United States Department of Agriculture
Forest Service
Washington Office
14th & Independence SW
P.O. Box 96090
Washington, DC 20090-6090

Reply To: 4060-3

Date: February 22, 1991

Floyd J. Marita
Regional Forester
USDA Forest Service
310 W. Wisconsin Avenue
Room 500
Milwaukee, Wisconsin 53203

Dear Dr. Marita

Enclosed is the approved signed Decision Notice/Designation Order and Establishment Record for Nancy Borook RNA within the White Mountain National Forest, Grafton County, New Hampshire.

Sincerely,

/s/Russell M. Burns
Russell M. Burns
Principle Research Silviculturist
Forest Management Research

missing pages
5, 6, 7, 8
description &
Boundary

Nancy Brook

ESTABLISHMENT RECORD FOR NANCY BROOK RESEARCH NATURAL AREA WITHIN THE WHITE MOUNTAIN NATIONAL FOREST, CARROLL AND GRAFTON COUNTIES, NEW HAMPSHIRE

DECISION NOTICE/DESIGNATION ORDER

Decision Notice
Finding of No Significant Impact
Designation Order

By virtue of the authority vested in me by the Secretary of Agriculture under regulations 7 CFR 2.42, 36 CFR 251.23, and 36 CFR Part 219, I hereby establish the Nancy Brook Research Natural Area. It shall be comprised of lands described in the section of the Establishment Record entitled "Location."

The Regional Forester has recommended the establishment of this Research Natural Area in the Record of Decision for the White Mountain National Forest Land and Resource Management Plan. That recommendation was the result of an analysis of the factors listed in 36 CFR 219.25 and Forest Service Manual 4063.41. Results of the Regional Forester's Analysis are documented in the White Mountain National Forest Land and Resource Management Plan and Final Environmental Impact Statement which are available to the public.

The Nancy Brook Research Natural Area will be managed in compliance with all relevant laws, regulations, and Forest Service Manual direction regarding Research Natural Areas. It will be administered in accordance with the management direction/prescription identified in the Establishment Record.

The White Mountain National Forest Land and Resource Management Plan is hereby amended to be consistent with the management direction identified in the Establishment Record and this Decision Notice/Designation Order. This is a non-significant amendment of the White Mountain National Forest Land and Resource Management Plan (36 CFR 219.10(f)).

The Forest Supervisor of the White Mountain National Forest shall notify the public of this decision and will mail a copy of the Decision Notice/ Designation Order and amended direction to all persons on the White Mountain National Forest Land and Resource Management Plan mailing list.

Based upon the Environmental Analysis, I find that designation of the Nancy Brook Research Natural Area is not a major Federal action significantly affecting the quality of the human environment (40 CFR 1508.27).

This decision is subject to appeal pursuant to 36 CFR Part 217. A Notice of Appeal must be in writing and submitted to:

The Secretary of Agriculture
14th & Independence Ave., S.W.
Washington, D.C. 20250

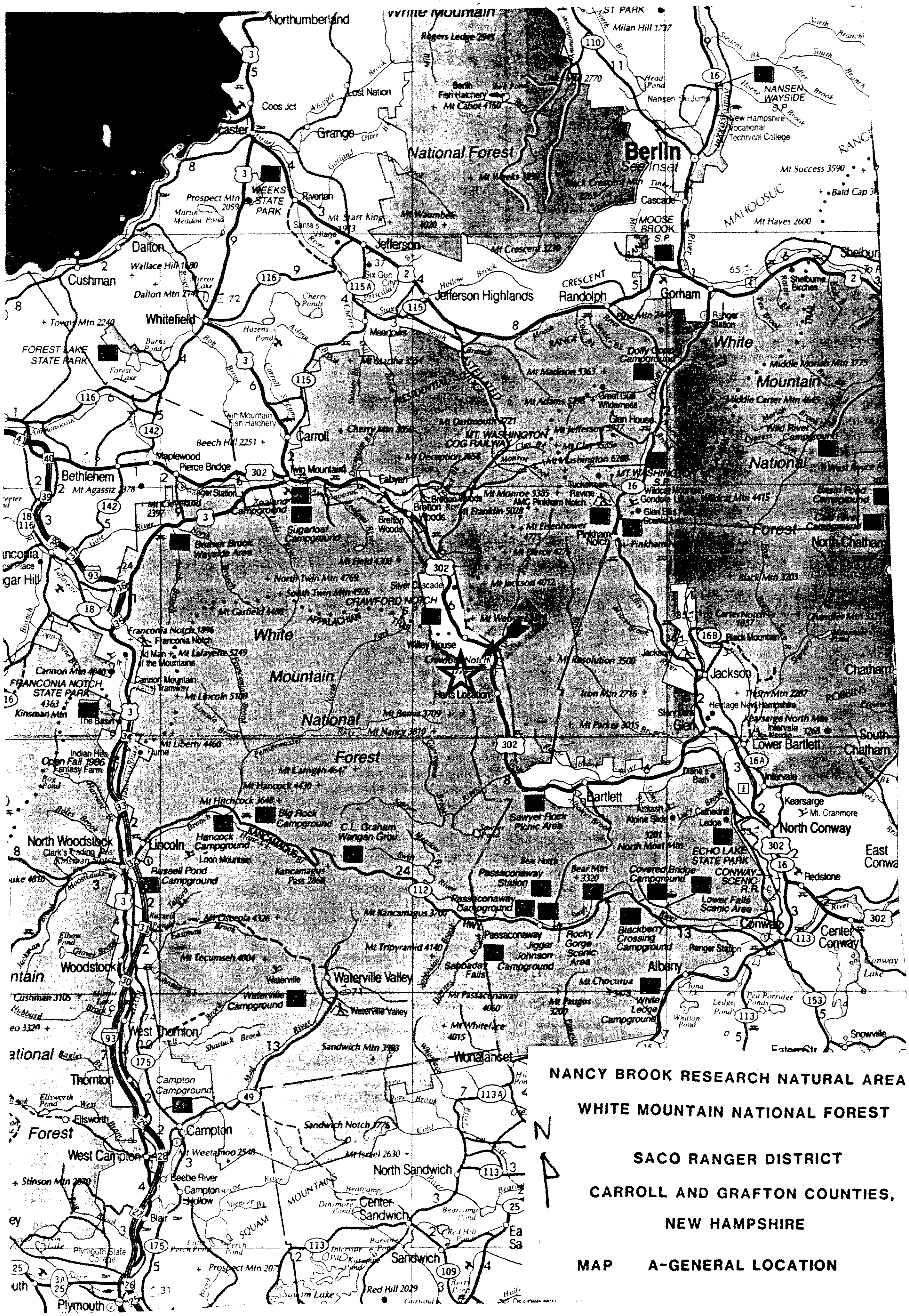
and simultaneously to the Deciding Officer:

Chief (1570)
USDA, Forest Service
P.O. Box 96090
Washington, D.C. 20090-6090

The Notice of Appeal prepared pursuant to 36 CFR 217.9(b) must be submitted within 45 days from the date of legal notice of this decision. Review by the Secretary is wholly discretionary. If the Secretary has not decided within 15 days of receiving the Notice of Appeal to review the Chief's decision, appellants will be notified that the Chief's decision is the final administrative decision of the U.S. Department of Agriculture (36 CFR 217.17(d)).

