1976

Recommendations of Alternative System Plans and Transmission Corridors for the Dickey/Lincoln School Hydroelectric Project

VTN Environmental Sciences (Firm)

Interior

Assessment Of
Alternative Power Transmission Corridors

For The
Dickey/Lincoln School Hydroelectric Project
United States Department Of The Interior

'N Consolidated, Inc.
on With
Frederick Associates

VOLUME 2

Recommendations of Alternative System Plans and Transmission Corridors for the Dickey/Lincoln School Hydroelectric Project

prepared for:
the United States Department of the Interior

by:
VTN Consolidated Inc.
in association with
Comitta Frederick Associates

1976

VOLUME II

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1.0 INTRODUCTION

This second volume of the Assessment of Alternative Power Transmission Corridors related to the Dickey Lincoln/School Hydro-electric Project, contains all relevant background materials to support the mapping and analysis of environmental resource information. Narrative explaining what information was evaluated and the sources and reasons for its consideration are integral to this assessment.

This volume serves two important functions; it contains all relevant background information as described above; and it was used as a working tool throughout the course of the study. Section 2.1, Qualification of Environmental Resource Data, was completed and circulated to agencies and individuals from whom environmental resource information was collected during the course of the study. Upon review by agencies and individuals, this section of the report served to check the accuracy, completeness, and use of the environmental resource information. (The United States Department of the Interior, Fish and Wildlife Service reviewed this section several times during the study).

2.0 DATA QUALIFICATION

Topical areas 2.1.1 through 2.1.16 which are addressed and qualified in Section 2.1 of the volume comprise the seventy discrete environmental resource information categories on the analysis matrix. See Figure 2-5 of Volume II. Since this information is used to graphically describe the existing environment throughout the analysis, it is essential that the information be well qualified and the best possible information available.

The Data Qualification Section is divided into four primary sections:

2.1 Qualification of Environmental Resource Data
2.2 Unmapped Data
2.3 Data Voids
2.4 Data to be Considered at Next Level (Scale) of Study

The first section, entitled Qualification of Environmental Resource Data, lists the Topical Areas of data investigation for the Environmental Resource Data component of the analysis. (See figure 4-4). There are sixteen (16) topical areas. Each topical area contains one or more discrete Data Components. The criteria for establishing components was primarily based upon the use of data for corridor analysis and evaluation. Other considerations were scale and existing data available.

The second component under Data Qualifications is Unmapped Data. The Unmapped Data portion lists data that has affects over large areas of land reltaive to our study area. This information is not point specific and its occurrence, location, and extent exist in generalized forms. For this report, information on such data is considered, but appears in narrative form and not on data overlay maps.

Section three, entitled Data Voids, defines information voids located during the inventory process. The Data Voids portion lists environmental resource data that would have been useful in the analysis portion of this study, but for reasons that are listed, this data did not exist or was not available for use in our study.

The fourth section of Data Qualification is Data to be Considered at the Next Level (scale) of Study. This is a listing of environmental resource data that was available but was not useful in the delineation of transmission corridors. This data should be considered in the delineation of transmission routes within corridors in the next level of study.

The data void list is brief and is not meant to preclude the use of environmental resource data used under Qualification of Environmental Resource Data in order to delineate transmission routes.

2.1 QUALIFICATION OF ENVIRONMENTAL RESOURCE DATA

The following section lists the 16 topical areas of environmental resource data. These areas are:

2.1.1 LAND USE

2.1.2 TOPOGRAPHY: SLOPE

2.1.3 RECREATION LAND USE

2.1.4 TRANSPORTATION

2.1.5 LAND OWNERSHIP

2.1.6 ORIENTATION

2.1.7 SURFACE HYDROLOGY

2.1.8 ARCHAEOLOGY

2.1.9 HISTORIC

2.1.10 PHYSIOGRAPHY

2.1.11 GROUND WATER

2.1.12 UNIQUE RESOURCES

2.1.13 EXISTING UTILITIES AND RIGHT OF WAYS

2.1.14 WILDLIFE

2.1.15 FISH

2.1.16 VEGETATION

Each of these topical areas contains two or more discrete data components. See figure 4-4. Each of these data components represents a separate data overlay map to be used for delineating and evaluating alternative transmission corridors. Information qualifying the data overlay maps is listed according to four topics:

a) Data Source and Scale

b) Legend/Criteria

c) Areas Included/Definition

d) Data Discussion

2.1.1 LAND USE

1.1 Urban Centers

a. Data Source and Scale

- o U.S.G.S. Quadrangle Sheets, 1:250,000
- o U.S.G.S. Quadrangle Sheets, 1:500,000
- o LAND/SAT Imagery at approximately 1:250,000
- o U.S.G.S. Quadrangle Sheets, 1:62,500

b. Legend/Criteria

Includes all towns delineated in yellow on U.S.G.S. Quadrangle Sheets. U.S.G.S. lists these areas as "Populated Places." Investigation shows these areas of extensive urbanization. Comparisons were made of the data sources listed above in order to insure use of the most current extent of urbanization.

c. Areas Included/Definition

Although there were no given criteria for the areas delineated as populated places on U.S.G.S. Quadrangle Sheets, investigation found most of these areas to be urban areas: 1) served by municipal sewage and water, 2) at least 35% impervious cover, 3) high energy consumers.

d. Data Discussion

Areas depicted on the map as urban centers represent the greatest population densities (greater than one building unit per 9.5 acres) and are viewed as substantial permanent physical impact on the landscape. These areas include structures and immediate area infrastructure (driveways, parking lots, surface and subsurface utilities). It can be assumed that these areas will pose severe impacts to transmission corridor location.

The extent of urbanization shown in Urban Centers often extended beyond the areas delimited on the 1:230000 U.S.G.S. Quadrangle Sheets. In such cases the limits of urbanization included in Urban Centers was extended to include areas with an"urban signature" on the LAND/SAT imagery.

1.2 Ex-Urban Development

a. Data Source and Scale

- o U.S.G.S. Quadrangle Sheets; 1:250,000
- o U.S.G.S. Quadrangle Sheets; 1:500,000
- o U.S.G.S. Quadrangle Sheets; 1:62,500
- o LAND/SAT Imagery at approximately 1:250,000
- o High altitude color photography, U-2 flights

b. Legend/Criteria

Includes residential, commercial, and light industrial development interpreted from the data sources listed above. This component includes development less dense than urban development; a density of at least one unit per 9.4 acres.

c. Areas Included/Definition

Most of these areas are not served by municipal sewage and water. These areas are attractive for infill growth and have good access.

d. Data Discussion

Ex-Urban Development was chosen as one of two intermediate categories in a range between densely populated and rural or forested areas. These areas are often located peripheral to areas mapped as Urban Centers, and represent the suburban population near urban centers.

These areas were mapped primarily from 15 minute U.S.G.S. Quadrangle Sheets on the basis of structure density. Much of this development is linear and occurs adjacent to transportation corridors, while some is more concentrated in "nodes" of development.

1.3 Towns/Centers

a. Data Source and Scale

- o U.S.G.S. Quadrangle Sheets; 1:250,000
- o U.S.G.S. Quadrangle Sheets; 1:500,000
- o U.S.G.S. Quadrangle Sheets; 1:62,500
- o LAND/SAT Imagery at approximately 1:250,000
- o State Highway Maps; various scales

b. Legend/Criteria

This component includes developed areas and populated places with the least development density. It includes town names listed in U.S.G.S. Quadrangle Sheets and State Highways maps. Many of these towns, although not densely populated, have historic significance or have been in existence for many years.

c. Areas Included/Definition

This development is the least dense of all developed lands mapped, with populations usually less than 1000.

d. Data Discussion

The development mapped on the "Towns Map" is significant in terms of historic importance as well as fulfilling a density criteria. Areas indicated on the "Towns Map" represent all mapped urbanization not indicated on the Urban Centers or Ex-Urban Development Maps. It represents the least densely populated areas of development and substantial permanent physical impact on the landscape. Most areas indicated on this map have a population of 1000 or less. Many are the surviving town centers traditional in the developing New England countryside.

1.4 Open Agricultural Land

a. Data Source and Scale

- o U.S.G.S. Quadrangle Sheets, 1:250,000
- o Comprehensive Plan, Grafton County, New Hampshire; Report No. 1, Physical Features and Natural Resources; New Hampshire Department of Resources and Economic Development, 1965
- o Vermont Land Capability; Vermont State Planning Office; September 1974
- o Vermont Land Capability, Generalized Land Use Maps, 1972; 1 inch = 2 miles
    - o Essex County
    - o Orange County
    - o Washington County
    - o Caledonia County
    - o Windsor County
- o Vermont Land Capability, Resource Opportunities Maps 1972; 1 inch = 2 miles
    - o Essex County
    - o Orange County
    - o Washington County
    - o Caledonia County
    - o Windsor County
- o U.S.G.S. Quadrangle Sheets, 1:62,500
- o LAND/SAT Imagery at approximately 1:250,000

b. Criteria

Includes all open lands (devoid of forest cover) that are presently in agriculture use, or are potential croplands. Prime agricultural soils or "soils of sufficient extent to have commercial worth for management and that are sufficiently well-drained, level, and free of stones to allow tilling and harvesting with machinery."[1] Lands or open areas over 4000 feet elevation are excluded.

c. Areas Included/Definition

Interpreted areas from U.S.G.S. Quadrangles as listed above checked against LAND/SAT imagery. Information both narrative and mapped from the reports listed above.

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[1] Vermont Land Capability. Vermont State Planning Office, September 1974; p. 44.

d. Data Discussion

The Open Agriculture Lands Map includes all cleared existing and potent agricultural lands with the exception of those lands over 4000 feet elevation. The open parcels located above 4000 feet are few and are either tundra areas or have soils unsuitable for agricultural use.

Lands that are open as a result of being open wetlands areas or floodplains adjacent to rivers are also not included, as they are not lands suitable for agricultural use.

1.5 Aerodromes

a. Data Source and Scale

- o U.S.G.S. Quadrangle Sheets; 1:250,000
- o Natural Oceanic and Atmospheric Administration Sectional Aeronautical Charts for:
  - New York; 1:500,000; 14 edition, April 22, 1976
  - Montreal; 1:500,000; 14 edition, April 22, 1976
  - Halifax; 1:500,000; 14 edition, April 22, 1976

b. Criteria

Includes all land and water, civil and military airports as identified by the Department of Defense, the Federal Aviation Administration and the Department of Commerce in accordance with the Air Cartographic Committee.

c. Areas Included/Definition

In addition to operating airports, the mapping includes abandoned airports considered for possible use in the future. The majority of information on this overlay was taken from the 14th edition of the Sectional Aeronautical Charts, April 22, 1976. This information becomes obsolete upon publication of the next edition, October 7, 1976.

d. Data Discussion

Aerodromes obtained from the above sources were delineated with a one mile diameter circle around the center of the facility. This delineation was criteria given to VTN by the Department of Interior and represents a setback distant to insure that transmission facilities do not interfere with communications or instrument landing equipment aboard aircraft. Areas mapped include ground based facilities as well as heavily used aquatic landing sites.

1.6 Indian Lands/Reservations

a) Data Source

- o Glenn Starbird; Dept. of Indian Affairs
- o Gregory Buesing; Federal Regional Council
- o U.S.G.S. Quadrangle Sheets, 15' series

b) Criteria

Legally acknowledged Indian Reservation lands are mapped onto the base maps. These lands represent areas owned and governed by individual tribal councils throughout the study area.

c) Areas Included/Definition

Delineated are all legal boundaries defining reservation lands. Only existing legally established lands are portrayed as Indian Reservations.

d) Data Discussion

B.I.A. designated reservation lands within the study boundaries prove to be few in number. As stated earlier, only legally recognized land holdings by tribal councils are defined as Indian Reservations. These land holdings are governed through interior tribal governments and must be seen as an important data component to be reviewed. Legislation protecting reservation lands necessitates tribal review of intrusion into individual properties.

2.1.2 SLOPE

2.1 0 to less than 15%

a. Data Source and Scale: Interpreted directly from U.S.G.S. Quadrangle Maps; 1:250,000 scale.

b. Areas Included/Definition: Represents land posing the least number of constraints to construction, operation, and maintenance of transmission corridors.

2.2 15% to less than 35%

a. Data Source and Scale: Interpreted directly from U.S.G.S. Quadrangle Maps; 1:250,000 scale.

b. Areas Included/Definition: Represents land posing moderate constraints to construction, operation, and maintenance of transmission corridors.

2.3 Greater than 35%

a. Data Source and Scale: Interpreted directly from U.S.G.S. Quadrangle Maps; 1:250,000 scale.

b. Areas Included/Definition: Represents land posing the severest constraints to construction, operation, and maintenance of transmission corridors.

Data Discussion: General Note for all Slope Categories

The primary consideration in establishing discrete categories for slope mapping was the use of slopes in the analysis and evaluation of corridors. Slope categories must correspond directly to corridor construction and maintenance criteria.

Initially the Department of Interior supplied VTN with five discrete slope breakdown important for construction, maintenance, and operation of transmission facilities. They are as follows:

1) Less than 5% slope: No restrictions.

2) Greater than 5% but less than 15% slope: Access roads can be built and maintained and construction equipment can navigate terrain with no severe restrictions.

3) Greater than 15% but less than 35% slope: Access roads need to be contoured in and require significantly more maintenance.

4) Greater than 35% but less than 55% slope: Operation of construction equipment on slope of 35% or greater is difficult or impossible.

5) Greater than 55% slope: Fill for construction and access roads does not hold; roads must be cut into slopes and often require structures.

The above slope categories were initially considered and would have been used if scale resolution permitted. A second consideration in establishing slope categories was the scale at which discrete independent categories on breakdowns could be manually mapped. Due to scale, time, and accuracy requirements, the five initial categories were consolidated into three, which appear above. A second source for slope criteria in regard to construction of transmission lines concurred with the recommendations supplied by the Department. Page 19 of Environmental Criteria for Electric Transmission Systems states that, "As a general rule, machine clearing (bull dozing) should not be done on slopes which exceed 35%."[2] The reason for this criteria is the impact of construction equipment on vegetation, soils, etc. as much as the potential hazards to equipment operators, etc., working on such slopes.

[2] Environmental Criteria for Electric Transmission Systems; United States Department of Interior, United States Department of Agriculture; February 1970.

2.1.3 RECREATION LAND USE

3.1 National Forests

a. Data Source and Scale

- o U.S.G.S. Quadrangle Sheets; 1:250,000
- o Vermont Highway Map 1"=5 miles
- o Maine Highway Map 1"=10 miles
- o New Hampshire Highway Map 1"=5 miles
- o Vermont Comprehensive Outdoor Recreation Plans 1"=2 miles
- o State O'Maine Facts 1976-booklet

b. Criteria

Delineated National Forests as shown on the above maps.

c. Areas Included/Definition

Includes National Forests.

d. Data Discussion

National Forest boundaries were transferred directly from the data sources listed above. They are mapped primarily for their value as lands for recreational use.

3.2 State Parks and State Forests

a. Data Source and Scale

- o U.S.G.S. Quadrangle Sheets; 1:250,000
- o Vermont Highway Map, 1"=5 miles
- o Vermont Comprehensive Outdoor Recreation Plan, 1"=2 miles
- o Guide to Vermont State Parks and Forest Recreation Areas, pamphlet.
- o New Hampshire Highway Map, 1"=5 miles
- o The Clean Getaway: Guide to New Hampshire's 32 State Parks, pamphlet.
- o State Owned Lands Administered by the New Hampshire Department of Resources and Economic Development, 1"=4 miles.
- o Maine Highway Map, 1"=10 miles
- o Maine Department of Parks and Recreation: maps of state parks, state forests, public lots, and other semi-public conservation lands.
- o A Downeast Experience - Maine State Parks pamphlet.

b. Criteria

Delineated State Parks and State Forests as shown on maps and pamphlets.

c. Areas Included/Definition

Includes State Parks and State Forests.

d. Data Discussion

State Park and State Forest boundaries were transferred directly from the data sources listed above. They are mapped primarily for their value as lands for recreational use.
In Vermont and New Hampshire one agency sets policies and makes decisions regarding permitted uses and or modifications of parks and forests. In Vermont this is the agency of Environmental Conservation and in New Hampshire it is the Department of Resources and Economic Development. Both agencies were consulted and although they differed somewhat in their attitude towards power lines, they agreed that parks and forests had virtually the same policies and that power line intrusions would be decided on a case by case basis.

