# DECISION NOTICE & FINDING OF NO SIGNIFICANT IMPACT DESIGNATION ORDER

**USDA Forest Service, Eastern Region**
**Green Mountain and Finger Lakes National Forests**
**Middlebury Ranger District**

**Towns of Goshen and Chittenden**
**Addison and Rutland Counties**

The Cape

## CAPE RNA DESIGNATION

### THE DECISION

By virtue of the authority vested in me by the Secretary of Agriculture under regulations at 7 CFR 2.42, 36 CFR 251.23, and CFR Part 219, I hereby establish The Cape Research Natural Area (RNA). It shall be comprised of 290 acres (117.4 hectares) of land in Rutland and Addison Counties, Vermont, on the Middlebury District of the Green Mountain National Forest, as described in the section of the Establishment Record entitled "Location".

The Regional Forester recommended the designation of The Cape area as a proposed RNA (hereafter referred to as a Candidate RNA or cRNA) in the Record of Decision for the Green Mountain National Forest Land and Resource Management Plan (LRMP) in 1986. 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 LRMP and Final Environmental Impact Statement which are available to the public.

The Regional Forester has reexamined The Cape cRNA to ensure that the environmental effects of establishing the area as an RNA have not changed since 1986. This analysis is documented in "The Cape Candidate Research Natural Area Environmental Assessment", which is attached to the Establishment Record as Appendix 3. Based on the analysis in the environmental assessment, it is my decision to adopt Alternative B, to establish The Cape as an RNA with the boundaries described therein. Alternative B is selected because it provides long-term protection and recognition of an old-age, rich-mesic, northern hardwood community, and includes the entire extent of the distinctive physical landscape and processes associated with this community. It includes more of the old-age community and associated physical environment than Alternative C, while eliminating a younger, disturbed, and less distinctive area found in Alternatives C and D. The area excluded from this RNA designation will be managed according to the standards and guidelines in the LRMP under its current Management Area designation of 8.1D. By excluding this area, Alternative B also avoids potential conflicts between public use of an adjacent travelway and RNA objectives. Alternative B also offers a more appropriate set of standards and guidelines for management of The Cape as an RNA than the Proposed Action. The Cape RNA will be managed in compliance with all relevant laws, regulations, and Forest Service Manual direction regarding RNA's, and in accordance with the management direction identified in the LRMP and in Alternative B.

The Green Mountain National Forest LRMP is hereby amended to change the allocation of 290 acres of The Cape area from Candidate to Established RNA (184 acres), and from Management Area (MA) 3.1 to Established RNA (106 acres) (pages 3.04, 4.10, 4.92,4.144,

4.163, 4.186, A.11), to be managed according to standards in the LRMP with the additional standards described in the section of the Establishment Record entitled "Management Prescription", and in Alternative B of the Cape cRNA Environmental Assessment. The remaining 20 acres of The Cape Special Area and original cRNA excluded from the Established RNA will continue to be managed as "The Cape Special Area", according to the original standards in the LRMP for Management Area 8.1D. This is a non-significant amendment of the LRMP (36 CFR 219.10(f)).

## OTHER ALTERNATIVES CONSIDERED AND REASONS THEY WERE NOT SELECTED

Alternatives considered were the Proposed Action, which would establish The Cape as an RNA using the boundaries described in Alternative B but with standards and guidelines that differ from Alternative B in terms of plant collecting, public use, vegetation management, fire, and reintroductions; Alternative A, the "No Action" alternative, which would continue management of The Cape as a Special Area; Alternative C, which would establish The Cape as an RNA using the boundaries defined in the LRMP; and Alternative D, which would establish The Cape as an RNA using the boundaries described in Alternative B except for an alternate western boundary.

The Proposed Action was not chosen because the standards and guidelines were not adequate for the management of the RNA. Sections on plant collecting for research, educational and other public use, vegetation management, fire, and reintroductions were either incomplete or ambiguous, or misrepresented the intent of the standard. These sections were clarified in Alternative B based on public comment. Alternative A was not selected because it would only provide uncertain and possibly short-term protection of The Cape area, and would not provide a suitable and unique community to the national network of RNAs, which is a desired future condition for the National Forest System. Alternative C was not selected because it did not include the new area to the south identified as having the same characteristics as The Cape area, and therefore would not adequately protect and recognize this unique forest ecosystem for research purposes. Alternative D was not selected because it included an area with none of the characteristics that distinguish the rest of The Cape, in addition to increasing the risk of conflict between public use and RNA objectives by using a town road and snowmobile trail as an RNA boundary.

Two alternatives were considered but, for various reasons, not carried forward in the analysis. An alternative to expand the RNA to 500 acres was not carried forward because it did not meet the purpose and need for designation of this RNA, the 500 acre minimum size did not have an adequate scientific basis for this forest community, type and region, and the expansion would necessarily include many areas of forest disturbed within the past 50 years. An alternative to include standards and guidelines to prohibit any human intervention (except research) in the RNA was not considered further because I believe such a prohibition to be excessive, given the uncertainty of future events. In addition, such an alternative would not meet one of the purposes for establishing RNAs, which is to help in implementing provisions of special acts, such as the Endangered Species Act.

## PUBLIC INVOLVEMENT

Public issues and management concerns related to the proposed action were identified by reviewing national direction for the establishment of RNA's, and by contacting interested or affected publics and Forest Service staff. Public comments were collected in response to a formal scoping letter mailed on 1 October 1992 to 200 interested individuals and organizations. This mailing informed the recipients of the Proposed Action and requested

their comments. Responses to this mailing included written letters, telephone calls, and personal contacts. Each comment received during scoping was evaluated to determine how it should be addressed in the environmental assessment. A list of those contacted and individual comments are found in Appendices 3B and 3C of the EA. As a result of this evaluation, six major issues were identified They are:

Issue 1: Some people believe the western boundary of The Cape RNA should remain along FR 403, providing a higher level of protection for the western portion of the RNA than proposed. This issue is the basis for Alternative D of the EA.

Issue 2: Some people believe that The Cape RNA boundaries should remain as stated in the Forest Plan (see D2 map). They believe that the LRMP boundaries encompass an RNA of sufficient size, and that there is little justification for the proposed expansion. This issue is the basis for Alternative C of the EA.

Issue 3: Some people expressed a concern for the loss of the timber resource in the proposed action. This is discussed in the "Environmental Effects" section of the EA.

Issue 4: Some people believe that The Cape Special Area should not be designated as an RNA. It would therefore remain under its current designation of Special Area with the boundaries and standards and guidelines described in the Forest Plan (p. 4.163; D2 map). This issue is the basis for Alternative A of the EA.

Issue 5: Some people believe that The Cape RNA should be expanded to 500 acres, as this would be consistent with the Forest Plan definition of an old growth community. This issue is addressed in the "Alternatives Not Carried Forward" section of the EA.

Issue 6: Most respondents had comments or suggestions regarding standards and guidelines for management of The Cape RNA. The comments included concerns about user restrictions and monitoring of use, fire policy, reintroductions, integrated pest management, a catastrophic event policy, and activities on adjacent lands. These suggestions and comments were evaluated and many were used to develop a revised set of standards and guidelines, which are included in Alternatives B, C, and D of the EA. Those suggestions not used are discussed in the EA as issues outside the scope of the analysis, or in the "Alternatives Not Carried Forward" section of the EA.

## FOREST PLAN CONSISTENCY

The LRMP is being amended to redesignate a portion of The Cape Special Area and an adjacent piece of land to The Cape Research Natural Area. Therefore, the redesignation will be consistent with the amended LRMP.

## FINDING OF NO SIGNIFICANT IMPACT

I have determined that designation of The Cape Research Natural Area, as described in Alternative B of the EA, is not a major Federal action significantly affecting the quality of the human environment (40 CFR 1508.27). In addition, I have determined that an amendment to the Green Mountain National Forest Land and Resource Management Plan, as described in Alternative B, will not significantly alter the multiple use goals and objectives of the Plan (36 CFR 219.10(f)). Therefore, an environmental impact statement is

not needed. The following factors were considered in this finding of no significant impact:

1. This designation and Forest Plan amendment will not produce any known significant irreversible resource commitments or any significant irretrievable loss of timber production, soil productivity, water quality, wildlife habitats, or recreation opportunities (Environmental Effects Section, EA, pages EA-12 - EA-15).

2. This designation and Forest Plan amendment will not affect public health or safety.

3. Unique characteristics of the geographical area are included in this designation, and will thereby be protected. This designation and plan amendment will therefore have no significant environmental effect upon these characteristics.

4. Based upon the involvement of Forest Service specialists, and specialists in other agencies, universities, and organizations, I do not expect the effects of this action on the quality of the human environment to be highly controversial (Environmental Effects section, EA, pages EA-12 - EA-15; Consultation section, EA, page EA-16).

5. There are no known effects of this designation on the human environment that are highly uncertain or involve unique or unknown risks (Environmental Effects section, EA, pages EA-12 - EA-15).

6. This action does not establish a precedent for future actions with significant effects, or represent a decision in principle about a future consideration. Each candidate RNA described in the Forest Plan may be studied individually on its own merits for redesignation as an RNA, or may be studied as part of an analysis of many candidate RNAs. Therefore, this designation does not establish a precedent for future Forest Plan amendments or designations having significant effects.

7. There will be no significant cumulative impacts associated with this designation and Forest Plan amendment. This action includes no ground-disturbing activities. In addition, the loss of opportunity to manage The Cape RNA for vegetation, wildlife, or recreation resources is minor in relation to the existence of these opportunities on adjacent lands (Environmental Effects section, EA, pages EA-12 - EA-15).

8. This action has no adverse effect upon scientific, historical, or cultural resources.

9. This action will have no adverse impact on Federally proposed or listed plant or animal species, since no ground-disturbing activities are proposed, no such species were identified in the area, and the action protects the forest community for scientific research.

10. This action does not threaten a violation of Federal, State, or local law or requirements imposed for the protection of the environment.

## APPEAL RIGHTS

This decision is subject to appeal pursuant to 36 CFR Part 217. Two (2) copies of the Notice of Appeal must be in writing and submitted to:

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

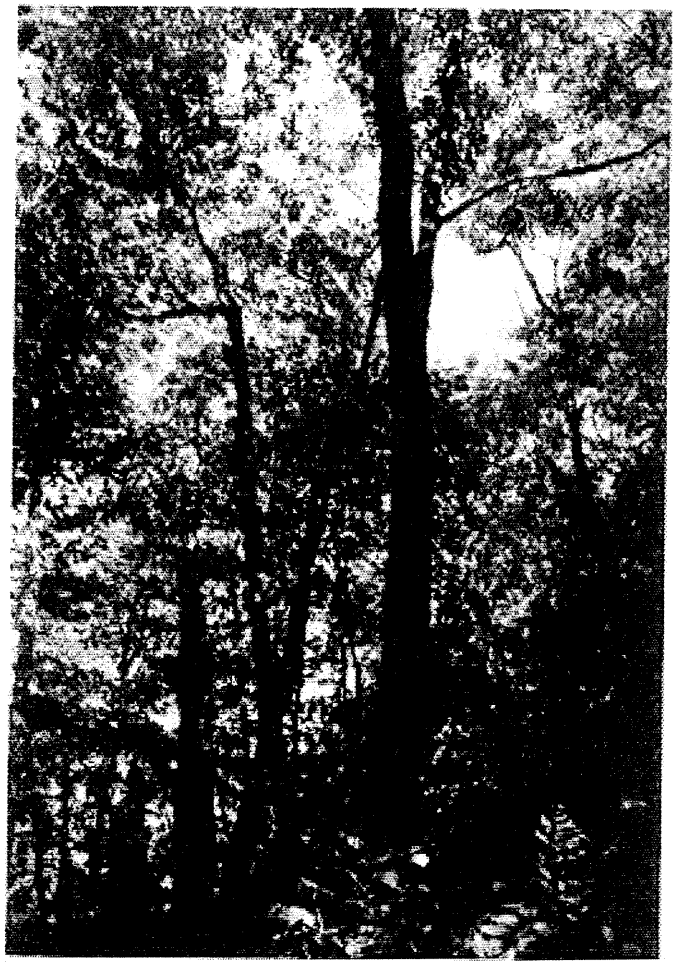
The Notice of Appeal prepared pursuant to 36 CFR 217.9(b) must be submitted within 45 days from the date of legal notice of this decision in the Federal Register. Review by the Secretary is wholly discretionary. If the Secretary has not decided within 15 days of receiving the Notice of Appeal to review 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)).

As mentioned above, legal notice of this decision will appear in the Federal Register. The Forest Supervisor of the Green Mountain National Forest shall notify the public of this decision and mail a copy of the Decision Notice and Designation Order to all scoping respondents and persons on the Green Mountain National Forest NEPA mailing list.

| _____ | _____ |
|---|---|
| Chief | Date |

EXHIBIT 3

PHOTOGRAPHS



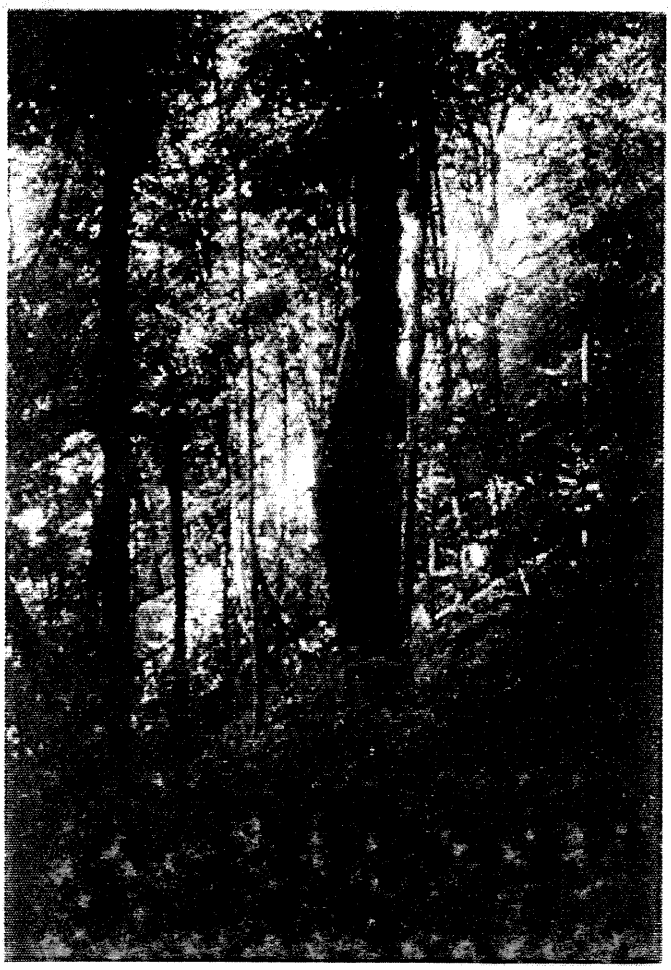
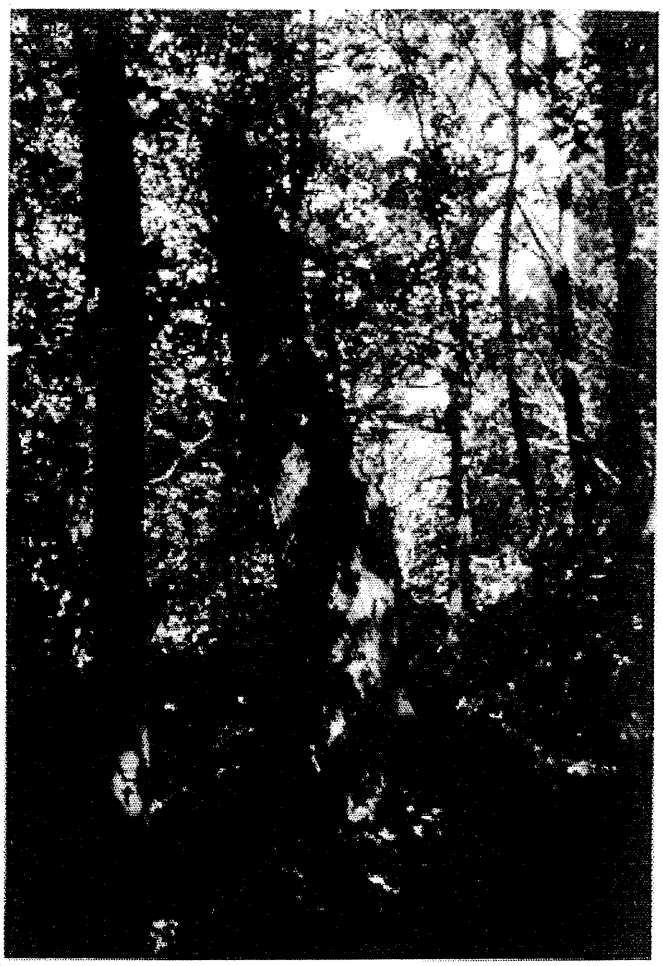


EXHIBIT 5

(continued)



# SIGNATURE PAGE

**for**

# RESEARCH NATURAL AREA ESTABLISHMENT RECORD

**The Cape Research Natural Area**

**Green Mountain National Forest**

**Addison and Rutland Counties, Vermont**

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 Diane Harlow Burbank Date 3/23/93
Diane Harlow Burbank, Forest Ecologist, Green Mountain National Forest

Recommended by Paul Lundberg Date 3/23/93
Paul Lundberg, District Ranger, Middlebury Ranger District

Recommended by Terry W. Hoffman Date 3/22/93
Terry W. Hoffman, Forest Supervisor, Green Mountain National Forest

Recommended by for Larry Payne Date 4/29/93
Floyd J. Marita, Regional Forester, Eastern Region

Recommended by Robert Lewis Jr. Date 5/13/93
Robert Lewis Jr., Station Director, Northeastern Forest Experiment Station

# TITLE PAGE

**Establishment Record for The Cape**

**Research Natural Area within the Green Mountain**

**National Forest, Rutland & Addison Counties, Vermont**

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# INTRODUCTION

## General Statement

The Cape Research Natural Area (RNA) is a 290 ac (117.4 ha) forest community located along a steep, west-facing mountain slope. It is bounded to the East by a sharp ridgeline, and to the West by Baker Brook. Soils of colluvial origin have formed in the area due to the steep slopes, and these soils support a rich-mesic, northern hardwood forest. The trees in the RNA are quite old and large, and the area has been little disturbed by humans. This forest is dominated by yellow birch (*Betula alleghaniensis*), sugar maple (*Acer saccharum*), and red spruce (*Picea rubens*) over 24 in (62 cm) diameter at breast height (dbh). The understory has a flora typical of rich sites. There are no other known undisturbed examples of this community type in Vermont. Because of its rich flora, relative lack of human disturbance, large trees, and old age, The Cape RNA is an important natural area of statewide and regional significance. The site has high potential for research.