Chief

2/14/91
Date



NANCY BROOK RESEARCH NATURAL AREA

WHITE MOUNTAIN NATIONAL FOREST

SACO RANGER DISTRICT

CARROLL AND GRAFTON COUNTIES,

NEW HAMPSHIRE

MAP A-GENERAL LOCATION

USDA-FOREST SERVICE

PHOTOGRAPHIC RECORD

(See FSM 1643.52)

PHOTOGRAPHER	DATE SUBMITTED
Lee Carbonneau	3 April 1987
HEADQUARTERS UNIT	**LOCATION**
	Nancy Brook

INITIAL DISTRIBUTION OF PRINTS AND FORM 1600-1:

☐ WO ☐ RO ☐ DIV. ☐ FOREST ☐ DISTRICT ☐ PHOTOGRAPHER Date _____

INSTRUCTIONS: Submit to Washington Office in quadruplicate. Permanent numbers will be assigned and the forms will be distributed as follows: (1) Washington Office, (2) RO or Station, (3) Forest or Center and (4) Photographer.

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1			Summer 1986	NH, WMNF Saco, Graf	Base of Nancy Cascades, a 200+ ft waterfall w/ a plunge pool at the bottom. Site of state endangered Geum peckii	
2			July 1986	Same	Mature stand of Spruce w/ large accumulation of dead woody material characteristic of eastern mesic old-growth forests	
3			July 1986	Same	Fungi are abundant in the moist litter and woody detritus of the old-growth forest stand	
4			Same	Same	Stand dominated by Balsam Fir, illustrating abundant Spruce/Fir regeneration	
5			Same	Same	Beaver Dam on Nancy Pond, high in Saddle of the Nancy Brook watershed	
6			August 1986	Same	Site of Geum peckii on Nancy Cascades	

☆ U.S. GOVERNMENT PRINTING OFFICE : 1973-730-157/208 3-1

NANCY BROOK

PHOTOGRAPHS

ALL PHOTOS BY
LEE CARBONNEAU &
FRANKIE BRACKLEY

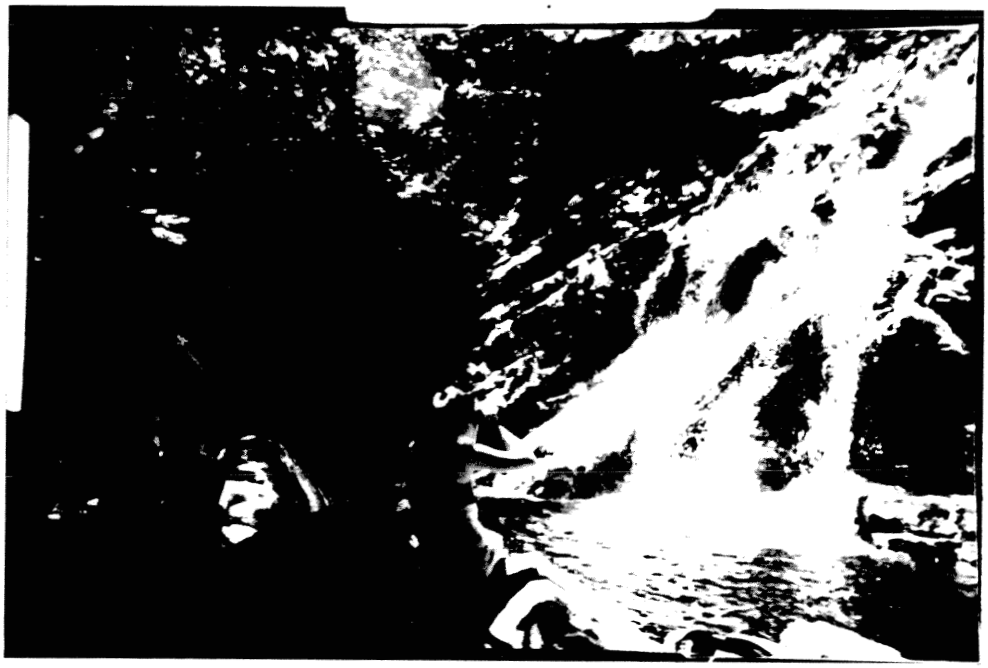

PHOTO #1 - BASE OF THE SCENIC NANCY CASCADES, A 200'+ WATERFALL WITH A PLUNGE POOL AT THE BOTTOM. SITE OF THE STATE ENDANGERED GEUM PECKII (MOUNTAIN AVENS)

PHOTO #2 - MATURE SPRUCE STAND WITH LARGE ACCUMULATION OF DEAD WOODY MATERIAL CHARACTERISTIC OF EASTERN MESIC OLD-GROWTH FORESTS.