In Maine, the Department of Parks and Recreation was consulted regarding parks and forests. Parks are under the jurisdiction of the Department of Parks and Recreation, while forests are under control of the Bureau of Public Lands and also, in two casesa semi-public special park authority. Although under separate agencies, in as much as it could be ascertained, the policies of these agencies are the same regarding possible power line transmission corridors.

3.3 Municipal Land

a. Data Source and Scale

- Vermont Comprehensive Outdoor Recreation Plan, 1"=2 Miles
- Mattawumkead Wild Forest, Penabscot County Commissioners, Maine, Scale 1"=¼ mile

b. Criteria

Delineated county, municipal, and town parks, forests and conservation lands as shown on maps.

c. Areas Included/Definition

Includes county, town, and municipal parks, forest and conservation lands.

d. Data Discussion

A thorough investigation was made into data sources for New Hampshire and Maine. In addition to contacting state planning offices, county and regional planning agencies were consulted in attempt to gather this information. Not only was it found that no state or regional maps exist which show municipal or town parks, forests, or conservation land, but many towns themselves do not have maps of these areas. There are approximately 450 towns in New Hampshire and Maine within the study area, and this information would have to be gathered on a town by town basis.

3.4 Scenic Wayside Areas

a. Data Source and Scale

- o U.S.G.S. Quadrangle Sheets; 1:250,000
- o Vermont Highway Map, 1"=5 miles
- o New Hampshire Highway Map, 1"=5 miles
- o Maine Highway Map, 1"=10 miles

b. Criteria

Delineated roadside rest areas/picnic areas, scenic overlooks/ towers and observation points.

c. Areas Included/Definition

Includes areas as mapped on respective highway maps showing roadside rest areas/picnic areas, scenic overlooks/towers and observation points.

d. Data Discussion

These are identified existing recreation facilities, many of which are used as landscape observation points.

3.5 Intensive Recreation Areas

a. Data Source and Scale

- o New Hampshire Highway Map, 1"=5 miles
- o Maine Highway Map, 1"= 10 miles
- o Vermont Highway Map, 1"=5 miles
- o Map and Guide of Vermont Private Campgrounds

b. Criteria

Delineated golf courses, ski areas, resort areas, campgrounds and identified boating and canoe areas.

c. Areas Included/Definition

Includes golf courses, ski areas, resort areas, campgrounds, and identified boating and canoeing areas.

d. Data Discussion

Much of this data is mapped as point information and represents discrete areas that receive heavy visitation or recreation use. These are mapped separately from areal extensive lands with more dispersed recreation such as State Parks.

3.6 Wild, Scenic and Designated Recreational Rivers

a. Data Source and Scale

- o Maine Highway Map, 1"-10 miles
- o Wild and Scenic Rivers - pamphlet
- o Allagash Wilderness Waterway - pamphlet
- o Penobscot Wild and Scenic River Study - informational brochure.

b. Criteria

Includes all rivers in the study area that are existing components of the National Wild and Scenic Rivers System, or are under study.

c. Areas Included/Definition

- o Allagash Wilderness Waterway
- o Penobscot River - under consideration, not yet officially designated as wild and scenic

d. Data Discussion

Wild and Scenic Rivers were authorized by the Wild and Scenic Rivers Act - Public Law 90-542, October 2, 1968 as amended. It states ". . . certain selected rivers of the nation which with their immediate environments, possess outstanding remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations. . ." The National Wild and Scenic Rivers Act provides a means for ". . .protecting and enhancing certain rivers which are worthy of preservation. It does not prohibit the construction of roads or bridges, that do not substantially interfere with full public use and enjoyment."

3.7 National Scenic Trails

a. Data Source and Scale

- o Public Law 90-543, October 2, 1968 - established National Trail System
- o U.S.G.S. Quadrangle Sheets; 1:250,000

b. Criteria

Includes the Appalachian National Scenic Trail. This is one of the two initial units of the National Trail System. Mount Katahdin in Maine is one of the Trail's termini.

c. Areas Included/Definition

- o Appalachian National Scenic Trail

d. Data Discussion

The National Scenic Trails were designated as of Public Law 90-543, October 2, 1968. "Rights-of-way and other properties Sec 9.(a). The Secretary of the Interior or the Secretary of Agriculture as the case may be, may grant easements and rights-of-way upon, over, under, accross, or along any component of the national trails system. . ." Location of the power line near a trail may detract from the users' view of the natural surroundings.

3.8 Scenic Roads/Designated

a. Data Source and Scale

- o Maine--Highway Map, 1"-10 miles
- o Vermont U.S. Army Corps of Engineers--Environmental Reconnaissance inventory of the State of Vermont--Proposed Scenic Road Corridors, 1:500,000
- o William F. Reid, Director Environmental Services Division Maine Department of Transportation

b. Criteria

Existing or proposed designated scenic road corridors

c. Areas Included/Definition

Mapping of scenic roads according to the above criteria includes a two mile wide corridor on either side of the road.

d. Data Discussion

- o Vermont: Proposed scenic road corridors prepared for the Department of the Army, Office of the Chief Engineer by the Engineer Agency for Resources Inventories, 1973. Indicates "Land and water areas which have been identified but have not been formally or legally designated or developed."
- o New Hampshire: No information on designated scenic roads has been found.
- o Maine: A state agency; the Scenic Highway Board recommended the roads as scenic roads. These roads were so delineated for their recreational, historical, or scenic values. Restrictions on these roads include prohibiting outdoor advertising. The Scenic Highway Board is no longer operative.

This information will be used to supplement the visual values of the roads that have been classified by ADT values.

Note: The recreational useage of "Large/Semi Public Lands" was also considered. These lands appear under the heading of Land Ownership, Section 5.3.

2.1.4 TRANSPORTATION

4.1 Roads; A.D.T 3000 and greater

a. Data Source and Scale

- o Vermont 1974 ADT map, 1"-10 miles
- o New Hampshire 1975 ADT map, 1"=8 miles
- o Maine 1972 ADT map, 1"=10 miles

b. Criteria

The ADT is a measure of the average number of vehicles that use a particular road during a twenty-four hour period.

c. Areas Included/Definition

Roads are graphically differentiated by ADT values. Two classifications of ADT values were determined and they are as follows:

1) ADT's greater than 3000 vehicles per day which corresponds primarily to Interstate and U.S. highways.

2) ADT's less than 3000 vehicles per day which corresponds primarily to state highway and secondary state highways.

d. Data Discussion

There are two primary reasons why the evaluation of roads within the study area was necessary. The first is some consideration of the visual impact of locating power lines near regularly travelled roads, and the second is to provide some means of access to the power lines themselves. ADT values, as published by the respective states, were chosen as a means to evaluate each road in terms of its visual impact upon the motorist. To the same end, one could also drive over the more important roads to determine their visual value. ADT values varied throughout the three states and on particular sections of the same road due to attractive features in the particular area. After manually inspecting the ADT maps, two breakdowns, one less than 3000 vehicles per day and the other more than 3000 vpd, were chosen as the criteria. These correspond to lower volume roads such as state highway and to higher value roads such as the Interstate and U.S. Routes. Eventually the visual impact of the higher volume roads will count twice as much as the lower volumes in the corridor evaluation process.

4.2 Roads; A.D.T Less Than 3000

a. Data Source and Scale

- o Vermont 1974 ADT map, 1"=10 miles
- o New Hampshire 1975 ADT map, 1"=8 miles
- o Maine 1972 ADT map, 1"=10 miles

b. Criteria

The ADT is a measure of the average number of vehicles that use a particular road during a twenty-four hour period.

c. Areas Included/Definition

Roads are graphically differentiated by ADT values. Two classifications of ADT values were determined and they are as follows:

1) ADT's greater than 3000 vehicles per day which corresponds primarily to Interstate and U. S. highways.

2) ADT's less than 3000 vehicles per day which corresponds primarily to state highway and secondary state highways.

d. Data Discussion

(See Section 4.1 Roads A.D.T. 3000 and greater.)

4.3 Roads with no ADT and Others

a. Data Source and Scale

- o U.S.G.S. Quadrangle Sheets; 1:250,000
- o Vermont Highway Map, 1"=5 miles
- o New Hampshire Highway Map, 1"=5 miles
- o Maine Highway Map, 1"=10 miles
- o Maine - Prentiss & Carlisle Co., Inc. Map, 1"=3 miles - compiled from U.S.G.S. and File information

b. Criteria

Roads with no state published ADT values identified on any of the maps

c. Areas Included/Definition

Roads of the following classification are mapped. County highways, other paved roads, gravel surfaced roads, graded and drained roads and other unimproved roads.

d. Data Discussion

The primary value of this classification of roads was to aid in determining access to the powerlines. As these roads are low volume, their impact on the visual quality of the motorist would be slight.

2.1.5 Land Ownership

5.1 Federally Owned Lands

a) Data Source and Scale

- o U.S.G.S. Quadrangle Sheets; 1:250,000
- o Vermont Highway Map 1"=5 miles
- o Vermont Comprehensive Outdoor Recreation Plan 1"=2 miles
- o New Hampshire Highway Map 1"=5 miles
- o Maine Highway Map 1"=10 miles
- o Maine Department of Parks and Recreation Maps 1"=4 miles

b) Criteria

Delineated federally owned lands

c) Areas Included/Definition

Includes all federally owned lands; forests, flood control and water supply or water shed lands, and military bases.

d) Data Discussion

It was considered important to group together all federal government right-of-ways properties because R.O.W.'s would have to be negotiated with the federal government not only as individual agencies but as a whole in the case that it was necessary to infringe on one of their properties. Hence for purposes of this analysis, all federal properties were seen as having equal constraint.

5.2. State Owned Lands

a) Data Source and Scale

- o U.S.G.S. Quadrangle Sheets, 1:250,000

Vermont:

- o Vermont Highway Map, 1"=5 miles
- o Vermont Comprehensive Outdoor Recreation Plan, 1"=2 miles
- o Guide to Vermont State Parks and Forest Recreation Areas, pamphlet

New Hampshire:

- o New Hampshire Highway Map, 1"=5 miles
- o The Clean Getaway: Guide to New Hampshire's 32 State Parks, pamphlet
- o State Owned Lands Administered by the Department of Resources and Economic Development 1"=4 miles

- o State Owned Lands Administered by New Hampshire Water Resources Board, list and map 1"=8 miles
- o State Owned Lands Administered by New Hampshire Fish and Game Department, map 1"=8 miles
- o Land Holdings Report 1975, New Hampshire Fish and Game Department, report

Maine:

- o Maine Highway Map 1"=10 miles
- o Department of Parks and Recreation: maps of state parks, state forests, public lots, other state lands, and semi-public conservation lands, 1"=4 miles

b) Criteria

Delineated state owned lands as shown on maps and pamphlets

c) Areas Included/Definition

Includes all state owned lands; parks, forests, state universities, public lots (Maine only), wildlife management areas, (game management areas), and reservoir and watershed lands.

d) Data Discussion

It was decided to group all state owned lands together because as noted above in the discussion on federal lands, the right-of-ways have to be negotiated with the state as an entity. Furthermore, individual breakdowns of the various state agencies appears in other sections such as in recreation, wildlife, and surface hydrology.

5.3 Large Institutional/Semi-Public Lands

a. Data Source and Scale

- o The Nature Conservancy, map of Land Holdings, (V.T.N. Base map), 1"=12 miles
- o The Connecticut River Watershed Council, List and map of Holdings, 1"-12 miles
- o New England Forestry Foundation - pamphlet and maps showing properties, various scales

New Hampshire

- o Land Holdings, University of New Hampshire, maps, 1"=8 miles
- o Major Land Holdings (showing Dartmouth College holdings) North Country Resource and Development Project, map, 1"=8 miles
- o Land Holdings, New Hampshire Audubon Society, map, 1"=8 miles (V.T.N. base)
- o Al Merril, Dartmouth College Outing Club, Hanover, N.H.
- o Land Holdings of the Society for the Protection of New Hampshire forests, map, 1:250,000

Maine

- o Maps of state parks and forests, public lots, semi-private lands, Maine Department of Parks and Recreation, maps, 1:250,000

- o Map of recent acquisitions, Maine Audubon Society, map, 1"=8 miles (V.T.N. base)
- o Maps of recent acquisitions, Maine Chapter of the Nature Conservancy, maps, 1:62,500
- o Map of ecological study area at Loring Air Force Base, University of Maines, Presque Isle, map, 1:62,500
- o Prof. Fred Knight, University of Maine, Orono, Department of Forestry
- o Prof. Terry, Colby College, Waterville, Me.

b. Criteria

Delineated private and semi-public parks, forests, and conservation/ conservancy lands

c. Areas Included/Definition

Included are land holdings of the following organizations:

-New England:
The Nature Conservancy, New England
The Connecticut River Watershed Council
The New England Forestry Foundation

-New Hampshire:
University of New Hampshire
Dartmouth College
New Hampshire Audubon Society
Society for the Protection of New Hampshire Forests

-Maine:
Maine Audubon Society
The Nature Conservancy, Maine Chapter
University of Maine, Orono
University of Maine, Presque Isle
Colby College

d. Data Discusssion

These lands are owned by semi-public or non-profit educational organizations or institutions. They are significant because they represent important conservation, open space values as well as being the result of actual economic investments of members and contributors to the various organizations. The conservation organizations represent a significant block of public sentiment towards conservation of natural resources.

5.4 Large Private Holdings

a) Data Source and Scale

- o Brown Company Ownership in Maine, New Hampshire, Vermont, map, 1"=3.4 miles
- o International Paper Company Properties in Vermont, New Hampshire, New York, map, 1"=25 miles

Vermont:

- o Diamond International Corporation Holdings, map, 1"=3.75 miles
- o Wagner Woodlands Co. holdings, maps, 1:62,500

New Hampshire:

- o Major Land Holdings, private, state, federal 1974, Department of Resources and Economic Development, 1"=4 miles

Maine:

- o Land Ownership Map Key, 1970, Department of Forestry
- o Maine Ownership Map, International Paper Company, 1974, 1"=14 miles
- o Scott Paper Company Timberlands 1972, Sportsman's Map, 1"=3.75 miles
- o Georgia-Pacific Sportsman's Map, 1"=3.25 miles
- o Lands Managed by Seven Islands Company, map, 1"=38 miles
- o Lands Owned by Diamond International Company, map, 1"=30 miles
- o St. Regis Company Ownership, 1"=10 miles
- o Great Northern Paper Company, map, 1"=3 miles

b) Criteria

Delineated land owned by major timber companies.

c) Areas Included/Definition

Includes timberlands owned by major timber companies - lumber paper, and pulp. Also shown are lands managed by land holding companies which are used for timber purposes, i.e. logging for paper, pulp, and lumber. Ownerships are primarily two types: single ownership where one individual or company owns a given parcel and undivided or multiple ownership in which several individuals or companies own a given tract of land together but no one individual (or company) owns a specific part of it.

d) Data Discussion

The rationale for this map is to locate large private timberlands, which in a sense may be seen as opportunities for power line transmission corridors. It is easier and less costly to negotiate with large owners than a series or small owners. Also the land unless otherwise identified as having specific resource value in another set of constraint maps could be seen as presenting an opportunity for location in as much as they are remote from human habitation and view as well as ecologically speaking, a disturbed or modified ecosystem.

