associations have well-drained to somewhat poorly drained characteristics. These associations have generally less soil depth, can be shallow to ledge, and are moderately productive. These soil associations typically support spruce-fir and other softwood forest types.



South Branch Boody Brook

Forest Cover – Primary Reserve

Forest cover types reflect the soil differences observed on the different sides of Boody Brook. South of Boody Brook the forest can be generally described as mixed hardwood-conifer forest or pine-hemlock spruce forest¹. Average stocking levels here are estimated to be around 180 to 200 ft²/acre of basal area. On slopes south of Boody Brook, sites are characterized by species such as sugar and red maples, yellow birch, american beech, eastern hemlock, red spruce, and an occasional eastern white pine with patchy mid-canopy growth including eastern hop-hornbeam and striped maple. Fully developed structural character, both in height and bole diameter as well as large, fallen woody debris, are evident features of this forest. This portion of the primary reserve is notable in that no signs of past harvest are evident. Natural disturbance appears to be primarily wind disturbance combined with age-related mortality producing small to moderate tree canopy gaps and patchy regeneration. North of Boody Brook the forest is primarily red spruce with mixtures of yellow birch, red maple, eastern white pine and balsam fir. As with the area south of Boody Brook, this area is characterized by fully developed tree heights (red spruce > 85') and a consistent population of large red spruce > 22" dbh. Average stocking levels are estimated to range from 180-220 ft²/acre of basal area. This area, unlike the area south of the south branch, reveals a ubiquitous past harvest for eastern white pine. The decayed stumps of the harvested

¹ J. Royte, P. DeMaynedier, field notes for an Inventory of Potential Ecological Reserves on Maine's Public Land and Private Conservation Lands, a Report Prepared for the Maine Forest Biodiversity Project, Janet McMahon, 1998

trees are uniformly evident within the spruce stands now dominating the low knolls. In one location, evidence of fire was clearly visible on the stump, but this appeared to be very localized.



Typical eastern white pine stump from harvest circa 1840

Chronographed core data from Seymour² indicates a disturbance prior to 1866 and again ca. 1900 (see appendix). Casual observation indicates that pine stumps from each harvest may be discernible in this area of the primary reserve. Wind and spruce budworm appear to be the primary natural disturbance factors. The eastern spruce bark beetle (*Dendroctonus rufipennis*) is noticeably active as a mortality factor in large diameter red spruce. Compared to other stands in the SFMA, mature balsam fir is absent from this forest. Wind has created small and large tree canopy gaps in the stand with resultant regeneration dominated by balsam fir with red spruce, eastern white pine, red maple and yellow and paper birch.

Forest Cover –Secondary Reserve

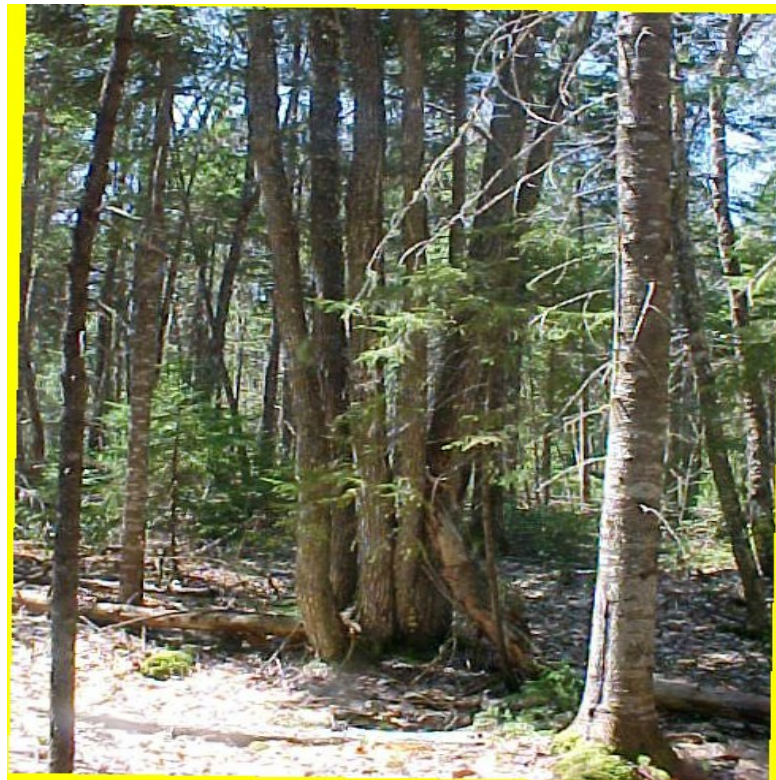
Outside the primary reserve a combination of both fire alone and harvesting followed by fire have created a starkly different forest composed primarily of early successional shade-intolerant species including white birch, bigtooth and quaking aspen, over emerging stands of more shade tolerant red maple, red spruce, and balsam fir. Records indicate that this fire occurred in 1915 with possible earlier fire influence in 1902. Average stocking levels in these areas is around 120-130 ft²/acre of basal area. In many areas, especially between the primary reserve and the southern ridge line of the Wadleighs, the absence of any stumps suggests that the area was not logged prior to the burn.

² Seymour, R., written notes on personal communication



"Stumpless" area in Secondary Reserve on Wadleigh Mountain

In other areas around the primary reserve, logging appears to have occurred prior to the fire event. The ridgelines of the Wadleighs also carry a scattered, site-specific population of northern red oak. Between the two ridgelines of Wadleigh lies a cedar seepage forest with minimal disturbance history. North of the primary reserve between the south and middle branches of Boody Brook, a hard burn on very shallow soils over rugged, broken ledge has left the site with only limited productivity for approximately 1,500' until the terrain smooths out and deeper soils limited the effects of the fire.



Red maple coppice growth delineating primary reserve boundary

4. Rationale:

Overall Reserve Rationale:

As a part of Baxter State Park, the SFMA was given *IN TRUST* to the People of Maine. As such, the application of forest reserves must be considered within the directives of Percival Baxter's Trust Communications regarding the SFMA. An approach to reserves within the SFMA was developed in the SFMA Management Plan³:

"The establishment of reserve areas within the SFMA is a difficult issue requiring careful consideration and judgment regarding the true intent of Baxter State Park donor Percival Baxter. In his trust communications to the 97th Legislature Baxter wrote primarily about his wish that careful management produce:

- *"a continuing crop of timber to be harvested and sold as are potatoes or any other product of the soil."*
- *"a showplace for those interested in forestry, a place where a continuing timber crop can be cultivated, harvested and sold; where reforestation and scientific cutting will be employed; an example and an inspiration to others."*
- *"beautiful great forests that for centuries have been producing a crop of wood without depletion..."*

Clearly, these words articulate a direction to practice sustainable forest management in the production of marketable wood products. Baxter directed that "scientific cutting", the removal of specific stems according to thoughtful silvicultural prescription and practice, be applied on the SFMA. On one hand, the establishment of reserves directly implies the elimination of all cutting, scientific or otherwise. On the other hand, Percival Baxter wanted the SFMA to be a *"showplace for those interested in forestry....an example and inspiration to others"* and the concept of ecological reserves within the matrix of managed (harvested) forest landscapes is emerging as a viable portion of *exemplary* forest management.