PHOTO #3 - FUNGI ARE ABUNDANT IN THE MOIST LITTER AND WOODY DETRITUS OF THE OLD-GROWTH FOREST STAND

PHOTO #4 - STAND DOMINATED BY BALSAM FIR, ILLUSTRATING ABUNDANT SPRUCE AND FIR REGENERATION

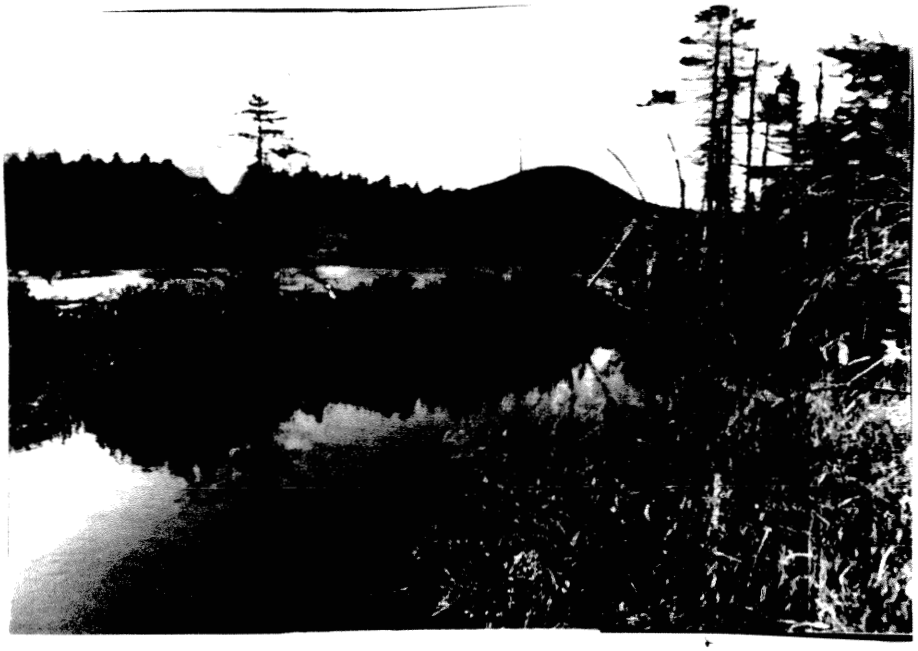

PHOTO #5 - BEAVER DAM ON NANCY POND, HIGH IN SADDLE OF THE NANCY BROOK WATERSHED

PHOTO #6 - SITE OF GEUM PECKII (A STATE ENDANGERED SPECIES)

SIGNATURE PAGE
for
RESEARCH NATURAL AREA ESTABLISHMENT RECORD
Nancy Brook Research Natural Area
White Mountain National Forest
Carroll and Grafton Counties, New Hampshire

The undersigned certify that all applicable land management planning and environmental analysis requirements have been met and that boundaries are clearly identified in accordance with FSM 4063.21, Mapping and Recordation and FSM 4063-41 5.e(3) in arriving at this recommendation.

Prepared by Lee Carbonneau — Date 1/30/89
Lee Carbonneau, Botanist
Environmental Consultant

Prepared by Frankie Brackley — Date 1/30/89
F. E. Brackley, Coordinator/Botanist
New Hampshire Natural Heritage Inventory

Prepared by [signature] — Date 1/29/89
Frederick T. Kacprzynski, Research Natural Area Coordinator
White Mountain National Forest

Recommended by [signature] — Date 1/20/89
Robert M. Walker, District Ranger
Saco Ranger District

Recommended by [signature] — Date 1/24/89
Steve Chandler, District Ranger
Pemigewasset Ranger District

Recommended by [signature] — Date 1/30/89
Michael B. Hathaway, Forest Supervisor
White Mountain National Forest

Recommended by [signature] — Date 2/27/89
Floyd J. Marita, Regional Forester
Eastern Region

Recommended by [signature] — Date 3/7/89
for Denver P. Burns, Station Director
Northeastern Station

ESTABLISHMENT RECORD FOR

NANCY BROOK RESEARCH NATURAL AREA WITHIN

THE WHITE MOUNTAIN NATIONAL FOREST, NEW HAMPSHIRE

TABLE OF CONTENTS

ESTABLISHMENT RECORD FOR

NANCY BROOK RESEARCH NATURAL AREA

WITHIN THE WHITE MOUNTAIN NATIONAL FOREST

NEW HAMPSHIRE

INTRODUCTION

The Nancy Brook Research Natural Area (RNA) is located within the White Mountain National Forest in Carroll and Grafton Counties, New Hampshire, and is entirely on National Forest land. As the largest tract of virgin forest left in New Hampshire and one of the largest in the northeast, Nancy Brook is a regionally significant area. Large tracts of virgin forest are so rare in the region that any good example must be protected.

The Nancy Brook area was suggested for RNA consideration in 1985 by F.E. Brackley, Coordinator/Botanist of the New Hampshire Natural Heritage Inventory.

The primary uses of this area is nonmanipulative ecological research. There is minor recreation use along the Nancy Pond Trail (Forest Trail No. 517). It is not expected to have an adverse impact on conduct of research in the area.

Nancy Brook RNA is not in any designated Wilderness although it adjoins the boundary of the Pemigewasset Wilderness. It is not in any designated Wild and Scenic River corridor but it includes the headwaters of Norcross Brook, a Wild and Scenic Inventory River.

Land Management Planning

Nancy Brook is recognized in the White Mountain National Forest Land and Resource Management Plan and Final Environmental Impact Statement (FEIS) as approved by Regional Forester Larry Henson on April 30, 1986. Nancy Brook is within Management Area 9.3, Candidate Research Natural Area. The Plan calls for study of the Nancy Brook area and for implementation as a Research Natural Area if the study supports it. Once designated, the RNA will be within Management Area 8.1, Special Areas, with its own specific management prescription. The primary management objective is protection of the old growth and Virgin Forest community. RNA designation overrides Regional designation of the Nancy Pond Scenic Area within the RNA, therefore the Nancy Pond Scenic Area designation and prescription in the Plan will be deleted.

Local History

The Nancy Pond area was once part of Elkin's Grant. It then became property of the Saunder's Estate which was approved for purchase by the National Forest Reservation Commission on November 23, 1934. Because of boundary disputes which required settlement, the land did not come under Forest Service administration until 1937.

The area east of Nancy Pond along Nancy Brook was not logged until after the 1938 hurricane destroyed a considerable area of virgin spruce along the north slopes. The Conway Supply Company salvaged the timber from 1939 through 1942. The virgin spruce along the southern slopes is intact except for occasional scattered blowdowns. These stands were probably not logged because of their steep slopes and inaccessibility. The spruce stand on the southern slopes are representative of many thousands of acres that once occurred in the White Mountains.

JUSTIFICATION

The old growth and virgin forest at Nancy Brook is composed of spruce and fir, forest Type 33, not currently represented in the RNA system in New England and identified in the Regional Guide under "Priority #1 - Unrepresented Forest Cover Types."

This old-growth red spruce/balsam fir (Picea rubens/Abies balsamea)[1/] stand is one of the largest tracts of virgin forest in the northeast. The area also includes two small bogs, beaver ponds, streams, a cascade with a 200 foot (61 m) waterfall and a high flat saddle with a four acre (1.6 ha) pond. The site also encompasses the summits of three mountains; Mt. Nancy 3906 foot (1191 m), Mt. Bemis 3706 foot (1130 m), and Duck Pond Mt. 3300 foot (1006 m). The large range of elevations, aspects, drainage conditions, and plant associations make this an excellent research area. Red spruce (Picea rubens) have been found to reach 375 years in this site and the area displays a complex mosaic of disturbance patterns characteristic of old-growth forests. The size of the area and its potential for baseline studies, especially those related to Spruce decline, make it unique in the northeast.