However, from an economic point of view, since timber is one of the major resources of Maine, New Hampshire, and Vermont, it is important to know exactly where the timberlands are located. The actual weighting of the timberlands map is, in the final analysis, a methodological consideration.

5.5 Parcel Density/Town:High
(See Parcel Density/Town:Low)
5.6 Parcel Density/Town:Medium
(See Parcel Density/Town: Medium)
5.7 Parcel Density/Town:Low

a) Data Source and Scale

Vermont:

- o List of real estate parcels per town, Vermont Bureau of Taxation
- o Areas of the State and its political subdivisions, State Planning Office list.
- o 1970 Census of Population, Vermont, U.S. Bureau of the Census

New Hampshire:

- o 1970 Census of Population, New Hampshire, U.S. Bureau of the Census

Maine:

- o Municipal Tax mapping Status, November 1975, Bureau of Taxation, Property Tax Division, report.
- o MIDAS printout, Population and area unincorporated areas, Maine, 1976.
- o Larry Record, Bureau of Taxation, Property Tax Division, Maine

b) Criteria

In Vermont and Maine the number of parcels per square mile in 3 relative densities, high, medium, and low were mapped on a town basis. The densities were low = 1 to 8 parcels per square mile; medium =8 to 28 parcels per square mile; high = greater than 28 parcels per square mile. In New Hampshire where parcel data was not available, population density was used to approximate parcel density based on an analysis and correlation of parcel density and population data for Vermont and Maine - see discussion below.

d. Data Discussion

The reason for mapping parcel density is that this figure gives a reasonable approximation of the number of parcels that a power line corridor would impact as it goes through a town. This has a definite value in a relative sense, because it is best to minimize the number of parcels impacted. As the number of parcels that are impacted rises, so does the cost of right-of-way aquisitions increase as well as the number of legal transactions and problems. The more "dense" areas (more parcels per square mile) are generally areas with higher land values, as well, because these are the more highly populated areas. Hence, by minimizing the number of parcels impacted in a given area, other factors being equal, costs both legal and economic are also minimized. It was recognized that parcel

densities are averaged for the whole area of a given town, and that in most cases the "denser" areas tend to be in the populated town centers. However, this objection is overcome because the densities are ranked in three broad categories and because the data has validity for comparing towns.

In New Hampshire, town parcel data was not available. However, analysis of data in Vermont and Maine showed a close correlation of population density (people per square mile - per town) with parcel density (number of parcels per square mile - per town). Inspection and analysis of the data showed these populated densities to fit best with the parcel densities:

Parcel Densities

Low	Medium	High
1 - 8	8 - 28	greater than 28

Population Densities

7	50	greater than 50

Using the above population densities, categories very close the same level of accuracy may be reached as was the case in using the parcel density figures, and for the purpose of analysis and comparison of towns, it was found that this yielded acceptable results.

2.1.6 ORIENTATION

6.1 West - Northwest

a) Data Source and scale
   - o USGS Quadrangle Sheets: 1: 62,500; various dates
   - o USGS Quadrangle Sheets: 1:250,000; various dates

b) Criteria
   All slopes over 15% with the orientation of west-northwest.

6.2 North - Northeast

a) Data Source and Scale
   - o USGS Quadrangle Sheets: 1: 62,500; various dates
   - o USGS Quadrangle Sheets: 1:250,000; various dates

b) Criteria
   All slopes over 15% with the orientation of north-northeast.

6.3 South - Southeast - Southwest

a) Data Source and Scale
   - o USGS Quadrangle Sheets: 1: 62,300; various dates
   - o USGS Quadrangle Sheets: 1:250,000; various dates

b) Criteria
   All slopes over 15% with the orientation of south-southeast-southwest.

6.4 East

a) Data Source and Scale
   - o USGS Quadrangle Sheets: 1: 62,000; various dates
   - o USGS Quadrangle Sheets: 1:250,000; various dates

b) Criteria
   All slopes over 15% with the orientation of east.

2.1.7 SURFACE HYDROLOGY

7.1 Lakes, Ponds, Great Ponds, Reservoirs, Large Rivers

a. Data Source and Scale

- o U.S.G.S. Quadrangle Sheets; 1:250,000
- o U.S.G.S. Quadrangle Sheets; 1:62,500
- o LAND/SAT Imagery at approximately 1:250,000
- o Great Ponds Laws, Maine Revised Statutes Annotated, State of Maine, 1975.
- o Chapter II, Management of Lakes and Ponds, Vermont Statutes Annotated, 1976.
- o Mr. Charles Watson, Resource Planner, New England River Basin Commission.
- o Maine Lakes, Fishery Research and Management Division, Maine Department of Inland Fisheries and Game.
- o A Study of Lakes in Northeastern Vermont by John R. Mills, Vermont Geological Society
- o Limnological Data Report for the Maine Department of Environmental Protection - U.S. Geological Survey Cooperative Lake Studies Project
- o A Quantitative Classification of Maine Lakes, The Environmental Studies Center, University of Maine at Orono.

b. Criteria

Open water bodies present legal, engineering and environmental constraints to the location of transmission corridors.

c. Areas Included/Definition

Includes all lakes, ponds, reservoirs greater than 160 acres and all large rivers which have 500 feet between their shores.

d. Discussion

Lakes, ponds, reservoirs, and large rivers were grouped together because it was felt that the inherent recreational, navigational, scenic, and aesthetic qualities of these water bodies present similar constraints to power transmission corridors.

7.2 Rivers and Streams

a. Data Source and Scale

- o U.S.G.S. Quadrangle Sheets; 1:250,000
- o U.S.G.S. Quadrangle Sheets; 1:62,500
- o LAND/SAT Imagery at approximately 1:250,000
- o Vermont Stream Survey, Vermont Fish and Game Department.

b. Criteria

The number of river and stream crossings will serve as an indication of the aesthetic and environmental impacts resulting from potential transmission corridor alignments.

c. Areas Included/Definition

All rivers and perennial streams as shown on U.S.G.S. Quadrangle Sheets, other than shown on data overlay 7.1

d. Discussion

This topic does not include intermittent streams because the primary source of information, U.S.G.S. Quadrangle Sheets, did not identify them in most situations. Also, the drainage density derived from the perennial streams is more than sufficient for the purposes of this study.

7.3 Wetlands

a. Data Source and Scale

- o U.S.G.S. Quadrangle Sheets; 1:250,000
- o U.S.G.S. Quadrangle Sheets; 1:62,500
- o LAND/SAT Imagery at approximately 1:250,000
- o Deer Wintering Areas and Wetlands, Department of Fish and Game, State of Vermont, 1"=approximately 1½ miles.

b. Criteria

Wetlands were delineated to indicate areas of potential constraint upon wildlife, vegetation, legal, engineering, and aesthetic values.

c. Areas Included/Definition

Includes all wetlands that are discernible from U.S.G.S. Quadrangle Sheets at a scale of 1:62,500 and LAND/SAT (1:250,000) Imagery.

7.4 Sensitive Watersheds

a. Data Source and Scale

- o U.S.G.S. Quadrangle Sheets; 1:500,000
- o U.S.G.S. Quadrangle Sheets; 1:250,000
- o Environmental Reconnaissance Inventory of the State of Vermont New England River Basins Commission, 1 inch = 8 miles.
- o Classifications of Surface Waters, New Hampshire Water Supply and Pollution Control Commission.
- o Surface Water Classification, Maine Environmental Improvement Commission, 1inch = 10 miles.
- o Androscoggin River Basin Water Quality Management Plan, New Hampshire Water Supply and Pollution Control Commission, 1 inch = 4 miles.
- o Saco River Basin Water Quality Management Plan, New Hampshire Water Supply and Pollution Control Commission, 1 inch = 15 miles.
- o Merrimack River Basin Water Quality Management Plan, New Hampshire Water Supply and Pollution Control Commission, 1 inch = 15 miles.
- o Connecticut River Basin Water Ouality Management Plan, New Hampshire Water Supply and Pollution Control Commission, 1 inch = 15 miles.
- o Guide Plan Report, Androscoggin River Basin, Maine and New Hampshire, New England River Basins Commission.
- o Water Resources Management in New Hampshire, Office of State Planning, New Hampshire.
- o Lake Memphremagog Basin, Water Quality Management Plan, Vermont Department of Water Resources.
- o Missisquoi River Basin, Water Quality Management Plan, Vermont Department of Water Resources.
- o Passumpsic River Basin, Water Quality Management Plan, Vermont Department of Water Resources.
- o Hydrologic Unit Map, State of Maine, U.S.G.S., Department of Interior.
- o Surface Water Classification, St. John-Aroostook Resource Conservation and Development Project, Soil Conservation Service, U.S. Department of Agriculture.
- o Public Water Supplies, New Hampshire Water Supply and Pollution Control Commission.
- o Classification of Surface Waters, Revised Statutes Annotated, State of Maine, 1975.
- o Regulations Governing Water Classification and Control of Quality, Agency of Environmental Conservation, State of Vermont.

b. Criteria

Most of these areas are associated with first order streams and or high elevations and are the most critical of the various watersheds to power transmission corridor impacts.

c. Areas Included/Definition

Inlcudes all Class "A" watersheds as identified by the States of New Hampshire and Vermont.

d. Discussion

This category was defined to recognize those areas which could potentially constrain power transmission corridor locations. These areas contain class "A" quality waters and or municipal water supply facilities, such as ponds, reservoirs, or wells.

7.5 Navigable Waterways

a. Data Source and Scale

- o Appendix K, Navigation, North Atlantic Regional Water Resources Study Group, North Atlantic Division, Corps of Engineers, U.S. Army.
- o Mr. Kenneth Jackson, Chief, Processing Section, U.S. Army Corps of Engineers.
- o "Permits for Activities in Navigable Waters or Ocean Waters," from the Federal Register, Vol. 40, No. 144 - Friday, July 25, 1975, under Title 33 - Navigation and Navigable Waters, Chapter II - Corps of Engineers, Department of the Army.

b. Criteria

- o Navigable Waters of the United States as defined by the U.S. Army Corps of Engineers.

c. Areas Included/Definition

- o There are only two such waters in the study area and they are the Penobscot and Kennebec Rivers in Maine.

d. Discussion

- o The "Navigable Waters of the United States" are regulated by a permit procedure controlled by the U.S. Army Corps of Engineers. A permit will be required for both overhead and submarine power transmission lines crossing any portion of the navigable waters.

  Potential "Navigable Waters of the United States" have been identified by the U.S. Army Corps of Engineers. However, this information will not be available until it has been approved by Congress.

2.1.8 ARCHAEOLOGIC

8.1 Existing Archaeologic Sites

a. Data Source

- o Dr. Margery Power, University of Vermont; Vermont Archaeologic Inventory.
- o Vermont Land Capability Maps: 1:2 mis.
- o State of Vermont Environmental Reconnaissance Inventory, Cultural Elements Map: 1:500,000
- o N.E. Natural Inventory (Computer printout).
- o

b. Criteria

The establishment of known sites have been delineated from a number of sources, as listed above. Existing sites have been defined by one mile radius zones around a known archaeologic area.

c. Areas Included/Definition

Information defined under this data component are only those sites which are known to contain archaeological findings. Although the number of known sites are few, the relative importance of known archaeologic resources justifies the separate data component overlay. Specific resources included are campsites, villages, burial grounds, ruins, petroglyphs, artifact sites, etc.

d. Data Discussion

The archaeologic sites which are defined within this data component are those which have been acknowledged as containing cultural resources. These sites have been separated from potential areas due to both legislative controls and the speculative nature of the sensitivity zones. Although protective legislations is not as explicit as that found within historical properties, the general character of the legal controls are a deterrent to physical destruction.

There exists a great void in both published and unpublished material within each state relative to archaeological information. This void has been produced by a lack of any consistent archaeological data survey coupled with a hesitancy by agencies to publish any public information on known sites within the respective state. Each state within the study area has not compiled any valid study of archaeological sensitive areas within their boundaries. Indeed, not until the summer of 1976 has an effort been made to begin to compensate for this deficiency. The emergence of a state archaeological officer will begin the data search and registry on a statewide and consistent basis. This new office will be installed in New Hampshire and Vermont in June and July, respectively. Until this procedure has been conducted, we have no state recognition of archaeological siting within the study area. Although some material may exist in existing personal files, there is a reluctance to divulge any of the known archaeological sites. The possibility of public awareness creating scavenging and demarcation of sites, prevents a completely open atmosphere in which to obtain information. Hence, the amount and value of data which has been gathered has been of an inconsistent nature.

NEW HAMPSHIRE

At present, New Hampshire Historical Committee administers the archaelogical findings within the State. Because a new State archaeologist will begin to survey the entire state territory, which will develop a new inventory of acknowledged sitings, the Historic Preservation Office's official stance is that there exist no unique or sensitive zones. Instead, it is to be understood that any area within state boundaries may be a potential sensitive archaeological site and no individual location may be unique in itself prior to the proposed survey. Within the State of New Hampshire there are no defined determinants which would influence location of the corridor. Interaction with the public agencies would begin only after preliminary corridor location has been established, the state agency then feels that the defined transmission routes would then be surveyed for possible infringement on archaeological zones.

VERMONT

The situation in the State of Vermont is similar to that found in New Hampshire. Vermont does not compile a systematic data file for their jurisdicition but will begin to do so in July 1976 when the State archaeologist enters office. At that time he will begin to catalogue archaeological information within its register. At present, there are some sites noted on base maps which designate known sensitive zones and individual sites. However, the information which is plotted is inconsistent and

no data exists for counties within the study area. Again, the position of the Division of Historic Preservation is that all land is of potential archaeological significance. Under this premise there are no physical limitations which would influence the decision process in locating corridor routes. The preliminary corridor selection will necessitate a reconnaissance survey to locate sensitive zones within the path of the proposed route.

MAINE

There are two archaeological files maintained within the State of Maine at present. The University of Maine at Orono and the Maine State Museum both collect a file on existing archaeological sites. However, there is a concentration of information collected and survyed only along the seacost region which lies outside the area of concern. A lack of effort within the defined study boundaries leaves no effective inventory to work from. The Army Corps of Engineers, with the aid of Dr. David Sangor will begin an environmental reconnaissance of the Maine area in the summer of 1976. This archaeological survey will mark the first of such data collections for the study area. Hence, VTN has no directional restrictions from which to work other than that presented by private consultant information. The Division of Historic Preservation also feels that an initial reconnaissance survey would be needed to judge the impact of a selected route upon archaeologic sites.

8.2 Archaeologic Sensitivity Zones

a. Data Source and Scale

- o New Hampshire Game and Furbearers: A History: "Areas of Known Indian Activity in New Hampshire."
- o "Guidelines for Assessment of Transmission Line Impact on Historic and Archaeologic Resources," D. Sangor
- o
- o "State of Vermont Environmental Reconnaissance Inventory," Cultural Elements Map: 1:500,000
- o Vermont Land Capability Maps: 1:2 mi.

b. Criteria

- o Information as to sensitive archaeologic zones have been delineated onto base maps for the study area. These zones are defining potential artifact sites along water bodies which are expected to yield archaeological discoveries. Data collected for the study area is from a variety of private consultant and individual sources as noted above.

c. Areas Included/Definition

Information represented are described archaeological sensitivity zones which have potential resource significance. This data is compiled for the entire study area.

d. Data Discussion

The defined sensitivity zones are those areas which are highly suspected of yielding archaeologic sites. Those zones which are mapped are those which have been designated by either previous studies, or by professional archaeologists familiar with the study region.

The defined sensitivity zones represent a possible deterrent to corridor routes. However, the areas are not strictly barred considering the speculative nature of the information. Intrusion into defined areas would necessitate archaeological surveys which will provide more precise definition of resource sites.

