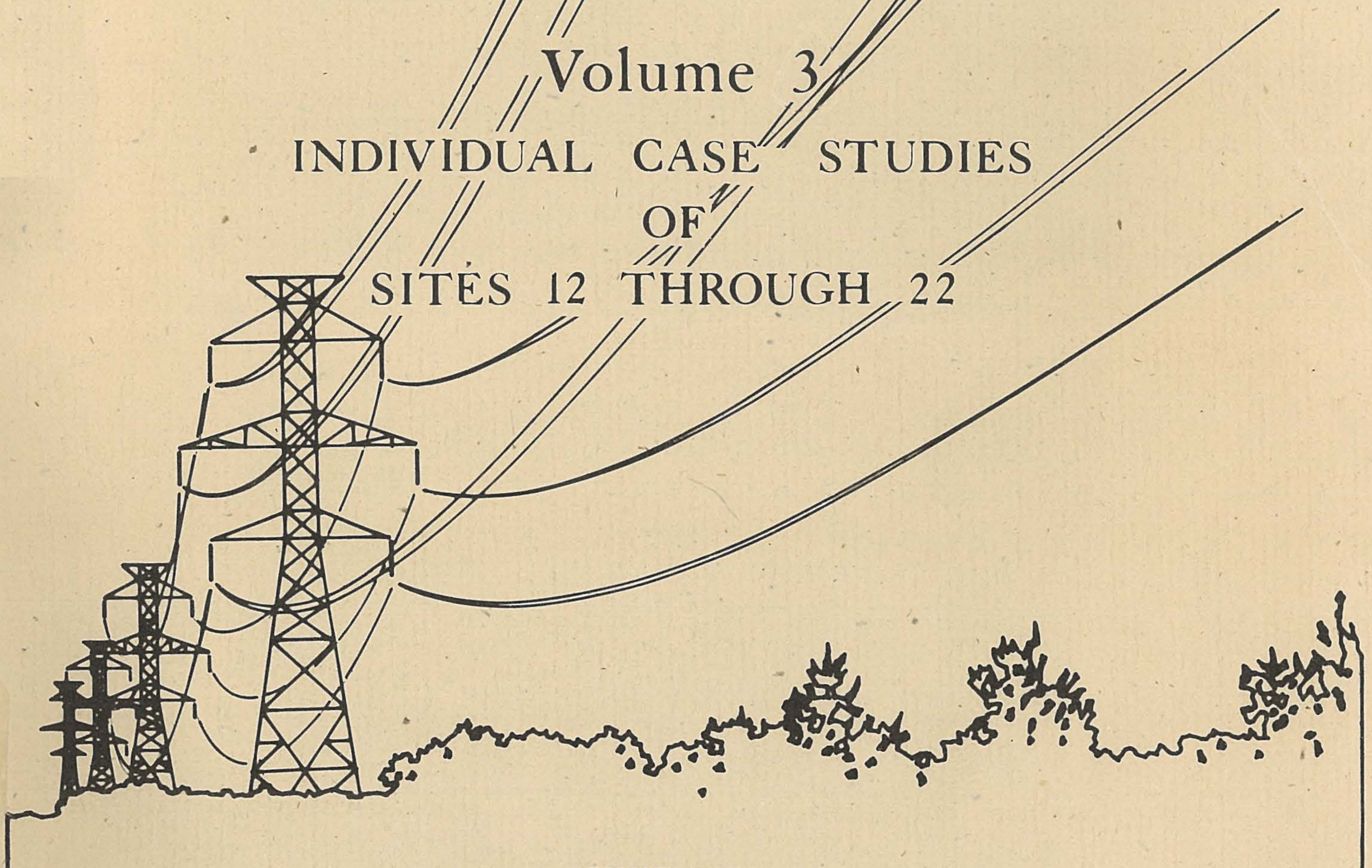
Individual Case Studies of Sites 12 through 22

3

ENVIRONMENTAL AND ECONOMIC ASPECTS OF CONTEMPORANEOUS ELECTRIC TRANSMISSION LINE RIGHT-OF-WAY MANAGEMENT TECHNIQUES

Volume 3

INDIVIDUAL CASE STUDIES OF SITES 12 THROUGH 22



JUNE 1977

Empire State Electric Energy Research Corporation (ESEERCO)

Environmental And Economic Aspects Of Contemporaneous Electric Transmission Line Right-Of-Way Management Techniques

VOLUME 3
INDIVIDUAL CASE STUDIES OF SITES 12 THROUGH 22

PREPARED FOR THE EMPIRE STATE ELECTRIC ENERGY RESEARCH CORPORATION (ESEERCO)

JUNE 1977

Prepared by:

ASPLUNDH
ENVIRONMENTAL
SERVICES
BLAIR MILL ROAD
WILLOW GROVE, PA. 19090

Under the Supervision of:
D. E. Holewinski, Division Manager
A. J. Zeigler, Project Coordinator
T. D. Mayer, Project Manager

Approved by:
H.R. Johns, Senior Vice President

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Dr. William R. Byrnes - Purdue University, Department of Forestry and Natural Resources.

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Introduction

"The primary purpose of the study is to document, for approximately twenty representative electric transmission right-of-way sites, each of about one to two miles in length:

..the existing condition of the right-of-way site in terms of such characteristics as vegetation, fish and wildlife, erosion and sedimentation, visual aspects, and multiple uses being made of the right-of-way.

..the conditions and events which could be reasonably imputed to have caused or influenced the existing condition of the right-of-way site such as construction and management techniques used on the site (including the economic costs of techniques used): soils; moisture; slope; exposure; multiple uses; and conditions, especially vegetation, prior to specific construction or management events".

"The secondary purpose of the study is to reasonably impute, based on the information documented above, the short and long term impact of various construction and management techniques actually used on each site, upon the condition of that site. It is recognized that these imputations will not constitute proof, according to commonly accepted scientific standards, that certain construction and management techniques produce certain results under certain conditions. Rather, these imputations will be recognized as the opinions of trained and informed persons in the field of rights-of-way management based on documented empirical information. (Empirical information, as it is used here, refers to available, reliable, previously documented material, plus documented observed information). The documented information, and the imputations made by Asplundh, will be used as a guide to rights-of-way managers when making management decisions, and to suggest further work and experimentation to be conducted in the on-going ESEERCO Rights-of-Way Management Study".[1]

The first of 3 volumes of this report is organized to first present the "General Methods" from which the study is based. This section establishes methods for site selection and for field data collection. These methods apply to each of the 22 sites. In addition to special studies, discussion of trends for these sites are also included in Volume I.

The "Individual Case Studies of Sites" follows in Volume II (Sites 1-11) and III (Sites 12-22) with specific detail pertinent to each site, depicting both information obtained from field observations and other sources, and further detail on the field studies conducted at the site according to the "General Methods" section. Tables and figures are presented not only to record data but to more clearly depict relationships as a useful method of analysis for arriving at conclusions. The maps in this report are also available at full scale (1"-200') for future field research studies. Each individual site case study is concluded with an evaluation and summary of results.

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[1] ESEERCO - Asplundh contract governing this work.

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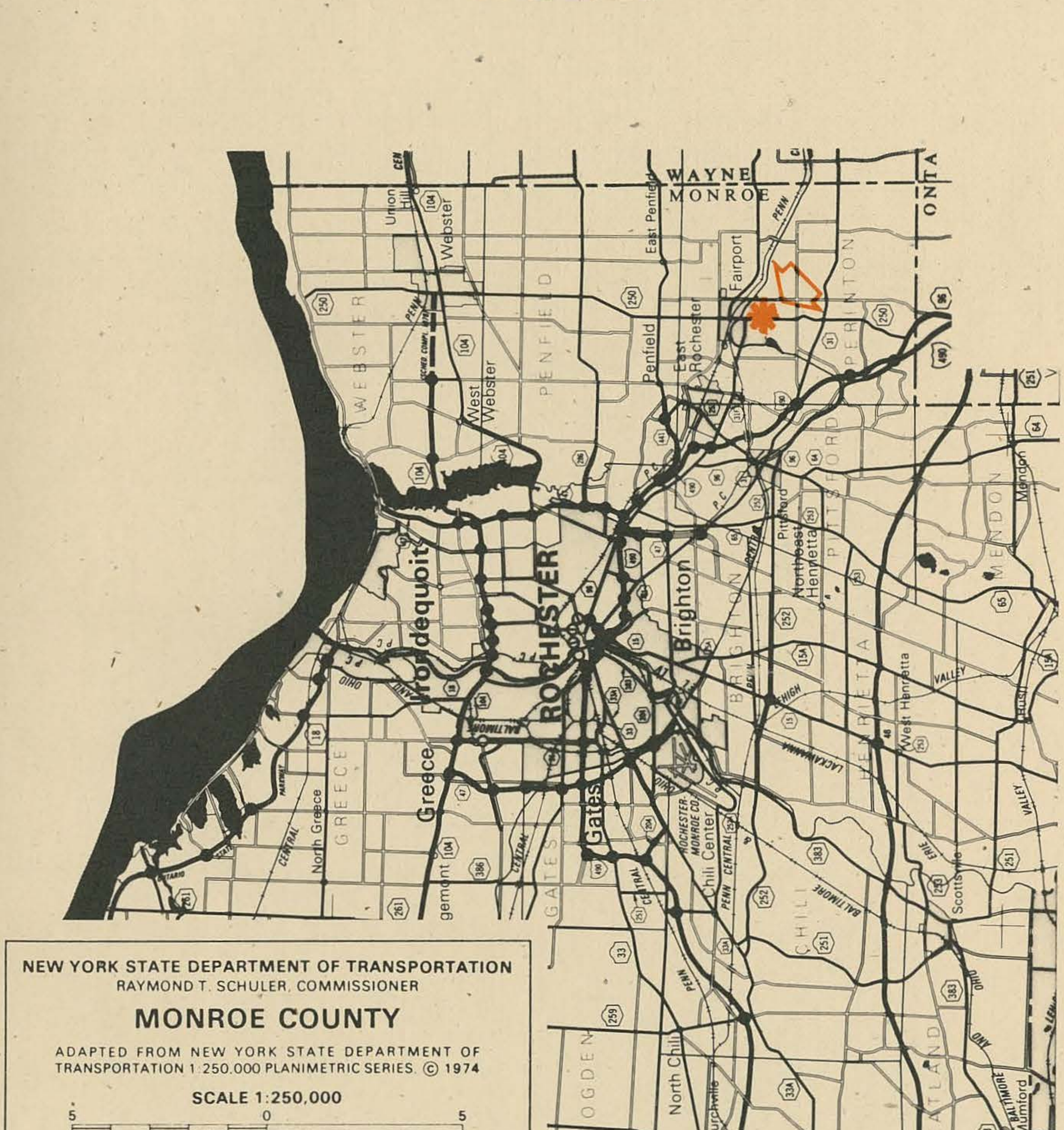
LOCKPORT to SOLVEY



Site 12 Lockport to Solvay

Study area extends from route 250 (structure 125 & 123) west to structure 121 and 119 and is located in Fairport. To reach the area, take route 31 to route 250 north and proceed toward Fairport. The study area is west of route 250 in Fairport.

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Site 12 Lockport to Solvay

1 Introduction

Site 12 is located in the Erie-Ontario Plain physiographic area of New York (Cline, 1970) in the Elm-Red Maple and Northern Hardwoods forest type area (Stout, 1958). The general landscape of the ROW and adjacent area is shown in Figs. 12.1.1 and 12.1.2.

The land is flat. The topography of the area is typically numerous low, rolling hills, dissected by streams flowing north into the lakes (Stout, 1958).

Typical forest types of the region are Elm-Red Maple and Northern Hardwoods, and Oak-Northern hardwoods. Located on the site were Aspen-Willow, and Northern Hardwoods forest types.

2 Location and Identification

Site 12 is approximately 1 mile south of Fairport in the town of Perinton, Monroe County, New York (77^{o} 26' 00" W. Longitude; 43^{o} 05' 10" N. Latitude).

The site is on the Lockport to Solvay ROW which is operated by the Niagara Mohawk Power Corporation (NMPC). The ROW tapers from 160 feet in width near structures 121 and 119, to 110 feet at structures 125 and 123, and consists of 2 double circuit 115 kV lines, each having steel lattice structures. The site is approixmately 2,400 feet in length, and extends from structures 121 and 119 east to Route 250.

3 Background

The following discussion outlines documentable management techniques of clearing, construction, restoration, and maintenance for site 12, as received from NMPC (information sent May 6, 1976, by Kenneth Finch and James Brogan, Niagara Mohawk Power Corporation, Syracuse, N.Y.; and telephone conversation on December 14, 1976, with James Brogan, NMPC, Syracuse, N.Y). All available pertinent information and cost data are included under each operation of clearing, construction, restoration, and maintenance.

3.1 Clearing

The original ROW was constructed in 1906, and was probably hand cleared with cross-cut saws, axes, and brush hooks. The slash was probably burned.

3.2 Construction

The original line was built in 1906 as a single circuit, 66 kV, 25 cycle line on square steel Aeromotor Towers with pin insulation. The towers were set on concrete footings.

In 1922, the tower tops were dismantled and new, double circuit steel crossarms added. Suspension insulators replaced the pin insulators. Angle towers were replaced with Blaw-Knox Strain Towers.

In 1926, a triple circuit tower line, with 2 lines operating at 115 kV and 1 line operating at 66 kV, 25 cycle, was constructed through the study area, parallel to the existing ROW on an additional 50-foot strip.

Between 1948 and about 1960, the 3 circuits operating at 66 kV, 25 cycle were reinsulated and reconductored, where necessary, to operate at 115 kV, 60 cycle.

3.3 Restoration

No information is available regarding restoration practices.

3.4 Maintenance

Prior to 1941 these lines were maintained by a transmission crew based in Mortimer Station. This crew periodically hand cleared the ROW during the winter, when other transmission work was slow.

In 1952 the ROW was sheardozed and the brush raked to the sides of the ROW. At that time the ROW consisted of very dense brush.

In 1957 contractors conducted a basil treatment of brush on ROW and a frill treatment of danger trees using 2,4-Dichlorophenoxyacetic acid (2,4-D) and 2,4,5-Trichlorophenoxyacetic acid (2,4,5-T).

In 1962, a broadcast foliage spray was applied by contractors to the ROW using Decamine 2D/2T (2,4-D and 2,4,5-T). The cost of this operation was approximately $243.60 per acre for 38.2 brush acres.

The 1966 contractors widened the existing ROW, clearing an additional 17-foot strip on the north side of the ROW and chemically treated all stumps over 4 inches in diameter.

From 1968 to date, the ROW at the study area has been annually mowed by NMPC, using a rubber tired tractor and an 8-foot brush hog.

4 General Reconnaissance

A general reconnaissance was made in accordance with the methodology and is set forth in Map 12.1 which shows site habitat conditions. In this reconnaissance it was noted that the major vegetational types correlated with the soil types on the mesic and hydric habitats.

The existing visual character of the ROW is depicted during all seasons of the year, from important vantage points both on and off the ROW. These points are identified as photo stations and are located on Map 12.1 and described in Appendix 17. Specific reference is made to some of these photo stations throughout the report and illustrated in Fig. 12.1. With the exception of aerial photography used to identify land use, older photographs depicting the area are not available.

In the context of its location the ROW site is not necessarily pleasing or objectionable to view. In some cases the ROW is mowed and is an extension of adjacent backyards of residences. Features within the area which may make the ROW somewhat sensitive to view include its location through this residential area. Here, the ROW is utilized by adjacent landowners for gardens, extension of backyards, and even for trash disposal. In addition, it appears that neighborhood children make extensive use of the ROW and adjacent woods for play. The ROW site is visible from Route 250 although an adjacent woods tend to screen most of the ROW from a nearby school. To the south, residences are screened by trees. The potential number of people viewing the site is high since the site is located adjacent to a number of residences in the suburb of Rochester known as Fairport, and it crosses Route 250 which is well traveled.

5 Field Studies - Results and Discussion

5.1 Soils

5.1.1 Geology and Soils

Site 12, Lockport to Solvay ROW, is located in Monroe County in that physiographic region termed the Erie-Ontario Lake region by Cline (1970) and the Erie-Ontario Lowland region, Ontario Lake Plain subdivision by Thompson (1966). It is in western New York, in the St. Lawrence River and Genesee River drainage basins (Heffner and Goodman, 1973). Bedrock geology is of Silurian age, 435 million to 395 million years ago, consisting predominately of dolostone, shale, salt beds, and sandstone. Surficial geology is glacial drift deposited about 10,000 to 5,000 years ago during the last stage of glaciation of the Pleistocene Epoch, also known as the Wisconsin Stage. This glacial drift largely consists of water-deposited sand and silt (Heffner and Goodman, 1973; Broughton et al., 1973).

Soils of this site are classified mainly in the order Entisols, but in 3 suborders, namely, Orthents (Claverack series), which have medium to fine textures, Aquents (Wayland series), which are seasonally saturated with water, and Psamments (Colonie and Elnora series), which have sandy or loamy sand textures. These are mineral soils without natural genetic horizons or with only the beginnings of such horizons. The central concept of this order is soils in deep regolith with no horizon except a plow layer on cultivated areas. The common characteristic of all Entisols is lack of significant profile development. One soil (Galen) is in the order Alfisols, suborder Udalfs, which have gray to brown surface horizons, medium to high base status, and contain an illuvial horizon in which silicate clays have accumulated (Buckman and Brady, 1969; Soil Survey Staff, 1975).

The soil association which occurs on site 12 is Colonie-Elnora-Minoa (Heffner and Goodman, 1973). Brief descriptions (Heffner and Goodman, 1973; Anon. 1972) of soil types occurring on the ROW study site (Map 12.1; Table 12.0) are:

Claverack loamy fine sand (CkA): These soils are deep, moderately well drained, and coarse textured, and border or occur in old glacial lakebeds. They formed in sandy deposits underlain by lacustrine high-lime clay at a depth of 20 to 40 inches. The soils are nearly level or have gently convex slopes. A seasonal high water table is approximately 18 to 24 inches below the surface and is perched above the slowly permeable substratum. The high water table does not persist for long periods. Permeability of the sandy surface layer and subsoil is moderately rapid to rapid. Soil reaction is strongly acid to moderately acid, although it may range from pH 5.1 to 7.3 throughout a typical profile; it was pH 5.6 in the surface mineral soil on this site. Claverack loamy fine sand is assigned to Woodland Suitability Group 3s1, designating moderately high productivity for timber (Class 3) and sandy soils

(Subclass s) which impart low water-holding capacity and normally low availability of nutrient elements. The indicator species is sugar-maple, and the site index is 60 to 65 feet.

Colonie fine sand (CcA): These are deep, well-drained to excessively drained, coarse-textured soils. They formed in water-laid or windblown deposits of fine sand on beaches, sandbars, or deltaic positions in association with old post-glacial lakebeds or outflow channels of the lakes. The soils are level to moderately steep and have convex slopes. A seasonal high water table rarely rises to within 4 feet of the surface and is normally much deeper. Permeability is rapid to a depth of 6 feet or more. Soil reaction is strongly acid to moderately acid, ranging from pH 5.1 to pH 6.0 throughout a typical profile; it was pH 5.4 in the surface mineral soil on this site. Colonie fine sand is assigned to Woodland Suitability Group 4s1 designating moderate productivity for timber and sandy soil conditions. The indicator species is white pine, and the site index is 60 to 70 feet.

Elnora loamy fine sand (ElA): These soils are deep, moderately well drained, level to gently sloping, and sandy. They formed in water-laid or windblown deposits of fine sands on areas that were formerly deltas, sandbars, or beaches in old glacial lakes. These soils are droughty in dry periods despite a seasonal high water table that rises to within 18 to 24 inches of the surface. Permeability is rapid throughout the soil. Soil reaction is strongly to moderately acid, ranging from pH 5.0 to pH 6.5 throughout a typical profile; however, it was pH 4.8 in the surface mineral soil on this site. Elnora loamy fine sand is assigned to Woodland Suitability Group 4s1, indicating moderate productivity and sandy soil. Again, the indicator species is white pine, and the estimated site index is 60 to 70 feet.

Galen very fine sandy loam (GaA): These are deep, moderately well-drained, medium-textured soils. These nearly level to gently sloping soils generally have simple convex or slightly concave slopes. They formed in a high lime or slightly acid, water-deposited fine sand and some silt. A seasonal high water table rises to within 18 to 24 inches of the surface. Permeability is moderate to moderately rapid, depending on the texture of the lamellaie and interlamellaie layers. Soil reaction is moderately acid to neutral, ranging from pH 5.0 to pH 7.0 throughout a typical profile; soil reaction was pH 5.7 in the surface mineral soil on this site. Galen very fine sandy loam is assigned to Woodland Suitability Group 2o1, designating high productivity and slight or no limitations for woodland use. The site index is 65 to 70 feet, and the indicator species is sugar-maple.

Wayland silt loam (WgA): Wayland soils are deep, poorly drained to very poorly drained, and have a medium-textured surface layer and a moderately fine-textured subsoil. These level to nearly level soils are of limited extent in Monroe County. They formed in recently deposited alluvial material and are subject to periodic flooding. Areas are on first bottoms principally along the major creeks and streams, in the oxbow areas of former stream channels, or in the lower depressions on floodplains. A seasonal high water table is at or near the surface for long periods. Permeability is moderately slow to moderate in the subsoil and variable in the substratum. Soil reaction is generally neutral in this county, and was pH 7.0 in the surface mineral soil on this site. Wayland silt loam is assigned to Woodland Suitability Group 4wl, designating moderate productivity and excessive wetness. The indicator species is red maple and the site index is 60 to 70 feet.

5.1.2 Humus Types

Organic layers present on the soil surface of the ROW and adjacent woodland were measured on the mesic study plot. Average thickness of the organic layers and A1 horizon was based on 5 samples taken at the edges, mid-points, and center of both the woods and the ROW study plots (Table 12.2). The presence and thickness of these layers were used for humus type classification. The humus classification key is not adaptable to areas exhibiting prolonged water saturation in the surface soil; therefore, similar measurements were not made on the hydric site. A few small vegetable gardens were present on the ROW, which is maintained by mowing. Otherwise, no evidence of plowing, grazing, or recent fires was noted.

Litter and a trace of fermentation layers were present on the ROW and in the woodland, while the humus layer was missing. Based on thickness of the A1 layer and absence of the humus layer, the predominant humus type was designated a "deep sand mull" on the ROW and a "very deep sand mull" in the woodland due to deeper organic matter incorporation in the woods. Litter in the woods was composed primarily of tree parts (leaves, twigs, and fruit) in contrast to the leaves and stems of grasses, herbs, and shrubs on the ROW. Random observations at various ROW and woodland locations revealed the characteristic nature of the sand mull to the mesic habitat on this site. All mesic areas evidenced high earthworn activity.

Based on these limited observations, it appears that ROW construction and periodic maintenance for brush control did not alter the thickness of surface organic layers on the soil, but incorporation of organic matter in surface mineral soil (A1 horizon) was reduced under ROW conditions. Elimination of the forest cover did result in a change in kind of organic material; however, regrowth and persistence of a mixed grass-herb-shrub cover has resulted in annual litter depositions and continuation of a protective organic layer on the ROW.

5.1.3 Soil Erosion

Current Active Erosion Observations of active erosion on the ROW and adjacent woodland were made on the Lockport to Solvay study area in August, 1976. Slight sheet erosion has occurred and small patches of bare soil are evident throughout large areas of the general ROW and adjacent woodland on all soil types. These light sandy soils have a high erosion potential that apparently is moderated by the protective canopy of trees and shrubs in the woodland and vegetative cover of grass, herbs, and shrubs on the ROW; otherwise, erosion likely would be greater. Large areas of bare soil occur in the woodland with scattered twig and leaf litter, as opposed to the fairly dense grass, herb, and shrub cover of the ROW with its attendant litter. This thin litter cover and rapid decomposition and incorporation of organic matter in the mineral soil is characteristic of mull humus types. The incorporated organic matter tends to improve soild structure and resistance to erosive forces.

Eroding areas were identified as to location on the ROW and adjacent woodland, soil type, average slope, and present plant cover (Table 12.3). Erosion was classified as to kind (sheet, rill, gully) and class (slight, moderate, severe); average depth of gullies were recorded. Aside from the previously mentioned slight sheet erosion occurring throughout certain areas of the site, active erosion on the ROW was limited to 3 areas, a stream crossing the ROW, and 1 tower site (Fig. 12.1.3), and what appears to be a recreational sand pile (Fig. 12.1.4). At the stream bank location there is moderate sheet and gully erosion with sediment leaving the ROW via the stream. At the sand pile there is moderate sheet and rill erosion which does not leave the ROW.

Severe sheet and gully erosion occurred on the forest floor at the stream bank in the interior woods. This area is intensely used by children and is bare and compacted. There was also moderate sheet, rill, and gully erosion at a building excavation off the ROW.

There was no restoration in the form of seeding and planting following construction of this ROW; therefore, denuded areas are dependent on natural plant invasion. A good cover of grass, herbs, and shrubs has developed throughout the entire ROW.

5.2 Vegetation

5.2.1 Habitat and Forest Types on the Site

Hydric Habitat The hydric, or wet, habitat (1) was located on a very slightly depressed, lowland area. Slope was negligible and aspect was flat. Drainage was impeded mainly on the ROW where a Red Osier Dogwood-Sensitive Fern vegetation type persisted, while the adjacent forest type was Northern Hardwoods. The wetness of the ROW may be partially due to the removal of the trees from this area, as a wet area in this forest was converted to the ROW community.

Mesic Habitat The mesic, or medium moist, habitat (2) was located on a nearly level, somewhat elevated area of a broad gently sloping hill. Slope was negligible and aspect was flat. Drainage was free but not excessive. The forest type was Northern Hardwoods, with red oak, beech, and red maple predominating.

5.2.2 Analysis of Forest Types and Associated ROW Vegetation

General Changes in Vegetation The primary impact of the ROW was to cause a change from a forest with a 4-layered structure to a shrub-herb-grass community. Obviously, removal of the trees caused this; and what was essentially a 2-layered ROW community developed, with the shrub layer consisting of shrubs and small trees not removed by maintenance, or which have arisen since the last mowing (Fig. 12.2).

In order to more completely characterize the forest types, an analysis was made on the forest plots to derive importance values for tree species (Table 12.4). Obviously, red maple was an important species on the hydric plot and beech and red oak were important species on the mesic plot.

On the hydric habitat, a Red Osier Dogwood-Sensitive Fern plant community developed. On the mesic habitat, a Northern Hardwoods forest type was changed to a Sumac-Goldenrod plant community.

Quantitative Changes There was a marked difference in the number of shrubs and herbs on the hydric habitat on the ROW as compared to the forest (Table 12.5; Figs. 12.3 and 12.4). There were 6 shrubs on the ROW as compared to 2 in the forest, and 31 herbs on the ROW, but 13 in the forest. A notable difference in the shrub and herb layers also occurred on the mesic habitat. There were 5 shrubs on the ROW as compared to 1 in the forest, and 24 herbs on the ROW, with 9 occurring in the forest (Table 12.5).

Qualitative Changes On the hydric 1 habitat, 6 species from the shrub and herb layers occurred both in the forest and on the ROW (Fig. 12.5), while 8 species occurred in the forest only (Table 12.6) and 30 species occurred on the ROW and not in the forest (Table 12.7).

On the mesic 2 habitat, 5 species from the shrub and herb layers occurred both in the forest and on the ROW, while 6 occurred in the forest alone, and 25 occurred on the ROW and not in the forest (Table 12.5). One shrub, maple-leaved viburnum, was found in the forest alone, and 5 shrubs occurred on the ROW only. In the herb layer, 5 species occurred in the forest alone and 20 occurred on the ROW only (Tables 12.6 and 12.7).

It appears that the ROW had a notable impact on the number of species in the shrub and herb layers, as they were more numerous on the ROW than in the adjacent forest. There was also a difference in the kind and abundance of species that occurred both in the forest and on the ROW (Fig. 12.1.5).

5.2.3 Analysis of Plant Communities for On-ROW Mapped Vegetation Plots

Table 12.8 presents a breakdown of major vegetational communities for the hydric and mesic plots on the Lockport to Solvay ROW. Much of the present composition of herbaceous and woody plant communities on this ROW area reflect the maintenance history.

The major plant communities now dominating the hydric and mesic plot locations are: Sensitive Fern-Sedge-Mixed Grass-Herb, Mixed Grass-Herb, and Sassafras-Mixed Grass-Herb. Since this ROW is annually mowed, most trees and shrubs are from stump sprouts or have developed from root suckers. Since sassafras is a "root-suckering" species, this may account for the large amount of sassafras which occurred on mesic plot 2. Mowing has apparently stimulated the root system into a mass "clone" of this species. The herbaceous material, grasses and herbs, will most likely play an important role in the contemporaneous and future development of this ROW, as long as mowing is retained as a maintenance technique.

5.2.4 Comparison of Forest Type with ROW Vegetation

The ROW was clear cut in 1906 and material was most likely piled and burned. In 1957 the ROW had a basal treatment using 2,4-D and 2,4,5-T. The ROW had a foliar application of Decamine (2,4-D and 2,4,5-T) in 1962. The existing ROW was cleared an additional 17 feet in 1966 and all stumps over 4 inches in diameter were chemically treated. Since 1968 the ROW has been annually mowed using a rubber tired tractor and an 8-foot brush hog.

The general impact of the above treatments of the ROW was to change the forest to shrub-herb-grass communities. On several towers, material apparently left from mowing has grown rather extensively (Fig. 12.1.6).

On the hydric habitat a Red Osier Dogwood-Sensitive Fern community was produced. There was a significant difference in the total number of shrub and herb species on the ROW as compared with the forest. There was also a qualitative difference in shrub and herb species on the ROW as compared to the forest, with some shrubs of the forest not on the ROW and several important shrubs of the ROW lacking, or sparse, in the forest.

On the mesic habitat, which was formerly occupied by a Northern Hardwoods forest type, a Sumac-Goldenrod community was produced. There was a significant increase in the total number of shrub and herb species on the ROW as compared with the forest. There was a qualitative difference in shrub and herb species on the ROW as compared to the forest with some shrubs of the forest not on the ROW and some shurbs of the ROW lacking, or sparse, in the forest. The same was true for herbs, i.e., some herbs of the forest were not on the ROW, while some herbs of the ROW were not in the forest.

5.3 Wildlife

The major game species for site 12, Lockport to Solvay, were determined by Asplundh Environmental Services (AES) in conjunction with the New York State Department of Environmental Conservation (DEC). These species are ring-necked pheasant, cottontail rabbit, and gray squirrel.

5.3.1 Acutal Use

Ring-necked Pheasant Five pheasants were flushed from the center of the ROW near structure 123 during the fall of 1975. These birds were apparently feeding in a cover of sassafras, willow, American elm, and mixed grasses. Pheasants were also heard crowing during the spring and summer of 1976 around the adjacent study area.

Cottontail Rabbit During the winter of 1976, with a heavy snow cover, rabbit tracks were found to be few in number. Tracks indicated rabbits were using edges and that they crossed the ROW to and from denser vegetation along the ROW edge.

Gray Squirrel No gray squirrel activity was noted at this site during the period of the study. However, there is good squirrel habitat in the northern hardwoods forest immediately north of the ROW study area.

Miscellaneous Wildlife Observations Various birds were seen and/or heard on the study area throughout the period of this study. The diversity of species may be attributed to the ecotone which is created due to the presence of the ROW. Birds observed on the ROW and on the ROW edge are included in Table 12.9.

Oppossum tracks were numerous throughout the ROW during the winter of 1976.

No other observations were made on this rather suburban study area.

5.3.2 Potential Use

Potential wildlife use of the plant species present on site 12 for the 3 major game species, pheasant, rabbit, and squirrel, is contained in Table 12.10. In addition to asterisk ratings from New York, asterisk ratings for the northeast were included for those plant species present on the study area which were not rated in the New York ratings. This additional data should provide supplemental information to the ROW manager regarding those plant species that may be of potential value to that game species (Martin et al., 1951).

5.4 Land Use

5.4.1 Location

Site 12 is located in an urban section of the town of Perinton, Monroe County, New York. Between 1960 and 1970 there was a 21.4% increase in the population of Monroe County with a 1970 distribution of 87.1% urban, 12.4% rural nonfarm, and .5% rural farm (U.S. Bureau of the Census, 1972). The closest community is Fairport (6,474) which is approximately 1 mile to the north.

5.4.2 Land Use Near the Time of Construction

The ROW was constructed during 1906. Data prior to the construction date is unavailable. The eraliest available data obtained from 1951 aerial photography indicated that the land adjacent to the ROW was primarily rural farm (Table 12.11; Fig. 12.6). Land use distribution included the following subtypes:

Agriculture:
- Ao - Orchards
- Ah - Horticulture or floriculture
- Ac - Cropland and cropland pasture

Commercial & Industrial:
- Cs - Commericial strip development

Forest Land:
- Fc - Forest brushland
- Fn - Forest lands
- Fp - Plantations

Residential:
- Rh - High density
- Rk - Shoreline development

Transportation:
- Tb - Barge canal

Water Resources:
- Wb - Marshes, shrub wetlands, and bogs

5.4.3 Land Use After Construction

Presently the adjacent land to site 12 has changed with a large decrease in agricultural uses and a large increase in housing, public and semi-public facilities, and areas currently under construction but considered to be developed for urban use. The area during the early 1960's was considered rural farm but now is defined as urban (Table 12.11; Fig. 12.6) with a land use distribution including the following subtypes:

Agriculture:
- Ac - Cropland and cropland pasture
- Ap - Pasture
- Ai - Inactive agricultural land

Forest Land:
- Fc - Forest brushland
- Fn - Forest lands
- Fp - Plantations

Public & Semi-public:
- P - Public and semi-public

Residential:
- Rh - High density
- Rm - Medium density
- Rk - Shoreline development

Transportation:
- Tb -Barge canal

Urban:
- Ui - Urban Inactive
- Uc - Under construction

Water Resources:
- Wb - Marshes, shrub wetlands, and bogs

In addition to use of the ROW for the transmission of electricl power, portions of the ROW are currently being used for extension of adjacent residential property uses, snowmobiling, hiking, and other recreational uses.

6 Evaluation, Interpretation, and Summary of Results

6.1 Conditions Which Existed Prior to Establishment of ROW

Soil, vegetation, and wildlife habitat conditions existing prior to ROW construction were based on observations made during the period of this study on adjacent undisturbed forest areas on both sides of the ROW.

6.1.1 Soils

This study area is located in the Erie-Ontario lowlands on nearly level to slightly undulating topography. The predominant dolostone, shale, and sandstone bedrock is covered by deep deposits of glacial drift, mostly acid water-laid or wind-blown sands, underlain in places with calcareous clay. Soils are primarily Entisols, mineral soils exhibiting little profile development. Five soil types identified on the site include the moderately well-drained Claverack and Elnora loamy fine sands and Galen very fine sandy loam, which formed in glacial lakebeds, deltas, sandbars, and beaches; the excessively drained Colonie fine sand that developed in both water-laid and wind-blown deposits along glacial lakes; and, the poorly drained Wayland silt loam that formed in recent alluvium on lowlands that are subject to periodic flooding.

Landforms and soil types present in the adjacent forest in 1976 likely reflect physiographic conditions at the time of original ROW construction in 1906 and expansion in 1926, but composition, density, and structure of plant growth in these soils may vary. Presently, portions of the mesic Claverack, Elnora, and somewhat droughty Colonie soils support a Northern Hardwoods forest type of moderate to moderately high productivity. Predicted site index is 60 to 65 for sugar-maple on Claverack loamy fine sand, and 60 to 70 for white pine on Colonie fine sand and Elnora loamy fine sand. Northern Hardwoods with red maple were prominent on the hydric Wayland silt loam soils, which are rated moderate for timber production with a predicted site index of 60 to 70 for red maple. Galen very fine sandy loam, which was primarily in residential use off the ROW in 1976, is rated high for timber production with a site index of 65 to 70 for sugar-maple.

The forest floor on mesic sites includes a relatively thick but variable litter layer composed of tree leaves and twigs, trace of fermentation, and deep mixed mineral-organic A1 horizon. Based on depth of organic matter incorporation and single-grain structure of the sandy surface soil, the humus type was classified a "very deep sand mull". Slight sheet erosion was evident throughout the forest in small patches where litter was thin and mineral soil exposed. Although not related to forest conditions, moderate to severe sheet and gully erosion occurred along the stream bank compacted through recreational use by children and a building excavation site.

6.1.2 Vegetation

Due to the early date of corridor establishment (1906) it is only possible to speculate on conditions prior to ROW construction. The large size and great age of scattered trees in the forest adjacent to the study plot area suggest that young stands of oak were present at the time of corridor clearing. Other ares of the ROW in the vicinity of the study area were estabished through agricultural land.

6.1.3 Wildlife

Wildlife, being mobile species which may or may not be observed during site visitation, were reasonably imputed to this area by the composition of the forested areas adjacent to the ROW. It can be assumed that those species currently utilizing the site, i.e., ring-necked pheasant, cottontail rabbit, and gray squirrel, utilized the habitat before ROW construction. Even though the presence of the ROW may influence current wildlife activity, it is likely that those species, designated by the DEC in conjunction with AES as major in this area, inhabited the vicinity prior to ROW construction. The degree of use is impossible to determine at this time.

6.1.4 Land Use

The earliest data available near the time of construction of the ROW in 1906 is 1951 aerial photography. The ROW and adjacent land area was rural farm with a land use distribution of agriculture (81.1%), commercial and industrial (.3%), forest land (12.1%), water resources (1.3%), transportation (3.4%), and residential (1.8%).

6.2 Conditions Which Exist at Present

6.2.1 Soils

Soils, topography, and associated moisture regimes on the ROW were similar to those identified and described for the general study area; except for Colonie fine sand, which only occurs as a small inclusion in the woodland south of the ROW. Soils on mesic ROW habitats, Claverack, Elnora, and Galen loamy sands and sandy loam, respectively, presently support a Blackberry- Sumac-Goldenrod plant community, while the hydric Wayland silt loam is occupied by Red Osier Dogwood-Sensitive Fern as the characteristic plant community.

Organic mulch on the surface of the general ROW consisted of a litter layer, composed of grass and herb remains, thin fermentation layer, and thick A1 horizon. The predominant humus type, based on depth of organic matter incorportion and sandy mineral soil, was a "deep sand mull". Slight sheet erosion occurred in small areas throughout the general ROW where litter cover was scattered and soil exposed. Additional moderate erosion was observed at 1 tower site with sparse plant cover, a sand pile used by local children, and along banks of a stream crossing the ROW. Sediment from gully erosion on the stream banks of the ROW and forest were deposited in the stream.

6.2.2 Vegetation

The present ROW vegetation largely reflects the impact of annual mowing, which has been used for vegetation control since 1968. On hydric sites the basic herbaceous community is Sensitive Fern-Sedge-Mixed Grass-Mixed Herb. Within this community sprouts from mowed woody species are abundant. These include single and multiple-stemmed clumps of American elm, basswood, elder, willows, and white ash.

On mesic sites Mixed Herb-Grass and Sassafras-Grass-Mixed Herb communities form the major cover. A conspicuous woody component consists of the thickets of sassafras of root-sucker origin, the result of annual mowing. Single sprouts and sprout clumps of black cherry, shagbark-hickory, white ash, northern red oak, red maple, and American elm are also abundant.

6.2.3 Wildlife

Ring-necked pheasant, cottontail rabbit, and gray squirrel are the major game species that probably currently utilize the study area. Indirect observations, i.e., crowing, as well as direct observations of ring-necked pheasants, indicated the species' presence in the vicinity. Cottontial rabbit tracks, particularly along the ROW edge, evidenced their presence on the study area. No gray squirrel activity was noted, although the habitat in the adjacent forest appeared good.

Oppossum (tracks) and various birds were also noted to be utilizing either the ROW, the adjacent forest, or both. Potential wildlife use is evident from plant species present on the site.

6.2.4 Land Use

Recent land use of the ROW and adjacent land area has sh ted from the 1951 percentages. The area is classified primarily as urban with a land use distribution of agriculture (22.3%), forest land (10.7%), public and semi-public (5.4%), water resources (1.3%), urban inactive (11.8%), transportation (3.4%), and residential (45.1%). With reference to the total area involved, shifts in land use are noted as follows:

Agriculture -	-58.8%
Commercial & Industrial -	- .3%
Forest Land -	- 1.4%
Public & Semi-Public -	+ 5.4%
Water Resources -	no change
Urban Inactive -	+11.8%
Transportation -	no change
Residential -	+43.3%

Land uses of public and semi-public and urban inactive are new types which were not présent in 1951.

In addition to use of the ROW for the transmission of electrical power, portions of the ROW are currently being used for extension of adjacent residential property uses, snowmobiling, hiking, and other recreational uses.

6.3 Environmental Effect and Probable Causes

6.3.1 Soils

Direct effects of ROW management on soils of this site were very minor and are restricted primarily to moderate sheet erosion at 1 tower site with sparse plant cover. Sporadic sheet erosion on the general ROW and gully erosion along the stream bank were also evident; however, similar erosion conditions were encountered in the bordering forest and seem to be a natural process on these soil and humus types or related to recreational use of these areas, especially the stream banks, that reduces soil cover and promotes compaction. A secondary effect of the stream bank erosion is deposition of sediments directly in the stream.

The litter layer on the ROW was comparable in thickness to that in the forest, but differed in composition, being mostly leaves and stems of grasses and herbs in contrast to tree leaves and twigs in the forest. Soil incorporation of organic matter was slightly less on the ROW than in the forest, 4.0 and 5.0 inches, respectively, but both exhibited well-developed sand mull humus types.

6.3.2 Vegetation

Although hand cutting, sheardozing, herbicide stump treatment, and broadcast spraying have all been used at some time on this ROW, the present vegetation largely reflects the annual mowing during the past 8 years. Mowing has eliminated certain woody species which do not sprout after cutting, and has favored those which sprout prolifically, particularly those species which produce root suckers. Since many hardwoods and deciduous shrubs can persist indefinitely under an annual mowing regime, it is likely that the woody component on this corridor will gradually increase.

6.3.3 Wildlife

The presence of the ROW has encouraged the development of many different plant species, mainly light-loving, on the ROW proper, thus enhancing the habitat for wildlife use. The ecotone created by the presence of the ROW often produces a greater variety and density of life than is found otherwise (Leopold, 1936), and this phenomenon has been termed the "edge effect" (Smith, 1974).

6.3.4 Land Use

It is not possible to attribute changes in land use within the area inventoried to the existence of the transmission ROW. Changes within the area may be attributed to other changing land use characteristics in Monroe County. The inventoried area has changed from rural farm to urban in character. It is apparent that the adjacent residences are utilizing the additional open spaces of the ROW as an extension of their property.

Table 12.1. Soil series present on the Lockport to Solvay study area.

Soil Series	Map Symbol[1]	Drainage Class[2]	Surface Soil pH	Surface Soil Texture	Woodland Suitability Group
Claverack	CkA	MG	5.6	loamy fine sand	3s1
Colonie	CcA	G-E	5.4	fine sand	4s1
Elnora	ElA	MG	4.8	loamy fine sand	4s1
Galen	GaA	MG	5.7	very fine sandy loam	2o1
Wayland	WgA	SPD-PD	7.0	silt loam	4w1

1 The third letter of the map symbol designates slope class:
A = 0-8%, B = 8-15%, C = 15-25%, D = 25-35%, E = 35-50%, F = 50-70%.

2 Drainage Class: VPD = very poorly drained, PD = poorly drained, SPD = somewhat poorly drained, ID = imperfectly drained, MG = moderately good, G = good, E = excellent (excessive).

Table 12.2. Average thickness of organic layers and A1 horizon and humus types for mesic site on ROW and adjacent woodland of site 12.

Moisture Regime	Location	Layer Thickness (in.)				Humus Type
		L	F	H	A1	
1. Mesic (2)[1]	ROW	1.0	.1	0	4.0	Deep sand mull
	Woodland	1.0	.1	0	5.0	Very deep sand mull

[1] Samples taken at vegetation study plot, the numbers of which is indicated by figure in parentheses.

Table 12.3. Areas exhibiting active erosion in August, 1976, on the Lockport to Solvay ROW study area.

Location	Soil Type	Average Slope (%)	Plant Cover	Erosion on Site: Kind	Erosion on Site: Class	Erosion on Site: Gully Depth (in.)
			ROW			
General ROW	Claverack loamy fine sand	3	Grass-herb	Sheet	Slight	-
Tower Site	Galen very fine sandy loam	4	Bare-grape	Sheet	Moderate	-
Stream Bank	Wayland silt loam	3	Herb-shrub	Sheet & Gully	Moderate	4
Sand Pile	Elnora loamy fine sand	4	Bare	Sheet & Rill	Moderate	-
			FOREST			
General Forest	Claverack loamy fine sand	3	Herb-litter (leaves)	Sheet	Slight	-
General Forest/ Stream Bank	Wayland silt loam	5	Bare (packed)	Sheet & Gully	Severe	4
Building Excavation	Wayland silt loam	3	Bare	Sheet & Rill & Gully	Moderate	12

Table 12.4. Importance value of trees in the upper tree layer in the forest adjacent to the ROW.

Site	Species	Relative Dominance Basal Area (% of total) 1	Relative Density (% of total) 2	Importance Value 1+2
Hydric 1	Red Maple	35.02	42	77.02
	Red Oak	28.82	18	46.82
	Basswood	25.04	14	39.04
	Bitternut Hickory	9.30	14	23.30
	Shagbark-Hickory	1.21	4	5.21
	American Hop-Hornbeam	.37	4	4.37
	Beech	.24	4	4.24
Mesic 2	Beech	27.97	44	81.97
	Red Oak	35.66	25	60.66
	Red Maple	23.93	25	48.93
	Shagbark-Hickory	2.44	6	8.44

Table 12.5. Comparison of species composition, abundance, and sociability (A.S.) in the tree, shrub, and herb layers, in the adjacent forest and on the ROW, on hydric and mesic habitats.

Species	Hydric (1) Forest A.S.	Hydric (1) ROW A.S.	Mesic (2) Forest A.S.	Mesic (2) ROW A.S.
Tree Layer				
American Hop-Hornbeam	+.1	-	-	-
Red Maple	2.1	-	1.1	-
Beech	+.1	-	2.1	-
Bitternut Hickory	1.1	-	-	-
Red Oak	1.1	-	1.1	-
Basswood	1.1	-	-	-
Shagbark-Hickory	+.1	-	+.1	-
No. Species	7	0	4	0
Shrub Layer				
Maple-leaved Viburnum	1.1	-	1.1	-
Grape spp.	+.2	2.2	-	2.2
Willow spp.	-	2.1	-	-
Elderberry	-	2.1	-	-
Red Osier Dogwood	-	1.1	-	-
Staghorn-Sumac	-	+.1	-	1.1
Spicebush	-	+.2	-	-
Witch-Hazel	-	-	-	++.1
Blackberry	-	-	-	3.1
Climbing Bittersweet	-	-	-	+.1
No. Species	2	6	1	5
Trees in the Shrub Layer				
Red Maple	3.1	-	3.1	-
Flowering Dogwood	2.1	-	+.1	-
American Elm	-	3.1	-	+.1
Quaking Aspen	-	+.1	-	++.1
Black Cherry	-	+.1	-	+.1
White Ash	-	+.1	-	++.1
Apple	-	+.1	-	-
Basswood	-	++.1	-	+.1
Red Oak	-	++.1	-	1.1
Bitternut Hickory	-	++.1	+.1	-
Beech	-	-	2.1	-
Shagbark-Hickory	-	-	-	2.1
Sassafras	-	-	-	2.1
No. Species	2	8	4	8

Table 12.5. Continued

Species	Hydric (1) Forest A.S.	Hydric (1) ROW A.S.	Mesic (2) Forest A.S.	Mesic (2) ROW A.S.
Herb[1] Layer				
Twisted-stalk	+.1	-	-	-
False Spikenard	++.1	+.1	1.1	+.2
Christmas Fern	2.2	+.2	-	-
Beech-Fern	2.2	-	-	-
Large-flowered Wake-robin	2.1	2.2	3.1	1.2
Wild Sarsaparilla	2.1	-	4.1	-
White Baneberry	2.1	-	1.2	-
Maidenhair-Fern	++.2	+.1	-	-
Marginal Shield-Fern	+.2	-	-	-
Hairy Solomon's Seal	+.2	-	+.1	-
Long-spurred Violet	1.2	-	-	-
Bloodroot	+.2	1.3	1.1	+.3
Jack-in-the-pulpit	++.1	+.1	-	-
Spotted Touch-me-not	-	3.2	-	-
Sensitive Fern	-	4.4	-	-
Nightshade	-	1.2	-	-
Sedge	-	3.3	-	-
Black-eyed Susan	-	++.1	-	+.1
Thistle	-	+.1	-	-
Lady-Fern	-	2.2	-	-
Marsh-Fern	-	+.2	-	-
Aster spp.	-	+.2	-	1.1
Goldenrod spp.	-	1.2	-	1.1
Winter-Cress	-	1.2	-	+.1
Strawberry	-	+.2	-	2.2
Wild Cranesbill	-	2.2	-	1.2
May-apple	-	2.1	-	-
Rough Bedstraw	-	1.2	+.2	+.2
Perfoliate Bellwort	-	(1.3)	-	-
Interrupted Fern	-	1.2	-	-
Chinese Mustard	-	++.1	-	+.1
Horsetail	-	3.1	-	-
Foamflower	-	+.2	-	-
Skunk-cabbage	-	+.2	-	-
Mixed Grass	-	1.2	-	4.5
Rush	-	1.2	-	-
Common Mullein	-	++.2	-	+.2
Dandelion	-	+.2	-	-
Papoose-root	-	-	+.1	-
Sweet Cicely	-	-	1.3	-
Queen Anne's-lace	-	-	-	1.3

Table 12. 5. Continued

Species	Hydric (1) Forest A.S.	Hydric (1) ROW A.S.	Mesic (2) Forest A.S.	Mesic (2) ROW A.S.
Fireweed	-	-	-	1.2
Asparagus	-	-	-	++.1
Common Periwinkle	-	-	-	(+.2)
St. John's-wort	-	-	-	1.2
Yarrow	-	-	-	1.2
Sheep-Sorrel	-	-	-	1.2
Woolly Blue Violet	-	-	-	(+.2)
Skullcap	-	-	-	(+.2)
Bugle-weed	-	-	-	(+.3)
Campion spp.	-	-	-	(+.2)
No. Species	13	31	9	24
Total No. Species				
Trees[2]	8	8	6	8
Shrubs	2	6	1	5
Herbs	13	31	9	24
Totals	23	45	16	37

1 For simplicity, herbs include all species of the layer.

2 Those trees which occurred both in the tree and shrub layers were considered as one in determining the total number of species.

Table 12.6. Characteristic species with abundance and sociability ratings (A.S.) in the shrub and herb layers of the adjacent forest which did not occur on the ROW.

Species	Forest A.S.	ROW A.S.
Hydric (1)		
Shrubs		
Maple-leaved Viburnum	1.1	-
Herbs[1]		
Twisted-stalk	+.1	-
Beech-Fern	2.2	-
Wild Sarsaparilla	2.1	-
White Baneberry	2.1	-
Marginal Shield-Fern	+.2	-
Hairy Solomon's Seal	+.2	-
Long-spurred Violet	1.2	-
No. Species	8	
Mesic (2)		
Shrubs		
Maple-leaved Viburnum	1.1	-
Herbs		
Wild Sarsaparilla	4.1	-
White Baneberry	1.2	-
Hairy Solomon's Seal	+.1	-
Papoose-root	+.1	-
Sweet Cicely	1.3	-
No. Species	6	

[1] For simplicity, herbs include all species of the herb layer.

Table 12.7. Characteristic species with abundance and sociability ratings (A.S.) in the shrub and herb layers of the ROW which were not in the adjacent forest.

Species	ROW A.S.	Forest A.S.
Hydric (1)		
Shrubs		
Willow spp.	2.1	-
Elderberry	2.1	-
Red Osier Dogwood	1.1	-
Staghorn-Sumac	+.1	-
Spicebush	+.2	-
Herbs[1]		
Spotted Touch-me-not	3.2	-
Sensitive Fern	4.4	-
Nightshade	1.2	-
Sedge	3.3	-
Black-eyed Susan	++.1	-
Thistle	+.1	-
Lady-Fern	2.2	-
Marsh-Fern	+.2	-
Aster spp.	+.2	-
Goldenrod spp.	1.2	-
Winter-Cress	1.2	-
Strawberry	+.2	-
Wild Cranesbill	2.2	-
May-apple	2.1	-
Rough Bedstraw	1.2	-
Perfoliate Bellwort	(1.3)	-
Interrupted Fern	1.2	-
Chinese Mustard	++.1	-
Horsetail	3.1	-
Foamflower	+.2	-
Skunk-cabbage	+.2	-
Mixed Grass	1.2	-
Rush	1.2	-
Common Mullein	++.2	-
Dandelion	+.2	-
No. Species	30	
Mesic (2)		
Shrubs		
Climbing Bittersweet	+.1	-
Grape spp.	2.2	-

Table 12.7. Continued

Species	ROW A.S.	Forest A.S.
Staghorn-Sumac	1.1	-
Witch-Hazel	++.1	-
Blackberry	3.1	-
<u>Herbs</u>		
Black-eyed Susan	+.1	-
Aster spp.	1.1	-
Goldenrod spp.	1.1	-
Strawberry	2.2	-
Wild Cranesbill	1.2	-
Chinese Mustard	+.1	-
Common Mullein	+.2	-
Queen Anne's-lace	<u>1.3</u>	-
Fireweed	1.2	-
Asparagus	++.1	-
Common Periwinkle	(+.2)	-
St. John's-wort	1.2	-
Yarrow	1.2	-
Sheep-Sorrel	1.2	-
Winter-Cress	+.1	-
Mixed Grass	<u>4.5</u>	-
Wooly Blue Violet	(+.2)	-
Skullcap	(+.2)	-
Bugle-weed	(+.3)	-
Campion spp.	(+.2)	-
No. Species	25	

[1] For simplicity, herbs include all species of the herb layer.