Complicating the consideration of SFMA reserves is the role of the SFMA as part of Baxter State Park. Aside from the SFMA, the 204,733 acres of Baxter State Park are forever protected from harvesting or any other significant human disturbance and comprise one of the premier "reserve" areas in Maine. A close examination of the forests of Baxter Park, however, reveals that much of the Park was harvested for wood products within the last 100 years. Many of the forest structures are just now approaching mature conditions and for many areas it will be another 100 years before true late-successional stages will be attained.

After weighing these considerations, it seems reasonable to consider, with some moderation, the idea of a mosaic of reserve areas within the confines of the SFMA, including some reasonable limitations on harvest disturbance regimes. Reserve areas should be considered on a landscape scale with the following benchmarks:

- Reserve areas should be considered in combination with Riparian areas and as a total these zones should have a target of from 10 - 15% of the total surface area of the SFMA less acres in ponds and lakes (note: currently, riparian areas cover 11% of the SFMA and listed reserve blocks cover 6% with approximately 13,000 acres unclassified).
- The importance of SFMA reserve areas in any regional sense may diminish over time as forest structures in the remainder of Baxter State Park mature.
- Designation of reserve areas should focus primarily on issues of connectivity, the establishment of more mature developmental classes, and the extension of riparian habitat complexes.
- Established reserve areas in excess of the target percentage may be reclassified as harvest blocks.

³ Baxter State Park, Scientific Forest Management Area Management Plan, 1998, pp. 43-44.

- As long as the target percentage is maintained or exceeded, selected reserve areas may be reclassified to harvest blocks in exchange for new classifications of reserve areas if the new classifications are better qualified as reserves based on the following considerations:
 1. if the diversity of stand structures in any one area is increased.
 2. to complement and sometimes complete the connectivity provided by riparian areas.
 3. to provide a baseline for comparison of developmental changes as a result of harvest or stand treatment activities.
 4. to allow some areas to proceed in development toward late-successional stages and multi-cohort stands.

Reserves have been included in the management strategy of the SFMA for over a decade. SFMA reserves, however, have developed primarily as small benchmark reserves and unique sites. The BBNA provides an opportunity to include a reserve with priorities that include the maintenance of biodiversity as well as providing a benchmark against which management can be evaluated. This action seems clearly within the realm of current thinking regarding exemplary scientific forest management. *“On scientific grounds, reserves are important because they contribute to protecting the full range of biodiversity, including ecosystem processes, that characterizes the forest and because they act as reference sites against which to assess the impact of management actions.”*⁴

As discussed in the SFMA management plan (see above), the uniqueness of the BBNA, and its appropriateness as a reserve must be viewed from the context of Baxter State Park as a whole. Currently, the BBNA has value as a representative example of undisturbed forest primarily because so much of Baxter State Park was harvested prior to transfer to Baxter or as a condition of transfer through “cutting rights” arrangements. If the majority of the sanctuary portion of BSP had never been harvested or burned by forest fire, it is possible that the value of the BBNA as simply 458 acres of reserve to add to 170,000+ acres would be diminished. Over the next 50 to 100 years, as the forests within the Park mature and reach late-successional stages, the appropriateness in relation to the Trust Communications of maintaining the BBNA as a reserve within the SFMA should be reviewed. As part of the SFMA the BBNA status will be reviewed at the 10 year planning revision of the SFMA management plan.

Primary Reserve Rationale:

There are many definitions for the term “Old Growth”. One that seems to fit for the BBNA is “An old growth forest is a forest ecosystem where the dominant trees largely exceed the biological maturity age of the species concerned taking into account its specific environment and its geographic location. The temporal dynamic of these forests is characterized by the coexistence of living trees, senescent trees and standing dead trees as well as the presence of fallen dead trees, lying on the ground, showing different decomposition levels. Old growth forests show little or no evidence of human disturbance.”⁵ This definition describes the BBNA primary reserve fairly well and highlights all the specific reasons for identifying this area as a candidate for a reserve.

The dominant trees appear to largely exceed the biological maturity age of the species. Using the “mean pathological age” as a comparison as listed in “Biodiversity in the Forests of Maine”⁶, the pathological age of red spruce is 170 years. BBNA spruce chronographed by Seymour displayed ages of

⁴ Norton, D., Chapter 16 – Forest Reserves, in *Maintaining Biodiversity in Forest Ecosystems*, Edited by Malcolm Hunter, Jr., Cambridge Univ. Press, 1999, Pg 526.

⁵ Bouchard, Andre R., Gouvernement du Québec, 1996. Biodiversité du milieu forestier - Bilan et engagements du ministère des ressources naturelles. Ministère des Ressources naturelles du Québec, 152 pages.

⁶ Flatebo, G., Foss, C., Pelletier, S., Biodiversity in the Forests of Maine, Guidelines for Land Management, UMCE Bulletin #7147, Appendix H, pg 151.

297, 210, 338, 251, 188+ and 234 (see appendix). Other species have not been measured, but indications are that dominant stems are frequently “old” relative to measures of the species potential natural lifespan.

Very little data has been gathered regarding the occurrence of dead standing, dead down and general volumes of coarse woody debris in the BBNA, but casual observation clearly indicates differences in the structures found in the primary reserve compared to other areas in the SFMA. The average height of trees is also notable. Heights are monitored in managed stands in the SFMA and typically vary from 55’ to 75’. Observations in the Primary Reserve indicate that red spruce are typically 85’ and may exceed 90’⁷. The stocking of large (22”-30” dbh) red spruce in the northern 1/3 of the primary reserve is probably unique in Maine as almost all of this type was harvested for spruce by 1940. The general forest type along the northeastern portion of the Primary Reserve perimeter is generally softwood without a clearly definable disturbance boundary. In this area, the presence of large diameter red spruce provided a primary criterion for the establishment of the primary reserve boundary.



Typical large dbh red spruce in primary reserve north of Boody Brook

The change in landforms and soil types between north and south of the south branch of Boody Brook has resulted in different forest types that effectively represent most of the typical forest types found in the SFMA. The addition of early successional, fire-disturbance and cedar seepage forest in the secondary reserve forms a very complete representation of forest structures found within the SFMA.