2.1.9 HISTORIC

9.1 National Register Sites

a. Data Source and Scale

- o National Register of Historic Places
- o Covered Bridge of Vermont, 1972; 1 inch = 5 miles
- o North Atlantic Regional Water Resources Study-- Visual and Cultural Environment
- o Maine Historic Resources Inventory - E. Shettleworth

b. Criteria

The National Register Contains all legally acknowledged historic sites within the study area. This information is published in the Federal Register and encompasses all three states.

c. Areas Included/Definition

All information listed has been identified as sensitive areas of historical significance. Information on all nationally recognized structures, properties, and districts have been collected for the study area. Also included in the mapping system are all national monuments.

d. The National Registry program acknowledges all existing properties which comply with federal regulations governing National Historic Places. This resource is recognized by the Federal Government as important to the national heritage of the country and governed by federal law. The governing legislations protecting these areas presents a definite barrier to any infringement of property utilization. This data component represents an obvious constraint on corridor location and must be treated accordingly.

9.2 State Register Sites

a. Data Source and Scale

- o Vermont State Register of Historical Properties
- o Covered Bridges of Vermont, 1972; 1 inch = 5 miles
- o Official Vermont Transportation Map, 1975; 1 inch = 5 miles
- o Maine Bureau of Parks and Recreation: USGS Locational Maps;
- o New Hampshire Historical Markers
- o Maine Official Transportation Map; 1" = 10 miles

b. Criteria

- Vermont
  The State of Vermont has compiled a file on significant historical properties within its jurisdiction. This data contains all state acknowledged properties of historical significance as administered by the Division of Historical Preservation. Also registered with the state is a comprehensive list of covered bridges, all of which are of historical significance.

- New Hampshire
  The State of New Hampshire administers an Historical Marker program. The program is under the direction of the State Historical Commission and identifies approximately 100 historical sites. Most markers will be found on state highway lands.

- Maine
  There exist a number of state acknowledged historical sites situated on state owned lands. These properties are administered by the Bureau of Parks and Recreation and represent the only state governed historical sites.

c. Areas Included/Definition

All properties noted are existing historical sites presently protected by individual state legislation. Included are all markers, structures, sites, properties and districts as now acknowledged and administered through state agencies.

d. Data Discussion

The state historical programs vary within each jurisdiction. Criteria for eligibility as well as types of inventories maintained are managed quite differently depending upon the administering department. Governing legislation varies with each state in accordance with differences in historical inventories and land ownership. State recognition of individual sites provides the basis for defining the status of historical significance within each territory.

Local sponsorship of historical properties are not defined within this survey. This data information was excluded due to two factors interrelated with local administration of such properties. Problems of information voids as well as problems of collection directed the study to bypass this segment. These problems are reflections of time constraints imposed upon the project study.

9.3 Potential National and State Historic Properties

a. o New Hampshire Inventory of Natural, Scenic, and Historic Areas

o Maine Historic Resources Inventory

o Vermont State Register of Historial Properties

o Maine Bureau of Parks and Recreational USGS Locational Maps;

o Land Water Recreation; Report No. 13. Appendix A

b. Criteria

This data component contains all properties which meet the criteria for becoming an officially registered historical site. These individual sites have been evaluated through state agencies and proclaimed as eligible for recognition as an historically significant resource of either national or state importance.

c. Areas Included/Definition

All properties delineated are state recognized properties which meet eligibility requirements as historical features. All properties shown are potential candidates for either national or state registry recognition.

d. Data Discussion

The potential historical sites represent individual properties which qualify under the eligibility requirements set forth by the historical registration guidelines. Each state historical officer has the task of qualifying potential registered properties within their respective jurisdiction. The eligibility status of the potential historical site loosely protects the individual property. Although under existing interim status no specific legal controls govern the proposed sites; the integrity of the nominations as provided by the administrating state agency should be recognized.

2.1.10 PHYSIOGRAPHY

10.1 Elevation above 2500 Feet

a. Data Source and Scale

- o U.S.G.S. Quadrangle Sheets; 1:250,000

b. Criteria

- o Vermont: Vogelman, Marvin and McCormack, 1969. Ecology of the Higher Elevations of the Green Mountains of Vermont. A report to the Governor's Commission on Environmental Control. Vermont is considering stringent legislation to limit landscape alteration above 2500 feet elevation.
- o New Hampshire: Presently. New Hampshire is not considering any similar restrictions.
- o Maine: Vogelman, 1972. Ecological Considerations of Higher Elevations. The Maine Mountain Conference. Natural Resources Council of Maine, Augusta, Maine. Maine is considering stringent legislation to limit landscape alteration above 2500 feet elevation.

c. Areas Included/Definition

Elevations above 2500 feet were mapped for the entire study area based upon criteria for each state as stated above.

10.2 Mountains, Hilltops, Military Ridges

a) Data Source and Scale
- o USGS Quadrangle Sheets: 1:250,000

b) Criteria

Topographic features that are visually significant in the landscape.

c) Areas Included/Definition

Approximately the top one third of all significant topographic features not included in areas above 2,500 feet elevation (Data Overlay 11.1). Significant topographic features include:

- o All ridges and mountains as denoted on the USGS Quadrangle Maps.
- o All hills denoted on the USGS Quadrangle Maps that have steeply sloping sides (over 35% slope) or are visually significant relative to the surrounding landscape.

10.3 Mountain Sides, Hillsides, and Valley Walls

a. Data Source and Scale

o U.S.G.S Quadrangle Sheets, 1:250,000

b. Criteria

Topographic features that are visually significant in the landscape. These features are more readily preceived than are flat or gently rolling landscape

c. Areas Included/Definition

All mountain sides, hillsides, and valley walls having a topographic slope of 15% or greater.

10.4 Narrow Valley Floors

a. Data Source and Scale

o U.S.G.S. Quadrangle sheets, 1:250,000

b. Criteria

Areas where a transmission route may visually dominate the landscape.

c. Areas Included/Definition

All valleys approximately 2 miles wide or less surrounded by areas of topographic slope greater than 15% on either side.

d. Data Discussion

These areas were considered visually significant since their limited size and enclosed space provides less opportunity for the landscape to "absorb" a cleared transmission right-of-way.

2.1.11 GROUND WATER

11.1 Aquifers and Aquifer Recharge Areas

a. Data Source and Scale

- VERMONT:
  - U.S.G.S. Hydrologic Investigation Atlas: 1,250,000 Ground-Water Favorability of the Connecticut River Basin, New England States
  - U.S.G.S. and Vermont Dept. of Water Resources Hydrologic Investigations 1:62,500 (3 maps) Ground-Water Favorability of the:
    - Winooski River Basin, Vt.
    - Lamoille River Basin, Vt.
    - Lake Memphremagog Basin, Vt.
- NEW HAMPSHIRE:
  - U.S.G.S. Hydrologic Investigation Atlas: 1:250,000 Ground-Water Favorability of the Connecticut River Basin, New England States
  - U.S.G.S. and N.H. Water Resources Board: Water Resources Investigations 1:125,000 Availability of Ground Water in:
    - Androscoggin River Basin, N.H.
    - Saco River Basin, N.H.
    - Pemigewasset and Winnipesaukee River Basins, N.H.
- MAINE:

  U.S.G.S. Hydrologic Investigation Atlases 1:62,500 (6 maps) Ground Water Favorability and Surficial Geology at:

  - Meduxnekeeg River and Prestile Stream Basins, Me.
  - Lower St. John River Valley, Me.
  - Lower Kennebec River Basin, Me.
  - Lower Androscoggin River Basin, Me.
  - Lower Aroostook River Basin, Me.
  - Lower Penabscot River Basin, Me.

b. Criteria

Ice contact and valley train deposits of glacial origin which are medium to very coarse sand and gravel. Saturated thickness varies according to location in valley, bedrock, elevation, and other factors. Areas are inferred to have high to medium potential to yield water. Areas of lower potential yield recharge to higher yield areas.

c. Areas Included/Definition

Aquifers and Aquifer Recharge Areas potentially significant to local or regional subsurface water supplies. Some, but not all studies differentiate between types of deposits enough to distinguish between aquifer and recharge areas; hence, it was necessary to group all aquifers and recharge areas together.

d. Data Discussion

Groundwater geologists and water resource specialists in in Vermont, New Hampshire, and Maine were consulted to aid in determining the appropriate data categories for this study. They are as follows:

Vermont:
David Butterfield, Department of Water Resources, Agency of Environmental Conservation, Montpelier, Vermont.

New Hampshire:
John Cotton, U. S. Geological Survey, Water Resources Division, Concord, New Hampshire.

Maine:
W. Bradford Caswell, Maine Bureau of Geology, Augusta, Maine.

Glenn C. Prescott, Jr., U. S. Geological Survey, Water Resources Division, Augusta, Maine.

John Attig, Androscoggin Valley Regional Planning Commission, Auburn, Maine.

From the discussions, a more complete understanding and analysis of the data was gained. Also, the ground water geologists gave professional opinions as to what ground water resources needed protection from possible herbicide contamination or other impact from the power line transmission corridors. Although the ground water specialists varied considerably in the degree to which they felt that herbicide spraying was a potential hazard to ground water resources, there was sufficient interest to warrant inclusion of these ground water areas in the study.

The following are the two primary reasons why aquifers and aquifer recharge areas were chosen and grouped together as being significant to protection: 1) characteristics of the data itself including lack of sufficient data discrimination to make finer distinctions among ground water areas; 2) the need to protect both the direct ground water sources where wells could be most fruitfully located, i.e. the aquifers, and the areas that were sources of ground water recharge, i.e. aquifer recharge areas.

2.1.12 UNIQUE RESOURCES

12.1 Identified Unique Resources

a. Data Source and Scale

- o Contact with representatives of the New England Natural Areas Project (NENAP)
- o Contact with New England Natural Resources Center
- o Publication: Protecting New England's Natural Heritage
- o NENAP Inventory; located by coordinates

b. Criteria

These sites were developed as being significant resources by NENAP's criteria. Over the states of Vermont, New Hampshire and Maine, 3468 sites were identified. The following number of sites are included within our study area:

- o Vermont
- o New Hampshire
- o Maine

c. Areas Included/Definition

Resources in the following categories are included on the unique resources overlay for the study area:

- o geologic
- o soils
- o hydrologic
- o flora
- o fauna: terrestrial animals
- o fauna: birds
- o fauna: aquatic life
- o archeological
- o cultural, aesthetic, visual
- o unassigned

Some of the sites mapped under unique resources will also appear on other overlays. (Archeological resource is an example.)

d. Data Discussion

The New England Natural Resources Center in their booklet, "Protecting New England's Natural Heritage," defines a natural area as: "areas of land or water that have not been significantly altered by man and that harbor native plant or animal communities or exhibit natural features of significant educational and scientific value." The data was mapped as point information to located areas that were considered worthy of protecting for future utilization.

12.2 Critical Areas; Maine

a. Data Source and Scale

- Publication: Maine's Critical Areas Program
- Publication: Guidelines for the Registration of Critical Area
- Contact with Maine State Planning Office, Resources Planning Division

b. Criteria

Critical Areas are officially recognized areas which contain natural features of state significance - either highly unusual natural features, or outstanding examples of more common features

c. Areas Included/Definition

Three critical areas are included in the study area. They are as follow:

1. Blanchard White Pine - largest white pine in Maine and co-champion in the United States - located in the town of Blanchard, Maine.

2. Safford Pond Rhododendron Stand - northernmost stand of *Rhododendron maximum* . Located in the town of Lexington, Maine.

3. Albany Mountain-laurel Stand - mountain-laurels located in the town of Albany, Maine.

d. Data Discussion

Critical Areas are a highly significant part of our natural heritage. They provide important opportunities for general natural history education, serving as museums and classrooms for study groups, conservation organizations, outdoor clubs and individuals. Critical areas also serve as study areas for professional researches involved in investigation of undisturbed natural features.

12.3 National Natural Landmarks

a. Data Source and Scale

- o U.S.G.S. Quadrangle Sheets; 1:250,000
- o U.S.G.S. Quadrangle Sheets; 1:62,500
- o Natural Landmark Brief, National Park Service, background information and plotted sites on U.S.G.S. Quadrangle Sheets; 1:62,500
- o Potential Natural Landmark Sites, National Park Service, background information and plotted sites on 1"=8 miles mapping
- o Potential sites--map of states (Maine--Vermont--New Hampshire) approximately 1"=8 miles
- o Federal Register Vol. 41, No. 27, Monday, February 9, 1976

b. Criteria

Criteria as stated in Federal Register: "To be eligible for natural landmark designation, a site must be nationally significant as possessing exceptional value or quality in illustrating or interpreting the national heritage of our Nation, and must present a true, accurate, essentially unspoiled example of natural history."

c. Areas Included/Definition

Include all sites in study area either declared National Natural Landmarks or currently under study for National Natural Landmark status.

d. Data Discussion

From the Federal Register Vol. 41, No. 27, Monday, February 9, 1976. The Natural Landmarks Program. "Registration as a Natural landmark requires agreement by the landowner to preserve, insofar as possible, the significant natural value contained in the site. Department of the Interior. . . upon request, provides consultative assistance in protecting and interpreting the natural values of the site." As there is no legal protection for these site the grouping of the registered sites and those under study is appropriate to delineate areas of significance.

12.4 Natural Scientific Research/Wilderness Study Areas

a. Data/Scale Criteria

- o Reseach Natural Areas, U.S. Fish and Wildlife Service, booklet and maps, 1" = 8 miles
- o The Nature Conservancy, maps of holdings, 1" = 250,000
- o The Land Conservancy Program, Connecticut River Watershed Council, list and map of sites, no scale.

Vermont

- o Natural Areas in Vermont, Reports 1 and 2, H.W. Vogelmann, University of Vermont, reports and maps, 1" = 20 miles
- o Vermont Land Capability Plan, Unique or Fragile Areas, counties, maps, 1" = 2 miles
- o Environmental Reconnaissance Inventory of the State of Vermont, Army Corps of Engineers, report and maps, 1:500,000

New Hampshire

- o University of New Hampshire, Scientific Study Areas and Holdings, maps, 1" = 8 miles
- o Audobon Society of New Hampshire, land ownership map, 1" = 8 miles

Maine

- o The Nature of Conservancy, Maine Chapter, maps of recent acquisitions, 1" = 8 miles
- o Maine Audobon Society, maps of recent acquisitions, 1" = 8 miles
- o Maine Department of Parks and Recreation, maps of National Parks and Forests, state parks, Nature Conservancy and Audobon Society Holdings, 1:250,000
- o U.S. Forest Service, Penobscot Experimental Forest, mpa, 1" = 58 chains (.72 miles)
- o University of Maine, Presque Isle, map of ecological study area location at Loring Air Force Base, 1:62,500
- o Prof. Fred Knight, University of Maine, Orono, Department of Forestry
- o Prof. Terry, Colby College, Waterville, Maine

b. Legend/Criteria

Includes areas owned, controlled, or used by public, semi-public, or private organizations, groups, or individuals - colleges, universities, conservation organizations, government agencies - which is used for the purpose of nature study, ecological, biological, zoological, or other scientific study.

c. Areas Included/Definition

These areas have been designated by the various organizations, agencies, or groups as having recognized value for scientific or ecological study. In some cases an agency has jurisdicition or owns a given property specifically to be used for scientific research. In other cases all land owned by a conservation organization may be deemed of value to ecological research. Finally, some areas may be used by a university of college, but privately or publicly owned with an informal agreement between the university and the land owner.

d. Data Discussion

Ecological or scientific research areas have value because they are prime examples of various types of ecosystems and generally are undisturbed by man's intervention. They may represent a particular stage of development or successional stage of an ecosystem. Forests, fields, transition zones, alpine zones, marshes, bogs, lakes, ponds, rivers, and streams are some of the types of ecosystems represented. Rare or unique species of plants or animals may be present in the area. Or a particular combination or organization of plants or organisms in a type of ecosystem may be the reason for its value as a study or research area.