Table 12.8. Major vegetational types for the Lockport to Solvay study area based on percent of study plots occupied by each plant community or other components on the ROW.

Community	Site Classification Hydric (1)	Site Classification Mesic (2)
	Percent of Total Area	
Sensitive Fern-Sedge-Mixed Grass-Herb	95.97	
American Elm	2.17	
Willow	1.44	
Red Osier Dogwood	.14	
Elderberry	.14	
Spicebush	.14	
Mixed Grass-Herb		65.20
Sassafras-Mixed Grass-Herb		30.82
Shagbark-Hickory		1.99
Sassafras		1.28
Red Oak		.28
Basswood		.28
American Elm		.15
Total	100.00	100.00

Table 12.9. Birds observed and/or heard on the ROW and on the ROW edge during the study period.

Species	Species
Red-tailed hawk	Catbird
Ring-necked pheasant	Wood thrush
Yellow-shafted flicker	Cardinal
Great crested flycatcher	Rose-breasted grosbeak
Blue jay	Song sparrow
Tufted titmouse	English sparrow

Table 12.10. Potential wildlife use of plant species[1] present on the ROW and adjacent woods for the major game species on the Lockport to Solvay study area.

Species	Wildlife Species		
	Pheasant	Rabbit	Squirrel
Trees			
Red Oak	*	+	****
Red Maple		*	**
Black Cherry	*	*	+
Apple	**	+	
Flowering Dogwood	+	+	
Bitternut Hickory			***
Shaybark Hickory			***
Beech			**
Shrubs			
Blackberry	***	**	+
Willow		+	
Red Osier Dogwood		+	
Staghorn-Sumac	*	+	
Grape	**		
Elderberry	*		
Herbs[2]			
Sedge	+		+
Sheep-Sorrel		**	
Strawberry	*	+	
Mixed Grass		**	
Goldenrod		*	
Skunk-cabbage	*		
Nightshade	+		

1 Those plants not included in this table provide a certain amount of cover (Table 12.5) for the 3 major game species, and may also provide seasonal food value, specific information pertaining to which is not now available. This applies also with regard to non-game species.

2 For simplicity, herbs include all species of the herb layer.

Table 12.11. Comparison of land use near the time of and after construction of the ROW.[1]

	Land Use	Percent of Total Area Near the Time of (-) and After (*) Construction 0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
(A)	Agriculture	--81.1 *****************22.3
(C,I)	Commercial & Industrial	-.3
(F)	Forest Land	----------12.1 *********10.7
(E)	Extractive Industry	
(N)	Non-productive	
(OR)	Outdoor Recreation	
(P)	Public & Semi-public	*****5.4
(W)	Water Resources	--1.3 **1.3
(U)	Urban Inactive	***********11.8
(T)	Transportation	---3.4 ***3.4
(R)	Residential	--1.8 *********************************45.1

1 Source: Lockwood Mapping Inc., Rochester, N.Y., air photo No. 17-758, May 7, 1973
USDA-SCS, Monroe County, air photo, 1951

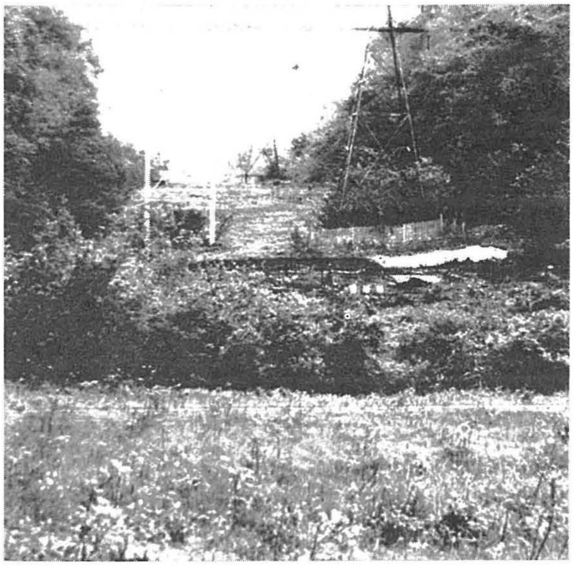


FIG. 12.1.1. General view of the ROW and adjacent forest, looking east, in spring, 1976 (Photo Station 7).

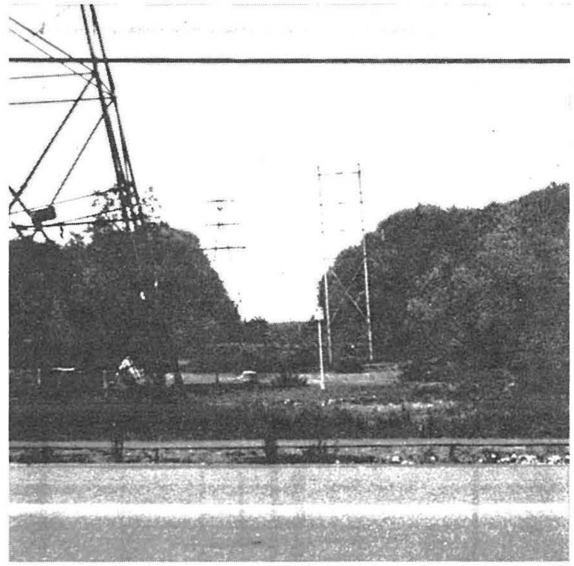


FIG. 12.1.2. General view of the ROW and adjacent area, looking west from Route 250, in spring,1976 (Photo Station 1).

FIG. 12.1.3. Open area on ROW under tower 122 exhibiting moderate sheet erosion, in spring, 1976 (Photo Station 2).

FIG. 12.1.4. Sand pile on ROW, in spring of 1976 (Photo Station 5).

FIG. 12.1.5. Large-flowered wake-robin on ROW during the spring of 1976.

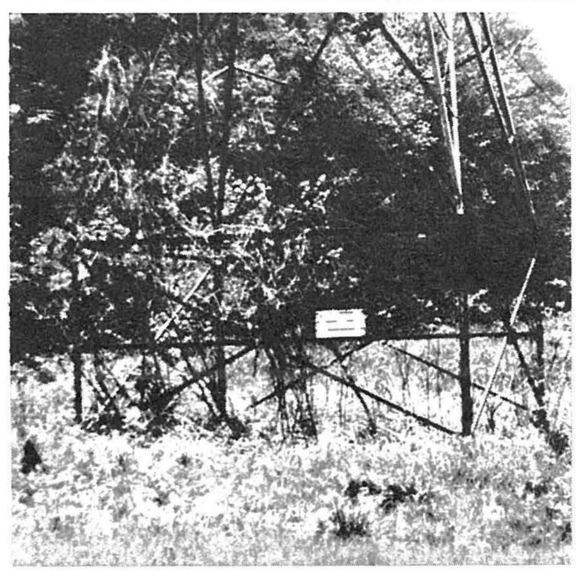


FIG. 12.1.6. Grape vines growing on tower on ROW during the spring of 1976 (Photo Station 4).

FIG. 12.1. Visual characteristics.

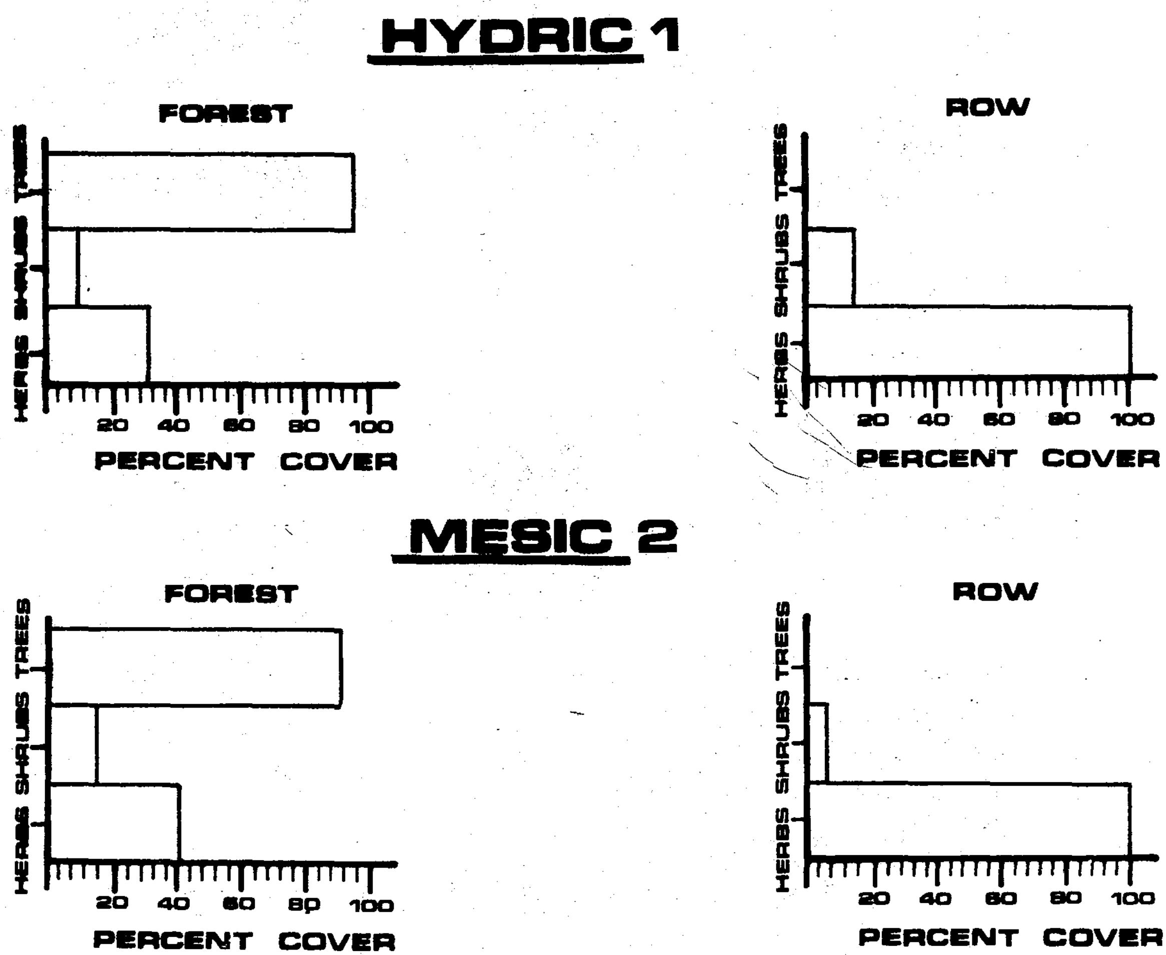


Fig. 12.2. Changes in cover value of tree, shrub, and herb layers from forest to ROW.

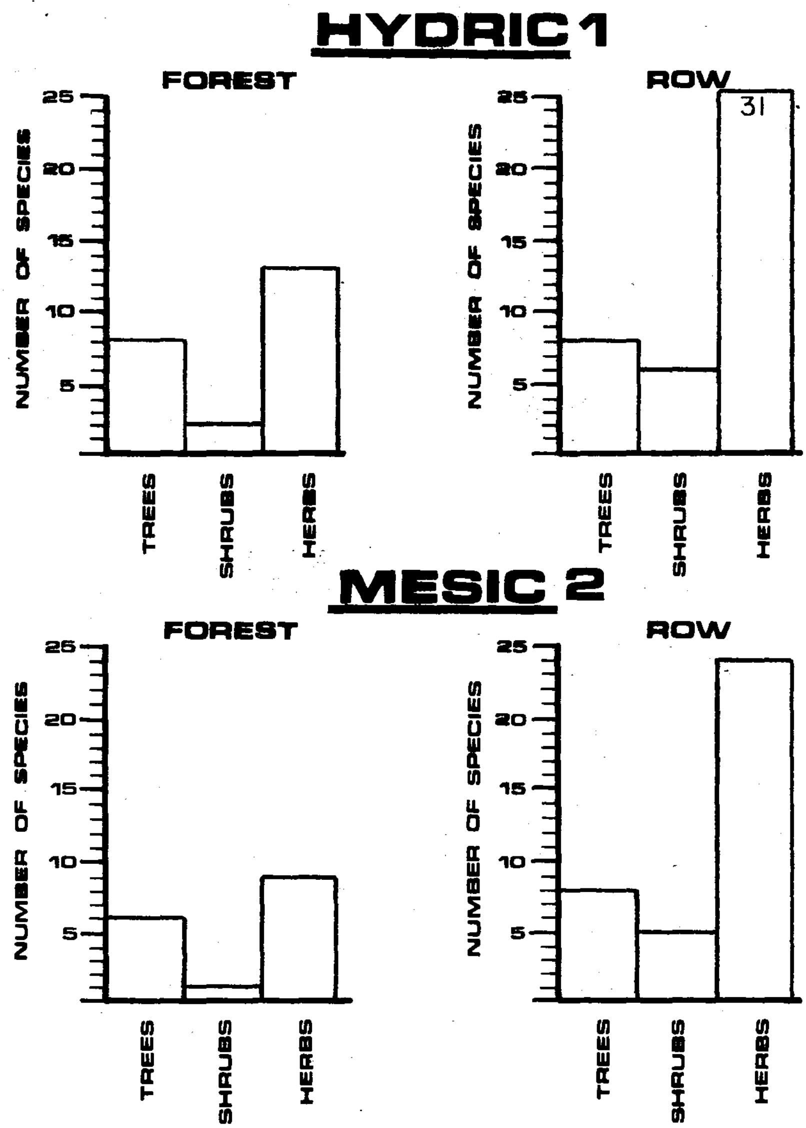


Fig. 12.3. Species diversity in the forest and on the ROW.

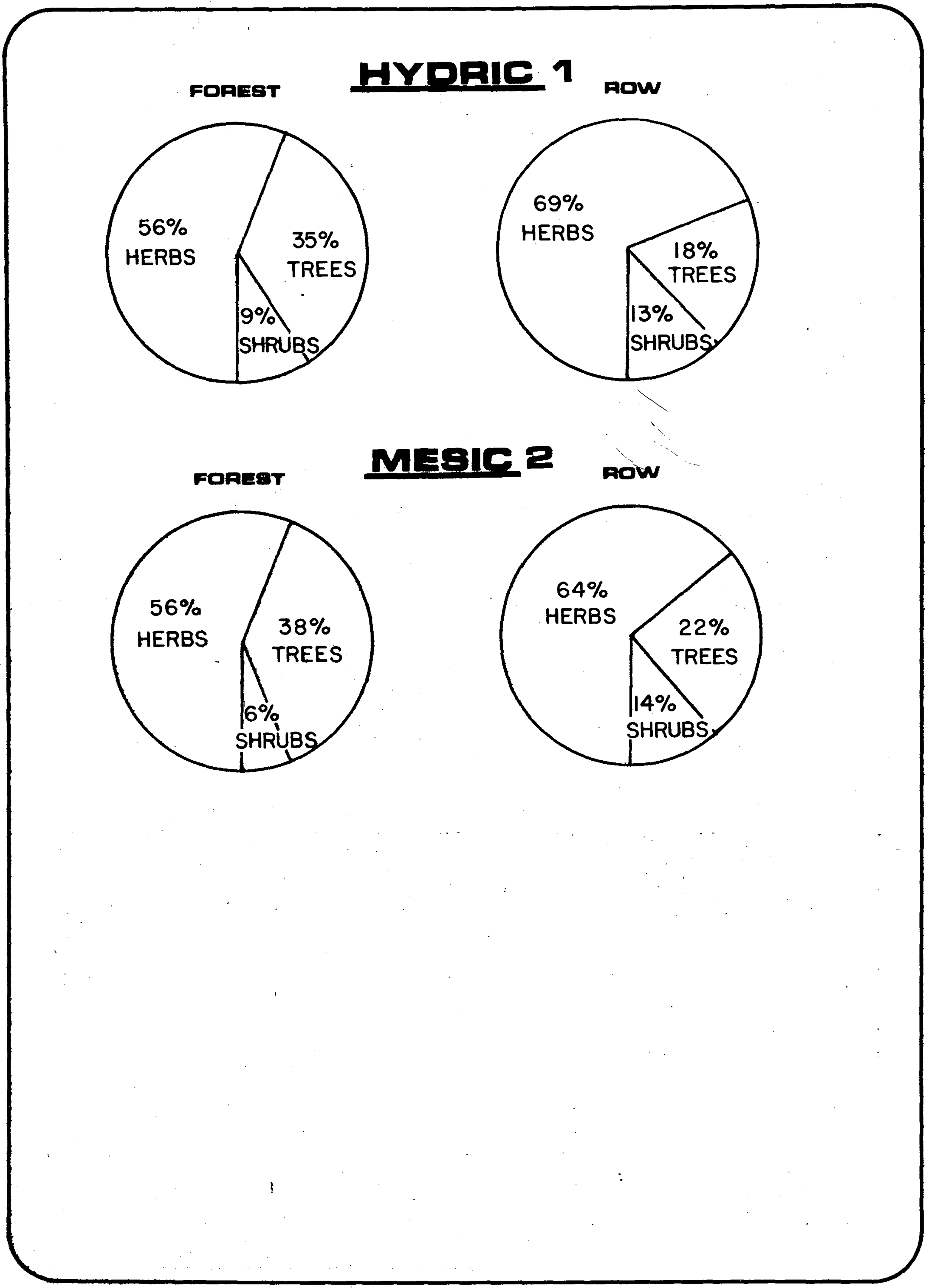


Fig. 12.4. Life form spectrum of the ROW as compared to the adjacent forest to compare species make-up of each, based on the number of species in each life form expressed as a percent of total species.

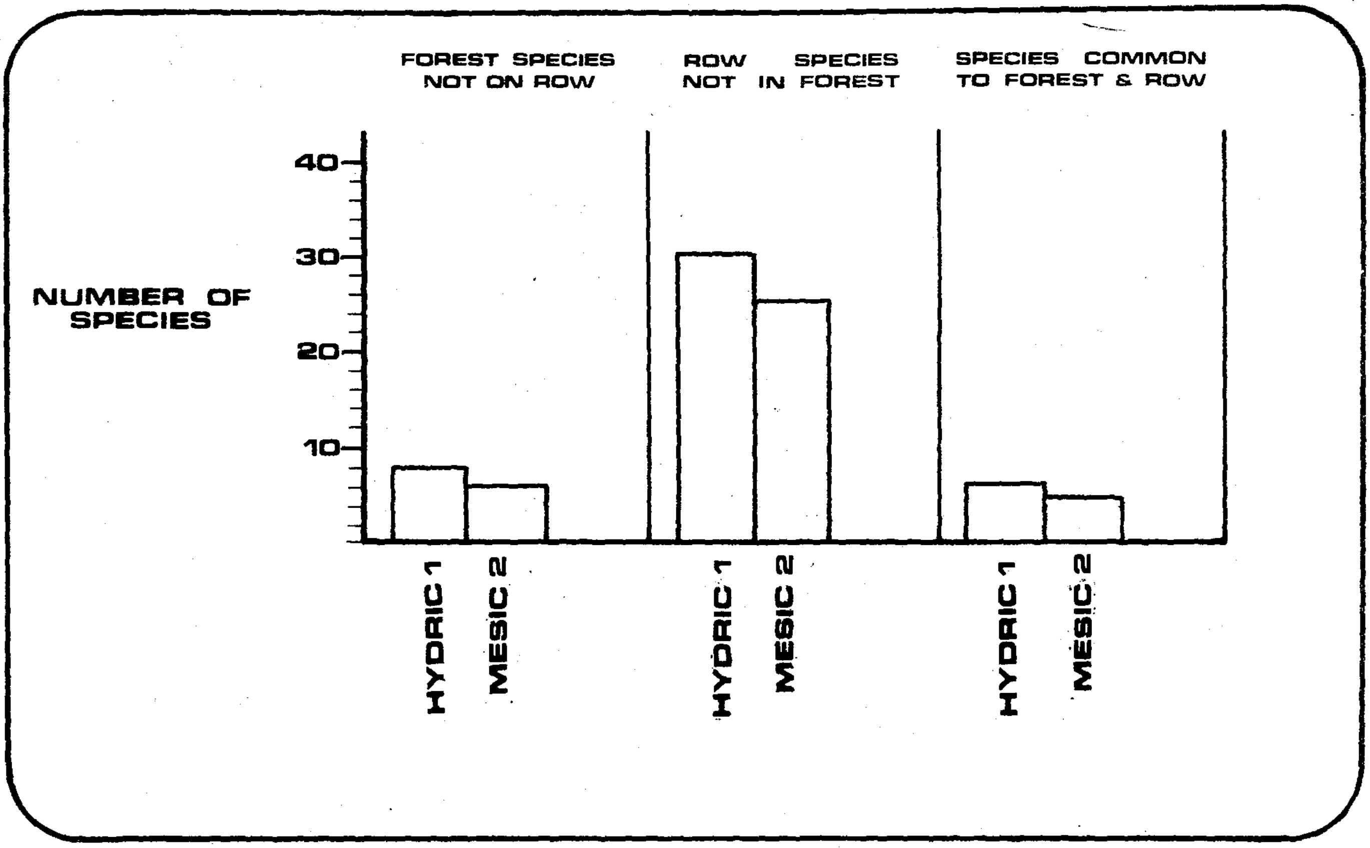
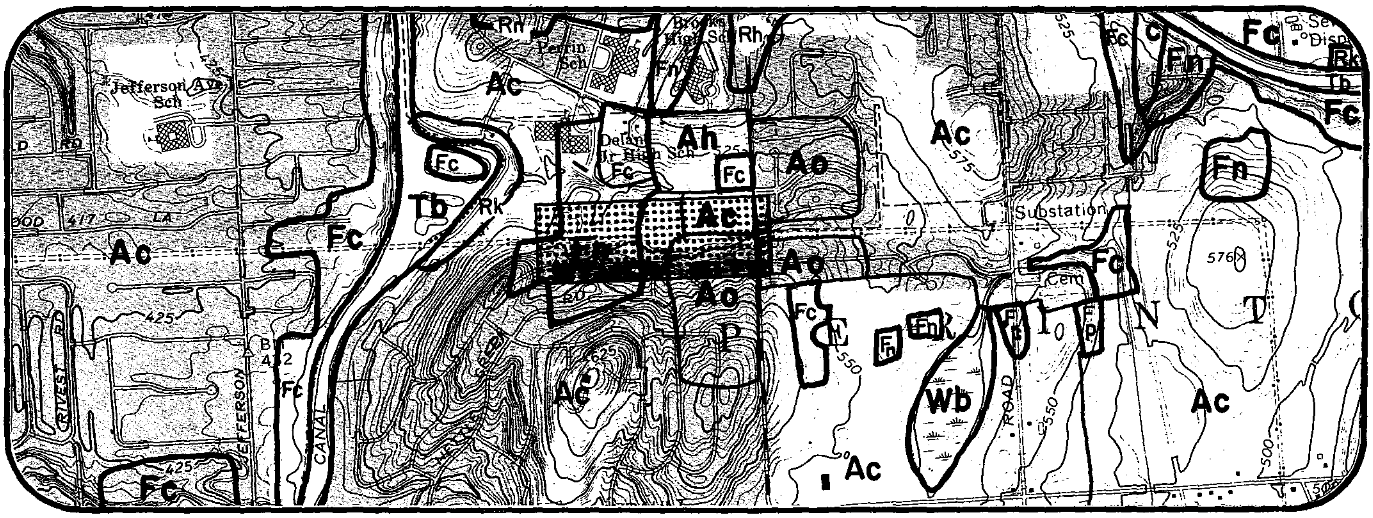
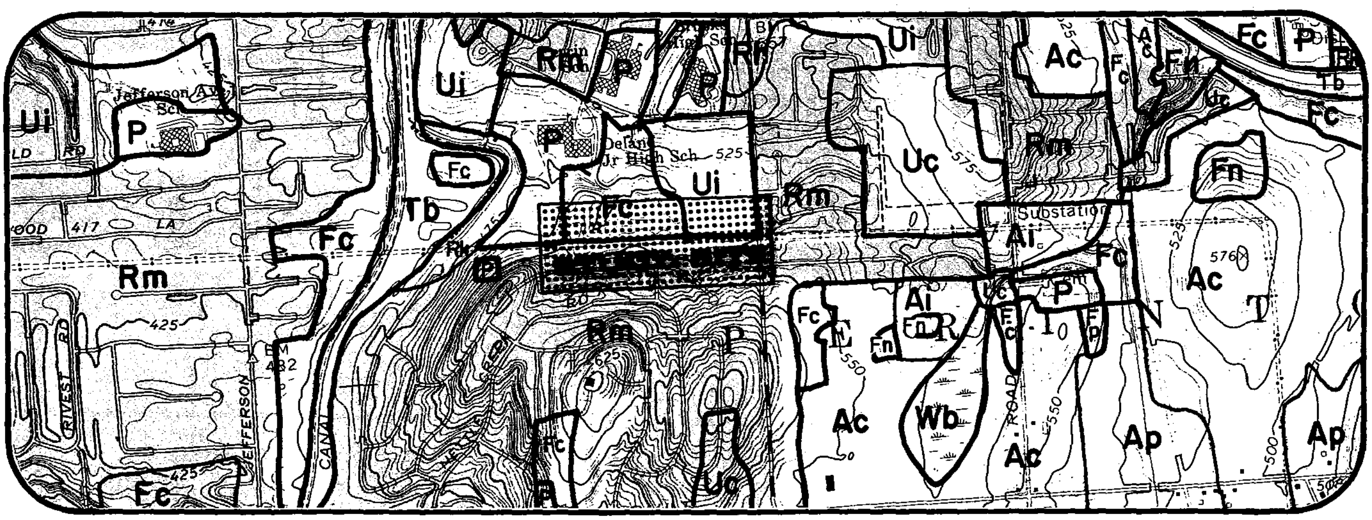


Fig. 12.5. Comparison of shrub and herb species in the forest and on the ROW.



LAND USE PRIOR TO ROW CONSTRUCTION (1951) SCALE 1"-2000



LAND USE AFTER CONSTRUTION OF ROW (1974) SCALE 1"-2000

LEGEND FOR LAND USE SYMBOLS

AGRICULTURE
- Ac - Cropland and cropland pasture
- Ah - Horticulture or floriculture
- Ai - Inactive agricultural land
- Ap - Pasture
- Ao - Orchards

COMMERCIAL AND INDUSTRIAL LAND USES
- Cs - Commercial strip development

FOREST LAND
- Fc - Forest brushland
- Fn - Forest lands
- Fp - Plantations

PUBLIC AND SEMI-PUBLIC LAND USES
- P - Public and semi-public land use

RESIDENTIAL LAND USE
- Rk - Shoreline development
- Rh - High density
- Rm - Medium density

TRANSPORTATION LAND USES
- Tb - Barge canal

URBAN
- Uc — Under Construction
- Ui — Urban Inactive

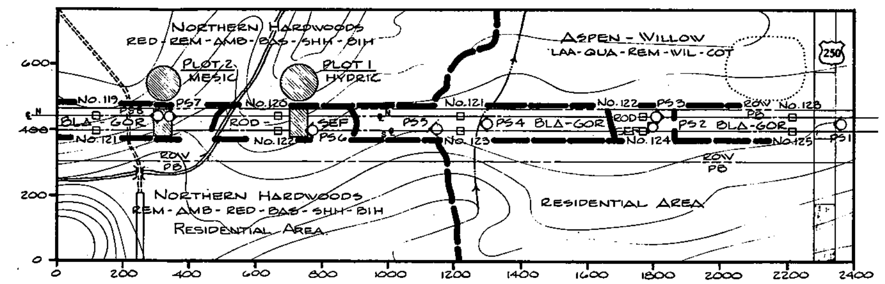
WATER RESOURCES
- Wb - Marshes, shrub wetlands and bogs

SOURCES:
- Lockwood Mapping Inc., Rochester, N.Y., air photo No. 17-758, May 7, 1973
- USDA-SCS, Monroe County, air photo, 1951
- Area Land Use Map, LUNR, Cornell University, N.Y., 1974
- U. S. G. S. Topographic Map, Fairport, N. Y., 1971

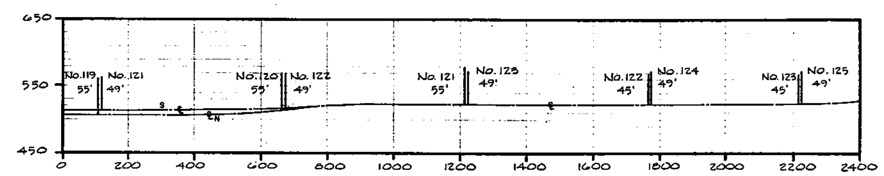
Fig. 12.6. Land use change.

ASPLUNDH ENVIRONMENTAL SERVICES
BLAIR MILL ROAD
WILLOW GROVE, PA

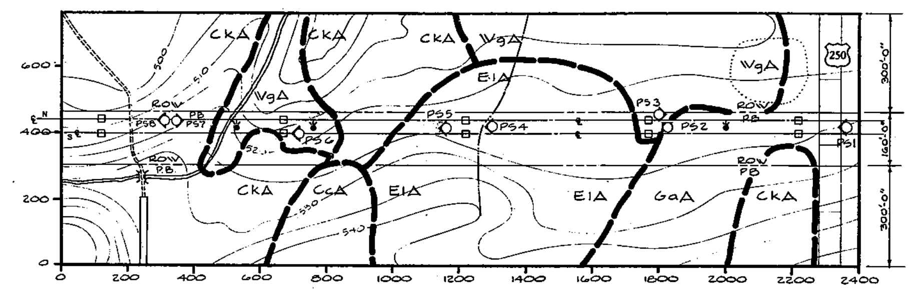
VEGETATION



CENTERLINE PROFILE



SOILS



NOTES:
- VERTICAL AND HORIZONTAL SCALE IN FEET
- 10 FOOT CONTOUR INTERVALS

LEGEND

WORKS AND STRUCTURES

- HIGHWAYS AND ROADS
- HEAVY DUTY
- MEDIUM DUTY
- LIGHT DUTY
- ACCESS ROAD
- UNIMPROVED DIRT ROAD
- NATIONAL INTERSTATE
- U.S. ROUTE
- STATE OR COUNTY
- SINGLE TRACK RAILROAD
- MULTIPLE TRACK RAILROAD
- ABANDONED RAILROAD TRACK
- RAILROAD OVER
- RAILROAD UNDER
- FORD
- ROAD CROSSING
- BUILDING
- EXCAVATION
- MINE DUMP
- PIPELINE
- TRANSMISSION STRUCTURES
- DAMS
- CULVERT
- TANKS
- WELLS
- BRUSH AND LOG DISPOSAL SITES
- SMALL PARKS, CEMETERY, ETC. (cem.)
- FENCE
- DITCH

BOUNDARIES

- NATIONAL OR STATE
- COUNTY
- MINOR CIVIL DIVISION
- RESERVATION, NATIONAL OR STATE
- LAND GRANT
- ROW PROPERTY BOUNDARY (ROW PB)
- ROW EASEMENT BOUNDARY (ROW EB)
- ROW CLEARING EDGING (ROW CE)
- SITE BOUNDARY
- THE CENTERLINE OF STRUCTURE (R/S ℄)
- VEGETATION OR SOIL BOUNDARY

SITE MARKERS

- SAMPLE LOCATION
- PHOTO STATIONS
- MAPPED PLOT ON ROW
- MAPPED PLOT OFF ROW

WATER SYMBOLS

- PERENNIAL STREAMS
- INTERMITTENT STREAMS
- SMALL RAPIDS
- LARGE RAPIDS
- DISAPPEARING STREAM
- CANALS AND DITCHES
- PERENNIAL LAKES AND PONDS
- INTERMITTENT LAKES AND PONDS
- SPRING
- MARSH, SWAMP OR WET MEADOW
- WET SPOT
- ALLUVIAL FAN

TOPOGRAPHIC RELIEF

- CONTOUR (23)
- DEPRESSION CONTOUR

SOIL SYMBOL AND NAME

CcA	COLONIE	fine sand (0 to 8% slope)
CkA	CLAVERACK	loamy fine sand (0 to 8%)
ElA	ELNORA	loamy fine sand (0 to 8%)
GaA	GALEN	very fine sandy loam (0 to 8%)
WgA	WAYLAND	silt loam (0 to 8% slope)

SOIL SYMBOLS

- ROCK
- SAND
- SCATTERED ROCK
- BARE AND ERODING (GULLY)
- BARE AND ERODING (SHEET)
- BARE AND INCREASING IN SIZE
- BARE AND HEALING
- ERODED BUT HEALED
- CLAY AREA
- WIND EROSION

PLANT COMMUNITY SYMBOLS

shrubs

ALR	ALDER	Alnus spp.
ARR	ARROW - WOOD	Viburnum recognitum
BAR	BARBERRY	Berberis spp.
BLA	BLACKBERRY	Rubus spp.
BLH	BLACK - VIBURNUM	Viburnum prunifolium
BLU	BLUEBERRY	Vaccinium spp.
BUT	BUTTONBUSH	Cephalanthus occidentalis
CAY	AMERICAN YEW	Taxus canadensis
CFH	FLY - HONEYSUCKLE	Lonicera canadensis
CHC	CHOKE - CHERRY	Prunus virginiana
CLB	CLIMBING BITTERSWEET	Celastrus scandens
CRA	GRAPE	Vitis spp.
DEY	DEWBERRY	Rubus spp.
ELD	ELDERBERRY	Sambucus canadensis
GRD	GRAY DOGWOOD	Cornus racemosa
GRJ	GROUND - JUNIPER	Juniperus communis
HAA	COMMON ALDER	Alnus serrulata
HAW	HAWTHORN	Crataegus spp.
HAZ	HAZELNUT	Corylus spp.
HUC	HUCKLEBERRY	Gaylussacia spp.
JAR	MULTIFLORA ROSE	Rosa multiflora
MAV	MAPLE - LEAVED VIBURNUM	Viburnum acerifolium
MOH	MOUNTAIN - HOLLY	Nemopanthus mucronata
MOL	MOUNTAIN - LAUREL	Kalmia latifolia
MOM	MOUNTAIN - MAPLE	Acer spicatum
NAN	NANNYBERRY	Viburnum Lentago
NJT	NEW JERSEY TEA	Ceanothus americanus
PIF	PINXTER - FLOWER	Rhododendron nudiflorum
POI	POISON IVY	Rhus radicans
POS	POISON SUMAC	Rhus vernix
PRA	NORTHERN PRICKLY ASH	Xanthoxylum americanum
PRU	BUCKTHORN	Rhamnus spp.
RIB	RIBES	Ribes spp.
ROD	RED OSIER DOGWOOD	Cornus stolonifera
SMC	SUMAC	Rhus spp.
SPA	SPECKLED ALDER	Alnus rugosa
SPB	SPICEBUSH	Lindera Benzoin
SPI	SPIRAEA	Spiraea spp.
SMS	SMOOTH SUMAC	Rhus glabra
STM	STRIPED MAPLE	Acer pensylvanicum
STS	STAGHORN - SUMAC	Rhus typhina
SWF	SWEET - FERN	Comptonia peregrina
TAH	TARTARIAN HONEYSUCKLE	Lonicera tatarica
WIH	WITCH - HAZEL	Hamamelis virginiana
WIL	WILLOW	Salix spp.
WIN	WINTERBERRY	Ilex verticillata
WIR	WILD - RAISIN	Viburnum cassinoides
ZBC	BLACK CHOKEBERRY	Pyrus melanocarpa

trees

ABU	BUTTERNUT	Juglans cinerea
AIL	TREE - OF - HEAVEN	Ailanthus altissima
ALD	ALTERNATE - LEAVED DOGWOOD	Cornus alternifolia
AMB	BEECH	Fagus grandifolia
AMC	CHESTNUT	Castanea dentata
AME	AMERICAN ELM	Ulmus americana
AMH	AMERICAN HORNBEAM	Carpinus caroliniana
APP	APPLE	Pyrus malus
BAF	BALSAM - FIR	Abies balsamea
BAS	BASSWOOD	Tilia americana
BIH	BITTERNUT HICKORY	Carya cordiformis
BLC	BLACK CHERRY	Prunus serotina
BLL	BLACK LOCUST	Robinia Pseudo-Acacia
BLW	BLACK WALNUT	Juglans nigra
CHO	CHESTNUT - OAK	Quercus prinus
COT	COTTONWOOD	Populus deltoides
EAH	HEMLOCK	Tsuga canadensis
ERC	RED CEDAR	Juniperus virginiana
FLD	FLOWERING DOGWOOD	Cornus florida
GRB	GRAY BIRCH	Betula populifolia
HOH	AMERICAN HOP-HORNBEAM	Ostrya virginiana
LAA	LARGE - TOOTHED ASPEN	Populus grandidentata
LAR	AMERICAN LARCH	Larix laricina
NWC	WHITE CEDAR	Thuja occidentalis
PAB	WHITE BIRCH	Betula papyrifera
PIC	PIN - CHERRY	Prunus pensylvanica
PIH	PIGNUT HICKORY	Carya glabra
PIP	PITCH - PINE	Pinus rigida
QUA	QUAKING ASPEN	Populus tremuloides
RED	RED OAK	Quercus rubra
REM	RED MAPLE	Acer rubrum
RES	RED SPRUCE	Picea rubens
SAS	WHITE SASSAFRAS	Sassafras albidum
SCO	SCRUB - OAK	Quercus ilicifolia
SCP	SCOTCH PINE	Pinus sylvestris
SHB	SERVICEBERRY	Amelanchier spp.
SHH	SHAGBARK - HICKORY	Carya ovata
SUM	SUGAR - MAPLE	Acer saccharum
SWB	SWEET BIRCH	Betula lenta
VIP	SCRUB - PINE	Pinus virginiana
WHA	WHITE ASH	Fraxinus americana
WHO	WHITE OAK	Quercus alba
WHP	WHITE PINE	Pinus strobus
YEB	YELLOW BIRCH	Betula lutea
YEP	TULIP - POPLAR	Liriodendron tulipifera

herbs

BLG	BLUE - JOINT GRASS	Calamagrostis canadensis
BON	BONESET	Eupatorium perfoliatum
BRN	BRACKEN	Pteridum aquilinum
BRO	BROOM - SEDGE	Artholophis virginicus
CAT	CAT - TAIL	Typha spp.
CHF	CHRISTMAS - FERN	Polystichum acrostichoides
CIF	CINNAMON - FERN	Osmunda cinnamomea
DEG	DEERTONGUE GRASS	Panicum clandestinum
GOR	GOLDENROD	Solidago spp.
HAF	HAY - SCENTED FERN	Dennstaedtia punctilobula
HOT	HORSETAIL	Equisetum spp.
INF	INTERRUPTED FERN	Osmunda Claytoniana
IRS	IRIS	Iris spp.
JAP	SMALL JACK-IN-THE-PULPIT	Arisaema triphyllum
LET	WILD LETTUCE	Lactuca canadensis
MSF	MARGINAL SHIELD-FERN	Dryopteris marginalis
NYF	NEW YORK FERN	Dryopteris noveboracensis
PEV	PEARLY EVERLASTING	Anaphalis margaritacea
PHR	PHRAGMITES	Pragmites spp.
POG	POVERTY - GRASS	Danthonia spicata
RDM	REINDEER LICHEN	Cladonia rangiferina
ROF	ROYAL FERN	Osmunda regalis
SEF	SENSITIVE FERN	Onoclea sensibilis
SPL	SPIKED LOOSESTRIFE	Lythrum Salicaria
SPM	SPHAGNUM MOSS	Sphagnum spp.
SSS	SOLOMON'S - SEAL	Polygonatum biflorum
SWA	SWAMP - BUTTERCUP	Ranunculus septentrionalis
WHS	WHITE SNAKEROOT	Eupatorium rugosum
YPL	BULLHEAD - LILY	Nuphar variegatum

REVISIONS :

DATA SOURCES :

ASPLUNDH ENVIRONMENTAL SERVICES
BLAIR MILL ROAD
WILLOW GROVE, PA. 19090

- N.M.P.C. ENGINEERING PLAN & PROFILE 9/12/74
- U.S.G.S. 7.5 MIN. TOPOGRAPHIC MAP, FAIRPORT, N.Y. 1971
- U.S.D.A., S.C.S. IN COOPERATION WITH CORNELL UNIVER. AGR. EXP. STA., SOIL SURVEY FOR MONROE CO. N.Y. U.S. GOV'T SERVICES 3/73
- LOCKWOOD MAPPING INC. ROCHESTER, N.Y. MONROE CO. AIR PHOTO NO. 17-75B (SCALE 1:12,000) APR. 9 1973
- U.S.G.S., SIOUX FALLS, S.D. MONROE CO. AIR PHOTO NO. NOT LISTED (SCALE 1:21,000) MAY 7, 1971
- ASPLUNDH ENVIRONMENTAL SERVICES A.E.S. PROJECT NO. 81-002B FIELD STUDIES 1975-76

This information is a part of the ESEERCO "STUDY OF ENVIRONMENTAL AND ECONOMIC ASPECTS OF CONTEMPORANEOUS ELECTRIC TRANSMISSION LINE RIGHT-OF-WAY MANAGEMENT TECHNIQUES"

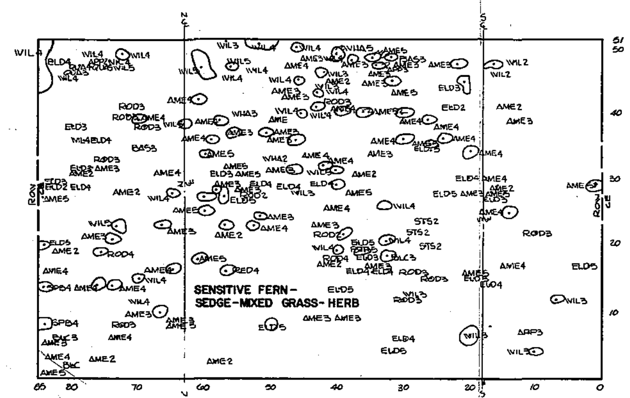
MAP 12.1

SITE 12 HABITAT CONDITIONS

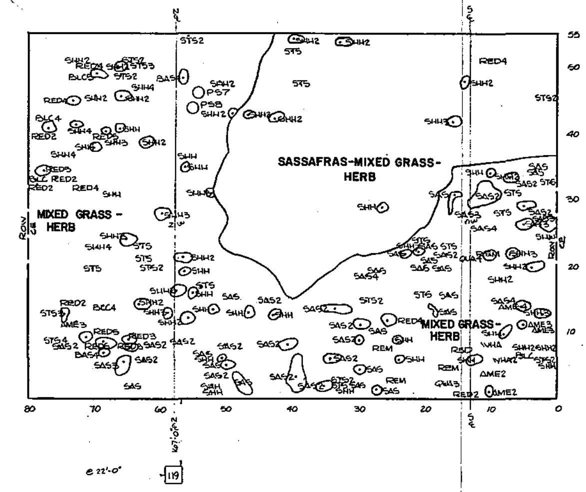
UTILITY: NIAGARA MOHAWK POWER CORP.
ROW DESCRIPTION: LOCKPORT TO SOLVAY 115 KV
STEEL LATTICE 160' ROW

SCALE: 1"=200'-0"
200 100 0 100 200 400 800 1000

PLOT 1 HYDRIC



PLOT 2 MESIC



NOTE: ALL SPECIES ON PLOT ARE EITHER STUMP SPROUTS OR ROOT SUCKERS; PLOTS MOWED ANNUALLY.

Note:
- VERTICAL AND HORIZONTAL SCALES ARE IN FEET

LEGEND

WORKS AND STRUCTURES

ACCESS ROAD

BRUSH AND LOG DISPOSAL SITES

BOUNDARIES

THE CENTERLINE OF STRUCTURE

ROW PROPERTY BOUNDARY

ROW EASEMENT BOUNDARY

EXISTING ROW CLEARING EDGE

WATER SYMBOLS

PERENNIAL STREAMS

INTERMITTENT STREAMS

SMALL RAPIDS

LARGE RAPIDS

DISAPPEARING STREAM

CANALS AND DITCHES

PERENNIAL LAKES AND PONDS

INTERMITTENT LAKES AND PONDS

SPRING

MARSH, SWAMP OR WET MEADOW

WET SPOT

ALLUVIAL FAN

SITE MARKERS

SAMPLE LOCATION

PHOTO STATION

SOIL SYMBOLS

ROCK

SCATTERED ROCK

herbs

BLG	BLUE - JOINT GRASS	Calamagrastis canadensis
BON	BONESET	Eupatorium perfoliatum
BRN	BRACKEN	Pteridum aquilinum
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PLANT COMMUNITY SYMBOLS

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POI	POISON IVY	Rhus radicans
POS	POISON SUMAC	Rhus vernix
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WIL	WILLOW	Salix spp.
WIN	WINTERBERRY	Ilex verticillata
WIR	WILD - RAISIN	Viburnum cassinoides
ZBC	BLACK CHOKEBERRY	Pyrus melanocarpa

trees

ABU	BUTTERNUT	Juglans cinerea
AIL	TREE - OF - HEAVEN	Ailanthus altissima
ALD	ALTERNATE - LEAVED DOGWOOD	Cornus alternifolia
AMB	BEECH	Fagus grandifolia
AMC	CHESTNUT	Castanea dentata
AME	AMERICAN ELM	Ulmus americana
AMH	AMERICAN HORNBEAM	Carpinus caroliniana
APP	APPLE	Pyrus malus
BAF	BALSAM - FIR	Abies balsamea
BAS	BASSWOOD	Tilia americana
BIH	BITTERNUT HICKORY	Carya cordiformis
BLC	BLACK CHERRY	Prunus serotina
BLL	BLACK LOCUST	Robinia Pseudo-Acacia
BLW	BLACK WALNUT	Juglans nigra
CHO	CHESTNUT - OAK	Quercus prinus
COT	COTTONWOOD	Populus deltoides
EAH	HEMLOCK	Tsuga canadensis
ERC	RED CEDAR	Juniperus virginiana
FLD	FLOWERING DOGWOOD	Cornus florida
GRB	GRAY BIRCH	Betula populifolia
HOH	AMERICAN HOP-HORNBEAM	Ostrya virginiana
LAA	LARGE - TOOTHED ASPEN	Populus grandidentata
LAR	AMERICAN LARCH	Larix laricina
NWC	WHITE CEDAR	Thuja occidentalis
PAB	WHITE BIRCH	Betula papyrifera
PIC	PIN - CHERRY	Prunus pensylvanica
PIH	PIGNUT HICKORY	Carya glabra
PIP	PITCH - PINE	Pinus rigida
QUA	QUAKING ASPEN	Populus tremuloides
RED	RED OAK	Quercus rubra
REM	RED MAPLE	Acer rubrum
RES	RED SPRUCE	Picea rubens
SAS	WHITE SASSAFRAS	Sassafras albidum
SCO	SCRUB - OAK	Quercus ilicifolia
SCP	SCOTCH PINE	Pinus sylvestris
SHB	SERVICEBERRY	Amelanchier spp.
SHH	SHAGBARK - HICKORY	Carya ovata
SUM	SUGAR - MAPLE	Acer saccharum
SWB	SWEET BIRCH	Betula lenta
VIP	SCRUB - PINE	Pinus virginiana
WHA	WHITE ASH	Fraxinus americana
WHO	WHITE OAK	Quercus alba
WHP	WHITE PINE	Pinus strobus
YEB	YELLOW BIRCH	Betula lutea
YEP	TULIP - POPLAR	Liriodendron tulipifera

REVISIONS :

DATA SOURCE :

ASPLUNDH ENVIRONMENTAL SERVICES
BLAIR MILL ROAD
WILLOW GROVE, PA. 19090

FIELD SURVEY - AES, 1975, 76

This information is a part of the ESEERCO "STUDY OF ENVIRONMENTAL AND ECONOMIC ASPECTS OF CONTEMPORANEOUS ELECTRIC TRANSMISSION LINE RIGHT-OF-WAY MANAGEMENT TECHNIQUES"

MAP 12.2

SITE 12

MAPPED PLOTS

UTILITY : NIAGARA MOHAWK POWER CORP.

ROW DESCRIPTION : LOCKPORT TO SOLVAY 115 KV.

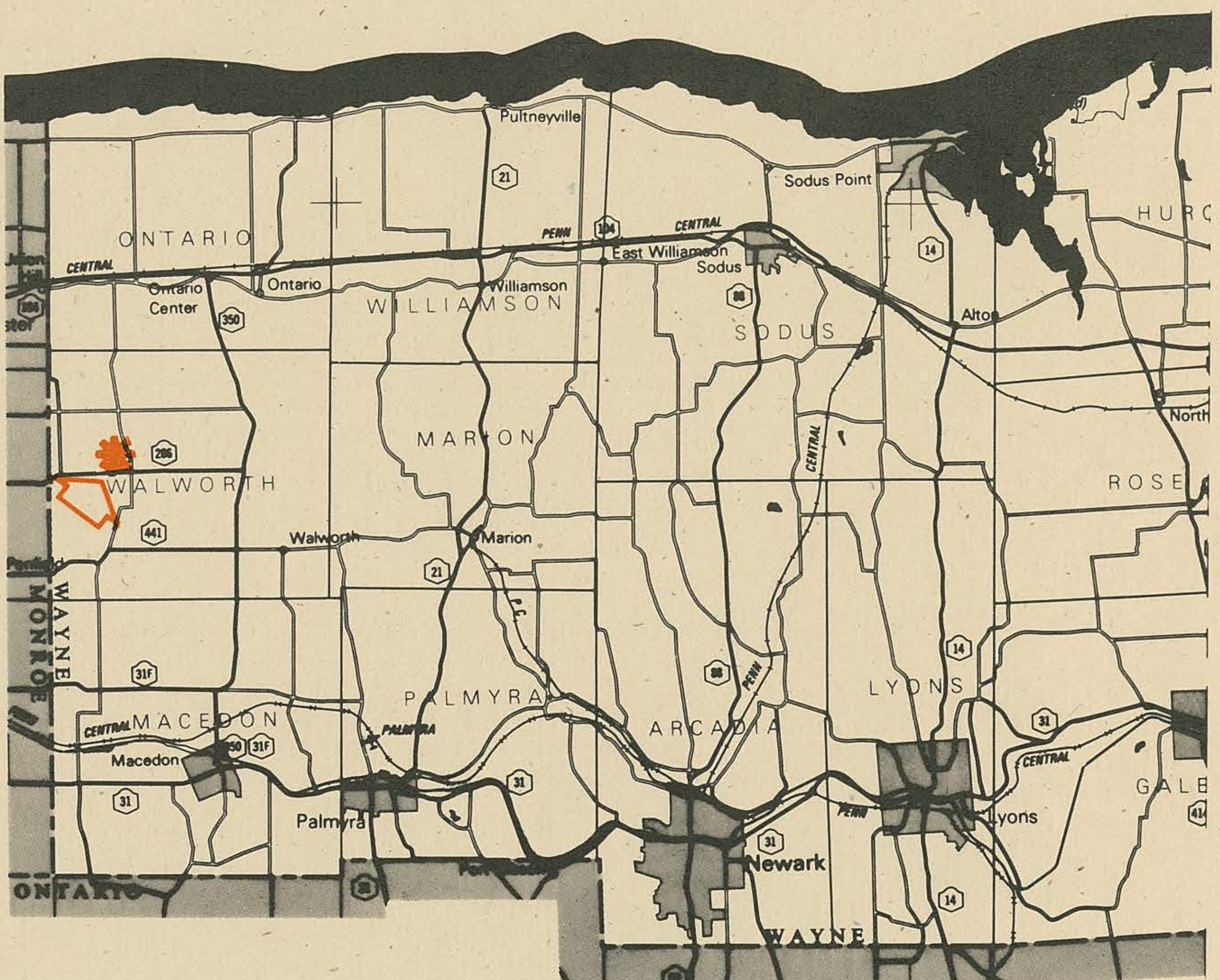
STEEL LATTICE 160 ROW

SCALE: 1" = 10' - 0"

10 5 0 5 10 20 40 50

SITE 13

STATION 121 to STATION 13A



NEW YORK STATE DEPARTMENT OF TRANSPORTATION
RAYMOND T. SCHULER, COMMISSIONER

WAYNE COUNTY

ADAPTED FROM NEW YORK STATE DEPARTMENT OF TRANSPORTATION 1:250,000 PLANIMETRIC SERIES, © 1974

SCALE 1:250,000

5 0 5

STATUTE MILES

N

Site 13 Station 121

Study area extends from County Line Road (structures 139 and 135) to the open area west of structures 142 and 138, and is located near Macedon. To reach the area, take route 90 (Thruway) to Exit 43 (route 21) and proceed north on route 21 to Palmyra; at Pálmyra take a left (west) on route 31 and proceed to Macedon. At Macedon turn right on route 350 and follow that to Atlantic Avenue (route 286) turning left thereon and continuing to County Line Road, taking a right on that road and proceeding to the site.

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Site 13 Station 121 to Station 13A

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Site 13 Station 121 to Station 13A

1 Introduction

Site 13 is located in the Erie-Ontario Plain physiographic area of New York (Cline, 1970) in the Elm-Red Maple and Northern Hardwoods forest type area (Stout, 1958). The general landscape of the ROW and adjacent area is shown in Fig. 13.1.1.

The land in this area is generally flat with low elevation. The region is dissected into numerous low rolling hills by streams flowing north into the lakes (Stout, 1958).

The typical forest type of the region is Elm-Red Maple and Northern Hardwoods (Stout, 1958). Located on the site are Northern Hardwoods and Red Maple-Ash forest types.

2 Location and Identification

Site 13 is approximately 5½ miles northwest of Walworth, in the town of Walworth, Wayne County, New York (77° 22' 00" W. Longitude; 43° 10' 00" N. Latitude).