A location map (Exhibit 1), boundary and contour map (Exhibit 2), stand map (Exhibit 3), and cover type map (Exhibit 4) are attached to this report. Also attached are color photographs (Exhibit 5) of the RNA.

Contributors to this establishment record are listed in Appendix 1.

## Ownership

The Cape RNA is owned outright by the United States and is administered by the US Forest Service, Green Mountain National Forest. There are no outstanding timber or mineral rights on any of these lands, nor are there any special use permits outstanding.

## Historical Statement

The settlement of the area which is now Goshen and Chittenden (The Cape was originally part of the town of Philadelphia) began around 1800, although the towns were chartered earlier. Lumber production was the first main industry in Goshen; there were several sawmills. The Middle/South Hill Road (the road nearest to the RNA) appears on an 1857 map of the town, but no settlements are shown. Beers' Atlas (Beers 1871) shows a dwelling on the west side of Middle Road, near Basin Brook; evidence of this dwelling is represented by a cellarhole on the west side of the road, in the same area. It is unclear what the history of the RNA itself is, but with its steep slopes, it is likely that the upper section of the area was never logged.

The lower, shallower slopes of the northern portion of the RNA are likely to have been cleared, probably in the late 1800's, and most likely for pasture. Evidence of very old log roads can be found along portions of the lower slopes, although there are no written records of logging activities in most of this area. These roads are probably at least 50 years old, as there remains no evidence of cut stumps in the area near the roads. Pieces of barbed wire fence can be found in the RNA running parallel to the slope at about 1900 ft (579 m) elevation. This may have been an upper limit of grazing, but the slope does not appear to have been cleared to this elevation. Above this elevation, the forest appears to have received very little, if any, human disturbance.

Small amounts of charcoal have been found in some of the soils of the RNA near the ridgeline. It appears that occasional small fires have started naturally within the RNA over the last 100 years. There is no evidence of catastrophic fire, and the moisture regime of most of The Cape indicates that any fire starting naturally would quickly extinguish itself. Fires probably start naturally in the RNA due to lightning strikes; fires may have occurred along the lower elevations in association with settlement activities in the 1800's, although no evidence for this exists. There is no evidence that Native Americans intentionally set fires in forests of this part of the Green Mountains (D. Lacy, pers. comm.).

There are two small areas of the RNA which have been logged within the last 50 years. The first area is along the ridgeline in the southern portion of the RNA. It is apparent from field visits that old logging activities initiated on the east side of the ridge also occurred to some extent over onto the west side of the ridge into the RNA. There is evidence of old hypo-hatchet marks on some dead trees in this area, and there is a vigorous understory of striped maple (*Acer pensylvanicum*), which is also indicative of removal of portions of the overstory. Although there are no written details of these activities, development of the forest community here indicates that they probably took place in the 1950's or 1960's.

The second area is a 48 ac (19.4 ha) area in the southwestern corner of the RNA below 1900 ft (579 m) elevation. This area is a mixed-age stand that was acquired by the U.S. Forest Service in 1983. The northern portion of this area is quite mature, based upon field visits in 1992, and is similar to the rest of the RNA in terms of species composition and community development. However, the southern portion of the area has evidence of recent cutting, and land records indicate that the previous landowner did some timber harvesting down to a 12 in (30 cm) diameter limit. This harvesting appears to have been intermittent, taking place from the 1950's through the early 1980's previous to acquisition by the Forest Service. The acreage harvested and volume and species removed are unknown as of this writing.

### Uses

The Cape RNA receives very little use at present. There are no maintained roads or trails through the area, and there is little evidence of disturbance, especially in areas above 1800 ft (549 m) elevation. The site has been used for research, and undoubtedly is used by hunters and adventurous hikers. No timber harvesting occurs within the RNA.

### Additional Designations

The Cape RNA does not occur within any other administratively or Congressionally designated areas, such as a Wilderness Area or National Recreation Area.

## LAND MANAGEMENT PLANNING

Pages 12-13 of the Record of Decision (ROD) for the Green Mountain National Forest Land and Resource Management Plan (LRMP) lists The Cape RNA as a Special Area and one of several potential RNAs (hereafter referred to as Candidate RNAs or cRNAs) (Appendix 2). The ROD also makes a decision to protect all Special Areas, including cRNAs, and to study each cRNA for its suitability for designation as an RNA. All cRNAs have been included in Management Area (MA) 8.1 in the LRMP for the Forest (USDA 1986).

The Green Mountain National Forest LRMP lists The Cape RNA as being 118 ac (48 ha) in size (USDA 1986); the size of the RNA established by this record is 290 ac (117.4 ha). Environmental analysis of this change in size, as well as changes in standards and guidelines for The Cape RNA, are documented in "The Cape Candidate Research Natural Area Environmental Assessment" (Appendix 3). The attached Decision Notice/FONSI/Designation Order amends the LRMP to include these changes under the

designation "8.1D The Cape Research Natural Area".

## OBJECTIVES

The objectives for establishing The Cape RNA are to:

1. Preserve a relatively undisturbed, rich-mesic, northern hardwood forest community that represents an important ecosystem for research, study, observation, monitoring, and those educational activities that maintain unmodified conditions.

2. Preserve and maintain the biological diversity found within the RNA.

3. Protect the RNA against serious environmental disruptions which may severely threaten its character, including both natural and human threats.

4. Provide a reference area for the study of succession.

5. Provide limited on-site and extension educational activities.

6. Provide a baseline area for measuring long-term ecological changes.

7. Provide an undisturbed control area for comparison to areas undergoing manipulation for research or management.

8. Monitor long-term effects on forest structure and biodiversity of past resource management techniques and practices that have occurred within small portions of the RNA.

## JUSTIFICATION STATEMENT

Establishment of The Cape as a RNA increases the protection and recognition of an important rich-mesic northern hardwood stand displaying little evidence of past human disturbance. The old age and undisturbed nature of this stand make it an important natural area for both Vermont and the Northeast Region. Relatively pristine remnants of the pre-European settlement forest that formerly occupied the slopes of the Green Mountains are extremely uncommon, and therefore have great biological significance. Additional small areas slightly disturbed by logging have been included to enhance the integrity of the colluvial slope ecosystem.

The Regional Guide for the Eastern Region (USDA 1983), Table 3-21, lists Society of American Foresters (SAF) Cover Type 25, Sugar Maple-Beech-Yellow Birch, as a priority 2 in New England forests for representation in RNAs. Priority 2 types are currently represented in one site in New England. Most of The Cape RNA can be described as SAF Type 25, with an increasing proportion of red spruce at higher elevations within the RNA.

The Cape RNA serves an important research function, since there are so few undisturbed examples of this community type available. Designation of this RNA provides an opportunity to study the forest dynamics that occur in northern hardwood stands approaching a "dynamic steady state" (Bormann and Likens 1979). As a block of intact, old forest, The Cape RNA provides the opportunity to study use of the area by interior forest

species. Along portions of the lower slope, the ridgeline, and the southwestern corner of the RNA, evidence of previous logging or clearing exists. These disturbed areas provide an opportunity to monitor and compare forest community development, and to assess and monitor differences in biodiversity between these areas and the old-age community.

Scientific interest in this area already exists, as demonstrated by an ongoing breeding bird survey being conducted within The Cape area by the Vermont Institute of Natural Science (Rimmer 1990). In addition, a two-year floristic inventory was initiated in 1993 by Sterling College and the Northeastern Forest Experiment Station in Burlington, Vermont.

In addition to the vegetative community, the physical qualities of The Cape RNA are also distinctive. The RNA occupies what is known as a "colluvial" slope, which is the result of steep grades, water seepage, and a high density of rocks and boulders. Associated with this slope are soils that are high in organic matter and nutrients, and high in calcareous material in places. The combination of topography, hydrology, soils, and lack of disturbance has produced some of the richest growing conditions on the Forest. The ground flora of The Cape RNA is extremely lush, and includes populations of several rich-woods plant species, such as Goldie's fern (*Dryopteris goldiana*), listed as uncommon by the Vermont Nongame and Natural Heritage Program.

## PRINCIPAL DISTINGUISHING FEATURES

The forest community that dominates this RNA is distinguished from other communities of the same type by the large size of its trees, the lack of human disturbance of most of the site, the rich, colluvial slope that it occupies, and the relatively large size of such an area in the region. The average tree diameter is more than 18 in (46 cm) dbh. Scattered throughout the area are numerous large diameter red spruce (over 25 in [64 cm] dbh), yellow birch (over 38 in [97 cm] dbh), and sugar maple (over 25 in [64 cm] dbh). The understory is mostly composed of sugar maple. The ecosystem is highly productive (the sugar maple site index is 72), has calcareous material in the soil substratum in places, and has several plant species which are indicators of rich soil conditions. Some of the larger trees are currently or are becoming decadent, with broken tops and limbs which contribute to the abundance of dead woody material on the forest floor. The oldest portions of the community, primarily located above 1900 ft (579 m) but extending to Baker Brook in places, show essentially no signs of past human disturbance.

## LOCATION DESCRIPTION

The Cape RNA is located in the towns of Chittenden (Rutland County) and Goshen (Addison County), Vermont (Exhibit 1). It is within the Green Mountain National Forest, in the Middlebury Ranger District, along the western slopes of the Green Mountains (Exhibit 2). It includes stands 16, 17, 18, 20, 104, 106, 107, 108 and 109 in Compartment 109, and stands 19, 20, and portions of stands 1 and 3 in Compartment 129 (Exhibit 3). The approximate centrum of the RNA is at 43°48'47"N latitude, 72°59'27"W longitude.

The boundary description reads as follows:

All that certain tract or parcel of land lying partially in Goshen Township, Addison County, Vermont and partially in Chittenden Township, Rutland County, Vermont on the waters of Baker Brook about 2 miles southerly of Goshen Four Corners. The Cape Research Natural Area consists of a portion of the following U.S. Tracts:

Tract 506h (Newton-Thompson Manufacturing Company)

Tract 505 (Clarke C. Fitts Estate)

Tract 563 (A. Hawley Churchill)

Tract 502n (American Realty Company)

Tracts 652c and 652d (Welland S. Horn)

and is more particularly described as follows:

All bearings in this description are referred to the true meridian.

BEGINNING AT CORNER 1, which is Corner 5 of said Tract 506h and Corner 6 of said Tract 652d, a 2" iron pipe with a brass cap stamped 5-506H LS11 1980 in a mound of stones. An 11" Spruce with blazes and 54-3 sign bears S55°W, 21.9 feet distant. The stump hole of a dead and down 20" Spruce with blazes and 54-3 sign bears S03°E, 30.0 feet distant.

THENCE through said Tract 652d N62°E, 146.4 feet to CORNER 2 position at the height of land. At said position set a 5/8" x 30" iron rod with a 2" aluminum cap stamped 2 RNA. Nailed 54-3 signs to a 7" Sugar Maple and a 12" Sugar Maple which bear N62°E, 7.4 and S04°E, 30.0 feet distant, respectively.

THENCE through said Tracts 652d, 563 and 502n and with the height of land the following 31 courses:

1. S14°E, 169 feet to CORNER 3. Set a 5/8" x 30" iron rod with an aluminum cap stamped 3 RNA. Nailed a 54-3 sign to a 3" Beech which bears N83°W, 7.9 feet distant.

2. S15°E, 161 feet to CORNER 4. Set a 5/8" x 30" iron rod with an aluminum cap stamped 4 RNA. Nailed 54-3 signs to a 4" Ash and a 6" Sugar Maple which bear S51°W, 4.4 and S61°E, 5.3 feet distant, respectively.

3. S17°E, 292 feet to CORNER 5. Set a 5/8" iron rod with an aluminum cap stamped 5 RNA. Nailed a 54-3 sign to a 10" Sugar Maple which bears N54°E, 9.5 feet distant.

4. S01°E, 217 feet to CORNER 6. Set a 5/8" x 30" iron rod with an aluminum cap stamped 6 RNA. Nailed 54-3 signs to a 9" Beech and an 11" Yellow Birch which bear N46°W, 7.9 and N61°E, 3.8 feet distant, respectively.

5. S02°E, 210 feet to CORNER 7. Set a 5/8" x 30" iron rod with an aluminum cap stamped 7 RNA. Nailed a 54-3 sign to a 14" Sugar Maple which bears S56°E, 3.1 feet distant.

6. S01°E, 281 feet to CORNER 8. Set a 5/8" x 30" iron rod with an aluminum cap stamped 8 RNA. Nailed a 54-3 sign to a 5" Sugar Maple which bears N57°W, 14.3 feet distant.

7. S01°W, 250 feet to CORNER 9. Set a 5/8" x 30" iron rod with an aluminum cap stamped 9 RNA. Nailed 54-3 signs to a 6" Sugar Maple and a 12" Sugar Maple which bear S74°E, 29.0 and S07°W, 8.0 feet distant, respectively.

8. S16°E, 234 feet to CORNER 10. Set a 5/8" x 30" iron rod with an aluminum cap stamped 10 RNA. Nailed a 54-3 sign to a 4" Beech which bears N68°E, 3.8 feet distant.

9. S21ºE, 261 feet to CORNER 11. Set a 5/8" x 30" iron rod with an aluminum cap stamped 11 RNA. Nailed 54-3 signs to a 5" Beech and a 9" Ash which bear N68ºE, 9.4 and S09ºE, 13.9 feet distant, respectively.

10. S12ºE, 227 feet to CORNER 12. Set a 5/8" x 30" iron rod with an aluminum cap stamped 12 RNA. Nailed 54-3 signs to a 4" Beech and a 6" Beech which bear N48ºW, 4.9 and S12ºW, 3.3 feet distant, respectively.

11. S25ºE, 287 feet to CORNER 13. Set a 5/8" x 30" iron rod with an aluminum cap stamped 13 RNA. Nailed a 54-3 sign to a 9" Sugar Maple which bears N12ºE, 12.8 feet distant.

12. S09ºE, 194 feet to CORNER 14. Set a 5/8" x 30" iron rod with an aluminum cap stamped 14 RNA. Nailed 54-3 signs to a 3" Beech and a 10" Sugar Maple which bear N69ºE, 13.5 and S19ºW, 14.0 feet distant, respectively.

13. S15ºW, 222 feet to CORNER 15. Set a 5/8" x 30" iron rod with an aluminum cap stamped 15 RNA. Nailed 54-3 signs to a 3" Beech and an 8" Yellow Birch which bear N78ºW, 5.7 and S15ºW, 25.2 feet distant, respectively.

14. S51ºW, 263 feet to CORNER 16. Set a 5/8" x 30" iron rod with an aluminum cap stamped 16 RNA. Nailed a 54-3 sign to a 3" Sugar Maple which bears N07ºE, 1.7 feet distant.

15. S03ºE, 170 feet to CORNER 17. Set a 5/8" x 30" iron rod with an aluminum cap stamped 17 RNA. Nailed a 54-3 sign to a 4" Beech which bears S23ºW, 5.8 feet distant.

16. S13ºW, 190 feet to CORNER 18. Set a 5/8" x 30" iron rod with an aluminum cap stamped 18 RNA. Nailed a 54-3 sign to a 3" Beech which bears S63ºE, 6.7 feet distant.

17. S10ºW, 200 feet to CORNER 19. Set a 5/8" x 30" iron rod with an aluminum cap stamped 19 RNA. Nailed 54-3 signs to a 4" Sugar Maple and a 4" Beech which bear S68ºE, 15.7 and N45ºE, 9.1 feet distant, respectively.

18. S07ºW, 236 feet to CORNER 20. Set a 5/8" x 30" iron rod with an aluminum cap stamped 20 RNA. Nailed 54-3 signs to a 3" Beech and a 7" Sugar Maple which bear S87ºW, 7.2 and N78ºE, 10.6 feet distant, respectively.

19. S06ºW, 191 feet to CORNER 21. Set a 5/8" x 30" iron rod with an aluminum cap stamped 21 RNA. Nailed a 54-3 sign to a 3" Sugar Maple which bears N50ºW, 4.8 feet distant.

20. S13ºE, 166 feet to CORNER 22. Set a 5/8" x 30" iron rod with an aluminum cap stamped 22 RNA. Nailed 54-3 signs to a 16" Yellow Birch and an 8" Sugar Maple which bear S16ºE, 27.8 and N66ºE, 16.4 feet distant, respectively.

21. S13ºE, 157 feet to CORNER 23. Set a 5/8" x 30" iron rod with an aluminum cap stamped 23 RNA. Nailed a 54-3 sign to a 20" Yellow Birch which bears N60ºE, 18.6 feet distant.

22. S27ºE, 103 feet to CORNER 24. Set a 5/8" x 30" iron rod with an aluminum cap stamped 24 RNA . Nailed 54-3 signs to a 6" Yellow Birch and a 4" Yellow Birch which bear S61ºW, 9.0 and S66ºE, 15.3 feet distant, respectively.

23. S63ºE, 287 feet to CORNER 25. Set a 5/8" x 30" iron rod with an aluminum cap stamped 25 RNA. Nailed a 54-3 sign to a 5" Yellow Birch which bears S03ºE, 3.3 feet distant.

24. S22ºE, 151 feet to CORNER 26. Set a 5/8" x 30" iron rod with an aluminum cap stamped 26 RNA. Nailed a 54-3 sign to a 4" Beech which bears S88ºW, 3.3 feet distant.

25. S30ºE, 111 feet to CORNER 27. Set a 5/8" x 30" iron rod with an aluminum cap stamped 27 RNA. Nailed 54-3 signs to a 3" Beech and a 6" Beech which bear S20ºE, 5.9 and S83ºE, 16.4 feet distant, respectively.

26. S26ºE, 172 feet to CORNER 28. Set a 5/8" x 30" iron rod with an aluminum cap stamped 28 RNA. Nailed a 54-3 sign to a 4" Beech which bears S38ºW, 2.7 feet distant.

27. S43ºE, 209 feet to CORNER 29. Set a 5/8" x 30" iron rod with an aluminum cap stamped 29 RNA. Nailed a 54-3 sign to a 10" Beech which bears S49ºW, 5.1 feet distant.