This area was identified as a significant site in both the 1962 and 1971 publications "Natural Areas of New Hampshire - suitable for ecological research." It has been designated a National Natural Landmark.

There is a population of a globally rare endemic species, Mountain Avens (Geum pecki)[2/] growing on the wet rocks of the Cascades within this RNA. At the present time, the Federal status of this species is 3C (Federal Register, Friday, September 27, 1985).

The old growth of Nancy Brook is also habitat for the rare northern three-toed woodpecker (Picoides tridactylus).[3/]

[1/] Source used for scientific and common names of trees: Little, E.L., Jr., 1979, Checklist of United States (Native and Naturalized), Agriculture Handbook No. 541, Washington, D.C., U.S. Department of Agriculture, 375 pp.

[2/] Source used for scientific and common names of non-tree plants: Fernald, M.L., 1970, Grays Manual of Botany, Eighth Edition, D. VanNostrand Company, New York, 1,632 pp.

[3/] Source for scientific and common names of birds: Peterson, Roger T., 1980, A Field Guide to the Birds East of the Rockies, Houghton Mifflin Company, Boston, MA, 384 pp.

Past studies include tree ring analysis by the Lamont-Doherty Geological Observatory at Columbia University, New York in 1979, a comparison of virgin spruce/fir stands of the northern and southern Appalachian Mountain Range (Oosting and Billings, 1951), study of tree age distribution in virgin forest stands (Leak, 1975), old-growth forest structure and species composition descriptions (Carbonneau, 1986). Current studies include a study of the size and age distributions of accessory species.

PRINCIPAL DISTINGUISHING FEATURES

This Research Natural Area has 1385 acres (561 ha) of uncut forest exhibiting natural disturbance patterns including hurricane and fire, and small scale patch disturbances. It includes unvegetated landslides, regenerating softwoods, and mature and old-growth forest stands. There are logs and snags in all stages of decay. The site includes a large proportion of the upper reaches of the Nancy Brook watershed. There is a 130 acre (52.6 ha) portion which was salvaged in 1939. This is the largest tract of virgin forest left in New Hampshire and one of the largest in the northeast. It contains a population of globally rare endemic species, Mountain Avens (Geum pecki).

LOCATION

Maps A and B show the location of the Nancy Brook RNA, each in greater detail.

The RNA is in the towns of Lincoln and Livermore in Grafton County; a minor portion of the site extends into Hart's Location in Carroll County. The RNA is in the Saco Ranger District of the White Mountain National Forest in New Hampshire (see Map A). The RNA is all on National Forest administered land and is completely surrounded by National Forest administered land.

The RNA is in the Nancy Brook and Halfway Brook watersheds, which drain into the Saco River.

The center of the RNA is at latitude 44 06' 50" north and longitude 71 23' 35" west.

Area

Total acreage is 1385 acres (561 ha).

Elevations

Elevations vary from 1900 ft. (579 m) to 3900 ft (1189 m).

Access

Access to the RNA by highway is, New Hampshire route 302 north from Bartlett, N.H. to the Nancy Pond trail (Forest trail no. 517). The Nancy Pond Trail leaves the west side of route 302 1.2 miles (2 k) north of the Sawyer River road and enters the RNA about 1 1/2 miles (3 k) from the road. It follows Nancy Brook Trail to Nancy Pond, through the center of The RNA, it then links up with the Mt. Bemis trail which follows the northern boundary to the summit of Mt. Bemis.

Air distance - Nancy Brook is 5 miles (8 km) from Bartlett, NH.
Road distance- Including trail distance, it is 7 miles (11 km) from Bartlett.

Boundaries

The boundary of the RNA consists of segments of surveyed lines when available and described lines where surveys are not available. The boundary of the RNA is as follows:

0 Starting point - Corner 7 of United States Tract 46aI as shown on map B and B1, which is described as:

Corner 7, common to the land of Saunders Estate, on north edge of Hawkins Logging Road, on a southeast slope among spruce and fir.

Set a 4"x4"x48" spruce post in a mound of stones scribed F.S. Cor 7 - 46 AI, from which a 12" hemlock bears S43^{o}W 0.45 chains blazed and scribed Cor 7 B.T.

An 18" hemlock bears S 22^{o} 30'E 0.59 chains blazed and scribed Cor 7 B.T.

South

61.25 Along the common line between Carroll and Grafton Counties, crossing the North fork of Nancy Brook for 14.15 chains, then, bearing left, the start of a semicircle of 15.00 chains diameter, ending on corner 6 of United States Tract 46aI, described as,

Corner 6, common to Saunders Estate on southeast slope. A 3" spruce stake scribed 752 x $\triangle$, with witness trees.

Set a 6"x6"x48" spruce post in a mound of stones scribed 18 F.S. on east face

A 10" spruce bears N27^{o}E 0.25 chain distant, blazed and scribed 18 BT

A 4" hemlock bears N80^{o}E 0.28 chain distant, blazed and scribed 18 BT

S 0^{o}51'W

28.88 Continuing with a line between Carroll and Grafton Counties

AREA BY COVER TYPES

SAF Types

The SAF classification of this area is as follows:

SAF Type	Kuchler Type	Acres/Hectares
35-Paper Birch-Red Spruce	87-Northeastern Spruce/Fir	895/362
33-Red Spruce-Balsam Fir	87-Northeastern Spruce/Fir	356/144
5-Balsam Fir	87-Northeastern Spruce/Fir	119/48
13-Black Spruce-Tamarack	85-Conifer Bog	15/6

New Hampshire Natural Heritage Inventory Community Classification

Under this classification system, there are two natural communities at Nancy Brook RNA. They are as follows:

1) "Northern New England Level Bog" - This community is best characterized as an ombrotrophic to poorly minerotrophic peatland. The surface of the bog is isolated from groundwater and the nutrients it contains by thick peat deposits. A nutrient impoverished environment exists here, with the surface being nourished primarily by rainwater. Some areas, such as the margin of the bog that contacts pond water, and scattered areas where subsurface water emerges, are mineral enriched. However, this enrichment is minimal in level bogs, and they are therefore classified as nutrient poor peatlands.

Bogs occur in wet depressions and low areas with impeded drainage, but reach their best development on ponds. This community is a vegetation complex that develops through a successional pond filling process.