The site is on the Station 121 to Station 13A ROW which is operated by the Rochester Gas & Electric Corporation (RG&E). This 400-foot easement consists of 2 single circuit 115 kV lines, each having wood pole H-frame structures. The project site is approximately 1,400 feet in length, and extends from County Line Road, which is east of structures 135 and 139, to structures 138 and 142 west of said road.

3 Background

The following discussion outlines documentable management techniques of clearing, construction, restoration, and maintenance for site 13, as received from RG&E (letter dated October 7, 1975, from Ray J. Murdock, Rochester Gas & Electric Company, Rochester, N.Y.). All available pertinent information and cost data are included under each operation of clearing, construction, restoration, and maintenance.

3.1 Clearing

The ROW was clear cut by contractors during October and November, 1967. Stumps were sprayed west of County Line Road, using Tordon 155 in oil in a selective application. No spray was applied east of County Line Road. Equipment included chain saws and bulldozers. Danger trees were removed. Logs 6 inches or more in diameter and suitable for sawing into lumber were cut into log lengths and piled along the ROW edge. Logs under 6 inches in diameter and brush were piled and burned. No information concerning cost is available.

3.2 Construction

Construction of the ROW was conducted late in 1967. No additional information is available.

3.3 Restoration

Restoration was by natural revegetation.

3.4 Maintenance

No information is available regarding ROW maintenance.

4 General Reconnaissance

A general reconnaissance was made in accordance with the methodology and is set forth in Map 13.1 which shows site habitat conditions. In this reconnaissance it was noted that the major vegetational types in general correlated with the soil types on the mesic and hydric habitats.

The existing visual character of the ROW is depicted during all seasons of the year, from important vantage points both on and off the ROW. These points are identified as photo stations and are located on Map 13.1 and described in Appendix 17. Specific reference is made to some of these photo stations throughout the report and illustrated in Fig. 13.1. With the exception of aerial photography used to identify land use, older photographs depicting the area are not available.

In the context of its location the site is generally pleasing to view. Much of the mesic areas of the ROW are covered by gray dogwood, and while this is difficult to traverse it provides good vegetative cover that is attractive. The character of the site appears similar to other old fields in the vicinity. There are no distinct natural features nearby which may make the ROW somewhat sensitive to view. However, there is one adjacent house near the ROW and the site is generally clearly visible from County Line Road which runs north and south and crosses the ROW. The portion of the site west of the road is well screened by vegetation, although the ROW is clearly visible from the adjacent residence south of the site. View from the residence is enhanced largely due to maintence by the owner of a mowed area which extends onto the ROW. Although the ROW site crosses County Line Road which appears moderately well traveled, the site is located in a rural area, and the potential number of people viewing the site is somewhat low.

5 Field Studies - Results and Discussion

5.1 Soils

5.1.1 Geology and Soils

Site 13, Station 121 to Station 13A ROW, is located in Wayne County, in that physiographic region termed the Erie-Ontario Plain by Cline (1970) and Erie-Ontario Lowland by Thompson (1966), on that area of transition between the Ontario Lake Plain and Ontario Drumlins subdivisions. Bedrock geology is of Silurian age, 435 million to 395 million years ago, consisting predominately of dolostone, shale, salt beds, sandstone, and most particularly in this area, limestone, Surficial geology is glacial drift consisting mainly of glacial till deposited directly by the ice sheet. Bedrock throughout the site occurs at about 20 to 40 inches (Broughton et al., 1973; Higgins and Case, 1974).

Soils on this site are classified in a variety of orders and suborders. One is in the order Alfisols, suborder Udalfs (Wassaic series), reflecting their gray to brown surface horizons and the presence of an illuvial horizon in which silicate clays have accumulated. Two soils are in the order Inceptisols, suborder Aquepts (Lyons and Newstead series), reflecting the absence of horizons of marked accumulation of clay and iron and aluminum oxides. One soil is in the order Mollisols, suborder Aquolls (Joliet series), indicating the presence of a surface horizon which is thick, dark, and organic-rich, with a high base supply (Buckman and Brady, 1966; Soil Survey Staff, 1975). Cline (1969) places this site within the broad soil association termed Sodus-Ira. Brief descriptions (Higgins and Case, 1974; Anon., 1972) of soil types occurring on the ROW study site (Map 13.1; Table 13.1) follow:

Joliet silt loam (JoA): These soils have developed in slightly acid to mildly alkaline glacial till deposits that are 10 to 20 inches thick over limestone bedrock, and occupy nearly level areas on bedrock-controlled till plains. Joliet silt loams are somewhat poorly drained, and are moderately permeable in the subsoil. Rooting depth is limited by a high water table, particularly during spring or other wet periods, and bedrock. In unlimed areas, soil reaction ranges from slightly acid to neutral in the surface layer and slightly acid to mildly alkaline in the subsoil; on this site in the upper 3 inches the pH was 6.8. Joliet is in Woodland Suitability Group 5w, designating low timber productivity (Class 5) and excessive wetness (Subclass w) as a limitation or restriction.

Lyons mucky silt loam and silt loam (LyA): These soils developed in alkaline galcial till deposits in Wayne County, on level or nearly level terrain, and occupy low wet spots within glacial till areas. Lyons soils are very poorly drained, and have a moderately permeable surface of 6 to 10 inches over a moderately slowly permeable subsoil. Lyons soils generally evidence a soil reaction ranging from pH 6.0 to pH 7.0 through the first 24 inches, and soil reaction was pH 6.7 in the upper 3 inches on this site. This soil is assigned to Woodland Suitability Group 4w1, designating moderate productivity and excessive wetness.

Newstead gravelly fine sandy loam (NwA): Newstead soils have formed in glacial till deposits over bedrock, with a depth of 20 to 40 inches, and occur on level or nearly level topography associated with bedrock formations. These soils are somewhat poorly to poorly drained and have moderate permeability above the bedrock. Soil reaction in the upper 3 inches was pH 6.8; in general, it ranges from pH 6.6 to pH 7.8 throughout a typical profile. The Woodland Suitability Group designation for Newstead soils is 4w1, indicating moderate productivity and excessive wetness, either seasonally or throughout the year.

Wassaic silt loam (WfA): These soils formed in the glacial till overlying bedrock in gently sloping terrain, averaging in depth from 20 to 40 inches. Permeability ranges from moderate to moderately rapid throughout the profile, and Wassaic soils are well to moderately well drained. Soil reaction varies from slightly acid to neutral throughout a typical profile (pH 6.0 to pH 7.0); in the upper 3 inches on this site, it was pH 6.8. Wassaic silt loam is assigned to Woodland Suitability Group 2o1, designating high productivity for timber, and no significant restrictions or limitations for woodland use or management.

5.1.2 Humus Types

Organic layers present on the soil surface of the ROW and adjacent woodland were measured on 2 mesic locations. Average thickness of the organic layers and A1 horizon was based on 5 samples taken at each location (Table 13.2). One of the 2 mesic locations was study plot 2, and the other was randomly selected. The presence and thickness of these layers were used for humus type classification. The humus classification key is not adaptable to areas exhibiting prolonged water saturation in the surface soil; therefore, similar measurements were not made on the hydric plot.

It appears that these mesic areas on the ROW were plowed at one time, but that such activity was abandoned at least 13 years ago, according to old aerial photographs. The adjacent woodland apparently was forested at that time. No evidence of grazing or recent fires was noted.

Of the organic layers (litter, fermentation, and humus), only the litter layer was present at each location sampled on both the ROW and adjacent woodland. Traces of the fermentation layer were located at scattered intervals on the ROW, but there were none in the woodland. The natural humus type on the ROW was somewhat modified by plowing. Based upon the presence of the A1 horizon, and the absence of the humus and fermentation layers, the predominant humus type was designated a "deep medium mull-P" with the "P" indicating evidence of plowing, on the ROW, and a "very deep medium mull" in the adjacent woodland on both locations. The A1 horizon in the woodland was considerably deeper than that on the ROW, while the litter layer on the ROW was slightly thicker than that in the woodland. Litter in the woods was composed primarily of tree parts (leaves, twigs, and fruit) in contrast to the leaves and stems of grasses, herbs, and shrubs on the ROW. High earthworm activity was noted throughout the study area.

Based upon these limited observations, it appears that ROW construction and periodic maintenance for brush control did not materially alter the depth of the litter layer on the soil. The changes noted above appear to be minor, and, regarding the A1 horizon, it is suspected that differences between the ROW and adjacent woodland relate more closely to previous plowing of the ROW area than to the construction, maintenance, or presence of the ROW. In addition, elimination of the forest cover resulted in a change in kind of organic material. However, regrowth and persistence of a mixed grass-herb-shrub cover has resulted in annual litter depositions and continuation of a protective organic layer on the ROW.

5.1.3 Soil Erosion

Current Active Erosion Observations of active erosion on the ROW and adjacent woodland were made on the Station 121 to Station 13A study area in August, 1976. Slight sheet erosion has occurred and small patches of bare soil were evident throughout large areas of the general ROW and adjacent forest. This scattered sheet erosion, which also occurred at 1 tower site, was largely evident in the Wassaic silt loam soils, which are well drained and have a tendency toward droughtiness in dry seasons. Fine silt loam soils, such as those present on this site, generally have a high erosion potential that may be moderated by the protective canopy of trees and shrubs in the forest and vegetative cover of grass, herbs, and shrubs on the ROW; otherwise, erosion likely would be greater. The woodland had larger areas of bare soil than the ROW, with scattered twig and leaf litter and some herbs, as opposed to a fairly dense shrub-grass-herb cover and its attendant litter on the ROW. In both areas litter comprises the only organic layer present (Table 13.2). This thin litter cover and rapid decomposition and incorporation of organic matter in the mineral soil is characteristic of mull humus types. The incorporated organic matter tends to improve soil structure and resistance to erosive forces.

Eroding areas were identified as to location on the ROW and adjacent woodland, soil type, average slope, and present plant cover (Table 13.3). Erosion was classified as to kind (sheet, rill, gully) and class (slight, moderate, severe); average depths of gullies were recorded. Aside from the slight sheet erosion occurring throughout certain areas of the site, active erosion on the ROW was limited to 2 areas that had been subjected to mechanical disturbance of the soil. In both instances man-made ditches, 1 with moderate gully erosion and 1 with slight sheet erosion, carry sediment resulting from such erosion off the ROW. One ditch appears to be utilized for irrigation and/or drainage purposes for farming, and the other parallels County Line Road.

There was apparently no restoration in the form of seeding or planting following construction of this ROW line, and denuded areas were therefore dependent on natural plant invasion. Natural plant invasion has been extensive throughout the ROW, and includes large communities of gray dogwood and aspen, as well as a general cover of mixed grass, herbs, low shrubs, and tree saplings. No areas of mass land movement such as landslides occurred on this site.

5.2 Vegetation

5.2.1 Habitat and Forest Types on the Site

Hydric Habitat The hydric, or wet, habitat (1) was located in a slightly depressed area of a nearly level plain. Slope was negligible and aspect was flat. Drainage was impeded. The forest type was Red Maple-Ash, consisting mainly of red maple, white ash, and black cherry.

Mesic Habitat The mesic, or medium moist, habitat (2) was located on a nearly level plain; slope was negligible. Drainage was free, but not excessive. The forest type was a disturbed Northern Hardwoods. Because a fallen tree at the edge of the forest interferred with normal vegetation patterns, the woods plot was located off the east corner of the ROW plot in this case.

5.2.2 Analysis of Forest Types and Associated ROW Vegetation

General Changes in Vegetation The primary impact of the ROW was to cause a change from a forest with a 4-layered structure to a shrub-herb-grass community. Obviously, removal of the trees caused this; and what was essentially a 2-layered ROW community developed, with the shrub layer consisting of shrubs and small trees which were not removed by maintenance practices, or which have arisen since the last maintenance procedures (Fig. 13.2), and an herb layer.

In order to more completely characterize the forest types, an analysis was made on the forest plots to derive importance values for tree species (Table 13.3). From this analysis, it is reasonable to assume that red maple and white ash were important species on the mesic plot.

On the hydric habitat, a Red Maple-Ash forest type was changed to a Red Osier Dogwood-Sensitive Fern plant community. On the mesic habitat, a Northern Hardwoods forest type was changed to a Sumac-Goldenrod plant community.

Quantitative Changes There was a marked increase in the number of herbs on the hydric habitat on the ROW, 18, as compared to the forest, 7 (Table 13.5; Figs. 13.3 and 13.4). Eight shrubs occurred on the ROW and 6 occurred in the forest. An increase in the number of shrubs and herbs on the ROW occurred on the mesic habitat; there were 4 shrubs in the forest, as compared to 8 on the ROW, and 9 herbs in the forest as compared to 12 on the ROW (Table 13.5).

Qualitative Changes On the hydric habitat, 7 species from the shrub and herb layers occurred both in the forest and on the ROW (Fig. 13.5), and of these, arrow-wood and poison ivy were more numerous in the forest, while gray dogwood, sedge, and grasses were more numerous on the ROW. Three shrub species and 3 herb species appeared only in the adjacent forest (Table 13.6), while 5 shrubs, particularly willow and red osier dogwood, and 14 herbs, including boneset, horsetail, cat-tail and nightshade, were unique to the ROW (Table 13.7).

On the mesic habitat, northern prickly ash and buckthorn occurred on both the ROW and the adjacent woodland (Table 13.5). Two shrub species occurred only in the woodland, while 6 occurred only on the ROW, including the abundant gray dogwood (Tables 13.6 and 13.7). Nine herb species appeared exclusively in the forest, the most numerous of which were false spikenard, wild leek, and trout-lily (Table 13.6). There were 12 herbs which were unique to the ROW, including mixed grass, goldenrod, aster, and strawberry (Table 13.7).

It appears that the ROW had a notable impact on the number of species from the pre-existing forest on both the hydric and mesic habitats. There was little impact on the number of shrubs on the hydric habitat, while there was a notable increase in the number of herbs on the ROW (Table 13,5).

On the hydric habitat, a marsh dominated by cat-tails, willow, red osier dogwood, boneset, and horsetail developed, and many of the shrubs of the forest were still present (Table 13.5).

On the mesic habitat, forest-dwelling herbs, in particular, including false spikenard, large-flowered wake-robin (Fig. 13.1.2), wild leak, and papoose-root, were not found on the ROW, although they were in the forest. The net effect was a change from an herb layer dominated by such species to one dominated by grasses, strawberry, goldenrod, aster, yarrow, Queen Ann's-lace, and sheep-sorrel. Gray dogwood and staghorn-sumac formed a prominent shrub layer on the ROW (Table 13.5).

5.2.3 Analysis of Plant Communities for On-ROW Mapped Vegetation Plots

Table 13.8 presents a breakdown of major vegetational communities for the hydric and mesic plots on the Station 121 to Station 13A study area. Much of the present composition of herbaceous and woody plant communities on this ROW can be explained by the habitat conditions following clear cutting.

The major plant communities now dominating the hydric and mesic locations are: Sedge-Mixed Grass-Herb, Cat-tail-Nightshade, Mixed Grass-Herb, and Gray Dogwood.

Gray dogwood is a prolific shrub on this ROW and occurs on both hydric and mesic sites, but is more abundant on the mesic sites (Fig. 13.1.3).

5.2.4 Comparison of Forest Type with ROW Vegetation

The ROW was clear cut in 1967 and the material was piled and burned. No information exists regarding chemical treatment.

The general impact of the above clearing technique of the ROW was to change the forest types to shrub-herb-grass communities. Some shrub and herb plants of the forest were replaced by plants favored by open conditions. Some tree species were found on the ROW, largely in the shrub layer (Fig. 13.1.4).

On the hydric habitat, formerly occupied by a Red Maple-Ash forest type, a Red Osier Dogwood-Sensitive Fern community was produced. There was a significant difference in the number and kind of species on the ROW as compared to the adjacent forest. In most cases when forest species occurred on the ROW it was to a much lesser degree than they occurred in the woods. The same is true of open-growing species of the ROW when they occurred under the forest canopy.

On the mesic habitat, formerly occupied by a Northern Hardwoods forest type, a Sumac-Goldenrod community was produced. There was a significant difference in the number and kind of species on the ROW as compared to the adjacent forest. There was a quantitative and a qualitative change of the shrub and herb species on the ROW as compared to the forest. In most cases when forest species occurred on the ROW it was to a much lesser degree than when they occurred in the woods. The same is true of open-growing species of the ROW when they occurred under the forest canopy.

5.3 Wildlife

The major game species for site 13, Station 121 to Station 13A, were determined by Asplundh Environmental Services (AES) in conjunction with the New York State Department of Environmental Conservation (DEC). These species are ring-necked pheasant, woodcock, and raccoon.

5.3.1. Actual Use

Ring-necked Pheasant During the course of the study pheasants were seen and heard throughout the study area. In the fall of 1975, 1 cock bird was flushed from the ROW edge. Two cocks were heard crowing on the ROW and along the ROW edge in spring, 1976. Due to the nature of the surrounding area, it being largely agricultural, this site lends itself to favorable conditions for pheasants.

Woodcock On March 19, 1976, from 5:30 p.m. to 7:00 p.m., a woodcock singing ground survey was conducted on this site. Peenting started at approximately 6:30 p.m. and was continuing, at a lesser rate, at 7:05 p.m., when observation was terminated. The weather was partly cloudy, with a temperature of 60 F, and the ground had a partial snow cover.

Three birds were located singing in the surrounding study area. One singing ground was located immediately adjacent to the ROW and marked with red ribbon. The other 2 singing grounds were roughly located to be pinpointed at a later date. One woodcock was flushed from a heavy cover of red osier dogwood on the ROW. This bird had been peenting on the ROW but left upon approach, and flew to his singing ground adjacent to the ROW. The last bird heard peenting was believed to be singing on the ROW. During the time of observation, woodcocks were flying up and down the ROW, going to and from singing grounds, on nuptial flights.

Woodcock singing ground surveys were again conducted on site 13, on April 14, 1976, from 5:45 p.m. to 7:15 p.m. The weather was 50% overcast, with no wind, and a temperature of 65 F.

One singing ground was located off the ROW, at the location marked with red ribbon on March 19, 1976. Two females were observed flying across the ROW toward that singing ground.

One singing male was located off the ROW in the field past the stream beyond structure 142. One bird was observed peenting on the ROW, past the stream, near structure 140 on the north side of the ROW; and beyond the study area on the opposite side of County Line Road, 1 bird was noted peenting off the ROW, in a field.

A total of 4 singing grounds were located in the vicinity of the study area, 1 of which was located on the ROW. Woodcock were flushed on and off the ROW during the study period. The presence of heavy earthworm activity in the soil may also account for the large amount of woodcock activity on this site.

Raccoon No raccoons were observed during the period of study although it is likely that this area with its forest, agricultural fields, and streams, affords good habitat for these animals.

Miscellaneous Wildlife Observations Various birds were seen and/or heard on the study area throughout the period of this study. The diversity of species may be attributed in part to the ecotone which is created due to the presence of the ROW. Birds observed on the ROW and on the ROW edge are included in Table 13.9.

Although not indicated as a major game species, cottontail rabbit utilization of the study area was very heavy, as indicated by tracks, browse, and pellets (Figs. 13.1.5 and 13.1.6). Rabbit browse was heavy on staghorn-sumac, pussy willow, sugar-maple, and apple. Although rabbit activity was heavy both on and off the ROW, it was much heavier on the ROW. Rabbit activity on the ROW may be more intense because of the dense shrub communities which exist there.

During the winter of 1976, gray squirrel tracks were noted to be slight off the ROW.

White-tailed deer use was slight throughout the study period. Only small amounts of browse were found during the study on raspberry.

Spring peeper activity was heavy off the ROW, in the adjacent woods, as indicated by vocalization during the spring of 1976.

Mole activity was moderate on the ROW on mesic plot 2 during the summer of 1975. Earthworm activity was heavy on the ROW and woodland during this period of time.

5.3.2 Potential Use

Potential wildlife use of the plant species present on site 13 for the 3 major game species, pheasant, woodcock, and raccoon, is contained in Table 13.10 (Martin et al., 1951).

5.4 Land Use

5.4.1 Location

Site 13 is located in a rural nonfarm section of the town of Walworth, Wayne County, New York. Between 1960 and 1970 there was a 16.8% increase in population of Wayne County with a 1970 distribution of 28.6% urban, 63.0% rural nonfarm, and 8.4% rural farm (U.S. Bureau of the Census, 1972). The closest community is Walworth which is approximately 5½ miles to the northwest.

5.4.2 Land Use Prior to Construction

The ROW was constructed during 1967. The earliest available data obtained from 1963 aerial photography indicates that the location of the ROW and adjacent land to the ROW was primarily rural nonfarm (Table 13.11; Fig. 13.6). Land use distribution included the following subtypes:

Agriculture:
- Ao - Orchards
- At - High intensity cropland
- Ac - Cropland and cropland pasture
- Ap - Pasture

Forest Land:
- Fc - Forest brushland
- Fn - Forest lands
- Fp - Plantations

Residential:
- Rs- Strip development

Water Resources:
- Wc - Artificial ponds
- Wb - Marshes, shrub wetlands, and bogs
- Ww - Wooded wetlands

5.4.3 Land Use After Construction

The adjacent land use to site 13 has had a minimal change from the 1963 data. The land adjacent to the ROW is still rural nonfarm (Table 13.11; Fig. 13.6) with a land use distribution which includes the following subtypes:

Agriculture:
- At - High intensity cropland
- Ac - Cropland and cropland pasture
- Ap - Pasture
- Ai - Inactive agricultural land

Extractive Industry:
- Eg - Sand and gravel pits

Forest Land:
- Fc - Forest brushland
- Fn - Forest lands
- Fp - Plantations

Residential:
- Rs - Strip development

Water Resources:
- Wc - Artificial ponds
- Wb - Marshes, shrub wetlands, and bogs
- Ww - Wooded wetlands

In addition to use of the ROW for the transmission of electrical power, the ROW is currently being used for snowmobiling, with 1 portion being utilized as an extension of adjacent residential property.

6 Evaluation, Interpretation, and Summary of Results

6.1 Conditions Which Existed Prior to Establishment of ROW

Soil, vegetation, and wildlife habitat conditions existing prior to ROW construction were based on observations made during the period of this study on adjacent undisturbed forest areas on both sides of the ROW.

6.1.1 Soils

This site is located on nearly level lowland that lies in a transition zone between the Ontario Lake Plain and Ontario Drumlins physiographic subregions. Surficial geology is calcareous glacial till overlying limestone, sandstone, and shale bedrock at 10 to 40 inches beneath the surface. Aspect is generally flat and all slopes less than 8%. Surface mineral soils are mostly silt loams, and some fine sandy loam, that are slightly acid to neutral. Four soil types were identified on the study area: somewhat poorly drained Joliet silt loam and Newstead gravelly fine sandy loam that formed in a nearly level till plain; very poorly drained Lyons mucky silt loam that developed in depressed till areas; and, moderately well-drained Wassaic silt loam that formed in glacial till on flat to gently sloping terrain.

In the bordering forest, which may represent conditions before ROW construction in 1967, soils with impeded drainage, Joliet, Lyons, and Newstead series, supported bottomland hardwood species, predominantly red maple and white ash, of low to moderate productivity with management limitations due to excessive wetness. The moderately well-drained, mesic, Wassaic soil supported hardwood species associated with moist sites, such as basswood, butternut, black cherry, and America hop-hornbeam, and were rated high in productivity with no management limitations. Portions of the Wassaic and Newstead soils adjacent to the ROW on the south side were occupied by residential areas and inactive agricultural land in 1976.

The forest floor on mesic sites was composed of a thin litter layer, 0.4 inches thick, consisting of tree leaves, twigs, and fruit, with decomposed organic matter incorporated to a depth of 5.5 inches in the mineral soil. Apparently high earthworm activity in these nearly neutral soils was important in organic matter breakdown and mixing with meneral soil. The predominant humus type in the forest was a "very deep medium mull". Slight, and in 1 case moderate, sheet erosion was observed throughout the forest on scattered areas where litter was sparse and surface soil exposed on gently sloping Wassaic silt loam.

6.1.2 Vegetation

The study area on this ROW was used as agricultural cropland, or had been recently abandoned from this use, at the time the corridor was established (1967).

6.1.3 Wildlife

Wildlife, being mobile species which may or may not be observed during site visitation, were reasonably imputed to this area by the composition of the forested areas adjacent to the ROW. It can be assumed that those species that currently occupy the site, i.e., ring-necked pheasant, woodcock, and raccoon, utilized the habitat before ROW construction. Even though the presence of the ROW may influence current wildlife activity, it is likely that those species, designated by the DEC in conjunction with AES as major in this area, unhabited the vicinity prior to ROW construction. The degree of use is impossible to determine at this time.

6.1.4 Land Use

The earliest data available prior to construction of the ROW in 1967 is 1963 aerial photography. The ROW and adjacent land area was rural farm, with a land use distribution of agriculture (69.3%), forest land (17.8%), water resources (12.0%), and residential (.9%).

6.2 Conditions Which Exist at Present

6.2.1 Soils

The same geologic materials, drainage conditions, and soil types summarized for the general study area in Section 6.1.1 were present on the ROW. Dominant shrub and herb species on the ROW in 1976 associated with soil types and moisture regimes were dogwood, willow, boneset, horsetail, and sedges on poorly drained Lyons and Newstead soils, and, sumac, dogwood, goldenrod, with mixed grasses and herbs, on the moderately well-drained Wassaic soils.

The soil surface on mesic sites of the ROW was covered with a thin litter layer, 0.6 inches thick, composed of shrub, herb, and grass remains. Organic matter was mixed with the mineral soil (A1 horizon) to a depth of 4.0 inches, presumably due to action of earthworms prominent on the site. Presence of the A1 horizon and modification of the soil surface due to past plowing on the ROW area resulted in a "deep medium mull-P" humus type.

Slight sheet erosion was evident at scattered locations throughout the general ROW, and 1 tower site, on gentle slopes of Wassaic silt loam where litter and plant cover was light and patches of surface soil exposed. Additional sheet and gully erosion occurred along 2 drainage ditches constructed as water diversions, with resulting sediments moving off the ROW via these ditches.

6.2.2 Vegetation

On hydric sites, the Sedge-Mixed Grass-Herb, and Mixed Grass-Herb communities form the major vegetation cover. Cat-tail-Nightshade dominate the wettest areas.

The Sedge-Mixed Grass-Herb, and Mixed Grass-Herb communities were being invaded by large numbers of tree seedlings and shrubs. These include American elm, shagbark-hickory; red maple, gray dogwood, arrow-wood, and willows. The Cat-tail-Nightshade community has far less invasion by woody species. These include white ash, cottonwood, and red maple.

On mesic sites, the major herbaceous cover is Mixed Grass-Herb, which is broken by large areas of gray dogwood. Woody plants invading the Mixed Grass-Herb community are white ash, quaking aspen, willow, elderberry, and pin-cherry. Gray dogwood thickets appear to resist invasion by other woody plants and form a more stable community.

6.2.3 Wildlife

Ring-necked pheasant, woodcock, and raccoon are the major game species that probably currently utilize the study area. Indirect observations (crowing) and direct observations of ring-necked pheasants indicated that species' presence on the study area. Woodcock singing ground surveys in the spring of 1976 evidenced their presence on the study area, and their use of openings on the ROW as well as adjacent to the ROW for purposes of spring mating activities. Although no raccoons were observed, directly or indirectly, the habitat appears to be favorable to that species.

A variety of other animals were noted, directly or indirectly, to be utilizing either the ROW, the adjacent forest, or both. Potential wildlife use is evident from plant species present on the site.

6.2.4 Land Use

Presently, the adjacent land uses to site 13 have had a minimal change from the 1963 data. The ROW and the adjacent land area are still considered to be rural farm with a distribution of agriculture (69.3%), forest land (17.5%), extractive industry (.3%), water resources (12.0%), and residential (.9%).

Classified as rural farm, the ROW and adjacent land area vary in land use distribution from overall county statistics which identify Wayne County as rural nonfarm. With reference to the total area involved, shifts in land use are noted as follows:

Agriculture -	no change
Forest Land -	- .3%
Extractive Industry -	+ .3%
Water Resources -	no change
Residential -	no change

Land use of extractive industry (.3%) is a new type which was not present in 1963. In addition to use of the ROW for the transmission of electrical power, the ROW is currently being used for snowmobiling, with 1 portion being utilized as an extension of adjacent residential property.

6.3 Environmental Effect and Probable Causes

6.3.1 Soils

Effects of ROW management on soils of this site were negligible. Some sheet and gully erosion occurred along 2 drainage ditches crossing the ROW; however, it is possible that these ditches were constructed for farming purposes in the area and/or for water diversion along County Line Road. Soil sediments from this erosion moved off the ROW via these ditches. The sporadic sheet erosion observed throughout the general ROW, as well as the adjoining forest, appears to be a natural occurrence on these mull humus types on silt loam soils and not related to ROW activities.

Litter mulch on the ROW was nearly equivalent to that in the forest, but source of litter varied from leaves and stems of grasses, herbs, and shrubs on the ROW to tree parts in the forest. A somewhat thinner A1 horizon on the ROW and modification of the surface soil by past plowing resulted in a "deep medium mull-P" humus type versus a "very deep medium mull" in the forest.

6.3.2 Vegetation

Since at the time of ROW establishment the corridor study area and adfacent lands were active or recently abandoned agricultural lands, ROW establishment has had little impact on the subsequent vegetation development. Open areas, both on the ROW and on the adjacent fields, have been slowly invaded by woody plants, largely shade intolerant species such as staghorn-sumac, willow, gray dogwood, arrow-wood, aspens, and cottonwood.

Although the vegetation management records for this portion of the corridor are incomplete, it does not appear that vegetation control has been necessary on the study area since ROW establishment in 1967. There is no immediate need for woody vegetation control in the near future.

6.3.3 Wildlife

The presence of the ROW has encouraged the development of many different plant species, mainly light-loving, on the ROW proper, thus enhancing the habitat for wildlife use. The ecotone created by the presence of the ROW often produces a greater variety and density of life than is found otherwise (Leopold, 1936), and this phenomenon has been termed the "edge effect" (Smith, 1974).

6.3.4 Land Use

It is not possible to attribute changes in land use within the area inventoried to the existence of the transmission ROW. Changes within the area may be attributed to other changing land use characteristics in Wayne County. The inventoried area remains rural farm in character. It is apparent that the adjacent residences are utilizing the additional open spaces of the ROW as an extension of their properties.

Table 13.1. Soil series present on the Station 121 to Station 13A study area.

Soil Series	Map Symbol[1]	Drainage Class[2]	Surface Soil pH	Surface Soil Texture	Woodland Suitability Group
Joliet	JoA	SPD	6.8	silt loam	5w
Lyons	LyA	VPD	6.7	mucky silt loam & silt loam	4w1
Newstead	NwA	SPD-PD	6.8	gravelly fine sandy loam	4w1
Wassaic	WfA	MG-G	6.8	silt loam	2o1

[1] The third letter of the map symbol designates slope class:
A = 0-8%, B = 8-15%, C = 15-25%, D = 25-35%, E = 35-50%, F = 50-70%.

[2] Drainage Class: VPD = very poorly drained, PD = poorly drained, SPD = somewhat poorly drained, ID = imperfectly drained, MG = moderately good, G = good, E = excellent (excessive).

Table 13.2. Average thickness of organic layers and A1 horizon and humus types for mesic sites on ROW and adjacent woodland of site 13.

Moisture Regime	Location	Layer Thickness (in.) L	F	H	A1	Humus Type
1. Mesic (2)[1]	ROW	.6	0	0	4.0	Deep medium mull-P
	Woodland	.4	0	0	6.0	Very deep medium mull
2. Mesic	ROW	.5	0	0	4.0	Deep medium mull-P
	Woodland	.3	0	0	5.0	Very deep medium mull
All Plots Combined	ROW	.6	0	0	4.0	Deep medium mull-P
	Woodland	.4	0	0	5.5	Very deep medium mull

[1] Samples taken at vegetation study plots, the numbers of which are indicated by figures in parentheses.

Table 13.3. Areas exhibiting active erosion in August, 1976, on the Station 121 to Station 13A ROW study area.

				Erosion on Site		
Location	Soil Type	Average Slope (%)	Plant Cover	Kind	Class	Gully Depth (in.)
		ROW				
General ROW	Wassaic silt loam	2	Bare-grass-herb	Sheet	Slight	-
Tower Site	Wassaic silt loam	2	Bare-grass	Sheet	Slight	-
Ditch on ROW	Joliet silt loam	6	Bare	Gully	Moderate	4
Ditch on ROW	Newstead gravelly fine sandy loam	3	Bare-grass	Sheet	Slight	-
		FOREST				
Forest	Wassaic silt loam	2	Bare-herb-litter (leaves)	Sheet	Moderate	-

Table 13.4. Importance value of trees in the upper tree layer in the forest adjacent to the ROW.

Site	Species	Relative Dominance Basal Area (% of total) 1	Relative Density (% of total) 2	Importance Value 1+2
Hydric (1)	Red Maple	74.21	68	142.21
	White Ash	25.79	32	57.79
Mesic (2)	Basswood	46.07	36	82.07
	Butternut	21.97	20	41.97
	Black Cherry	15.11	24	39.11
	American Hop-Hornbeam	13.38	12	25.38
	Red Maple	3.35	4	7.35
	White Ash	.12	4	4.12

Table 13.5. Comparison of species composition, abundance and sociability (A.S.) in the tree, shrub, and herb layers, in the adjacent forest and on the ROW, on hydric and mesic habitats.

Species	Hydric (1)		Mesic (2)	
	Forest A.S.	ROW A.S.	Forest A.S.	ROW A.S.
Tree Layer				
Red Maple	2.1	-	+.1	-
White Ash	1.1	-	+.1	-
American Hop-Hornbeam	-	-	+.1	-
Basswood	-	-	1.1	-
Black Cherry	-	-	1.1	-
Butternut	-	-	1.1	-
No. Species	2	0	6	0
Shrub Layer				
Arrow-wood	4.2	+.3	-	-
Gray Dogwood	2.1	3.3	-	2.5
Northern Prickly Ash	+.1	-	2.1	+.1
Virginia Creeper	2.2	-	2.3	-
Poison Ivy	3.3	1.4	-	-
Raspberry	2.1	-	-	-
Willow spp.	-	3.1	-	-
Red Osier Dogwood	-	3.1	-	++.1
Staghorn-Sumac	-	+.1	-	3.1
Buckthorn	-	++.1	+.1	+.1
Blackberry	-	1.3	-	-
Gooseberry sp.	-	-	+.1	-
Wild-raisin	-	-	-	++.1
Grape	-	-	-	+.1
Climbing Bittersweet	-	-	-	1.2
No. Species	6	8	4	8
Trees in the Shrub Layer				
Red Maple	3.1	3.1	3.1	+.1
White Ash	2.1	3.1	-	++.1
Black Cherry	1.1	++.1	2.1	+.1
Black Locust	+.1	+.1	-	-
Quaking Aspen	-	+.1	-	-
American Hop-Hornbeam	-	-	2.1	-
Large-toothed Aspen	-	-	-	1.1
American Elm	-	-	-	+.1
Cottonwood	-	-	-	+.1
Apple	-	-	-	++.1
No. Species	4	5	3	7

Table 13.5. Continued

Species	Hydric (1) Forest A.S.	Hydric (1) ROW A.S.	Mesic (2) Forest A.S.	Mesic (2) ROW A.S.
Herb[1] Layer				
Royal Fern	+.2	–	–	–
Jack-in-the-pulpit	(+.2)	–	+.1	–
Early Meadow-Rue	+.2	–	–	–
Sedge	1.2	2.2	–	–
Mixed Grass	1.2	2.3	–	4.4
Wild Cranesbill	+.2	+.2	–	+.2
Strawberry	1.2	2.2	–	2.2
Boneset	–	3.3	–	–
Horsetail	–	3.4	–	–
Bedstraw spp.	–	3.2	–	–
Winter-Cress	–	1.1	–	–
Northern Water Plantain	–	2.2	–	–
Cat-tail	–	2.4	–	–
Nightshade	–	2.4	–	–
Iris	–	+.3	–	–
Sensitive Fern	–	1.2	–	–
Goldenrod spp.	–	3.2	–	3.2
Aster spp.	–	2.2	–	2.2
Yarrow	–	2.2	–	1.2
Heal-all	–	1.2	–	–
Daisy spp.	–	2.1	–	+.1
False Spikenard	–	–	3.3	–
Large-flowered Wake-robin	–	–	1.1	–
Wild Leek	–	–	(3.2)	–
White Baneberry	–	–	1.1	–
Papoose-root	–	–	(1.3)	–
Christmas Fern	–	–	+.2	–
Trout-Lily	–	–	3.1	–
Large-leaved Aster	–	–	(+.4)	–
Cinquefoil spp.	–	–	–	++.2
Queen Anne's-lace	–	–	–	1.2
Sheep-Sorrel	–	–	–	1.2
Butterfly-weed	–	–	–	+.2
Upright Yellow Wood-Sorrel	–	–	–	+.2
No. Species	7	18	9	12
Total No. Species				
Trees	4	5	6	7
Shrubs	6	8	4	8
Herbs	7	18	9	12
Totals	17	31	19	27

[1] For simplicity, herbs include all species of the layer.

Table 13.6. Characteristic species with abundance and sociability ratings (A.S.) in the shrub and herb layers of the adjacent forest which did not occur on the ROW.

Species	Forest A.S.	ROW A.S.
Hydric (1)		
Shrubs		
Northern Prickly Ash	+.1	-
Virginia Creeper	2.2	-
Raspberry	2.1	-
Herbs[1]		
Early Meadow-Rue	+.2	-
Royal Fern	+.2	-
Jack-in-the-pulpit	(+.2)	-
No. Species	6	
Mesic (2)		
Shrubs		
Virginia Creeper	2.3	-
Gooseberry sp.	+.1	-
Herbs		
Jack-in-the-pulpit	+.1	-
False Spikenard	3.3	-
Large-flowered Wake-robin	1.1	-
Wild Leek	(3.2)	-
White Baneberry	1.1	-
Papoose-root	(1.3)	-
Christmas Fern	+.2	-
Trout-Lily	3.1	-
Large-Leaved Aster	(+.4)	-
No. Species	11	

[1] For simplicity, herbs include all species of the herb layer.

Table 13.7. Characteristic species with abundance and sociability ratings (A.S.) in the shrub and herb layers of the ROW which were not in the adjacent forest.

Species	ROW A.S.	Forest A.S.
Hydric (1)		
Shrubs		
Willow spp.	3.1	-
Red Osier Dogwood	3.1	-
Staghorn-Sumac	+.1	-
Buckthorn	++.1	-
Blackberry	1.3	-
Herbs[1]		
Boneset	3.3	-
Horsetail	3.4	-
Bedstraw spp.	3.2	-
Winter-Cress	1.1	-
Northern Water Plantain	2.2	-
Cat-tail	2.4	-
Iris	+.3	-
Sensitive Fern	1.2	-
Goldenrod spp.	3.2	-
Aster spp.	2.2	-
Yarrow	2.2	-
Heal-all	1.2	-
Daisy spp.	2.1	-
Nightshade	2.4	-
No. Species	19	
Mesic (2)		
Shrubs		
Gray Dogwood	2.5	-
Red Osier Dogwood	++.1	-
Staghorn-Sumac	3.1	-
Wild-raisin	++.1	-
Climbing Bittersweet	1.2	-
Grape	+.1	-
Herbs		
Strawberry	2.2	-
Mixed Grass	4.4	-
Wild Cranesbill	+.2	-
Goldenrod spp.	3.2	-

Table 13.7. Continued

Species	ROW A.S.	Forest A.S.
Aster	2.2	-
Yarrow	1.2	-
Daisy	+.1	-
Cinquefoil	++.2	-
Queen Anne's-lace	1.2	-
Sheep-Sorrel	1.2	-
Butterfly-weed	+.2	-
Upright Yellow Wood-Sorrel	+.2	-
No. Species	18	

[1] For simplicity, herbs include all species of the herb layer.

Table 13.8. Major vegetational types for the Station 121 to Station 13A study area based on percent of study plots occupied by each plant community or other components on the ROW.

Community	Site Classification Hydric (1)	Site Classification Mesic (2)
	Percent of Total Area	
Sedge-Mixed Grass-Herb	43.4	
Cat-tail-Nightshade	24.7	
Mixed Grass-Herb	17.2	47.8
Gray Dogwood	5.1	27.1
Standing Water	4.0	
Mixed Grass-Herb-Gray Dogwood	3.4	20.4
Red Osier Dogwood	.9	
White Ash	.5	
Arrow-wood	.4	
Red Maple	.2	
Willow	.2	
Disturbed Area		4.0
Buckthorn		.5
Staghorn-Sumac		.1
American Elm		.1
Total	100.00	100.00

Table 13.9. Birds observed and/or heard on the ROW and on the ROW edge during the study period.

Species	Species
Canada goose	Robin
Canvasback	Yellow warbler
Ring-necked pheasant	Yellowthroat
American woodcock	Baltimore oriole
Downy woodpecker	Brown-headed cowbird
Hairy woodpecker	Common grackle
Yellow-shafted flicker	Red-winged blackbird
Eastern wood pewee	Cardinal
Black-capped chickadee	American goldfinch
Catbird	Song sparrow

Table 13.10. Potential wildlife use of plant species[1] present on the ROW and adjacent woods for the major game species on site 13, Station 121 to Station 13A.

Species	Wildlife Species		
	Pheasant	Raccoon	Woodcock
<u>Trees</u>			
Black Cherry	*		
<u>Shrubs</u>			
Gray Dogwood	+		
Red Osier Dogwood	+		
Grape	*	*	
Staghorn-sumac	+		
Blackberry			+
Raspberry			+
<u>Herbs</u>			
Sedge			+
Nightshade	+		

1 Those plants not included in this table provide a certain amount of cover (Table 13.5) for the 3 major game species, and may also provide seasonal food value, specific information pertaining to which is not now available. This applies also with regard to non-game species.

Table 13.11. Comparison of land use prior to and after construction of the ROW.[1]

	Land Use	Percent of Total Area Prior to (-) and After (*) Construction 0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
(A)	Agriculture	---69.3 ***69.3
(C,I)	Commercial & Industrial	
(F)	Forest Land	-----------17.8 ***********17.5
(E)	Extractive Industry	---.3
(N)	Non-productive	
(OR)	Outdoor Recreation	
(P)	Public & Semi-public	
(W)	Water Resources	----------12.0 **********12.0
(U)	Urban Inactive	
(T)	Transportation	
(R)	Residential	-.9 *.9

1 Source: ASCA/USDA, Salt Lake City, air photo No. 36117 274 38, Oct. 22, 1974
USDA-SCS, Wayne County, air photo No. 252, June 26, 1963

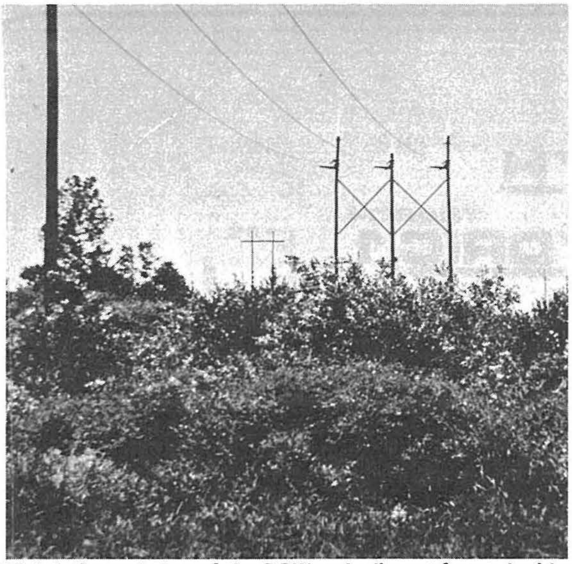


FIG. 13.1.1. General view of the ROW and adjacent forest, looking west from County Line Road, in summer, 1975 (Photo Station 1).

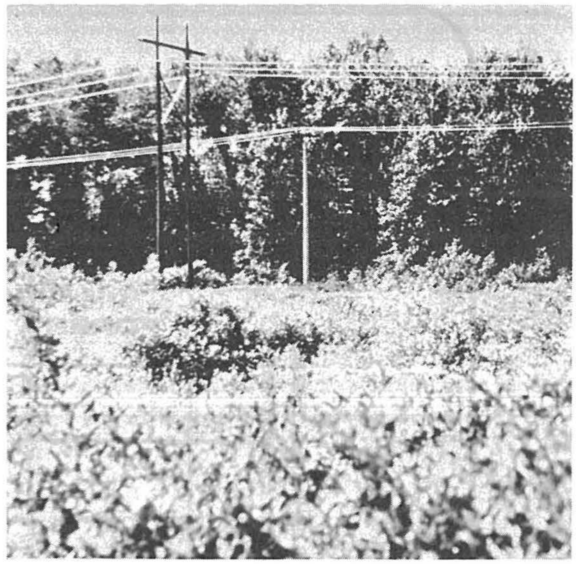


FIG. 13.1.2. Large-flowered wake-robin off ROW, in the spring of 1975.

FIG. 13.1.3. Solid community of gray dogwood on ROW, in summer, 1975 (Photo Station 7).

FIG. 13.1.4. Large-toothed aspen, an undesirable species, on ROW, in spring, 1976 (Photo Station 10).

FIG. 13.1.5. Rabbit gnawings on ROW during the winter of 1976.

FIG. 13.1.6. Rabbit hole and tracks on ROW during the winter of 1976.

FIG. 13.1. Visual characteristics.

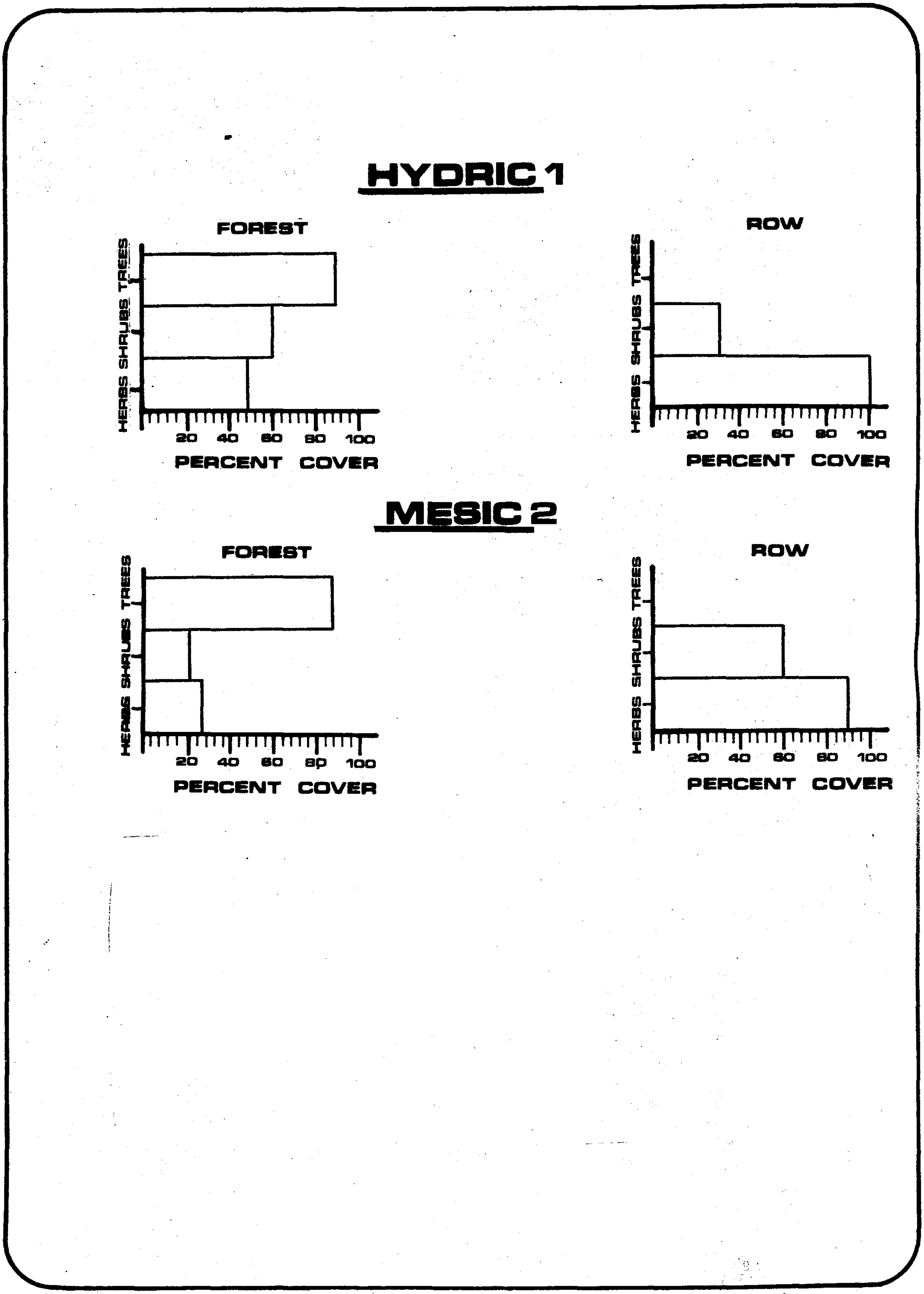


Fig. 13.2. Changes in cover value of tree, shrub, and herb layers from forest to ROW.

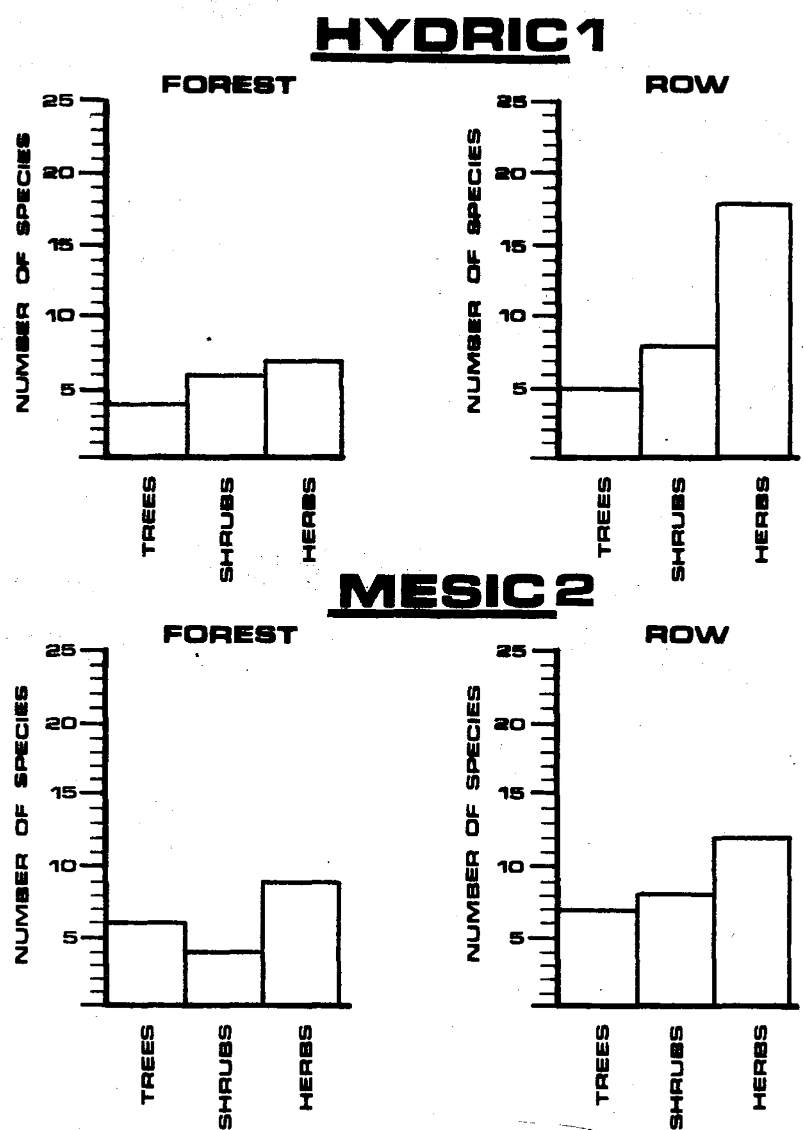


Fig. 13.3. Species diversity in the forest and on the ROW.