Except perhaps for marginal areas in one or two of the experimental forests, the factor of lack of disturbance by man plays a very significant role in determining the value of these areas. Hence, the intrusion by a power line into these areas would constitute a severe impact and seriously undermine or jeopardize its value. This is because these areas were particularly selected due to their unique character as good examples of ecosystems and because they are undisturbed.

12.5 Wilderness/Primitive Areas

a. Data Source and Scale

- o The Wilderness System - published by the Wilderness Society
- o Wilderness Act, 1964 - Chapter 23. National Wilderness Preservation System

b. Criteria

The 1964 Wilderness Act defines wilderness as "an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this chapter an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation."

c. Areas Included/Definition

Within the study area there are two Wilderness Areas. The Great Gulf Wilderness Area and the Presidential Range-Dry River, both located in the White Mountain National Forest in New Hampshire.

2.1.13 UTILITIES AND R.O.W.'s

13.1 Existing Electric Transmission Lines; Substations, Generation Facilities

a. Data Source and Scale

- o Bangor Hydroelectric System Map; 1:500,000
- o Transmission Systems and Lines, Central Maine Power Company; 1 inch = 4.5 miles
- o Electric Utilities Transmission in New Hampshire; 1 inch = 6 miles
- o Vermont Electrical Transmission Routes; 1 inch = 4 miles
- o U.S.G.S. Quadrangle Sheets, 15' series

b. Criteria

All major electric transmission routes have been collected at various scales which define each system held by individual private utility companies. Each respective plan delineates specific line paths as well as substations and connections to other systems. The U.S.G.S. 15' series were used to help locate more accurately both lines and stations.

c. Areas Included/Definition

The electric transmission lines which were mapped onto the overlay system were 115kv-230kv-345kv routes within the study area. Also, all substation and generation points along the system are delineated and labeled.

d. Data Discussion; see: 15.2 Data Discussion.

13.2 Existing Oil Lines

a. Data Source and Scale

- o Regional Map - State of Maine: USAF Searsport-Limestone Pipeline. 1' = 20 mi.
- o U.S. Petroleum and Gas TRANSPORTATION CAPACITIES
- o New Hampshire Gas Utility Franchise Areas--Gas and Oil Transmission Pipeline Companies; 1 inch - 6 miles
- o Portland-Montreal Pipeline System; 1 inch = 20 miles
- o Portland-Baugon Pipeline System; 1 inch = 1 mile
- o Products Pipeline - Searsport-Limestone Maine. 1" = 1000'

b. Criteria

This component contains all major oil pipelines as noted by individual corporation owners. Only large mains are described as significant pipeline routes. Individual township lines or small local routes are excluded from the mapping system.

c. Areas Included/Definition

Major pipeline routes include product and crude petroleum systems which traverse the study area. All lines are subterranean pipelines.

d. Data Discussion

The utilities and right of way's topical area is an establishment of existing utility corridors which traverse the study area. R.O.W.'s which are defined, may be viewed as a possible resource potential for existing easement corridors within the landscape. Among the alternatives to possible corridors considered here: electric transmission, gas pipelines, oil pipelines, and abandoned railroads.

Electric transmission routes delineated are those minimum voltage (115 kv) lines established by DOI engineers as significant for the study. Transmission corridors are existing lines only, no proposed routes are defined within this topical area. Also included into the mapping overlay are transmission line substations and generation facilities which are an integral part of the system. Generation facilities include all hydro, steam, nuclear. combustion turbine, fossil fuel, and hydro-diesel plants as provided by individual power company sources.

Oil pipelines reflect existing routes maneuvering within the study boundaries. Main lines are defined as any product or crude petroleum pipeline which traversed more than a single township boundary. This definition is to avoid small scale local, if any, systems within urbanized areas. Included in the overlay mapping are pumping stations directly connected to the pipeline system.

13.3 Railroad Corridors: Active and Abandoned

a. Data Source and Scale

- o U.S.G.S. Quadrangle Sheets; 1:62,500
- o U.S.G.S. Quadrangle Sheets; 1:250,000
- o New Hampshire Public Utilities Commission, Railroad lines 1973; 1"=10 miles
- o Publication: Abandoned Railroads in Maine, The Maine Department of Parks and Recreation, Planning and Research Division

b. Criteria

U.S.G.S. indicates active railraods of single or multiple track and narrow and standard guage track. Abandoned railroads with cleared right-of-ways can also be identified.

c. Areas Included/Definition

Active railroads and abandoned right-of-ways or "inactive" railroads are graphically differentiated on the overlay.

d. Data Discussion

Location of railroads are important as powerlines can produce electromagnetic and electrostatic fields which under certain conditions cause voltages to appear on wire communication lines. No interference is expected if lines do not parallel each other for less than one mile, with a separation greater than one-quarter to one-half mile.

Abandoned railroads provide an existing right-of-way which may be possibly utilized as a land resource. This pre-existing system of rail transportation routes has an already assembled linear conglomerate of land holdings.

14.1 Endangered and Threatened Species

a. Data Source and Scale

- Mr. Kenneth Anderson, Chief, Planning and Coordination Division, Department of Inland Fisheries and Wildlife, Augusta, Maine
- Dr. Malcom W. Coulter, Professor of Wildlife Resources, School of Forest Resources, University of Maine, Orono
- Mr. Owen Fenderson, Research Biologist, Maine Department of Inland Fisheries and Wildlife, Fisheries Research and Management Division, Bangor, Maine
- Mr. William Snow, U.S. Department of the Interior, Fish and Wildlife Service, Augusta, Maine
- Mr. Edward Sontiere, Ph.D. candidate, University of Maine, Orono
- Mr. Melvin Evans, Area Supervisor, U.S. Department of the Interior, Fish and Wildlife Service, Concord, New Hampshire
- Mr. John Lanier, Wildlife Ecologist, White Mountain National Forest, Eastern Region Forest Service, U.S. Department of Agriculture, Laconia, New Hampshire
- Mr. John Low, Wildlife Ecologist, White Mountain National Forest, Eastern Region Forest Service, U.S. Department of Agriculture, Laconia, New Hampshire
- Mr. Benjamin Day, Chief Game Biologist, Fish and Game Department, Agency of Environmental Conservation, Montpelier, Vermont
- Mr. Paul Nickerson, Endangered Species Coordinator, Fish and Wildlife Service, U.S. Department of the Interior, Boston, Massachusetts

- Report on Endangered and Threatened Species Including Those Species Deserving Special Consideration in New Hampshire and Vermont, Rene M. Bollengier, Jr., Bureau of Sport Fisheries and Wildlife, Division of Wildlife Services, Concord, New Hampshire . 1974. Mimeo
- Endangered and Threatened Wildlife and Plants, Reclassification of American Alligator and Other Amendments, Fish and Wildlife Service, Department of the Interior
- Vermont Eyrie Sites, Walter R. Spofford, Etna, New York
- Vol. VII, Inland Fisheries; Part 1, Species Assessments and Strategis Plans, Department of Inland Fisheries and Wildlife
- Environmental Reconnaissance Inventory of the State of Vermont, U.S. Army Corps of Engineers, (maps at 1:500,000)
- "Endangered Fish and Wildlife," Vermont Fish and Game Department, Agency of Environmental Conservation

b. Criteria

Fish and wildlife species designated by the federal government will be considered for mapping purposes. The actual number of species to be mapped will be in direct response to the amount and type of data available.

These species may not be threatened throughout their entire range in the United States but have declined significantly in New Hampshire and Vermont, or are peripheral and occupy such a limited range, that they are rare in number and should receive special attention by various planning agencies.

c. Areas Included/Definition

This category includes Endangered Species, those species in danger of extinction throughout all or a significant portion of their range; and threatened species, those species which are likely to become endangered within the foreseeable future throughout all or a significant portion of their range.

Common Name	Scientific Name	Status	State(s)
o Sunapee Trout			
o Blueback Trout			
o Short-nose Sturgeon			
o Lake Sturgeon			
o American Osprey			
o Pine Martin			

d. Discussion

These fish and wildlife species and their habitats receive broad Federal protection under the Endangered Species Act of 1973. The sanctions placed upon the destruction of these species or their habitat are strong and well placed. These species are measurably close to extinction. The finality of that ultimate classification is moral cause to protect them.

The Endangered Species Act (16 U.S.C. 1531-1543, 87 Stat. 884) of December 28, 1973 made it a violation to harass any of the federally designated wildlife species. "Harass" as defined in the above Act "means an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavorial patterns which include, but are not limited to, breeding, feeding or sheltering."

14.2 SPECIES OF SPECIAL CONCERN

a. Data Source and Scale

- o Mr. Kenneth Anderson, Chief, Planning and Coordination Division, Department of Inland Fisheries and Wildlife, Augusta, Maine
- o Mr. Francis Dunn, Wildlife Biologist, Department of Inland Fisheries and Wildlife, Patten, Maine

- Mr. Owen Fenderson, Research Biologist, Maine Department of Inland Fisheries and Wildlife, Fisheries Research and Management Division, Bangor, Maine
- Mr. Frank Gramlich, U.S. Department of the Interior, Fish and Wildlife Service, Augusta, Maine
- Mr. Alfred Meister, Chief Fishery Biologist, Atlantic Sea Run Salmon Commission, Bangor, Maine
- Mr. Don Alison,Biologist, New Hampshire Fish and Game Department, Concord, New Hampshire
- Mr. Melvin Evans, Area Supervisor, U.S. Department of the Interior, Fish and Wildlife Service, Concord, New Hampshire
- Mr. Henry A. Laramie, New Hampshire Fish and Game Department, Concord, New Hampshire
- Mr. Tudor Richards, New Hampshire Audubon Society, Concord, New Hampshire
- Mr. Ted Walski, Biologist, New Hampshire Fish and Game Department, Concord, New Hampshire
- Mr. Benjamin Day, Chief Game Biologist, Fish and Game Department, Agency of Environmental Conservation, State of Vermont, Montpelier, Vermont
- Mr. James Stewart, Biologist, Agency of Environmental Conservation, Fish and Game Department, Montpelier, Vermont
- Mr. Jeffery Wallin, Biologist, Agency of Environmental Conservation, Fish and Game Department, Montpelier, Vermont
- Mr. Paul Nickerson, Endangered Species Coordinator, Fish and Game Service, U.S. Department of the Interior, Boston, Massachusetts
- Walter Whitworth, Biologist, University of Connecticut, Storrs, Connecticut

- Report on Endangered and Threatened Species Including Those Species Deserving Special Consideration in New Hampshire and Vermont, Rene M. Bollengier, Jr., Bureau of Sport Fisheries and Wildlife, Division of Wildlife Services, Concord, New Hampshire
- Vol. VII, Inland Fisheries: Part 1, Species Assessments and Strategic Plans, Department of Inland Fisheries and Wildlife
- Environmental Reconnaissance Inventory of the State of Vermont, U.S. Army Corps of Engineers, (scale:1:500,000)
- "Some Recent Records of Martens in Maine," Malcolm W. Coulter, Maine Field Naturalist, April, 1959, Vol. 15, No. 2, pages 50-53
- Distribution of Cottontail Rabbits (Sylvilagus spp.) in Northern New England, S. N. Jackson, the University of Connecticut, Storrs, Connecticut

b. Criteria

Fish and wildlife species which have been identified by the individual states as being 'species of special concern.' The actual number of species to be mapped will be in direct response to the amount and type of data available.

c. Areas Included/Definition

This data category includes the nesting site locations of the Northern Bald Eagle in Maine and the Common Loon in New Hampshire and Maine.

d. Discussion

The habitat locations of these wildlife species should be given special consideration in relation to the placement of a power transmission corridor. Realizing that the corridors vary in width from one to six miles, these habitats may occur in the corridor without the actual right-of-way severely impacting them. Inventories of nest locations for both species are incomplete pending expanded field reconnaissance.

14.3 Restoration Areas

a. Data Source and Scale

- Mr. Frank Gramlich, U.S. Department of the Interior, Fish and Wildlife Service, Augusta, Maine
- Mr. Alfred Meister, Chief Fishery Biologist, Atlantic Sea Run Salmon Commission, Bangor, Maine
- Mr. Rene Bollengier, Team Leader, Peregrine Falcon Recovery Program, U.S. Department of the Interior, Fish and Wildlife Service, Concord, New Hampshire
- Mr. Al Knight, U.S. Department of the Interior, Fish and Wildlife Service, Laconia, New Hampshire
- Mr. John Lanier, Wildlife Ecologist, White Mountain National Forest, Eastern Region Forest Service, U.S. Department of Agriculture, Laconia, New Hampshire
- Mr. Roger Lanse, U.S. Department of the Interior, Fish and Wildlife Service
- Mr. Henry A. Laramie, New Hampshire Fish and Game Department, Concord, New Hampshire
- Mr. John Low, Wildlife Ecologist, White Mountain National Forest, Eastern Region Forest Service, U.S. Department of Agriculture, Laconia, New Hampshire
- Mr. Howard Nowell, Ecologist, New Hampshire Fish and Game Department, Concord, New Hampshire
- Mr. Jeffery Wallin, Wildlife Biologist, Vermont Fish and Game Department, Rutland, Vermont
- Mr. Theodore Walshi. Wildlife Biologist, New Hampshire Fish and Game Department, Concord, New Hampshire

- o Report on Endangered and Threatened Species Including Those Species Deserving Special Consideration in New Hampshire and Vermont, Rene M. Bollengier, Jr., Bureau of Sport Fisheries and Wildlife, Division of Wildlife Services, Concord, New Hampshire
- o "Potential Atlantic Salmon Habitat Areas," hand drawn map by Mr. Alfred Meister, Department of Inland Fisheries and Wildlife, Augusta, Maine
- o "Potential Peregrine Falcon Restoration Areas," Rene Bollinger, U.S. Department of the Interior, Fish and Wildlife Service, Concord, New Hampshire
- o Fish Habitats, Woods, and Wildlife Support Areas, New Hampshire Guide Plan for Water and Related Land Resources, New Hampshire Office of Comprehensive Planning and New England River Basins Commission, 1975, (1 inch = 2 miles)
- o Environmental Reconnaissance Inventory of the State of Vermont, U.S. Army Corps of Engineers, (maps at 1:500,000)

b. Criteria

This category includes those areas so designated by the U.S. Fish and Wildlife Service, White Mountain National Forest, Atlantic Sea Run Salmon Commission of Maine and the respective state agencies.

c. Areas Included/Definition

The three wildlife species mapped in this category are the Peregrine Falcon, Atlantic Salmon and the Pine Martin in New Hampshire.

d. Discussion

The mapped areas have been designated as favorable environments for the reintroduction of the respective wildlife species. These areas should be regarded as particularly sensitive to any type of development. Potential release sites for New Hampshire wild turkeys were not recorded in time to be included in this report.