A more subtle indication of the “old growth” status of the primary reserve is indicated by Selva’s survey work for the Order Caliciales. Selva asserts that lichens in the Order Caliciales serve as a biomonitor of forest ecosystems and he applies the relative occurrence of lichens to an Index of Ecological Continuity developed by F. Rose. Selva writes, “*Among the spruce-fir stands included in the investigation, a Caliciales index value of 25 corresponds with an IEC value of 100 assigned to ancient forests according to Rose, (1974, 1976). With Caliciales index values of 46 and 36, respectively, the red*

⁷ Owen, Ray, personal communication

spruce stands at Boody Brook and North Turner Mountain rank as the premier ancient forest sites in northeastern North America.”⁸

Combined, these considerations provide a powerful argument regarding the placement of the undisturbed forest around Boody Brook into reserve status. The determination of the boundary of the Primary Reserve was made using the following criteria:

- Evidence of past harvest limited to pine removal > 100 y.a.
- No evidence of widespread forest fire disturbance

Structural characteristics included multiple age classes, regular stocking large downed woody debris, large standing snags, tree ages in excess of 150-200 years in tolerant, late-successional species (red spruce, sugar maple, eastern hemlock). Prior to leaf-out in May of 2000, the area was closely examined over a three-day period by SFMA staff and the actual boundary of the primary reserve was flagged in orange and monumented with GPS points.

Protection from human disturbance is a priority in the management of the primary reserve. Consequently, access development, including foot trail construction, will be prohibited. If the primary reserve were much larger (>25,000 acres), fire protection could also be restrained to conditions indicating potential spread of fire outside the primary reserve. The small size of the BBNA, coupled with the consideration that the uniqueness of the area is in large part due to the absence of fire as an influencing factor in forest development suggests that the primary reserve should be protected from fire. Protection measures should be limited to means that do not threaten the unique structures of the reserve itself (hand fire lines, aerial water/retardant drops). Insect protection should be prohibited.

Secondary Reserve Rationale:

The secondary reserve follows topographic boundaries to provide several opportunities to the BBNA:

- Provide a buffering capacity to protect the primary reserve from natural and human disturbance such as invasion of non-native plants from roadside seeding and windthrow as a result of harvesting activities. The secondary reserve provides between 1,000' and 2,000' of no-disturbance buffer between any active harvesting and management in the tertiary reserve and the primary reserve. Buffering is less than 1,000' in the extreme northeastern corner of the secondary reserve, but terrain north of the topographic break that defines the reserve line will restrict active management.
- Provide additional reserve acreage to allow benchmark comparison and study of early-successional forest development with and without significant prior human disturbance.
- Increase the representativeness of the reserve design by including several typical forest types not represented within the primary reserve (early-successional, cedar seepage, occasional northern red oak on specific habitats).

Insect and fire protection are allowed in the secondary reserve, but implementation of protection measures should be considered from the viewpoint of minimizing human influence within the primary reserve.

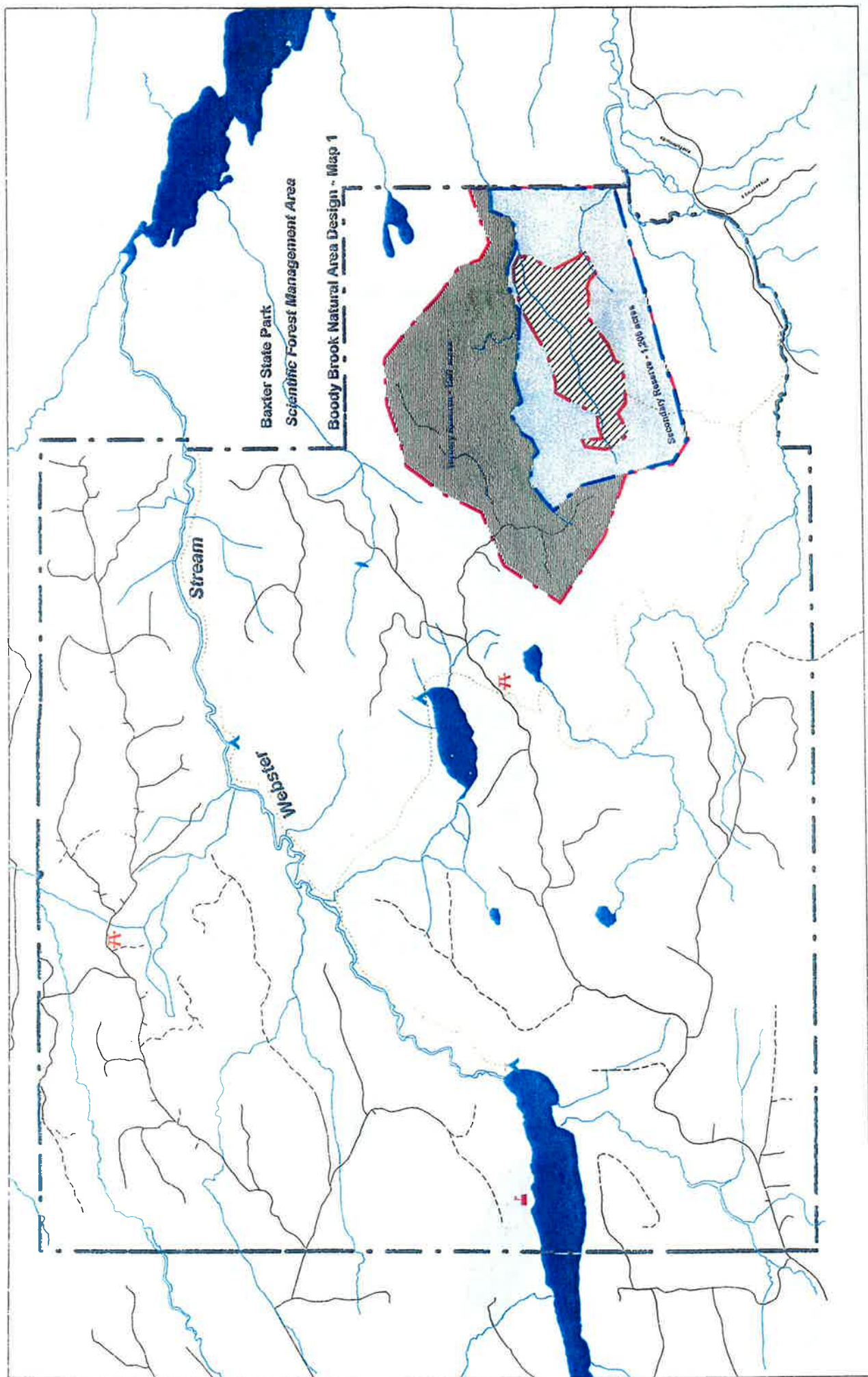
Tertiary Reserve Rationale:

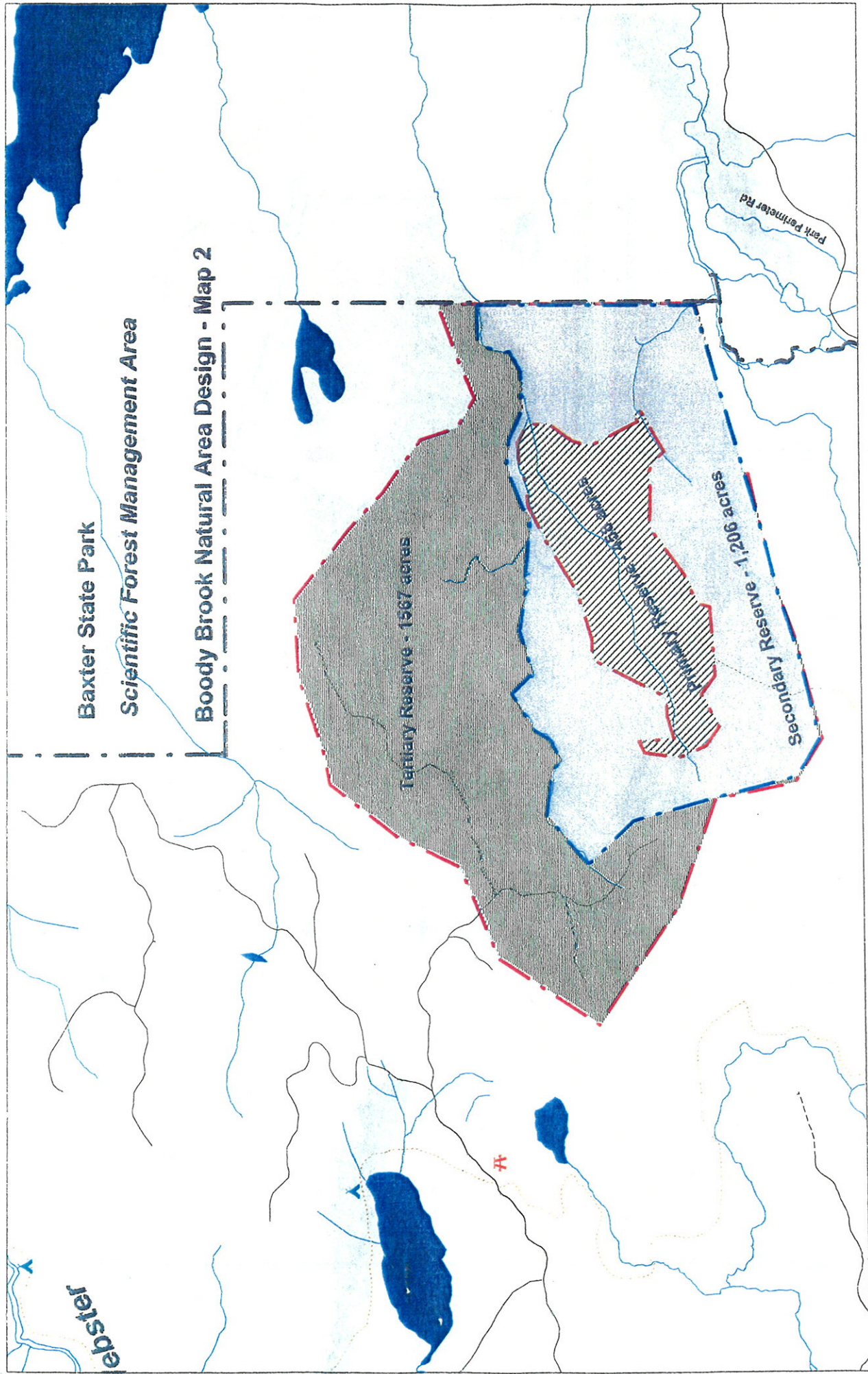
The tertiary reserve shall include the entire Boody Brook (north, middle and south branches) watershed. The purpose of the tertiary reserve is to provide a third layer of conservative thinking and action toward the protection of the primary reserve. Normal forest management activities including harvesting and road construction activities are permitted in this area with the exception that forest road construction is limited to no closer than 1,500' from the secondary reserve boundary. Any planting or seeding within the tertiary reserve should be carefully considered from the perspective of primary reserve protection. In addition, harvesting activities should attempt to blend any disturbance into the boundary

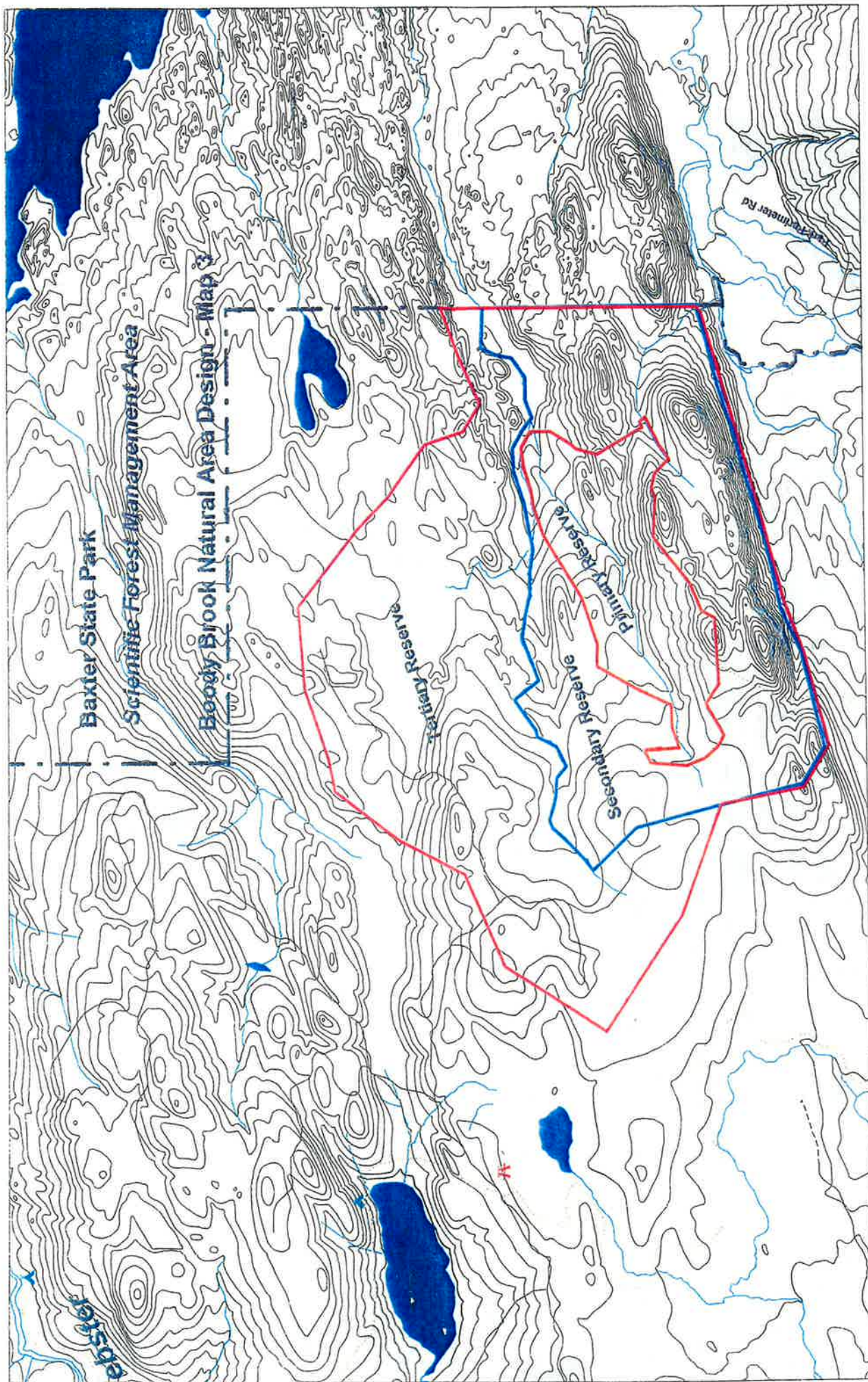
⁸ Selva, Steven B., Principal Investigator, Using Lichens in the Order Caliciales to Assess Ecological Continuity in the Forests of Baxter State Park, Maine, 1999, pg 8.