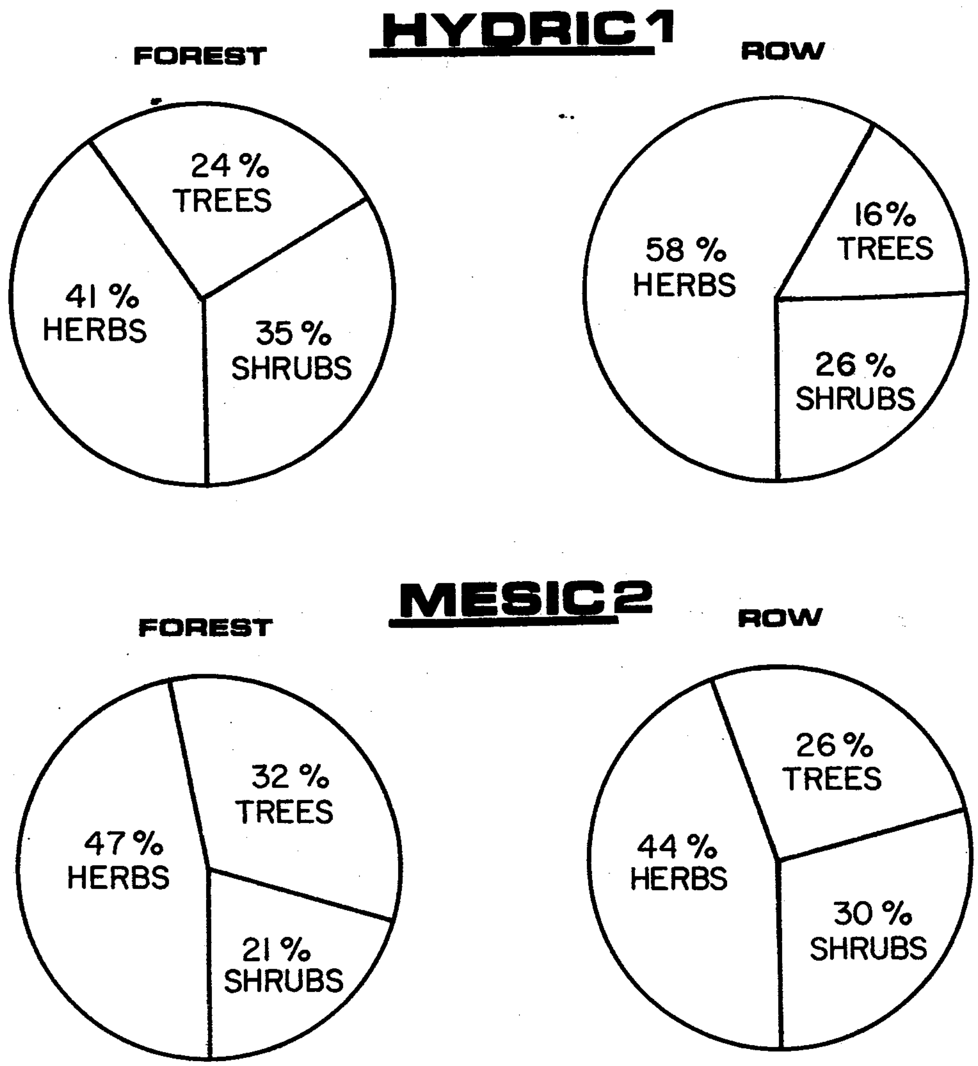


Fig. 13.4. Life form spectrum of the ROW as compared to the adjacent forest to compare species make-up of each, based on the number of species in each life form expressed as a percent of total species.

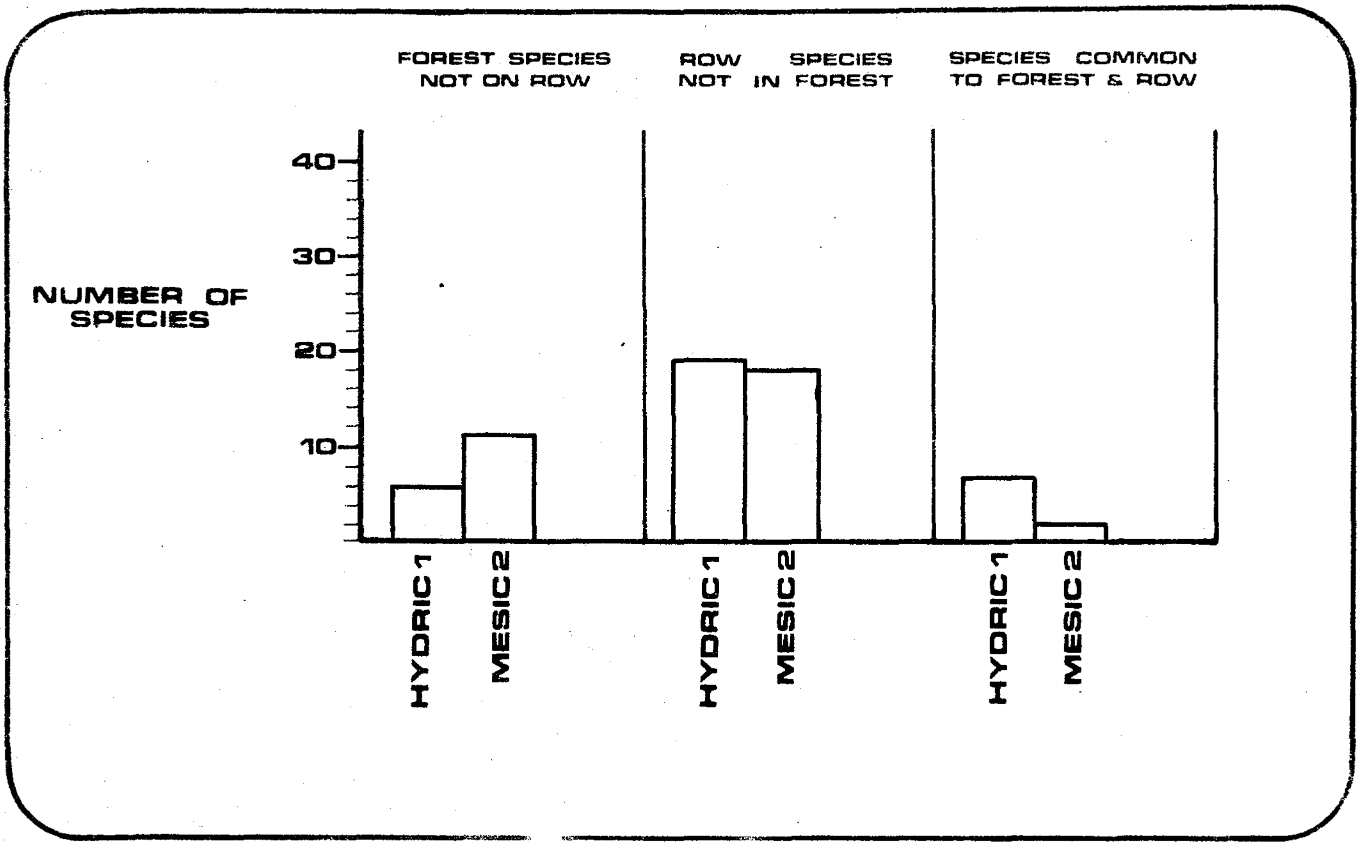
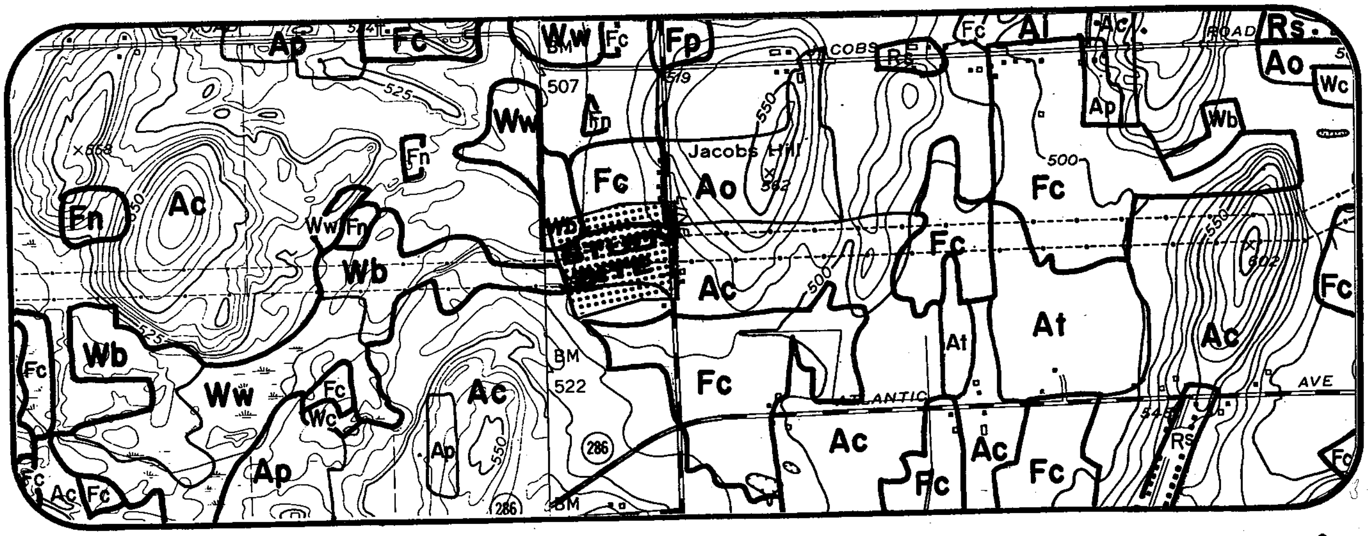
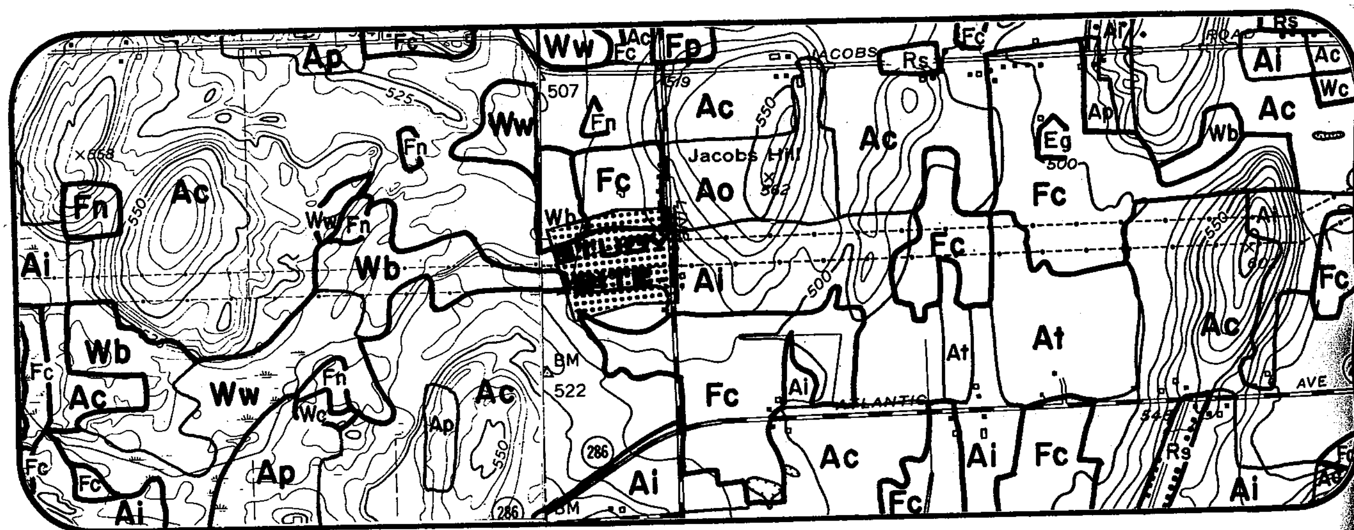


Fig. 13.5. Comparison of shrub and herb species in the forest and on the ROW.



LAND USE PRIOR TO ROW CONSTRUCTION (1952) SCALE 1"-2000



LAND USE AFTER CONSTRUTION OF ROW (1974) SCALE 1"-2000

LEGEND FOR LAND USE SYMBOLS

AGRICULTURE
- Ac - Cropland and cropland pasture
- Ai - Inactive agricultural land
- Ao - Orchards
- Ap - Pasture
- At - High intensity cropland

EXTRACTIVE INDUSTRY LAND USE
- Eg - Sand and gravel pits

FOREST LAND
- Fc - Forest brushland
- Fn - Forest lands
- Fp - Plantations

RESIDENTIAL LAND USE
- Rs - Strip development

WATER RESOURCES
- Wb - Marshes, shrub wetlands and bogs
- Wc - Artificial ponds
- Ww - Wooded wetlands

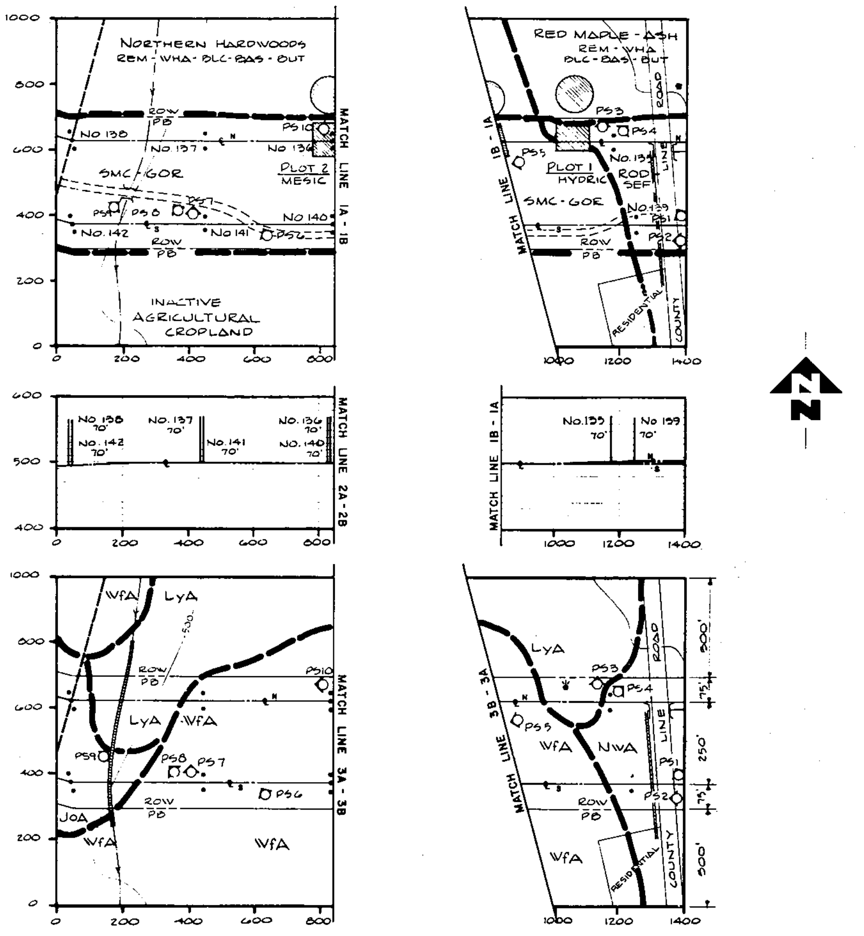
SOURCES:
- ASCA/USDA, Salt Lake City, air photo No. 36117 274- 38, Oct. 22, 1974
- USDA-SCS, Wayne County, air photo No. 252, June 26, 1973
- Area Land Use Map, LUNR, Cornell University, N.Y., 1974
- U. S. G. S. Topographic Maps, Ontario, N.Y., 1969, and Webster, N. Y., 1971

Fig. 13.6. Land use change.

VEGETATION

CENTERLINE PROFILE

SOILS



Notes:
- Vertical and Horizontal scale in feet
- 10 foot Contour Intervals

LEGEND

WORKS AND STRUCTURES

- HIGHWAYS AND ROADS
- HEAVY DUTY
- MEDIUM DUTY
- LIGHT DUTY
- ACCESS ROAD
- UNIMPROVED DIRT ROAD
- NATIONAL INTERSTATE
- US ROUTE
- STATE OR COUNTY
- SINGLE TRACK RAILROAD
- MULTIPLE TRACK RAILROAD
- ABANDONED RAILROAD TRACK
- RAILROAD OVER
- RAILROAD UNDER
- FORD
- ROAD CROSSING
- BUILDING
- EXCAVATION
- MINE DUMP
- PIPELINE
- TRANSMISSION STRUCTURES
- DAMS
- CULVERT
- TANKS
- WELLS
- BRUSH AND LOG DISPOSAL SITES
- cem — SMALL PARKS, CEMETERY, ETC
- FENCE
- DITCH, TRENCH

BOUNDARIES

- NATIONAL OR STATE
- COUNTY
- MINOR CIVIL DIVISION
- RESERVATION, NATIONAL OR STATE
- LAND GRANT
- ROW / PB — ROW PROPERTY BOUNDARY
- ROW / EB — ROW EASEMENT BOUNDARY
- ROW / CE — ROW CLEARING EDGING
- SITE BOUNDARY
- N/S — THE CENTERLINE OF STRUCTURE
- VEGETATION OR SOIL BOUNDARY

SITE MARKERS

- SAMPLE LOCATION
- PHOTO STATIONS
- MAPPED PLOT ON ROW
- MAPPED PLOT OFF ROW
- APPROX. LOCATION OF WOODCOCK SINGING GROUND

WATER SYMBOLS

- PERENNIAL STREAMS
- INTERMITTENT STREAMS
- SMALL RAPIDS
- LARGE RAPIDS
- DISAPPEARING STREAM
- CANALS AND DITCHES
- PERENNIAL LAKES AND PONDS
- INTERMITTENT LAKES AND PONDS
- SPRING
- MARSH, SWAMP OR WET MEADOW
- WET SPOT
- ALLUVIAL FAN

TOPOGRAPHIC RELIEF

- 23 — CONTOUR
- DEPRESSION CONTOUR

SOIL SYMBOL AND NAME

JoA	JOLIET	silt loam (0 to 8% slope)
LyA	LYONS	mucky silt loam and silt loam (0 to 8%)
NwA	NEWSTEAD	gravelly fine sandy loam (0 to 8%)
WfA	WASSAIC	silt loam (0 to 8% slope)

SOIL SYMBOLS

- ROCK
- SAND
- SCATTERED ROCK
- BARE AND ERODING (GULLY)
- BARE AND ERODING (SHEET)
- BARE AND INCREASING IN SIZE
- BARE AND HEALING
- ERODED BUT HEALED
- CLAY AREA
- WIND EROSION

PLANT COMMUNITY SYMBOLS

shrubs

ALR	ALDER	Alnus spp.
ARR	ARROW - WOOD	Viburnum recognitum
BAR	BARBERRY	Berberis spp.
BLA	BLACKBERRY	Rubus spp.
BLH	BLACK - VIBURNUM	Viburnum prunifolium
BLU	BLUEBERRY	Vaccinium spp.
BUT	BUTTONBUSH	Cephalanthus occidentalis
CAY	AMERICAN YEW	Taxus canadensis
CFH	FLY - HONEYSUCKLE	Lonicera canadensis
CHC	CHOKE - CHERRY	Prunus virginiana
CLB	CLIMBING BITTERSWEET	Celastrus scandens
CRA	GRAPE	Vitis spp.
DEY	DEWBERRY	Rubus spp.
ELD	ELDERBERRY	Sambucus canadensis
GRD	GRAY DOGWOOD	Cornus racemosa
GRJ	GROUND - JUNIPER	Juniperus communis
HAA	COMMON ALDER	Alnus serrulata
HAW	HAWTHORN	Crataegus spp.
HAZ	HAZELNUT	Corylus spp.
HUC	HUCKLEBERRY	Gaylussacia spp.
JAR	MULTIFLORA ROSE	Rosa multiflora
MAV	MAPLE - LEAVED VIBURNUM	Viburnum acerifolium
MOH	MOUNTAIN - HOLLY	Nemopanthus mucronata
MOL	MOUNTAIN - LAUREL	Kalmia latifolia
MOM	MOUNTAIN - MAPLE	Acer spicatum
NAN	NANNYBERRY	Viburnum Lentago
NJT	NEW JERSEY TEA	Ceanothus americanus
PIF	PINXTER - FLOWER	Rhododendron nudiflorum
POI	POISON IVY	Rhus radicans
POS	POISON SUMAC	Rhus vernix
PRA	NORTHERN PRICKLY ASH	Xanthoxylum americanum
PRU	BUCKTHORN	Rhamnus spp.
RIB	RIBES	Ribes spp.
ROD	RED OSIER DOGWOOD	Cornus stolonifera
SMC	SUMAC	Rhus spp.
SPA	SPECKLED ALDER	Alnus rugosa
SPB	SPICEBUSH	Lindera Benzoin
SPI	SPIRAEA	Spiraea spp.
SMS	SMOOTH SUMAC	Rhus glabra
STM	STRIPED MAPLE	Acer pensylvanicum
STS	STAGHORN - SUMAC	Rhus typhina
SWF	SWEET - FERN	Comptonia peregrina
TAH	TARTARIAN HONEYSUCKLE	Lonicera tatarica
WIH	WITCH - HAZEL	Hamamelis virginiana
WIL	WILLOW	Salix spp.
WIN	WINTERBERRY	Ilex verticillata
WIR	WILD RAISIN	Viburnum cassinoides
ZBC	BLACK CHOKEBERRY	Pyrus melanocarpa

trees

ABU	BUTTERNUT	Juglans cinerea
AIL	TREE - OF - HEAVEN	Ailanthus altissima
ALD	ALTERNATE - LEAVED DOGWOOD	Cornus alternifolia
AMB	BEECH	Fagus grandifolia
AMC	CHESTNUT	Castanea dentata
AME	AMERICAN ELM	Ulmus americana
AMH	AMERICAN HORNBEAM	Carpinus caroliniana
APP	APPLE	Pyrus malus
BAF	BALSAM - FIR	Abies balsamea
BAS	BASSWOOD	Tilia americana
BIH	BITTERNUT HICKORY	Carya cordiformis
BLC	BLACK CHERRY	Prunus serotina
BLL	BLACK LOCUST	Robinia Pseudo-Acacia
BLW	BLACK WALNUT	Juglans nigra
CHO	CHESTNUT - OAK	Quercus prinus
COT	COTTONWOOD	Populus deltoides
EAH	HEMLOCK	Tsuga canadensis
ERC	RED CEDAR	Juniperus virginiana
FLD	FLOWERING DOGWOOD	Cornus florida
GRB	GRAY BIRCH	Betula populifolia
HOH	AMERICAN HOP-HORNBEAM	Ostrya virginiana
LAA	LARGE - TOOTHED ASPEN	Populus grandidentata
LAR	AMERICAN LARCH	Larix laricina
NWC	WHITE CEDAR	Thuja occidentalis
PAB	WHITE BIRCH	Betula papyrifera
PIC	PIN - CHERRY	Prunus pensylvanica
PIH	PIGNUT HICKORY	Carya glabra
PIP	PITCH - PINE	Pinus rigida
QUA	QUAKING ASPEN	Populus tremuloides
RED	RED OAK	Quercus rubra
REM	RED MAPLE	Acer rubrum
RES	RED SPRUCE	Picea rubens
SAS	WHITE SASSAFRAS	Sassafras albidum
SCO	SCRUB - OAK	Quercus ilicifolia
SCP	SCOTCH PINE	Pinus sylvestris
SHB	SERVICEBERRY	Amelanchier spp.
SHH	SHAGBARK - HICKORY	Carya ovata
SUM	SUGAR - MAPLE	Acer saccharum
SWB	SWEET BIRCH	Betula lenta
VIP	SCRUB - PINE	Pinus virginiana
WHA	WHITE ASH	Fraxinus americana
WHO	WHITE OAK	Quercus alba
WHP	WHITE PINE	Pinus strobus
YEB	YELLOW BIRCH	Betula lutea
YEP	TULIP - POPLAR	Liriodendron tulipifera

herbs

BLG	BLUE - JOINT GRASS	Calamagrostis canadensis
BON	BONESET	Eupatorium perfoliatum
BRN	BRACKEN	Pteridum aquilinum
BRO	BROOM - SEDGE	Arthalophis virginicus
CAT	CAT-TAIL	Typha spp.
CHF	CHRISTMAS FERN	Polystichum acrostichoides
CIF	CINNAMON - FERN	Osmunda cinnamomea
DEG	DEERTONGUE GRASS	Panicum clandestinum
GOR	GOLDENROD	Solidago spp.
HAF	HAY - SCENTED FERN	Dennstaedtia punctilobula
HOT	HORSETAIL	Equisetum spp.
INF	INTERRUPTED FERN	Osmunda Claytoniana
IRS	IRIS	Iris spp.
JAP	SMALL JACK-IN-THE-PULPIT	Arisaema triphyllum
LET	WILD LETTUCE	Lactuca canadensis
MSF	MARGINAL SHIELD FERN	Dryopteris marginalis
NYF	NEW YORK FERN	Dryopteris noveboracensis
PEV	PEARLY EVERLASTING	Anaphalis margaritacea
PHR	PHRAGMITES	Pragmites spp.
POG	POVERTY - GRASS	Danthonia spicata
RDM	REINDEER LICHEN	Cladonia rangiferina
ROF	ROYAL FERN	Osmunda regalis
SEF	SENSITIVE FERN	Onoclea sensibilis
SPL	SPIKED LOOSESTRIFE	Lythrum Salicaria
SPM	SPHAGNUM MOSS	Sphagnum spp.
SSS	SOLOMON'S - SEAL	Polygonatum biflorum
SWA	SWAMP - BUTTERCUP	Ranunculus septentrionalis
WHS	WHITE SNAKEROOT	Eupatorium rugosum
YPL	BULLHEAD - LILY	Nuphar variegatum

REVISIONS :

DATA SOURCES :

ASPLUNDH ENVIRONMENTAL SERVICES
aes
BLAIR MILL ROAD
WILLOW GROVE PA 19090

- RG&E Engineering Plan & Profile 1/6/66
- USGS 7.5 min Topographic Map, Ontario N.Y. 1952
- USDA, SCS in cooperation with Cornell Univ Agr Exp Sta Interim Soil Report Wayne Co N.Y. 1974
- ASCS/USDA, Salt Lake City, Utah Wayne Co. air photo No 36117 274 38 scale (1:40,000) Oct. 22, 1974
- Asplundh Environmental Services AES Project No 81-0028 Field Studies 1975-76

This information is a part of the ESEERCO "STUDY OF ENVIRONMENTAL AND ECONOMIC ASPECTS OF CONTEMPORANEOUS ELECTRIC TRANSMISSION LINE RIGHT-OF-WAY MANAGEMENT TECHNIQUES"

MAP 13.1

SITE 13 HABITAT CONDITIONS

UTILITY: Rochester Gas & Elec Corp.

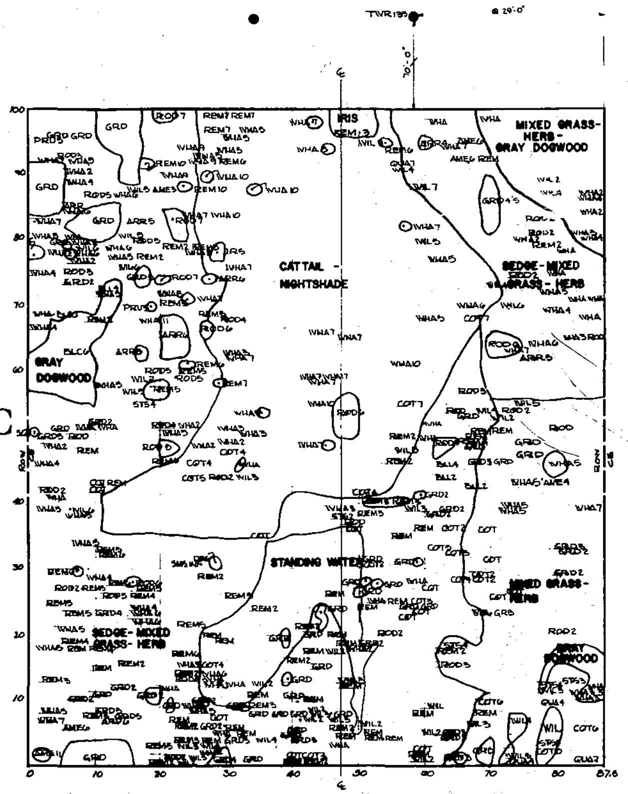
ROW DESCRIPTION: Station 121 to Station 13A 115 KV

Wooden Pole 'H' Frame 400' ROW

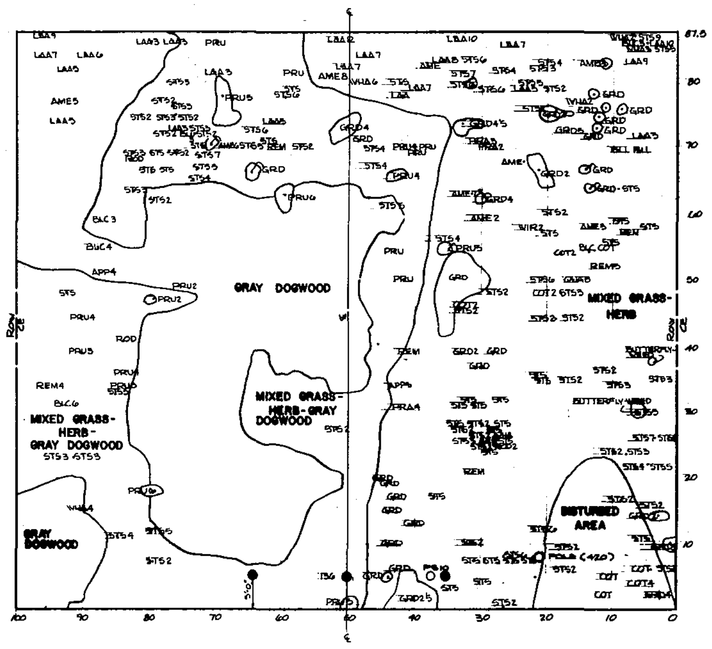
SCALE: 1" = 200'-0"

200 100 0 100 200 400 800 1000

PLOT 1 HYDRIC



PLOT 2 MESIC



NOTES:
-VERTICAL AND HORIZONTAL SCALES ARE IN FEET

LEGEND

WORKS AND STRUCTURES

- ACCESS ROAD
- BRUSH AND LOG DISPOSAL SITES

SITE MARKERS

- SAMPLE LOCATION
- PHOTO STATION

BOUNDARIES

- THE CENTERLINE OF STRUCTURE
- ROW PROPERTY BOUNDARY
- ROW EASEMENT BOUNDARY
- EXISTING ROW CLEARING EDGE

WATER SYMBOLS

- PERENNIAL STREAMS
- INTERMITTENT STREAMS
- SMALL RAPIDS
- LARGE RAPIDS
- DISAPPEARING STREAM
- CANALS AND DITCHES
- PERENNIAL LAKES AND PONDS
- INTERMITTENT LAKES AND PONDS
- SPRING
- MARSH, SWAMP OR WET MEADOW
- WET SPOT
- ALLUVIAL FAN

This information is a part of the ESEERCO "STUDY OF ENVIRONMENTAL AND ECONOMIC ASPECTS OF CONTEMPORANEOUS ELECTRIC TRANSMISSION LINE RIGHT-OF-WAY MANAGEMENT TECHNIQUES"

SOIL SYMBOLS

- ROCK
- SCATTERED ROCK

PLANT COMMUNITY SYMBOLS

herbs

BLG	BLUE-JOINT GRASS	Calamagrostis canadensis
BON	BONESET	Eupatorium perfoliatum
BRN	BRACKEN	Pteridum aquilinum
BRO	BROOM-SEDGE	Artholophis virginicus
CAT	CAT-TAIL	Typha spp.
CHF	CHRISTMAS-FERN	Polystichum acrostichoides
CIF	CINNAMON-FERN	Osmunda cinnamomea
DEG	DEERTONGUE GRASS	Panicum clandestinum
GOR	GOLDENROD	Solidago spp.
HAF	HAY-SCENTED FERN	Dennstaedtia punctilobula
HOT	HORSETAIL	Equisetum spp.
INF	INTERRUPTED FERN	Osmunda Claytoniana
IRS	IRIS	Iris spp.
JAP	SMALL JACK-IN-THE-PULPIT	Arisaema triphyllum
LET	WILD LETTUCE	Lactuca canadensis
MSF	MARGINAL SHIELD-FERN	Dryopteris marginalis
NYF	NEW YORK FERN	Dryopteris noveboracensis
PEV	PEARLY EVERLASTING	Anaphalis margaritacea
PHR	PHRAGMITES	Pragmites spp.
POG	POVERTY-GRASS	Danthonia spicata
RDM	REINDEER LICHEN	Cladonia rangiferina
ROF	ROYAL FERN	Osmunda regalis
SEF	SENSITIVE FERN	Onoclea sensibilis
SPL	SPIKED LOOSESTRIFE	Lythrum Salicaria
SPM	SPHAGNUM MOSS	Sphagnum spp.
SSS	SOLOMON'S-SEAL	Polygonatum biflorum
SWA	SWAMP-BUTTERCUP	Ranunculus septentrionalis
WHS	WHITE SNAKEROOT	Eupatorium rugosum
YPL	BULLHEAD-LILY	Nuphar variegatum

shrubs

ALR	ALDER	Alnus spp.
ARR	ARROW-WOOD	Viburnum recognitum
BAR	BARBERRY	Berberis spp.
BLA	BLACKBERRY	Rubus spp.
BLH	BLACK-VIBURNUM	Viburnum prunifolium
BLU	BLUEBERRY	Vaccinium spp.
BUT	BUTTONBUSH	Cephalanthus occidentalis
CAY	AMERICAN YEW	Taxus canadensis
CFH	FLY-HONEYSUCKLE	Lonicera canadensis
CHC	CHOKE-CHERRY	Prunus virginiana
CLB	CLIMBING BITTERSWEET	Celastrus scandens
CRA	GRAPE	Vitis spp.
DEY	DEWBERRY	Rubus spp.
ELD	ELDERBERRY	Sambucus canadensis
GRD	GRAY DOGWOOD	Cornus racemosa
GRJ	GROUND-JUNIPER	Juniperus communis
HAA	COMMON ALDER	Alnus serrulata
HAW	HAWTHORN	Crataegus spp.
HAZ	HAZELNUT	Corylus spp.
HUC	HUCKLEBERRY	Gaylussacia spp.
JAR	MULTIFLORA ROSE	Rosa multiflora
MAV	MAPLE-LEAVED VIBURNUM	Viburnum acerifolium
MOH	MOUNTAIN-HOLLY	Nemopanthus mucronata
MOL	MOUNTAIN-LAUREL	Kalmia latifolia
MOM	MOUNTAIN-MAPLE	Acer spicatum
NAN	NANNYBERRY	Viburnum Lentago
NJT	NEW JERSEY TEA	Ceanothus americanus
PIF	PINXTER-FLOWER	Rhododendron nudiflorum
POI	POISON IVY	Rhus radicans
POS	POISON SUMAC	Rhus vernix
PRA	NORTHERN PRICKLY ASH	Xanthoxylum americanum
PRU	BUCKTHORN	Rhamnus spp.
RIB	RIBES	Ribes spp.
ROD	RED OSIER DOGWOOD	Cornus stolonifera
SMC	SUMAC	Rhus spp.
SPA	SPECKLED ALDER	Alnus rugosa
SPB	SPICEBUSH	Lindera Benzoin
SPI	SPIRAEA	Spiraea spp.
SMS	SMOOTH SUMAC	Rhus glabra
STM	STRIPED MAPLE	Acer pensylvanicum
STS	STAGHORN-SUMAC	Rhus typhina
SWF	SWEET-FERN	Comptonia peregrina
TAH	TARTARIAN HONEYSUCKLE	Lonicera tatarica
WIH	WITCH-HAZEL	Hamamelis virginiana
WIL	WILLOW	Salix spp.
WIN	WINTERBERRY	Ilex verticillata
WIR	WILD-RAISIN	Viburnum cassinoides
ZBC	BLACK CHOKEBERRY	Pyrus melanocarpa

trees

ABU	BUTTERNUT	Juglans cinerea
AIL	TREE-OF-HEAVEN	Ailanthus altissima
ALD	ALTERNATE-LEAVED DOGWOOD	Cornus alternifolia
AMB	BEECH	Fagus grandifolia
AMC	CHESTNUT	Castanea dentata
AME	AMERICAN ELM	Ulmus americana
AMH	AMERICAN HORNBEAM	Carpinus caroliniana
APP	APPLE	Pyrus malus
BAF	BALSAM-FIR	Abies balsamea
BAS	BASSWOOD	Tilia americana
BIH	BITTERNUT HICKORY	Carya cordiformis
BLC	BLACK CHERRY	Prunus serotina
BLL	BLACK LOCUST	Robinia Pseudo-Acacia
BLW	BLACK WALNUT	Juglans nigra
CHO	CHESTNUT-OAK	Quercus prinus
COT	COTTONWOOD	Populus deltoides
EAH	HEMLOCK	Tsuga canadensis
ERC	RED CEDAR	Juniperus virginiana
FLD	FLOWERING DOGWOOD	Cornus florida
GRB	GRAY BIRCH	Betula populifolia
HOH	AMERICAN HOP-HORNBEAM	Ostrya virginiana
LAA	LARGE-TOOTHED ASPEN	Populus grandidentata
LAR	AMERICAN LARCH	Larix laricina
NWC	WHITE CEDAR	Thuja occidentalis
PAB	WHITE BIRCH	Betula papyrifera
PIC	PIN-CHERRY	Prunus pensylvanica
PIH	PIGNUT HICKORY	Carya glabra
PIP	PITCH-PINE	Pinus rigida
QUA	QUAKING ASPEN	Populus tremuloides
RED	RED OAK	Quercus rubra
REM	RED MAPLE	Acer rubrum
RES	RED SPRUCE	Picea rubens
SAS	WHITE SASSAFRAS	Sassafras albidum
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VIP	SCRUB-PINE	Pinus virginiana
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WHP	WHITE PINE	Pinus strobus
YEB	YELLOW BIRCH	Betula lutea
YEP	TULIP-POPLAR	Liriodendron tulipifera

REVISIONS:

DATA SOURCE: ASPLUNDH ENVIRONMENTAL SERVICES, BLAIR MILL ROAD, WILLOW GROVE PA 19090

FIELD SURVEY - AES, 1975, 76

SCALE: 1" = 10' - 0"

10 5 0 5 10 20 40 50

MAP 13.2

SITE 13

MAPPED PLOTS

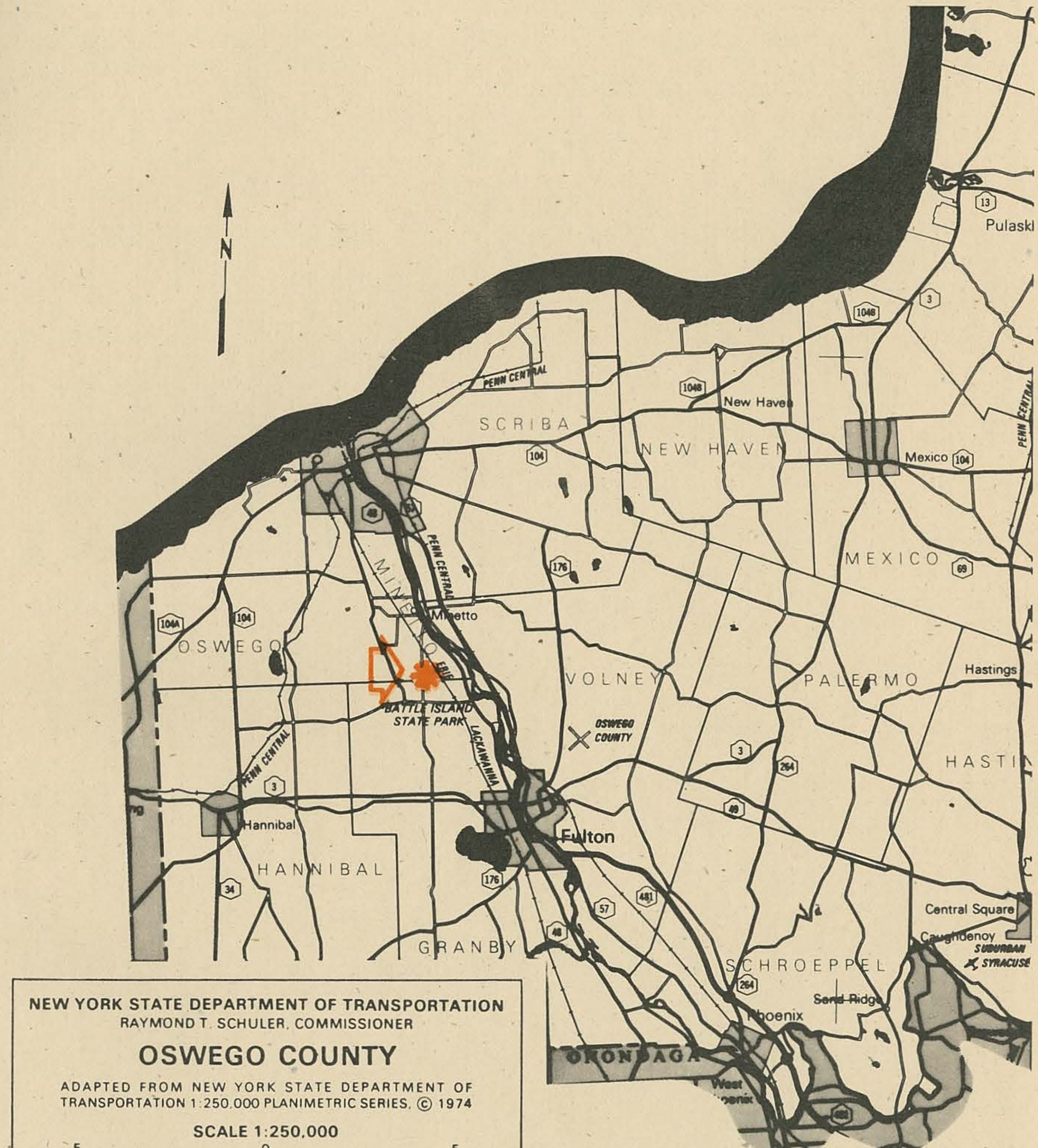
UTILITY: Rochester Gas & Electric Corp.

ROW DESCRIPTION: Station 121 to 13A 115 KV.

Wooden Pole 'H' Frame 400' ROW

SITE 14

OSWEGO to VOLNEY



Site 14 Oswego to Volney

Study area extends from the Oswego River (structure 63) west to include structure 54, west of County Route 8, and is located in the vicinity of Minetto. To reach the area, take route 57 north to Fulton, to the junction of routes 176 and 3; take a left on routes 176 and 3 and proceed to route 48. Take a right on route 48 and stay on route 48 for 4.8 miles to the study area.

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Site 14 Oswego to Volney

1 Introduction

Site 14 is located in the Erie-Ontario Plain physiographic area of New York (Cline, 1970) in the Elm-Red Maple and Northern Hardwoods forest type area (Stout, 1958). The general landscape of the ROW and the adjacent area is shown in Fig. 14.1.1.

The topography of the area is generally flat, and is dissected into numerous low, rolling hills, by streams flowing north into the lakes. The elevation range is slight (Stout, 1958).

The typical forest types of the region are Northern Hardwoods, and Elm-Red Maple and Northern Hardwoods. Located on the study area are Northern Hardwoods, Oak-Northern Hardwoods, Elm-Red Maple, Red Pine, and Scotch Pine forest types.

2 Location and Identification

Site 14 is located approximately 1½ miles south of Minetto in the town of Minetto, Oswego County, New York (76° 27' 30" W. Longitude; 43° 23' 30" N. Latitude).

The site is on the Oswego to Volney ROW which is operated by the Niagara Mohawk Power Corporation (NMPC). This ROW varies in width, but has an average width of 250 feet. The ROW consists of 1 double circuit 345 kV line on single steel pole structures from the Oswego River west to structure 61, where the line converts to 2 single circuit lines on steel lattice structures. From structure 60 west to the end of the study area, the 2 single circuit lines are supported by single circuit wood pole H-frame structures. The project site is approximately 7,000 feet in length and extends from structure 65, west of the Oswego River, to structure 54 west of County Route 8.

3 Background

The following discussion outlines documentable management techniques of clearing, construction, restoration, and maintenance regarding site 14 as received from NMPC (information sent May 6, 1976, by Kenneth Finch and James Brogan, Niagara Mohawk Power Corporation, Syracuse, N.Y.; telephone conversations with James Brogan, December 14, 1976, NMPC, Syracuse, N.Y.). All available pertinent information and cost data are included under each operation of clearing, construction, restoration, and maintenance.

3.1 Clearing

Site 14 was selectively cleared between early October, 1973, and mid-May, 1974. Contractors cleared structure work areas and wire pulling sites first, to facilitate construction activities, and then the mid-span portions of the ROW. Access roads, work areas, and wire pulling sites were cleared during November and December, 1973. The remainder of the ROW was cleared during April and early May, 1974.

During October of 1974 a selective follow-up operation was conducted and individual stems were removed which were thought to interfere with wire pulling activities and jeopardize reliability when the line became energized.

Equipment used by the clearing contractor included: chain saws, D-4 bulldozer with brush rake to collect and pile slash, a rubber tire skidder to separate and pile logs, tracked backhoe/bucket loader to install culverts, 4-wheel drive vehicles for personnel transportation, and a 2-ton truck with Beaver trailer to move equipment over the highway.

The method of slash disposal was determined by the specific clearing types. In most areas of the ROW, trees were dropped and lopped where they fell. At sensitive road crossings, the slash was removed from the site. At structure work areas and wire pulling sites, the slash was collected and piled. Within certain areas, clearing forested sites resulted in large slash piles (Fig. 14.1.2), which were to be burned. However, permission to burn was never granted.

No herbicides were applied at the time of initial clearing.

Roughly 265 brush acres were selectively cleared along the ROW. The average cost of the initial clearing operation, including culverts, stream fords, and gates, was approximately $879.25 per brush acre.

3.2 Construction

Construction activity began in January, 1974, and was completed in February, 1975. The first activities involved moving the poles from the yard in Oswego to their respective sites. These poles were transported on flat-bed tractor/trailers to the ROW, at which point the trailer was hooked to a bulldozer and pulled along the ROW to the structure sites. Erection within the study area occurred during the spring and summer, 1974. The wood pole structures were framed on the ground and set with an Athey Wagon (a crane boom mounted on a trailer and pulled from site to site by a D-11 bulldozer). Pole holes were dug by a backhoe mounted with a special "clam" or hole attachment. A 100-ton rubber tire crane was used to erect the tubular steel and lattice steel structures. Wire pulling of the #11 line through the study area occurred during August, 1974, and the #12 line was pulled during January, 1975. The soft line for the #11 line was pulled in with a D-4 bulldozer and for the #12 line it was flown in by helicopter.

3.3 Restoration

Because of limited investment in access road development, extensive damage to the ROW resulted during the early stages of the project. Thus, restoration efforts were conducted by the contractor between September and mid-November, 1974. The objective of this initial restoration effort was to repair damaged access roads and culverts. Most disturbances of the access road were repaired in the spring of 1975 with the use of bulldozers.

Final restoration was conducted during June and July, 1975. Bulldozers were used for rough and finished grading, a backhoe for culvert replacement, and a tractor and disc to grade certain laydown areas.

During the summer of 1975, after construction and restoration activities had been completed, extensive damage was done to the ROW west of Route 48 by unknown person(s) removing firewood. It appears that a bulldozer was used to skid downed logs on the ROW to the work area at structure 59. Here, apparently, the logs were bucked to fireplace length, loaded into a dump truck, and removed from the ROW. The waterbars and seeding of the access road between structures 58 and 59, and 60 and 61 were totally destroyed, resulting in minor erosion of the roadway. Severe rutting was caused both on and off the ROW, by skidding the logs out. A grass seed test plot at structure 59 was severely disturbed, and several desirable shrubs which remained on the ROW after clearing were heavily damaged.

In 1975, a double 30 inch culvert installed between structure 55 and 56 failed during heavy thunderstorm runoff in late summer, 1975. Water, overflowing the road, eroded roadway gravel into the stream channel and blocked the culverts.

In March, 1976, this culvert installation was removed and replaced with a 40 by 65 inch by 20-foot pipe arch, at a cost of approximately $1,400.00.

3.4 Maintenance

No maintenance has been conducted for the ROW to date.

4 General Reconnaissance

A general reconnaissance was made in accordance with the methodology and is set forth in Map 14.1 which shows site habitat conditions. In this reconnaissance it was noted that the major vegetation types correlated with the soil types on the hydric, mesic, and xeric habitats.

The existing visual character of the ROW is depicted during all seasons of the year, from important vantage points both on and off the ROW. These points are identified as photo stations and are located on Map 14.1 and described in Appendix 17. Specific reference is made to some of these photo stations throughout the report and illustrated in Fig. 14.1. With the exception of aerial photography used to identify land use, older photographs depicting the area are not available.

Within the surrounding landscape this ROW is generally pleasing to view. The ROW creates a vista through a forest covered area, and for the most part is screened from adjacent roads. When visible, the ROW site seems to fit in with the part agricultural, part residential character of the vicinity. The ROW site is located just west of the Oswego River which is extensively utilized, and provides a distinct natural landmark within the area. Although the actual site does not include the ROW crossing of the river, the intersection of the ROW with the river provides a locational reference to many motorists and local residents. The terrain in general is flat, but gently sloping with drumlins dominating the landscape. The ROW site is crossed by state Route 48 and county Route 8. The ROW is generally well screened by sugar-maples at Route 48 but is clearly visible to the east from Route 8 due to an adjecent open field. One set of structures is located on the high bank of the Oswego River, and should be visible from this location. Although the site is located in a rural area, the potential number of people viewing the ROW site is somewhat high. The ROW site is located near the community of Oswego, and is crossed by 2 highways as previously mentioned.

5 Field Studies - Results and Discussion

5.1 Soils

5.1.1 Geology and Soils

Site 14, Oswego to Volney ROW, is located in Oswego County in the

Erie-Ontario Plain (Cline, 1970), also termed the Ontario Drumlins subdivision of the Erie-Ontario Lowland region due to the domination by drumlins of the terrain (Thompson, 1966). It is in the Oswego River drainage basin. Bedrock geology is of Ordovician age, 500 to 435 million years ago, consisting predominantly of shale and sandstone. Surficial geology is basically glacial drift, and soils in this area have developed both in glacial till and glaciofluvial outwash (Broughton et al., 1973; Rapparlie, 1974).

A majority of the soils on this site are classified in the order Inceptisols, suborder Ochrepts (Alton, Ira, Minoa, Sodus, and Williamson series), reflecting the absence of horizons of marked accumulation of clay, and iron and aluminum oxides, and the theory that their horizons form rather quickly and result mostly from alteration of parent materials. A few soils are in the suborder Aquepts (Raynham and Scriba series), indicating that they are wet. In addition, 2 soils are in the order Entisols, suborders Aquent (Wallkill) and Psamment (Oakville), reflecting their lack of significant profile development (Buckman and Brady, 1969; Soil Survey Staff, 1975). This site falls within the parameters of the Sodus-Ira-Scriba (Cline, 1970). Brief descriptions (Anon., 1972; Rapparlie, 1974) of soil types noted on the ROW study site (Map 14.1; Table 14.1) follow:

Alton gravelly fine sandy loam (AgA): These soils formed in glacial outwash, terrace or beach deposits dominated by red and gray sandstone with lesser quantities of shale, granite, and limestone, on nearly level terraces and short moderate slopes on terraces or beach ridges, eskers or kames. Alton soils are deep and well drained to somewhat excessively drained. Soil reaction is generally strongly to medium acid, ranging from pH 5.0 to pH 5.9 in the first 16 inches of a typical profile; and it was pH 5.4 in the surface mineral soil on this site. Alton gravelly fine sandy loam is assigned to Woodland Suitability Group 3o1, designating moderately high productivity for timber (Class 3) and no significant limitations for woodland use or management (Subclass o).

Ira gravelly fine sandy loam (IrA): Ira soils developed in glacial till derived mainly from sandstone, and occupy nearly level to gently sloping tops of drumloidal hills and, occasionally, till plains or the sloping sides of drumloidal hills. These soils are deep and moderately well drained, although internal drainage is somewhat impeded by the presence of a fragipan at about 20 to 40 inches, and mottling occurs beginning at about 13 inches. Normally strongly acid, although the pH value may range from 5.0 to 6.0 throughout the first 20 inches of a typical profile, soil reaction was pH 5.6 in the surface 3 inches on this site. As with the Alton soil, Ira is in Woodland Suitability Group 3o1, designating moderately high productivity and the absence of any significant limitations or restrictions.

Minoa very fine sandy loam (MnA): These soils formed in lacustrine deposits on level to gently sloping relief. In general, they are in areas associated with sandy deltas of former glacial lakes. Generally deep and somewhat poorly drained, Minoa very fine sandy loam evidences mottling throughout the profile, beginning at about 18 inches, and a seasonal water table ranging from 6 to 8 inches. The soil varies from medium acid to neutral, and throughout a typical profile may range from pH 5.0 to calcareous; soil reaction was pH 6.0 in the surface horizon on this site. Assigned to Woodland Suitability Group 3w3, potential productivity for timber is moderately high, and a high water table and poor drainage cause management limitations.

Oakville loamy fine sand (OaA): Oakville soils formed from sandy deposits that were laid down or modified by water, wind, or both, and occur on level to gently sloping glaciofluvial terraces, sand dunes, beach ridges, sand bars, or deltas. These soils are deep and well drained, and are sandy throughout. Soil reaction is normally slightly acid to neutral, but ranges from pH 5.5 to pH 6.5 in the surface 8 inches of a typical profile; however, it was pH 4.8 in the upper 3 inches on this site. Oakville is assigned to Woodland Suitability Group 4s1, indicating moderate productivity for timber, and sandy soils which impart low water-holding capacity and normally low availability of nutrient elements.

Raynham silt loam (RaA): These soils developed in silty or very fine sandy sediments that were deposited in glacial lakes; they occur as narrow swales, roughly circular wet spots or elongated drainageways, or as large areas on relatively uniform oblong lake plains or elongated lake terraces parallel to creeks that outlet into lakes or rivers. They are deep and somewhat poorly drained, and mottling begins at about 9 inches. Soil reaction was pH 5.8. Raynham is in Woodland Suitability Group 3w4, reflecting moderate timber productivity and excessive water causing limitations for woodland use or management.

Scriba gravelly fine sandy loam (ScA): Scriba soils formed in glacial till derived from sandstone, and occur on level to sloping till plains and drumloidal formations. Deep and somewhat poorly drained, internal drainage is impeded by the presence of a fragipan at about 14 inches, and mottling begins at about 7 inches. The depth to the seasonal water table ranges from the surface to 12 inches. These soils are generally slightly to medium acid, varying from pH 5.0 to pH 6.0 in the upper 13 inches of a typical profile, and soil reaction was pH 5.6 in the surface mineral soils on this site. Scriba soils are assigned to Woodland Suitability Group 3w2, designating moderately high productivity for timber and management limitations related to poor drainage and a high water table.