14.4 Deer Wintering Areas

a. Data Source and Scale

- o Mr. Kenneth Anderson, Chief, Planning and Coordination Division, Department of Inland Fisheries and Wildlife, Augusta, Maine
- o Mr. Steven Chick, Biologist, Department of Inland Fisheries and Wildlife, Strong, Maine
- o Mr. James Conners, Supervisor of Mapping and Resource Analysis, Department of Conservation, Land Use Regulation Commission, Augusta, Maine

- o Mr. Allan Cox, Department of Conservation, Land Use Regulation Commission, Augusta, Maine
- o Mr. Gary Donovan, Wildlife Biologist, Department of Inland Fisheries and Wildlife, Augusta, Maine
- o Mr. Francis Dunn, Wildlife Biologist, Department of Inland Fisheries and Wildlife, Patten, Maine
- o Mr. Frederick B. Hurley, Jr., Wildlife Resource Planner, Department of Inland Fisheries and Wildlife, Planning and Coordination Division, Augusta, Maine
- o Mr. Maynard F. Marsh, Commissioner, Department of Inland Fisheries and Wildlife, Administration Division, Augusta, Maine
- o Mr. Lee Perry, Biologist, Department of Inland Fisheries and Wildlife, Maine
- o Ms. Suanne Singer, Programmer Analyst, State Planning Office, Economic Planning and Analysis Division, Augusta, Maine
- o Mr. Henry A. Laramie, New Hampshire Fish and Game Department, Concord, New Hampshire
- o Mr. Peter Piattoni, Office of Comprehensive Planning, Concord, New Hampshire
- o Mr. Benjamin W. Day, Chief Game Biologist, Fish and Game Department, Agency of Environmental Conservation, Montpelier, Vermont
- o Mr. Nate Dickinson, Biologist, Fish and Game Department, Agency of Environment Conservation, Vermont
- o Land Use Regulation Commission Maps, Department of Conservation, Augusta, Maine (maps at 1"=5280', 1"=1320', 1"=440')

- o Fish Habitats, Woods, and Wildlife Support Areas, New Hampshire Guide Plan, 1975. 1"=2 miles
- o Environmental Reconnaissance Inventory of the State of Vermont, U.S. Army Corps of Engineers, 1:500,000
- o Deer Wintering Areas and Wetlands, Fish and Game Department, State of Vermont, 1"=1½ miles
- o Vermont Electrical System Planning Maps. Green Mountain Power Co. Map Number .

b. Criteria

This overlay indicates deer wintering areas.

c. Areas Included/Definition

Whitetail deer have adapted to severe winters in the northern portion of their range by retreating to wintering areas called yards. Yards are chosen, and historically returned to, because they buffer the climate. The largest and most heavily utilized of these areas tend to be located on slopes that receive the most direct sunlight. Yards are usually located at lower elevations. Thick coniferous growth is favored by deer since it breaks the wind and reduces both nocturnal cooling and snow cover. But, some hardwood vegetation is necessary because it provides better browse than most conifers.

d. Discussion

The deer wintering areas have been mapped because they represent the most critical habitat during the life cycle of the Whitetail deer. Protection of this habitat insures a high percentage of winter survival. This data must be qualified somewhat to emphasize its dynamic nature. Deer wintering area use varies according to the severity of the winter. Hence, deer group together more readily and sooner in more severe winters.

The deer wintering area information for the State of Maine exists on a regional wildlife management level when based upon minor watersheds. The regions within the jurisdiction of the Land Use Regulation Commission currently have the best, most consistent data. Obtaining data from the remaining regions was more difficult inthat they currently lack completely up-to-date coverage.

14.5 Waterfowl Areas

a. Data Source and Scale

- o Ms. Mary Brady, The Research Institute of the State of Maine, South Portland, Maine
- o Mr. Alan Hutchinson, Biologist, Department of Inland Fisheries and Wildlife, Orono, Maine
- o Mr. Lee Perry, Biologist, Department of Inland Fisheries and Wildlife, Maine
- o Mr. Peter Piattoni, Office of Comprehensive Planning, Concord, New Hampshire
- o Mr. Benjamin Day, Chief Game Biologist, Agency of Environmental Conservation, Fish and Game Department, Montpelier, Vermont

- o Fish Habitats, Woods, and Wildlife Support Areas, New Hampshire Guide Plan, 1975, 1"=2 miles
- o Environmental Reconnaissance Inventory of the State of Vermont, U.S. Army Corps of Engineers, 1:500,000
- o Vermont Land Capability. Vermont State Planning Office
- o U.S.G.S. Quadrangle Sheets, 1:250,000

b. Criteria

Includes prime habitat for waterfowl production and migration as identified and delineated by the States of Vermont and New Hampshire. All wetlands in the State of Maine were mapped due to the current lack of other readily accessible sources of information.

c. Areas Included/Definition

The waterfowl habitat delineated in this overlay consists of prime nesting, resting, and feeding areas.

d. Discussion.

The major migratory corridors in the region are located along the Atlantic seacoast and Lake Champlain outside of the study area. Secondary corridors occur in association with the major drainage systems, such as the Penobscot and Connecticut Rivers. This overlay presents information which is closely related to data category, 7.4, Wetlands.

14.6 Wildlife Refuges and Management Areas

a. Data Source and Scale

- Mr. Kenneth Anderson, Chief, Planning and Coordination Division, Department of Inland Fisheries and Wildlife, Augusta, Maine
- Mr. Melvin Evans, Area Supervisor, U.S. Department of the Interior, Fish and Wildlife Service, Concord, New Hampshire
- Mr. Henry A. Laramie, New Hampshire Fish and Game Department, Concord, New Hampshire
- Mr. Hilbert R. Siegler, New Hampshire Fish and Game Department, Game Research and Management Division, Concord, New Hampshire
- Mr. Benjamin Day, Chief Game Biologist, Fish and Game Department, Agency of Environmental Conservation, Montpelier, Vermont
- State of Maine Lands, Game and Wildlife Management Areas Map, State Planning Office, Augusta, Maine
- John Lanier. U.S. Forest Service. Laconia, New Hampshire
- Fish Habitats, Woods, and Wildlife Support Areas, New Hampshire Guide Plan, 1975, 1"=2 miles
- Environmental Reconnaissance Inventory of the State of Vermont, U.S. Army Corps of Engineers, (maps at 1:500,000)
- U.S.G.S. Quadrangle Sheets, 1:250,000

b. Criteria

Includes wildlife refuges and management areas as identified and delineated by the respective states and the U.S. Department of Agriculture.

c. Areas Included/Definition

State and federal lands owned and operated with the express purpose of managing the habitat for fish and wildlife species.

d. Discussion

Areas in this category can be placed in two general groups: wetland areas and upland areas. Power line construction and maintenance and physical presence would affect wetlands differently than upland areas. Upland areas might, in fact,

benefit from certain aspects of power lines. Therefore, individual impacts would need to be studied on a case-by case basis. State lands managed primarily for timber resources or tourism/recreation were not included in this data category.

2.1.15 FISH

15.1 Warm Water Fish Habitats

a. Data Source and Scale

- o Mr. Lyndon Bond, Chief, Department of Inland Fisheries and Wildlife, Fisheries Research Division, Augusta, Maine
- o Mr. Owen C. Fenderson, Research Biologist, Department of Inland Fisheries and Wildlife, Fisheries Research and Management Division, Bangor, Maine
- o Mr. Richard Harvey, The Research Institute of the State of Maine, South Portland, Maine
- o Ms. Suanne Singer, Programmer Analyst, State Planning Office, Economic Planning and Analysis Division, Augusta, Maine
- o Mr. Melvin Evans, Area Supervisor, Fish and Wildlife Service, U.S. Department of the Interior, Concord, New Hampshire
- o Mr. Howard Nowell, Ecologist, New Hampshire Fish and Game Department, Concord, New Hampshire
- o Mr. Peter Piattoni, Office of Comprehensive Planning, Concord, New Hampshire
- o Mr. Roger Lanse, Fisheries Biologist, Fish and Wildlife Service, U.S. Department of the Interior, Hadley, Massachusetts

- o Environmental Reconnaissance Inventory of the State of Vermont, U.S. Army Corps of Engineers, 1:500,000
- o Fish Habitats, Woods and Wildlife Support Areas, New Hampshire Guide Plan, 1975, 1"=2 miles

b. Criteria

Indicates warm water fish habitats.

c. Areas Included/Definition

These fish habitats can be related to such water quality factors as temperature and dissolved oxygen. Realizing that fish species inhabit different types of water, the use of the lakes, rivers, streams, ponds and reservoirs as corridor sites will impact fish species accordingly.

d. Discussion

The fish habitats were delineated separately because various species exhibit different tolerances to change; and the recreational use of these waters will change in relation to the fish species location and associated state fishing regulations.

Warm water fishes will be affected by a different range of potential water temperature changes than the cold water species. Both warm and cold water fish species occur in the same waters (different depths of a lake, for instance). Therefore, waters are classed as warm or cold depending on whichever group of fish dominates.

Fish habitat information for the State of Maine was not mapped because it does not currently exist or was not readily accessible.

15.2 Cold Water Fish Habitats

a. Data Source and Scale

- Mr. Lyndon Bond, Chief, Department of Inland Fisheries and Wildlife, Fisheries Research Division, Augusta, Maine
- Mr. Owen C. Fenderson, Research Biologist, Department of Inland Fisheries and Wildlife, Fisheries Research and Management Division, Bangor, Maine
- Mr. Richard Harvey, The Research Institute of the State of Maine, South Portland, Maine
- Ms. Suanne Singer, Programmer Analyst, State Planning Office, Economic Planning and Analysis Division, Augusta, Maine
- Mr. Melvin Evans, Area Supervisor Fish and Wildlife Service, U.S. Department of the Interior, Concord, New Hampshire
- Mr. Howard Nowell, Ecologist, New Hampshire Fish and Game Department, Concord, New Hampshire
- Mr. Peter Piattoni, Office of Comprehensive Planning, Concord, New Hampshire
- Mr. Roger Lanse, Fisheries Biologist, Fish and Wildlife Service, U.S. Department of the Interior, Hadley, Massachusetts

- Environmental Reconnaissance Inventory of the State of Vermont, U.S. Army Corps of Engineers, 1:500,000
- Fish Habitats, Woods and Wildlife Support Areas, New Hampshire Guide Plan, 1975, 1"=2 miles

b. Criteria

Indicates cold water fish habitats.

c. Areas Included/Definition

These fish habitats can be related to such water quality factors as temperature and dissolved oxygen. Realizing that fish species inhabit different types of water, the use of the lakes, rivers, streams, ponds and reservoirs in the study area will vary accordingly.

d. Discussion

The fish habitats were delineated separately because various species exhibit different tolerances to change; and the recreational use of these waters will change in relation to the fish specie location and associated state fishing regulations. Cold water fishes will be affected by a different range of potential water temperature changes than the warm water species.

Fish habitat information for the State of Maine was not mapped because it does not currently exist or was not readily accessible.

15.3 Anadromous Fish Habitats

a. Data Source and Scale

- o Mr. Lyndon Bond, Chief, Department of Inland Fisheries and Wildlife, Fisheries Research Division, Augusta, Maine
- o Mr. Owen C. Fenderson, Research Biologist, Department of Inland Fisheries and Wildlife, Fisheries Research and Management Division, Bangor, Maine
- o Mr. Richard Harvey, The Research Institute of the State of Maine, South Portland, Maine
- o Ms. Suanne Singer, Programmer Analyst, State Planning Office, Economic Planning and Analysis Division, August, Maine
- o Mr. Melvin Evans, Area Supervisor, Fish and Wildlife Service, U.S. Department of the Interior, Concord, New Hampshire
- o Mr. Howard Nowell, Ecologist, New Hampshire Fish and Game Department, Concord, New Hampshire
- o Mr. Alfred Meister, Chief Fishery Biologist, Atlantic Sea Run Salmon Commission, Bangor, Maine
- o Mr. Peter Piattoni, Office of Comprehensive Planning, Concord, New Hampshire
- o Mr. Roger Lanse, Fisheries Biologist, Fish and Wildlife Service, U.S. Department of the Interior, Hadley, Massachusetts

- o Environmental Reconnaissance Inventory of the State of Vermont, U.S. Army Corps of Engineers, 1:500,000
- o Fish Habitats, Woods and Wildlife Support Areas, New Hampshire Guide Plan, 1975, 1"=2 miles
- o The Atlantic Sea Run Salmon of Maine, Atlantic Sea Run Salmon Commission, University of Maine South Campus, Bangor, Maine

b. Criteria

Indicates existing Atlantic Salmon fish habitats.

c. Areas Included/Definition

This habitat is critical becaue it provides Atlantic Salmon and other anadromous fish with spawning and nursery habitat to complete the fresh water phase of their life cycles. Atlantic Salmon require a reasonably unobstructed migratory path and clean spawning and nursery areas to continue to reproduce in their current distribution.

d. Discussion

Each state recognizes Atlantic Salmon as a significant recreational opportunity. Vermont and New Hampshire, for example, are currently involved in a cooperative stocking and restoration program with the Federal government and several other New England states. Maine is the only New England state with self-operating native populations of anadromous Atlantic Salmon. Note: all three states have landlocked non-migratory populations of Atlantic Salmon.

2.1.16 VEGETATION

16.1 Endangered and Threatened Species

a. Data Source and Scale

- University of Maine Herbarium, Orono, Maine
- Mr. Harry R. Tyler, Jr., Biologist-Planning Analyst, Executive Department, State Planning Group, Augusta, Maine
- University of New Hampshire Herbarium, Durham, New Hampshire
- Dr. Herbert Vogelmann, Pringle Herbarium, University of Vermont, Burlington, Vermont
- Mr. Christopher Campbell, graduate student in botany, Harvard University, Cambridge, Massachusetts
- Dr. Norton Miller, Gray Herbarium, Harvard University, Cambridge, Massachusetts
- Dr. Kenneth Robertson, Gray Herbarium, Harvard University, Cambridge, Massachusetts
- Dr. Elizabeth Shaw, curator, New England Botanical Club Herbarium, Harvard University, Cambridge, Massachusetts
- Mr. Paul Nickerson, Endangered Species Coordinator, Fish and Wildlife Service, U.S. Department of the Interior, Boston, Massachusetts

- Threatened or Endangered Fauna or Flora, Review of Status of Vascular Plants and Determination of "Critical Habitat," Fish and Wildlife Service, U.S. Department of the Interior

b. Criteria

Vegetative species recommended by the Smithsonian Institute (House Document 94-51) to the Department of Interior were considered for mapping purposes. The actual number of species mapped was in direct response to the amount and type of data available. As yet, these species are not officially recognized

as endangered or threatened. We consider them as similar to wildlife Species of Special Concern. These species may not be threatened throughout their entire range in the United States but have declined significantly in Vermont, New Hampshire and Maine, or are peripheral and occupy such a limited range, that they are rare in number and should receive special attention by various planning agencies.

When and if they will be designated as Endangered or Threatened they will be defined as follows:

Endangered Species, those species in danger of extinction throughout all or a significant portion of their range; and threatened species, those species which are likely to become endangered within the forseeable future throughout all or a significant portion of their range.

c. Areas Included/Definition

The following plant species were mapped:

Name	State
o Scirpus Ancistrochaetus	Vt.
o Astragalus Robbinsii Var. Jesupi	Vt., N.H.
o Isotria Medeoloides	Vt., N.H.
o Calamagrostis Inexpansa Var. Novae-Angliae	Vt., N.H.
o Cypripedium Arietinum	Vt.
o Potamogeton Hillii	Vt.
o Geum Peckii	N.H.
o Potentilla Robbinsiana	N.H.
o Paronychia Argyrocoma Var. Albimontana	N.H.
o Isoetes Eatonii	N.H.
o Isoetes Foveolata	N.H.
o Listera Auriculata	N.H.
o Carex Elachycarpa	Me.
o Mimulus Ringens Var. Colpophilus	Me.
o Paronychia Argyrocoma Var. Albimontana	Me.
o Carex Oronensis	Me.
o Listera Auriculata	Me.

d. Discussion

These species and their habitats would receive broad Federal protection under the Endangered Species Act of 1973 when and if they are designated by the Secretary of the Interior. These species are measurably close to extinction and there are severe sanctions placed upon the disruption or taking of these species or their habitat. The finality of that ultimate classification is moral and potentially legal, cause to protect them.

16.2 Alpine Tundra (Species of Special Concern)

a. Data Source and Scale

- o Vermont Natural Areas, Report 2, Herbert W. Vogelmann, Central Planning Office and Interagency Committee on Natural Resources, Montpelier, Vermont
- o LAND/SAT Imagery at approximately 1:250,000
- o U.S.G.S. Quadrangle Sheets, 1:500,000
- o U.S.G.S. Quadrangle Sheets, 1:250,000
- o U.S.G.S. Quadrangle Sheets, 1:62,500

b. Criteria

Indicates those areas of Alpine Tundra vegetation.

c. Areas Included/Definition

Includes those areas shown as white, meaning treeless lands, above 4000 feet on the U.S.G.S. Quadrangle Sheets. There are some exceptions where the Alpine Tundra extend to 3600 to 3700 feet on certain mountains in response to severe climatological and topographical conditions.

d. Discussion

The delicate ecology of the Alpine Tundra to any form of disturbance necessitated mapping it on a separate overlay.