of the secondary reserve. Large scale harvest or management activities causing substantial changes in canopy densities should be avoided in the tertiary reserve.

Maps









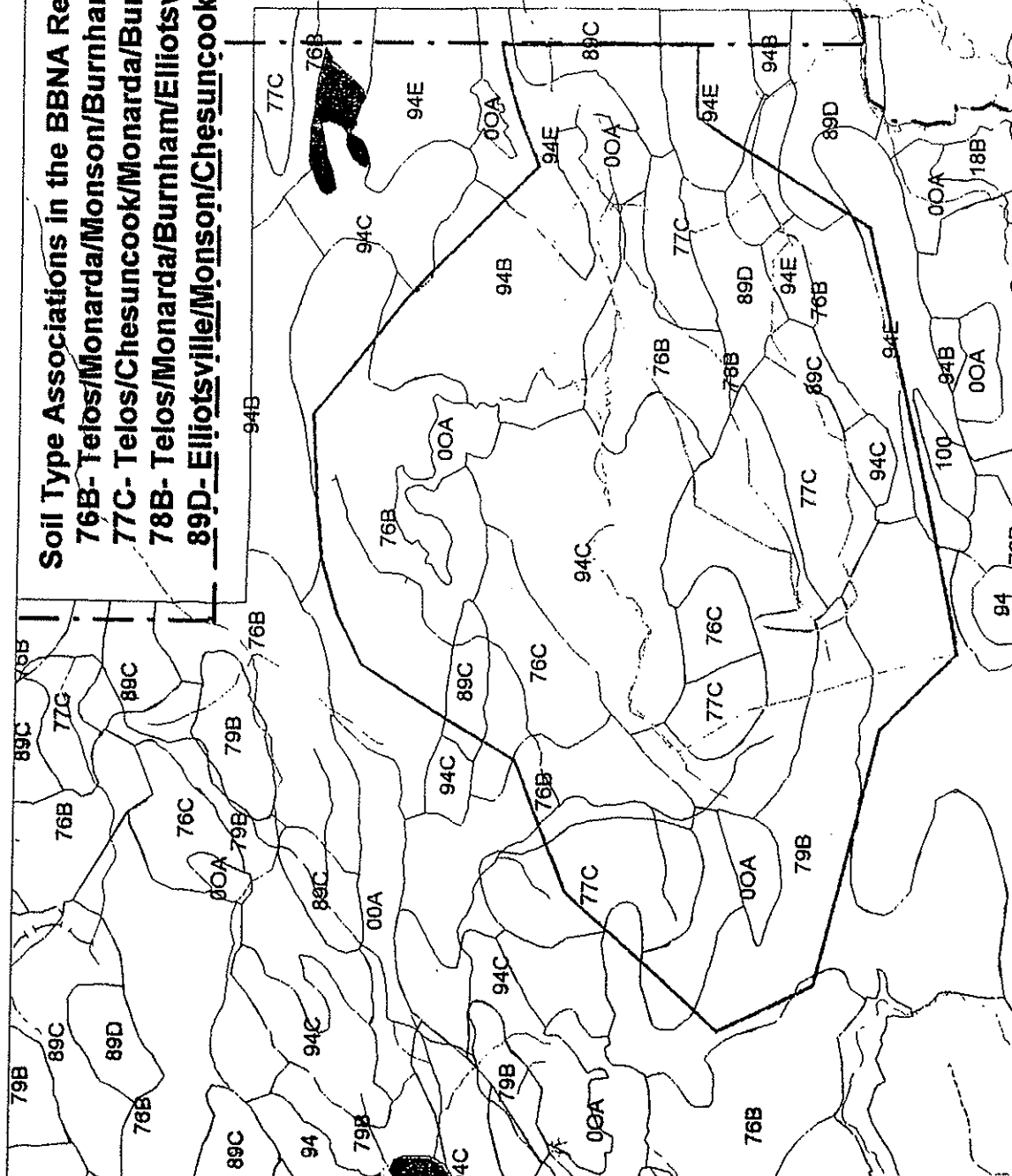
76B- Telos/Monarda/Monson/Burnham

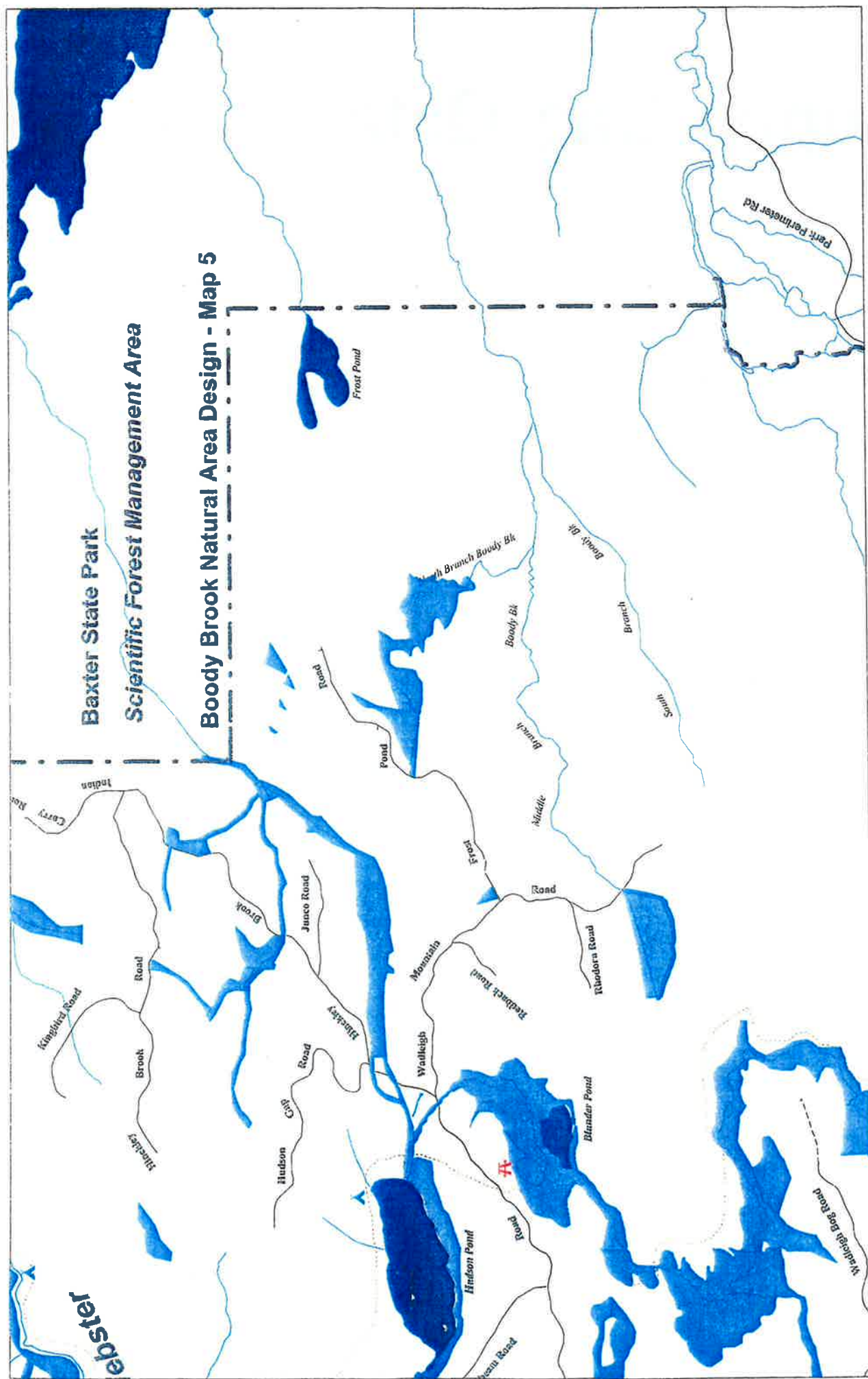
76B- Tefos/Monarda/Monson/Burnham

77C- Telos/Chesuncook/Monarda/Burnham

78B- Telos/Monarda/Burnham/Elliotsville

89D-Elliotsville/Monson/Chesuncook/Telos/Monarda

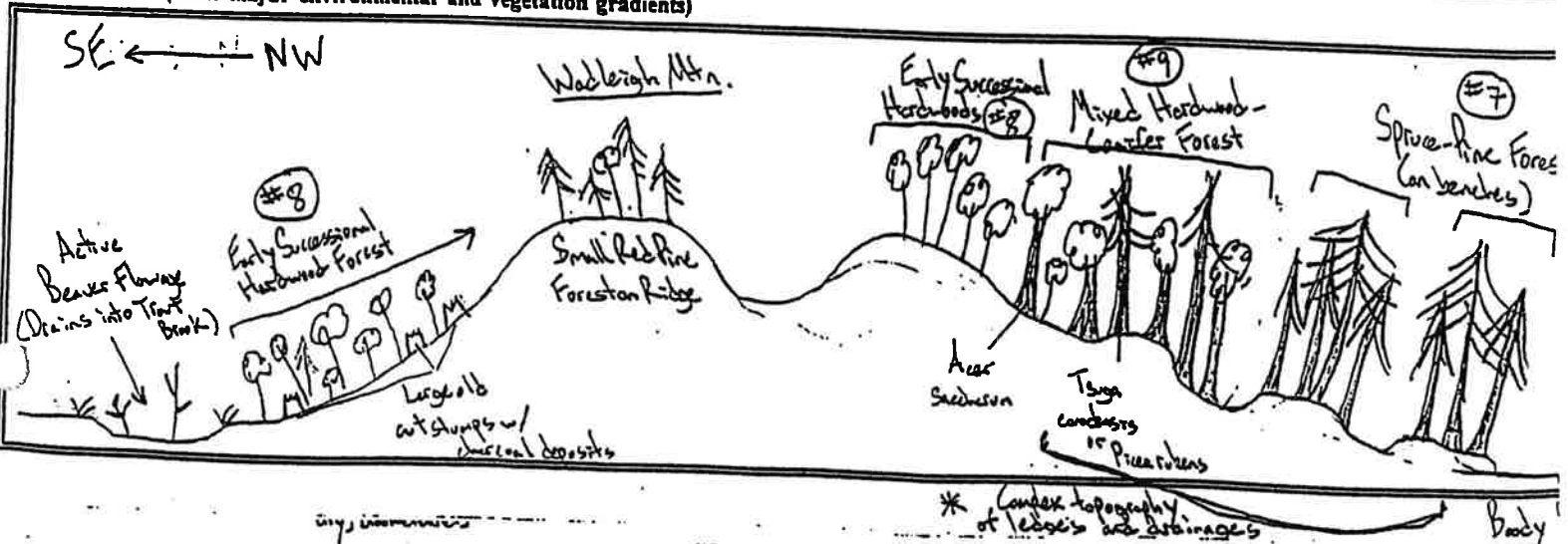




Supporting Data

TIME - Hemlock/Spruce Forest Size: 35 acres Elevation, slope, aspect, landscape position: ~ Same as #9 Soil: Dominant species: Tree: <i>Tsuga canadensis</i>, <i>Picea rubens</i> <i>Acer saccharum</i> & <i>A. pensylvanicum</i> Shrub/sapling: <i>Viburnum alnifolium</i>, <i>Ostrya virginiana</i>, <i>Fagus grandifolia</i> Herb: <i>Streptopus roseus</i>, <i>Maianthemum canadensis</i>, <i>Trillium borealis</i>, <i>Trillium undulatum</i>, <i>Urtica perfoliata</i>, <i>Aralia nudicaulis</i> Basal area: <i>Metrola virginiana</i>, <i>Abies</i>, Canopy