Sodus gravelly fine sandy loam (SgB): These soils developed from glacial till derived from gray and red sandstone; they occupy gently sloping to very steep uplands and rolling hills on drumlins and other convex land forms of glacial till plains. Deep and well drained, these soils nevertheless evidence a fragipan at about 20 inches, and some mottling occurs. Sodus soils are generally strongly acid to neutral and may range form pH 5.0 to pH 6.0 in the surface 20 inches of a typical profile; soil reaction was pH 5.0 in the upper mineral horizon on this site. Sodus soils are in Woodland Suitability Group 3o1, indicating moderately high timber productivity with no significant limitations or restrictions for woodland use or management.

Wallkill silt loam (WaA): Wallkill soils developed in alluvial mineral materials underlain by muck or peat; they occur where streams or rivers flow through areas of organic soils on nearly level to depressional areas. These soils are deep, and very poorly drained, with mottling occurring from about 8 inches. The seasonal water table is at the surface. Underlying the typical silt loam is well-decomposed organic material, beginning at about 24 inches. Soil reaction is generally slightly acid, although it may range from pH 5.0 to pH 6.0 throughout a typical profile; however, it was pH 6.5 in the upper 3 inches on this site. Assigned to Woodland Suitability Group 4w1, these soils have moderate productivity for timber, with excessive wetness as a limitation for woodland use or management.

Williamson very fine sandy loam (WiA): These soils formed in water- or wind-deposited silt and very fine sand; they occur on level to sloping relief. Deep and moderately well drained, they nevertheless contain a fragipan at about 20 inches, and mottling begins at about 17 inches. The depth to the seasonal water tabel is from 18 to 24 inches. Soil reaction is generally strongly acid, and ranges from pH 5.0 to pH 6.0 in the surface 40 inches throughout a typical profile; it was pH 5.5 in the upper mineral horizon on this site. Williamson very fine sandy loam is assigned to Woodland Suitability Group 3o1, designating moderately high timber productivity and no significant limitations for woodland use or management.

5.1.2 Humus Types

Organic layers present on the soil surface of the ROW and adjacent woodland were measured on 2 mesic locations. Average thickness of the organic layers and A1 horizon was based on 5 samples taken at each location (Table 14.2). The presence and thickness of these layers were used for humus type classification.

The humus classification key is not adaptable to areas exhibiting prolonged water saturation in the surface soil; therefore, similar measurements were not made on the hydric area. In addition, as the only xeric habitat occurred near the Oswego River, where the ROW and forest both support a substantial tree cover, no humus study was made at that location. In certain areas of the ROW, evidence exists of abandoned orchards, but no evidence of plowing, grazing, or recent fires was noted.

All organic layers (litter, fermentation, and humus) plus an A1 horizon (mixed mineral and organic) were present at each location on both the ROW and woodland. Based on thickness of the fermentation, humus, and A1 layers, the predominant humus type was designated a "thin duff mull with very shallow A1". Organic layers on the ROW were nearly equivalent in depth to those in the woodland. Organic layers in the woods were composed primarily of tree parts (leaves, twigs, and fruit) in contrast to the leaves and stems of grasses, herbs, and shrubs on the ROW.

Based on these limited observations, it appears that ROW construction did not materially alter thickness of surface organic layers on the soil, but elimination of the forest cover did result in a change in kind of organic material. However, regrowth and persistence of a mixed grass-herb-shrub cover has resulted in annual litter depositions and continuation of a protective organic layer on the ROW.

5.1.3 Soil Erosion

Current Active Erosion Observations of active soil erosion on the ROW and adjacent woodland were made on the Oswego to Volney study area in June, 1976. No active erosion was evident in the woodland on any soil type or slope, apparently due to the protective canopy of trees and shrubs and undisturbed organic layers present on the soil. Likewise, no active or recent erosion was observed on the general ROW, areas on which woody brush was selectively cleared but with little or no disturbance to the soil surface. In general, good vegetation cover, composed of grasses, herbs, and low shrubs, has developed on the general ROW following clearing, and a protective litter mulch from these plant parts was present (14.2).

Eroding areas on the ROW were identified as to location, soil type, average slope, and present plant cover (Table 14.3). Erosion was classified as to kind (sheet, rill, gully) and class (slight, moderate, severe). No gullies were noted. Active erosion sufficiently large to be plotted on the base map was limited to areas around towers; which are bare but healing (Map 14.1). Active erosion on the ROW was limited to areas that had been subjected to fairly recent mechanical disturbance of the soil, such as tower sites and access roads (Table 14.3). On 1 area near a culvert under the access road, severe sheet and rill erosion has occurred, and the sediment resulting therefrom has entered a flowing stream by which it has apparently left the ROW (Fig. 14.1.3). In general, however, sediment resulting from erosion accumulated on lower slopes and did not leave the ROW via streams or collect in water impoundments.

There was restoration in the form of seeding following construction of this ROW. In many areas this was complimented by or superseded by natural plant invasion. Waterbars on access roads and portions of the access roads themselves have been seeded, but to a great extent remained bare due to road use. Tower sites were also seeded, and evidenced some grass cover therefrom, as well as grass and herbs invading naturally (Fig. 14.1.4). The area of the stream bank which is actively eroding showed no evidence of seeding, and little natural plant invasion has occurred. That is due in part to progressive sheet and rill erosion, and in part to the activities of local children noted playing in the stream at the culvert site, and sliding down and scrambling up the eroding bank. There were no areas of mass land movement such as landslides on this site.

5.2 Vegetation

5.2.1 Habitat and Forest Types on the Site

Hydric Habitat The hydric, or wet, habitat (1) was located on the nearly level terrain of a stream bottom with negligible slope and flat aspect. Drainage was impeded, largely due to a seasonally high water table. The forest type was typical Elm-Red Maple, with America elm and red maple the dominant species, in association with white ash and black ash.

Mesic Habitat The mesic, or medium moist, habitat (2) was located on a south-facing slope, which occupied the lower portion of a low rounded hill. Slope was approximately 5% on a south- to east-facing slope. Drainage was quite free but not excessive. The forest type was Northern Hardwoods with dominant species of white ash, sugar-maple, yellow birch, and basswood.

Xeric Habitat The xeric, or dry, habitat (3) was located on nearly flat terrain above the Oswego River. Slope was negligible and aspect was basically flat. Drainage was excessive. The forest type was Oak-Northern Hardwoods.

5.2.2 Analysis of Forest Types and Associated ROW Vegetation

General Changes in Vegetation The primary impact of the ROW was to cause a change from a forest with a 4-layered structure to a shrub-herb-grass community. Since this was a selectively cleared ROW, this is true only in the clear cut areas of the ROW where removal of the trees caused essentially a 2-layered ROW community to develop, composed primarily of shrubs and herbs with mixed grasses. Trees remain as a part of the existing shrub community and consist of seedlings and saplings, either not removed in initial clearing or established since the last treatment (Fig. 14.2).

In order to more completely characterize the forest types, an analysis was made on the forest plots to derive importance values for tree species (Table 14.4). Obviously, quaking aspen and American elm were important species on the hydric plot, and quaking aspen, white ash, and black cherry were important species on the mesic plot. No importance values were determined for the xeric plot, which was added at a later date.

On the hydric habitat, an Elm-Red Maple forest type was changed to a Red Osier Dogwood-Sensitive Fern plant community. On the mesic habitat, a Northern Hardwoods forest type was changed to a Sumac-Goldenrod plant community. On the xeric habitat, no clearing was done, so the forest canopy was not disturbed to any great extent, except for the establishment of an access road. The forest type is Oak-Northern Hardwoods.

Quantitative Changes A notable increase in the number of shrub and herb species on the hydric and mesic habitats was apparent on the ROW as compared with the adjacent forest; on the hydric habitat there were 9 shrubs and 18 herbs on the ROW as compared to 4 shrubs and 5 herbs in the forest; on the mesic habitat there were 6 shrubs and 20 herbs on the ROW as compared to 3 shrubs and 14 herbs in the forest. The xeric habitat was similar in number in the shrub and herb layers both on the ROW and in the forest. There was no clearing performed on the xeric habitat (Table 14.5; Figs. 14.3 and 14.4).

Qualitative Changes On the hydric 1 habitat, 4 shrub and herb species occurred both in the forest and on the ROW (Fig. 14.5). One shrub, Virginia creeper, occurred in the forest exclusively (Table 14.6), and 6 shrubs occurred on the ROW only, namely, gray dogwood, winterberry, staghorn-sumac, nannyberry, elderberry, and willow (Table 14.7). In the herb layer, 4 species appeared in the forest but not on the ROW, and 17 occurred on the ROW and not in the forest (Tables 14.6 and 14.7).

On the mesic 2 habitat, 5 shrub and herb species occurred both in the forest and on the ROW (Fig. 14.5). Two shrubs, Virginia creeper and poison ivy, occurred in the forest exclusively, and 5 shrubs occurred on the ROW only (Tables 14.6 and 14.7).

On the xeric 3 habitat, 8 shrub and herb species occurred both in the forest and on the ROW (Fig. 14.5). Four shrubs occurred in the forest exclusively as compared to 5 on the ROW only. In the herb layer, 10 species appeared in the forest but not on the ROW, and 13 species occurred on the ROW and not in the forest (Tables 14.6 and 14.7). A number of the species found on the ROW bordered the access road, or were found in what appeared to be natural openings that in turn bordered the access road.

In general, those plants which occupied the ROW on the hydric and mesic habitats were light-loving plants of open areas. Conversely, those plants that occurred in the forest were mainly forest-dwelling species that do well under considerable shade (Table 14.5).

5.2.3 Analysis of Plant Communities for On-ROW Mapped Vegetation Plots

Table 14.8 presents a breakdown of major vegetational communities for hydric and mesic plots on the Oswego to Volney ROW. Much of the present composition of herbaceous and woody plant communities on this area can be explained by the past clearing practice.

The hydric and mesic plot locations were clear cut in 1973 to 1974 and no maintenance has been performed to date.

The major plant communities now dominating the hydric and mesic plot locations are Sedge-Rush-Mixed Grass-Herb, and Mixed Grass-Herb. The majority of these species are light-loving species which have come in since the initial line clearing and spread primarily by roots or other vegetative means. These include perennial grasses and sedges, blackberry, and bracken. It is expected that these species will play an important part in the continued development of the vegetation on the ROW.

5.2.4 Comparison of Forest Type with ROW Vegetation

The hydric and mesic habitats were cleared in 1973 to 1974. The xeric habitat was partially cleared for an access road. No maintenance has occurred to date on this ROW.

The general impact of the above clearing technique of the ROW was to change the forest types (Elm-Red Maple, Northern Hardwoods, and Oak-Northern Hardwoods) to a shrub-herb-grass community. Some shrub and herb plants of the forest were replaced by plants favored by open conditions.

On the hydric habitat, formerly occupied by an Elm-Red Maple forest type, a Red Osier Dogwood-Sensitive Fern community was produced. There was a significant difference in the number and kind of species on the ROW as compared to the adjacent forest. There was a quantitative and qualitative change in the shrub and herb species on the ROW as compared to the forest.

On the mesic habitat, formerly occupied by a Northern Hardwoods forest type, a Sumac-Goldenrod community was produced. There was a significant difference in the number and kind of species on the ROW as compared to the adjacent forest. There were quantitative and qualitative changes in the shrub and herb species on the ROW as compared to the forest.

On the xeric habitat no clearing was required, except for the establishment of an access road, so the forest canopy was not disturbed to a great extent, and vegetation changes occurred along the access road.

5.3 Wildlife

The major game species for site 14, Oswego to Volney, were determined by Asplundh Environmental Services (AES) in conjunction with the New York State Department of Environmental Conservation (DEC). These species are white-tailed deer, cottontail rabbit, and woodcock.

5.3.1 Actual Use

White-tailed Deer White-tailed deer observations consisted of direct observations and signs, tracks, and browse. One doe was seen feeding and bedding on the ROW at the edge of the alder swamp near structure 57, in the spring of 1975. Deer tracks were moderate throughout the study area during the spring of 1976.

Browse Survey Four browse transects were established on study area 14 (Tables 14.9 and 14.10; Fig. 14.6). Those transects were established at each permenent study plot location, with 1 transect on each side of the ROW, on June 8, 1976. No transect was performed on the xeric plot because it was in a wooded section of the selectively cleared ROW.

Overall browse utilization was highest on the ROW edge, 49%; however, the number of stems browsed was fairly constant, namely 15 on the ROW, 19 at the edge, and 15 in the interior woods (Table 14.9; Fig. 14.6). There were more stems available on the ROW than either in the interior woods or on the ROW edge (Table 14.9).

Raspberry and dewberry were the most abundant species present, but were not utilized as browse. Wild-raisin and gray dogwood were the next most abundant species present, and both were heavily utilized as browse (Table 14.10).

Cottontail Rabbit Cottontail rabbit observations consisted of direct sighting and signs, namely browse. One rabbit was seen running to escape cover on the ROW near tower 62. Rabbits were also flushed from a cover of mixed grasses and herbs on the ROW during the spring and summer of 1976.

Woodcock On March 24, 1976, from 5:00 p.m. to 7:00 p.m., woodcock singing ground surveys were conducted on study area 14. The weather was clear with slight haze, and the temperature was about 60 F.

Peenting began at 6:32 p.m. in the woods north of the ROW and adjacent to study area 15. The peenting male bird's primary singing ground was located on the ROW of study area 15, near structure 76. He also utilized a secondary singing ground on study area 14, in the access road near structure 58.

Two females were noted flying from the woods north of study area 15, across the ROW's of sites 15 and 14, also in the vicinity of structure 58. Observations were terminated at 7:00 p.m.

A second woodcock singing ground survey was conducted on April 11, 1976. The weather was partly cloudy with winds of 18 mph, and a temperature of 56 F.

No birds were noted during the period of observation, from 6:40 p.m. to 7:30 p.m.; however, normal "peenting" activity may have been disrupted due to the bad weather conditions.

Miscellaneous Wildlife Observations Various birds were seen and/or heard on the study area throughout the period of this study. The diversity of species may be attributed to the ecotone which is created due to the presence of the ROW. Birds observed on the ROW and on the ROW edge are included in Table 14.11.

During the spring of 1976, there was moderate to heavy spring peeper activity as indicated by vocalization. Deer tracks were moderate throughout the ROW study area during this time. One ruffed grouse nest was found (Fig. 14.1.5) in the woods to the south of structure 63 when the hen grouse was flushed from the nest. This nest was observed and was successfully hatched. A brood of grouse was also observed west of Route 48 near structure 62 as the brood crossed the road. One bird dusting area was observed on the mesic plot on the ROW (Fig. 14.1.6). Frequent dusting is needed for some species of birds, such as falanacious game birds, or they may become lousy with lice from the genus Mallophoga (Stoddard, 1936). One active woodchuck burrow was observed off the ROW near the mesic woods plot.

5.3.2 Potential Use

Potential wildlife use of the plant species present on site 14 for the 3 major game species, deer, rabbit, and woodcock, is contained in Table 14.12. In addition to asterisk ratings from New York, asterisk ratings from Pennsylvania were included for those plants present on the study area that were not rated in the New York evaluation for deer. The same was done for cottontail rabbit with the inclusion of the asterisk ratings from Connecticut. This additional data should provide supplemental information to the ROW manager regarding those plant species that may be of potential value to those game species (Martin et al., 1951).

5.4 Land Use

5.4.1 Location

Site 14 is located in a rural nonfarm section of the town of Minetto, Oswego County, New York. Between 1960 and 1970 there was a 17.2% increase in population of Oswego County with a 1970 distribution of 40.1% urban, 56.0% rural nonfarm, and 3.9% rural farm (U.S. Bureau of the Census, 1972). The closest community is Minetto which is approximately 1½ miles to the north.

5.4.2 Land Use Prior to Construction

The ROW was constructed during 1974. The earliest available data obtained from 1955 aerial photography indicates that the adjacent land to the ROW was primarily rural farm (Table 14.13; Fig. 14.7). Land use distribution included the following subtypes:

Agriculture:
- Ac - Cropland and cropland pasture
- Ap - Pasture

Commercial:
- Cs - Commercial strip development

Forest Land:
- Fn - Forest lands
- Fp - Plantations

Outdoor Recreation:
- Or - Outdoor recreation

Residential:
- Rm - Medium density
- Rk - Shoreline development

Transportation:
- Tb - Barge canal

Water Resources:
- Wb - Marshes, shrub wetlands, and bogs
- Ww - Wooded wetlands

5.4.3 Land Use After Construction

The adjacent land use to site 14 has changed slightly from the 1955 data. Agriculture and water resources land uses have decreased significantly, while forest land has increased. The land adjacent to the ROW is rural nonfarm (Table 14.13; Fig. 14.7), with a land use distribution which includes the following subtypes:

Agriculture:
- Ac - Cropland and cropland pasture
- Ap - Pasture
- Ai - Inactive agricultural land

Commercial and Industrial:
- Cs - Commercial strip development

Forest Land:
- Fn - Forest lands
- Fp - Plantations

Outdoor Recreation:
- Or - Outdoor recreation

Residential:
- Rm - Medium density
- Rk - Shoreline development

Transportation:
- Tb - Barge canal

Water Resources:
- Wb - Marshes, shrub wetlands, and bogs
- Ww - Wooded wetlands

In addition to use of the ROW for the transmission of electrical power, portions of the ROW are currently being used for snowmobiling and hunting.

6 Evaluation, Interpretation, and Summary of Results

6.1 Conditions Which Existed Prior to Establishment of ROW

Soil, vegetation, and wildlife habitat conditions existing prior to ROW construction were based on observations made during the period of this study on adjacent undisturbed forest areas on both sides of the ROW.

6.1.1 Soils

The Oswego to Volney study area is located on undulating to rolling topograpy characterized by glacial till drumlin formations, stratified glacial outwash deposits, some wind-blown silt and fine sand accumulations, and alluvium in depressional areas. Underlying bedrock is dominated by sandstone, containing some lime, and shale. The site exhibits a variety of slopes with gradients of 0 to 15% on east and west exposures, dry to wet moisture regimes, and 9 different soil types associated with specific geologic materials, relief, and drainage condtions. Surface mineral soils are predominately fine sandy loams, with some fine sand and silt loam in old lake and alluvial deposits, that are slightly to strongly acid and in lowlands underlain by fragipans.

In the bordering forest, xeric sites occur on well to excessively drained Alton and Oakville soil series on level to gently sloping outwash material and support upland hardwoods of moderate to moderately high productivity; mesic sites occupy well to moderately well drained Sodus and Williamson soils, with fragipans, on gently sloping drumlins and water- or wind-deposits, respectively, and support upland hardwoods of moderately high productivity with no special management limitations; and hydric sites occur mostly on the poorly drained Minoa, Raynham, Scriba, and Wallkill soil series which formed in lowland lake deposits, till or alluvium, and are occupied by bottomland hardwoods of moderate to moderately high productivity, but with management limitations due to excessive wetness. Portions of the Alton, Ira and Scriba soils were occupied by Red and Scotch pine plantations.

The forest floor on mesic habitats of the adjoining forest was composed of litter, fermentation, and humus layers, 0.7 inches thick, and a mixed mineral-organic A1 horizon averaging 0.4 inches in depth. The humus type was classified a "thin duff mull with very shallow A1". There was no active erosion observed on any soil type or slope under woodland cover conditions.

6.1.2 Vegetation

At the time of ROW clearing (1973 to 1974) the forest cover consisted of even-aged natural hardwood stands and red and Scotch pine plantations. These stands were approximately 35 years old, and had become established on recently abandoned agricultural land.

Stands of the American Elm-Red Maple type predominated on hydric sites. White and black ash were conspicuous associates of these stands. Mesic sites supported red pine and Scotch pine plantations and natural stands of Northern Hardwoods. In these hardwood stands, red and sugar-maple, beech, and white ash were abundant species. Oak-Northern Hardwoods mixtures were the cover on xeric sites. Major species were white and black oak, red and sugar-maple, beech, and white ash.

6.1.3 Wildlife

Wildlife, being mobile species which may or may not be observed during site visitation, were reasonably imputed to this area by the composition of the forested areas adjacent to the ROW. It can be assumed that those species currently occupying the site, i.e., white-tailed deer, cottontail rabbit, and woodcock, occupied the habitat prior to ROW construction. The degree of use is impossible to determine at this time. Although current wildlife activity may be influenced by the presence of the ROW, it is likely that those species, designated by the DEC in conjunction with AES as major in this area, inhabited the vicinity even before ROW construction. The degree of use is impossible to determine at this time.

6.1.4 Land Use

The earliest data available prior to construction of the ROW in 1974 is 1955 aerial photography. The ROW and adjacent land area were rural farm with a land use distribution of agriculture (34.0%), commercial and industrial (.2%), forest land (45.7%), outdoor recreation (.4%), water resources (14.3%), transportation (3.1%), and residential (2.3%).

6.2 Conditions Which Exist at Present

6.2.1 Soils

The same geologic formations, topography, moisture regimes, and soil types identified and described for the general study area under Section 6.1.1 were present on the ROW. The only exception is Raynham silt loam that occurred in an elongated swale in a somewhat poorly drained area of the bottomland hardwood forest along the south side of the study area and did not extend onto the ROW. Prominent shrub and herb species on the ROW in 1976 associated with existing soil types and moisture regimes were: dewberry, blueberry, and bracken, intermingled with upland hardwoods that were not removed in ROW clearing, on xeric Alton and Oakville soils; dewberry, sumac, viburnum, and mixed grasses and herbs on mesic Sodus and Williamson series; and, red osier dogwood, viburnum, sensitive fern, horsetail, and sedges on hydric Minoa, Scriba, and Wallkill soil series. A portion of the Minoa and Sodus fine sandy on the west end of the study area was occupied by inactive agricultural land in 1976.

Organic matter accumulations on mesic habitats of the ROW included litter, fermentation, and humus layers, 0.6 inches thick, and an A1 horizon with organic matter incorporated to a depth of 0.5 inches. The resultant humus type was designated a "thin duff mull with very shallow A1".

No active erosion was observed on the general ROW, areas that were selectively cleared with minimal disturbance to the surface soil. However, slight to moderate sheet and rill erosion was evident at numerous locations where soil was mechanically disturbed during ROW construction and/or recent firewood removal from the site. These include 6 tower sites, 2 staging and stringing areas, and 4 access road waterbar structures and culvert crossing. Eroding areas were either bare or partially stabilized by plant cover from restoration seeding and natural invasion. Sediments resulting from erosion at the culvert crossing entered a flowing stream, while those from other eroding areas were deposited on lower slopes of the ROW.

6.2.2 Vegetation

Present conditions on the study area are extremely variable due to the variety of practices used during corridor construction. Where structure work areas and wire pulling sites were clear cut, an herbaceous cover of native and direct seeded herbs and grasses form the low cover. Open soil is uncommon except where intermittent drainage channels and shifting soils have removed the seed.

Where taller forest trees were cut in selective clearing, many smaller trees, often stems of low vigor, have been exposed. Some of these trees show evidence of increasing vigor, but others are declining.

Open soil on construction roads has partially healed following grading, waterbar construction, and direct seeding. However, runoff from heavy rains has resulted in erosion and loss of seed, particularly where the grade is excessive.

6.2.3 Wildlife

White-tailed deer, cottontail rabbit, and woodcock are the major game species that currently utilize the study area. Indirect observations of white-tailed deer, i.e., tracks and browse, indicated deer using the ROW area. Deer were also seen on the site. Browse surveys indicated that more woody stems were available on the ROW than either on the ROW edge or in the interior woods. Raspberry and dewberry were the most abundant species, but were not browsed. Those species that were heavily utilized by deer and were also fairly abundant were arrow-wood, gray dogwood, red maple, and wild-raisin.

Indirect observations (browse) of cottontail rabbits as well as direct observation indicated that species' presence on the ROW.

Woodcock were observed in the spring of 1976 in mating activities on the study area. Singing ground surveys indicated the presence of a secondary singing ground on the access road on site 14.

A variety of other animals were noted, directly or indirectly to be utilizing either the ROW, the adjacent forest, or both. Potential wildlife use is evident from plant species present on the site.

6.2.4 Land Use

Recent land use of the ROW and adjacent land area has shifted from the 1955 percentages. The area is classified primarily as rural nonfarm with a distribution of agriculture (26.9%), commercial and industrial (.2%), forest land (63.5%), outdoor recreation (.4%), water resources (3.3%), transportation (3.1%), and residential (2.6%). With reference to the total area involved, shifts in land use are noted as follows:

Agriculture -	- 7.1%
Commercial and Industrial -	no change
Forest Land -	+17.8%
Outdoor Recreation -	no change
Water Resources -	-11.0%
Transportation -	no change
Residential -	+ .3%

In addition to use of the ROW for the transmission of electrical power, protions of the ROW are currently being used for snowmobiling and hunting.

6.3 Environmental Effect and Probable Causes

6.3.1 Soils

The major impact of ROW management observed on soils of this site in 1976 was the frequent occurrence of active sheet and rill erosion on tower site, access road, and staging-stringing locations. Plant cover and organic mulch had been removed and surface mineral soils disturbed on these areas during ROW construction. Access roads, especially waterbar structures, were severely damaged during firewood removal activities on the site following ROW construction and restoration in 1974 to 1975. Eroding areas were bare or only partially stabilized by grass and herbaceous plants in 1976. Some erosion sediment entered a stream on the ROW, but most accumulated on lower slopes of the ROW with no apparent detrimental effect.

Presence and depth of organic layers on mesic areas of the ROW as well as the resultant humus type were nearly equivalent to those in the adjacent forest. The only difference was in source of litter, primarily leaves and stems of the mixed shrub-herb-grass cover on the ROW versus tree parts in the forest.

6.3.2 Vegetation

The environmental impact from this recently established corridor varies with the degree of tree removal at each location. Where tower and stringing sites were completely denuded of forest cover, large numbers of annual and perennial herbaceous plants form the present cover. Woody plants are becoming established in these communities.

Where selective clearing was used, the impact varies with the number of trees removed from these sites. Where only scattered trees were cut, the remaining forest was left essentially undisturbed and little change has occurred in the amount and composition of understory vegetation. When it was necessary to remove large numbers of trees, however, many annuals and biennials have invaded the understory. Where crown removal was heavy, many exposed low-vigor trees have declined further in vigor and are dying back from the top.

At the western edge of the study area, debris from corridor clearing has blocked the course of a small stream, resulting in a large area of standing water. Most trees and shrubs in this area have died and a large number of aquatic and emergent species are becoming established.

6.3.3 Wildlife

The presence of the ROW has encouraged the development of many different plant species, mainly light-loving, on the ROW proper, thus enhancing the habitat for wildlife use. The ecotone created by the presence of the ROW often produces a greater variety and density of life than is found otherwise (Leopold, 1936), and this phenomenon has been termed the "edge effect" (Smith, 1974).

6.3.4 Land Use

Because 1955 data was used to identify land use classifications prior to construction in 1974, the changes noted as having occurred since the ROW was constructed may have actually occurred during the 19 years prior to construction. Since the beginning of the field study in the spring of 1975, little change actually took place.

It is not possible to attribute changes in land use within the area inventoried to the existance of the transmission ROW. Changes within the area may be attributed to other changing land use characteristics in Oswego County. The inventoried area has changed from rural farm to rural nonfarm in character.

Table 14.1. Soil series present on the Oswego to Volney study area.

Soil Series	Map Symbol[1]	Drainage Class[2]	Surface Soil pH	Surface Soil Texture	Woodland Suitability Group
Alton	AgA	G-E	5.4	gravelly fine sandy loam	3o1
Ira	IrA	MG	5.6	gravelly fine sandy loam	3o1
Minoa	MnA	SPD	6.0	very fine sandy loam	3w3
Oakville	OaA	G	4.8	loamy fine sand	4s1
Raynham	RaA	SPD	5.8	silt loam	3w4
Scriba	ScA	SPD	5.6	gravelly fine sandy loam	3w2
Sodus	SgB	G	5.0	gravelly fine sandy loam	3o1
Wallkill	WaA	VPD	6.5	silt loam	4w1
Williamson	WiA	MG	5.5	very fine sandy loam	3o1

1 The third letter of the map symbol designates slope class:

A = 0-8%, B = 8-15%, C = 15-25%, D = 25-35%, E = 35-50%, F = 50-70%.

2 Drainage Class: VPD = very poorly drained, PD = poorly drained, SPD = somewhat poorly drained, ID = imperfectly drained, MG = moderately good, G = good, E = excellent (excessive).

Table 14.2. Average thickness of organic layers and A1 horizon and humus types for mesic sites on ROW and adjacent woodland of site 14.

Moisture Regime	Location	Layer Thickness (in.) L	F	H	A1	Humus Type
1. Mesic (2)[1]	ROW	.2	.1	.3	.5	Thin duff mull with very shallow A1
	Woodland	.3	.1	.1	.4	Thin duff mull with very shallow A1
2. Mesic	ROW	.2	.1	.3	.5	Thin duff mull with very shallow A1
	Woodland	.4	.1	.2	.4	Thin duff mull with very shallow A1
All Plots Combined	ROW	.2	.1	.3	.5	Thin duff mull with very shallow A1
	Woodland	.4	.1	.2	.4	Thin duff mull with very shallow A1

[1] Sample taken at vegetation study plot, the numbers of which is indicated by figures in parentheses.

Table 14.3. Areas exhibiting active erosion in June, 1976, on the Oswego to Volney ROW study area.

Location	Soil Type	Average Slope (%)	Plant Cover	Erosion on ROW		
				Kind	Class	Gully Depth (in.)
Tower Site	Oakville loamy fine sand	3	Goldenrod-mixed herb	Sheet	Slight	-
Tower Site	Alton gravelly fine sandy loam	1	Bare-seeded	Sheet	Slight	-
Tower Site	Scriba gravelly fine sandy loam	2	Bare-mixed herb	Sheet & Rill	Moderate	-
Tower Site	Williamson very fine sandy loam	2	Grass-herb	Sheet	Slight	-
Tower Site	Minoa very fine sandy loam	2	Bare-grass-herb	Sheet	Slight	-
Tower Site	Minoa very fine sandy loam	3	Bare-grass-herb	Sheet	Moderate	-
Tower Site Staging Site	Scriba gravelly fine sandy loam	2	Grass-sedge	Sheet	Slight	-
Stringing Site	Scriba gravelly fine sandy loam	3	Goldenrod-herb	Sheet & Rill	Slight	-
Access Road/Water Bar	Sodus gravelly fine sandy loam	12	Bare-seeded	Sheet & Rill	Slight	-
Water Bar on Access Road	Alton gravelly fine sandy loam	3	Bare-seeded	Sheet & Rill	Slight	-

Table 14.3. Continued

Location	Soil Type	Average Slope (%)	Plant Cover	Erosion on ROW: Kind	Erosion on ROW: Class	Erosion on ROW: Gully Depth (in.)
Water Bar on Access Road	Ira gravelly fine sandy loam	8	Bare-seeded	Sheet & Rill	Slight	-
Stream Bank at Culvert Site	Wallkill silt loam	6	Bare	Sheet & Rill	Severe	-

Table 14.4. Importance value of trees in the upper tree layer in the forest adjacent to the ROW.

Site	Species	Relative Dominance Basal Area (% of total) 1	Relative Density (% of total) 2	Importance Value 1+2
Hydric 1	Quaking Aspen	49.00	33	82.00
	American Elm	15.40	19	34.40
	Black Cherry	14.10	18	32.10
	Red Oak	9.40	11	20.40
	White Ash	4.90	11	15.90
	Sugar-Maple	4.30	4	8.30
	Red Maple	2.90	4	6.90
Mesic 2	Quaking Aspen	70.11	65	135.11
	White Ash	22.82	19	41.82
	Black Cherry	5.39	7	12.39
	Sugar-Maple	1.24	5	6.24
	Tulip-Poplar	.22	2	2.22
	Yellow Birch	.22	2	2.22
Xeric 3	No importance values were determined for xeric plot 3.			

Table 14.5. Comparison of species composition, abundance and sociability (A.S.) in the tree, shrub, and herb layers, in the adjacent forest and on the ROW, on hydric, mesic, and xeric habitats.

Species	Xeric (3)		Hydric (1)		Mesic (2)	
	Forest A.S.	ROW A.S.	Forest A.S.	ROW A.S.	Forest A.S.	ROW A.S.
Tree Layer						
Red Maple	-	-	+.1	-	-	-
White Ash	-	-	1.1	-	1.1	-
Red Oak	+.1	+.1	1.1	-	-	-
Quaking Aspen	-	-	2.1	-	(3.1)	3.1
American Elm	-	-	1.1	-	-	-
Black Cherry	+.1	++.1	1.1	-	+.1	-
Sugar-Maple	+.1	-	+.1	-	+.1	-
Tulip-Poplar	-	-	-	-	++.1	-
Yellow Birch	++.1	-	-	-	++.1	-
Basswood	-	-	-	-	+.1	-
Black Oak	+.1	++.1	-	-	-	-
Large-toothed Aspen	1.1	3.1	-	-	-	-
Sassafras	+.1	-	-	-	-	-
White Oak	++.1	++.1	-	-	-	-
No. Species	8	5	7	0	7	1
Shrub Layer						
Arrow-wood	+.1	1.2	4.4	3.2	3.1	2.2
Red Osier Dogwood	-	-	+.1	3.2	-	-
Grape	-	+.1	++.1	++.1	-	+.2
Virginia Creeper	+.1	-	2.4	-	1.2	-
Gray Dogwood	-	-	-	1.1	-	-
Winterberry	-	-	-	+.2	-	-
Staghorn-Sumac	-	-	-	+.1	-	-
Nannyberry	-	-	-	1.1	-	-
Elderberry	-	-	-	++.1	-	-
Poison Ivy	+.2	-	-	-	4.5	-
Staghorn-Sumac	-	-	-	-	-	3.1
Hawthorn	-	-	-	-	-	1.1
Dewberry	-	2.1	-	-	-	3.4
Blackberry	-	-	-	-	-	+.1
Striped Maple	1.1	-	-	-	-	-
Maple-leaved Viburnum	1.1	-	-	-	-	-
Honeysuckle	-	+.1	-	-	-	-
Raspberry	-	(+.1)	-	-	-	-
Blueberry	-	1.3	-	-	-	-
Willow spp.	-	-	-	1.2	-	-
No. Species	5	6	4	9	3	6

Table 14.5. Continued

Species	Xeric (3)		Hydric (1)		Mesic (2)	
	Forest A.S.	ROW A.S.	Forest A.S.	ROW A.S.	Forest A.S.	ROW A.S.
<u>Trees in the Shrub Layer</u>						
Red Maple	+.1	-	3.1	-	-	3.1
White Ash	1.1	1.1	3.1	1.1	3.1	1.1
Sassafras	-	3.1	+.1	-	3.1	3.1
Quaking Aspen	-	-	-	3.1	(3.1)	3.1
Black Cherry	1.1	1.1	-	1.1	-	1.1
American Elm	-	-	-	+.1	++.1	+.1
Sugar-Maple	2.1	1.1	-	-	2.1	-
Bitternut Hickory	-	-	-	-	2.1	+.1
Flowering Dogwood	<u>4.4</u>	1.1	-	-	+.1	1.1
American Hornbeam	-	-	-	-	+.1	-
Pin-Cherry	-	-	-	-	-	3.1
American Hop-Hornbeam	+.1	-	-	-	-	++.1
Red Oak	-	1.1	-	-	-	2.1
White Oak	1.1	1.1	-	-	-	+.1
Chestnut	+.1	-	-	-	-	-
Alternate-leaved Dogwood	+.1	-	-	-	-	-
Large-toothed Aspen	-	3.1	-	-	-	-
Black Oak	-	1.1	-	-	-	-
No. Species	9	9	3	4	8	12
<u>Herb[1] Layer</u>						
Sensitive Fern	-	-	<u>3.3</u>	<u>3.3</u>	1.2	-
Interrupted Fern	-	-	2.3	-	-	-
New York Fern	-	-	2.3	-	-	-
Wood-Fern spp.	-	-	1.3	-	-	-
Royal Fern	-	-	+.3	-	1.3	-
Cowslip	-	-	-	<u>2.3</u>	-	-
Horsetail	-	-	-	<u>3.5</u>	-	-
Spotted Touch-me-not	-	-	-	<u>3.3</u>	-	-
Joe-Pye-weed	-	-	-	<u>2.4</u>	-	-
Boneset	-	-	-	2.2	-	++.1
Spiked Loosestrife	-	-	-	1.2	-	-
Nightshade	-	-	-	1.1	-	+.3
Goldenrod spp.	-	+.2	-	<u>3.3</u>	-	1.2
Hawkweed spp. (yellow)	-	+.2	-	+.2	(++.1)	+.2
Mixed Grass	1.2	1.2	-	1.2	-	3.3
English Plantain	-	-	-	+.2	-	+.2
Common Evening-Primrose	-	-	-	+.1	-	1.2
Aster spp.	1.2	+.1	-	++.2	-	-
Sheep-Sorrel	-	1.2	-	++.2	-	<u>3.3</u>
Queen Anne's-lace	-	1.2	-	++.2	-	-
Sedge	-	-	-	<u>3.4</u>	-	-
Rush	-	-	-	<u>3.4</u>	-	-
Cinquefoil spp.	-	+.2	-	-	+.2	+.1
Cinnamon-Fern	-	-	-	-	+.2	-

Table 14.5. Continued

Species	Xeric (3) Forest A.S.	Xeric (3) ROW A.S.	Hydric (1) Forest A.S.	Hydric (1) ROW A.S.	Mesic (2) Forest A.S.	Mesic (2) ROW A.S.
Shinleaf	-	-	-	-	+.2	-
Bracken	1.1	3.1	-	-	(+.1)	-
Ground-Pine	-	-	-	-	(+.3)	-
Large-flowered Wake-robin	3.4	-	-	-	(++.1)	-
Christmas Fern	-	-	-	-	+.2	+.2
Wild Lily-of-the-valley	1.1	+.2	-	-	1.3	-
False Spikenard	1.1	-	-	-	+.1	-
Spinulose Wood-Fern	-	-	-	-	1.2	-
Strawberry	-	1.1	-	-	1.2	2.3
White Snakeroot	-	-	-	-	-	1.4
Yarrow	-	+.2	-	-	-	1.2
Mouse-ear	-	-	-	-	-	+.1
Butter-and-eggs	-	-	-	-	-	++.2
Wild Yam-root	-	-	-	-	-	++.1
Devil's Paint-brush	-	-	-	-	-	++.1
Field Cat's-foot	-	-	-	-	-	++.2
Common Speedwell	-	-	-	-	-	+.2
Common Mullein	-	-	-	-	-	++.1
Common Periwinkle	+.2	+.2	-	-	-	-
White Baneberry	1.3	-	-	-	-	-
Sweet-scented Bedstraw	1.2	1.2	-	-	-	-
Tall Meadow-Rue	+.1	-	-	-	-	-
May-apple	+.4	-	-	-	-	-
Wild Sarsaparilla	+.1	-	-	-	-	-
Columbine	1.1	1.1	-	-	-	-
Violet spp.	+.2	-	-	-	-	-
Spreading Dogbone	+.1	-	-	-	-	-
Twisted-stalk	+.1	-	-	-	-	-
Rattlesnake-Fern	(+.1)	-	-	-	-	-
Everlasting Pea	-	1.2	-	-	-	-
Dame's-Violet	-	+.1	-	-	-	-
Gill-over-the-ground	-	+.3	-	-	-	-
Upright Yellow Wood-sorrel	-	1.2	-	-	-	-
Burdock	-	+.2	-	-	-	-
Blue-eyed Grass	-	+.2	-	-	-	-
No. Species	17	20	5	18	14	20
Total No. Species						
Trees	14	9	8	4	12	12
Shrubs	5	6	4	9	3	6
Herbs	17	20	5	18	14	20
Totals	36	35	17	31	29	38

[1] For simplicity, herbs include all species of the layer.

Table 14.6. Characteristic species with abundance and sociability ratings (A.S.) in the shrub and herb layers of the adjacent forest which did not occur on the ROW.

Species	Forest A.S.	ROW A.S.
Hydric (1)		
Shrubs		
Virginia Creeper	2.4	-
Herbs[1]		
Interrupted Fern	2.3	-
New York Fern	2.3	-
Wood-fern spp.	1.3	-
Royal Fern	+.3	-
No. Species	5	
Mesic (2)		
Shrubs		
Virginia Creeper	1.2	-
Poison Ivy	4.5	-
Herbs		
Sensitive Fern	1.2	-
Royal Fern	1.3	-
Cinnamon-Fern	+.2	-
Shinleaf	+.2	-
Bracken	(+.1)	-
Ground-Pine	(+.3)	-
Large-flowered Wake-robin	(++.1)	-
Wild Lily-of-the-valley	1.3	-
False Spikenard	+.1	-
Spinulose Wood-fern	1.2	-
No. Species	12	
Xeric (3)		
Shrubs		
Virginia Creeper	+.1	-
Poison Ivy	+.2	-
Striped Maple	1.1	-
Maple-leaved Viburnum	1.1	-

Table 14.6. Continued

Species	Forest A.S.	ROW A.S.
Herbs		
Large-flowered Wake-robin	3.4	-
False Spikenard	1.1	-
White Baneberry	1.3	-
Tall Meadow-Rue	+.1	-
May-apple	+.4	-
Wild Sarsaparilla	+.1	-
Violet spp.	+.2	-
Spreading Dogbane	+.1	-
Twisted-stalk	+.1	-
Rattlesnake-Fern	(+.1)	-
No. Species	14	

[1] For simplicity, herbs include all species of the layer.

Table 14.7. Characteristic species with abundance and sociability ratings (A.S.) in the shrub and herb layers of the ROW which were not in the adjacent forest.

Species	ROW A.S.	Forest A.S.
Hydric (1)		
Shrubs		
Gray Dogwood	1.1	-
Winterberry	+.2	-
Staghorn-Sumac	+.1	-
Nannyberry	1.1	-
Elderberry	++.1	-
Willow	1.2	-
Herbs		
Cowslip	2.3	-
Horsetail	3.5	-
Spotted Touch-me-not	3.3	-
Joe-Pye-weed	2.4	-
Boneset	2.2	-
Spiked Loosestrife	1.2	-
Nightshade	1.1	-
Goldenrod spp.	3.3	-
Hawkweed spp. (yellow)	+.2	-
Mixed Grass	+.2	-
English Plantain	+.2	-
Common Evening-Primrose	+.1	-
Aster spp.	++.2	-
Sheep-Sorrel	++.2	-
Queen Anne's-lace	++.2	-
Sedge	3.4	-
Rush	3.4	-
No. Species	23	
Mesic (2)		
Shrubs		
Grape	+.2	-
Staghorn-Sumac	3.1	-
Hawthorn	1.1	-
Dewberry	3.4	-
Blackberry	+.1	-
Herbs		
Boneset	++.1	-
Nightshade	+.3	-
Goldenrod spp.	1.2	-

Table 14.7. Continued

Species	ROW A.S.	Forest A.S.
Mixed Grass	3.3	-
English Plantain	+.2	-
Common Evening-Primrose	1.2	-
Sheep-Sorrel	3.3	-
White Snakeroot	1.4	-
Yarrow	1.2	-
Mouse-ear	+.1	-
Butter-and-eggs	++.2	-
Wild Yam-root	++.1	-
Devil's Paint-brush	++.1	-
Field Cat's-foot	++.2	-
Common Speedwell	+.2	-
Common Mullein	++.1	-
No. Species	21	
Xeric (3)		
Shrubs		
Grape	+.1	-
Dewberry	2.1	-
Honeysuckle	+.1	-
Raspberry	(+.1)	-
Blueberry	1.3	-
Herbs		
Goldenrod spp.	+.2	-
Hawkweed spp. (yellow)	+.2	-
Sheep-Sorrel	1.2	-
Queen Anne's-lace	1.2	-
Cinquefoil spp.	+.2	-
Strawberry	1.1	-
Yarrow	+.2	-
Everlasting Pea	1.2	-
Dame's-Violet	+.1	-
Gill-over-the-ground	+.3	-
Upright Yellow Wood-sorrel	1.2	-
Burdock	+.2	-
Blue-eyed Grass	+.2	-
No. Species	18	

Table 14.8. Major vegetational types for the Oswego to Volney study area based on percent of study plots occupied by each plant community and other components on the ROW.

Community	Site Classification Hydric (1)	Site Classification Mesic (2)
	Percent of Total Area	
Sedge-Rush-Mixed Grass-Herb	36.90	
Arrow-wood-Mixed Grass-Herb	25.30	
Open (Access Road)	15.70	3.40
Horsetail-Sensitive Fern-Mixed Grass	14.0	
Stream	1.70	
Red Osier Dogwood	1.40	
Willow	1.40	
Sensitive Fern	1.20	
Arrow-wood	.80	1.60
Nannyberry	.80	
Quaking Aspen	.60	3.30
Winterberry	.10	
Black Cherry	.10	
Mixed Grass-Herb		58.90
Sheep-Sorrel-Mixed Grass-Herb		13.20
Quaking Aspen-Sassafras-Mixed Grass-Herb		8.70
Blackberry-Mixed Herb		6.20
Red Maple		1.50
Red Oak		.90
Pin-Cherry		.60
Staghorn-Sumac		.60
Sassafras		.50
Open		.50
Christmas Fern		.10
Total	100.00	100.00

Table 14.9. Browse survey showing plant species and number ratio of browsed to total stems with per- cent actual use for ROW, ROW edge, and woods.

Species	ROW		ROW Edge		Woods		Total	
	Ratio	%	Ratio	%	Ratio	%	Ratio	%
American Elm			0/1	0			0/1	0
American Hop-Hornbeam			1/1	100			1/1	100
Arrow-wood			2/2	100	3/5	60	5/7	71
Blackberry			1 1/2	50	0/16	0	1/18	5
Black Cherry			1/1	100			1/1	100
Dewberry	0/19	0					0/19	0
Gray Dogwood	7/8	88	3/4	75	5/5	100	15/17	88
Raspberry	0/10	0	0/10	0	0/9	0	0/29	0
Red Maple	0/1	0			7/7	100	7/8	88
Staghorn-Sumac	0/4	0	1/3	33			1/7	14
Quaking Aspen	4/10	40	1/5	20			5/15	33
White Ash	0/2	0			0/4	0	0/6	0
Wild-raisin	4/4	100	9/10	90	0/4	0	13/18	72
Total	15/58	26	19/39	49	15/50	30	49/147	33

Table 14.10. Browse survey showing most abundant plant species and number ratio of browsed to total stems with percent actual use for ROW, ROW edge, and woods.

Location	Raspberry Ratio	Raspberry %	Dewberry Ratio	Dewberry %	Wild-raisin Ratio	Wild-raisin %	Gray Dogwood Ratio	Gray Dogwood %
ROW	0/10	0	0/19	0	4/4	100	7/8	88
ROW Edge	0/10	0			9/10	90	3/4	75
Woods	0/9	0			0/4	0	5/5	100
Total	0/29	0	0/19	0	13/18	72	15/17	88

Table 14.11. Birds observed and/or heard on the ROW and the ROW edge during the study period.

Species	Species
Green heron	Blue jay
Canada goose	Common crow
Red-tailed hawk	Black-capped chickadee
Sparrow hawk	Catbird
Ruffed grouse	Robin
Killdeer	Wood thrush
American woodcock	Yellow warbler
Herring gull	Yellow throat
Ringed-billed gull	Red-winged blackbird
Mourning dove	Cardinal
Rock dove	Indigo bunting
Downy woodpecker	Rose-breasted grosbeak
Hairy woodpecker	American goldfinch
Eastern kingbird	Fox sparrow
Eastern phoebe	Song sparrow
Eastern wood pewee	Rufus-sided towhee
Great crested flycatcher	Slate-colored junco

Table 14.12. Potential wildlife use of plant species[1] present on the ROW and adjacent woods for the major game species on the Oswego to Volney study area.

Species	Wildlife Species		
	Deer	Rabbit	Woodcock
<u>Trees</u>			
Red Oak	*	*	
Sugar-Maple	****		
Black Oak	*	*	
Large-toothed Aspen	**		
Yellow Birch	*		
Sassafras	+		
White Oak	*	*	*
Black Cherry	*	*	
American Hop-Hornbeam	+		
Red Maple	****	*	
White Ash	*		
Quaking Aspen	**		
American Elm	+		
Tulip-poplar	+		
Pin-Cherry	*	*	
Alternate-leaved Dogwood	*	+	
Flowering Dogwood	*	+	
<u>Shrubs</u>			
Maple-leaved Vibrunum	*		
Arrow-wood	*		
Virginia Creeper		+	
Gray Dogwood	*	+	
Staghorn-Sumac	**		
Hawthorn	+		
Raspberry	+	**	+
Blackberry	+	**	+
Willow	*	+	
Blueberry	+	*	
<u>Herbs</u>[2]			
Fern	*		
Goldenrod	+		
Mixed Grass	*	**	
Hawkweed	+		
Strawberry		+	

Table 14.12. Continued

Species	Wildlife Species		
	Deer	Rabbit	Woodcock
Sheep-Sorrel		**	
English Plantain		**	
Sedge			+

1 Those plants not included in this table provide a certain amount of cover (Table 14.5) for the 3 major game species, and may also provide seasonal food value, specific information pertaining to which is not now available. This applies also with regard to non-game species.

2 For simplicity, herbs include all species of the herb layer.

Table 14.13. Comparison of land use prior to and after construction of the ROW.[1]

Land Use		Percent of Total Area Prior to (-) and After (*) Construction 0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
(A)	Agriculture	------------------------34.0 *****************26.9
(C,I)	Commercial & Industrial	-.2 *.2
(F)	Forest Land	------------------------------45.7 ***63.5
(E)	Extractive Industry	
(N)	Non-productive	
(OR)	Outdoor Recreation	-.4 *.4
(P)	Public & Semi-public	
(W)	Water Resources	----------14.3 ***3.3
(U)	Urban Inactive	
(T)	Transportation	---3.1 ***3.1
(R)	Residential	--2.3 **2.6

[1] Source: United Aerial Mapping, San Antonio, Texas, air photo No. 3-603, Apr. 27, 1974
USDA, air photo No. ARY-1P, July 31, 1955

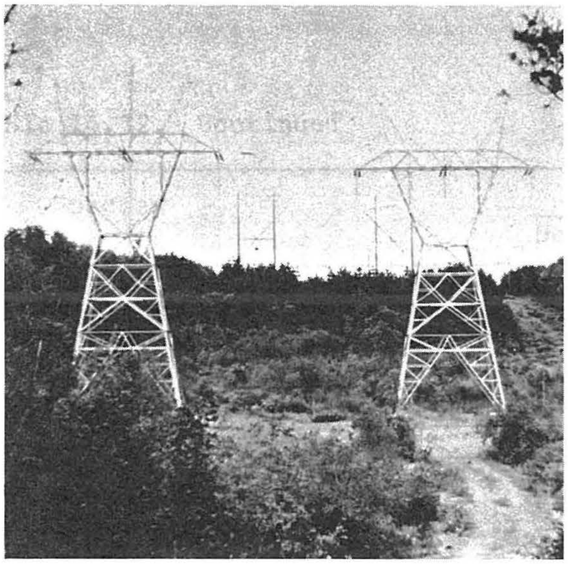


FIG. 14.1.1. General view of the ROW and adjacent forest, looking west, in summer, 1975 (Photo Station 4).

FIG. 14.1.2. Slash pile on ROW, in spring, 1975 (Photo Station 6).

FIG. 14.1.3. Severe sheet and rill erosion at access road where culvert was installed on bank of stream crossing ROW.

FIG. 14.1.4. Unseeded tower site reclaimed through natural succession, in summer, 1976.

FIG. 14.1.5. Grouse nest in woods adjacent to the ROW, in spring, 1976.

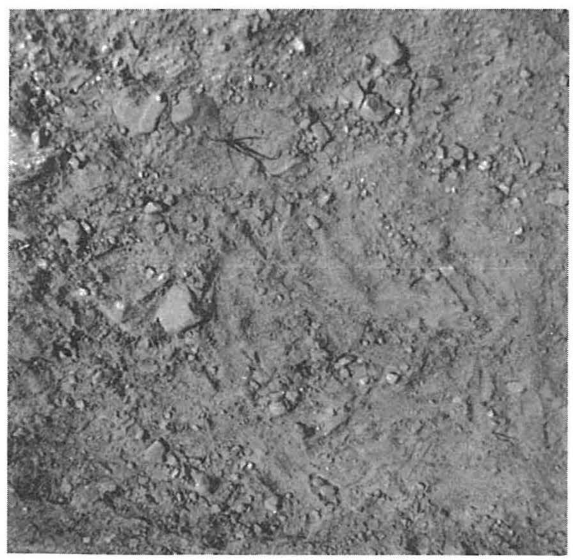


FIG. 14.1.6. Bird dusting area on ROW, in the spring of 1976.

FIG. 14.1. Visual characteristics.