16.3 Spruce-Fir Association

16.4 Northern Hardwoods Association

16.5 Lowland Hardwoods Association

16.6 Transitional Hardwoods Association

16.7 White or Red Pine/Eastern Hemlock Association

16.8 Pitch Pine

a. Data Source and Scale

- o Mr. Paul Adumus, Environmental Biologist, Center for Natural Areas, South Gardner, Maine
- o Dr. Burton Anderson, State Planning Office, Resources Planning Division, Augusta, Maine
- o Dr. Marshall D. Ashley, Forest Resources, School of Forest Resources, University of Maine, Orono, Maine
- o Mr. George Borasa, Director, Utilization Forester, De-Partment of Conservation, Bureau of Forestry, Augusta, Maine
- o Mr. Temple A. Bowen, Jr., Deputy Commissioner, Department of Conservation, Augusta, Maine
- o Mr. Joseph Chaisson, Executive Department, State Planning Office, Augusta, Maine

- Mr. James Norris, Department of Finance and Administration, Bureau of Taxation, Augusta, Maine
- Mr. Harry R. Tyler, Jr., Biologist-Planning Analyst, Executive Department, State Planning Group, Augusta, Maine
- Mr. John Walker, Director, Bureau of Forestry, Augusta, Maine
- Mr. Norman Hudson, Agency of Environmental Conservation, Department of Forests, Parks and Recreation, Montpelier, Vermont
- Mr. Carl Mayer, Project Leader, Northeastern Forest Experiment Station, United States Department of Agriculture.

- The Timber Resources of Maine, Northeastern Forest Experiment Station, United States Department of Agriculture, 1"=50 miles
- The Forest Resources of New Hampshire, Northeastern Forest Experiment Station, United States Department of Agriculture, 1"=15 miles
- The Timber Resources of Vermont, Northeastern Forest Experiment Station, United States Department of Agriculture 1"=30 miles
- Natural Forest Vegetation Zones of New England, by New England Section, Society of America Foresters, 1955, 1"=20 miles

b. Criteria

Indicates specific vegetation associations

c. Areas Included/Definition

These vegetation associations were mapped in response to economic, aesthetic, and wildlife values.

d. Discussion

The lack of current data in relation to this study's scale and scope was recognized as a limitation. Therefore, the forest associations were generalized as little as possible to optimize the data.

2.2 UNMAPPED DATA

2.2.1 Seismic Risk Zones

a. Data Source

- o A, Tectonic Map, Seismotectonic Map of the Eastern United States, 1974 U.S. Geologic Survey; 1:500,000
- o B, Earthquake Epicenters, 1800-1972, Seismotectonic Map of the Eastern United States, 1974 U.S. Geologic Survey; 1:500,000
- o C, Seismotectonic Map, Seismotectonic Map of the Eastern United States, 1974 U.S. Geologic Survey; 1:500,000
- o Earthquake Information Bulletin; Jan.-Feb. 1974; Volume 7, No. 1, United States Department of Interior
- o Seismic Hayard Index for the United States

b. Data Discussion

Most locations of past earthquake epicenters plotted on the U.S.G.S. Seismotectonic Maps used as references sources for these overlays are generalized. Due to the relatively low frequency of occurence of eastern earthquakes (about 6.2 earthquakes of MMIV-V or greater per year during 1900-1970), it was considered desirable to include data from the earlier period of less complete records in order to obtain as long a record of seismic activity as possible. This means that probably 85 percent of the epicenter locations upon which these maps are based are from macroseismic rather than instrumental observations and limited correspondingly in accuracy.

Based upon this information and information from the National Earthquake Information Service, we can expect relatively few significant earthquakes within the study area. Given the nature of transmission facilities, there is very little seismic risk.

2.2.2 Bedrock Geology

Data Discussion

The topic of bedrock geology represents a non-barrier data component when considering impact upon transmission facilities. Influence upon engineering costs are minimal in relation to location of power lines. As a result, the corridor is not responsive to the bedrock geology as it relates to the present level of survey.

Data available for mapping of bedrock geology is inconsistant throughout the study region. Sporadic plotting of such information provides a poor foundation for evaluation of geologically significant features.

2.2.3 Surficial Geology

a. Data Source

- Robert G. Doyle, State Geologist, State of Maine.
- Charles G. Doll, State Geologist, University of Vermont.

b. Discussion

Surficial geology is discussed in Section 3.5.3 and also in 3.5.2, Ground Water and Aquifers. Certain specific surficial geologic deposits have been mapped because they represent the major important groundwater aquifers of the region. However, other surficial geologic deposits have not been mapped since they are not critical determinants in the location of transmission corridors and because available data on the subject was inconsistent.

2.2.4 Regional Climatic Data

Discussion

Regional climatic conditions within the study area are discussed in section 3.2 of the main text. The characteristics of such regional conditions make the mapping of such data meaningless realtive to specific corridor locations. Information at this level has been gathered for other than micro-climatic information. Micro-climatic conditions have been accounted for relative to slope orientation and physiographic characteristics which might influence location.

2.2.5 Existing Gas Lines

a. Data Source

- o New England Regional Commission
- o Federal Energy Administration
- o Maine Public Utilities
- o New Hampshire Public Utilities Commission
- o Vermont Energy Office
- o Vermont Public Service Board
- o Gas Industry Development in New England, Energy Program Technical Report 75-9. New England Regional Commission, Nov. 1975.
- o U.S. Petroleum and Gas Transportation Capacities, National Petroleum Councils Committee on Oil and Gas Transportation Facilities, Sept. 1967.

b. Data Discussion

Research into the area of gas lines reveals a lack of any pipeline routes within study boundaries. Individual gas and oil maps delineating all major pipeline routes show none penetrating into the defined study area. Both regional and individual state maps were utilized to check and cross check all routes within the New England states. Also referenced were representatives from the above agencies defining pipeline routes within their jurisdiction.

2.2.6 Moose Wintering Areas

a. Data Source

- Francis Duhn, Maine Inland Fisheries and Game

b. Data Discussion

Moose, another resident Big Game Animal in Maine, has no open season but yet is abundant. Unlike other subspecies of Moose, for example, Shirras Moose, these animals do not concentrate on winter habitat. Hence, no critical habitat could be identified other than the entire Home Range Distribution which encompasses most of Maine. Such distribution characteristics prove meaningless relative to the mapping system in determining constraints to define specific corridor alignment.

2.3 DATA DEFICIENCIES

2.3.1 Shallow Depth to Bedrock

Depth to bedrock information is not uniformly obtainable throughout the study area. Soil series from which this kind of information is usually derived, is not available for most of the area of northern Maine, which comprises more than half of the land area.

Also from a constraint point of view, depth to bedrock may be considered of minimal value to determining engineering costs to the location of power lines.

2.3.2 Rock Slide/Earch Slide Areas

a. Data Source

- Robert G. Doyle, State Geologist, State of Maine
- Charles G. Doll, State Geologist, University of Vermont

b. Discussion

The northeastern region of the United States does not have areally extensive rock slide or earth slide problems. This is partially due to the age of the landscape and the weathering that has taken place over the years. Extensive rock slides have occurred within the study area, especially in the White Mountain Area. While quite destructive, these landslide areas are not extensive in area and will be a consideration in the routing stage of transmission facility location.

Slides in the study area are characteristically long and narrow, averaging about 100 feet. Extensive study on rock and debris slides were made by Arthur Casagrande and Don U. Deere in their investigation for the New Hampshire Department of Public Works and Highways, entitied: Investigation of Engineering Problems Affecting Interstate Route 93 through Franconia Notch (December, 1966). Further information on landslides can be found in the work of Flaccos, Edward, White Mountain Landslides, Appalachia, December, 1958.

2.3.3 Endangered and Threatened Floral Species

a. Data Source

- o Pringle Herbarium, Burlington, Vermont.
- o Harvard University Herbarium, Cambridge, Massachusetts.
- o University of New Hampshire Herbarium.
- o University of Maine at Orono Herbarium, Orono, Maine.
- o New England Botanical Club, Harvard University, Cambridge, Massachusetts.
- o Dr. C. Barry Aellquist, Boston State College, Boston, Massachusetts.

b. Data Discussion

At present, the information retained by the above persons and sponsors have not taken the existing block of new data (herbarium specimen records) and analyzed it for Endangered and Threatened Species . The processing of the data having not been completed, provides no foundation for creating a distribution map for such designated species. The lack of mappable information within this data component creates an information void relative to Endangered and Threatened Species.

2.3.4 Species of Special Concern

a. Data Source

- Report on Endangered and Threatened Species including those species deriving special consideration in New Hampshire and Vermont, Bollengier, 1974.
- Mr. Ben Day, Vermont Fish and Game
- Mr. Anderson, Maine Inland Fish and Wildlife
- Mr. H. Nowell, New Hampshire Fish and Game

b. Data Discussion

Unreliably mapped data exists for the following federally defined species:

Common Tern	Red-Headed Wood Pecker
Short-billed Marsh Wren	Golden Eagle
Piping Plover	Blue Bird
Upland Plover	Rock Vole
Barn Owl	New England Cottontail Rabbit

Very little is known on the specific distributions of the individual critical habitat or ranges of each respective species. In some instances the species may be so widespread that mapping would not be meaningful. Plants for instance might require narrow habitat requirements to exist and be inventoried in a few locations--however potential occurrence may be much larger.

The undefinable characteristics of such speices creates an informational void. The data deficiency encountered makes this topical area unusable in the mapping system for locating transmissions corridors.

2.3.5 Waterfowl

a. Data Source

- o Tudor Richards, New Hampshire Audubon Society
- o Mr. Anderson, Maine Inland Fisheries and Wildlife
- o Mr. Ben Day, Vermont Fish and Game

b. Data Discussion

While the waterfowl are not the only migratory birds within the study area, they are the only taxa to restrict themselves to a readily identifiable habitat. Migrating terrestrial birds have few, if any, critical habitat requirements which impose constraints to corridors. The absence of explicit mappable information leaves no barrier reference points to influence corridor location.

2.3.6 Species Under Consideration for Endangered and Threatened Floral Species

a. Data Source

- o Endangered and Threatened Plants of the U.S., 197, Smithsonian Institute, Washington, D.C.
- o Endangered Species Act, 1973, U.S. Government
- o Rene Bollengier, U.S.F.W.S., Concord, New Hampshire

b. Data Discussion

Species of plants considered here are listed by "state" and not by specific locality. This topic represents plant species recommended for Endangered and Threatened status. None listed here have been specifically designated by the Secreatry of the Interior as qualifying for protection under the Endangered and Threatened Species Act of 1973. Plant species indluded below have been recommended for recognition by a branch of the Department of the Interior.

New Hampshire	Vermont
Whitlow-wort	Potomoyeton hillii
Mountain Avens	
Calamagostis inexpansa var. novae-angliae dwarf (in que foil)	

2.4 DATA TO BE CONSIDERED AT NEXT LEVEL (SCALE) OF STUDY

2.4.1 Zoning

a. Data Source

Comprehensive Land Use Plan for the Plantations and Unorganized Townships of the State of Maine, a working draft for public review, Maine Land Use Regulation Commission

b. Data Discusssion

A thorough investigation was made into the possibility of gathering data and mapping zoning. Discussions with state planning officials and regional planning commissions as well as an investigation of existing data sources were undertaken. The final conclusion was that zoning should not be mapped at this preliminary study level, but that it would become important at the next, final level of analysis.

First, zoning data is not consistently available throughout the study area, either through towns, counties, or regional planning agencies. Not all of the towns have zoning. Many regional planning commissions do not have either copies of the town's zoning plans under their jurisdiction or a composite zoning map. In New Hampshire, within the study area, there are no regional planning agencies, and the counties do not keep records of zoning.

An alternative to collection data for all town's zoning would be to select only the most populated ones. In the study area there are approximately 10-15 towns and cities over 10,000 population.

However, this was dropped as an alternative. State and regional planners uniformly argued that at our scale of analysis - of 1"=8 miles, zoning patterns could not be meaningfully distinguished. More importantly, zoning would not extend significantly beyond the existing urbanized or built up areas. Rural or agricultural lands would be mapped in other categories and would not as such be significant constraints.

In Maine, there is a unique case, the Land Use Regulation Commission's zoning within the unorganized towns and plantations. The Land Use Regulation Commission was consulted extensively to determine the importance of various lands and resources protected under its rules and regulations. It must be realized that at the time of writing this report that the Comprehensive Land Use Plan is in the process of being adopted. Public discussion and debate is a part of the process of formal adoption. According to L.U.R.C. most of the resource protection priorities will most likely remain the same, with, for example, protection of wetlands having the highest degree of protection.

The data mapping undertaken in this study is virtually the same as that being done by the Commission, except that their maps are more detailed and data collection has taken place over a much larger period of time. It was argued that with few exceptions all of the protection areas mapped by LURC have mapped in this study. The exceptions are the areas which would not appear on maps undertaken at our scale of analysis such as the stream, lake, and pond 250 foot setbacks. Interrim Land Use Guidance Maps were consulted for wildlife habitats especially "deer wintering areas" because these maps contained the best comprehensive source of this information. Hence, by having mapped virtually the same information as that mapped by L.U.R.C. the concerns of this regulatory commission have been addressed in a manner consitent with their policies toward resource protection.

2.4.2 Existing Municipal Wells

a. Data Source

- o Vermont Department of Water Resources, Geohydrologist
- o New Hampshire State Office of Comprehensive Planning
- o U.S. Geological Survey, Groundwater Geologist, Augusta, Maine
- o Maine Department of Water Resources
- o Maine Department of Human Services

b. Data Discussion

Information regarding municipal wells is primarily contained at the local level within each township. The large number of individual townships makes the task of data accumulation a time consuming and labor intensive inventory process. Also, the availability and quality of information would be inconsistent across the study area. The study both in time and scope of detail must avoid this information for the present level of survey. However, most local municipal wells are found within the areas defined as town centers on the overlay system. Town centers as plotted on the mapping system represent an area of approximately 160 acres at the defined centers.

2.4.3 ROCK OUTCROPS

Discussion

Data which may be obtained is relatively inconsistent across the study area. The inadequate quality of available data hinders the recognition of rock outcrops for the assessment process. Data which is mapped is too point specific to influence corridor location at the present level of survey. However, there are no large areal extensive rock outcrops which can be defined as meaningful to the corridor route.

2.4.4 EXISTING TELEPHONE LINES

a. Data Source

- o New England Telephone, Regional Office, Engineering Division

b. Data Discussion

In an effort to locate the primary "spine" corridors within each state, there is no readily available information catalogued by New England Telephone. Although there exists a wealth of information on hand at the regional engineering office, the data is not in any usable form for mapping of such routes. Sources indicate the time span necessary to gather the information we require would exclude our present assessment time-frame. Also, the engineering office views such information gathering as low priority relative to other existing office efforts.

2.4.5 Arnold Trail (National Historic Place)

a. Data Source

- National Register of Historic Places, Federal Register, Vol. 41, No. 28.
- A Downeast Experience, Maine: Historic Memorials, Maine Department of Commerce and Industry, State House, Augusta, Me.
- Historic Maine; the Great State of Maine, Historic Sites Department of Commerce and Industry, State House, Augusta, Me.
- Mr. John Briggs, Historian, Department of Conservation, State of Maine.
- Mr. Dave Clark and L. J. Hovig, National Park Service, North Atlantic Region, Boston, Mass.
- Mr. Earl G. Shettleworth Jr. State Historic Preservation Officer (SHPO). Director, Maine Historical Preservation Commision, 31 Western Ave. Augusta, Me.
- Area Investigation Report on Benedict Arnold Scenic Road: Maine, H. Gurney, W. Johnson, R. Wittpenn; Natural Park Service - Northeast Region, U.S. Department of the Interior, March 1965

b. Data Discussion

The Benedict Arnold Historic trail in Maine represents a "concept for historic interpretation" of the route followed by Benedict Arnold and his troops in the autumn of 1775 on the Maine portion of their historic march to Quebec. The trail stretches 194 mile from Fort Popham at the Kennebec River north and west to the Canadian border at Coburn Grove, Maine. There are presently 33 interpretive panels at nine different sites along the route, including Popham Hallowell, Skowhegan, Solon, Moscow, Stratton,Sarampus, Chain of Ponds and Coburn Grove. The sites of these markers located within the 'study area' have been plotted on the environmental resource data map entitled National Register Historic Sites (9.1).