However, there is no "climax" in the traditional sense, with succession occurring on a time scale akin to geologic time. Bog plants communities reflect a complex interaction of many factors including succession, hydrology, peat forming processes, natural disturbance, and nutrient status.

Heath shrubs (Ericaceae spp.) dominate in this community. These include: labrador tea (Ledum groenlandicum), sweet gale (Myrica gale), bog rosemary (Andromeda glaucaphylla), leatherleaf (Chamaedaphne calyculata), and cranberry (Vaccinium oxycoccus). Dwarf black spruce (Picea mariana) and tamarack (Larix laricina) are common.

Plants that utilize carnivory for a source of nutrients characterize this community. These are pitcher plants (Sarracenia purpurea), bladderworts (Utricularia,spp.), and round-leaved sundew (Drosera rotundifolia). Other characteristic species are three-leaved solomon's seal (Smilacina trifoliata), buckbean (Menyanthes trifoliata), sedges (Carex trisperman), (C.pauciflora), (C.oligosperma), pale laurel (Kalmia polifolia), and hare's-tail cotton-grass (Eriophorum spissum).

2) "Northern New England High Elevation Spruce/Fir Forest" - This forest community is confined to the higher regions of New England at elevations ranging from approximately 2200 to 4000 ft. (671 to 1219 m). A montane climate is typical, with very cold and windy winters and cool moist summers with frequent fog, especially at higher elevations.

Dominant tree species are balsam fir (Abies balsamea) and red spruce (Picea rubens). Nearly always present, and occasionally becoming a significant component of the canopy are Mountain paper birch (Betula papyrifera var. cordifolia) and mountain ash (Sorbus americana). Mosses and liverworts are abundant, covering much of the forest floor. Other dominats are hobblebush (Viburnum alnifolium), wood-sorrel (Oxalis montana), and goldthread (Coptis groenlandica). Characteristic species include bead lily (Clintonia borealis), large leaved goldenrod (Solidago macrophylla), snowberry (Gaultheria hispidula), bunchberry (Cornus canadense), and blueberry (Vaccinium angustufolium).

The upper limit of this community on higher mountains is indicated by the decreasing occurrence of red spruce, dwarfed trees, and thinning of forest cover with frequent disturbance patches dominated by saplings and shrubs. This is a somewhat arbitrary boundary, since this subalpine forest is a broad ecotone between the boreal spruce fir forest and the arctic environment above treeline.

PHYSICAL AND CLIMATIC CONDITIONS

Physical Conditions

The slope of the RNA ranges from 17% to 80% with an average of 1% exposed rock. the aspect range of this site is 360 degrees.

Photographs provided with this Establishment Record illustrate the physical features of this site.

Climate

The climate in the White Mountains is classified as humid continental with short, cool summers, and long cold winters. There is a large range in both diurnal and annual temperatures. Precipitation is distributed nearly evenly over the 12 months. In general, air masses flow from west to east, with northwesterly flows in the winter, and southwesterly flows in the summer. The region occasionally is exposed to maritime air during the fall and winter when colder polar air moves south and cyclonic disturbances travel up the east coast. Normally, a snowpack develops each winter, with depths increasing with elevation. Mild midwinter temperatures occasionally melt part or all of the snowpack, especially at lower elevations. With a deep snowpack and thick humus layer, it is not unusual for soils to remain unfrozen even in the coldest months.

There are data available from several precipitation and temperature observation stations nearby including Fabyan, Pinkham Notch, and Mount Washington, New Hampshire.

The elevations for the three stations are 1620 (494 m), 2010 (613 m), and 6262 feet (1909 m) above sea level, respectively. Data from the station at Pinkham Notch are listed since it more closely represents conditions at mid-slope elevations. Elevations within the RNA range approximately from 2000 feet (610 m) to 4310 feet (1314 m).

Climatic Records for Pinkham Notch, New Hampshire

Averages for the period 1950-1982

Mean Temperatures

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	
15.5	17.0	25.6	37.4	50.0	59.0	63.1	60.9	53.3	43.7	32.5	19.7	39.8	F
-9.2	-8.3	-3.6	3.0	10.0	15.0	17.3	16.1	11.8	6.5	0.3	6.8	4.3	C

Precipitation

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	
4.30	4.55	4.97	4.35	4.30	4.80	4.55	4.51	4.65	5.11	6.17	5.42	57.68	in.
109	116	126	110	109	122	116	115	118	130	157	138	1465	mm.

Summarized by R.S. Ferrin and S. Simms. 1982.

DESCRIPTION OF VALUES

Flora

A general list of vegetation for Nancy Brook follows:[4/]
red spruce (Picea rubens), yellow birch (Betula lutea), paper birch (Betula papyrifera), mountain ash (Sorbus americana), mountain maple (Acer spicatum), striped maple (Acer pensylvanicum), hemlock (Tsuga canadensis), balsam fir (Abies balsamea), hobblebush (Viburnum alnifolium), mountain holly (Nemopanthus mucronatay), clintonia (Clintonia borealis), creeping snowberry (Gaultheria hispidula), bunchberry (Cornus canadensis), lowbush blueberry (Vaccinium angustifolia), late sweet blueberry (Vaccinium angustifilium), whorled aster (Aster acuminatur), spinulose wood fern (Dryopteris spinulosa), wood sorrel (Oxalis montana), trillium (Trillium undulatum), rose mandarin twisted stalk (Streptopus roseus), canada mayflower (Maianthemum canadense), wild sarsaparilla (Aralia nudicaulis), mountain goldenrod (Solidago macrophylla), wild currants (Ribes spp), moss spp. and liverwort spp. The area of the Cascades, a series of waterfalls in a steep gorge, supports a population of the globally rare endemic plant, Mountain Avens (Geum pecki).

The area is mostly virgin high-elevation spruce/fir, with a mosaic of patches in various stages of succession. Some parts suffered severe blowdown in the 1938 hurricane. Small patches of recent blowdown are present. There are two small bogs with a ring of tamarack-black spruce around the edges and several boggy areas.

The predominant vegetation in the bogs consists of:
black spruce (Picea mariana), tamarack (Larix laricina), sweet gale (Myrica gale), pitcher plant (Sarracina purpurea), pale laurel (Kalmia polifolia),

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[4/] See Appendix C for the Vegetation Sampling Scheme.

roundleaf sundew (Drosera rotundifolia), intermediate sundew (Drosera intermedia), leatherleaf (Chamaedaphne calyculata), small cranberry (Vaccinium oxycoccos), tawny cotton-grass (Eriophorum virginicum), labrador tea (Ledum groenlandicum), and few-flowered sedge (Carex pauciflora).