28. S16ºE, 172 feet to CORNER 30. Set a 5/8" x 30" iron rod with an aluminum cap stamped 30 RNA. Nailed a 54-3 sign to a 3" Beech which bears S15ºW, 3.9 feet distant.

29. S29ºE, 195 feet to CORNER 31. Set a 5/8" x 30" iron rod with an aluminum cap stamped 31 RNA. Nailed a 54-3 sign to a 10" Beech which bears S68ºW, 9.8 feet distant.

30. S22ºE, 179 feet to CORNER 32. Set a 5/8" x 30" iron rod with an aluminum cap stamped 32 RNA. Nailed a 54-3 sign to a 9" Sugar Maple which bears S35ºW, 5.2 feet distant.

31. S15ºE, 188 feet to CORNER 33. Set a 5/8" x 30" iron rod with an aluminum cap stamped 33 RNA. Nailed 54-3 signs to a 7" Beech and an 11" Sugar Maple which bear S83ºW, 21.1 and N23ºW, 23.4 feet distant, respectively.

THENCE S66ºW, 644 feet to CORNER 34 which is Corner 3 of said Tract 652c and Corner 1 of U.S. Tract 908 (Elwin F. Leysath and Dorothy M. Leysath Butterfield).

THENCE with said Tract 652c and with said Tract 908, reversed, S66ºW to CORNER 35 the intersection of Line 3-4 of Tract 652c and the center of Baker Brook.

THENCE with the center of Baker Brook as it meanders, upstream, to an intersection with Line 2-3 of Tract 506h. From said intersection Corner 2 bears S65ºW, 400 feet distant.

THENCE northwesterly to an intersection with Line 5-1 of Tract 506h. From said intersection Corner 1 of Tract 506h bears S62ºW, 160 feet distant.

THENCE with said Tract 506h, reversed, N62ºE, about 2132 feet to THE PLACE OF THE BEGINNING and contains 290 acres (117 hectares), be the same, more or less.

**Area**

The Cape RNA occupies 290 ac (117.4 ha).

## Elevation

The elevation of the RNA ranges from 1600 ft (488 m) to 2635 ft (803 m).

## Maps and Photos

In addition to the location map, boundary/contour map, stand map, and cover type map included in Exhibits 1-4 of this report, further details regarding this area may be found on the Mt. Carmel topographic quadrangle map (USGS 7.5' series). This quadrangle map is available at the Middlebury District Office in Middlebury, Vermont, or in the Forest Supervisor's Office in Rutland, Vermont. In addition, land records, recorded by U.S. Tract number, and compartment records, recorded by compartment number, are also available at the Middlebury District Office.

Six color photos are included in Exhibit 5 of this report. Recent Forest Service aerial photographs (black and white, leaf-off) 389-97 through 389-101 for flightline 5 taken in May 1990 also cover this area. These aerial photos are available at the Middlebury District Office or the Supervisor's Office.

## Access

The RNA is reached by driving east from Brandon, Vermont on State Route 73 approximately 7 miles (11 km) to Goshen Four Corners and Goshen Town Highway #15, which is also known as the Middle or South Hill Road, and as Forest Road (FR) 403 (Exhibit 1). Travel south on this road from Goshen Four Corners for approximately 1.7 miles (2.7 km). Access to The Cape can be gained by walking from this point east to Baker Brook. This point on Baker Brook is the northwest corner of the RNA. During most times of year and especially during wet seasons, travel on this road requires a four-wheel drive vehicle.

# COVER TYPES

Cover types of The Cape RNA, as defined by Kuchler (1966) and SAF (Eyre 1980), are displayed below. Upland openings of 3 ac (1.2 ha) occur along the lower slopes of the RNA, and are succeeding to the Kuchler/SAF type listed below. Wetlands of 13 ac (5.3 ha) occur along the riparian corridor adjacent to Baker Brook, and are not classified by Kuchler or SAF type. A map of cover types can be found in Exhibit 4.

## Kuchler Type

| Type | Description | Acres | Hectares |
|---|---|---|---|
| 99 | Northern Hardwoods:*Acer-Betula-Fagus-Picea-Tsuga* | 274 | 110.9 |

## SAF Type

| Type | Description | Acres | Hectares |
|---|---|---|---|
| 25 | Sugar Maple-Beech-Yellow Birch | 274 | 110.9 |

## PHYSICAL AND CLIMATIC CONDITIONS

### Physical

The Cape is a small mountain in the western Green Mountains, and is a locally prominent feature of the area. The RNA occupies the western slope of this mountain from ridgeline to Baker Brook at the foot of the slope. Topographically, The Cape is characterized by a flat, narrow ridgeline, which runs north-south and descends steeply and quickly to the West to a flat, narrow valley cut through by Baker Brook. The small valley is wider to the North than to the South. Slopes tend to be steep at 45-65%, with the steepest sections occurring primarily along the upper slopes of the RNA. Steep slopes also extend downslope to Baker Brook midway north-south in the RNA. These slopes are also colluvial in origin, with a high proportion of rocks and boulders, and several seeps of various sizes. The lower slopes vary from gentle in the northern section of the RNA to steep and irregular in the southern portion. The dominant aspect is west-southwest.

Baker Brook is a first-order, high-gradient, cold water stream, dominated by boulder-rubble and gravel substrate. This stream flows south into Furnace Brook, which feeds Otter Creek and ultimately Lake Champlain.

### Climate

The climate is typical of the western Green Mountains and much of the Middlebury Ranger District, and can be described as humid-continental, with short, cool summers and long, cold winters. Continental air masses moving in from subarctic North America (cold, dry air) or from the Gulf of Mexico (warm, moist air) shape the area's weather (Lautzenheiser 1959). Atmospheric flow is usually from a westerly direction. Only rarely do North Atlantic storms moving in from the east affect the weather in the western Green Mountains. Unstable spring and fall weather, hitting the rugged terrain of the Green Mountains, results in short periods of high winds and heavy rainfall.

Annual mean temperature in the western Green Mountains is near 46$^{o}$F (8$^{o}$C). During the summer, tropical lows may linger in the area bringing heavy overcast and rainfall. The average daily maxima for July is near 80$^{o}$F (27$^{o}$C), with daily minima around 50$^{o}$F (10$^{o}$C). The growing season averages from 130-150 days in this area, modified somewhat by topography. Clear skies and 21$^{o}$F (-6$^{o}$C) temperatures typify winter weather. One to two weeks of frigid (-20$^{o}$F to -30$^{o}$F; -29$^{o}$C to -34$^{o}$C) temperatures occur in December or January. Midwinter thaws can occur in late January or February.

Despite weather extremes, precipitation is evenly distributed throughout the year, mostly in long, gentle rainfall events. Thunderstorms produce the heaviest local rainfall intensities. Annual precipitation averages about 38 in (965 mm).

Average annual snowfall is from 55-65 in (140-165 cm) in the western Green Mountains, falling throughout the winter. Most winters have several storms of 5 in (13 cm) or more per year; snowfalls of 20 in (51 cm) or more are unusual. Ice storms, sleet, freezing rain, and flooding often result from warmer periods in early and late winter.

Because of the prevailing westerlies that dominate Vermont's weather, coastal and tropical storms rarely affect the climate in the western Green Mountains. Tornadoes are also uncommon, with one or more possibly occurring in a year. Most are small and affect only very localized areas. Thunderstorms occur on 20-30 days per year, and can occasionally cause much wind damage from downbursts. Usually one icestorm can be expected in a year,

often causing widespread damage to trees and limbs.

Climatic data was summarized from a publication by Lautzenheiser (1959) of the U.S. Weather Bureau. The nearest weather station is an automated station at Chittenden, Vermont, which has been collecting precipitation data for 45 years. The Chittenden station is approximately 5 mi (8 km) south-southeast of the RNA at approximately 1100 ft (335 m) elevation. The next closest station is an automated station in Rutland, Vermont, which has been collecting climate data (primarily temperature and precipitation) for 75 years. The Rutland station is approximately 10 mi (16 km) south of the RNA at approximately 600 ft (183 m) elevation. The next closest weather station is located in Burlington, Vermont, which has been collecting a full range of climate data for over 100 years. The Burlington station is approximately 48 mi (77 km) north-northwest of the RNA at approximately 340 ft (104 m) elevation. Data from these stations can be obtained by calling the Northeastern Regional Climate Center in Ithaca, New York, at 607-255-1751.

## DESCRIPTION OF VALUES

### Flora

There are no known federal-listed, state-listed, or rare plant species that currently exist within the RNA. However, the area is habitat for several species listed as uncommon by the Vermont Nongame and Natural Heritage Program, including ginseng (*Panax quinquefolius*), Minnesota sedge (*Carex albursina*), Goldie's fern, and Braun's holly fern (*Polystichum braunii*). There are large populations of many rich woods species, some of which are quite uncommon in New England outside of Vermont.

The steep slopes of the RNA are occupied by a very fine example of an old, rich-mesic northern hardwood forest. This late-successional community is dominated by yellow birch, red spruce, sugar maple, and American beech (*Fagus grandifolia*). Red spruce is found mostly at the higher elevations, while sugar maple dominates the lower elevations of the steep slopes. The bottom of the steep slope has greater diversity than the upper slope. The more gentle low slopes in the northern portion of the RNA are dominated by a mix of northern hardwoods, including sugar maple, beech, white ash (*Fraxinus americana*), and red maple (*Acer rubrum*). Beech is more prevalent on drier knolls, which occur in the southwestern corner of the RNA. Portions of this corner have also been logged recently, and are dominated in places by sapling and pole stands of beech and yellow birch. This small area will likely succeed to beech and sugar maple within the next 100 years.

The understory shrub layer is composed of striped maple, mountain maple (*Acer spicatum*), red spruce, sugar maple, and red-berried elder (*Sambucus pubens*). Sugar maple is by far the most common tree sapling along the low slopes, whereas red spruce is more common as a sapling along the upper slopes.

Characteristic ground flora species include Goldie's fern, maidenhair fern (*Adiantum pedatum*), silvery spleenwort (*Athyrium thelypteroides*), blue cohosh (*Caulophyllum thalictroides*), wood nettle (*Laportea canadensis*), Virginia waterleaf (*Hydrophyllum virginianum*), wild ginger (*Asarum canadense*), foamflower (*Tiarella cordifolia*), and jack-in-the-pulpit (*Arisaema atrorubens*). At the higher elevations, Clintonia (*Clintonia borealis.*) and wood sorrel (*Oxalis montana*) become increasingly abundant. In 1988, a botanical reconnaissance of The Cape was conducted and a list of vascular plants found within the upland portions of the RNA was prepared, which can be found in Appendix 5.

## Fauna

There are no known federal-listed, state-listed, or rare animal species that currently utilize the RNA.

No formal reconnaissance of The Cape was conducted for vertebrate or invertebrate species. However, based on more informal site visits by wildlife biologists and ornithologists over the past 10 years, it is known that common mammals utilizing the RNA include black bear (*Ursus americanus* (Pallas)), porcupine (*Erethizon dorsatum* (L.)), and red squirrel (*Tamiasciurus hudsonicus* (Erxleben)). Other mammals likely to use The Cape RNA, although sign of them is not well-documented, include little brown myotis (*Myotis lucifugus* (LeConte)), gray fox (*Urocyon cinereoargenteus* (Schreber)), fisher (*Martes pennanti* (Erxleben)), and bobcat (*Lynx rufus* (Schreber)). All of these species require at least mature forests for feeding and/or reproduction, and may find optimum habitat in overmature or old-age forests such as The Cape (DeGraaf and Rudis 1986). Breeding birds which use the area include ovenbird (*Seiurus aurocapillus* (L.)), red-eyed vireo (*Vireo olivaceus* (L.)), black-throated blue warbler (*Dendroica caerulescens* (Gmelin)), wood thrush (*Hylocichla mustelina* (Gmelin)), and black-throated green warbler (*Dendroica virens* (Gmelin)) (Rimmer 1990).

Nomenclature for mammals follows Banks et. al. (1987); nomenclature for birds follows AOU (1983).

## Geology

The northern hardwood community of The Cape RNA is situated upon glacial till deposited during the Wisconsinan glacial advance (Doll 1961; VanDiver 1987). The till varies in depth and density, and there are bedrock outcrops in several places within the RNA. Cambrian metamorphic rock of the Camel's Hump group underlies the glacial deposits of the RNA. This rock is in the Pinnacle Formation, described as follows: schistose graywacke, gray to buff, commonly striped, quartz-albite-sericite-biotite-chlorite rock predominates; quartz-cobble and boulder conglomerate is common, chiefly near the base (Doll 1961). A small amount of Forestdale marble may underlie portions of the western edge of the RNA, and can be described as buff to rusty-weathered white, buff, and pink and white mottled dolomite containing local interbeds of dolomitic sandstone, gray-green phyllitic quartzite, and crossbedded sandy dolomite (Doll 1961).

## Soils

The soils of The Cape fall generally into the Rawsonville series, which consists of moderately deep, moderately well-drained, upland soils formed in loamy glacial till. Average soil depths are between 35 and 40 in (89-102 cm), with pH's ranging from 4.5 to 5.8. Taxonomically, these soils can be characterized as coarse-loamy, mixed, frigid Typic Haplorthods. Near the ridgeline there are frequent bedrock (schistose) outcrops, with water moving readily through the soil and along the top of the bedrock. Soils of the upper slopes tend to be extremely stony, ranging from 25-40% of the surface dominated by stones. Soils of the steep lower slopes are less stony, usually from 10-20%. Bedrock outcrops still occur along these lower slopes, and water movement through the soil and over bedrock is quite common. High amounts of loose organic matter occur throughout the area, and nutrient enrichment is obvious from the ground flora indicators along the middle and lower slopes. Soils along the entire slope gradient are colluvial in origin.

Another soil of lesser extent that occurs in the northwestern corner of the RNA has an unusual C horizon characterized by the presence of calcareous material and a pH of 7.5. This soil is most likely in the Amenia series, described as deep, moderately well-drained upland soils formed in firm glacial till. Taxonomically these soils are coarse-loamy, mixed, mesic Aquic Eutrochrepts. Mottling begins at 20+ in (51 cm), and there are inclusions of somewhat poorly and poorly drained soils. This soil, like those in the Rawsonville series, still tends to be stony and colluvial in origin, with a moderately high nutrient status.

In the southwestern corner of the RNA, there is an area of Tunbridge soils, described as moderately deep, well-drained upland soils formed in loamy glacial till. These soils are coarse-loamy, mixed, frigid Typic Haplorthods. They differ from the Rawsonville soils by having a thinner spodic or Bh horizon. Nutrient status is noticeably lower in this area as well.

Information on soils was contributed by N. Burt, (Green Mountain NF Soil Scientist, 1992 field survey, Appendix 6). Complete soils information about these soil series can be found in the Soil Survey for Rutland County (SCS in press), the Soil Survey of Addison County (SCS 1971), and the Soil Series Description for the Amenia Series (SCS 1976).

## Lands

The Cape RNA is owned outright by the United States and is administered by the U.S. Forest Service, Green Mountain National Forest. It includes portions of U.S. Tracts 502n, 505, 506h, 563, 652c and 652d. Tract 502n was acquired in 1936 from the American Realty Company. Tract 505 was acquired in 1935 from the Clark C. Fitts Estate. Tract 506h was acquired in 1937 from the Newton and Thompson Manufacturing Company. Tract 563 was acquired in 1937 from A. Hawley Churchill. Tract 652d was acquired in 1982 from Welland Horn. Tract 652c was acquired in 1983 from Welland Horn. There are no outstanding timber or mineral rights on any of these lands, nor are there any special use permits outstanding.

The RNA is surrounded on three sides by forest land which is both suited to timber production and within designations suitable for timber harvesting. To the North, the land is owned privately and has been harvested intermittently in the past. Efforts to acquire this private land are ongoing. To the East, the land has been designated in the LRMP as MA 2.1A, which emphasizes continuous forest cover and unevenaged management as the primary silvicultural system (USDA 1986). To the South, the land has been designated in the LRMP as MA 3.1, which emphasizes a mosaic of vegetative conditions, with evenaged management as the primary silvicultural system (USDA 1986). To the West, the land has been designated in the LRMP, as amended by this record, as MA 8.1D, The Cape Special Area, and was part of the original 8.1D designation for The Cape cRNA (USDA 1986). No timber management activities occur within 8.1 designations.

All activities proposed for Forest lands adjacent to The Cape RNA will be analyzed for potential impacts to the RNA. Mitigation measures will be employed where necessary to protect the biological and research values of the RNA.

## Cultural

A cultural resource overview of Green Mountain National Forest has been conducted, and no cultural features were identified within the RNA.. However, a detailed cultural resource survey of the RNA has not been conducted and none are currently planned.

## IMPACTS AND POSSIBLE CONFLICTS

### Minerals

The entire mineral estate for this area is owned by the United States, and therefore there are no outstanding mineral rights on The Cape RNA. There are no known mineral deposits or associated development activities within or adjacent to The Cape RNA.

### Grazing

The Cape RNA is unsuitable for grazing. There is no grazing on the Middlebury Ranger District, and the Green Mountain National Forest is not permitting grazing on forested lands.

### Timber

The RNA includes 274 ac (110.9 ha) of forest land, 3 ac (1.2 ha) of upland shrub openings, and 13 ac (5.3 ha) of wetlands. Currently 53% (155 ac; 62.7 ha) of the RNA is classified as not suited for timber production due to steep slopes or a presence of wetlands. An additional 27% (78 ac; 31.6 ha) of the RNA may prove not suited for timber production in an analysis, due to wet, seepy areas and steep slopes observed during field review for this record.

A small area along the eastern boundary of the RNA has been logged within the last 50 years, as described in the "Historical Statement". This affects the quality of the RNA because it lies topographically above the rest of the area, and hence in its watershed. The effect on most of the RNA is likely very minimal and will not influence its value as an RNA. Likewise, a small area in the southwest corner of the RNA has also been recently logged and is described in the "Historical Statement". Because it is situated topographically below most of the RNA, its effects on the RNA are negligible. Effects on Baker Brook also appear minimal, as an area of the brook adjacent to this part of the RNA is being used as a control site for a fisheries monitoring project.