The original route followed by Arnold and his army is not entirely a hiking trail; the route contains many long and rough portages and significant lengths of water travel. Arnold's men used canoes for travel over many large lakes and parts of the Kennebec and Dead Rivers. Portions of the original route around Augusta, Winslow, Waterville, Skowhegan, and Madison have undergone urbanization and the character of the trail surroundings in these areas have changed significantly.

The trail has been delineated in two ways:

1) the route of Arnold's expedition in Maine
2) A proposal for a "Benedict Arnold Scenic Road" utilizing roads in proximity to the historic trail route.

When entered on to the National Register of Historic Places in 1969 the location of the trail was recognized by a large rectangular area defined by points of latitude and longitude. This is the recognition provided in the register. It is further qualified in the accompaning text to the National Register of Historic Places Inventory - Nomination Form that;

"There is a Master U.S.G.S. Map enclosed with a rectangle outlined on it with the latitude and longitude coordinates stated. This rectangle is for general location purposed only . The historic area lies somewhere within this general rectangle. It is not implied that everything inside the rectangle is to be considered historic or pertinent to Col. Arnolds march."

Since the trail runs across the entire state of Maine any one of the proposed system plans will have to cross the trail. There are several important factors that should be considered at a more site specific (transmission route) level of study.

1) From an overview of information on the Arnold trail it is evident that both the surroundings of the historic trail location and the propose 'scenic road' location should receive equal considerations in relation to protection and integration of possible impacts of transmission lines.

2) The National Park Service has developed recommendations for recreation and interpretative development in certain locations along the trail. These recommendations should be considered in locating any trail crossings by transmission lines.

3) In some areas the historic trail route and the proposed 'scenic road' closely parallel one another; while in other areas they are separated by some distance. In certain instances (primarily dependant upon the visual impact of transmission facilities) it may be desirable to cross the trail route and the scenic road in a location where they are separated from one another.

3.0 INDIVIDUALS/AGENCIES CONTACTED

The following section contains a list of individuals and/or agencies contacted during the course of this assignment. Contact was established primarily to obtain information on environmental resource data or agency policy related to such data and their impact as a result of transmission corridor/ transmission route location. The contacts are listed alphabetically by state with a separate section for contacts having a regional or federal overview.

3.1 Regional/Federal

Blunt, Terry	Connecticut River Watershed Council	Easthampton, Ma.
Peceoraro, Mr.	Federal Energy Research Administration	Boston, Ma.
Buesing, Gregory	Federal Regional Council	Boston, Ma.
Campbell, Christopher	Harvard University	Cambridge, Ma.
Miller, Dr. Norton	Harvard University	Cambridge, Ma.
Robertson, Dr. Kenneth	Harvard University	Cambridge, Ma.
Schmidt, Alan	Harvard University, GSD - Lab for Computer Graphics	Cambridge, Ma.
Shaw, Elizabeth	Harvard University	Cambridge, Ma.
Trout, Frank	Harvard University	Cambridge, Ma.
Grayer, Eugene	Mobil Pipeline Company	Plainfield, N.J.
Carlson, Jane	NERBC	Boston, Ma.
Allen Jackson	National Cartographic Information Center, Chief Edit	Reston, Va.
Brittle, Diane	National Cartographic Information Center	Reston, Va.
Aslain, Eddie	National Park Service	Boston, Ma.
Benjamin, Jack	National Park Service	Boston, Ma.

Peluso, Gene	National Park Service	Boston, Ma.
Northrup, Brad	The Nature Conservancy, Director	Boston, Ma.
Lautzchueiser, Robert	New England Climatologist (Private Consultant)	Boston, Ma.
Hemenway, John	New England Forestry Foundation Executive Director	Boston, Ma.
Hagenstein, Perry R.	New England Natural Resources Center	Boston, Ma.
Vidka, Mr.	New England Regional Commission	Boston, Ma.
Schneeberg, Sara	New England River Basins Commission	Boston, Ma.
Watson, Charles	New England River Basins Commission, Resource Planner	Boston, Ma.
Burnam, Rueben	New England Telephone	Boston, Ma.
Sullivan, Bob	New England Telephone	Boston, Ma.
Mayer, Carl	Northeast Forest Experimental Station, Project Leader	Upper Darby, Pa.
Jackson, Kenneth	U.S. Army Corps of Engineers, Chief, Processing Section	Waltham, Ma.
Ladd, Ruth	U.S. Fish and Wildlife Service	Boston, Ma.
Nickerson, Paul	U.S. Fish and Wildlife Service, Endangered Species Coordinator	Boston, Ma.
Goode, Elizabeth	U.S. Geological Survey	Boston, Ma.
Ryder, Robert	U.S. Department of the Interior	Boston, Ma.
Whitworth, Walter	University of Connecticut	Storrs, Ct.

3.2 Maine

Attig, John	Androscoggin Valley Regional Planning Commission, Geologist	Auburn, Me.
Kilham, Steve	Androscoggin Valley Regional Planning Commission	Auburn, Me.
Monroe, Mike	Bangor Hydroelectric	Bangor, Me.

Hartranft, John L.	Boyse-Cascade (also Oxford) Paper Company, General Manager Woods Department	Rumford, Me.
Hendon, Ken	Bureau of Forestry	Augusta, Me.
Clunie, Bob	Bureau of Geology	Augusta, Me.
Doyle, Robert G.	Bureau of Geology, State Geologist	Augusta, Me.
Briggs, John	Bureau of Parks and Recreation	Augusta, Me.
Hoar, Leigh	Bureau of Public Lands	Augusta, Me.
Adamus, Paul	Center for Natural Areas (Private Consultant)	South Gardiner, Me.
Kelley, Donald	Central Maine Power Company	Augusta, Me.
Terry, Prof.	Colby College, Botany Department	Waterville, Me.
Tyler, Harry J.	Critical Areas Porgra, Maine State Planning Office	Augusta, Me.
James, Richard	Department Environmental Protection, Maine, Division Water Quality Control	Augusta, Me.
Bowen, Temple	Department of Forestry	Augusta, Me.
Gooley, Robert	Department of Forestry, Director	Augusta, Me.
Hammond, Ray	Department of Human Services	Augusta, Me.
Starbird, Glen	Department of Indian Affairs	Augusta, Me.
Chicle, Steven	Department of Inland Fisheries and Game, Assistant Biologist	Strong, Me.
Bond, Lyndon	Department of Inland Fisheries and Wildlife, Fisheries Department, Chief	Augusta, Me.
Donovan, Gary	Department of Inland Fisheries and Game	Augusta, Me.
Dunn, Francis	Department of Inland Fisheries and Wildlife, Moose Biologist	Patten, Me.
Fenderson, Owen	Department of Inland Fisheries and Wildlife	Bangor, Me.
Gramlich, Frank	Department of Inland Fisheries and Wildlife	Augusta, Me.

Hurley, Frederick	Department of Inland Fisheries and Game	Augusta, Me.
Cieslinski, Tom	Department of Parks and Recreation	Augusta, Me.
Pruzunka, Alfred	Department of Water Resources	Augusta, Me.
Fiske, Robert Raymond, Earl	Forestry Mapping	
Carson, Jim House, Skip	Great Northern Paper	Millenocket, Me.
Campbell, Wallace	Hudson Paper & Pulp Company Head, Woodlands Division	Augusta, Me.
Connors, Jim Radsky, Tom Tood, Fred	Land Use Regulation Commission	Augusta, Me.
Fongenie, Ray	Loring Air Force Base, Engineering Division	Limestone, Me.
Connors, James	LURC, Maine Department Environmental Protection	Augusta, Me.
Dow, Todd	Maine Association of Conservation Commissions	Keenebunkport, Me.
Ginn, Bill	Maine Audubon Society	Portland, Me.
Baswell, Branford	Maine Bureau of Geology	Augusta, Me.
Cottrell, Barbara	Maine Bureau of Public Lands	Augusta, Me.
Parker, Vicky	Maine Bureau of Public Lands	Augusta, Me.
Record, Larry	Maine Bureau of Taxation	Augusta, Me.
Walker, John	Maine Department of Conservation Director, Bureau of Forestry	Augusta, Me.
Hammond, Ray	Maine Department of Health and Welfare	Augusta, Me.
Meister, Alan	Maine Department of Inland Fisheries and Wildlife	Bangor, Me.
Perry, Lee	Maine Department Inland Fisheries and Wildlife	Augusta, Me.
Shettlesworth, Earl G.	Maine Historic Preservation Commission	Augusta, Me.

Bradford, Charles	Maine Nature Conservancy	Manchester, Me.
Bradford, Mrs. Charles	Maine Nature Conservancy	Augusta, Me.
Smith, Mary Lynn	Maine Nature Conservancy	Augusta, Me.
Nadeau, J.H.	Maine Public Service Co.	Presque Isle, Me.
Cunningham, Mr.	Maine Public Utilities Commission	Augusta, Me.
Anderson, Burton	Maine State Planning Office	Augusta, Me.
Pease, Alan	Maine State Planning Office	Augusta, Me.
Powell, Fourtin	Maine State Planning Office	Augusta, Me.
Singer, Suanne	Maine State Planning Office	Augusta, Me.
Norris, James	Maine State Property Taxation	Augusta, Me.
Dickson, Tom	North Maine Woods Association	Bangor, Me.
Markus, Diane	Paper Industry Office	Augusta, Me.
Secretary	Penobscot County Commissions Office	Bangor, Me.
Carter, Key	Penobscot Valley Regional Planning Commission	Bangor, Me.
Anderson, Kenneth	Planning Department of Inland Fisheries and Wildlife, Chief	Augusta, Me.
Nelson, Forest	Prentis and Carlisle Company	Bangor, Me.
Meadows, Ed	Seven Islands Land Company	Bangor, Me.
Gould, John	St. Regis Paper Company	Bucksport, Me.
Tyrone, Theodore	Sewall Company	Old Town, Me.
Brockway, Bruce	Timberlands Diamond International Company, Manager	Old Town, Me.
Brady, Mary Harvey, Dick	TRIGOM, Research Institute of the Gulf of Maine	South Portland, Me.
Snow, Bill	U.S. Fish and Wildlife Service	Augusta, Me.
Blum, Barton	U.S. Forest Service	Orono, Me.
Frank, Robert	U.S. Forest Service	Orono, Me.
Prescott, Glen	U.S. Geological Survey	Augusta, Me.

Joslin, Robert	U.S. Soil Conservation Service	Orono, Me.
Ashley, Marshal	University of Maine, Forestry Department	Orono, Me.
Coulter, Malcolm	University of Maine	Orono, Me.
Davis, Ronald	University of Maine, Professor of Botany	Orono, Me.
Holland, Maxine	University of Maine, Wildlife Society	Orono, Me.
Homola, Dr.	University of Maine	Orono, Me.
Hutchinson, Alan	University of Maine, Department of Inland Fisheries and Game, Wildlife Biologist	Orono, Me.
Knight, Fred	University of Maine Professor of Forestry	Orono, Me.
Loder, Chad	University of Maine, Professor of Botany	Presque Isle, Me.
Smith, Richard	University of Maine, Business Office	Farmington, Me.
Tripp, Terrence	University of Maine	Presque Isle, Me.

3.3 New Hampshire

Sargent, Howard J.	Archaeologist (Private Consultant)	Georges Mills, N.H.
Barnham, Bob	Dartmouth College, Asssisant to Vice President of Administration	Hanover, N.H.
Crooker, Mrs.	Dartmouth College	Hanover, N.H.
Wilson, Linda	New Hampshire Division of Historic Preservation	Concord, N.H.
Nowell, Howard	New Hampshire Fish and Game Department	Concord, N.H.
Willey, Joe	New Hampshire Fish and Game Department	Concord, N.H.
Piattoni, Peter	New Hampshire Office of Comprehensive Planning	Concord, N.H.

Barbour, Roy	Public Service Company	Manchester, N.H.
Ellsworth, Bruce	New Hampshire Public Utilities Commission	Concord, N.H.
McCabe, Beverly	Society for Protection of New Hampshire Forests	Concord, N.H.
Lanier, John	White Mountain National Forest U.S. Department of Agriculture Wildlife Ecologist	Laconia, N.H.

3.4 Vermont

Drown, Warren	Atlas Plywood Company	Montpelier, Vt.
Lathrop, Shirlene	Vureau of Taxation	Montpelier, Vt.
Hudson, Norman	Department of Forests, Parks, Recreation	Montpelier, Vt.
Butterfield, David	Department of Water Resources	Montpelier, Vt.
Nesbitt, Tom	Department of Water Resources	Montpelier, Vt.
Koenemann, Ed	Environment Conservation	Montpelier, Vt.
Day, Ben	Fish and Game Department	Montpelier, Vt.
Dickenson, Nate	Fish and Game Department, Deer Biologist	Springfield, Vt.
Green Norman	Forestry Department	Montpelier, Vt.
Boyle, Terrence	Landscape Architect (Private Consultant)	Burlington, Vt.
Fischer, Montgomery	New England River Basins Commission	Montpelier, Vt.
Doll, Charles G.	University of Vermont, State Geologist	Burlington, Vt.
Hoffman, Ben	State Lands Management	Montpelier, Vt.
Malloy, Dennis	State Planning Office	Montpelier, Vt.
Fuller, Robert	University of Vermont	Burlington, Vt.
Power, Margery	University of Vermont	Burlington, Vt.
Vogelmann, Dr. H.W.	University of Vermont, Prof. of Botany	Montpelier, Vt.

Beard, Carol	Velco	Rutland, Vt.
Dumas, Roger	Vermont Energy Office	Montpelier, Vt.
MacMartin, Jim	Vermont Fish and Game Department	Montpelier, Vt.
Lanza, Frank J.	Vermont Highway Department	Montpelier, Vt.
Finney, William	Vermont Division of Historical Preservation	Montpelier, Vt.
Gilbertson, Eric	Vermont Division of Historical Preservation	Montpelier, Vt.
Bradley, Darby	Vermont Natural Resources Council	Montpelier, Vt.
Kline, Robert	Vermont Natural Resources Council	Montpelier, Vt.
Malloy, Dennis	Vermont Office of State Planning	Montpelier, Vt.
Crilly, Ed	Vermont Public Service Board	Montpelier, Vt.
Foster, Wayne	Vermont Public Service Board	Montpelier, Vt.

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This section contains a listing of maps from which information can be obtained under each topic listed. The list is not comprehensive as it lists only valuable mapped information which may not appear in the Data Qualification Section; Section 2.1 of Volume II.

Supplementary map references are listed in the Data Qualification Section in conjunction with other information sources, and serve to complement this inventory.

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6.0 REFERENCE OF RESOURCES CITED

This section provides a comprehensive list of all the documents reviewed for the inventory process. Information contained within are utilized for the purpose of defining the environmental resources of the study region. This section should not be confused with Section 4.0--List of Works Cited--which is explained within its respective chapter.

The reference list is noted by topical area, as in the Data Qualification section, which relates directly to the Analysis Matrix. The (16) sixteen topical areas are sub-divided into individual state and regional headings. This breakdown represents the geographical coverage of the information noted within an individual document.

6.1 Land Use

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