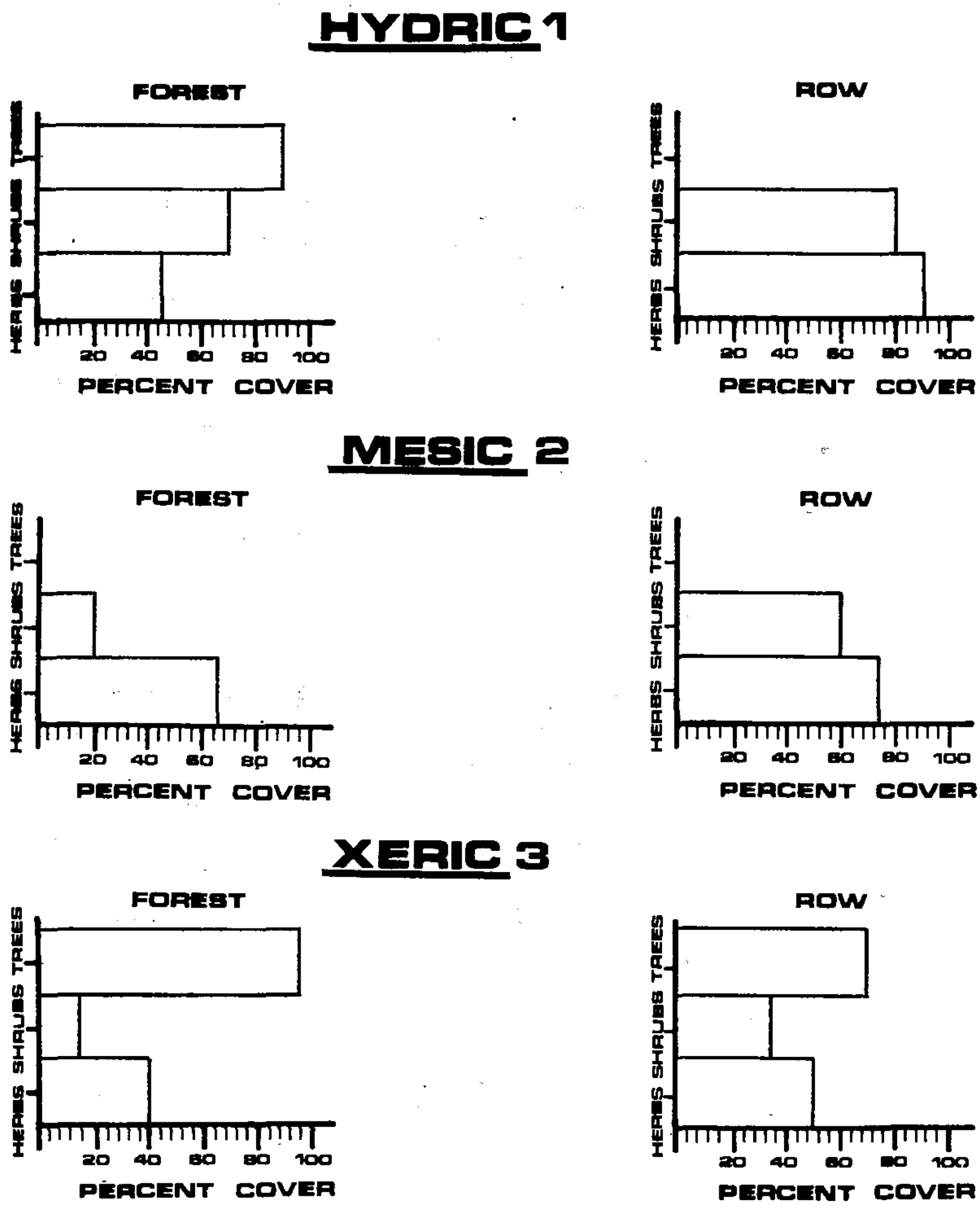


Fig. 14.2. Changes in cover value of tree, shrub, and herb layers from forest to ROW.

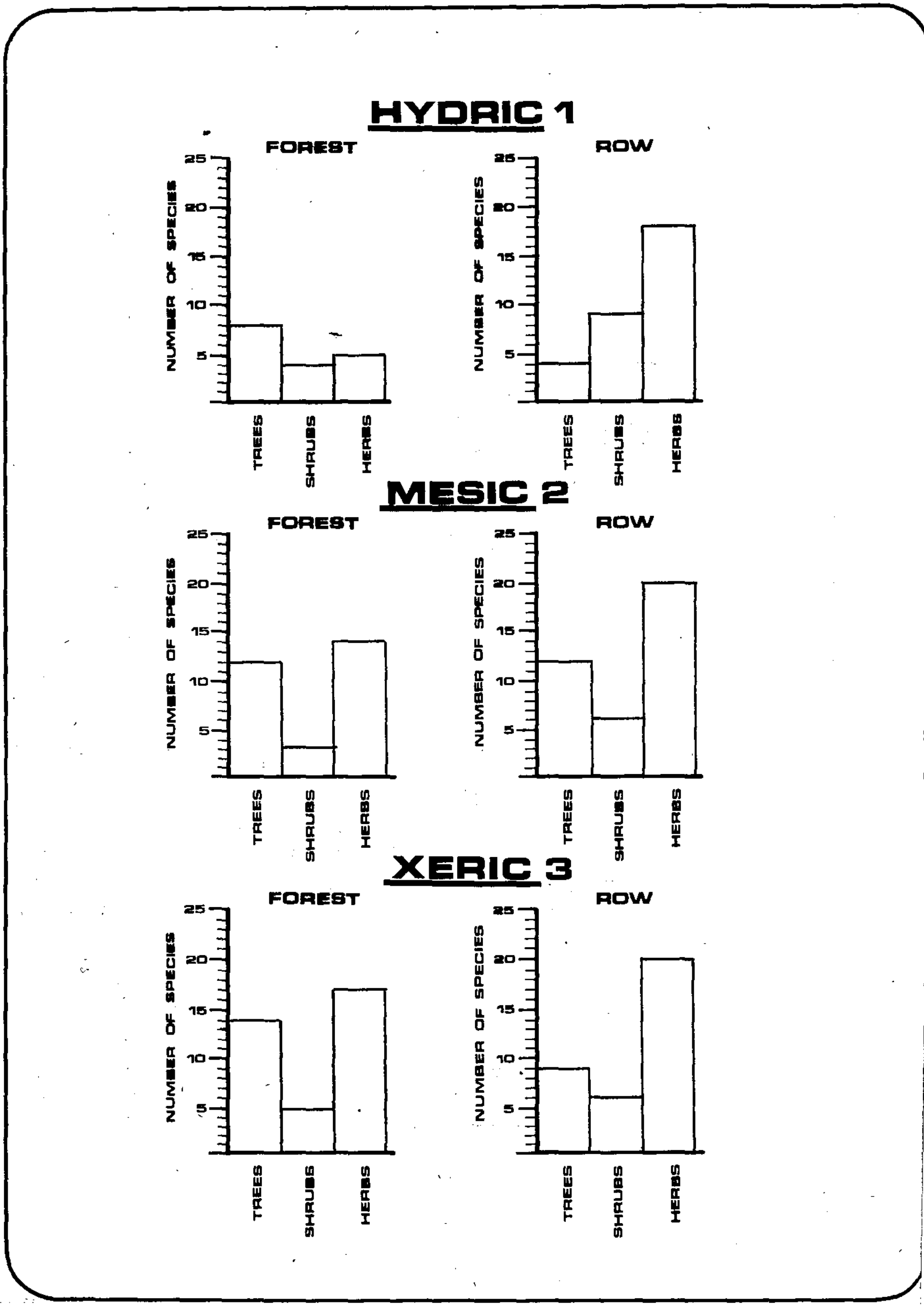


Fig. 14.3. Species diversity in the forest and on the ROW.

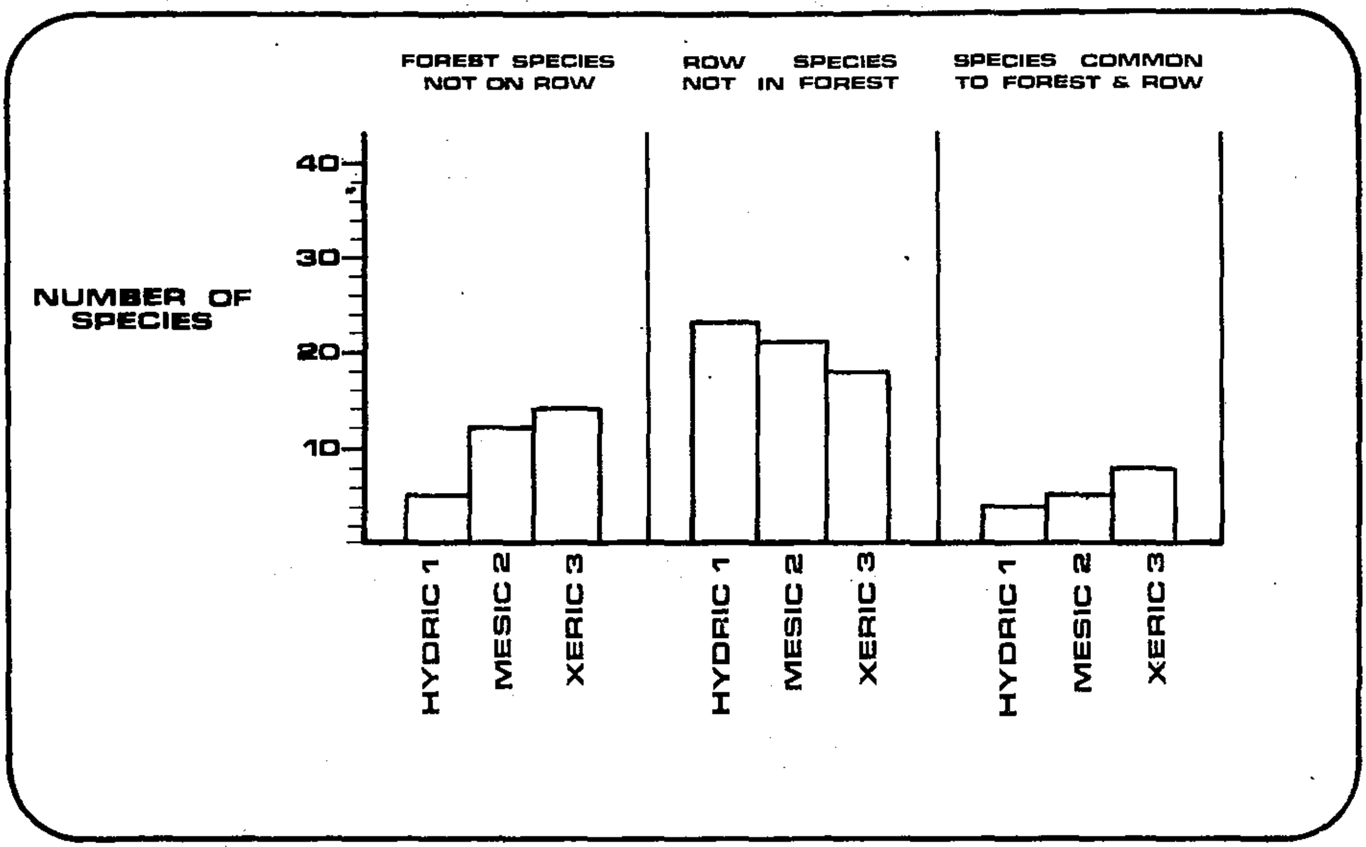


Fig. 14.5. Comparison of shrub and herb species in the forest and on the ROW.

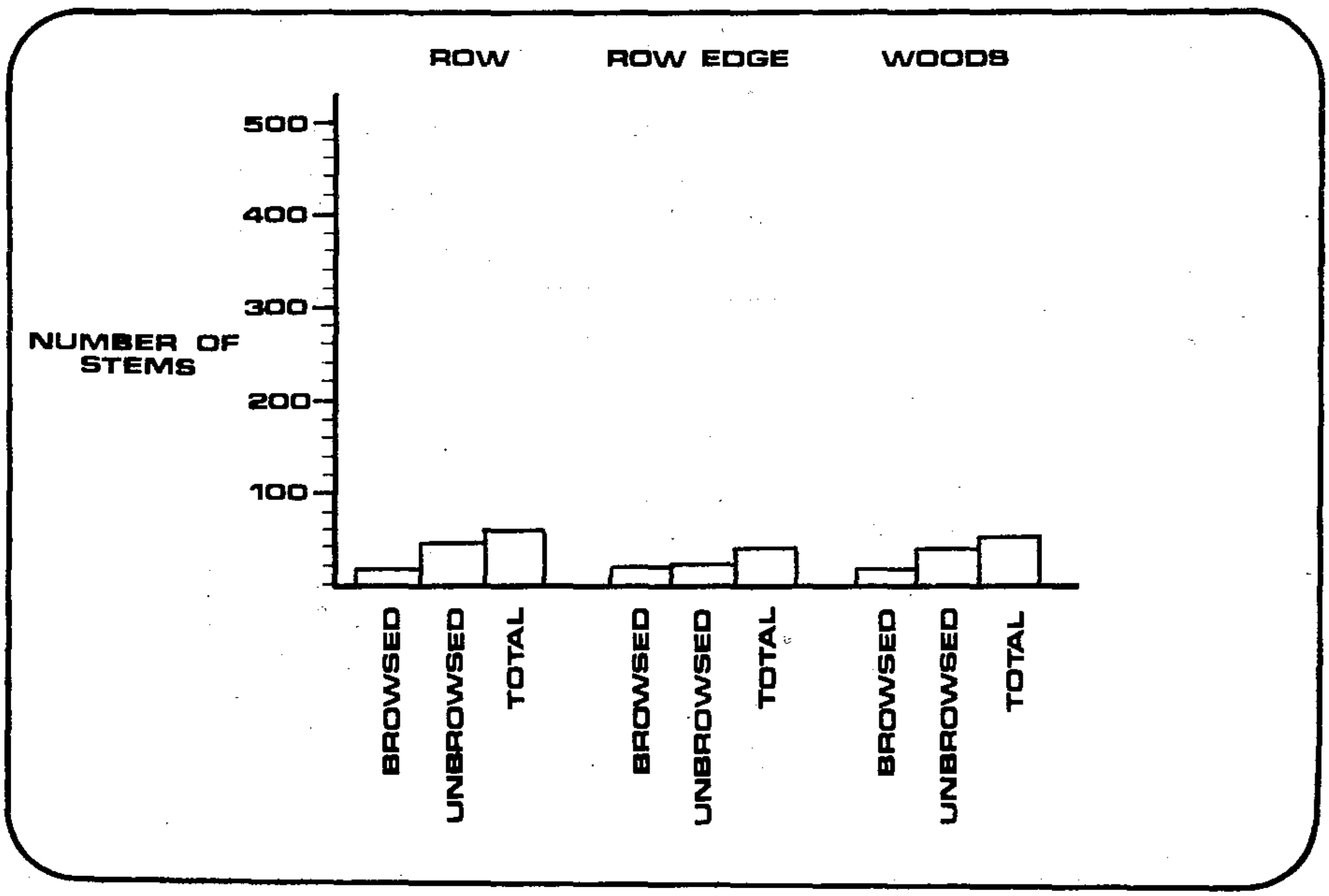
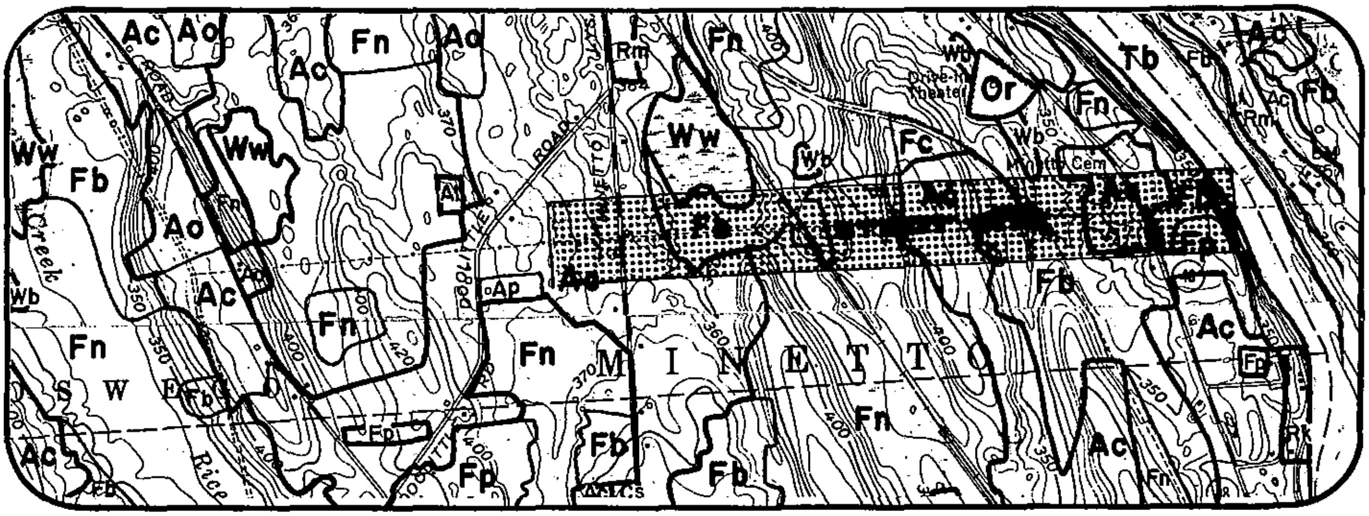
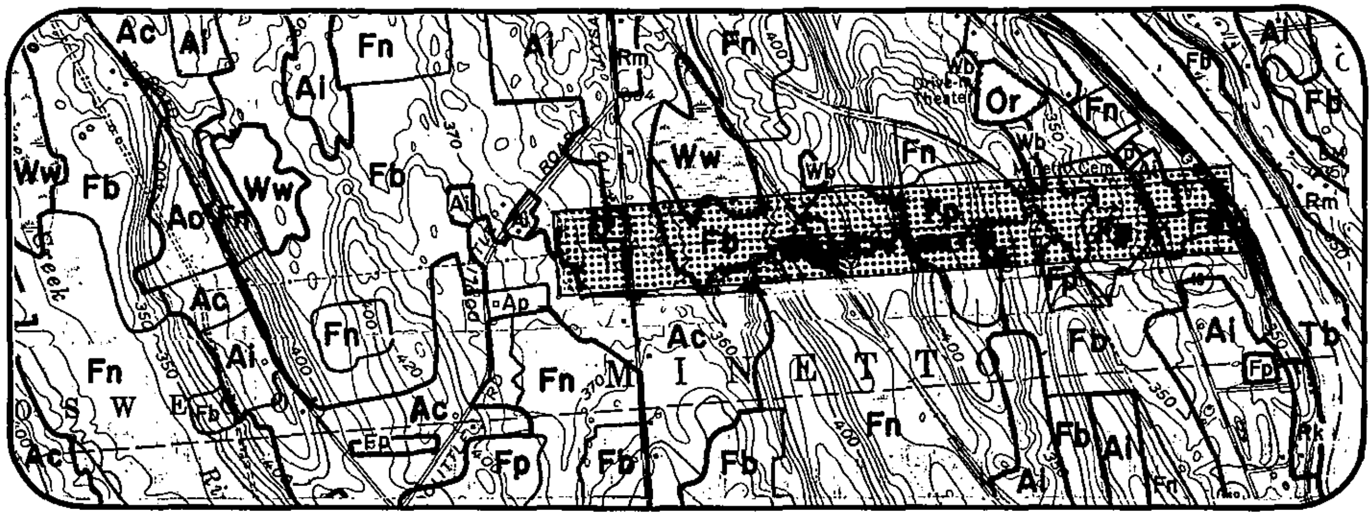


Fig. 14.6. Browse survey showing number of browsed, unbrowsed, and total stems for the ROW, ROW edge, and forest for 4 browse transects.



LAND USE PRIOR TO ROW CONSTRUCTION (1965) SCALE 1"- 2000 N



LAND USE AFTER CONSTRUTION OF ROW (1974) SCALE 1"- 2000 N

LEGEND FOR LAND USE SYMBOLS

AGRICULTURE
- Ac - Cropland and cropland pasture
- Ai - Inactive agricultural land
- Ap - Pasture

COMMERCIAL AND INDUSTRIAL LAND USES
- Cs - Commercial strip development

FOREST LAND
- Fn - Forest lands
- Fp - Plantations

OUTDOOR RECREATION LAND USE
- Or - Outdoor recreation

RESIDENTIAL LAND USE
- Rk - Shoreline development
- Rm- Medium density

TRANSPORTATION LAND USE
- Tb - Barge Canal

WATER RESOURCES
- Wb- Marshes, shrub wetlands and bogs
- Ww - Wooded wetlands

SOURCES:
- United Aerial Mapping, San Antonio, Texas, air photo No. 3-603, Apr. 27, 1974
- USDA, air photo No. ARY-IP-62, July 31, 1955
- Area Land Use Map, LUNR, Cornell University, N.Y., 1974
- U. S. G. S. Topographic Maps, Oswego East, N. Y., 1954, and Fulton, N.Y., 1955

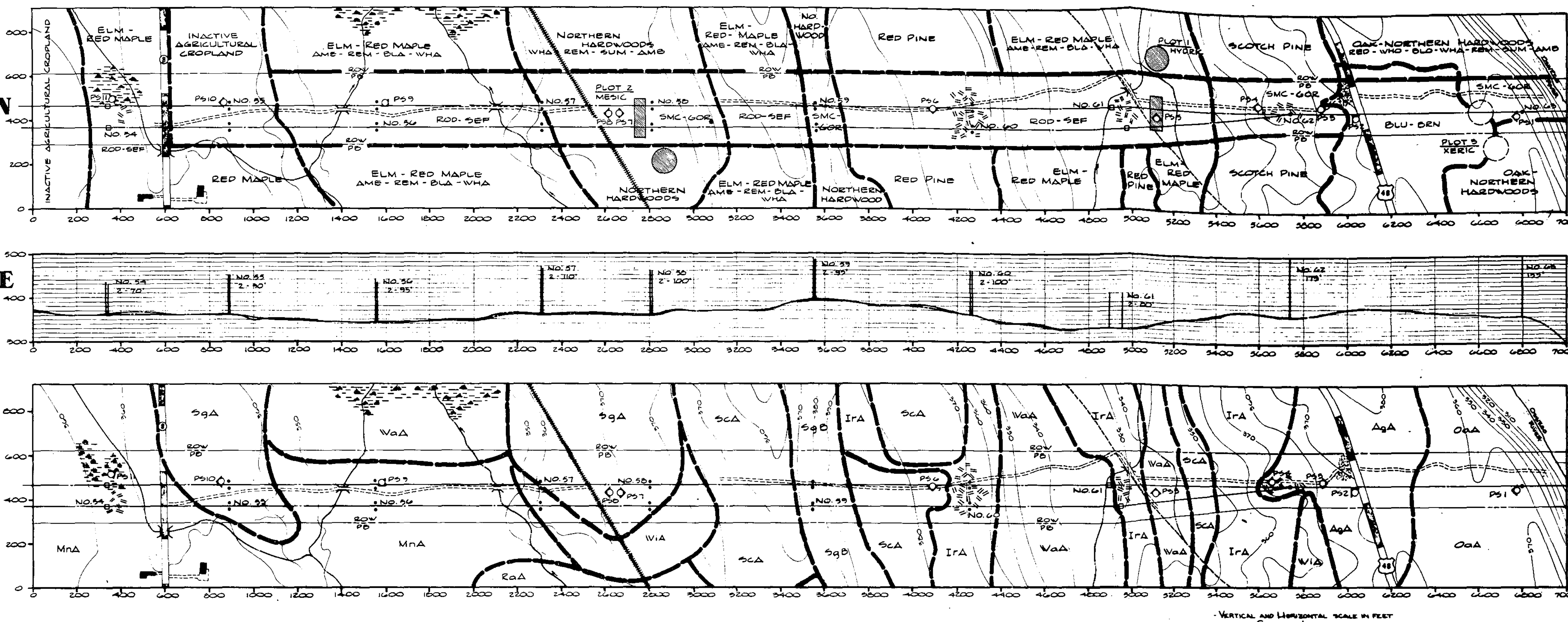
Fig. 14.7. Land use change.

aes ASPLUNDH ENVIRONMENTAL SERVICES

VEGETATION

CENTERLINE PROFILE

SOILS



LEGEND

WORKS AND STRUCTURES

HIGHWAYS AND ROADS
HEAVY DUTY
MEDIUM DUTY
LIGHT DUTY
ACCESS ROAD
UNIMPROVED DIRT ROAD
NATIONAL INTERSTATE
US ROUTE
STATE OR COUNTY
SINGLE TRACK RAILROAD
MULTIPLE TRACK RAILROAD
ABANDONED RAILROAD TRACK
RAILROAD OVER
RAILROAD UNDER
FORD
ROAD CROSSING
BUILDING
EXCAVATION
MINE DUMP
PIPELINE
TRANSMISSION STRUCTURES
DAMS
CULVERT
TANKS
WELLS
BRUSH AND LOG DISPOSAL SITES
SMALL PARKS, CEMETERY, ETC
FENCE

BOUNDARIES

NATIONAL OR STATE
COUNTY
MINOR CIVIL DIVISION
RESERVATION, NATIONAL OR STATE
LAND GRANT
ROW PROPERTY BOUNDARY
ROW EASEMENT BOUNDARY
ROW CLEARING EDGING
SITE BOUNDARY
THE CENTERLINE OF STRUCTURE
VEGETATION OR SOIL BOUNDARY

SITE MARKERS

SAMPLE LOCATION
PHOTO STATIONS
MAPPED PLOT ON ROW
MAPPED PLOT OFF ROW
APPROX. LOCATION OF WOODCOCK SINGING GROUND

WATER SYMBOLS

PERENNIAL STREAMS
INTERMITTENT STREAMS
SMALL RAPIDS
LARGE RAPIDS
DISAPPEARING STREAM
CANALS AND DITCHES
PERENNIAL LAKES AND PONDS
INTERMITTENT LAKES AND PONDS
SPRING
MARSH, SWAMP OR WET MEADOW
WET SPOT
ALLUVIAL FAN

TOPOGRAPHIC RELIEF

CONTOUR
DEPRESSION CONTOUR

SOIL SYMBOL AND NAME

AgA	ALTON gravelly fine sandy loam (0 to 8%)
IrA	IRA " " " " "
MnA	MINOA very fine sandy loam (0 to 8% slope)
OaA	OAKVILLE loamy fine sand "
RaA	RAYNHAM silt loam (0 to 8% slope)
ScA	SCRIBA gravelly fine sandy loam (0 to 8%)
SgB	SODUS " " " " (8 to 15%)
WaA	WALLKILL silt loam (0 to 8% slope)
WiA	WILLIAMSON very fine sandy loam (0 to 8%)

SOIL SYMBOLS

ROCK
SAND
SCATTERED ROCK
BARE AND ERODING (GULLY)
BARE AND ERODING (SHEET)
BARE AND INCREASING IN SIZE
BARE AND HEALING
ERODED BUT HEALED
CLAY AREA
WIND EROSION

This information is a part of the ESEERCO "STUDY OF ENVIRONMENTAL AND ECONOMIC ASPECTS OF CONTEMPORANEOUS ELECTRIC TRANSMISSION LINE RIGHT-OF-WAY MANAGEMENT TECHNIQUES"

PLANT COMMUNITY SYMBOLS

shrubs

ALR	ALDER	Alnus spp.
ARR	ARROW - WOOD	Viburnum recognitum
BAR	BARBERRY	Berberis spp.
BLA	BLACKBERRY	Rubus spp.
BLH	BLACK - VIBURNUM	Viburnum prunifolium
BLU	BLUEBERRY	Vaccinium spp.
BUT	BUTTONBUSH	Cephalanthus occidentalis
CAY	AMERICAN YEW	Taxus canadensis
CFH	FLY - HONEYSUCKLE	Lonicera canadensis
CHC	CHOKE - CHERRY	Prunus virginiana
CLB	CLIMBING BITTERSWEET	Celastrus scandens
CRA	GRAPE	Vitis spp.
DEY	DEWBERRY	Rubus spp.
ELD	ELDERBERRY	Sambucus canadensis
GRD	GRAY DOGWOOD	Cornus racemosa
GRJ	GROUND - JUNIPER	Juniperus communis
HAA	COMMON ALDER	Alnus serrulata
HAW	HAWTHORN	Crataegus spp.
HAZ	HAZELNUT	Corylus spp.
HUC	HUCKLEBERRY	Gaylussacia spp.
JAR	MULTIFLORA ROSE	Rosa multiflora
MAV	MAPLE - LEAVED VIBURNUM	Viburnum acerifolium
MOH	MOUNTAIN - HOLLY	Nemopanthus mucronata
MOL	MOUNTAIN - LAUREL	Kalmia latifolia
MOM	MOUNTAIN - MAPLE	Acer spicatum
NAN	NANNYBERRY	Viburnum Lentago
NJT	NEW JERSEY TEA	Ceanothus americanus
PIF	PINXTER - FLOWER	Rhododendron nudiflorum
POI	POISON IVY	Rhus radicans
POS	POISON SUMAC	Rhus vernix
PRA	NORTHERN PRICKLY ASH	Xanthoxylum americanum
PRU	BUCKTHORN	Rhamnus spp.
RIB	RIBES	Ribes spp.
ROD	RED OSIER DOGWOOD	Cornus stolonifera
SMC	SUMAC	Rhus spp.
SPA	SPECKLED ALDER	Alnus rugosa
SPB	SPICEBUSH	Lindera Benzoin
SPI	SPIRAEA	Spiraea spp.
SMS	SMOOTH SUMAC	Rhus glabra
STM	STRIPED MAPLE	Acer pensylvanicum
STS	STAGHORN - SUMAC	Rhus typhina
SWF	SWEET - FERN	Comptonia peregrina
TAH	TARTARIAN HONEYSUCKLE	Lonicera tatarica
WIH	WITCH - HAZEL	Hamamelis virginiana
WIL	WILLOW	Salix spp.
WIN	WINTERBERRY	Ilex verticillata
WIR	WILD - RAISIN	Viburnum cassinoides
ZBC	BLACK CHOKEBERRY	Pyrus melanocarpa

trees

ABU	BUTTERNUT	Juglans cinerea
AIL	TREE - OF - HEAVEN	Ailanthus altissima
ALD	ALTERNATE - LEAVED DOGWOOD	Cornus alternifolia
AMB	BEECH	Fagus grandifolia
AMC	CHESTNUT	Castanea dentata
AME	AMERICAN ELM	Ulmus americana
AMH	AMERICAN HORNBEAM	Carpinus caroliniana
APP	APPLE	Pyrus malus
BAF	BALSAM - FIR	Abies balsamea
BAS	BASSWOOD	Tilia americana
BIH	BITTERNUT HICKORY	Carya cordiformis
BLC	BLACK CHERRY	Prunus serotina
BLL	BLACK LOCUST	Robinia Pseudo-Acacia
BLW	BLACK WALNUT	Juglans nigra
CHO	CHESTNUT - OAK	Quercus prinus
COT	COTTONWOOD	Populus deltoides
EAH	HEMLOCK	Tsuga canadensis
ERC	RED CEDAR	Juniperus virginiana
FLD	FLOWERING DOGWOOD	Cornus florida
GRB	GRAY BIRCH	Betula populifolia
HOH	AMERICAN HOP-HORNBEAM	Ostrya virginiana
LAA	LARGE - TOOTHED ASPEN	Populus grandidentata
LAR	AMERICAN LARCH	Larix laricina
NWC	WHITE CEDAR	Thuja occidentalis
PAB	WHITE BIRCH	Betula papyrifera
PIC	PIN - CHERRY	Prunus pensylvanica
PIH	PIGNUT HICKORY	Carya glabra
PIP	PITCH - PINE	Pinus rigida
QUA	QUAKING ASPEN	Populus tremuloides
RED	RED OAK	Quercus rubra
REM	RED MAPLE	Acer rubrum
RES	RED SPRUCE	Picea rubens
SAS	WHITE SASSAFRAS	Sassafras albidum
SCO	SCRUB - OAK	Quercus ilicifolia
SCP	SCOTCH PINE	Pinus sylvestris
SHB	SERVICEBERRY	Amelanchier spp.
SHH	SHAGBARK - HICKORY	Carya ovata
SUM	SUGAR - MAPLE	Acer saccharum
SWB	SWEET BIRCH	Betula lenta
VIP	SCRUB - PINE	Pinus virginiana
WHA	WHITE ASH	Fraxinus americana
WHO	WHITE OAK	Quercus alba
WHP	WHITE PINE	Pinus strobus
YEB	YELLOW BIRCH	Betula lutea
YEP	TULIP - POPLAR	Liriodendron tulipifera

herbs

BLG	BLUE - JOINT GRASS	Calamagrostis canadensis
BON	BONESET	Eupatorium perfoliatum
BRN	BRACKEN	Pteridum aquilinum
BRO	BROOM - SEDGE	Artholophis virginicus
CAT	CAT-TAIL	Typha spp.
CHF	CHRISTMAS - FERN	Polystichum acrostichoides
CIF	CINNAMON - FERN	Osmunda cinnamomea
DEG	DEERTONGUE GRASS	Panicum clandestinum
GOR	GOLDENROD	Solidago spp.
HAF	HAY - SCENTED FERN	Dennstaedtia punctilobula
HOT	HORSETAIL	Equisetum spp.
INF	INTERRUPTED FERN	Osmunda Claytoniana
IRS	IRIS	Iris spp.
JAP	SMALL JACK-IN-THE-PULPIT	Arisaema triphyllum
LET	WILD LETTUCE	Lactuca canadensis
MSF	MARGINAL SHIELD-FERN	Dryopteris marginalis
NYF	NEW YORK FERN	Dryopteris noveboracensis
PEV	PEARLY EVERLASTING	Anaphalis margaritacea
PHR	PHRAGMITES	Pragmites spp.
POG	POVERTY - GRASS	Danthonia spicata
RDM	REINDEER LICHEN	Cladonia rangiferina
ROF	ROYAL FERN	Osmunda regalis
SEF	SENSITIVE FERN	Onoclea sensibilis
SPL	SPIKED LOOSESTRIFE	Lythrum Salicaria
SPM	SPHAGNUM MOSS	Sphagnum spp.
SSS	SOLOMON'S - SEAL	Polygonatum biflorum
SWA	SWAMP - BUTTERCUP	Ranunculus septentrionalis
WHS	WHITE SNAKEROOT	Eupatorium rugosum
YPL	BULLHEAD - LILY	Nuphar variegatum

REVISIONS :

DATA SOURCES :

ASPLUNDH ENVIRONMENTAL SERVICES
BLAIR MILL ROAD
WILLOW GROVE PA

NMPC ENGINEERING PLAN & PROFILE REV 10/21/74
USGS 7.5 MIN TOPOGRAPHIC MAP, OSWEGO EAST N / 54
USDA SCS IN COOPERATION WITH THE OSWEGO CO SOIL & WATER CONSERVATION DISTRICT CORNELL UNIV AGR EXP STA 4/74
UNITED AERIAL MAPPING, SAN ANTONIO TEXAS OSWEGO CO AIR PHOTO NO 3-663 SCALE (1:24,000) APR 27 1974
USDA - SCS HYATTSVILLE, MD OSWEGO CO AIR PHOTO NO 540 36075 174-72 SCALE (1:48,000) JUNE 10, 1975
ASPLUNDH ENVIRONMENTAL SERVICES AES PROJECT NO 81-0028 FIELD STUDIES 1975-76

MAP 14.1

SITE 14 HABITAT CONDITIONS

UTILITY: NIAGARA MOHAWK POWER CORP

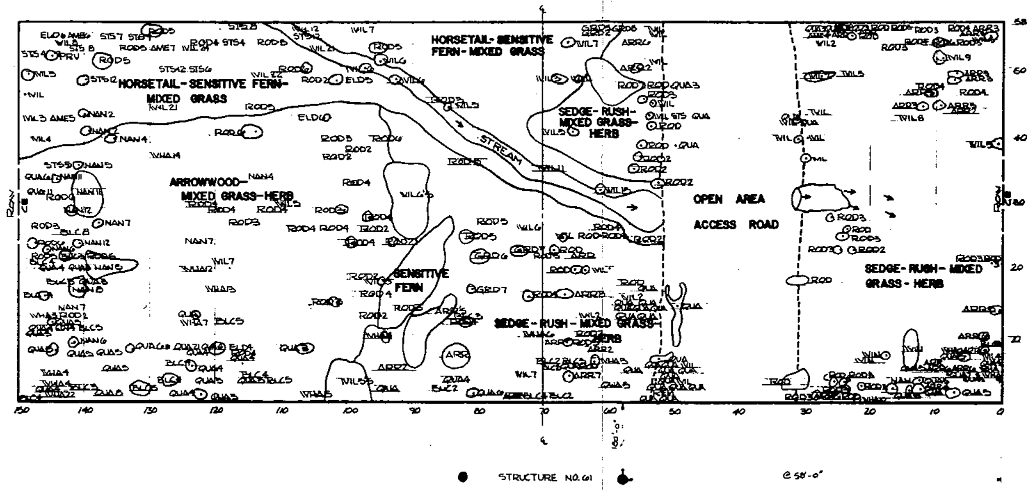
ROW DESCRIPTION: OSWEGO - VOLNEY 345 KV

WOODEN POLE 'H' FRAME 225'-325' ROW

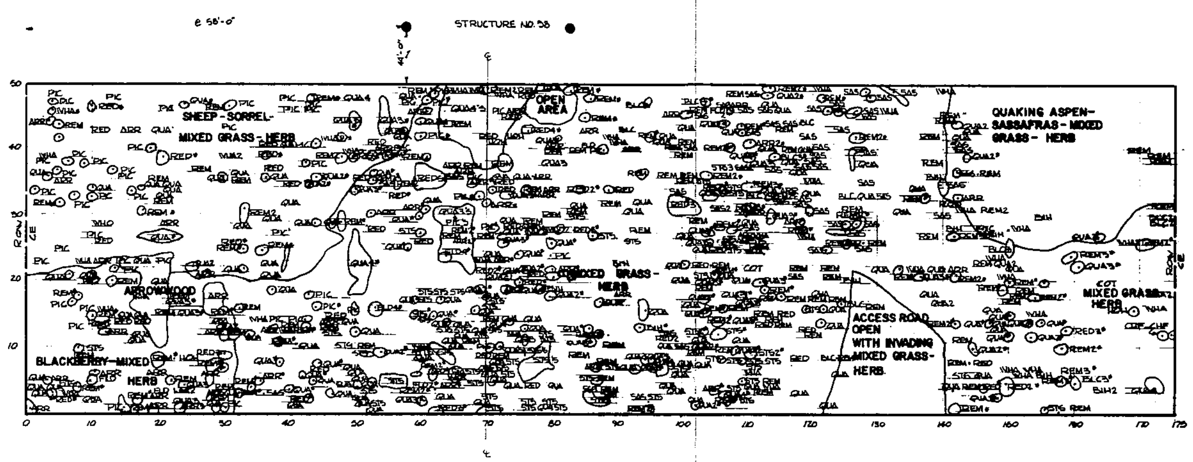
SCALE: 1" = 200'-0"

200 100 0 100 200 400 800 1000

PLOT 1 HYDRIC



PLOT 2 MESIC



NOTES:
- VERTICAL AND HORIZONTAL SCALES ARE IN FEET

LEGEND

WORKS AND STRUCTURES

- ACCESS ROAD
- BRUSH AND LOG DISPOSAL SITES

BOUNDARIES

- THE CENTERLINE OF STRUCTURE
- ROW PROPERTY BOUNDARY (ROW PB)
- ROW EASEMENT BOUNDARY (ROW EB)
- EXISTING ROW CLEARING EDGE (ROW CE)

WATER SYMBOLS

- PERENNIAL STREAMS
- INTERMITTENT STREAMS
- SMALL RAPIDS
- LARGE RAPIDS
- DISAPPEARING STREAM
- CANALS AND DITCHES
- PERENNIAL LAKES AND PONDS
- INTERMITTENT LAKES AND PONDS
- SPRING
- MARSH, SWAMP OR WET MEADOW
- WET SPOT
- ALLUVIAL FAN

SITE MARKERS

- SAMPLE LOCATION
- PHOTO STATION

SOIL SYMBOLS

- ROCK
- SCATTERED ROCK

PLANT COMMUNITY SYMBOLS

herbs

BLG	BLUE-JOINT GRASS	Calamagrostis canadensis
BON	BONESET	Eupatorium perfoliatum
BRN	BRACKEN	Pteridum aquilinum
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WIN	WINTERBERRY	Ilex verticillata
WIR	WILD-RAISIN	Viburnum cassinoides
ZBC	BLACK CHOKEBERRY	Pyrus melanocarpa

trees

ABU	BUTTERNUT	Juglans cinerea
AIL	TREE-OF-HEAVEN	Ailanthus altissima
ALD	ALTERNATE-LEAVED DOGWOOD	Cornus alternifolia
AMB	BEECH	Fagus grandifolia
AMC	CHESTNUT	Castanea dentata
AME	AMERICAN ELM	Ulmus americana
AMH	AMERICAN HORNBEAM	Carpinus caroliniana
APP	APPLE	Pyrus malus
BAF	BALSAM-FIR	Abies balsamea
BAS	BASSWOOD	Tilia americana
BIH	BITTERNUT HICKORY	Carya cordiformis
BLC	BLACK CHERRY	Prunus serotina
BLL	BLACK LOCUST	Robinia Pseudo-Acacia
BLW	BLACK WALNUT	Juglans nigra
CHO	CHESTNUT-OAK	Quercus prinus
COT	COTTONWOOD	Populus deltoides
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HOH	AMERICAN HOP-HORNBEAM	Ostrya virginiana
LAA	LARGE-TOOTHED ASPEN	Populus grandidentata
LAR	AMERICAN LARCH	Larix laricina
NWC	WHITE CEDAR	Thuja occidentalis
PAB	WHITE BIRCH	Betula papyrifera
PIC	PIN-CHERRY	Prunus pensylvanica
PIH	PIGNUT HICKORY	Carya glabra
PIP	PITCH-PINE	Pinus rigida
QUA	QUAKING ASPEN	Populus tremuloides
RED	RED OAK	Quercus rubra
REM	RED MAPLE	Acer rubrum
RES	RED SPRUCE	Picea rubens
SAS	WHITE SASSAFRAS	Sassafras albidum
SCO	SCRUB-OAK	Quercus ilicifolia
SCP	SCOTCH PINE	Pinus sylvestris
SHB	SERVICEBERRY	Amelanchier spp.
SHH	SHAGBARK-HICKORY	Carya ovata
SUM	SUGAR-MAPLE	Acer saccharum
SWB	SWEET BIRCH	Betula lenta
VIP	SCRUB-PINE	Pinus virginiana
WHA	WHITE ASH	Fraxinus americana
WHO	WHITE OAK	Quercus alba
WHP	WHITE PINE	Pinus strobus
YEB	YELLOW BIRCH	Betula lutea
YEP	TULIP-POPLAR	Liriodendron tulipifera

REVISIONS :

DATA SOURCE :

ASPLUNDH ENVIRONMENTAL SERVICES
BLAIR MILL ROAD
WILLOW GROVE, PA. 19090

FIELD SURVEY - AES, 1975, '76

This information is a part of the ESEERCO "STUDY OF ENVIRONMENTAL AND ECONOMIC ASPECTS OF CONTEMPORANEOUS ELECTRIC TRANSMISSION LINE RIGHT-OF-WAY MANAGEMENT TECHNIQUES"

MAP 14.2

SITE 14

MAPPED PLOTS

UTILITY : NIAGARA MOHAWK POWER CORP.

ROW DESCRIPTION : OSWEGO to VOLNEY 345 KV.

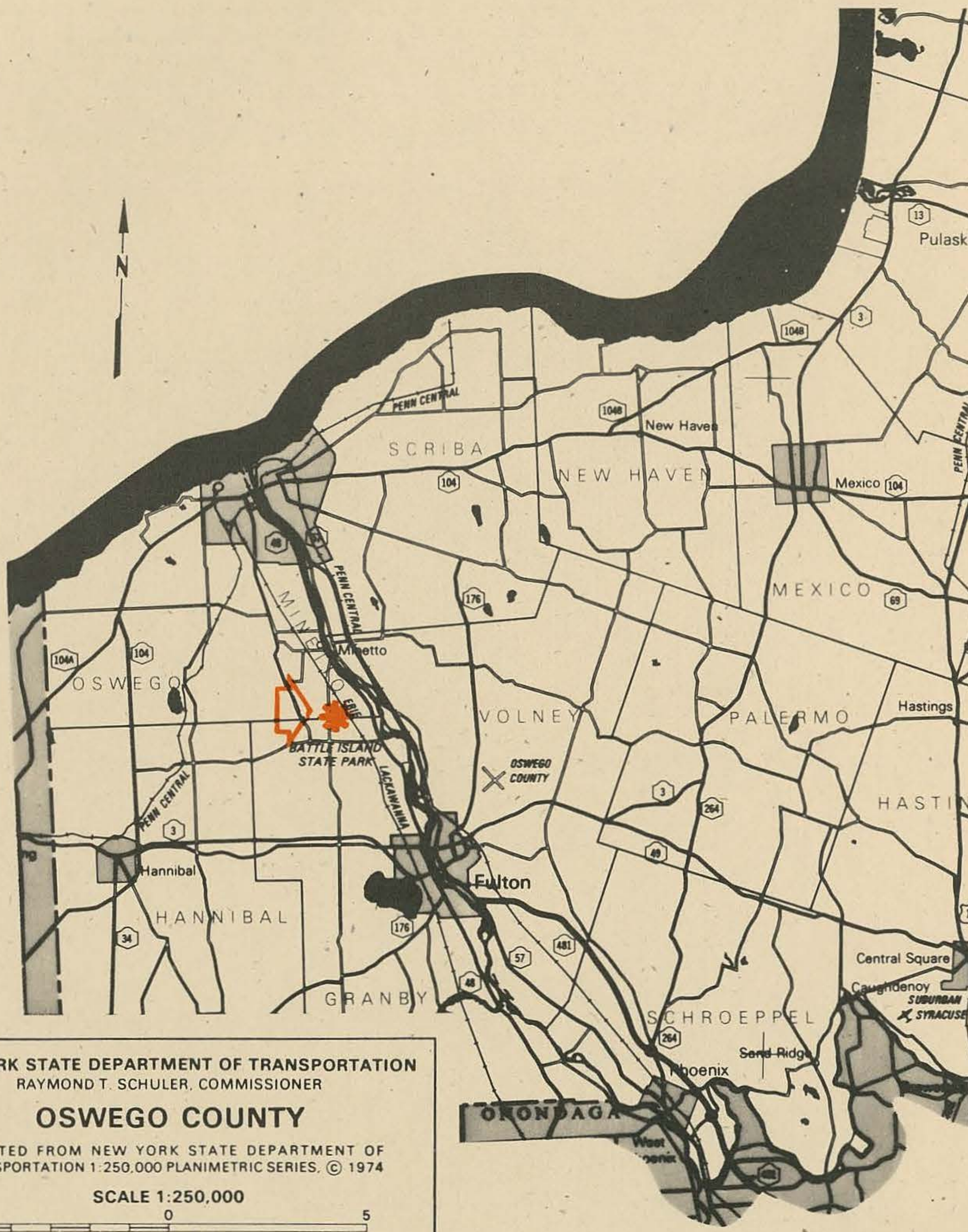
WOODEN POLE 'H' FRAME 225'-325' ROW

SCALE: 1" = 10'-0"

10 5 0 5 10 20 40 50

SITE 15

OSWEGO to CLAY #4



Site 15 Oswego to Clay #4

Study area parallels site 14, in part, and extends from the Oswego River (structure 84) to County Rt. 8 (structure 71). To reach the area, take route 57 north to Fulton, to the junction of routes 176 and 3; take a left on routes 176 and 3 and proceed to route 48. Take a right on route 48 and stay on route 48 for 4.8 miles to the study area.

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Site 15 Oswego to Clay #4

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Site 15 Oswego to Clay #4

1 Introduction

Site 15 is located in the Erie-Ontario Plain physiographic area of New York (Cline, 1970) in the Elm-Red Maple and Northern Hardwoods forest type area (Stout, 1958). The general landscape of the ROW and the adjacent areas is shown in Fig. 15.1.1.

The topography of the area is generally flat, and is dissected into numerous low, rolling hills by streams flowing north into the lakes. The elevation range is slight (Stout, 1958).

The typical forest types of the region are Northern Hardwoods, and Elm-Red Maple and Northern Hardwoods. Located on the study area are Northern Hardwoods, Oak-Northern Hardwoods, Elm-Red Maple, Red Pine, and Scotch Pine.

2 Location and Identification

Site 15 is located approximately 1½ miles south of Minetto, in the town of Minetto, Oswego County, New York (76° 27' 30" W. Longitude; 43° 23' 30" N. Latitude).

The site is on the Oswego to Clay ROW which is operated by the Niagara Mohawk Power Corporation (NMPC). This ROW varies in width from 60 to 100 feet. The ROW consists of a single circuit 115 kV line on wood pole H-frame structures. The project site is approximately 6,800 feet in length and extends from structure 84, west of the Oswego River, to structure 71, west of County Route 8.

3 Background

The following discussion outlines documentable management techniques of clearing, construction, restoration, and maintenance for site 15, as received from NMPC (information sent May 6, 1976, by Kenneth Finch and James Brogan, Niagara Mohawk Power Corporation, Syracuse, N.Y.; telephone conversations with James Brogan, December 14, 1976, NMPC, Syracuse, N.Y.). All available pertinent information and unit cost data are included under each operation of clearing, construction, restoration, and maintenance.

3.1 Clearing

The ROW was clear cut and slash was burned in 1939. Clearing was done by "linemen" and was accomplished using hand tools, including axes, handsaws, and brush hooks.

3.2 Construction

This line was originally built between July, 1939, and mid-1940. Construction materials were delivered by truck to the ROW, at road crossings or other accessible points. Horses were then used to move materials to most points along the ROW.

3.3 Restoration

There was neither a restoration effort nor the implementation of any erosion control measures on this line.

3.4 Maintenance

Vegetation maintenance records for this line begin in 1955, when herbicides were first used. Prior to that time brush control probably consisted of frequent hand clearing to prevent stump and root sprouts from growing into the conductors.

In 1955 the ROW was broadcast foliar sprayed with 2,4-Dichlorophenoxyacetic acid (2,4-D) and 2,4,5-Trichlorophenoxyacetic acid (2,4,5-T), or Esteron, at a cost of $59.88 per acre.

In 1959 the ROW was again broadcast foliar sprayed with the Esteron mixture at $85.00 per acre.

In 1960 a follow-up selective foliar spray program was conducted to treat those stems which survived the 1959 maintenance. At that time it was believed that if NMPC could achieve total kill with this follow-up program another application might be unnecessary for 10 years or more. The Esteron (2,4-D and 2,4,5-T) mixture was again applied. Cost per acre was approximately $45.83.

Also in 1960, 3 men with chain saws and a small bulldozer were used to remove danger trees. The dozer was used to push the trees over, and away from the energized conductor as they were cut.

During late July and early August, 1962, NMPC personnel were used for a combined basal and selective broadcast treatment. The majority of the ROW had a basal treatment using backpacks, while scattered dense stands were broadcast foliar sprayed. The chemical used and cost of the operation are unknown.

In 1967 contractors applied a selective broadcast foliar application of Tordon 101 at a cost of approximately $130.56 per acre.

4 General Reconnaissance

A general reconnaissance was made in accordance with the methodology and is set forth in Map 15.1 which shows site habitat conditions. In this reconnaissance it was noted that the major vegetational types correlated with the soil types on the hydric, mesic, and xeric habitats.

The existing visual character of the ROW is depicted during all seasons of the year, from important vantage points both on and off the ROW. These points are identified as photo stations and are located on Map 15.1 and described in Appendix 17. Specific reference is made to some of these photo stations throughout the report and illustrated in Fig. 15.1. With the exception of aerial photography used to identify land use, older photographs depicting the area are not available.

Within the surrounding landscape this ROW is generally pleasing to view. The ROW creates a vista through a forest covered area, and for the most part is screened from adjacent roads. When visible, the ROW site seems to fit with the part agricultural, part residential character of the vicinity. The ROW site is located just west of the Oswego River which is extensively utilized, and provides a distinct natural landmark within the area. Although the actual site does not include the ROW crossing of the river, the intersection of the ROW with the river provides locational reference to many motorists and local residents. The terrain in general is flat, but gently sloping with drumlins dominating the landscape. The ROW site is crossed by State Route 48 and County Route 8. The ROW is generally well screened by sugar-maples at Route 48 but is clearly visible from Route 8 due to an adjacent open field. One set of structures is located on the high bank of the Oswego River, and should be visible from this location. Although the site is located in rural area, the potential number of people viewing the ROW site is somewhat high. The ROW site is located near the community of Oswego, and is crossed by 2 highways as previously mentioned.

5 Field Studies - Results and Discussion

5.1 Soils

5.1.1 Geology and Soils

Site 15, Oswego to Clay ROW, is located in Oswego County in the Erie-Ontario Plain (Cline, 1970), also termed the Ontario Drumlins subdivision of the Erie-Ontario Lowland region due to the domination by drumlins of the terrain (Thompson, 1966). It is in the Oswego River drainage basin. Bedrock geology is of Ordovician age, 500 to 435 million years ago, consisting predominantly of shale and sandstone. Surficial geology is basically glacial drift, and soils in this area have developed both in glacial till and glaciofluvial outwash (Broughton et al., 1973; Rapparlie, 1974).

A majority of the soils on this site are classified in the order Inceptisols, suborder Ochrepts (Alton, Ira, Minoa, Sodus, and Williamson series), reflecting the absence of horizons of marked accumulation of clay and iron and aluminum oxides, and the theory that their horizons form rather quickly and result mostly from alteration of parent materials. One soil is in the suborder Aquepts (Scriba), indicating wetness. In addition, 2 soils are in the order Entisols, suborders Aquents (Wallkill) and Psamment (Oakville), reflecting their lack of significant profile development (Buckman and Brady, 1969; Soil Survey Staff, 1975). This site falls within the parameters of the Sodus-Ira association, in which drumlins appear as conspicuous features of the landscape. Soil series of this association occurring on this site are Sodus-Ira-Scriba (Cline, 1970). Brief descriptions (Anon., 1972; Rapparlie, 1974) of soil types noted on the ROW study site (Map 15.1; Table 15.1) follow:

Alton gravelly fine sandy loam (AgA): These soils formed in glacial outwash, terrace or beach deposits dominated by red and gray sandstone with lesser quantities of shale, granite, and limestone, on nearly level terraces and short moderate slopes on terraces or beach ridges, eskers, or kames. Alton soils are deep and well drained to somewhat excessively drained. Soil reaction is generally strongly to medium acid, ranging from pH 5.0 to pH 5.7 in the first 16 inches of a typical profile; it was pH 5.4 in the surface mineral soil on this site. Alton gravelly fine sandy loam is assigned to Woodland Suitability Group 3o1, designating moderately high productivity for timber (Class 3) and no significant limitations for woodland use or management (Subclass o).