Timber management practices will not take place within the RNA because Management Area 8.1D is excluded from the land base allocated to timber production (USDA 1986). This decision was made in the ROD accompanying the LRMP for Green Mountain National Forest (Appendix 2). Additional discussion of the effects of this RNA designation on management opportunities may be found in "The Cape Candidate Research Natural Area Environmental Assessment" in Appendix 3.

### Watershed Values

The Cape RNA drains west and its surface waters drain into Baker Brook. Baker Brook flows south into Furnace Brook, which feeds Otter Creek and ultimately Lake Champlain. As a first-order stream, this brook has a small watershed of approximately 2000 ac (809.4 ha). The Cape RNA occupies approximately 14% of this watershed. Establishment of this RNA will result in minimal changes in the water quality of Baker Brook.

### Recreation Values

The RNA receives limited use by researchers. The area also receives minimal use by birders, hunters, and hikers. At levels occurring at the time of designation, these activities are believed to be compatible with RNA objectives. Use will be monitored to assess this

continued compatibility. There are no established trails or formal recreational establishments within the RNA, and none will be established in the area.

There have been indications of illegal all-terrain vehicle use in a small area on the ridge in the southeast corner of the RNA. This use and other off-highway vehicle (OHV) uses are prohibited in both the RNA and in the area outside of the RNA where it was discovered, and this prohibition will be strictly enforced.

FR 403, also known as the Middle or South Hill Road, parallels Baker Brook and is approximately 200-300 ft (61-91 m) west of this brook, which forms the western boundary of the RNA. Where this road parallels the RNA, it is classified as an unimproved town road in Goshen, and an unimproved town trail in Chittenden. The road receives relatively little use, with the highest frequency of use occurring in the winter when the road serves as a Corridor 7 snowmobile trail. Current use of the road is unlikely to have a negative impact on the RNA, as most casual use associated with the road is likely to remain west of Baker Brook.

Further discussion of the effects of this designation on the social environment can be found in "The Cape Candidate Research Natural Area Environmental Assessment" in Appendix 3.

**Wildlife and Plant Values**

Establishment of the RNA will probably have a positive impact on the forest community and on the uncommon plant populations at the site. Wildlife species which require mature forests will benefit from designation and protection of the RNA. Wildlife and plants which require disturbance, high light conditions, or young stands are unlikely to meet habitat needs in the RNA, except in the small random openings created by natural processes such as windthrow and death of large old trees. These younger or more disturbed conditions often occur elsewhere in areas of the Forest with different designations. Further discussion of the effects of this RNA designation on the environment can be found in "The Cape Candidate Research Natural Area Environmental Assessment" in Appendix 3.

**Special Management Area Values**

The Cape RNA is not in an established or proposed Wilderness, Wild and Scenic River, or National Recreational Area. The nearest Congressionally established area is the Breadloaf Wilderness, which is approximately 8 mi (13 km) northeast of the RNA. The establishment of The Cape RNA will not impact the purposes or management of the Breadloaf Wilderness or any other Congressionally designated areas on the Forest.

**Transportation Plans**

As mentioned under "Recreation Values", FR 403 parallels the western boundary of the RNA some 200-300 ft (61-91 m) to the west of the boundary. The current use of the road does not appear to impact Baker Brook or lands further east within the RNA. FR 53 is an even less-used, unimproved dirt road which approaches the RNA from the south. This road comes to an end approximately 0.5 mi (0.8 km) south of the RNA. Use of this road will also have no impact on the RNA except as another point of access for users. The unimproved nature of this road appears to be an adequate deterrent to most potential users.

No construction of new, permanent roads is planned within the immediate area of the RNA. Temporary roads built in association with timber harvesting on adjacent lands are a possibility; impacts of such road construction on the RNA will be analyzed, and mitigated if

necessary, as part of the analysis for each proposed activity.

## MANAGEMENT PRESCRIPTION

A. RESEARCH

1. Green Mountain National Forest and Northeastern Forest Experiment Station personnel shall encourage the use of "The Cape" RNA by scientists and educators.

2. The Director of the Northeastern Forest Experiment Station (NEFES), in consultation with the Forest Supervisor and Middlebury District Ranger, is responsible for the approval, oversight, and coordination of studies or research conducted in the area. Additional information can be found in Forest Service Manual (FSM) 4063.

3. Access to the RNA by scientists external to the Forest Service may be authorized by the Middlebury District Ranger, through a Letter of Authorization, once research is approved. Use shall conform to conditions specified in approved study plans or cooperative agreements.

4. Copies of all data, reports, and publications resulting from research in the area, including theses, dissertations, articles, monographs, etc., will be provided to the Station Director, Regional Forester, and Forest Supervisor. The final report on the results of the research study shall be submitted to the Forest Service no later than one year following completion of the research.

5. Collection of baseline data is allowed. Destructive sampling is not permitted. Activities such as clipping of vegetation, use of increment borers, temporary shelters for instrumentation, flagging, permanent markers to relocate long-term plots, and tree tagging may be allowed, but will be reviewed for approval by the Station Director on a case by case basis.

6. Research projects involving collection of flora and/or fauna will be reviewed for approval by the Station Director on a case by case basis. All researchers conducting investigations which involve collection in the RNA must, as a condition of approval, must: obtain appropriate permits from State and Federal agencies; carefully control collection of endangered, threatened, or rare plants; and deposit a voucher sample of each plant collected in an herbarium approved by the Station Director.

B. EDUCATION

1. Educational parties external to the Forest Service wishing to use the RNA must receive authorization in advance from the Middlebury District Ranger. Educational use may be allowed as long as the use supports, promotes, or does not degrade the special values for which the RNA was established, and does not disturb on-going research activities.

2. Educational use may be allowed for upper level undergraduate and graduate classes. All other educational use will be discouraged. Visits will be limited to groups of no more than 8 people, with no more than one group active in the

RNA at any given time. This restriction is needed to protect the steep, fragile slopes from degradation by foot traffic.

C. PUBLIC USE

1. Research and educational use may be permitted; other public use of the area, such as hiking, hunting, camping, fishing, etc., will not be encouraged. A monitoring plan will be developed in cooperation with the Station Director to track the effects of all uses on the RNA. If monitoring of the impacts of use shows that use is threatening RNA values, steps will be taken to reduce use of the RNA. This may include issuance of a Forest Supervisor's Order (36 CFR Part 261, Subpart B) to protect the RNA's features.

2. Use of the area by domesticated animals is prohibited.

3. No trails will be established in the RNA.

4. Off-highway vehicles, including saddle-pack and draft animals, and bicycles will not be allowed in the RNA.

5. Activities occurring within the RNA, as viewed from on-site, will meet the low visual sensitivity standards described in the LRMP (p. 4.48-4.50). Activities occurring within the RNA that can be seen from sensitive off-site areas (e.g. homes, travelways) will meet the Visual Quality Objective of RETENTION.

D. VEGETATION MANAGEMENT

1. Vegetative management, including logging or other wood gathering activities, prescribed burning, and grazing, will not be allowed.

2. Openings in the area will be the result of natural events only.

3. In the event of catastrophic storm damage, no salvage operations will occur unless there is a real threat to resources, human life, and structures on surrounding lands.

E. FIRE

1. Wildfires will be suppressed; firefighting within the RNA will involve quick suppression using techniques which least alter the landscape and disturb the ground.

2. Normally suppression will be accomplished using hand tools. Aerial fire suppression may be used if it is determined that less damage to the RNA than hand suppression would result. The use of mechanized equipment and vehicles must be approved by the Forest Supervisor in consultation with the Regional Forester and Station Director. Evidence of firefighting will be obliterated, to the extent possible, as a cost of the fire. The need and desirability for post fire community restoration will be determined by the Station Director.

F. MANAGEMENT OF ADJACENT AREAS

1. Managers planning activities in areas adjoining the RNA shall consult these guidelines. Consider the size, location, and characteristics of the RNA so that

activities on adjacent lands will not have an adverse effect on the RNA. The Station Director shall be consulted as part of this process.

G. FISH, WILDLIFE, AND PLANTS

1. Habitats provided will be the result of natural processes with little to no modification by humans. An exception may be the reintroduction of species extirpated from areas within The Cape. Decisions regarding the need for reintroduction will be made on a case by case basis by the Regional Forester and Station Director. The scientific community and those conducting research in the RNA will be consulted.

H. THREATENED AND ENDANGERED SPECIES

1. Research and monitoring of populations of endangered, threatened, sensitive, or rare species will be especially encouraged.

2. All threatened, endangered, sensitive, or rare species shall be protected from activities occurring within the RNA, including research and educational activities.

3. The Forest Service is legally obligated to protect, and implement recovery plans for, federally listed Threatened and Endangered species. If such a species is found in the RNA, the Forest Service will consult with the U.S. Fish and Wildlife Service and Station Director about an appropriate course of action to take within the RNA.

I. SOIL, WATER, AND AIR

1. Use will be dispersed and controlled to prevent excessive damage to soil and water.

J. INTEGRATED PEST MANAGEMENT

1. Protection of the RNA from introduced and endemic insects, diseases, plants, and animals may be allowed, but only when the values for which the RNA was established are severely threatened over the long-term. Decisions regarding the need for action will be made by the Forest Supervisor in consultation with the Regional Forester and Station Director. The scientific community and those conducting research within the RNA will be consulted.

2. Protection will follow Integrated Pest Management (IPM) guidelines established in the LRMP for Management Prescription 8.1 (p. 4.88-4.90).

K. TRANSPORTATION SYSTEM

1. No roads will be established within the RNA. Existing skid trails will be allowed to revert to natural conditions.

L. CORRIDORS

1. Facilities and corridors for utility rights-of-way will not be established or allowed in the RNA.

M. FACILITIES

1. No facilities of any kind will be allowed within the RNA.

N. CULTURAL RESOURCES

1. Archaeological activities, including limited excavation, may be allowed, but will be reviewed for approval by the Station Director.

2. Significant cultural resources will be protected through dispersal, control, and limits on public use of the RNA.

O. MINERALS, OIL, AND GAS

1. Surface occupancy or disturbance for mineral, oil, and gas exploration or removal will be prohibited.

2. Subsurface exploration and extraction may be allowed only when environmental analysis demonstrates that the RNA will not be adversely affected by such activities.

## ADMINISTRATION RECORDS AND PROTECTION

Administration and protection of The Cape RNA is the responsibility of the:

District Ranger
Green Mountain National Forest
Middlebury Ranger District
R.D. #4, Box 1260
Middlebury, VT 05753

The research coordinator and Station Director for this area is:

Director
Northeastern Forest Experiment Station
5 Radnor Corporate Center
100 Matsonford Rd.
Suite 200, P.O. Box 6775
Radnor, PA 19087-4585

Plant collections will be housed at the Pringle Herbarium at the University of Vermont, Burlington, VT.

The research data file is maintained at the following offices:

Regional Forester
Eastern Region
310 W. Wisconsin Ave.
Rm. 500
Milwaukee, WI 53203

Station Director
Northeastern Forest Experiment Station
5 Radnor Corporate Center
100 Matsonford Rd.
Suite 200, P.O. Box 6775
Radnor, PA 19087-4585

Forest Supervisor
Green Mountain National Forest
231 North Main St.
Rutland, VT 05701

Research proposals are to be submitted to the Station Director for review and approval. The Middlebury District Ranger then provides authorization for approved research within the RNA through a Letter of Authorization.

Special protection needs are:

Strict enforcement of policies prohibiting the use of off-highway vehicles within the RNA.

Annual monitoring of all uses of the RNA for research, education, and recreation.

## ARCHIVING

The Station Director shall establish and maintain a system for archiving data and reports from the RNA in a manner that will facilitate the exchange and transfer of information among Stations and scientists.

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Whitaker, J.O. Jr. 1980. The Audubon Society field guide to North American mammals. Alfred A. Knopf, New York, NY.

## APPENDIX 1: CONTRIBUTORS

**Contributors To This Report:**

USDA Forest Service, Green Mountain National Forest:
- Diane Burbank, Forest Ecologist, Supervisor's Office
- Nancy Burt, Forest Soil Scientist, Supervisor's Office
- Chris Casey, Assistant Ranger, Middlebury Ranger District
- Clayton Grove, Forest Biologist, Supervisor's Office
- David Lacy, Forest Archeologist, Supervisor's Office
- Fred Putnam, Assistant Ranger, Middlebury Ranger District

Charles Cogbill, Forest Ecologist, Sterling College, Craftsbury Common, VT.

Everett Marshall, Database Manager/Botanist, Vermont Nongame and Natural Heritage Program, Waterbury, VT

Chris Rimmer, Biologist, Vermont Institute of Natural Science, Woodstock, VT.

Elizabeth Thompson, Plant Ecologist, Montpelier, VT (first draft of the establishment record).

**Record of Decision, pages 12-13**

As quoted in the Record of Decision:

**PROTECT SPECIAL AREAS**

Decision:

The decision is to protect all known special areas having uncommon or outstanding characteristics (Table 3).

Alternative D2 adds 3 special areas to the 14 which were protected in all the earlier alternatives we considered. As a result, 13 special areas cover 31,500 acres (10%) of the Green Mountain National Forest and 4 areas cover 500 acres (4%) of the Finger Lakes National Forest. When new special areas are "discovered" or acquired in the future, they will also be given extra protection.

Reasons:

This decision was made to address the public's identification of areas which needed special protection. The 3 new areas were added to the earlier list as a result of an analysis of public comments on the Draft EIS/Plan. Beaver Meadows/ Abbey Pond and other remote, high elevation ponds have been added to the group of special areas which will be studied to determine if they should become Research Natural Areas (Table 3).

Protection of special areas is compatible with the State of Vermont's goal to protect fragile areas and the goals of the Nature Conservancy and other organizations to protect and enhance natural diversity through the preservation of uncommon sites and species.

Protection of special areas will provide immeasurable benefits to the public at very little cost and will enhance the stability and health of the entire forest ecosystem. Long term protection of special areas is important to do on public lands since it cannot be assured on private lands.

This decision does not foreclose the option of placing additional measures of protection on these special areas in the future, nor does it preclude protecting new areas should they be "discovered" or acquired.

Table 3 Special Areas Protected

| Name | Special Features |
|---|---|
| LONG TRAIL/ APPALACHIAN TRAIL (LT/AT) | This unique trail corridor the backbone of the mountains through the National Forest. The LT extends from Massachusetts to Canada. The AT coincides with the southern 97 miles of the LT. |
| WHITE ROCKS NRA | This area was established by Congress for the purpose of preserving and protecting "existing wild values and to promote wild forest and aquatic habitats..." (PL 98-322, Sec. 201(b)). |
| GROUT POND | The pond and shoreline will remain remote and undeveloped even though there is good road access and many people living nearby. |
| THE CAPE* | A large, mature hardwood stand, where little human activity appears to have occurred, will be preserved in its natural condition. |
| MOUNT HORRID* | Spectacular cliffs created by glaciers which provide habitats for peregrine falcons and many rare plants. |
| TEXAS FALLS | A short series of low falls, cascades and potholes in a small gorge scoured by glacial meltwater. |
| CRYSTAL BROOK GLACIAL KETTLE | A large natural hole on otherwise flat terrain caused by the settling of glacial sand and gravel after a large block of ice melted beneath. |
| ROBERT FROST TRAIL | A National Recreation Trail in a serene wooded environment that evokes the poems of Vermont's poet laureate Robert Frost. |
| BEAVER MEADOWS/ ABBEY POND* | Isolated beaver meadows and pond which support heron rookeries and provide solitude and remoteness to recreationists. |
| MOUNT ABRAHAM | One of the highest, most popular peaks in Vermont which supports fragile, sub-alpine vegetation and spectacular views. The area will be studied as a potential Research Natural Area. |
| REMOTE* PONDS | These sensitive, undeveloped ponds possess uncommon recreational, scenic and biological values. The ponds will be studied for their Research Natural Area potential. |
| RATTLESNAKE POINT/FALLS OF LANA | The cliffs, waterfalls and gorge provide spectacular views, excellent picnicking and day hiking opportunities and habitats for several uncommon plants and animals. |
| CRANBERRY* BOG | A small, high elevation bog with native cranberries and other uncommon vegetation. This ecological community will be studied as a possible Research Natural Area. |
| INTERLOKEN TRAIL | A National Recreation Trail on the FLNF which follows along a plateau between Seneca and Cayuga Lakes with diverse terrain, long views and a wide variety of habitats. |
| FINGER LAKES TRAIL | A short segment of a heavily used 700 mile trail across southern New York. |
| OLD GROWTH* | Small areas on the FLNF left to the forces of nature. |

* Potential Research Natural Areas

# APPENDIX 3: THE CAPE CANDIDATE RESEARCH NATURAL AREA ENVIRONMENTAL ASSESSMENT

## GREEN MOUNTAIN NATIONAL FOREST
## MIDDLEBURY DISTRICT
## RUTLAND AND ADDISON COUNTIES, VERMONT

### Purpose and Need for Action

The Green Mountain National Forest (GMNF) is proposing to establish The Cape Big Tree Community (hereafter referred to as The Cape) as a Research Natural Area (RNA). At a national level, the desired future condition for RNAs is a national network of ecological areas designated in perpetuity to "illustrate adequately or typify for research or education purposes the important forest and range types in each forest region, as well as other plant communities that have special or unique characteristics of scientific interest and importance" (36 CFR 251.23). The purpose of establishing The Cape RNA is to contribute a unique forest community found in the GMNF to the national network of RNAs. Currently, no RNAs have been established in the GMNF.

The Cape RNA would contribute to the RNA network by providing an example of a rich-mesic, northern hardwood forest disturbed primarily by natural processes and events, as discussed in the Land and Resource Management Plan (LRMP) for the GMNF (p. 4.163). The old age and relatively undisturbed nature of this community is quite unusual for New England, and its rich, colluvial slopes enhance its uniqueness. Establishment of The Cape RNA would provide long-term protection and recognition of this forest type and its unique features.

The Cape is designated in the LRMP as a Special Area under Management Area (MA) 8.1D. The LRMP further defines The Cape as a potential RNA (hereafter referred to as Candidate RNA or cRNA) based upon it's old age, large trees, and rarity of these features in the state and region. While the LRMP was being developed, comments received from interested publics supported establishment of an RNA in the area. No other areas within the Forest were found to offer this unique combination of community type, age, and lack of disturbance. The Record of Decision (ROD) for the LRMP directs the Forest Service to protect all cRNAs as Special Areas until they can be studied for designation as RNAs.