Fauna

The New Hampshire Breeding Bird Atlas, a cooperative project of the University of New Hampshire Department of Forest Resources and the Audubon Society of New Hampshire, produced a list of species occurring within the Nancy Brook area in Block #6624 which can be found in Appendix B.

A number of wood frogs (Rana sylvatica)[5/] and green frogs (Rana clamitans melanota) have been observed during the course of this study.

The Nancy Brook area supports the following mammals: deer (Odocoileus virginianus borealis)[6/], moose (Alces americana), snowshoe hare (Lepus americanus), and beaver (Castor canadensis). The deer population is reported to be high in this RNA. Nancy Pond is not stocked because the survival rate of trout is too low. Beaver activity is currently low.

Geology and Soils

The bedrock of this area is part of the Littleton Formation chiefly composed here of gray gneiss. There is a section of Mt. Lafayette Granite Prophry that runs east of the Cascades. Further information on the geology of this quadrangle can be found in Henderson et al. 1977.

According to the "Soils Survey of Grafton County, New Hampshire" by Latimer et al. (1939) the soil classification within this RNA is simply "rough mountainous land."

ELT's

The RNA consists of Ecological Land Types (ELT) 2, 6, 6E, 06, and 14, as illustrated on Map C. A description of those ELT's follows:

[5/] Source of scientific and common names of Amphibians: DeGraaf, R. and D. Rudis, 1983, Amphibians and Reptiles of New England, Habitats, and Natural History, The University of Massachusetts Press.

[6/] Source of scientific and common names of mammals: Godin, Alfred J., 1977, Wild Mammals of New England, The John Hopkins University Press, Baltimore, MD, 304 pp.

Ecologic Land Type 2 (32%)

Softwood, Knolls, Ridges, and Steep Side Slopes with Ledgy, Bouldery Soils.

Geomorphic History and Typical Landforms - Continental ice sheet scoured ridges, knolls, and steep side slopes. Slopes are overall slightly to moderately convex, micro slopes are irregular and steep except on ridge and knoll tops where they are of moderate gradient. Surface drainage features are typically absent.
Soil Substrata - Soil materials are typically bouldery to very bouldery, friable, non-plastic, rapidly permeable sandy loams one to two feet deep to bed rock. Boulders are angular, from 30 to 60% of total volume and derived from local rock types, and soil textures range from sandy loams to loamy sands and are moderately well to moderately poorly graded. Bedrock is invariably hard and fresh.

Forest Association - The climax association is a moderately low red spruce and balsam fir forest typically composed of equal proportions of each. The subclimax association is composed entirely of paper birch and a variety, and the presubclimax association is very short duration pin cherry with somewhat more persistent mountain ash as an accessory.

Inclusions - On long side slopes at higher elevations as much as 40% by area of land type 14 is included in this map unit. Elsewhere, up to 20% by area of land type 6 is locally included in the map unit.

Ecological Land Type 6 (16%)

Predominantly Softwood on Steep Upper Mountain Side Slopes with Deep Bouldery Colluvium.

Geomorphic History and Typical Landforms - Alpine glaciation and subsequent periglacial creep forming long, very steep, slightly concave upper mountain side slopes. Small draiageways are very widely spaced, unbranched and unentrenched with steep gradients. Local relief is very high.

Soil Substrata - Very bouldery, non-plastic, very permeable, moderately well to well-drained sandy loam colluvium five to seven feet (1.5 to 2.1 m) deep to sandy loam tills, or, less commonly to ledge rock. The colluvium contains 40 to 60% by volume of locally derived subangular rock fragments 6 inches (15 cm) to 4 (1.2 m) in diameter.

Forest Associations - The climax association is red spruce and balsam fir with equal proportions of each to red spruce and balsam fir with the former dominant and with sugar maple as an accessory. The subclimax ranges from paper birch to a paper birch, white birch variety, and yellow birch allocation with red maple as an accessory where sugar maple is a climax accessory. Presubclimax associations are pin cherry and mountain maple, with striped maple an accessory at lower elevations and mountain ash an accessory at higher elevations.

Inclusions - Up to 30% off the total area of this map unit is composed of small scattered bodies of land type 2 or land type 105.

Ecological Land Type 6E (24%)

Softwoods on High Mountain Slopes and Notch Floors with Deep Till.

Geomorphic History and Typical Landforms - Continental ice sheet ablation and subsequent alpine glacio-fluvial deposition, slightly concave, gentle to moderately steep side slopes and broad notch floors at moderately high elevations. Overall smooth, but with strongly micro undulating knolls twoto five acres (.8 to 2.0 ha) in extent. Intervening swales with local relief in low tens of feet, and overall moderately low to moderately high relief. Small drainageways are closely spaced, essentially unentrenched and well-branched.

Soil Substrata - Soil materials are bouldery, rapidly permeable, well-graded, non-plastic, sandy loam tills, containing 25 to 40%, subrounded and subangular boulders by volume, well-graded grom 3 inches (8 cm) to 2 feet (.6 m) in diameter, and composed of mixed rock types. This till is typically more than 8 feet (2.4 m) thick, and is typically overlain by two to four feet (.61 to 1.2 m) of a well-graded, moderately permeable, subangular, locally derived boulders.

Forest Associations - The climax association is a moderately low canopied forest of balsam fir and red spruce, with fir dominating the composition, but apparently with shorter individual duration than the spruce. Subclimax associations consist of yellow and paper birches and a variety of white birch with the paper birch compositionally dominant, but of shorter duration than the yellow birch. Presubclimax associations are pin cherry, mountain maple, and mountain ash in order of persistence.

Inclusions - Up to 30% of the area is this map unit is composed of small intermingled areas of land types 15H and 6D.

Ecological Land Type 06 (15%)

Extremely steep slopes with very bouldery colluvium supporting moderately low softwood forest.

Extremely steep upland breaks with slopes greater than 80% with very bouldery sandy loam soil materials containing 50% to 75% boulders by volume. Spruce-fir forests with moderately low biomass are climax. Runoff is subsurface and fairly rapid.

Ecological Land Type 14 (13%)

Geomorphic History and Typical Landforms - Subsurface frost churning with overall very smooth, steep to very steep, upper side slopes at high elevations. Slopes are long and uniform, local relief is very high, and surface drainageways are extremely widely spaced, well-entrenched, unbranched and have very steep gradients.

Soil Substrata - Very permeable, very bouldery, well-drained, well-graded, non-plastic sandy loam to loamy sand angular drift more than eight feet (2.4 m) deep to hard fresh bedrock. Boulders are locally derived, angular to subangular, well-graded to about three feet (.91 m) in diameter and comprise 40 to 65% of the total mantel volume. Soil materials have low bulk densities.