Ira gravelly fine sandy loam (IrA): Ira soils developed in glacial till derived mainly from sandstone, and occupy nearly level to gently sloping tops of drumloidal hills and, occasionally, till plains or the sloping sides of drumloidal hills. These soils are deep and moderately well drained, although internal drainage is somewhat impeded by the presence of a fragipan at about 20 to 40 inches, and mottling occurs, beginning at about 13 inches. Normally strongly acid, although the pH may range from 5.0 to 6.0 throughout the first 20 inches of a typical profile, soil reaction was pH 5.6 in the surface 3 inches on this site. As with the Alton soil, Ira is in Woodland Suitability Group 3o1, designating moderately high productivity and the absence of any significant limitations or restrictions.

Minoa very fine sandy loam (MnA): These soils formed in lacustrine deposits on level to gently sloping relief. In general they are in areas associated with sandy deltas of former glacial lakes. Generally deep and somewhat poorly drained, Minoa very fine sandy loam evidences mottling throughout the profile, beginning at about 8 inches, and a seasonal water table ranging from 6 to 18 inches. The soil varies from medium acid to neutral and throughout a typical profile may range from pH 5.0 to calcareous; soil reaction was pH 6.0 in the surface horizon on this site. Assigned to Woodland Suitability Group 3w3, potential productivity for timber is moderately high, and a high water table and poor drainage cause management limitations.

Oakville loamy fine sand (OaA): Oakville soils formed from sandy deposits that were laid down or modified by water, wind, or both, and occur on level to gently sloping glaciofluvial terraces, sand dunes, beach ridges, sand bars, or deltas. These soils are deep and well drained, and are sandy throughout. Soil reaction is normally slightly acid to neutral but ranges from pH 5.5 to pH 6.5 in the surface 8 inches of a typical profile; however, it was pH 4.8 in the upper 3 inches on this site. Oakville is assigned to Woodland Suitability Group 4s1, indicating moderate productivity for timber, and sandy soils which impart low water-holding capacity and normally low availability of nutrient elements.

Scriba gravelly fine sandy loam (ScA): Scriba soils formed in glacial till derived from sandstone, and occur on level to sloping till plains and drumloidal formations. Deep and somewhat poorly drained, internal drainage is impeded by the presence of a fragipan at about 14 inches, and mottling begins at about 7 inches. The depth to the seasonal water table ranges from the surface to 12 inches. These soils are generally slightly to medium acid varying from pH 5.0 to pH 6.0 in the upper 13 inches of a typical profile; soil reaction was pH 5.6 in the surface mineral soil on this site. Scriba soils are assigned to Woodland Suitability Group 3w2, designating moderately high productivity for timber and management limitations related to poor drainage and a high water table.

Sodus gravelly fine sandy loam (SgA and SgB): These soils developed from glacial till derived from gray and red sandstone; they occupy gently sloping to very steep uplands and rolling hills on drumlins and other convex land forms of glacial till plains. Deep and well drained, these soils nevertheless evidence a fragipan at about 20 inches, and some mottling occurs. Sodus soils generally are strongly acid to neutral and may range from pH 5.0 to pH 6.0 in the surface 20 inches of a typical profile; soil reaction was pH 5.0 in the upper mineral horizon on this site. Sodus soils are in Woodland Suitability Group 3o1, indicating moderately high timber productivity with no significant limitations or restrictions for woodland use or management.

Wallkill silt loam (WaA): Wallkill soils developed in alluvial mineral materials underlain by muck or peat; they occur where streams of rivers flow through areas of organic soils on nearly level to depressional areas. These soils are deep, and very poorly drained, with mottling occurring from about 8 inches. The seasonal water table is at the surface. Underlying the typical silt loam is well-decomposed organic material, beginning at about 24 inches. Soil reaction is generally slightly acid, although it may range from pH 5.0 to pH 6.0 throughout a typical profile; however, it was pH 6.5 in the upper 3 inches on this site. Assigned to Woodland Suitability Group 4w1, these soils have moderate productivity for timber, with excessive wetness as a limitation for woodland use or management.

Williamson very fine sandy loam (WiA): These soils formed in water- or wind-deposited silt and very fine sand; they occur on level to sloping relief. Deep and moderately well drained, they nevertheless contain a fragipan at about 20 inches, and mottling begins at about 17 inches. Soil reaction is generally strongly acid, and ranges from pH 5.0 to pH 6.0 in the surface 40 inches throughout a typical profile; it was pH 5.5 in the upper mineral horizon on this site. Williamson very fine sandy loam is assigned to Woodland Suitability Group 3o1, designating moderately high timber productivity and no significant limitations for woodland use or management.

5.1.2 Humus Types

Organic layers present on the soil surface of the ROW and adjacent woodland were measured on 2 mesic locations and 2 xeric locations, and 1 location in each moisture regime was a vegetation study plot. Average thickness of the organic layers and A1 horizon was based on 5 samples taken at each location (Table 15.2). The presence and thickness of these layers were used for humus type classification. As the humus classification key is not adaptable to areas exhibiting prolonged water saturation in the surface soil, similar measurements were not made on the hydric site. No evidence of plowing, grazing, or recent fires was noted, although there is evidence in some areas of an abandoned orchard.

All organic layers (litter, fermentation, and humus) plus an A1 horizon (mixed mineral and organic) were present at each site on both the ROW and woodland on the mesic locations; the predominant humus type was disignated a "thin duff mull with very shallow A1". On the xeric locations, the predominant humus type was designated a "very shallow sand mull" as in all instances the humus layer was either very thin or absent. Organic layers on the ROW were nearly equivalent in depth to those in the woodland on both mesic and xeric locations. Organic layers in the woods were composed primarily of tree parts (leaves, twigs, and fruit) in contrast to the leaves and stems of grasses, herbs, and shrubs on the ROW.

Based on these limited observations, it appears that ROW construction and periodic maintenance for brush control did not materially alter thickness of the surface organic layers of the soil. Elimination of the forest cover did result in a change in kind of organic material; however, regrowth and persistence of a mixed grass-herb-shrub cover has resulted in annual litter depositions and continuation of a protective organic layer on the ROW.

5.1.3 Soil Erosion

Current Active Erosion Observations of active soil erosion on the ROW and adjacent woodland were made on the Oswego to Clay study area in June, 1976. No active erosion was evident in the woodland on any soil type or slope, apparently due to the protective canopy of trees and shrubs and undisturbed organic layers present on the soil. Likewise, no active or recent erosion was observed on the general ROW, on areas on which woody brush was controlled but with little or no disturbance to the soil surface. Good vegetation cover, composed of grasses, herbs, and low shrubs had developed on the general ROW following chemical treatments for brush control, and a protective litter mulch from these plant parts was present (Table 15.2).

Eroding areas on the ROW were identified as to location on the ROW, soil type, average slope, and present plant cover (Table 15.3). Erosion was classified as to kind (sheet, rill, gully) and class (slight, moderate, severe). No gully erosion was noted, nor any large eroding areas; thus, none were plotted on the base map.

There was no restoration in the form of seeding and planting following construction of this ROW; therefore, denuded areas are dependent upon natural plant invasion. Access roads have largely healed (Fig. 15.1.2), and in the 2 areas where healing is not complete, herbs, grasses and mosses have invaded.

5.2 Vegetation

5.2.1 Habitat and Forest Types on the Site

Xeric Habitat The xeric, or dry, habitat (1) was located on nearly flat terrain above the Oswego River. Slope was negligible and aspect was flat. Drainage was excessive. The forest type was Scotch Pine along the ROW and Oak-Northern Hardwoods about 70 feet beyond that border.

Mesic Habitat The mesic, or medium moist, habitat (2) was located on the top of a low rounded hill. Slope was approximately 3% on an east-facing slope and 3% on a west-facing slope. Drainage was quite free, although not excessive. The forest type was Northern Hardwoods, with dominant species of red maple, sugar-maple, and beech, along with white ash.

Hydric Habitat The hydric, or wet, habitat (3) was located on nearly level terrain with negligible slope and flat aspect. Drainage was impeded, largely due to a seasonally high water table. The forest type was Elm-Red Maple, with American elm and red maple the dominant species, in association with white ash and black ash.

5.2.2 Analysis of Forest Types and Associated ROW Vegetation

General Changes in Vegetation The primary impact of the ROW was to change a forest with a 4-layered structure to a shrub-herb-grass community. Obviously, this was caused by removal of the trees; and what was essentially a 2-layered ROW community developed, with the shrub layer consisting of shrubs and small trees which were not removed by maintenance spraying, or which have arisen since the last spray application (Fig. 15.2), and an herb layer.

In order to more completely characterize the forest types, an analysis was made on the forest plots to derive importance values for tree species (Table 15.4). Obviously, sassafras and Scotch pine were important species on the xeric plot, as were red maple, white ash, and quaking aspen on the mesic plot, and red maple and white ash on the hydric plot.

On the xeric habitat, Scotch Pine and Oak-Northern Hardwoods forest types were changed to a Blueberry-Bracken plant community with bracken prominent. On the mesic habitat, a Northern Hardwoods forest type was changed to a Sumac-Goldenrod plant community. On the hydric habitat, an Elm-Red Maple forest type was changed to a Red Osier Dogwood-Sensitive Fern plant community, with sedge and horsetail prominent (Table 15.5).

Quantitative Changes No major increase in the number of shrub species on the xeric and mesic habitats was apparent on the ROW as compared with the adjacent forest, although on the hydric habitat 2 shrubs occurred in the forest and 7 occurred on the ROW. There was no major increase in the number of herb species on the mesic habitat on the ROW, as compared with the adjacent forest, while there was a major increase in herb species on the ROW on the xeric habitat (47 on the ROW; 31 in the forest). On the xeric habitat there was a marked increase in the number of herb species on the ROW, 30 species as compared to 15 in the forest (Table 15.5; Figs. 15.3 and 15.4).

Qualitative Changes On the xeric 1 habitat, 6 shrub and herb species occurred both in the forest and on the ROW (Fig. 15.5); of these, low sweet blueberry was more prevalent in the forest than on the ROW, while bracken, yarrow, and goldenrod were more abundant on the ROW. Four shrub species occurred only in the forest, the most abundant of which were teaberry and maple-leaved viburnum (Table 15.6), while 6 occurred only on the ROW, the most numerous of which were staghorn-sumac, blackberry, and dewberry (Table 15.7). Ten herbs appeared only in the adjacent woodland; the most important of these included wild sarsaparilla, ground-pine, large-leaved aster, wild lily-of-the-valley, and false spikenard (Table 15.6). Twenty-five herb species appeared only on the ROW; of these, the major species were poverty-grass, mixed grass, and sheep-sorrel (Table 15.7).

On the mesic 2 habitat, only arrow-wood and strawberry occurred both in the forest and on the ROW, and strawberry was much more numerous on the ROW (Table 15.5). Three shrub species occurred in the forest only (rose, Virginia creeper, elderberry), and 4 appeared only on the ROW (staghorn-sumac, hawthorn, blackberry, dewberry). Eight herb species were found in the adjacent forest but not on the ROW, including New York fern, spinulose wood-fern, and marsh-fern. Ten herbs were found only on the ROW, the most numerous of which were bracken, hair-cap moss, and goldenrod (Tables 15.6 and 15.7).

On the hydric 3 habitat, 16 shrub and herb species occurred both on the ROW and in the adjacent forest (Fig. 15.5). Common alder was fairly sparse in both areas. Royal fern, sensitive fern, tearthumb, and cowslip were much more plentiful in the forest, while sedge and horsetail were more abundant on the ROW. One small patch of purple-flowering raspberry appeared only in the forest, while 6 shrub species were found only on the ROW, including elderberry, arrow-wood, and red-osier dogwood. Ten herbs occupied the ROW area but not the adjacent woodland, including goldenrod and cat-tail, while 6 were found only in the forest, including nightshade, cinnamon fern, and arrowhead (Tables 15.6 and 15.7).

It appears that the ROW had little impact on the number of species in the forest on the mesic habitat. On the hydric habitat, there was a notable increase in the number of shrubs and herbs. In addition, there was little impact on the number of shrub species on the xeric habitat, while considerably more herbs occurred on the ROW than in the forest.

Forest-dwelling species, such as ground-pine, Indian cucumber-root, and false spikenard in particular, were not found on the ROW, although they were in the forest, on the xeric habitat. The net effect was a change from an herb layer dominated by such forest-dwelling species to one dominated by grasses, sheep-sorrel, mints, hawkweed, and cinquefoil. Dewberry and blackberry formed prominent shrub layers on the ROW.

On the mesic habitat, forest-dwelling ferns, in particular, were not found on the ROW although they were in the adjacent forest. The net effect was a change from an herb layer dominated by ferns to one dominated by bracken, hari-cap moss, aster, goldenrod, grasses, and sheep-sorrel. Staghorn-sumac, dewberry, and blackberry formed prominent shrub layers on the ROW.

On the hydric habitat, such species as nightshade, cinnamon-fern, and arrowhead, prominent in the forest, were absent from the ROW, while an herb layer on the ROW dominated by cat-tail and goldenrod developed. A shrub layer also developed on the ROW with greater species diversity than that of the adjacent woodland.

5.2.3 Analysis of Plant Communities for On-ROW Mapped Vegetation Plots

Table 15.8 presents a breakdown of major vegetational communities for the xeric, mesic, and hydric areas on the Oswego to Clay ROW. Much of the present composition of herbaceous and forest plant communities on this ROW can be explained by past maintenance history.

Existing knowledge indicated variations in herbicide treatments since 1955, the last of which was a broadcast application.

The major plant communities now dominating the 3 plot locations, xeric, mesic, and hydric, are: Rubus-Bracken-Mixed Grass-Herb, Rubus-Mixed Grass-Herb, and Horsetail-Sedge-Herb. The majority of these species are not adversely affected by herbicides and will most likely play an important part in the continued development of this ROW.

In some areas some clones from the genus Rubus, blackberry and dewberry, are quite dense and may present a nuisance in future maintenance cycles.

Generally speaking, the major species now occupying the ROW are light-loving species which have come since the initial clearing or expanded after chemical treatments by means of root suckers or other forms of reproduction.

5.2.4 Comparison of Forest Type with ROW Vegetation

The ROW was clear cut in 1939 and the material was burned. Prior to 1955, the ROW was foliar sprayed with 2,4-D and 2,4,5-T. The same type of treatment was repeated in 1959 and 1960. Danger trees were also removed in 1960. A combined basal and foliar treatment was applied in 1962. The chemical used was unknown. The ROW was foliar sprayed in 1967 and the herbicide is again unknown.

The general impact of the above clearing and treatment of the ROW was to change the forest types (Scotch Pine, Red Pine, Oak-Northern Hardwoods, Northern Hardwoods, and Elm-Red Maple) to shrub-herb-grass communities. Some shrub and herb plants of the forest were replaced by plants favored by open conditions.

On the xeric habitat, which was formerly occupied by a Scotch Pine and Oak-Northern Hardwoods forest type, a Blueberry-Bracken community was produced. There was a significant change in total number of shrub and herb species on the ROW as compared with the forest. There was a qualitative difference in shrub and herb species on the ROW as compared with the forest with 3 important shrubs, blackberry, dewberry, and staghorn-sumac, on the ROW but lacking in the forest. This is most evident in the herb layer, i.e., some of the herbs of the forest were not on the ROW, while some herbs of the ROW were not in the forest.

On the mesic habitat, which was formerly occupied by a Northern Hardwoods forest type, a Sumac-Goldenrod community was produced. There was not a notable change in the total number of shrub and herb species on the ROW as compared with the forest. There was, however, a qualitative change in the kinds of shrubs and herbs on the ROW as compared with the forest, with such light-loving plants as asters and goldenrods on the ROW but not in the forest.

On the hydric habitat, which was formerly occupied by an Elm-Red Maple forest type, a Red Osier Dogwood-Sensitive Fern community was produced. There was a notable change in the total number of shrubs on the ROW as compared to the forest. The herb layers were only slightly different in number of species between the ROW and the forest. There was a qualitative change in the shrub and herb layers between the 2 areas.

Various plant communities developed on the ROW after clearing and maintenance, in addition to those on the mapped plots. Among others, alder (Fig. 15.1.3), cat-tail (Fig. 15.1.4), and arrow-wood (Fig. 15.1.5) developed. Such communities, among others, have served to shade the many small streams crossing the ROW (Fig. 15.1.6).

5.3 Wildlife

The major game species for site 15, Oswego to Clay, were determined by Asplundh Environmental Services (AES) in conjunction with the New York State Department of Environmental Conservation (DEC). These species are white-tailed deer, cottontail rabbit, and woodcock.

5.3.1 Actual Use

White-tailed Deer White-tailed deer tracks were found in moderate abundance on the ROW study area during the spring of 1976. One doe was observed crossing the ROW, near the xeric plot, through a cover of bracken and dewberry, at that time.

Browse Survey Six browse transects were established on study area 15 at each permanent study plot location, with 1 transect on each side of the ROW, on June 8, 1976 (Tables 15.9 and 15.10; Fig. 15.6).

Overall browse utilization was highest in the woods at 67% actual use; however, many more stems were available on the ROW and at the edge of the ROW than in the woods (Table 15.9; Fig. 15.6).

Dewberry far surpassed all other species in total abundance but was not utilized. Red maple, arrow-wood, and quaking aspen were the next most abundant species present and were also heavily utilized by deer (Tables 15.9 and 15.10).

Cottontail Rabbit Cottontail rabbit observations consisted of direct sightings and signs, i.e., pellets and browse. One rabbit was flushed from a cover of mixed herbs and dewberry during the summer of 1976. Remains of a rabbit were found, left by a predator near structure 75, during the spring of 1976. Rabbit pellets were slight throughout the ROW during this period of time. Slight rabbit browse was found on young sassasfras twigs, also during the spring of 1976.

Woodcock On March 24, 1976, from 5:00 p.m. to 7:00 p.m. a woodcock singing ground survey was conducted on study area 15. The weather was clear with a slight haze, and a temperature of approximately 60 F.

Peenting started off the ROW at 6:32 p.m. The male bird, after peenting for a few minutes in the woods, started his nuptial flights and landed on his primary singing ground between structures 75 and 76. One female landed within 10 feet of the observers and very near the outer parameter of the primary singing ground. She remained there a short period of time and then flew to the middle of the primary singing ground. While the bird was under close observation, she appeared to be agitated and obviously taking part in mating activity. During this time, the male bird was at the secondary singing ground.

The secondary singing ground was located on site 14, immediately adjacent to the study area 15. There, the male bird was singing on the access road for a short period of time, until he returned to the primary singing ground. Observations were terminated at this time to avoid interferring with regular mating activity.

A second woodcock singing ground survey was conducted on April 11, 1976. The weather was partly cloudy, with winds of 18 mph, and a temperature of 56 F.

No birds were noted during the period of observation, from 6:40 to 7:30 p.m.; however, normal "peenting" activity may have been disrupted due to the bad weather.

Miscellaneous Wildlife Observations Various birds were seen and/or heard on the study area throughout the period of the study. Birds observed on the ROW and on the ROW edge are included in Table 15.11.

During the summer of 1975, 1 gray squirrel was seen crossing the ROW, a nest of ground bees was found on xeric plot 1, and a bird dusting area was found on an access road between structure 83 and 84.

During the spring of 1976, there was moderate to heavy spring peeper activity as indicated by vocalization. Mole activity was heavy on the ROW as evidenced by numerous tunnels near xeric plot 1. Remains of a small mammal were found near its escape entrance along with a fresh predator scat on mesic plot 2.

5.3.2 Potential Use

Potential wildlife use of the plant species present on site 15 for the 3 major game species, deer, rabbit, and woodcock, is contained in Table 15.12. In addition to asterisk ratings from New York, asterisk ratings from Pennsylvania were included for deer for those plant species present on the study area that were not rated in the New York evaluation for deer. Data from Connecticut was used in evaluating rabbit potential use (Martin et al., 1951).

It may be noted that the potential use of the plants for woodcock is quite sparse. This is so because the majority of the woodcocks' diet consists of earthworms. Plant material is ingested either to act as a form of grit which aids indigestion or simply by chance (Pettingill, 1936).

5.4 Land Use

5.4.1 Location

Site 15 is located in a rural nonfarm section of the town of Minetto, Oswego County, New York. Between 1960 and 1970 there was a 17.2% increase in population of Oswego County with a 1970 distribution of 40.1% urban, 56.0% rural nonfarm, and 3.9% rural farm (U.S. Bureau of the Census, 1972). The closest community is Minetto which is approximately 1½ miles to the north.

5.4.2 Land Use Near the Time of Construction

The ROW was constructed during 1949 to 1950. The earliest available data obtained from 1955 aerial photographs indicates that the adjacent land to the ROW was primarily rural farm (Table 15.13; Fig. 15.7). Land use distribution included the following subtypes:

Agriculture:
- Ac - Cropland and cropland pasture
- Ap - Pasture

Commercial and Industrial:
- Cs - Commercial strip development

Forest Land:
- Fn - Forest lands
- Fp - Plantations

Outdoor Recreation:
- Or - Outdoor recreation

Residential:
- Rm - Medium density
- Rk - Shoreline development

Transportation:
- Tb - Barge canal

Water Resources:
- Wb - Marshes, shrub wetlands, and bogs
- Ww - Wooded wetlands

5.4.3 Land Use After Construction

The adjacent land use to site 15 has changed slightly from the 1955 data. Agriculture and water resources land uses have decreased significantly, while forest land has increased. The land adjacent to the ROW is still rural nonfarm (Table 15.13; Fig. 15.7), with a land use distribution which includes the following subtypes:

Agriculture:
- Ac - Cropland and cropland pasture
- Ap - Pasture
- Ai - Inactive agricultural land

Commercial and Industrial:
- Cs - Commercial strip development

Forest Land:
- Fn - Forest lands
- Fp - Plantations

Outdoor Recreation:
- Or - Outdoor recreation

Residential:
- Rm - Medium density
- Rk - Shoreline development

Transportation:
- Tb - Barge canal

Water Resources:
- Wb - Marshes, shurb wetlands, and bogs
- Ww - Wooded wetlands

In addition to use of the ROW for the transmission of electrical power, portions of the ROW are currently being used for snowmobiling and hunting.

6 Evaluation, Interpretation, and Summary of Results

6.1 Conditions Which Existed Prior to Establishment of ROW

Soil, vegetation, and wildlife habitat conditions existing prior to ROW construction were based on observations made during the period of this study on adjacent undisturbed forest areas on both sides of the ROW. Since this ROW parallels the Oswego to Volney line constructed in 1974, biological and phsical resources of the adjacent forest are similar.

6.1.1 Soils

The Oswego to Clay study area is located on undulating to rolling topography characterized by glacial till drumlin formations, stratified glacial outwash deposits, some wind-blown silt and fine sand accumulations, and alluvium in depressional areas. Underlying bedrock is dominated by sandstone, containing some lime, and shale. The site exhibits a variety of slopes with gradients of 0 to 15% on east and west exposures, dry to wet moisture regimes, and 8 different soil types associated with specific geologic materials, relief, and drainage conditions. Surface mineral soils are predominately fine sandy loams, with some fine sand and silt loam in old lake and alluvial deposits, that are slightly to strongly acid and in lowlands underlain by fragipans.

In the bordering forest, xeric sites occur on well- to excessively drained Alton and Oakville soil series on level to gently sloping outwash material and support upland hardwoods of moderate to moderately high productivity; mesic sites occupy well- to moderately well-drained Sodus and Williamson soils, with fragipans, on gently sloping drumlins and water- or wind-deposits, respectively, and support upland hardwoods of moderately high productivity with no special management limitations; and, hydric sites occur mostly on the poorly drained Minoa, Scriba, and Wallkill soil series which formed in lowland lake deposits, till and alluvium, respectively, and are occupied by bottomland hardwoods of moderate to moderately high productivity, but with management limitations due to excessive wetness. Portions of the Alton, Ira, and Scriba soils were occupied by Red and Scotch pine plantations.

Humus types in the adjoining forest varied with moisture regimes and associated soil types; xeric sites exhibited a "very shallow sand mull" with distinct litter and A1 layers, but only a trace of fermentation and humus; while mesic sites had all layers present, with thin fermentation and humus, and were classified "thin duff mull with very shallow A1". The only difference was a slightly greater accumulation of partially decomposed organic remains on the mesic site. No active erosion was evident in the woodland on any soil type or slope.

6.1.2 Vegetation

Most of the study area was active or recently abandoned agricultural land at the time of corridor establishment (1939 to 1940). Some of these open lands had been planted to red pine or Scotch pine, probably during the mid-thirties. Other areas were in seedling or small sapling stands of Northern Hardwoods (mesic sites), Oak-Northern Hardwoods (xeric sites), or Elm-Red Maple (hydric sites).

6.1.3 Wildlife

Wildlife, being mobile species which may or may not be observed during site visitation, were reasonably imputed to this area by the composition of the forested areas adjacent to the ROW. It can be assumed that those species currently occupying the site, i.e., white-tailed deer, cottontail rabbit, and woodcock, occupied the habitat prior to ROW construction. Although current wildlife activity may be indluenced by the presence of the ROW, it is likely that those species, designated by the DEC in conjunction with AES as major in this area, inhabited the vicinity before ROW construction. The degree of use is impossible to determine at this time.

6.1.4 Land Use

The earliest data available near the time of construction of the ROW in 1949 to 1950 is 1955 aerial photography. The ROW and adjacent land area was rural farm with a land use distribution of agriculture (34.0%), commercial and industrial (.2%), forest land (45.7%), outdoor recreation (.4%), water resources (14.3%), transportation (3.1%), and residential (2.3%).

6.2 Conditions Which Exist at Present

6.2.1 Soils

The same geologic formations, topography, moisture regimes, and soil types identified and described for the general study area under Section 6.1.1 were present on the ROW. Prominent shrub and herb species on the ROW in 1976 associated with these soil types and moisture regimes were: sumac, blueberry, bracken, and goldenrod on xeric Alton and Oakville soils; sumac, dewberry, blackberry, and goldenrod on mesic Sodus and Williamson series; and, viburnum, red osier dogwood, sensitive fern, horsetail, and sedges on hydric Minoa, Scriba, and Wallkill soil series. A portion of the Minoa and Sodua fine sandy loams on the west end of the study area was occupied by inactive agricultural land in 1976.

Organic matter accumulations on xeric sites of the ROW were limited to thin litter and fermentation layers with slight soil incorporation, resulting in a "very shallow sand mull" humus type. In contrast, mesic sites had all organic layers present with somewhat deeper soil incorporation and exhibited "thin duff mull with very shallow A1" humus types. There was no active erosion evident on the general ROW, areas on which woody brush was controlled with broadcast and selective foliar or basal sprays with little or not soil disturbance. Slight to moderate sheet erosion, however, was occurring on 3 segments of the access road which were only partially stabilized by naturally invading vegetation.

6.2.2 Vegetation

On hydric sites the major herbaceous communities are Horsetail-Sedge-Mixed Herb, and Horsetail-Sensitive Fern-Sedge-Mixed Herb. Small clumps of arrow-wood or elderberry have seeded into these communities. Other woody plants are also abundant. These include white ash, wild-raisin, American elm, and red osier dogwood.

On mesic sites the major herbaceous cover is the Rubus-Mixed Grass-Herb community. Tree seedlings and shrubs are abundant, and clumps of arrow-wood are conspicuous. Quaking aspen thickets, of root-sucker origin, cover small areas locally.

The major community on xeric sites is the Rubus-Bracken Mixed Grass-Herb community, or where maintenance roads have recently healed, Mixed Grass-Herb. Red maple, white oak, red oak, and sassafras seedlings occur in these communities, but woody plant invasion is not as aggressive as on hydric and mesic sites.

6.2.3 Wildlife

White-tailed deer, cottontail rabbit, and woodcock are the major game species that currently utilize the study area. Indirect observations of white-tailed deer, i.e., tracks, indicated deer use of the ROW. One deer was seen on the site. Browse surveys indicated that more woody stems were available on the ROW and at the edge of the ROW than in the adjacent forest, but overall utilization was highest in the forest. Dewberry was more abundant than other species but was not utilized by deer, while red maple, arrow-wood, and quaking aspen were heavily browsed.

Indirect observations, i.e., pellets, browse, and a carcass, of cottontail rabbit indicated that species' use of the ROW area. One rabbit was flushed from a cover of mixed herbs and dewberry.

Woodcock were observed in the spring of 1976 in mating activities on the study area. Singing ground surveys indicated the presence of a primary singing ground on the ROW.

A variety of other animals were noted, directly or indirectly, to be utilizing either the ROW, the adjacent forest, or both. Potential wildlife use is evident from plant species present on the site.

6.2.4 Land Use

Recent land use of the ROW and adjacent land area has shifted from the 1955 percentages. The area is classified primarily as rural nonfarm, with a distribution of agriculture (26.9%), commercial and industrial (.2%), forest land (63.5%), outdoor recreation (.4%), water resources (3.3%), transportation (3.1%), and residential (2.6%). With reference to the total area involved, shifts in land use are noted as follows:

Agriculture -	- 7.1%
Commercial and Industrial -	no change
Forest Land -	+17.8%
Outdoor Recreation -	no change
Water Resources -	-11.0%
Transportation -	no change
Residential -	+ .3%

In addition to use of the ROW for the transmission of electrical power, portions of the ROW are currently being used for snowmobiling and hunting.

6.3 Environmental Effect and Probable Causes

6.3.1 Soils

Impacts of ROW management evident on soils of this site in 1976 were very minor, limited to slight to moderate sheet erosion on 3 areas of the access road, 1 at a culvert crossing, where surface soil had been disturbed and only partially healed by invading plants. Sediments resulting from erosion at the culvert crossing entered a small intermittent stream, while that from other eroding areas merely accumulated on lower slopes of the ROW.

Organic layers and resultant humus types on xeric and mesic sites of the ROW were equivalent to those on comparable sites in the bordering forest. Source of annual litter deposits varied, however, being mostly leaves and stems of shrub, herb and grass species that developed on the ROW in contrast to leaves, needles, twigs and fruit of tree species present in the forest.

6.3.2 Vegetation

The general impact of ROW establishment and maintenance has been to hold back the natural successional trend of these open fields from herbaceous communities into forest stands. On hydric sites, American elm and red maple are seeding in, and if not controlled periodically, would form dense stands similar to those adjacent to the corridor. This strong successional trend is also evident on mesic sites where red maple and white ash are extremely abundant. Thus, these corridor areas would develop forest cover similar in composition to the adjacent stands, if vegetation control was not used regularly to hold back succession.

6.3.3 Wildlife

The presence of the ROW has encouraged the development of many different plant species, mainly light-loving, on the ROW proper, thus enhancing the habitat for wildlife use. The ecotone created by the presence of the ROW often produces a greater variety and density of life than is found otherwise (Leopold, 1936), and this phenomenon has been termed the "edge effect" (Smith, 1974).

6.3.4 Land Use

It is not possible to attribute changes in land use within the area inventoried to the existence of the transmission ROW. Changes within the area may be attributed to other changing land use characteristics in Oswego County. The inventoried area has changed from rural farm to rural nonfarm in character.

Table 15.1. Soil series present on the Oswego to Clay study area.

Soil Series	Map Symbol[1]	Drainage Class[2]	Surface Soil pH	Surface Soil Texture	Woodland Suitability Group
Alton	AgA	G-E	5.4	gravelly fine sandy loam	3o1
Ira	IrA	MG	5.6	gravelly fine sandy loam	3o1
Minoa	MnA	SPD	6.0	very fine sandy loam	3w3
Oakville	OaA	G	4.8	loamy fine sand	4s1
Scriba	ScA	SPD	5.6	gravelly fine sandy loam	3w2
Sodus	SgA, SgB	G	5.0	gravelly fine sandy loam	3o1
Wallkill	WaA	VPD	6.5	silt loam	4w1
Williamson	WiA	MG	5.5	very fine sandy loam	3o1

1 The third letter of the map symbol designates slope class:
A = 0-8%, B = 8-15%, C = 15-25%, D = 25-35%, E = 35-50%, F = 50-70%.

2 Drainage Class: VPD = very poorly drained, PD = poorly drained, SPD = somewhat poorly drained, ID = imperfectly drained, MG = moderately good, G = good, E = excellent (excessive).

Table 15.2. Average thickness of organic layers and A1 horizon and humus types for mesic and xeric sites on ROW and adjacent woodland of site 15.

Moisture Regime	Location	Layer Thickness (in.) L	F	H	A1	Humus Type
1. Mesic (2)[1]	ROW	.3	.2	.3	.5	Thin duff mull with very shallow A1
	Woodland	.5	.2	.1	.5	Thin duff mull with very shallow A1
2. Mesic	ROW	.3	.2	.3	.5	Thin duff mull with very shallow A1
	Woodland	.5	.2	.2	.5	Thin duff mull with very shallow A1
All Mesic Plots Combined	ROW	.3	.2	.3	.5	Thin duff mull with very shallow A1
	Woodland	.5	.2	.2	.5	Thin duff mull with very shallow A1
3. Xeric (1)	ROW	.2	.2	0	.2	Very shallow sand mull
	Woodland	.4	.1	0	.4	Very shallow sand mull
4. Xeric	ROW	.3	.1	0	.3	Very shallow sand mull
	Woodland	.3	.1	.1	.4	Very shallow sand mull
All Xeric Plots Combined	ROW	.3	.2	0	.3	Shallow sand mull
	Woodland	.4	.1	.1	.4	Thin duff mull with very shallow A1

[1] Samples taken at vegetation study plots, the numbers of which are indicated by figures in parentheses.

Table 15.3. Areas exhibiting active erosion in June, 1976, on the Oswego to Clay ROW study area.

Location	Soil Type	Average Slope (%)	Plant Cover	Erosion on ROW: Kind	Class	Gully Depth (in.)
Access Road	Oakville loamy fine sand	4	Bare-hair-cap moss-mixed grass-herb	Sheet	Slight	---
Access Road/ Water Bar	Ira gravelly fine sandy loam	3	Bare-herb	Sheet	Slight	---
Culvert at Access Road	Ira gravelly fine sandy loam	3	Bare-herb	Sheet	Moderate	---

Table 15.4. Importance value of tree species in the upper tree layer in the forest adjacent to the ROW.

Site	Species	Relative Dominance Basal Area (% of total) 1	Relative Density (% of total) 2	Importance Value 1+2
Xeric 1	Sassafras	77.81	73	150.81
	Scotch Pine	12.18	8	20.18
	Sugar-Maple	4.81	5	9.81
	Norway Spruce	2.24	8	10.24
	Black Cherry	2.54	2	4.54
	White Pine	.26	2	2.26
	Red Oak	.16	2	2.16
Mesic 2	Red Maple	75.37	54	129.37
	White Ash	11.27	21	32.27
	Quaking Aspen	7.21	11	18.21
	Black Cherry	3.54	7	10.54
	Large-toothed Aspen	2.61	7	9.61
Hydric 3	Red Maple	60.95	50	110.95
	White Ash	39.05	50	89.05

Table 15.5. Comparison of species composition, abundance and sociability (A.S.) in the tree, shrub, and herb layers, in the adjacent forest and on the ROW, on hydric, mesic, and xeric habitats.

Species	Xeric (1) Forest A.S.	Xeric (1) ROW A.S.	Mesic (2) Forest A.S.	Mesic (2) ROW A.S.	Hydric (3) Forest A.S.	Hydric (3) ROW A.S.
Tree Layer						
Sassafras	4.1	-	-	-	-	-
White Pine	++.1	-	-	-	-	-
Black Cherry	++.1	-	+.1	-	-	-
Red Oak	++.1	-	-	-	-	-
Norway Spruce	+.1	-	-	-	-	-
Scotch Pine	1.1	-	-	-	-	-
Sugar-Maple	+.1	-	-	-	-	-
Red Maple	-	-	2.1	-	1.1	-
Large-toothed Aspen	-	-	+.1	-	-	-
Quaking Aspen	-	-	1.1	-	-	-
White Ash	-	-	1.1	-	1.1	-
No. Species	7	0	5	0	2	0
Shrub Layer						
Low Sweet Blueberry	1.3	++.4	-	-	-	-
Teaberry	1.1	-	-	-	-	-
Staghorn-Sumac	-	1.3	-	4.1	-	-
Hawthorn spp.	-	+.1	-	++.1	-	+.1
Arrow-wood	-	++.1	4.3	3.3	-	1.2
Blackberry spp.	-	4.2	-	1.1	-	-
Maple-leaved Viburnum	3.4	-	-	-	-	-
Choke-Cherry	+.1	-	-	-	-	-
Rose spp.	++.2	-	++.1	-	-	-
Nannyberry	-	+.1	-	-	-	-
Dewberry	-	3.4	-	2.2	-	-
Virginia Creeper	-	-	1.2	-	-	-
Elderberry	-	-	1.1	-	-	2.1
Common Alder	-	-	-	-	+.3	+.3
Purple-flowering Raspberry	-	-	-	-	+.3	-
Willow spp.	-	-	-	-	-	+.1
Red-Osier Dogwood	-	-	-	-	-	+.3
Virgin's-bower	-	-	-	-	-	+.1
No. Species	5	7	4	5	2	7

Table 15.5. Continued

Species	Xeric (1)		Mesic (2)		Hydric (3)	
	Forest A.S.	ROW A.S.	Forest A.S.	ROW A.S.	Forest A.S.	ROW A.S.
<u>Trees in the Shrub Layer</u>						
Flowering Dogwood	1.1	+.1	-	-	-	-
Red Oak	2.1	2.1	+.1	+.1	-	-
Sassafras	3.1	3.1	-	-	-	-
Shagbark-Hickory	++.1	++.1	-	-	-	-
Chestnut	++.1	-	-	-	-	-
Black Cherry	+.1	-	2.1	-	-	-
Sugar-Maple	+.1	-	-	-	-	-
White Oak	+.1	1.1	-	-	-	-
Red Maple	-	++.1	3.1	4.1	3.1	3.1
Quaking Aspen	-	+.1	-	1.1	-	-
Scotch Pine	-	1.1	-	-	-	-
Bitternut Hickory	-	++.1	-	++.1	-	-
White Pine	-	++.1	-	-	-	-
White Ash	-	-	+.1	-	4.1	4.1
Black Oak	-	-	+.1	-	-	-
Alternate-leaved Dogwood	-	-	+.1	-	-	-
American Hornbeam	-	-	+.1	-	-	-
Pin-Cherry	-	-	-	2.1	-	-
Apple	-	-	-	1.1	-	1.1
American Elm	-	-	-	-	1.1	1.1
No. Species	8	10	7	6	3	4
<u>Herb Layer</u>[1]						
Wild Lily-of-the-valley	3.3	-	+.3	-	-	-
Bracken	1.2	2.4	-	2.3	-	-
Wild Sarsaparilla	3.1	-	-	-	-	-
Partridge-berry	++.2	-	-	-	-	-
False Spike-nard	1.1	-	++.1	-	-	-
Strawberry	1.1	1.2	+.1	2.2	-	-
Hair-cap Moss	+.2	+.2	-	3.3	-	-
Ground-Pine	2.3	-	-	-	-	-
Mint spp.	-	1.2	-	-	-	-
Large-leaved Aster	2.3	-	-	-	-	-
Indian Cucumber-root	+.2	-	-	-	-	-
Yarrow	+.2	1.3	-	-	-	-
Goldenrod spp.	+.2	1.2	-	2.1	-	3.4

Table 15.5. Continued

Species	Xeric (1) Forest A.S.	Xeric (1) ROW A.S.	Mesic (2) Forest A.S.	Mesic (2) ROW A.S.	Hydric (3) Forest A.S.	Hydric (3) ROW A.S.
Solomon's-seal	+.1	-	-	-	-	-
Helleborine	(++.1)	-	-	-	-	-
Large-flowered Wake-robin	+.1	-	++.2	-	-	-
Dandelion	-	+.2	-	-	-	-
Basil	-	1.2	-	-	-	-
Timothy	-	+.2	-	-	-	-
Dame's-Violet	-	(+.2)	-	-	-	-
Everlasting Pea	-	(+.2)	-	-	-	-
Wild Lupine	-	(+.2)	-	-	-	-
Nightshade	-	+.2	-	-	2.3	-
Poverty-Grass	-	2.2	-	-	-	-
Aster spp.	-	+.1	-	1.2	-	1.2
Queen Anne's-lace	-	+.1	-	-	-	-
St. John's-wort	-	+.1	-	-	-	-
Reindeer Lichen	-	++.2	-	-	-	-
Common Evening-Primrose	-	++.1	-	-	-	-
Milkweed	-	+.1	-	-	++.1	+.1
Spreading Dogbane	-	+.1	-	-	-	-
Black-eyed Susan	-	++.1	-	+.2	-	-
Hawkweed spp.	-	1.1	-	+.1	-	-
Mixed Grass	-	2.3	-	1.2	-	-
Sheep-Sorrel	-	2.2	-	1.3	-	-
Cut-leaved Grape-fern	-	1.2	-	-	-	-
Old-field Cinque-foil	-	1.1	-	1.1	-	-
Bush-Clover	-	++.2	-	-	-	-
Rough-fruited Cinquefoil	-	1.2	-	-	-	-
Pearly Everlasting	-	+.2	-	-	-	-
New York Fern	-	-	1.4	-	-	-
Christmas Fern	-	-	+.2	-	-	-
Royal Fern	-	-	+.1	-	3.2	(+.2)
Spinulose Wood-Fern	-	-	(1.2)	-	-	-
Marsh-Fern	-	-	(1.2)	-	1.2	1.2
Common Speedwell	-	-	-	+.3	-	+.1
Sensitive Fern	-	-	-	-	3.4	2.3
Cinnamon-Fern	-	-	-	-	2.2	-
Tearthumb	-	-	-	-	2.4	1.4
Sedge	-	-	-	-	2.2	4.4
Horsetail	-	-	-	-	1.3	4.4

Table 15.5. Continued

Species	Xeric (1)		Mesic (2)		Hydric (3)	
	Forest A.S.	ROW A.S.	Forest A.S.	ROW A.S.	Forest A.S.	ROW A.S.
Cowslip	-	-	-	-	1.2	+.3
Arrowhead spp.	-	-	-	-	2.2	-
Spotted Touch-me-not	-	-	-	-	2.1	2.2
Mosses	-	-	-	-	2.2	-
Sweet-scented Bed-straw	-	-	-	-	1.2	-
Rush	-	-	-	-	+.2	-
Tall Meadow-Rue	-	-	-	-	+.1	1.1
Common Stitchwort	-	-	-	-	+.1	1.1
Boneset	-	-	-	-	+.1	1.2
Joe-Pye-weed	-	-	-	-	1.2	1.3
Swamp-Buttercup	-	-	-	-	+.1	+.2
Iris spp.	-	-	-	-	1.3	1.3
Lady-Fern	-	-	-	-	-	1.2
Map-apple	-	-	-	-	-	+.4
Violet spp.	-	-	-	-	-	1.2
Blue-eyed Grass	-	-	-	-	-	(++.1)
Cat-tail	-	-	-	-	-	(2.3)
Pokeweed	-	-	-	-	-	+.1
Common Buttercup	-	-	-	-	-	1.2
No. Species	15	30	9	11	21	25
Total No. Species						
Trees[2]	11	10	9	6	3	4
Shrubs	5	7	4	5	2	7
Herbs	15	30	9	11	21	25
Totals	31	47	22	22	26	36

1 For simplicity, herbs include all species of the layer.

2 Those trees which occurred both in the tree and shrub layers were considered as one in determining the total number of species.

Table 15. 6. Characteristic species with abundance and sociability ratings (A.S.) in the shrub and herb layers of the adjacent forest which did not occur on the ROW.

Species	Forest A.S.	ROW A.S.
Xeric (1)		
Shrubs		
Teaberry	1.1	-
Maple-leaved Viburnum	3.4	-
Choke-Cherry	+.1	-
Rose spp.	++.2	-
Herbs[1]		
Wild Sarsaparilla	3.1	-
Partridge-berry	++.2	-
False Spikenard	1.1	-
Ground-Pine	2.3	-
Large-leaved Aster	2.3	-
Indian Cucumber-root	+.2	-
Solomon's-seal	+.1	-
Helleborine	(++.1)	-
Large-flowered Wake-robin	+.1	-
Wild Lily-of-the-valley	3.3	-
No. of Species	14	
Mesic (2)		
Shrubs		
Rose spp.	++.1	-
Virginia Creeper	1.2	-
Elderberry	1.1	-
Herbs		
Wild Lily-of-the-valley	+.3	-
False Spikenard	++.1	-
Large-flowered Wake-robin	++.2	-
New York Fern	1.4	-
Christmas Fern	+.2	-
Royal Fern	+.1	-
Spinulose Wood-Fern	(1.2)	-
Marsh-Fern	(1.2)	-
No. Species	11	

Table 15.6. Continued

Species	Forest A.S.	ROW A.S.
Hydric (3)		
Shrubs		
Purple-flowering Raspberry	+.3	-
Herbs		
Nightshade	2.3	-
Cinnamon-Fern	2.2	-
Arrowhead spp.	2.2	-
Mosses	2.2	-
Sweet-scented Bedstraw	1.2	-
Rush	+.2	-
No. Species	7	

[1] For simplicity, herbs include all species of the herb layer.

Table 15.7. Characteristic species with abundance and sociability ratings (A.S.) in the shrub and herb layers of the ROW which were not in the adjacent forest.

Species	ROW A.S.	Forest A.S.
Xeric (1)		
Shrubs		
Staghorn-Sumac	1.3	-
Hawthorn spp.	+.1	-
Arrow-wood	++.1	-
Blackberry spp.	4.2	-
Nannyberry	+.1	-
Dewberry	3.4	-
Herbs[1]		
Wild Lupine	(+.2)	-
Mint spp.	1.2	-
Dandelion	+.2	-
Basil	1.2	-
Timothy	+.2	-
Dame's-Violet	(+.2)	-
Everlasting Pea	(+.2)	-
Nightshade	+.2	-
Poverty-Grass	2.2	-
Aster spp.	+.1	-
Queen Anne's-lace	+.1	-
St. John's-wort	+.1	-
Reindeer Lichen	++.2	-
Common Evening-Primrose	++.1	-
Milkweed	+.1	-
Spreading Dogbane	+.1	-
Black-eyed Susan	++.1	-
Hawkweed spp.	1.1	-
Mixed Grass	2.3	-
Sheep-Sorrel	2.2	-
Cut-leaved Grape-fern	1.2	-
Old-field-Cinquefoil	1.1	-
Bush-Clover	++.2	-
Rough-fruited Cinquefoil	1.2	-
Pearly Everlasting	+.2	-
No. Species	31	
Mesic (2)		
Shrubs		
Staghorn-Sumac	4.1	-
Hawthorn spp.	++.1	-
Blackberry spp.	1.1	-
Dewberry	2.2	-

Table 15.7. Continued

Species	ROW A.S.	Forest A.S.
Herbs		
Bracken	2.3	=
Hair-cap Moss	3.3	-
Goldenrod spp.	2.1	-
Aster spp.	1.2	-
Black-eyed Susan	+.2	-
Hawkweed spp.	+.1	-
Mixed Grass	1.2	-
Sheep-Sorrel	1.3	-
Old-field-Cinquefoil	1.1	-
Common Speedwell	+.3	-
No. Species	14	
Hydric (3)		
Shrubs		
Hawthorn spp.	+.1	-
Elderberry	2.1	-
Willow spp.	+.1	-
Red Osier Dogwood	+.3	-
Virgin's-bower	+.1	-
Arrow-wood	1.2	-
Herbs		
Common Speedwell	+.1	-
Aster spp.	1.2	-
Lady-Fern	1.2	-
May-apple	+.4	-
Violet spp.	1.2	-
Blue-eyed Grass	(++.1)	-
Cat-tail	(2.3)	-
Pokeweed	+.1	-
Common Buttercup	1.2	-
Goldenrod spp.	3.4	-
No. Species	16	

[1] For simplicity, herbs include all species of the herb layer.

Table 15.8. Major vegetational types for the Oswego to Clay study area based on percent of study plots occupied by each plant community and other components on the ROW.

Community	Site Classification		
	Xeric (1)	Mesic (2)	Hydric (3)
	Percent of Total Area		
Rubus-Bracken-Mixed Grass-Herb	52.20		
Bracken-Rubus-Mixed Grass-Herb	28.30		
Access Road(healed with mixed grass-herb)	19.10		
Junk	.30		
Staghorn-Sumac	.10	.30	
Rubus-Mixed Grass-Herb		91.60	
Quaking Aspen		4.90	
Quaking Aspen-Pin-Cherry-Red Maple		2.20	
Arrow-wood		.80	.40
Red Maple		.20	.10
Horsetail-Sedge-Herb			72.20
Horsetail-Sensitive Fern-Sedge-Herb			14.50
Tearthumb-Sedge-Herb			8.90
Map-apple			3.10
Red Osier Dogwood			.30
Joe-Pye-weed			.30
Elderberry			.10
Common Alder			.10
Total	100.00	100.00	100.00

Table 15.9. Browse survey showing plant species and number ratio of browsed to total stems with percent actual use for ROW, ROW edge, and woods.

Species	ROW		ROW Edge		Woods		Total	
	Ratio	%	Ratio	%	Ratio	%	Ratio	%
Alternate-leaved Dogwood			2/2	100			2/2	100
American Elm	0/1	0					0/1	0
Arrow-wood	4/5	80	3/3	100	3/10	80	15/18	83
Black Cherry	1/2	50	0/2	0	0/1	0	1/5	20
Black Oak			0/1	0			0/1	0
Dewberry	0/113	0	0/44	0			0/157	0
Elderberry	2/2	100					2/2	100
Pin-Cherry			0/1	0			0/1	0
Norway Spruce					0/2	0	0/2	0
Apple	1/1	100					1/1	100
Red Maple	8/29	28	16/26	62	7/8	88	31/63	49
Red Oak	0/1	0	0/3	0			0/4	0
Sassafras	0/1	0					0/1	0
Scotch Pine	0/1	0	0/2	0			0/3	0
Staghorn-Sumac	1/3	33					1/3	33
Quaking Aspen			3/4	75	2/2	100	5/6	83
White Ash			0/1	0	7/13	54	7/14	50
Wild-raisin	1/1	100					1/1	100
Total	18/160	11	24/89	27	19/36	67	66/285	23

Table 15.10. Browse survey showing most abundant plant species and number ratio of browsed to total stems with percent actual use for ROW, ROW edge, and woods.

Location	Species							
	Dewberry		Red Maple		Arrow-wood		Quaking Aspen	
	Ratio	%	Ratio	%	Ratio	%	Ratio	%
ROW	0/113	0	8/29	28	4/5	80		
ROW Edge	0/44	0	16/26	62	3/3	100	0/1	0
Woods			7/8	88	8/10	88	7/13	50
Total	0/157	0	31/63	49	15/18	83	7/14	50

Table 15.11. Birds observed and/or heard on the ROW and the ROW edge during the study period.

Species	Species
Green heron	Robin
Canada goose	Wood thrush
Sparrow hawk	Myrtle warbler
American woodcock	Worm-eating warbler
Herring gull	Yellow warbler
Ring-billed gull	Baltimore oriole
Yellow-shafted flicker	Red-winged blackbird
Eastern kingbird	Scarlet tanager
Eastern wood pewee	Indigo bunting
Great crested flycatcher	American goldfinch
Blue jay	Song sparrow
Black-capped chickadee	Rufus-sided towhee
Catbird	Slate-colored junco

Table 15.12. Potential wildlife use of plant species[1] present on the ROW and adjacent woods for the major game species on the Oswego to Clay study area.

Species	Wildlife Species		
	Deer	Rabbit	Woodcock
Trees			
Sassafras	+		
White Pine	+		
Black Cherry	*	*	
Red Oak	*	+	
Scotch Pine	+		
Sugar-Maple	****	*	
Red Maple	****	*	
Large-toothed Aspen	**		
Quaking Aspen	**		
White Ash	**		
Flowering Dogwood	*	+	
Black Oak	*	+	
Alternate-leaved Dogwood	*	+	
American Hornbeam	*		
Pin-Cherry	*	*	
Apple	*	+	
American Elm	+		
Shrubs			
Low Sweet Blueberry	+		
Teaberry	**		
Staghorn-Sumac	**	+	
Hawthorn spp.	+		
Arrow-wood	*		
Blackberry	+	**	+
Maple-leaved Viburnum	*		
Choke Cherry	*		
Nannyberry	*		
Dewberry	+	**	+
Purple-flowering Raspberry	+	**	+
Willow	*	+	
Red Osier Dogwood	*	+	
Herbs[2]			
Bracken	*		
Goldenrod	+	*	
Grasses	*		
Cut-leaved Grape-fern	*		

Table 15.12. Continued

Species	Wildlife Species		
	Deer	Rabbit	Woodcock
New York Fern	*		
Christmas-Fern	*		
Royal Fern	*		
Spinulose Wood-Fern	*		
Marsh-Fern	*		
Sensitive Fern	*		
Cinnamon-Fern	*		
Lady-Fern	*		
Sheep-Sorrel		**	+
Panic-Grass		*	
Strawberry		+	
Sedge			+
Violet			+

[1] Those plants not included in this table provide a certain amount of cover (Table 15.5) for the 3 major game species, and may also provide seasonal food value, specific information pertaining to which is not now available. This applies also with regard to nongame species.