Part of the process of designating an RNA is to study the suitability of the candidate area for establishment relative to criteria and concerns described in Forest Service Manual (FSM) 4063. These include: the nature of the area's distinctive features; the ability of the area to represent or protect important ecosystems or communities; the size of the area; the degree to which the area is undisturbed by humans or approximates a pristine condition; and the types and degree of conflicting uses. Although general site conditions and environmental effects of designation of The Cape as an RNA are much the same as described on pages 4.49-4.50 of the Draft Environmental Impact Statement (DEIS) for the LRMP, new information has been gathered since issuance of the LRMP that has implications for the area's suitability.

During evaluation of its suitability, the boundaries of The Cape cRNA were reviewed to determine what would be most appropriate for ecological and research purposes. This review was conducted through a mailing in February of 1991 and a subsequent series of field visits in 1991 and 1992 involving scientists, interested members of the public, and Forest Service specialists. During this review, three previously unrecognized conditions were discovered.

First, the acreage of The Cape cRNA as defined in the LRMP was underestimated by 86 acres. This was a simple calculation error made during LRMP development.

Second, the LRMP showed the western boundary of The Cape cRNA at Forest Road (FR) 403, also known as the Middle Road or South Hill Road, and which is also part of the Corridor 7 snowmobile trail system. However, field visits showed a previously unrecognized colluvial slope extending from the top of the ridge to Baker Brook, but not continuing to the road. This type of slope is distinctive for the high levels of organic matter and nutrients that occur there, and the rich growing conditions these levels provide for plants. The continuity of this landform is important for designing future research projects.

Third, a 106-acre area along the southern boundary of The Cape cRNA was found to be part of the colluvial slope described above. In addition, the upper slope and mid-slope portions of this area were found to include a relatively undisturbed, rich-mesic, northern hardwood community quite similar to that found in the Special Area. The hardwood areas found along the lower slope and riparian area adjacent to Baker Brook are part of the same community, but have evidence of prior logging. At the time the LRMP was developed, a detailed reconnaissance of this 106-acre area had not been undertaken. Therefore, the full extent of the resources present there was unknown at that time.

## Proposed Action

The proposed action is to designate a 290 acre northern hardwood community, defined as "The Cape", as an RNA, and to manage it according to the standards and guidelines described below. A map of the Proposed Action can be found in Appendix A. The LRMP had originally identified The Cape as a 118 acre Special Area and cRNA, to be managed according to the direction provided in the LRMP (p. 4.163), which includes studying the suitability of The Cape for establishment as an RNA. The proposed action will amend the LRMP.

Comments from the public as well as field review by scientists and Forest Service specialists have led to a recommendation of new boundaries for The Cape RNA. As part of the proposed action, the northern and eastern boundaries of The Cape RNA would remain as described in the LRMP for The Cape cRNA. We propose to relocate the western boundary of The Cape cRNA from FR 403 to Baker Brook in order to include only the colluvial slope within the RNA, and to avoid snowmobile use along the RNA boundary. The southern boundary of The Cape cRNA will be expanded further south to incorporate an additional 106 acres of this colluvial slope. To do this, we propose to include stands 19 and 20 of Compartment 129 in the RNA, and to extend the southern boundaries of these two stands (between Tracts 652c and 908) east to a point at the height of land at approximately 2460 ft elevation. This southern expansion will be bound to the east by the height of land, and to the west by Baker Brook. The land between Baker Brook and FR 403 which is excluded from this RNA proposal would remain designated as MA 8.1. These new boundaries would meet the stated national purposes for RNA establishment as well as the needs of researchers by maintaining the ecological integrity of the colluvial slope landform and old-age forest community within The Cape.

As an RNA, The Cape would primarily be managed to provide research opportunities. New standards and guidelines have been developed in order to protect and manage the RNA for research and limited education purposes (FSM 4063). The following standards and guidelines would apply:

A. RESEARCH

1. Green Mountain National Forest and Northeastern Forest Experiment Station personnel shall encourage the use of "The Cape" RNA by scientists and educators.

2. Use of the RNA by researchers external to the Forest Service may be authorized by the Middlebury District Ranger. Use shall conform to conditions specified in approved study plans or cooperative agreements.

3. The Director of the Northeastern Forest Experiment Station (NEFES) will be responsible for any studies or research conducted in the area, and requests to conduct research in the area will be referred to him/her. In consultation with the Forest Supervisor and Middlebury District Ranger, the Station Director will evaluate research proposals and coordinate all studies and research in the RNA.

4. Copies of all data, reports, and publications resulting from research in the area, including theses, dissertations, articles, monographs, etc., will be provided to the Station Director, Regional Forester, and Forest Supervisor. The final report on the results of the research study shall be submitted to the Forest Service no later than one year following completion of the research.

5. Collection of baseline data is allowed. Destructive sampling is not permitted. Activities such as clipping of vegetation, use of increment borers, temporary shelters for instrumentation, flagging, permanent markers to relocate long-term plots, and tree tagging may be allowed, but will be reviewed for approval by the Station Director on a case by case basis.

6. 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 Station Director. When necessary, appropriate permits for collection will be obtained from state and federal agencies. Collection of endangered, threatened, or rare species will be carefully controlled.

B. EDUCATION

1. Use of the RNA by educational parties external to the Forest Service may be authorized by the Middlebury District Ranger. Educational use may be allowed as long as the use supports, promotes, or does not degrade the special values for which the RNA was established.

2. Educational use may be allowed for upper level undergraduate and graduate classes. All other educational use will be discouraged. Visits will be limited to groups of 5-8 people, with no more than one group active in the RNA at any given time. A Forest Service representative will participate in all educational visits.

C. PUBLIC USE

1. Research and educational use may be permitted; other public use of the area, such as hiking, hunting, camping, fishing, etc., will be discouraged. Permission for such use will be obtained from the Middlebury District Ranger. Use of the area by domesticated animals is prohibited. If monitoring of recreational use shows that use is threatening RNA values, a Forest Supervisor's Order (36 CFR Part 261, Subpart B) shall be issued to protect the RNA's features.

2. No trails will be established in the RNA.

D. VEGETATION MANAGEMENT

1. Vegetative management, including logging or other wood gathering activities, prescribed burning, and grazing, will not be allowed.

2. Openings in the area will be the result of natural events only.

E. FIRE

1. All wildfires that endanger the RNA will be quickly suppressed using means that will cause minimal damage to the area. Normally suppression will be accomplished using hand tools. Aerial fire suppression and other ground disturbances, such as bulldozer firelines, will only be used where the fire cannot be contained outside the boundaries of the RNA. All evidence of human disturbance will be obliterated as a cost of the fire.

F. MANAGEMENT OF ADJACENT AREAS

1. Managers planning activities in areas adjoining the RNA should consult these guidelines. Consider the size, location, and characteristics of the RNA so that activities will not have an adverse effect on the RNA. The Forest RNA Coordinator shall be consulted as part of this process.

G. FISH, WILDLIFE, AND PLANTS

1. Habitats provided will be the result of natural processes with little to no modification by humans. An exception may be the reintroduction of species extirpated from their historic habitats.

H. THREATENED AND ENDANGERED SPECIES

1. Research and monitoring of populations of endangered, threatened, sensitive, or rare species will be especially encouraged.

2. All threatened, endangered, sensitive, or rare species shall be protected from activities occurring within the RNA, including research and educational activities.

3. The Forest Service is legally obligated to protect and implement recovery plans for federally listed Threatened and Endangered species. If such a species is found in the RNA, the Forest Service will consult with the U.S. Fish and Wildlife Service and Station Director about an appropriate course of action to take within the RNA.

I. SOIL, WATER, AND AIR

1. Use will be dispersed and controlled to prevent excessive damage to soil and water.

J. INTEGRATED PEST MANAGEMENT

1. Protection of the RNA from introduced and endemic insects, diseases, plants, and animals will be allowed only when the special values of the RNA are threatened. Decisions regarding the need for action will be made by the

Regional Forester and Station Director.

2. Protection will follow Integrated Pest Management (IPM) guidelines established in the LRMP for Management Prescription 8.1 (p. 4.88-4.90).

K. TRANSPORTATION SYSTEM

1. No roads will be established within the RNA. Existing skid trails will be allowed to revert to natural conditions.

L. CORRIDORS

1. Facilities and corridors for utility rights-of-way will not be established or allowed in the RNA.

M. FACILITIES

1. No facilities of any kind will be allowed within the RNA.

N. CULTURAL RESOURCES

1. Archaeological activities, including limited excavation, may be allowed, but will be reviewed for approval by the Station Director.

2. Significant cultural resources will be protected through dispersal, control, and limits on public use of the RNA.

O. MINERALS, OIL, AND GAS

1. Surface occupancy or disturbance for mineral, oil, and gas exploration or removal will be prohibited.

2. Subsurface exploration and extraction may be allowed only when environmental analysis demonstrates that the RNA will not be adversely affected by such activities.

## Public Issues Related to the Proposed Action

Public issues and management concerns related to the proposed action were identified by reviewing national direction for the establishment of RNA's, and by contacting interested or affected publics and Forest Service staff. The major issues identified were used to develop alternatives to the proposed action, and to assess the environmental consequences of the proposed action and alternatives.

Public comments were collected in response to a formal scoping letter mailed on 1 October 1992 to 200 interested individuals and organizations (Appendix B). This mailing informed the recipients of the Proposed Action and requested their comments. Responses to this mailing included written letters, telephone calls, and personal contacts. A list of those individuals who responded during scoping can be found in the Consultation section of the Environmental Assessment (EA).

Each comment received during scoping was evaluated to determine how it should be addressed in this assessment. Appendix C quotes the actual concerns of each respondent and explains how their concerns were addressed. As a result of this evaluation, nine general issues were identified. Six of these issues were carried forward as part of the

environmental assessment. They are:

Issue 1: Some people believe the western boundary of The Cape RNA should remain along FR 403, providing a higher level of protection for the western portion of the RNA than proposed. This issue is the basis for Alternative D.

Issue 2: Some people believe that The Cape RNA boundaries should remain as stated in the LRMP (see D2 map). They believe that the LRMP boundaries encompass an RNA of sufficient size, and that there is little justification for the proposed expansion. This issue is the basis for Alternative C.

Issue 3: Some people expressed a concern for the loss of the timber resource in the proposed action. This is discussed in the "Environmental Effects" section.

Issue 4: Some people believe that The Cape Special Area should not be designated as an RNA. It would therefore remain under its current designation of Special Area with the boundaries and standards and guidelines described in the LRMP (p. 4.163; D2 map). This issue is the basis for Alternative A.

Issue 5: Some people believe that The Cape RNA should be expanded to 500 acres, as this would be consistent with the LRMP definition of an old growth community. This issue is addressed in the "Alternatives Not Carried Forward" section.

Issue 6: Most respondents had comments or suggestions regarding standards and guidelines for management of The Cape RNA. The comments included concerns about user restrictions and monitoring of use, fire policy, reintroductions, integrated pest management, a catastrophic event policy, and activities on adjacent lands. These suggestions and comments were evaluated and many were used to develop a revised set of standards and guidelines, which are included in Alternatives B, C, and D. Those suggestions not used are discussed below as issues outside the scope of the analysis or in the Alternatives Not Carried Forward section.

Three issues raised were determined to be outside the scope of this analysis and are discussed below.

- **Some people expressed concern over the way recreational and educational uses are being discouraged in the standards and guidelines for The Cape RNA (Appendix C: 6-1, 6-3).**

  This issue is outside the scope of this decision because it is national in scope. Forest Service policy for the use of research natural areas is found in FSM 4063. The policy states: "Research Natural Areas may be used only for research, study, observation, monitoring, and those educational activities that maintain unmodified conditions." (FSM 4063.03); and, "Generally, do not authorize educational use of a research natural area by anyone below the upper class college or graduate student level." (FSM 4063.33). Protection guidelines also include the prohibition of "...any form of recreational use if such use threatens or interferes with the objectives or purposes for which the research natural area is established." (FSM 4063.3).

- **Some people expressed concern over the way in which research use is restricted in the standards and guidelines for The Cape RNA (Appendix C: 6-5, 6-20).**

  This issue is outside the scope of this decision because it is national in scope. Forest Service policy regarding research use in RNAs can also be found in FSM 4063. No

restrictions other than those stated in the manual, which are the minimum required by the agency, are included in any alternative.

- **Some people expressed concern that future activities occurring on adjacent federal lands would be unnecessarily restricted by this designation. Others were concerned that future activities on adjacent lands would not be adequately restricted with the proposed designation (Appendix C: 5.1, 6-2, 6-10, 6-17).**

  This issue is outside the scope of this decision because it is not the purpose of this decision to place restrictions on adjacent federal lands. Adjacent management area designations and prescriptions, and the environmental effects of adjacent prescriptions, were analyzed in the DEIS, reviewed by the public, incorporated into the Final EIS, and incorporated into the LRMP.

## Alternatives to the Proposed Action

This section describes the four alternatives that were developed in response to the issues generated by the Proposed Action. Other alternatives are also described which were examined during the analysis but were not considered in further detail in the analysis. All alternatives, with the exception of Alternative A (No Action), would establish The Cape as a Research Natural Area, and with the Proposed Action meet the desired future condition of contributing a suitable, unique forest community from the Green Mountain National Forest to the network of RNAs. The alternatives differ in the degree of suitability, the acreage assigned to the RNA, and in standards and guidelines for management of the area.

**Alternative A** would not designate The Cape cRNA as a RNA. This alternative fulfills the NEPA requirement for the "No Action" alternative, and serves as a baseline for effects analysis. It also addresses concerns that The Cape cRNA is not qualified for designation as a RNA.

Under this alternative, The Cape would remain a Special Area, as designated in the LRMP (p. 4.163). The boundaries would remain as depicted on the D2 map, and standards and guidelines would remain as described in the LRMP. The LRMP, however, would be amended to correct the erroneous acreage stated for this area; the correct acreage is 204 acres. A map of Alternative A can be found in Appendix A. The 106-acre expansion area described in the proposed action would remain as MA 3.1, with no further protection than that described under standards and guidelines for this designation.

**Alternative B** would amend the LRMP by designating The Cape as a 290-acre RNA. The boundaries are identical to those described in the Proposed Action. A map of Alternative B can be found in Appendix A. This alternative differs from the Proposed Action in that standards and guidelines were modified to respond to the following concerns expressed during scoping: plant collections for research (changes to A.6), educational use (changes to B.1, B.2), public use (changes to C.1; addition of C.2, C.4), vegetation management (addition of D.3), fire policy (changes to E.1; addition of E.2), and reintroductions (changes to G.1). Additional minor changes were made in the standards and guidelines to clarify ambiguous wording. The Cape RNA would be given the Management Area designation of 8.1D "The Cape Research Natural Area". The 20-acre portion of the Special Area excluded from the RNA will continue to be managed as a Special Area under the original standards and guidelines established for 8.1D. This area will be designated 8.1D "The Cape Special Area", and may be redesignated a different prescription in a separate analysis. The following standards and guidelines would apply to the RNA:

A. RESEARCH

1. Green Mountain National Forest and Northeastern Forest Experiment Station personnel shall encourage the use of The Cape RNA by scientists and educators.

2. The Director of the Northeastern Forest Experiment Station (NEFES), in consultation with the Forest Supervisor and Middlebury District Ranger, is responsible for the approval, oversight, and coordination of studies or research conducted in the area. Additional information can be found in Forest Service Manual (FSM) 4063.

3. Access to the RNA by scientists external to the Forest Service may be authorized by the Middlebury District Ranger through a Letter of Authorization, once research is approved. Use shall conform to conditions specified in approved study plans or cooperative agreements.

4. Copies of all data, reports, and publications resulting from research in the area, including theses, dissertations, articles, monographs, etc., will be provided to the Station Director, Regional Forester, and Forest Supervisor. The final report on the results of the research study shall be submitted to the Forest Service no later than one year following completion of the research.

5. Collection of baseline data is allowed. Destructive sampling is not permitted. Activities such as clipping of vegetation, use of increment borers, temporary shelters for instrumentation, flagging, permanent markers to relocate long-term plots, and tree tagging may be allowed, but will be reviewed for approval by the Station Director on a case by case basis.

6. Research projects involving collection of flora and/or flora will be reviewed for approval by the Station Director on a case by case basis. All researchers conducting investigations which involve collection in the RNA must, as a condition of approval: obtain appropriate permits from State and Federal agencies; carefully control collection of endangered, threatened, or rare plants; and deposit a voucher sample of each plant collected in an herbarium approved by the Station Director.

B. EDUCATION

1. Educational parties external to the Forest Service wishing to use the RNA must receive authorization in advance from the Middlebury District Ranger. Educational use may be allowed as long as the use supports, promotes, or does not degrade the special values for which the RNA was established, and does not disturb on-going research activities.

2. Educational use may be allowed for upper level undergraduate and graduate classes. All other educational use will be discouraged. Visits will be limited to groups of no more than 8 people, with no more than one group active in the RNA at any given time. This restriction is needed to protect the steep, fragile slopes from degradation by foot traffic.

C. PUBLIC USE

1. Research and educational use may be permitted; other public use of the area, such as hiking, hunting, camping, fishing, etc., will not be encouraged. A monitoring plan will be developed in cooperation with the Station Director to track the effects of all uses on the RNA. If monitoring of the impacts of use

shows that use is threatening RNA values, steps will be taken to reduce use of the RNA. This may include issuance of a Forest Supervisor's Order (36 CFR Part 261, Subpart B) to protect the RNA's features.

2. Use of the area by domesticated animals is prohibited.

3. No trails will be established in the RNA.

4. Off-highway vehicles, including saddle-pack and draft animals, and bicycles will not be allowed in the RNA.

5. Activities occurring within the RNA, as viewed from on-site, will meet the low visual sensitivity standards described in the LRMP (p. 4.48-4.50). Activities occurring within the RNA that can be seen from sensitive off-site areas (e.g. homes, travelways) will meet the Visual Quality Objective of RETENTION.

D. VEGETATION MANAGEMENT

1. Vegetative management, including logging or other wood gathering activities, prescribed burning, and grazing, will not be allowed.

2. Openings in the area will be the result of natural events only.

3. In the event of catastrophic storm damage, no salvage operations will occur unless there is a real threat to resources, human life, and structures on surrounding lands.

E. FIRE

1. Wildfires will be suppressed; firefighting within the RNA will involve quick suppression using techniques which least alter the landscape and disturb the ground.