Forest Associations - The climax association is a moderately low red spruce and balsam fir forest with fir dominating the composition. The subclimax association consists entirely of paper birch and a variety of white birch with mountain ash as an accessory.

Inclusions - Inclusions of small scattered areas of land types 2 and 60 account for upwards to 20% of the total area of this unit.

Lands

Acquired from Saunders Estate on 12/22/36; Parker Young Co. on 3/13/36; and Morey Estate on 4/9/36. There are no outstanding rights.

Cultural

No comprehensive cultural resource survey has occurred within the RNA, but there are two known cultural sites within the RNA:

1. Nancy Brook "Mill Site" (Site #27-GR-2276)

   This site is reportedly from the 1930's containing much debris. It is an unevaluated site. This site is located near the Nancy Brook Trail a short distance from the eastern boundary of the RNA.

2. Mt. Bemis Fire Lookout Site (Site #27-CA-2141)

   This is the site of a 1940 USFS Fire Lookout that was destroyed in 1960. It has been evaluated and determined ineligible for the National Register. This site is near the boundary of the RNA. No management steps are required for the fire lookout site. The "Mill Site" should be avoided and protected until assessed and evaluated as to significance.

IMPACTS AND POSSIBLE CONFLICTS

Mineral Resources

These comments on mineral "potential" are derived from the joint Bureau of Mines and USGS investigation of 1980-81 pursuant to the 1964 Wilderness Act which required evaluation of mineral potential of wilderness and RARE II areas.

This RNA was rated as having moderate mineral resource potential for tin deposits of several possible kinds and deposits containing lead, zinc, uranium, beryllium, and thorium. There are no known mineral deposits and no current mineral activity.

Minerals activities will not be allowed in the RNA.

Grazing

A range resource overview was done in 1980 for the Forest Plan. That study indicated the forested portion of the White Mountain Forest is not range land. Existing farms adjacent to the Forest boundary and on inholdings wage an incessant battle against tree encroachment to maintain pastures and hay fields. It is not a natural grassland system. Grass and grasslike species are not able to become established on these forest soils during the brief times when clearings are created by clearcuts, wildfire, or blowdowns. For two or, at most, three years following a clearcut, forage supplies may exist in quantity if not quality for limited potential grazing use. But these forages are neither grasses nor high quality forbs.

For all practical purposes, the Research Natural Area does not have a range resource. Therefore, it has no impact on grazing.

Timber

Nancy Brook was identified in the Forest Plan as a RNA. It was determined as unsuitable for timber production in the third stage of the Timber Resource Land Suitability Analysis. In that stage of the analysis, lands not suited for timber production are either 1) not needed to meet timber demand projections, 2) needed to meet other management objectives which preclude timber production, or 3) are not cost efficient in meeting Forest objectives over the planning horizon. Therefore, designation of Nancy Brook as a RNA would not impact the timber outputs as reflected in the Forest Plan.

About 1100 acres (445 ha) of the total 1385 acres (560 ha) are considered noncommercial because of high elevation (over 2700 feet using our current standards) and steep slopes (over 30%). It is estimated that approximately 300 acres (121 ha) would be classified as Commercial Forest Land (CFL). It is also estimated that this now supports about 5,100,000 board feet of commercial timber. Long term productivity for 300 acres (121 ha) at a mean annual growth of 200 board feet per acre would mean a potential yearly timber withdrawal because of the RNA of about 60,000 board feet.

Watershed Values

The Majority of the RNA is within the Saco River Basin. Nancy Brook and Halfway Brook are two of the brooks draining into the Saco River. Drainage densities of their headwater streams is very high. A small part of the area near Norcross Pond drains into the east branch of the Pemigewasset watershed which is in the Merrimack River Basin. Designation of the area as an RNA does not conflict with watershed values. A 130 acre (53 ha) area cut over in 1939 (salvage cut) is included as part of the watershed below the cascades. It is shown on Map D as the young Spruce/Fir/Paper Birch stand just south of Nancy Brook. This area could be used as a comparison to the stands in the Halfway Brook drainage which were also blown down in the 1938 hurricane but never salvaged.

Recreation Values

This area has long been recognized for its scenic combination of cascades and ponds. A part of this area of unique natural beauty was declared a "Scenic Area" by the United States Forest Service in 1964. Under that designation it is protected and managed so that the special values of its near-primitive environment area available for public study, use, and enjoyment. The RNA designation and management will replace the Scenic Area designation and management.

There is only one trail, the Nancy Pond Trail (Forest Trail No. 517) within the RNA. This is the only trail accessing the Research Natural Area and had 400 Recreation Visitor Days in 1985. The low and essentially linear use of the trail on forested areas minimizes the impact of recreation on the RNA. Presently, there is some minor dispersed backcountry camping use. This use will be restricted through the Forest Restricted Use Area (RUA) process. Although Nancy Pond is not stocked, people occasionally fish there.

Trail use in the White Mountain National Forest is very specific to the trail itself; and users rarely leave the trails. This type of recreation use does not impact the old growth forest and, therefore, is a compatible use.

Wildlife and Plant Values

Designation of this area as a RNA enhances wildlife and plant values.

The presence of all successional stages, from unvegetated landslides to old-growth forest stands, provides a wide range of wildlife habitats. The location would be suitable habitat for re-introduction of the Pine Marten (Martes americana americanaa) because it is remote, quite, and contains suitable mature old-growth vegetation, with plenty of logs for runways into deep snow and an excellent food supply of numerous Red-Squirrels.

Tree Species	% of Density	% total BA
balsam fir	49%	34%
red spruce	44%	61%
mt. paper birch	6%	4%
other (mostly mt. ash)	1%	1%

Understory Composition	Seedlings
balsam fir	62%
paper birch	21%
red spruce	16%
mountain ash	1%
Abundant hobblebush	

Ground cover - (Dominant species in forested areas):	
mosses and lichens	12.1%
clintonia, creeping snowberry, bunchberry, goldthread	87.0%
blueberries	1.0%

Other Descriptions
Total Density is 414/acre (1035/ha)
Total Basal Area is 149 sq.ft./acre (34.6 sq. m/ha)
Snag Density = 112/acre (280/ha)
Snag BA = 59.8 sq.ft./acre (13.9 sq. m/ha)
Log Density = 186.8 acre (467/ha)
Log Volume = 13433 cubic ft/acre (951 cubic m/ha)

Tree Age Distribution

Increment cores were taken in 1979 by the tree-ring laboratory at Lamont-Doherty Geological Observatory of Columbia University, Palisades, NY by Jacoby and Peters. The spruce trees sampled ranged from 120 to 367 years old. All ages of trees were present (these records are part of the files).