height/% closure: <i>Tsuga</i>. dbh (median): (max):	Size: 35 acres Elevation, slope, aspect, landscape position: ~1055', flat & low Soil: Peat Dominant species: Tree: <i>Picea mariana</i> Shrub/sapling: <i>P. mariana</i>, <i>Chamaedaphne calyculata</i>, <i>Leucochoena canadensis</i>, <i>Rhododendron</i> Herb: <i>Carex brunescens</i>, all of the shrubs above, and <i>Sphagnum</i> spp. Basal area: Canopy height/% closure: $\emptyset$ fern dbh (median): (max): Condition/comments: Patches of Oldgrowth <i>Tsuga</i> such as this are small and scattered throughout the southern portion of the Boody Brook area. Surrounding mixtures of <i>Acer</i> spp., Pop. spp., and Bet. spp. suggest that the area may have burned and Hemlock was resistant. Data collected: e.g. 0.1 ha plot; prism plot; water sample; tree core data; photos photos observation - Representative DBH: <i>P. rubens</i> = 24.5", 15", 16.5", 18.0", 17.0"; in <i>T. canadensis</i> = 28.0", 24.5", 29.0", 22.0", 8.0", 9.5", 30.5"	Size: 30 Elevation, slope, aspect, landscape position: ~2,200-2,500', ~24° slope, No. Exposed upper hillside Soil: Coarse sandy silt loam Dominant species: Tree: <i>Picea rubens</i>, <i>Abies balsamea</i> Shrub/sapling: <i>P. rubens</i>, <i>A. balsamea</i>, <i>Betula</i> <i>cordifolia</i> Herb: <i>Clintonia borealis</i>, <i>Aralia nudicaulis</i>, <i>Gaultheria hispida</i>, <i>Bryophytes</i> Basal area: 32.73 Canopy height/% closure: 60 dbh (median): 7 (max): 24 Condition/comments: 160, 208, 64 mm 174, 133 Natural disturbance history only in Spruce budworm and Windthrow. Older, intact forest runs upslope in a (100 m wide) surrounding stream drain Larger area is increasingly altered Data collected: e.g. 0.1 ha plot; prism plot; water sample; tree core data; photos 0.1 ha plot, photos, soils, animal tree core data.
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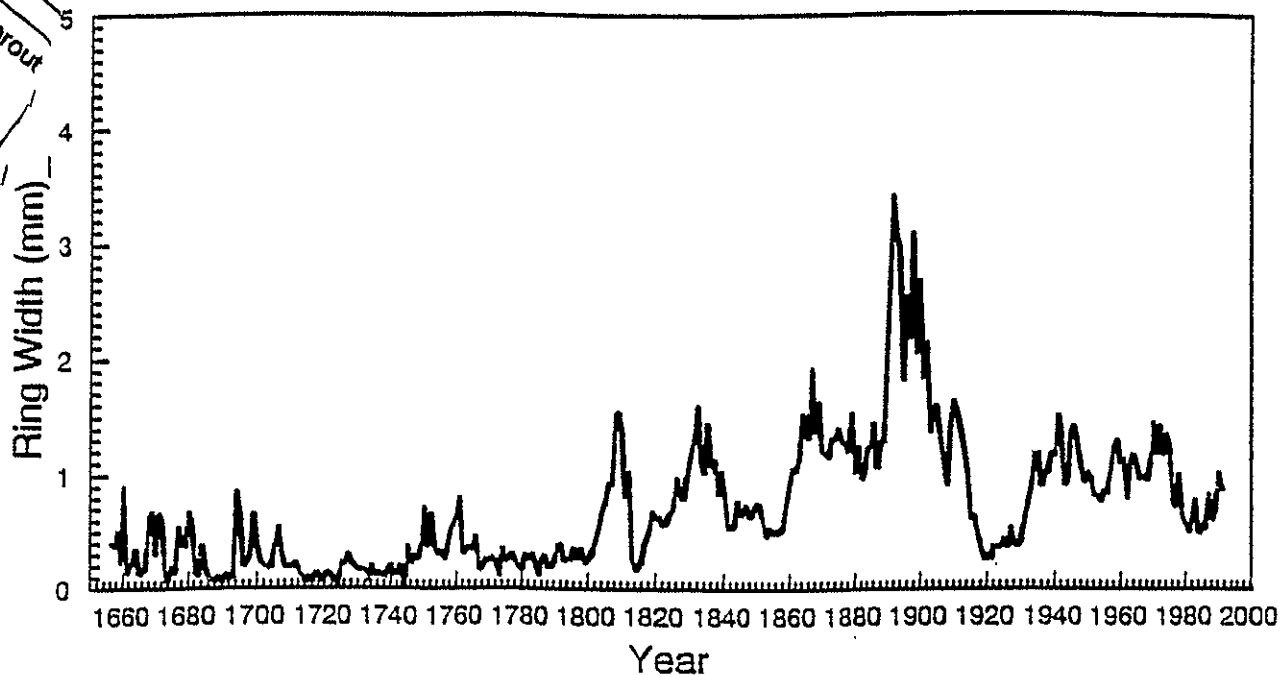
SKETCH MAP (show major environmental and vegetation gradients)



Tree 10 (Boody Brook)

23.0" Red spruce

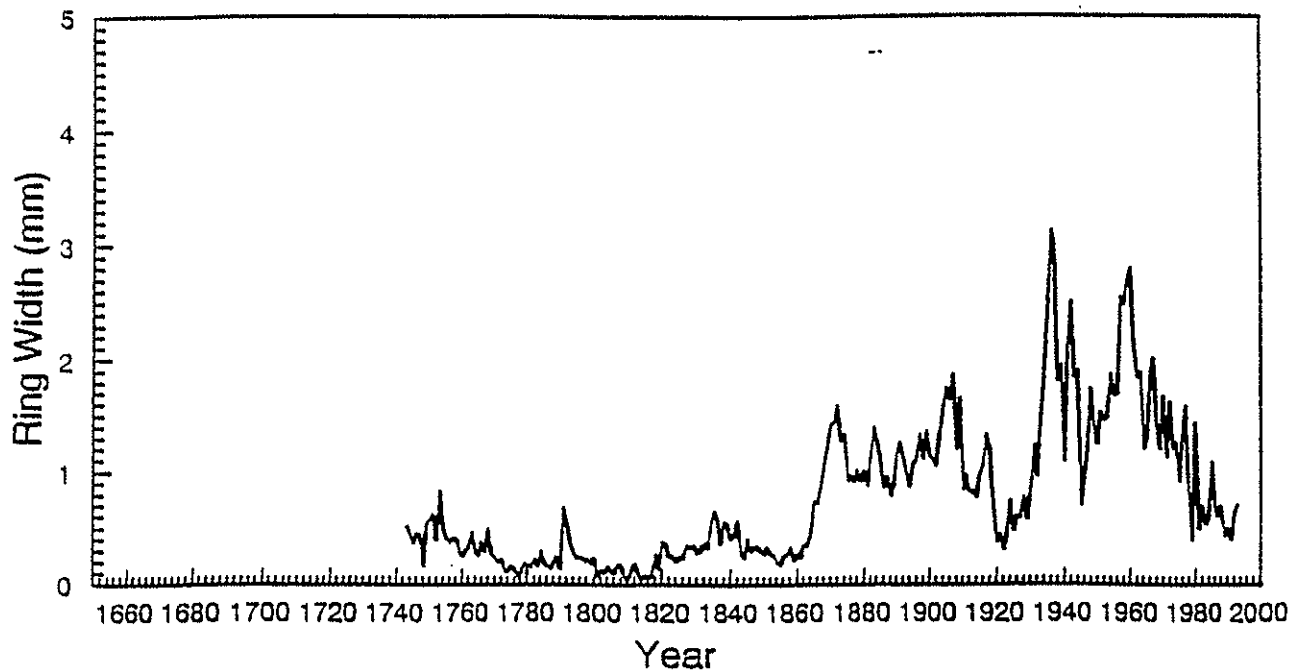
Age (bh) = 338+



Tree 17 (Boody Brook)