2. Normally suppression will be accomplished using hand tools. Aerial fire suppression may be used if it is determined that less damage to the RNA than hand suppression would result. The use of mechanized equipment and vehicles must be approved by the Forest Supervisor in consultation with the Regional Forester and Station Director. Evidence of firefighting will be obliterated, to the extent possible, as a cost of the fire. The need and desirability for post fire community restoration will be determined by the Station Director.

F. MANAGEMENT OF ADJACENT AREAS

1. Managers planning activities in areas adjoining the RNA shall consult these guidelines. Consider the size, location, and characteristics of the RNA so that activities on adjacent lands will not have an adverse effect on the RNA. The Station Director shall be consulted as part of this process.

G. FISH, WILDLIFE, AND PLANTS

1. Habitats provided will be the result of natural processes with little to no modification by humans. An exception may be the reintroduction of species extirpated from areas within The Cape. Decisions regarding the need for reintroduction will be made on a case by case basis by the Regional Forester and Station Director. The scientific community and those conducting research in the RNA will be consulted.

H. THREATENED AND ENDANGERED SPECIES

1. Research and monitoring of populations of endangered, threatened, sensitive, or rare species will be especially encouraged.

2. All threatened, endangered, sensitive, or rare species shall be protected from activities occurring within the RNA, including research and educational activities.

3. The Forest Service is legally obligated to protect, and implement recovery plans for, federally listed Threatened and Endangered species. If such a species is found in the RNA, the Forest Service will consult with the U.S. Fish and Wildlife Service and Station Director about an appropriate course of action to take within the RNA.

I. SOIL, WATER, AND AIR

1. Use will be dispersed and controlled to prevent excessive damage to soil and water.

J. INTEGRATED PEST MANAGEMENT

1. Protection of the RNA from introduced and endemic insects, diseases, plants, and animals may be allowed, but only when the values for which the RNA was established are severely threatened over the long-term. Decisions regarding the need for action will be made by the Forest Supervisor in consultation with the Regional Forester and Station Director. The scientific community and those conducting research within the RNA will be consulted.

2. Protection will follow Integrated Pest Management (IPM) guidelines established in the LRMP for Management Prescription 8.1 (p. 4.88-4.90).

K. TRANSPORTATION SYSTEM

1. No roads will be established within the RNA. Existing skid trails will be allowed to revert to natural conditions.

L. CORRIDORS

1. Facilities and corridors for utility rights-of-way will not be established or allowed in the RNA.

M. FACILITIES

1. No facilities of any kind will be allowed within the RNA.

N. CULTURAL RESOURCES

1. Archaeological activities, including limited excavation, may be allowed, but will be reviewed for approval by the Station Director.

2. Significant cultural resources will be protected through dispersal, control, and limits on public use of the RNA.

O. MINERALS, OIL, AND GAS

1. Surface occupancy or disturbance for mineral, oil, and gas exploration or removal will be prohibited.

2. Subsurface exploration and extraction may be allowed only when environmental analysis demonstrates that the RNA will not be adversely affected by such activities.

**Alternative C** would amend the LRMP by designating The Cape as a 204-acre RNA. The boundaries are those described in the LRMP for The Cape cRNA: the northern boundary follows the public/private land boundary north of the Goshen/Chittenden town line; the eastern boundary follows the height of land; the southern boundary follows the southern boundary of Compartment 109; and the western boundary follows the eastern edge of FR 403, which is also part of the Corridor 7 snowmobile trail system. A map of Alternative C can be found in Appendix A. The amendment corrects the error in the acreage described in the LRMP (p. 4.163) for The Cape cRNA. This area would be managed according to standards and guidelines described in Alternative B.

This alternative addresses concerns of the public that expansion of the RNA is unnecessary by not including the 106-acre southern extension identified as having similar characteristics to The Cape, and by keeping the area between FR 403 and Baker Brook within the RNA, which has been identified as having few similarities to The Cape. It addresses concerns regarding standards and guidelines in the same way as Alternative B.

**Alternative D** would amend the LRMP by designating The Cape cRNA as a 310-acre RNA. The boundaries are identical to those described in the proposed action, except that the western boundary is maintained along the eastern edge of FR 403 instead of being relocated to Baker Brook. The 106-acre southern extension would be included in the RNA, recognizing the continuation of the biological and physical characteristics that are unique to The Cape area. A map of Alternative D can be found in Appendix A. This area would be managed according to standards and guidelines described in Alternative B. By including the 20 acres between the road and brook, this alternative addresses concerns that the western edge of the RNA, including the riparian area, needs better long-term protection due to the presence of the road.

## Alternatives Not Carried Forward

Two alternatives to the Proposed Action were considered but, for various reasons, not carried forward. This section describes these alternatives and the reasons for not considering them further in the analysis.

- **Expansion of the RNA to 500 acres to provide the minimum acreage consistent with the LRMP definition of an old growth community.**

  An alternative for further expansion of the Cape RNA was suggested by a scoping respondent. The suggestion was to enlarge the RNA to a 500 acre size in order to be consistent with recommendations in the LRMP (p. N.22) for the size of old-growth communities (Villanueva 1984). The respondent believes that some stands and portions of stands adjacent to the Cape are "...as old or older than stands within the proposed RNA...". In addition, the respondent suggested that if the additional acreage was not incorporated in the RNA, then a Special Area designation should be given to lands adjacent to the RNA to "...create an 'effective' old-growth area of at least 500 acres..."

This alternative was reviewed but not considered in further detail because the purposes for creating this particular RNA are two-fold. The first is to protect the forest community that currently exists in the Cape area. This community is unique due to its old-age, its rich colluvial slopes, and its relatively undisturbed nature. The second purpose, and most important in terms of this administrative designation, is to provide a complete ecosystem with unique research opportunities. The purpose of designating this RNA is not to create additional old growth for the future. Further discussion of this issue can be found in Appendix 3C.

- **Management of The Cape RNA according to standards and guidelines that do not allow for human intervention of any kind beyond basic research.**

  Several respondants requested an alternative that would prohibit human intervention under all circumstances, including fire, catastrophic wind damage, pest outbreaks, and plant and animal reintroductions. Such an alternative would be counter to national direction for RNAs (FSM 4063), and would unnecessarily rule out future actions that may be consistent with the purposes of RNAs. An example would be the reintroduction of a species which, in the future, had been extirpated from the region, including the RNA. In the case of fire policy, the LRMP requires that all wildfires be suppressed on all Forest lands.

## Environmental Effects

Chapter 4 of the Draft Environmental Impact Statement (DEIS) for the Green Mountain National Forest LRMP, as incorporated into the FEIS in 1986, contains a discussion of the elements of the environment affected by management practices; the physical and biological effects of these practices; a comparison of the direct, indirect, and cumulative effects of alternatives; and the irreversible or irretrievable commitment of resources. Specifically, the environmental consequences of designating the original 204 (corrected) acres of The Cape as a Special Area and cRNA (MA 8.1D) are discussed in the DEIS (pp. 4.49-4.50). This EA is therefore tiered to the DEIS as incorporated into the FEIS.

Copies of the DEIS and FEIS are available at all three Ranger Districts and the Supervisor's Office on the Green Mountain National Forest. Other environmental consequences of the Proposed Action and Alternatives for this EA are discussed in the remainder of this section.

### The Proposed Action

The environmental consequences of designating 184 acres of the original 204 acres of The Cape cRNA as a RNA, as described in the Proposed Action, are the same as those discussed in the DEIS (p. 4.49-4.50), as incorporated in the FEIS. These consequences include restrictions placed on vegetation management and recreational use, and potential restrictions on recreational activities for resource protection based on future monitoring.

The exclusion from designation of a 20-acre portion of the original cRNA will provide an opportunity to redesignate this area in the future for other management purposes. This exclusion will have no further effects on the environment, as the area would remain in MA 8.1D as "The Cape Special Area", to be managed under the original 8.1D standards and guidelines described in the LRMP.

The environmental consequences of redesignating the 106-acre southern extension of the colluvial slope from MA 3.1 to MA 8.1D "The Cape RNA", as described in the Proposed Action, would be minimal. Although the area is dominated by sugar maple and is productive, excessively steep slopes make half of this area not suited for timber harvest. The redesignation would lead to the loss of opportunity to actively manage for habitat

diversity or high-quality sugar maple on the more moderate slopes of the extension. However, it would also provide additional protected mature and overmature forest habitat for plant and animal species dependent upon these older communities. As there are no plans or public interest for improving access to the extension or developing the area for more intensive public use, this redesignation will have minimal impact on recreational opportunities within the area.

Standards and guidelines specified under the Proposed Action are consistent with LRMP direction for The Cape cRNA. Additional constraints on recreational use described for the Proposed Action are nominal and will have minimal impact on the social environment, as the area currently receives little use by people.

**Alternative A**

The environmental consequences of Alternative A, the "No Action" alternative, are as described in the DEIS (p. 4.49-4.50), as incorporated in the FEIS. These consequences include restrictions placed on vegetation management and recreational use, and potential restrictions on recreational activities for resource protection based on monitoring results.

By not designating The Cape as an RNA, the GMNF would not be contributing a suitable, unique, forest community to the national network of RNAs identified in FSM 4063 as a desired future condition for the National Forest System. Under this alternative, no RNAs will have been designated within the GMNF since its establishment in 1932.

**Alternative B**

The environmental consequences of designating 184 acres of the original 204 acres of The Cape cRNA as a RNA, as described in Alternative B, are the same as those discussed in the DEIS (p. 4.49-4.50), as incorporated in the FEIS. These consequences include restrictions placed on vegetation management and recreational use, and potential restrictions on recreational activities for resource protection based on monitoring results.

The exclusion from designation of a 20-acre portion of the original cRNA will provide an opportunity to redesignate this area in the future for other management purposes. This exclusion will have no further effects on the environment, as the area would remain in MA 8.1D as "The Cape Special Area", to be managed under the original 8.1D standards and guidelines described in the LRMP.

The environmental consequences of redesignating the 106-acre southern extension of the colluvial slope from MA 3.1 to MA 8.1D "The Cape RNA", as described in Alternative B, would be minimal. The redesignation would create the loss of opportunity to alter vegetative conditions on the more moderate slopes of the extension, but will also provide protected, mature forest habitats for species dependent on these habitats. As there are no plans or public interest for improving access to or development of the area for more intensive public use, this redesignation will have minimal impact on recreational opportunities within the area.

Standards and guidelines specified under this alternative are consistent with LRMP direction for The Cape cRNA. Additional constraints on recreational use described for this alternative will have minimal impact on the social environment, as current levels of use in the area are generally acceptable. The explicit prohibition of off-highway vehicle (OHV) use of the area, which protects flatter access points to the RNA, will have minimal impact on users as there is little OHV use of the area currently. The addition of the VQO of Retention will have little impact on the aesthetic environment, although it will prevent the unlikely occurrence of very tall research structures being built within the RNA.

### Alternative C

The environmental consequences of designating the original 204 acres of The Cape cRNA as a RNA, as described in Alternative C, are the same as those discussed in the DEIS (p. 4.49-4.50), as incorporated in the FEIS. These consequences include restrictions placed on vegetation management and recreational use, and potential restrictions on recreational activities for resource protection based on monitoring results. Potential restrictions in this alternative include the possiblity that a closure order could be issued for the Corridor 7 snowmobile trail that follows the western RNA boundary along FR 403, if monitoring demonstrates that use of the trail leads to increased use or degradation of the RNA.

Standards and guidelines specified under this alternative are consistent with LRMP direction for The Cape cRNA. Additional constraints on recreational use described for this alternative will have minimal impact on the social environment, as current levels of use in the area are generally acceptable. The explicit prohibition of OHV use of the area will have minimal impact on users as there is little OHV use of the area currently. The addition of the VQO of Retention will have little impact on the aesthetic environment, although it will prevent the unlikely occurrence of very tall research structures being built within the RNA.

### Alternative D

The environmental consequences of designating the original 204 acres of The Cape cRNA as a RNA, as described in Alternative D, are the same as those discussed in the DEIS (p. 4.49-4.50), as incorporated in the FEIS. These consequences include restrictions placed on vegetation management and recreational use, and potential restrictions on recreational activities for resource protection based on monitoring results. Potential restrictions in this alternative include the possiblity that a closure order could be issued for the Corridor 7 snowmobile trail that follows the western RNA boundary along FR 403, if monitoring demonstrates that use of the trail leads to increased use or degradation of the RNA.

The environmental consequences of redesignating the 106-acre southern extension of the colluvial slope from MA 3.1 to MA 8.1D "The Cape RNA", as described in Alternative B, would be minimal. The redesignation would create the loss of opportunity to alter vegetative conditions on the more moderate slopes of the extension, but will also provide protected, mature forest habitats for species dependent on these habitats. As there are no plans or public interest for improving access to or development of the area for more intensive public use, this redesignation will have minimal impact on recreational opportunities within the area.

Standards and guidelines specified under this alternative are consistent with LRMP direction for The Cape cRNA. Additional constraints on recreational use described for this alternative will have minimal impact on the social environment, as current levels of use in the area are generally acceptable. The explicit prohibition of OHV use of the area will have minimal impact on OHV users. The addition of the VQO of Retention will have little impact on the aesthetic environment, although it will prevent the unlikely occurrence of very tall research structures being built within the RNA.

### Cumulative Effects of the Proposed Action and Alternatives

The cumulative effects of designation of all or a portion of the original 204-acre cRNA, as described under the Proposed Action and Alternatives B, C, and D, would be minimal and would not differ from those discussed in the DEIS (p. 4.57; 4.69), as incorporated in the FEIS. There are no cumulative effects evident in association with Alternative A, the "No Action" alternative, other than the loss of opportunity to add a suitable and unique RNA from Green Mountain National Forest to the national network of RNAs.

The Cape cRNA, as defined in each alternative, is surrounded to the North by private land, and to the East and South by public land under designations suitable for vegetation management and semi-primitive recreation. Activities such as trail construction and timber harvesting may occur on these lands near The Cape in the future. Designation of the Cape RNA itself, as defined in the Proposed Action and Alternatives B-D, is unlikely to have more of an impact on such projects than those impacts associated with the area's current designation.

Excluding the 20-acre area between FR 403 and Baker Brook from the RNA, as in the Proposed Action and Alternative B, will provide the opportunity to redesignate this area to meet other management needs. Including this portion in the RNA, as in Alternatives C and D, leaves a travelway, the center line of which serves as the public land boundary, as the western boundary of the RNA. Most casual use of the Cape cRNA associated with this road is concentrated between FR 403 and Baker Brook. Therefore, designation of this 20-acre portion as part of the RNA has a greater potential to lead to conflicts between public use and RNA objectives.

Under the Proposed Action and Alternatives B and D, the loss of future opportunities to manage vegetation and wildlife habitat, and to build trails within the 106-acre southern extension, is quite minor. Over half of the area is unsuited for timber production; there are no requests for trails in the extension; and early successional forest habitat will exist outside the RNA due to management activities, as well as inside the RNA in small randomly located openings caused by natural events.

In the foreseeable future, there is a proposal under analysis to harvest timber and perform other vegetation management activities in the area south of the 106-acre extension proposed for designation as part of the RNA in the Proposed Action and Alternatives B and D. The analysis for this management proposal, known as the Baker Brook II analysis, includes an alternative which extends vegetation management into the extension. The area involved is approximately 20 acres of stands 1 and 3 of Compartment 129, and is characterized by excessively steep slopes. Designation of this area as part of The Cape RNA would put this Baker Brook II alternative in direct conflict with the proposed standards and guidelines for the RNA described in the Proposed Action and Alternatives B and D.

Also in the forseeable future, a temporary snowmobile trail may be built east of The Cape between the ridgeline of The Cape and Puss N Kill Brook. This construction has been proposed in an alternative described in the Baker Brook II analysis mentioned earlier. Use of this trail has the potential to increase use of The Cape RNA by providing better access; the area between this proposed trail and The Cape is also steep, however, and it's unlikely to become a popular means of getting to the RNA. Designation of The Cape as an RNA could influence management of this temporary trail if it is found, through monitoring, to contribute to excessive use of the RNA.

## Consultation

A list of those agencies, groups, and individuals who were asked to comment is found in Appendix A. Those who responded or participated in the analysis are listed in this section.

### Green Mountain National Forest Participants

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|---|---|
| D. Burbank | ID Team Leader, Forest Ecologist, Supervisors Office |
| P. D'Andrea | ID Team, Forest NEPA Coordinator, Supervisor's Office |
| F. Putnam | ID Team, Assistant Ranger, Middlebury District |
| M. Burbank | Forestry Technician, Middlebury District |
| N. Burt | Forest Soil Scientist, Supervisor's Office |
| C. Casey | Assistant Ranger, Middlebury District |
| C. Grove | Forest Biologist, Supervisor's Office |
| T. Hoffman | Forest Supervisor, Supervisor's Office |
| N. Iwanicki | Forest Surveyor, Supervisor's Office |
| P. Lundberg | District Ranger, Middlebury District |
| D. Marks | Landscape Architect, Supervisor's Office |
| A. Mates | Recreation Specialist, Supervisor's Office |
| M.J. Packer | Forest Planner, Supervisor's Office |
| J. Torres | Ecologist, NEPA Coordinator, Middlebury District |

### Other Agencies, Groups, and Individuals Consulted

| | |
|---|---|
| W.H. Barnard | Professor of Biology, Norwich University, Northfield, VT. |
| J.L. Bouton | Windsor County Forester, White River Junction, VT. |
| C. Cogbill | Forest Ecologist, Sterling College, Craftsbury Common, VT. |
| P. Edgerton | Former Ecologist, USDA Forest Service R9 Regional Office, Milwaukee, WI. |
| D. Funk | RNA Coordinator, Northeastern Forest Experiment Station, Durham, NH. |
| W.B. King | Ripton, VT. |
| E. Marshall | Botanist, Vermont Nongame and Natural Heritage Program, Waterbury, VT. |
| B. Mattesen | Bristol, VT. |
| M. Mitchell | Soil Scientist, Westminster, VT. |
| J.M. Northup | Ad Hoc Associates, Salisbury, VT. |
| N.A. Richards | Professor of Forestry, SUNY Environmental Studies and Forestry, Syracuse, NY. |
| P.H. Richardson | CT River Watershed Commission, Norwich, VT. |
| C. Rimmer | Biologist, Vermont Institute of Natural Science, Woodstock, VT. |
| W. Sayre | A. Johnson Lumber Company, Bristol, VT. |
| M.L. Smith | Ecologist, Northeastern Forest Experiment Station, Durham, NH. |
| W. Taylor | Chittenden Planning Commission, Chittenden, VT. |
| E. Thompson | Plant Ecologist, Montpelier, VT. |
| L. Tyrrell | RNA Coordinator, USDA Forest Service R9 Regional Office, North Central and Northeastern Forest Experiment Stations, St. Paul, MN. |
| G. Wade | Botanist, Northeastern Forest Experiment Station, Burlington, VT. |
| J. Wood | Forester, Bell Gates Lumber Corp., Jefforsonville, VT.; also representing Associated Industries of Vermont, Timber Policy Task Force. |
| B. Young | Preserve Appalachian Wilderness, Brattleboro, VT. |

## References

Rimmer, C. 1990. Vermont forest bird monitoring program. 1990 summary. Vermont Institute of Natural Science, Woodstock, VT. Unpublished Report.