Below are the records by Leak (1985) of the oldest trees in this stand:

spruce.....390 yrs. old
balsam fir.....202 yrs. old
mt. paper birch.....212 yrs. old
mt. ash.....55 yrs. old

Wilderness, Wild and Scenic River, or National Recreation Area Values

Nancy Brook RNA is not in any designated Wilderness although it adjoins the boundary of the Pemigewasset Wilderness. It is not in any designated Wild and Scenic River corridor but it includes the headwaters of Norcross Brook, an identified Inventory Wild and Scenic River Corridor. It is a designated National Natural Landmark.

Transportation Plans

There are no roads in or near the RNA. No new roads are planned. No effects on transportation plans are anticipated.

MANAGEMENT PLAN

The management objective of the Nancy Brook RNA is to maintain the unique assemblage of species within this exemplary natural community. It will not require any active vegetative management in order to perpetuate the natural community, flora, or fauna.

The Nancy Brook RNA will not be managed for recreational use. The Nancy Pond Trail (Forest Trail No. 517), the only access to this site, crosses through the center of the RNA and will continue to be maintained for access and passage. Recreational use along the trail will be monitored. Dispersed camping in the RNA will be restricted.

Increment coring of trees will be limited.

Nonmanipulative research activities are allowed within the RNA. The authority to allow research in the Nancy Brook RNA rests with the Northeastern Research Station Director. When occupancy and/or use of the RNA for research is desired, a proponent must contact the District Ranger, Saco Ranger District, or the Forest Supervisor, White Mountain National Forest with an outline of the planned research activity. The proponent will be given guidance and information about application procedures.

When approved, the Station Director shall execute a cooperative agreement or special use permit to cover the planned research activity. Scientists must file copies of all research data, report, and other pertinent documents with the Station, Region, or Forest. Current studies include a study of the size and age distributions of accessory species.

The Forest Service will not consent to any mineral activity within the area.

No fences exist nor are planned in or adjacent to the area.

ADMINISTRATION RECORDS AND PROTECTION

Administration and protection of the Nancy Brook RNA is the responsibility of the White Mountain National Forest. The District Ranger, Saco Ranger District, has direct responsibility.

The Director of the Northeastern Forest Experiment Station (NEFES) will be responsible for any studies or research conducted in the area. All plant and animal specimens collected in the course of research conducted on the area will be properly preserved and maintained within university or federal agency herbaria and museums, approved by the NEFES Director.

Records for the Nancy Brook RNA will be maintained in the following offices:

Regional Forester, Milwaukee, Wisconsin
NEFES, Durham, New Hampshire
White Mountain National Forest Supervisor, Laconia, NH
District Ranger, Saco Ranger District, Conway, NH

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APPENDIX A

Contributors to this Establishment Record:

New Hampshire Breeding Bird Atlas, a cooperative project of the University of New Hampshire Department of Forest Resources and the Audubon Society of New Hampshire.

U.S. Forest Service, White Mountain National Forest:
Fred Kacprzynski - Research Natural Area Coordinator
Steve Fay - Soil Scientist
Randy Ferrin - Hydrologist
Sylvia Simms - Hydrologist Aide
Donald Marks - Forester
Sara Buckmaster - Transportation Planner
Eileen M. Woodland - Realty Specialist
Billee Hoornbeeck - Archeologist
Edward A. Merski - Timber Forester

New Hampshire Natural Heritage Inventory:
Frankie Brackley, Coordinator/Botanist
Edie E. Hentcy, Data Manager/Biologist
John Korpi, Community Ecologist

Lee Carbonneau - Environmental Consultant

APPENDIX B

Name	Breeding Code	Name	Breeding Code
Black Duck (Anas rubripes)	CO	White-throated Sparrow (Zonotrichia albicollis)	CO
Wood Duck (Aix sponsa)	CO	Slate-colored Junco (Junco hyemalis)	PO
Spruce Grouse (Canachites canadensis)	CO	Pine Siskin (Carduelis pinus)	PO
Chimney Swift (Chaetura peligica)	SI	Rose-breasted Grosbeak (Pheucticus ludovicianus)	PO
Downey Woodpecker (Picoides pubescens)	PO	Rusty Blackbird (Euphagus carolinus)	PO
Black-backed 3-toed Woodpecker (Picoides arcticus)	CO	Northern 3-toed Woodpecker (Picoides tridactylus)	PR
Common Yellowthroat (Geothlypis trichas)	PO	Ovenbird (Seiurus aurocapillus)	PO
Bay-breasted Warbler (Dendroica castanea)	PO	Blackpoll Warbler (Dendroica striata)	CO
Yellow-bellied Flycatcher (Empidonax flaviventris)	PO	Black-throated Green Warbler (Dendroica virens)	PO
Tree Swallow (Iridoprocne bicolor)	PO	Blue Jay (Cyanocitta cristata)	PO
Boreal Chickadee (Parus hudsonicus)	PO	Brown Creeper (Certhia familiaris)	PO
Winter Wren (Troglodytes troglodytes)	PO	Wood Thrush (Hylocichla mustelina)	PO
Hermit Thrush (Catharus guttatus)	PO	Swainson's Thrush (Catharus ustulatus)	PO
Veery (Catharus fuscescens)	PO	Golden-crowned Kinglet (Regulus satrapa)	PO
Black-throat Blue Warbler (Dendroica caerulescens)	PO	Yellow-rumper Warlber (Dendroica coronata)	PO
Magnolia Warbler (Dendroica magnolia)	PO	Nashville Warbler (Vermivora ruficapilla)	PO
Red-eyed Vireo (Vireo olivaceuso)	PO	Solitary Vireo (Vireo solitarius)	PO
Cedar Waxwing (Bombycilla cedrorum)	PO	Ruby-crowned Kinglet (Regulus calendula)	PO

Breeding Codes - SI = Sighted, species observed during its breeding season; PO = Possible Breeder, individual observed during its breeding season in possible nesting habitat; PR = Probable Breeder, a pair observed during their breeding season in possible nesting habitat, territorial behavior, courtship, etc; CO = Confirmed Breeder, nest building, distraction-display, occupied or nest, young, fledglings.

Source - Breeding Bird Atlas of New Hampshire. A Cooperative project of the University of New Hampshire, Department of Forest Resources and the Audubon Society of New Hampshire.