16.6" Red Spruce

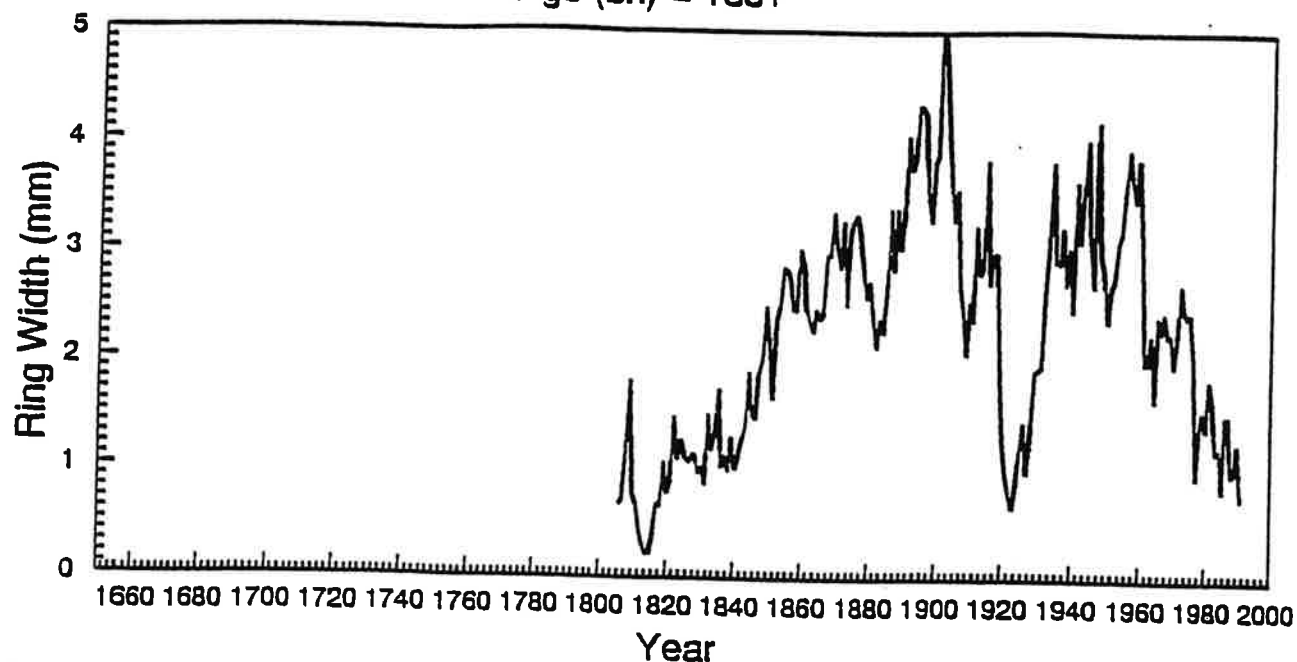
Age (bh) = 251



Tree 01 (Boody Brook)

28.1", 87' Red Spruce (just dead, bark beetle)

Age (bh) = 188+

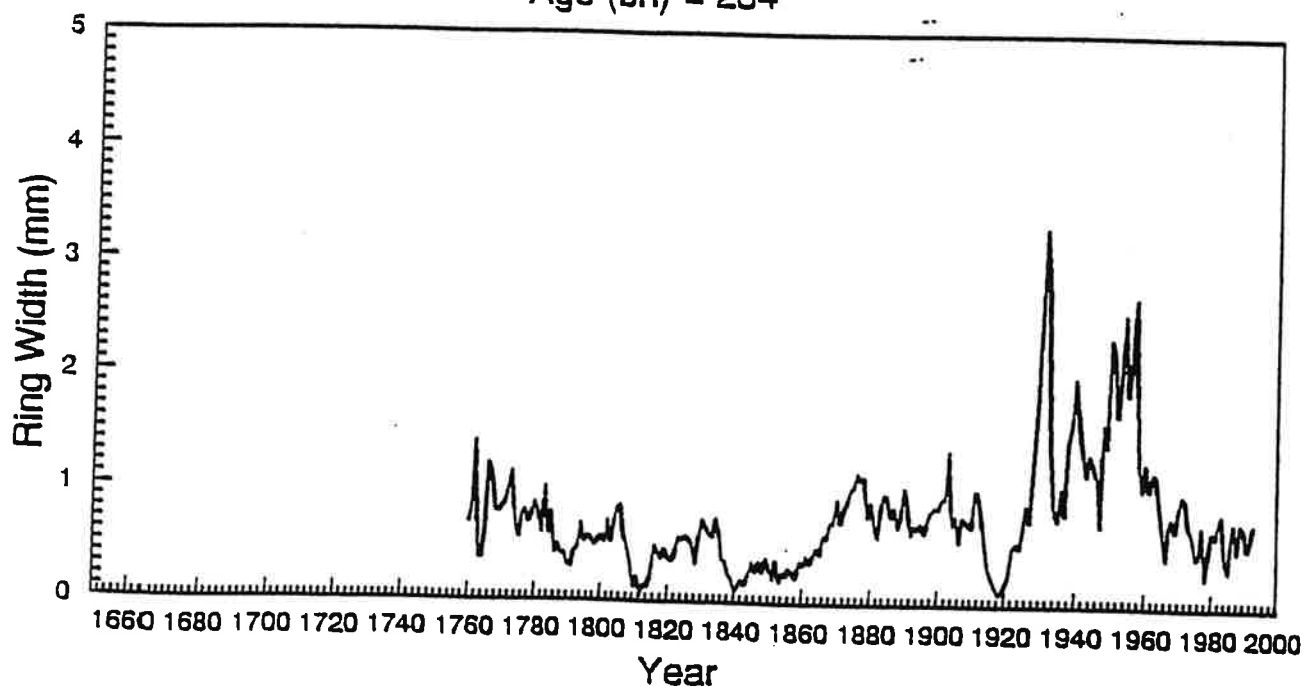


Cross-dated; last ring assumed to be 1991

Tree 18 (Boody Brook)

20.2" Red Spruce (forked)

Age (bh) = 234



Second-growth Trees (Boody Brook)

Tree 2 - Red spruce (Age @ bh = 101)

Tree 3 - Red maple sprout (Total age = 108)