Villanueva, L.T. 1984. Providing old growth communities and overmature forest stands on the Green Mountain National Forest. Green Mountain National Forest. Unpublished report.

## Appendix 3B: Agencies, Groups, and Individuals Contacted

| | |
|---|---|
| Abenaki Nation | Abenaki Research Project, Swanton, VT. |
| D. Allard | Townshend, VT. |
| J. Anderson | Natural Resources Conservation Districts, Waterbury, VT. |
| L. Anderson | Save Lincoln Mountain Committee, Bristol, VT. |
| R. Axtmann | Brooklyn Park, MN. |
| G. Ayers | GMNF Monitoring Project, Leverett, MA. |
| C. Ayre | Otter Creek Natural Resources District, Middlebury, VT. |
| Z. Baggett | New Bern, NC. |
| D. Bailey | Richmond, VT. |
| W. Barnard | Norwich University, Northfield, VT. |
| J. Barnes | East Barre, VT. |
| S. Barrows | West Rutland, VT. |
| E. Bateson | Conservation Law Foundation, Boston, MA. |
| P. Baughman | Starksboro, VT. |
| C. Bennett | Central Vt. Public Service Corp., Rutland, VT. |
| D. Bessette | Vermont Forest Products Association, Starksboro, VT. |
| M. Biltonen | Lake City, MN. |
| B. Bissonnette | Rochester, VT. |
| J. Blaskowski | Mississquoi Nat'l Wildlife Refuge, Swanton, VT. |
| R. Borland | Vermont Forest Products Association, Barton, VT. |
| L. Botzojorns | Green Mountain Club, Inc., Waterbury Center, VT. |
| D. Boucher | Office of Representative Sanders, Washington, DC. |
| J. Bouton | Windsor County Forester, White River Junction, VT. |
| R. Brocke | SUNY-Environmental Studies and Forestry, Syracuse, NY. |
| C. Brown | Waitsfield, VT. |
| W. Brumback | New England Wildflower Society, Framingham, MA. |
| D. Brynn | Addison County Forester, Middlebury, VT. |
| G.B. Bush | Townshend, VT. |
| B. Cadwell | Ben's Trucking, Thetford Center, VT. |
| A. Calfee | Calfee Woodland Group LTD, Manchester Center, VT. |
| C. Canham | Institute of Ecosystem Studies, Millbrook, NY. |
| R. Carbonetti | Society of American Foresters, Richmond, VT. |
| D. Carle | Arlington, MA. |
| B. Carney | Bel Air, MD. |
| T. Carney | Schenectady, NY. |
| G. Carrier | Cerosimo Lumber Co., Brattleboro, VT. |
| Chairperson | Town of Chittenden Selectboard, Chittenden, VT. |
| Chairperson | Town of Goshen Selectboard, Goshen, VT. |
| Chairperson | Town of Hancock Selectboard, Hancock, VT. |
| J. Chamberlain | Otter Creek Audubon Society, Middlebury, VT. |
| B. Chambers | SUNY-Environmental Studies and Forestry, Syracuse, NY. |
| J. Chapman | Vt. Federation of Sportsmens Clubs, S. Burlington, VT. |
| J. Churchill | Castleton, VT. |
| C. Cogbill | Plainfield, VT. |
| J. Cole | Wrentham, MA. |
| S. Coveny | Durham, NH. |
| Y. Daly | Rutland, VT. |
| S. Darling | Vt. Department of Fish and Wildlife, Pittsford, VT. |
| K. Davis | Davis Contracting Service, Hardwick, VT. |
| D. DeHayes | University of Vermont, Burlington, VT. |
| C. Dern | Paul Bunyan Logging, Inc., Dorset, VT. |

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|---|---|
| M. Desmueles | The Nature Conservancy, Montpelier, VT. |
| D. Dessecker | The Ruffed Grouse Society, Rice Lake, WI. |
| L. Dickmann | Westport, CT. |
| J. Difley | American Forest Council, Troy, NY. |
| J. Donnelly | University of Vermont, Burlington, VT. |
| B. & O. Eastman | Green Mountain Audubon Society, Burlington, VT. |
| G. Elderd, Jr. | Tunbridge, VT. |
| J. Elliott | Lancaster, NH. |
| N. Farquhar | Vermont Natural Resources Council, Montpelier, VT. |
| J. Fayen | Independent Logging Co., South Strafford, VT. |
| A. Fenn | Otter Creek Audubon Society, Middlebury, VT. |
| C. Fichtel | Vermont Nongame and Natural Heritage Program, Waterbury, VT. |
| M. Fischer | National Wildlife Federation, Montpelier, VT. |
| L. Forcier | University of Vermont, Burlington, VT. |
| M. Fournier | Yankee Pulpwood, LTD, Lunenburg, VT. |
| M. Franklin | Wilmington, VT. |
| D. Funk | USDA FS Northeastern Forest Experiment Station, Durham, NH. |
| J. Gagnon | Vermont Forest Products Association, Pittsford, VT. |
| L. Garland | Vt. Department of Fish and Wildlife, Essex Junction, VT. |
| P. Garrett | USDA FS Northeastern Forest Experiment Station, Durham, NH. |
| J. Gibson | Cuttingsville, VT. |
| A. Goldberg | Fitts, Olsen, Carnahan & Giddings, Brattleboro, VT. |
| R. Gonda | Appalachian Mountain Club, Vt Chapter, S. Burlington, VT. |
| E. Goodenough | Ducks Unlimited, Inc., Westford, VT. |
| D. Goodridge | Logging and Trucking, Albany, VT. |
| P. Graves | Grand Forks, ND. |
| G. Green | District 9 Environmental Board, Essex Junction, VT. |
| J. Harvey | South Londonderry, VT. |
| D. Haskin | Marietta, GA. |
| M.H. Young | Brooklyn, NY. |
| J. Hennigan | Salisbury, VT. |
| T. Hewitt | South Woodstock, VT. |
| C. Hill | PAW Net, Inc., Goshen, VT. |
| D. Hirth | University of Vermont, Burlington, VT. |
| M. Hobart | Burlington, VT. |
| D. Hoffman | S.A.V.E., Waterville, VT. |
| S. Holmes | Vermont Natural Resources Council, Manchester Ctr., VT. |
| L. Huey | Rutland Plywood Corp., Fair Haven, VT. |
| E. Huntington | Finch Pruyn & Co., Inc., Glens Falls, NY. |
| D. Jacques | Barre, VT. |
| C. Johnson | Vt. Dept. of Forests, Parks & Recreation, Waterbury, VT. |
| K. Johnson | AIV-Forest Policy Task Force, Montpelier, VT. |
| B. Keefe | Office of Senator Jeffords, Rutland, VT. |
| J. Kellogg | Division of Water Quality, Waterbury, VT. |
| W. King | Ripton, VT. |
| R. Klein | The Nature Conservancy, Montpelier, VT. |
| L. Krassner | Sierra Club, South Burlington, VT. |
| W. Kropelin | Vermont Tree Farm Committee, Jeffersonville, VT. |
| J. LaClair | Office of Senator Jeffords, Montpelier, VT. |
| T. Ladwig | South Royalton, VT. |
| N. Lamson | USDA FS NE Area State & Private Forestry, Durham. NH. |
| M. Lathrop | Pittsford, VT. |
| C. Lathrop | Claire Lathrop Band Mill, Inc., Bristol, VT. |
| F. & E. Layden | Rutland, VT. |

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| Hon. P. Leahy | US Senate, Washington, DC. |
| H. Lehman | Trust for Public Land, New York, NY. |
| J. Leopold | Green Mountain Audubon Society, Burlington, VT. |
| L. Levine | Forest Care, Putney, VT. |
| A. Lewis | Morbark of New England, Montpelier, VT. |
| J. & F. Love | Pittsford, VT. |
| L. Madigan | Mountain Times, Killington, VT. |
| A. Mahler | Heartwood, Paoli, IN. |
| M. Mahr | Missoula, MT. |
| D. Manley | Peru, VT. |
| E. Marshall | Vermont Nongame and Natural Heritage Program, Waterbury, VT. |
| D. Mason | NE Vt Development Association, St. Johnsbury, VT. |
| B. Mattesen | Bristol, VT. |
| B. Maynes | Vt Dept. Travel and Tourism, Montpelier, VT. |
| P. McEdwards | Catamount Trail Association, Burlington, VT. |
| S. Meeker-Lowry | Catalyst, Inc., Montpelier, VT. |
| F. Merrill | Vermont Conservation Biology, Woodstock, VT. |
| L. Milford | Conservation Law Foundation, Montpelier, VT. |
| J. Mondlak | Brandon Chamber of Commerce, Brandon, VT. |
| J. Moody | Sharon VT. |
| W. Moore | Hyde Park, VT. |
| J. Morrissey | Beecher Falls, VT. |
| C. Motyka | Vt Dept. of Forests, Parks, and Recreation, Waterbury, VT. |
| J. Northup | Ad Hoc Associates, Salisbury, VT. |
| K. Omland | Rutland, VT. |
| J. Paleio | Williamstown, VT. |
| B. Paquin | Office of Senator Leahy, Montpelier, VT. |
| S. Parker | St. Johnsbury, VT. |
| S. Parren | Vermont Nongame and Natural Heritage Program, Waterbury, VT. |
| H. Paynter | COVERTS, Pittsford, VT. |
| S. Peckham | Eagle Lumber Co., Inc., Readsboro, VT. |
| W. Pelkey | Vermont Association of Snow Travelers, Montpelier, VT. |
| A. Petermann | Burlington, VT. |
| J. Philbrook | Rutland County Forester, Pittsford, VT. |
| D. Pierce | White Mountain National Forest, Laconia, NH. |
| A. Plumb | Plumb Lumber Co., Inc., Chester, VT. |
| M. Poindexter | USDA FS Eastern Region, Milwaukee, WI. |
| A.& A. Quakenbush | Central Vermont Audubon Society, Waterbury, VT. |
| H. Racine | Brandon, VT. |
| R. Raskevitz | Newfane, VT. |
| Regional Director | Wilderness Society, Boston, MA. |
| T. Resch | Office of Congressman Sanders, Bennington, VT. |
| N. Richards | SUNY-Environmental Studies and Forestry, Syracuse, NY. |
| P. Richardson | Ct River Watershed Commission, Norwich, VT. |
| F. Rieben | Manchester Center, VT. |
| C. Rimmer | Vermont Institute of Natural Science, Woodstock, VT. |
| G. Roberts | Mill River Lumber, LTD, North Clarendon, VT. |
| J. Rogalski | Gansevoort, NY. |
| T. Rooney | Willow Grove, PA. |
| S. Selva | University of Maine, Fort Dent, ME. |
| B. Samal | McNeil Generating Station, Burlington, VT. |
| Hon. B. Sanders | US House of Representatives, Washington, DC. |
| J. Sayden | Groveton, NH. |
| W. Sayre | The A. Johnson Company, Bristol, VT. |

| | |
|---|---|
| T. Scherbatskoy | Vt Monitoring Coop., Univ. of Vermont, Burlington, VT. |
| P. Schlesinger | Woods Hole Research Center, Woods Hole, MA. |
| K. Schneider | NYS Natural Heritage Program, Latham, NY. |
| R. Selk | University of Michigan, Ann Arbor, MI. |
| P. Sendak | USDA FS Northeastern Forest Experiment Stn., Burlington, VT. |
| A. Serdin | Bronx, NY. |
| D. Shaffer | Green Mountain Club, Inc., Waterbury Center, VT. |
| J. Shallow | Vermont Natural Resources Council, Montpelier, VT. |
| J. Shane | University of Vermont, Burlington, VT. |
| N. Sheldon | American Forests, North Hero, VT. |
| B. Shupe | Mad River Valley Planning District, Waitsfield, VT. |
| S. Sinclair | Vt Dept. of Forests, Parks, and Recreation, Waterbury, VT. |
| C.& D. Smith | Middlebury, VT. |
| R. Smith | North Clarendon, VT. |
| P. Smith | Vermont Wilderness Association, Belmont, VT. |
| R. Smith | Vt. Federation of Sportsmens Clubs, Arlington, VT. |
| S. Smoot | St. Paul, MN. |
| R. Spooner | Disabled Outdoors Magazine, Orwell, VT. |
| C. Steiner | Steiner's Saw Service, Townshend, VT. |
| R.& J. Steward | R & J Forest Products, Plainfield, VT. |
| S. Thiele | Montrose, PA. |
| E. Thompson | Montpelier, VT. |
| J. Titchner | USDA Soil Conservation Service, Winooski, VT. |
| D. Torrey | Pittsford, VT. |
| L. Tritton | USDA FS Northeastern Forest Experiment Stn., Burlington, VT. |
| E. Van Loon | Woodland Fiber Inc., Plymouth, NH. |
| E.& P. Viereck | North Bennington, VT. |
| G. Wade | USDA FS Northeastern Forest Experiment Stn., Burlington, VT. |
| B. Whittaker | Vt Timberland Owner's Association, East St. Johnsbury, VT. |
| C. Williams | Morrisville, VT. |
| H. Willis | Otter Creek Audubon Society, Middlebury, VT. |
| J. Woods | Bell-Gates Lumber Corp., Jeffersonville, VT. |
| K. Woods | Bennington College, Bennington, VT. |
| S. Wright | Sterling College, Crafsbury Common, VT. |
| T. Yager | The A. Johnson Co., Bristol, VT. |
| A. Young | Chester, VT. |
| B. Young | Preserve Appalachian Wilderness, Brattleboro, VT. |
| S. Young | National Audubon Society, Waitsfield, VT. |
| E. Zencey | East Calais, VT. |
| S. Zwicky & N. Breiden | East Middlebury, VT. |
| M. Zwikelmaier | Preserve Appalachain Wilderness, Sharon, VT. |

## Appendix 3C: List of Public Comments

Each response during the scoping process of the environmental analysis was reviewed to identify specific issues or concerns. This appendix contains a listing of those comments in the respondent's own words, where possible. (Comments received as personal communications are paraphrased). Following each comment is a statement noting how the comment was addressed within the EA. Comments are grouped by issue. Those that are categorized as "General Comments" are listed last.

Issue 1. Western boundary at Middle Road

1-1 "What I do not understand is the rational that led you to move the western boundary from the road to the center of Baker Brook...I recognize that the road is a problem and would suggest that you move the boundary back to the road."

This comment is addressed in Alternative D and in the Effects Section.

Issue 2. Boundary as Described in the LRMP

2-1 "Our position is that the only acceptable alternative for 'The Cape Big Tree Area' is ... the original boundary established in the forest plan. ... We would like to address the question of the need for the proposed boundary expansion. The need expressed ... seems to indicate a concern over possible 'human activities' and 'incompatible uses'. The other is a matter of convenience, for the boundary identification. We find these reasons to be poor justification for any further loss of multiple use acreage."

This comment is addressed in the Purpose and Need statement, Alternative C, and in the Effects Section.

Issue 3. Concern for Loss of Timber Resource

3-1 "If it is found that this area is truly in need of a boundary expansion, then a process should be taken to fully mitigate the timber resource base loss. ... The continuing loss of timber resource base on the Green Mountain National Forest must stop. The approved Forest Plan harvest volumes and acreage in your district are down nearly 50% below the planned levels! This is unacceptable considering the cutback in resource base and allowable cut that the plan level represents historically."

The process of mitigating the timber resource base is outside the scope of this analysis, as it is a programmatic issue and would require a separate environmental analysis to implement. However, the effects of each alternative on management opportunities are discussed in the Effects Section.

Issue 4. No RNA Should Be Established

4-1 "We have strong reservations on the designation of any Research Natural Area's (RNA's) on the GMNF."

This comment is addressed in Alternative A, the No Action Alternative.

4-2 "We ... are on record as unanimously opposed to the attempt by the U.S. Forest Service to create a 'Research Natural Area' at 'the Cape' in Chittenden. ... The information presented was insufficient and inconclusive for the necessity of creating this 'Research Natural Area'."

This comment is addressed in Alternative A, the No Action Alternative.

Issue 5. Expand RNA Boundary or "Effective" Boundary by 200 Acres

5-1 "As part of the analysis, I recommend that you consider expanding the RNA boundary, or an 'effective' boundary by another 200 or more acres. Here are my reasons: 1.) The Cape is the finest example of an old growth community presently known to occur on the GMNF. 2.) Analysis supporting the Forest Plan ... , the Plan's Environmental Impact Statement and Record of Decision, and the Plan itself recommend that old growth communities should be created and sustained in blocks of 500 or more acres. 3.) Information re. the proposed Baker Brook Timber Sale indicates that stands and portions of stands adjacent to the proposed 300 acre Cape RNA are as old or older than stands within the proposed RNA. 4.) If official guidelines re. the creation of RNAs prevent the inclusion of these adjacent, old stands and younger stands in the RNA then protect the additional acreage with a non-RNA special area designation."

This comment is addressed in the Public Issues Section and the Alternatives Not Carried Forward Section; see also response to Issue G-1. In addition, we have no evidence to indicate that stands or portions of stands adjacent to The Cape RNA, as defined in the Proposed Action and Alternatives B and D, are as old or older than The Cape RNA community. On four separate occasions, scientists and agency specialists conducted thorough field reconnaissances of the cRNA and surrounding lands. The 106-acre extension was included in the proposal and Alternatives B and D due to these evaluations; the remaining areas adjacent to the cRNA were determined by all to be unsuitable for designation in the context of this RNA's objectives.

Issue 6. Standards and Guidelines

6-1 "...it is our belief that the creation of a 'Research Natural Area' could be the first step in 'Prohibiting Recreational use of the land'. ... It is our belief and desire that the land was obtained for public use and should be free of restrictions."

This comment is addressed in Alternative A, the No Action Alternative, as an issue outside the scope of the analysis in the Public Issues Section, and in the Effects Section.

6-2 "The letter gives the impression that all planned activities adjacent to the area may be incompatible. This is an improper description of the area and situation. ... The concept of isolating an area from any possible impact by humans, even on surrounding land, is counterproductive to the needs of modern research."

This comment is addressed as an issue outside the scope of the analysis in the Public Issues Section.

6-3 "I find the draft guidelines ... to be too restrictive as they pertain to educational visits. 1.) It states that 'visits will be limited to groups of 5-8...' Does the guideline mean that a group of less than five would not be acceptable? 2.)... I cannot see how a single group of 10-20 students supervised by an instructor would be more disruptive than two-three groups of 5-8. 3.) The requirement that 'a Forest Service representative will participate in all educational visits' is restrictive."

These comments are addressed in Alternative B, and as an issue outside the scope of the analysis in the Public Issues Section. Restrictions on public use in addition to those defined in FSM 4063 will protect the unstable colluvial slopes of the RNA from unnecessary degradation.

6-4 (paraphrased) Please add "no OHV's" to the Public Use Section of the Standards and Guidelines. This needs to be explicitly stated.

This comment is addressed in Alternative B and in the Effects Section.

6-5 "In A.6, This requirement that all plant and animal specimens collected for research will be preserved and stores in herbaria or museums seems excessive."

This comment is addressed in Alternative B.

6-6 "In E.1, obliteration of all evidence of human disturbance is not practical or possible. If a bulldozer or manmade fire line is built in an emergency, efforts to artificially re-establish the pit-mound topography would be a bigger disturbance, not a healing or restoration of what was previously undisturbed by humans."

This comment is addressed in Alternative B.

6-7 "We support the draft Standards and Guidelines for the proposed Cape RNA."

This comment is noted.

6-8 "The Standards and Guidelines as proposed seem quite good. I have a couple of concerns, however. Under Research, Item 6 suggests that plant and animal collecting can be done without a permit ... To me collecting is basically destructive sampling and should therefore be ... reviewed for approval on a case-by-case basis."

This comment is addressed in Alternative B.

6-9 "I would like to see monitoring of use by researchers and educators as well, since they can also have an adverse impact on a natural area. Is there any provision for monitoring and tracking of use?"

This comment is addressed in Alternative B.

6-10 "It is unclear what management emphasis will remain for the area between Baker Brook and the road. I recommend 8.1 Standards and Guidelines should be strictly interpreted to fully protect riparian zone and water quality values."

This issue is clarified in the Purpose and Need statement, the Proposed Action, and under each Alternative; adjacent activity is discussed as an issue outside the scope of analysis in the Public Issues Section.

6-11 "The proposed RNA Standards and Guidelines are thorough and sensible."

This comment is noted.

6-12 "I believe that the Standards and Guidelines as set forth are fine ... I am pleased to note that visits will be limited to groups of 5-8 people. The steep topography with shallow soil in places argues for real caution, as even moderate levels of visitation could produce significant disturbance, mainly in the form of erosion."

This comment is noted.

6-13 "In the 'Draft Standards', Item A.2, the text suggests ... that the Ranger approves the research. Item A.3 pretty well clarifies the issue, but it might help to put A.3 ahead of A.2, and rephrase present A.2 to indicate that once research is approved, activities on the RNA should be cleared with the Ranger."

This comment is addressed in Alternative B.

6-14 "Under B.1 maybe add to the last sentence ..'and does not disturb on-going research activities'."

This comment is addressed in Alternative B.

6-15 "E.1 What about the rare but possible natural fires? Shouldn't these be allowed as natural succession?"

This comment is addressed in the Alternatives Not Carried Forward Section.

6-16 "In general, I applaud the concept and guidelines for this RNA, but do have one concern. I think such an RNA will be most valuable in the long run if it provides protection of natural processes against all further human inputs to the fullest extent possible. It should have no loopholes that permit any planned human inputs ... Specifically I see two loopholes that should be closed. G. Fish, Wildlife and Plants 'An exception may be the reintroduction of species extirpated from their historic habitats.' ... J. Integrated Pest Management 'Protection of the RNA from introduced and endemic insects, diseases, plants, and animals will be allowed only when the special values of the RNA are threatened.'"

This comment is addressed in Alternative B and in the Alternatives Not Carried Forward Section.

6-17 "I would recommend that F.1 be made more specific with guidelines for the establishment of a buffer around the cape and linkages to the rest of the fores (sic)."

This comment is addressed as an issue outside the scope of the analysis in the Public Issues Section.

6-18 "Please change that no aerial fire suppression will be used to something where aerial fire suppression could be used if needed to prevent human-caused fires started outside the cape from entering the cape. Water drops could be used on human-caused fires inside the cape also. I believe that using water drops will cause less damage to the area than using handcrews."

This comment is addressed in Alternative B.

6-19 (paraphrased) The Cape should be allowed to burn if there's a fire going on inside the boundary. The same could be said for a catastrophic windthrow event. Salvage operations should not be allowed and the area should be allowed to recover without human intervention.

This comment is addressed in Alternative B and in the Alternatives Not Carried Forward Section.

6-20 (paraphrased) The research limitations are too severe; the term 'destructive sampling' is too ambiguous, and is usually interpreted in a very restrictive way.

This comment is addressed as an issue outside the scope of the analysis in the Public Issues Section.

6-21 "I agree with the proposed standards and guidelines sent to me for comment."

This comment is noted.

6-22 "...the area does not have a visual sensitivity or VQO assigned to it...My first impression is that the area should meet a high visual sensitivity and Retention."

This comment is addressed in Alternative B.

General Comments

G-1 "We must first take issue with the idea of labeling this area as 'old growth'. The area is described in the GMNF Plan as 'The Cape Big Tree Area'. NO mention of old growth is made. The area does not meet the definition of old growth that is in the plan."

We agree that this area does not meet the LRMP definition for old-growth in terms of acreage; several trees older than 170 years exist within the cRNA.

However, over the course of this review, we have learned that the 500 acre minimum requirement for a sustainable old-growth community was difficult to defend in this case. Research in other old-age northern hardwood communities in New England suggest that a functional old growth community can be found in many sizes, depending upon the physical nature of the landscape as well as the community of organisms comprising it; it is not defined by some preconceived acreage figure (Cogbill, pers. comm.). In addition, several species associated with overmature northern hardwoods breed within the area, including pileated woodpeckers and wood thrushes (Rimmer 1990; pers. comm.).

G-2 "We have a major disagreement with some of the information that was presented and with the manner in which it was used. It was presented that all of the land to the west of the existing area, that is proposed for the "natural area" expansion is in MA 8.1. This is not true. There was no change from the GMNF draft plan (page 4.152) to the final approved plan (page 4.163). The record of decision is also consistent. The management designation of this area cannot be changed by a mapping error."

We have discussed this apparent inconsistency, and have concluded that the D2 map included with the final approved LRMP is the relevant document to be used. This map shows that MA 8.1D extends from the ridgeline to the Middle Road. We acknowledge that this MA boundary is not that shown in the draft LRMP; however, the draft LRMP also gives no indication of what MA occurs between the western edge of the 8.1D area and FR 403. Any redesignation of the 8.1D area between Baker Brook and the Middle Road to a new MA may be evaluated in a separate analysis and document, and is outside the scope of this analysis.

G-3 "The description of the area tells me it is an excellent candidate. I trust there are no better areas of this type in the GMNF."

This comment is noted.

G-4 "I am impressed with the quality and size of the old growth northern hardwood forest at The Cape."

This comment is noted.

G-5 "By including all of the area from the brook to 1900 feet below the old growth and stand 19 in The Cape boundary, there is a full elevational gradient for the site. This area is largely undisturbed with the exception of the flatter portions of stand 19 and would include the large benches which are particularly rich due to colluvial action."

This comment is noted.

G-6 "...I am very happy with the boundary as proposed. ... Although I originally recommended using the road as a downslope boundary, and that there are good reasons for doing that, I feel that Baker Brook is a natural and reasonable boundary and should provide an adequate buffer."

This comment is noted; Alternative D uses the road as boundary.

G-7 "I favor the final proposal and agree that the inclusion of the southern slope will best maintain ecological and scientific value. The western boundary of Baker Brook seems reasonable but may change over time."

This comment is noted.

G-8 "I fully support the establishment of the 300 acre proposed area, with its recently expanded boundaries."

This comment is noted.

G-9 "With these comments as a caveat, I recommend that this RNA and these guidelines be approved as a model for possibly more such areas in the Northeast."

This comment is noted.

G-10 "I whole-heartedly support the designation of the NRA (sic), and thank the Forest Service for recognizing the need to preserve this important island of undisturbed forest. As you are aware, this is the only known "virgin" "Old Growth" stand on the forest. As such it serves two distinct roles: 1.) it is a model for scientific understanding of old growth conditions, and 2.) it is a reservoir of genetic material, a seed for the future restoration/recovery of an ailing forest ecosystem."

This comment is noted.

G-11 "I strongly support your expanded, 300-acre version of The Cape Research Natural Area."

This comment is noted.

## APPENDIX 4: BOUNDARY CERTIFICATION

### UNITED STATES DEPARTMENT OF AGRICULTURE

### GREEN MOUNTAIN AND FINGER LAKES NATIONAL FORESTS

State of Vermont :
: ss
County of Rutland:

I, Nancy E. Iwanicki, a licensed Land Surveyor in the State of Vermont hereby certify that the attached boundary description of The Cape Research Natural Area was prepared by me from a hand compass and tape survey of the east line by Forest Service surveyors under my direction and from the records of the Green Mountain & Finger Lakes National Forests as to the following tracts:

U.S. Tract 506h (Newton-Thompson Manufacturing Co.)

U.S. Tract 652d (Welland S. Horn)

U.S. Tract 502n (American Realty Company)

U.S. Tract 505 (Clarke C. Fitts)

U.S. Tract 908 (Elwin F. Leysath & Dorothy M. Leysath Butterfield)

U.S. Tract 652c (Welland S. Horn)

U.S. Tract 563 (A. Hawley Churchill)

I declare that this description has been checked by me and is correct and consistent with the above documents to the best of my knowledge and belief.

NOTE: A Compass Rule Adjustment was done on the courses from Corner 2 to Corner 33 to fit the record bearings and distances of U. S. Tracts 506h, 505, 652c, and 908.

**Revised 22 March 1993**
30 November 1992

Nancy E. Iwanicki

Nancy E. Iwanicki, VT L.S. #566

## APPENDIX 5: PLANT SPECIES LIST

**Vascular Plant Species List, E. Thompson, 1989.**

| Scientific Name* | Common Name |
|---|---|
| Canopy: | |
| *Acer rubrum* L. | Red maple |
| *Acer saccharum* Marsh. | Sugar maple |
| *Betula alleghaniensis* Britton | Yellow birch |
| *Fagus grandifolia* Ehrh. | American beech |
| *Fraxinus americana* L. | White ash |
| *Picea rubens* Sarg. | Red spruce |
| *Tilia americana* L. | Basswood |
| Shrub layer: | |
| *Acer pensylvanicum* L. | Striped maple |
| *Acer saccharum* Marsh. | Sugar maple |
| *Acer spicatum* Lam. | Mountain maple |
| *Betula alleghaniensis* Britton | Yellow birch |
| *Fagus grandifolia* Ehrh. | American beech |
| *Lonicera canadensis* Bartr. | Canada honeysuckle |
| *Picea rubens* Sarg. | Red spruce |
| *Sambucus pubens* Michx. | Red-berried elder |
| *Tilia americana* L. | Basswood |
| Herb layer: | |
| *Acer pensylvanicum* L. | Striped maple |
| *Acer saccharum* Marsh. | Sugar maple |
| *Actaea pachypoda* Ell. | White baneberry |
| *Actaea rubra* (Ait.) Willd. | Red baneberry |
| *Adiantum pedatum* L. | Maidenhair fern |
| *Allium tricoccum* Ait. | Wild leeks |
| *Aralia nudicaulis* L. | Wild sarsaparilla |
| *Arisaema atrorubens* (Ait.) Blume | Jack-in-the-pulpit |
| *Asarum canadense* L. | Wild ginger |
| *Aster acuminatus* Michx. | Whorled wood aster |
| *Aster divaricatus* L. | White wood aster |
| *Athyrium filix-femina* (L.) Roth. | Lady fern |
| *Athyrium thelypteroides* (Michx.) Desv. | Silvery spleenwort |
| *Carex albursina* Sheldon | Minnesota sedge |
| *Carex deweyana* Schwein. | Sedge |
| *Carex plantaginea* Lam. | Plantain-leaved sedge |
| *Caulophyllum thalictroides* (L.) Michx. | Blue cohosh |
| *Cinna latifolia* (Trev.) Griseb. | Wood reed |
| *Circaea alpina* L. | Small enchanter's nightshade |
| *Clintonia borealis* (Ait.) Raf. | Blue-bead lily |
| *Cystopteris fragilis* (L.) Bernh. | Fragile fern |
| *Dicentra canadensis* (Goldie) Walp. | Squirrel corn |
| *Dryopteris goldiana* (Hook.) Gray | Goldie's fern |
| *Dryopteris marginalis* (L.) Gray | Marginal wood fern |
| *Dryopteris spinulosa* (O. F. Muell.) Watt | Spinulose wood fern |

| Scientific Name | Common Name |
|---|---|
| *Dryopteris spinulosa var. intermedia* (Muhl.) Underw. | Intermediate wood-fern |
| *Erythronium americanum* Ker | Trout lily |
| *Galium asprellum* Michx. | Rough bedstraw |
| *Geranium robertianum* L. | Herb-robert |
| *Hydrophyllum virginianum* L. | Waterleaf |
| *Impatiens pallida* Nutt. | Pale touch-me-not |
| *Laportea canadensis* (L.) Wedd. | Wood nettle |
| *Lonicera canadensis* Bartr. | Canada honeysuckle |
| *Lycopodium lucidulum* Michx. | Shining clubmoss |
| *Maianthemum canadense* Desf. | Canada mayflower |
| *Medeola virginiana* L. | Indian cucumber-root |
| *Milium effusum* L. | Wood millet |
| *Mitella diphylla* L. | Bishop's cap |
| *Monotropa uniflora* L. | Indian pipe |
| *Onoclea sensibilis* L. | Sensitive fern |
| *Osmorhiza claytoni* (Michx.) C. B. Clarke | Sweet cicely |
| *Oxalis montana* Raf. | Mountain wood sorrel |
| *Panax quinquefolius* L. | Ginseng |
| *Picea rubens* Sarg. | Red spruce |
| *Polygonatum pubescens* (Willd.) Pursh | Solomon's seal |
| *Polypodium virginianum* L. | Rock polypody |
| *Polystichum braunii* (Spenner) Fee | Braun's holly fern |
| *Prenanthes sp.* L. | Rattlesnake-root |
| *Pteretis pensylvanica* (Willd.) Fern. | Ostrich fern |
| *Ranunculus abortivus* L. | Small buttercup |
| *Ribes cynosbati* L. | Prickly gooseberry |
| *Ribes hirtellum* Michx. | Smooth gooseberry |
| *Ribes lacustre* (Pers.) Poir. | Bristly black currant |
| *Sambucus pubens* Michx. | Red-berried elder |
| *Smilacina racemosa* (L.) Desf. | False solomon's seal |
| *Streptopus roseus* Michx. | Rose twisted stalk |
| *Tiarella cordifolia* L. | Foamflower |
| *Trillium erectum* L. | Red trillium |
| *Uvularia grandiflora* Sm. | Large-flowered bellwort |
| *Viola blanda* Willd. | White violet |
| *Viola canadensis* L. | Canada violet |
| *Viola renifolia* Gray | Kidney-leaved violet |
| *Viola rotundifolia* Michx. | Early yellow violet |

*Nomenclature for trees follows Little (1979); for other plants it follows Fernald (1950).

## APPENDIX 6: SOILS MAP AND DESCRIPTION

### THE CAPE PROPOSED RNA - SOILS MAP AND DESCRIPTION

Three major soil areas were identified in the proposed Cape RNA. These soil areas are shown on the attached map, and described below.

Soil Area #1 -

Rawsonville soils, with inclusions of Hogback (10%) and Houghtonville and Mundal (25%). Moderately well-drained. Average soil depth was 35 to 40 inches. Side slopes averaged 45 to 65%. Most pH readings ranged from 4.5 to 5.8. Common plant species found: Canada violet, Virginia waterleaf, impatiens, common elderberry, maidenhair fern, Christmas fern, gooseberry, allium, stinging nettle, sweet cicely, blue cohosh, Goldies fern, jack-in-the-pulpit, wild ginger, foam flower, lady fern, wood ferns, red trillium, and sugar maple in the overstory, understory, and sapling layers.

Soil Area #2 -

A suitable soil series could not be identified. Soils are moderately well drained, and over 40 inches deep. Inclusions of somewhat poorly and poorly drained soils cover 25% of the area. Sideslopes are 15 to 25%. The upper part of the profile (A, Bhs, Bs) is much like Peru. The C horizon was somewhat compacted, but not a Cd horizon. Mottling began at 22 inches. At 35 to 40 inches, the C was influenced by calcareous material, with a pH of 7.5. Common plant species: sugar maple and paper birch in the overstory; sugar maple and juneberry in the sapling layer; sugar maple, beech, black cherry, yellow birch, red spruce seedlings; wood ferns, carex, Canada mayflower, wood strawberry, sensitive fern, lady fern, striped maple, sessile bellwort, wild lettuce, cinnamon fern, New York fern, Indian pipe, jack-in-the-pulpit, and false Solomon seal.

Soil Area #3 -

Tunbridge soils; inclusions of Berkshire (20%). Slopes ranged from 15 to 70%. Small rocky knolls occur in the eastern half of this area. Well drained, except moderately well drained next to the stream. Common vegetation: beech, yellow birch and sugar maple in the overstory; hobblebush, sugar maple, beech, red spruce in understory; woodferns, painted trillium, wild sarsaparilla, Clintonia, wood sorrel, false Solomon seal.

N.Burt, with field assistance by Martha Mitchell and Marie Louise Smith. 8/13/92