[2] For simplicity, herbs include all species of the herb layer.

Table 15.13. Comparison of land use near the time of and after construction of the ROW.[1]

	Land Use	Percent of Total Area Near the Time of (-) and After (*) Construction 0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
(A)	Agriculture	------------------------34.0 ******************26.9
(C,I)	Commercial	-.2 *.2
(F)	Forest Land	--------------------------------45.7 ***63.5
(E)	Extractive Industry	
(N)	Non-productive	
(OR)	Outdoor Recreation	-.4 *.4
(P)	Public & Semi-public	
(W)	Water Resources	-----------14.3 ***3.3
(U)	Urban Inactive	
(T)	Transportation	---3.1 ***3.1
(R)	Residential	--2.3 **2.6

1 Source: United Aerial Mapping, San Antonio Texas, air photo No. 3-603, Apr. 27, 1974
USDA, air photo No. ARY-1P-62, July 31, 1955

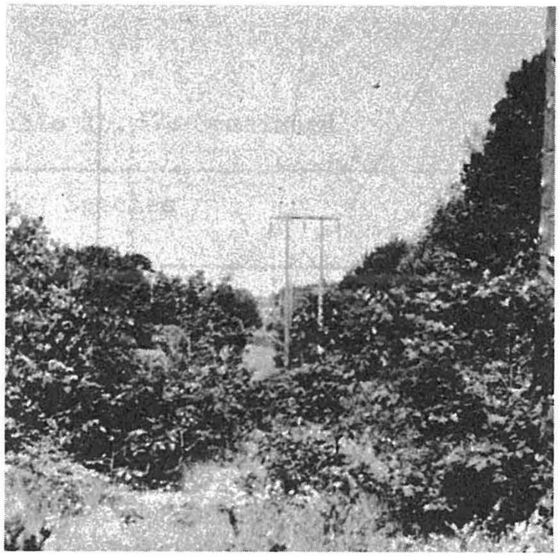


FIG. 15.1.1. General view of the ROW and adjacent forest, looking west, in spring, 1976 (Photo Station 1).

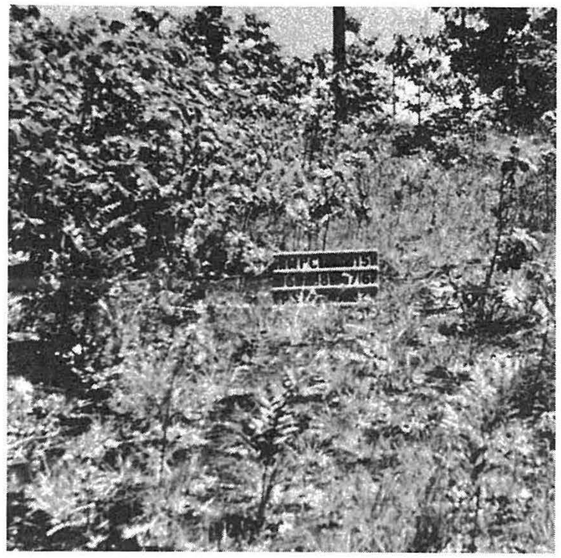


FIG. 15.1.2. Slight sheet erosion on ROW on healed-over access road, in spring, 1976 (Photo Station 2).

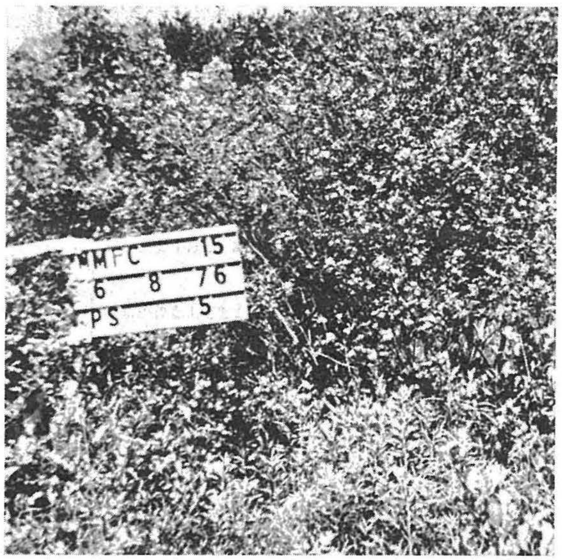


FIG. 15.1.3. Alder community on ROW, in spring, 1976 (Photo Station 5).

FIG. 15.1.4. Cat-tail community on ROW, in summer, 1975 (Photo Station 6).

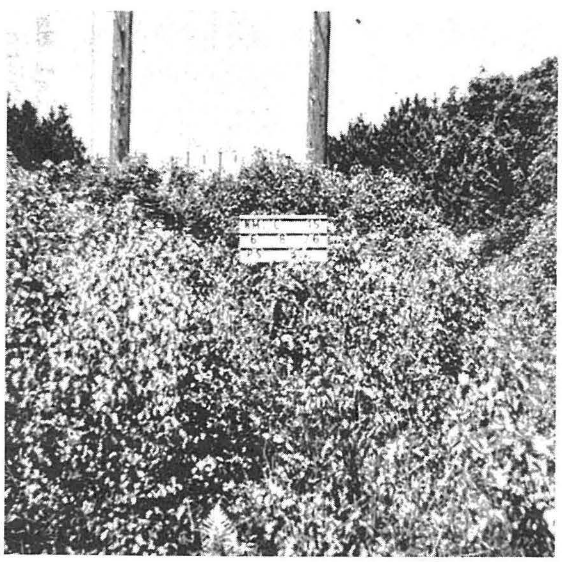


FIG. 15.1.5. Arrow-wood community on ROW, in spring, 1976 (Photo Station 8).

FIG. 15.1.6. Small stream crossing ROW well shaded by sedge, spiked loosestrife, elderberry, and alder, in summer, 1975 (Photo Station 11).

FIG. 15.1. Visual characteristics.

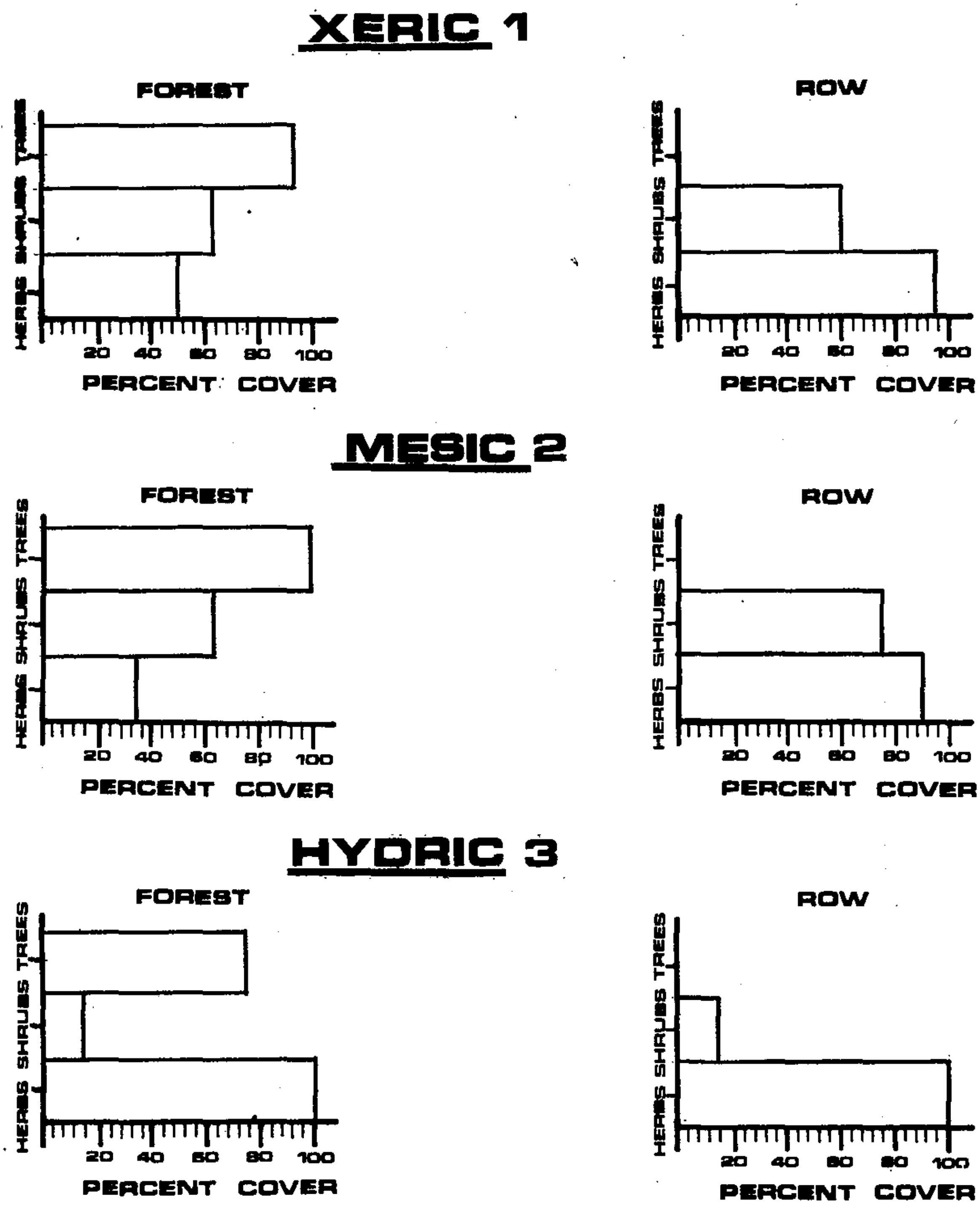


Fig. 15.2. Changes in cover value of tree, shrub, and herb layers from forest to ROW.

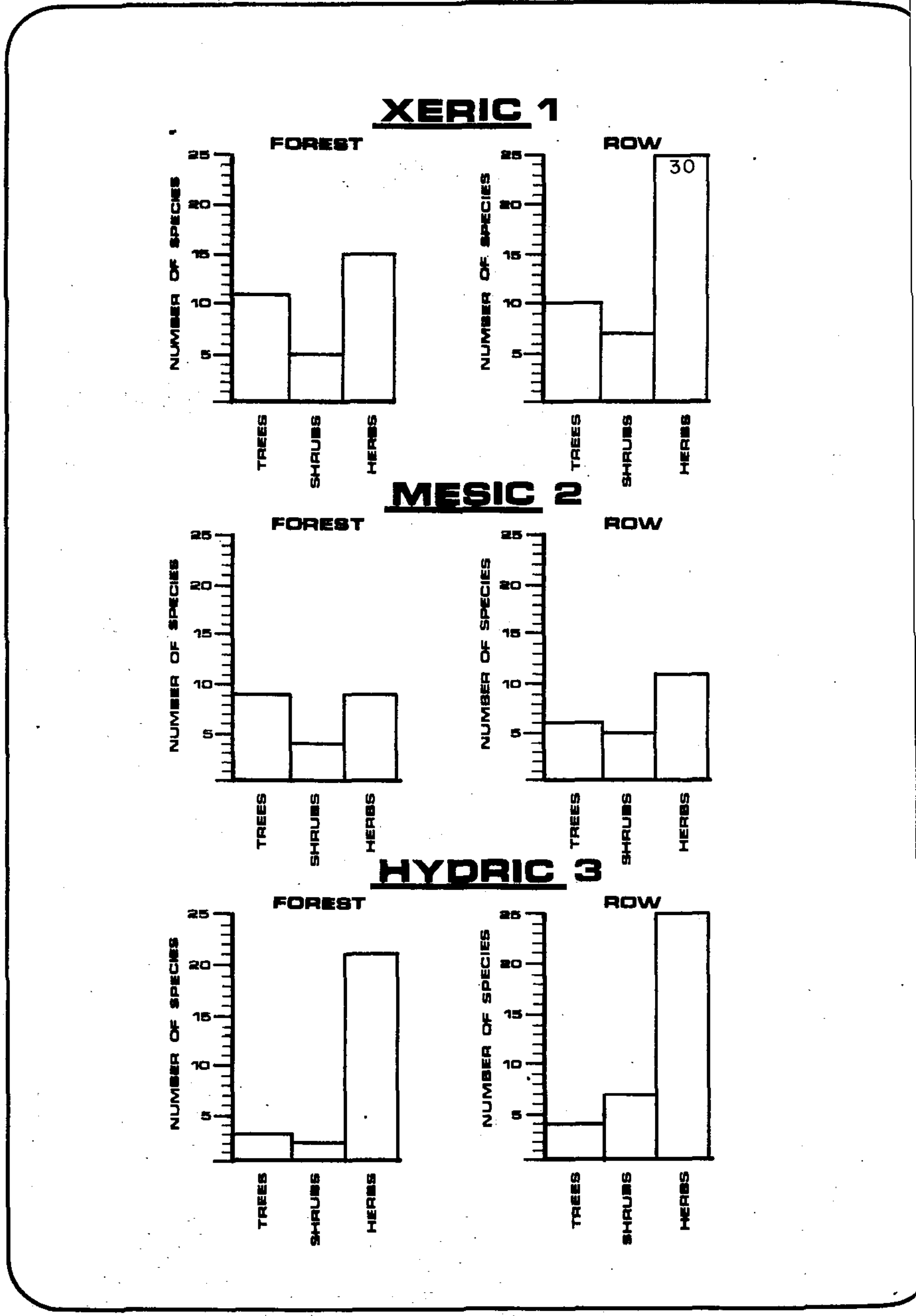


Fig. 15.3. Species diversity in the forest and on the ROW.

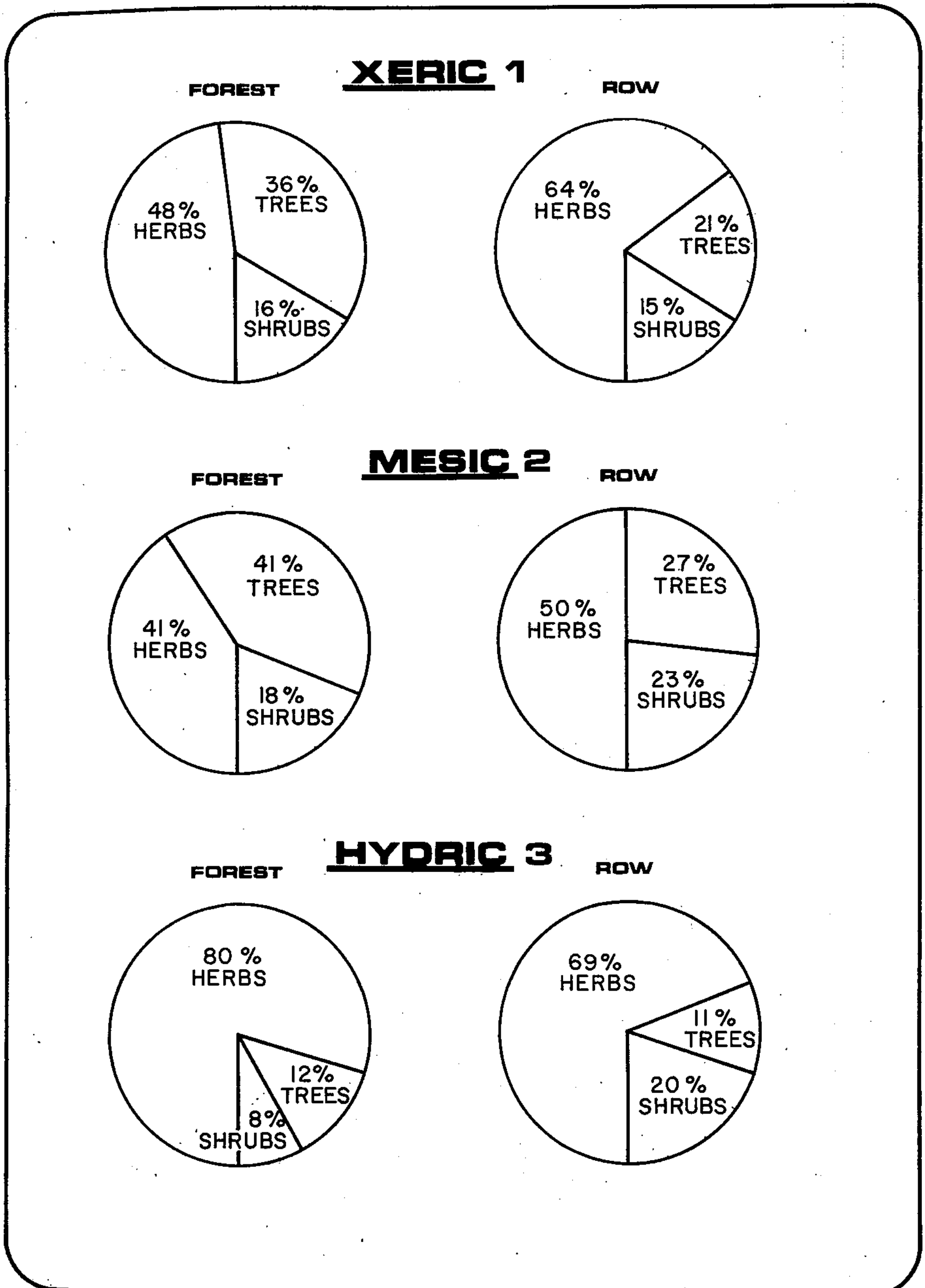


Fig. 15.4. Life form spectrum of the ROW as compared to the adjacent forest to compare species make-up of each, based on the number of species in each life form expressed as a percent of total species.

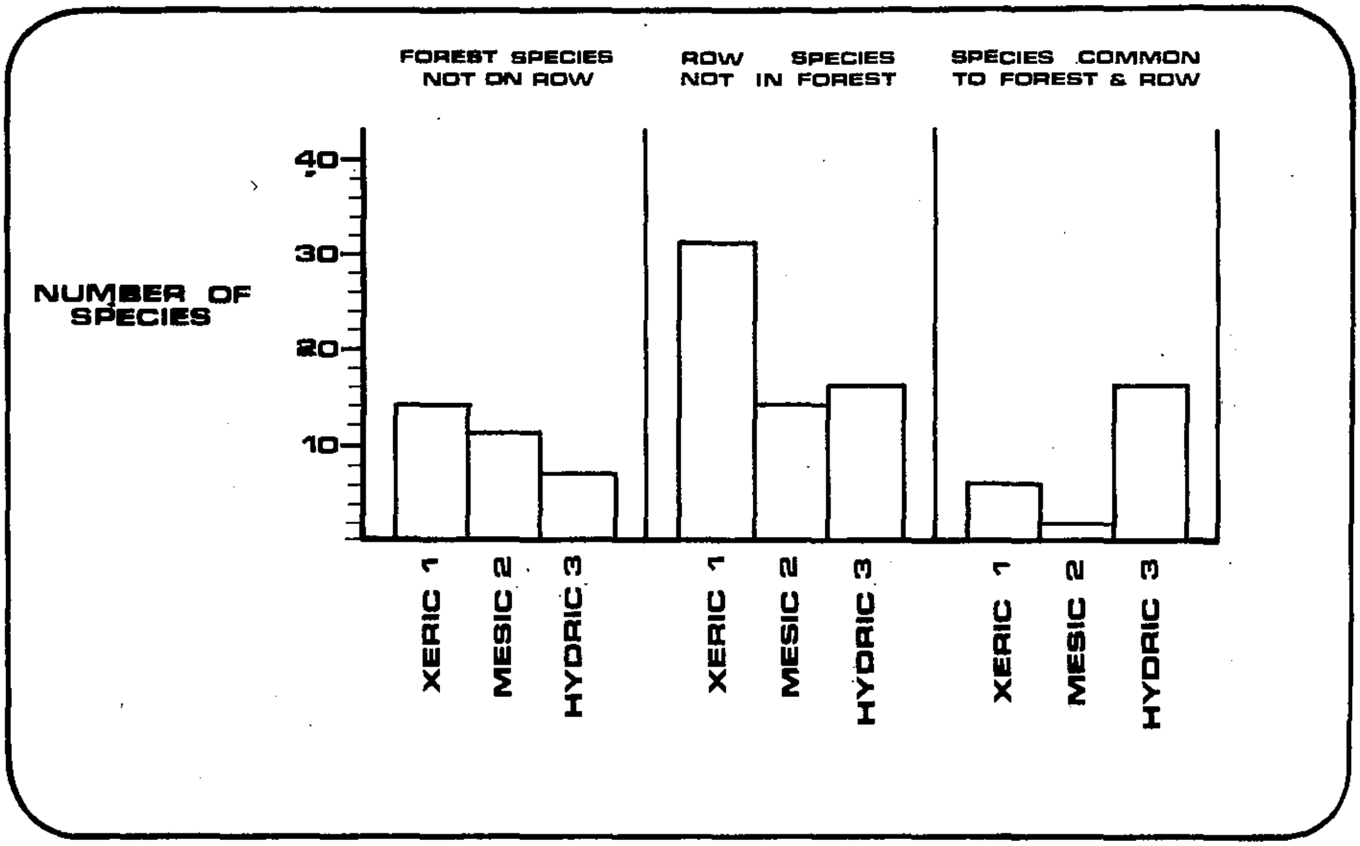


Fig. 15.5. Comparison of shrub and herb species in the forest and on the ROW.

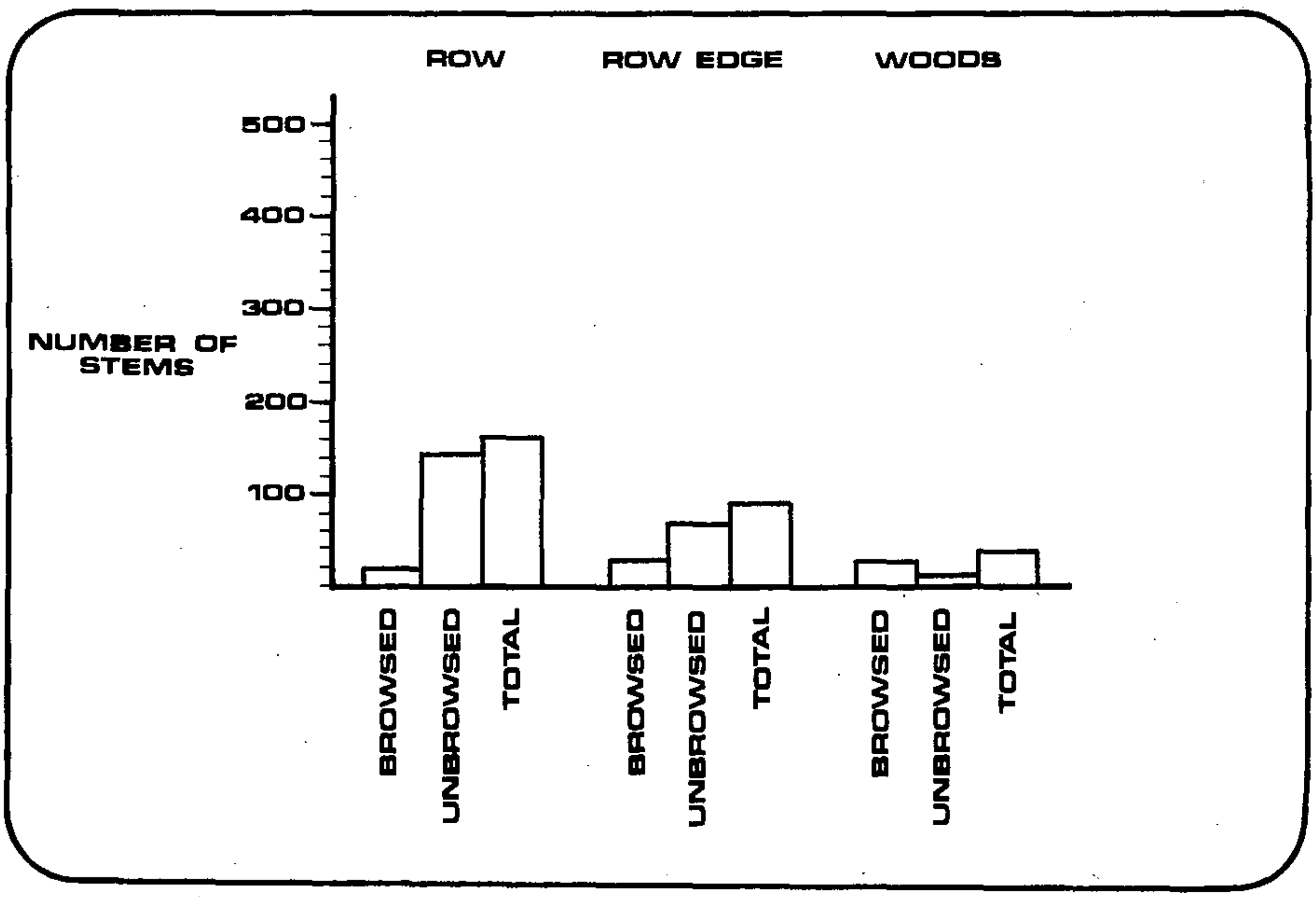
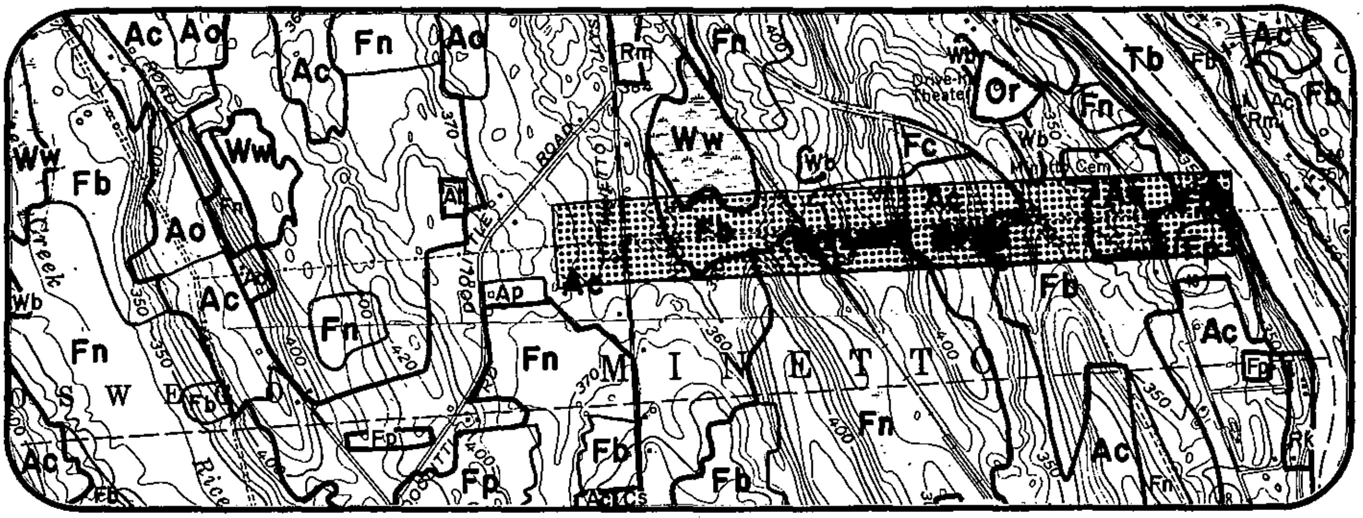
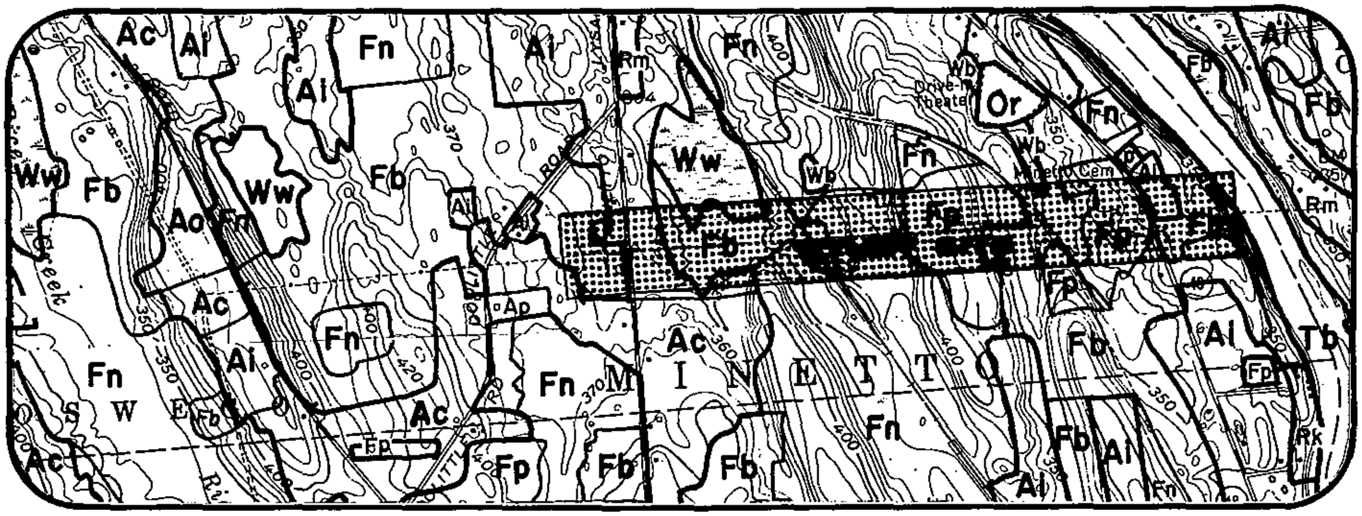


Fig. 15.6. Browse survey showing number of browsed, unbrowsed, and total stems for the ROW, ROW edge, and forest for 6 browse transects.



LAND USE PRIOR TO ROW CONSTRUCTION (1965) SCALE 1"- 2000



LAND USE AFTER CONSTRUTION OF ROW (1974) SCALE 1"- 2000

LEGEND FOR LAND USE SYMBOLS

AGRICULTURE
- Ac - Cropland and cropland pasture
- Ai - Inactive agricultural land
- Ap - Pasture

COMMERCIAL AND INDUSTRIAL LAND USES
- Cs - Commercial strip development

FOREST LAND
- Fn - Forest lands
- Fp - Plantation

OUTDOOR RECREATION LAND USE
- Or - Outdoor recreation

RESIDENTIAL LAND USE
- Rk - Shoreline development
- Rm - Medium density

TRANSPORTATION LAND USE
- Tb - Barge canal

WATER RESOURCES
- Wb - Marshes, shrub wetlands and bogs
- Ww - Wooded wetlands

SOURCES:
- United Aerial Mapping, San Antonio Texas, air photo No. 3-603, Apr. 27, 1974
- USDA, air photo No. ARY-1P-62, July 31, 1955
- Area Land Use Map, LUNR, Cornell University, N.Y., 1974
- U.S.G.S. Topographic Maps, Oswego East, N.Y., 1954 and Fulton, N. Y., 1955

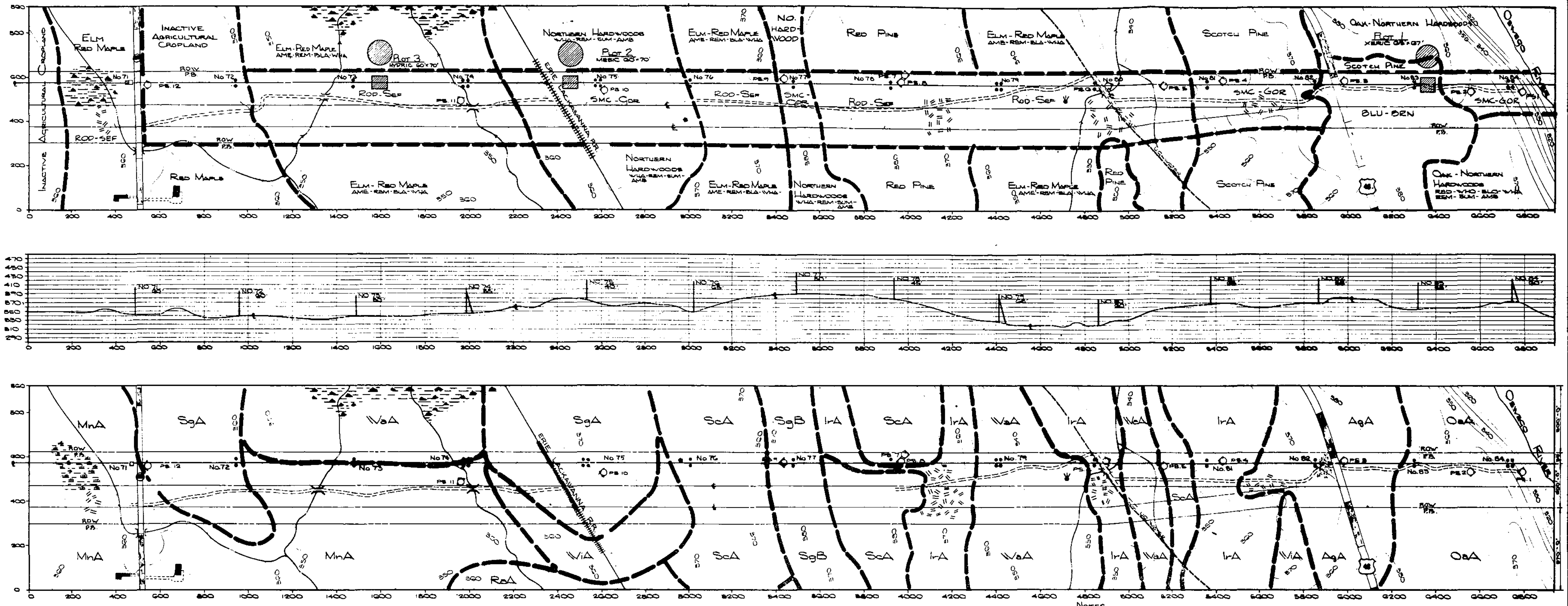
Fig. 15.7. Land use change.

ASPLUNDH ENVIRONMENTAL SERVICES

VEGETATION

CENTERLINE PROFILE

SOILS



Notes

- Horizontal and Vertical scale in feet
- 10 foot Contour Intervals

LEGEND

WORKS AND STRUCTURES

- HIGHWAYS AND ROADS
- HEAVY DUTY
- MEDIUM DUTY
- LIGHT DUTY
- ACCESS ROAD
- UNIMPROVED DIRT ROAD
- NATIONAL INTERSTATE
- US ROUTE
- STATE OR COUNTY
- SINGLE TRACK RAILROAD
- MULTIPLE TRACK RAILROAD
- ABANDONED RAILROAD TRACK
- RAILROAD OVER
- RAILROAD UNDER
- FORD
- ROAD CROSSING
- BUILDING
- EXCAVATION
- MINE DUMP
- PIPELINE
- TRANSMISSION STRUCTURES
- DAMS
- CULVERT
- TANKS
- WELLS
- BRUSH AND LOG DISPOSAL SITES
- SMALL PARKS, CEMETERY, ETC.
- FENCE

BOUNDARIES

- NATIONAL OR STATE
- COUNTY
- MINOR CIVIL DIVISION
- RESERVATION, NATIONAL OR STATE
- LAND GRANT
- ROW PROPERTY BOUNDARY
- ROW EASEMENT BOUNDARY
- ROW CLEARING EDGING
- SITE BOUNDARY
- THE CENTERLINE OF STRUCTURE
- VEGETATION OR SOIL BOUNDARY

SITE MARKERS

- SAMPLE LOCATION
- PHOTO STATIONS
- MAPPED PLOT ON ROW
- MAPPED PLOT OFF ROW
- APPROX. LOCATION OF WOODCOCK SINGING GROUND

WATER SYMBOLS

- PERENNIAL STREAMS
- INTERMITTENT STREAMS
- SMALL RAPIDS
- LARGE RAPIDS
- DISAPPEARING STREAM
- CANALS AND DITCHES
- PERENNIAL LAKES AND PONDS
- INTERMITTENT LAKES AND PONDS
- SPRING
- MARSH, SWAMP OR WET MEADOW
- WET SPOT
- ALLUVIAL FAN

TOPOGRAPHIC RELIEF

- CONTOUR
- DEPRESSION CONTOUR

SOIL SYMBOL AND NAME

AgA	ALTON gravelly fine sandy loam (0 to 8% slope)
IrA	IRA gravelly fine sandy loam (0 to 8% slope)
OaA	OAKVILLE loamy fine sand (0 to 8% slope)
ScA	SCRIBA gravelly fine sandy loam (0 to 8% slope)
SgA	SODUS " " " " (0 to 8% slope)
SgB	SODUS " " " " (8 to 15% slope)
WaA	WALLKILL silt loam (0 to 8% slope)
WiA	WILLIAMSON very fine sandy loam (0 to 8%)
MnA	MINOA very fine sandy loam (0 to 8% slope)
RaA	RAYNHAM silt loam (0 to 8% slope)

SOIL SYMBOLS

- ROCK
- SAND
- SCATTERED ROCK
- BARE AND ERODING (GULLY)
- BARE AND ERODING (SHEET)
- BARE AND INCREASING IN SIZE
- BARE AND HEALING
- ERODED BUT HEALED
- CLAY AREA
- WIND EROSION

PLANT COMMUNITY SYMBOLS

shrubs

ALR	ALDER *Alnus spp.*
ARR	ARROW-WOOD *Viburnum recognitum*
BAR	BARBERRY *Berberis spp.*
BLA	BLACKBERRY *Rubus spp.*
BLH	BLACK-VIBURNUM *Viburnum prunifolium*
BLU	BLUEBERRY *Vaccinium spp.*
BUT	BUTTONBUSH *Cephalanthus occidentalis*
CAY	AMERICAN YEW *Taxus canadensis*
CFH	FLY-HONEYSUCKLE *Lonicera canadensis*
CHC	CHOKE-CHERRY *Prunus virginiana*
CLB	CLIMBING BITTERSWEET *Celastrus scandens*
CRA	GRAPE *Vitis spp.*
DEY	DEWBERRY *Rubus spp.*
ELD	ELDERBERRY *Sambucus canadensis*
GRD	GRAY DOGWOOD *Cornus racemosa*
GRJ	GROUND-JUNIPER *Juniperus communis*
HAA	COMMON ALDER *Alnus serrulata*
HAW	HAWTHORN *Crataegus spp.*
HAZ	HAZELNUT *Corylus spp.*
HUC	HUCKLEBERRY *Gaylussacia spp.*
JAR	MULTIFLORA ROSE *Rosa multiflora*
MAV	MAPLE-LEAVED VIBURNUM *Viburnum acerifolium*
MOH	MOUNTAIN-HOLLY *Nemopanthus mucronata*
MOL	MOUNTAIN-LAUREL *Kalmia latifolia*
MOM	MOUNTAIN-MAPLE *Acer spicatum*
NAN	NANNYBERRY *Viburnum Lentago*
NJT	NEW JERSEY TEA *Ceanothus americanus*
PIF	PINXTER-FLOWER *Rhododendron nudiflorum*
POI	POISON IVY *Rhus radicans*
POS	POISON SUMAC *Rhus vernix*
PRA	NORTHERN PRICKLY ASH *Xanthoxylum americanum*
PRU	BUCKTHORN *Rhamnus spp.*
RIB	RIBES *Ribes spp.*
ROD	RED OSIER DOGWOOD *Cornus stolonifera*
SMC	SUMAC *Rhus spp.*
SPA	SPECKLED ALDER *Alnus rugosa*
SPB	SPICEBUSH *Lindera Benzoin*
SPI	SPIRAEA *Spiraea spp.*
SMS	SMOOTH SUMAC *Rhus glabra*
STM	STRIPED MAPLE *Acer pensylvanicum*
STS	STAGHORN-SUMAC *Rhus typhina*
SWF	SWEET-FERN *Comptonia peregrina*
TAH	TARTARIAN HONEYSUCKLE *Lonicera tatarica*
WIH	WITCH-HAZEL *Hamamelis virginiana*
WIL	WILLOW *Salix spp.*
WIN	WINTERBERRY *Ilex verticillata*
WIR	WILD-RAISIN *Viburnum cassinoides*
ZBC	BLACK CHOKEBERRY *Pyrus melanocarpa*

trees

ABU	BUTTERNUT *Juglans cinerea*
AIL	TREE-OF-HEAVEN *Ailanthus altissima*
ALD	ALTERNATE-LEAVED DOGWOOD *Cornus alternifolia*
AMB	BEECH *Fagus grandifolia*
AMC	CHESTNUT *Castanea dentata*
AME	AMERICAN ELM *Ulmus americana*
AMH	AMERICAN HORNBEAM *Carpinus caroliniana*
APP	APPLE *Pyrus malus*
BAF	BALSAM-FIR *Abies balsamea*
BAS	BASSWOOD *Tilia americana*
BIH	BITTERNUT HICKORY *Carya cordiformis*
BLC	BLACK CHERRY *Prunus serotina*
BLL	BLACK LOCUST *Robinia Pseudo-Acacia*
BLW	BLACK WALNUT *Juglans nigra*
CHO	CHESTNUT-OAK *Quercus prinus*
COT	COTTONWOOD *Populus deltoides*
EAH	HEMLOCK *Tsuga canadensis*
ERC	RED CEDAR *Juniperus virginiana*
FLD	FLOWERING DOGWOOD *Cornus florida*
GRB	GRAY BIRCH *Betula populifolia*
HOH	AMERICAN HOP-HORNBEAM *Ostrya virginiana*
LAA	LARGE-TOOTHED ASPEN *Populus grandidentata*
LAR	AMERICAN LARCH *Larix laricina*
NWC	WHITE CEDAR *Thuja occidentalis*
PAB	WHITE BIRCH *Betula papyrifera*
PIC	PIN-CHERRY *Prunus pensylvanica*
PIH	PIGNUT HICKORY *Carya glabra*
PIP	PITCH-PINE *Pinus rigida*
QUA	QUAKING ASPEN *Populus tremuloides*
RED	RED OAK *Quercus rubra*
REM	RED MAPLE *Acer rubrum*
RES	RED SPRUCE *Picea rubens*
SAS	WHITE SASSAFRAS *Sassafras albidum*
SCO	SCRUB-OAK *Quercus ilicifolia*
SCP	SCOTCH PINE *Pinus sylvestris*
SHB	SERVICEBERRY *Amelanchier spp.*
SHH	SHAGBARK-HICKORY *Carya ovata*
SUM	SUGAR-MAPLE *Acer saccharum*
SWB	SWEET BIRCH *Betula lenta*
VIP	SCRUB-PINE *Pinus virginiana*
WHA	WHITE ASH *Fraxinus americana*
WHO	WHITE OAK *Quercus alba*
WHP	WHITE PINE *Pinus strobus*
YEB	YELLOW BIRCH *Betula lutea*
YEP	TULIP-POPLAR *Liriodendron tulipifera*

herbs

BLG	BLUE-JOINT GRASS *Calamagrostis canadensis*
BON	BONESET *Eupatorium perfoliatum*
BRN	BRACKEN *Pteridium aquilinum*
BRO	BROOM-SEDGE *Andropogon virginicus*
CAT	CAT-TAIL *Typha spp.*
CHF	CHRISTMAS-FERN *Polystichum acrostichoides*
CIF	CINNAMON-FERN *Osmunda cinnamomea*
DEG	DEERTONGUE GRASS *Panicum clandestinum*
GOR	GOLDENROD *Solidago spp.*
HAF	HAY-SCENTED FERN *Dennstaedtia punctilobula*
HOT	HORSETAIL *Equisetum spp.*
INF	INTERRUPTED FERN *Osmunda Claytoniana*
IRS	IRIS *Iris spp.*
JAP	SMALL JACK-IN-THE-PULPIT *Arisaema triphyllum*
LET	WILD LETTUCE *Lactuca canadensis*
MSF	MARGINAL SHIELD-FERN *Dryopteris marginalis*
NYF	NEW YORK FERN *Dryopteris noveboracensis*
PEV	PEARLY EVERLASTING *Anaphalis margaritacea*
PHR	PHRAGMITES *Pragmites spp.*
POG	POVERTY-GRASS *Danthonia spicata*
RDM	REINDEER LICHEN *Cladonia rangiferina*
ROF	ROYAL FERN *Osmunda regalis*
SEF	SENSITIVE FERN *Onoclea sensibilis*
SPL	SPIKED LOOSESTRIFE *Lythrum Salicaria*
SPM	SPHAGNUM MOSS *Sphagnum spp.*
SSS	SOLOMON'S-SEAL *Polygonatum biflorum*
SWA	SWAMP-BUTTERCUP *Ranunculus septentrionalis*
WHS	WHITE SNAKEROOT *Eupatorium rugosum*
YPL	BULLHEAD-LILY *Nuphar variegatum*

REVISIONS :

DATA SOURCES :

ASPLUNDH ENVIRONMENTAL SERVICES
BLAIR MILL ROAD
WILLOW GROVE PA 19090

- NIAGARA HUDSON CENTRAL DIVISION - PLAN & PROFILE 11/5/74
- USGS 7.5 MIN TOPOGRAPHIC MAP, OSWEGO EAST, NY. '54
- USDA., SCS IN COOPERATION WITH THE OSWEGO CO. SOIL & WATER CONSERVATION DISTRICT CORNELL UNIV. AGR. EXP. STA. 4/'74
- UNITED AERIAL MAPPING, SAN ANTONIO, TEXAS. OSWEGO CO. AIR PHOTO NO 3-603 SCALE (1:24,000) APR 27 1974
- USDA-SCS, HYATTSVILLE, MD. OSWEGO CO. AIR PHOTO NO. 548 36075 274-72 SCALE (1:48,000) JUNE 10, 1975
- ASPLUNDH ENVIRONMENTAL SERVICES AES. PROJECT NO 81-0028 FIELD STUDIES 1975-76

This information is a part of the ESEERCO "STUDY OF ENVIRONMENTAL AND ECONOMIC ASPECTS OF CONTEMPORANEOUS ELECTRIC TRANSMISSION LINE RIGHT-OF-WAY MANAGEMENT TECHNIQUES"

MAP 15.1

SITE 15 HABITAT CONDITIONS

UTILITY : NIAGARA MOHAWK POWER CORP.

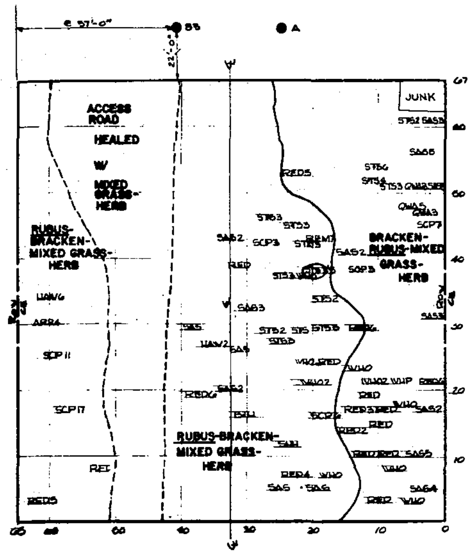
ROW DESCRIPTION : OSWEGO TO CLAY #4 115 KV.

WOODEN POLE 'H' FRAME VARIABLE 60'-100'

SCALE: 1" = 200'-0"

200 100 0 100 200 400 800 1000

PLOT 1 XERIC



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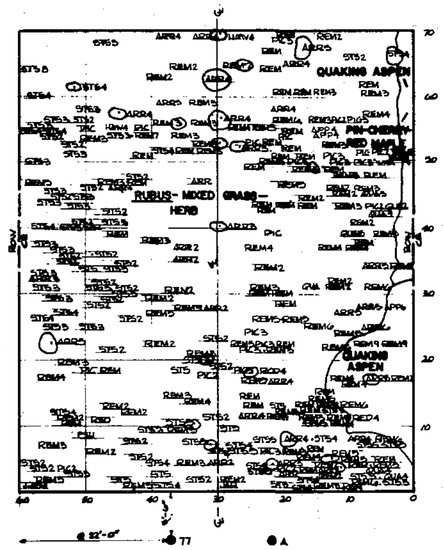
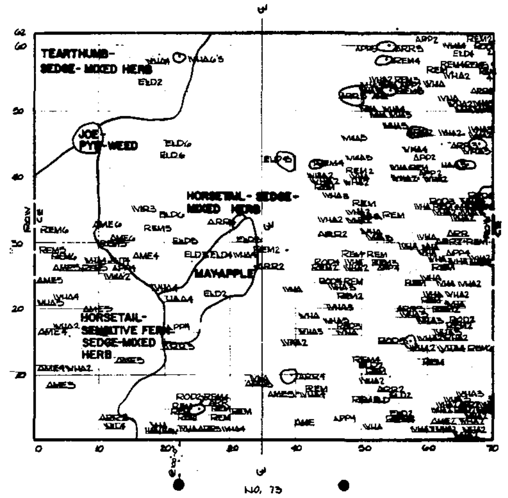


PLOT 3 HYDRIC



LEGEND

WORKS AND STRUCTURES

- ACCESS ROAD
- BRUSH AND LOG DISPOSAL SITES

BOUNDARIES

- THE CENTERLINE OF STRUCTURE
- ROW PROPERTY BOUNDARY
- ROW EASEMENT BOUNDARY
- EXISTING ROW CLEARING EDGE

WATER SYMBOLS

- PERENNIAL STREAMS
- INTERMITTENT STREAMS
- SMALL RAPIDS
- LARGE RAPIDS
- DISAPPEARING STREAM
- CANALS AND DITCHES
- PERENNIAL LAKES AND PONDS
- INTERMITTENT LAKES AND PONDS
- SPRING
- MARSH, SWAMP OR WET MEADOW
- WET SPOT
- ALLUVIAL FAN

SITE MARKERS

- SAMPLE LOCATION
- PHOTO STATION

SOIL SYMBOLS

- ROCK
- SCATTERED ROCK

PLANT COMMUNITY SYMBOLS

herbs

BLG	BLUE-JOINT GRASS	Calamagrostis canadensis
BON	BONESET	Eupatorium perfoliatum
BRN	BRACKEN	Pteridum aquilinum
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YPL	BULLHEAD-LILY	Nuphar variegatum

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MAV	MAPLE-LEAVED VIBURNUM	Viburnum acerifolium
MOH	MOUNTAIN-HOLLY	Nemopanthus mucronata
MOL	MOUNTAIN-LAUREL	Kalmia latifolia
MOM	MOUNTAIN-MAPLE	Acer spicatum
NAN	NANNYBERRY	Viburnum Lentago
NJT	NEW JERSEY TEA	Ceanothus americanus
PIF	PINXTER-FLOWER	Rhododendron nudiflorum
POI	POISON IVY	Rhus radicans
POS	POISON SUMAC	Rhus vernix
PRA	NORTHERN PRICKLY ASH	Xanthoxylum americanum
PRU	BUCKTHORN	Rhamnus spp.
RIB	RIBES	Ribes spp.
ROD	RED OSIER DOGWOOD	Cornus stolonifera
SMC	SUMAC	Rhus spp.
SPA	SPECKLED ALDER	Alnus rugosa
SPB	SPICEBUSH	Lindera Benzoin
SPI	SPIRAEA	Spiraea spp.
SMS	SMOOTH SUMAC	Rhus glabra
STM	STRIPED MAPLE	Acer pensylvanicum
STS	STAGHORN-SUMAC	Rhus typhina
SWF	SWEET-FERN	Comptonia peregrina
TAH	TARTARIAN HONEYSUCKLE	Lonicera tatarica
WIH	WITCH-HAZEL	Hamamelis virginiana
WIL	WILLOW	Salix spp.
WIN	WINTERBERRY	Ilex verticillata
WIR	WILD-RAISIN	Viburnum cassinoides
ZBC	BLACK CHOKEBERRY	Pyrus melanocarpa

trees

ABU	BUTTERNUT	Juglans cinerea
AIL	TREE-OF-HEAVEN	Ailanthus altissima
ALD	ALTERNATE-LEAVED DOGWOOD	Cornus alternifolia
AMB	BEECH	Fagus grandifolia
AMC	CHESTNUT	Castanea dentata
AME	AMERICAN ELM	Ulmus americana
AMH	AMERICAN HORNBEAM	Carpinus caroliniana
APP	APPLE	Pyrus malus
BAF	BALSAM-FIR	Abies balsamea
BAS	BASSWOOD	Tilia americana
BIH	BITTERNUT HICKORY	Carya cordiformis
BLC	BLACK CHERRY	Prunus serotina
BLL	BLACK LOCUST	Robinia Pseudo-Acacia
BLW	BLACK WALNUT	Juglans nigra
CHO	CHESTNUT-OAK	Quercus prinus
COT	COTTONWOOD	Populus deltoides
EAH	HEMLOCK	Tsuga canadensis
ERC	RED CEDAR	Juniperus virginiana
FLD	FLOWERING DOGWOOD	Cornus florida
GRB	GRAY BIRCH	Betula populifolia
HOH	AMERICAN HOP-HORNBEAM	Ostrya virginiana
LAA	LARGE-TOOTHED ASPEN	Populus grandidentata
LAR	AMERICAN LARCH	Larix laricina
NWC	WHITE CEDAR	Thuja occidentalis
PAB	WHITE BIRCH	Betula papyrifera
PIC	PIN-CHERRY	Prunus pensylvanica
PIH	PIGNUT HICKORY	Carya glabra
PIP	PITCH-PINE	Pinus rigida
QUA	QUAKING ASPEN	Populus tremuloides
RED	RED OAK	Quercus rubra
REM	RED MAPLE	Acer rubrum
RES	RED SPRUCE	Picea rubens
SAS	WHITE SASSAFRAS	Sassafras albidum
SCO	SCRUB-OAK	Quercus ilicifolia
SCP	SCOTCH PINE	Pinus sylvestris
SHB	SERVICEBERRY	Amelanchier spp.
SHH	SHAGBARK-HICKORY	Carya ovata
SUM	SUGAR-MAPLE	Acer saccharum
SWB	SWEET BIRCH	Betula lenta
VIP	SCRUB-PINE	Pinus virginiana
WHA	WHITE ASH	Fraxinus americana
WHO	WHITE OAK	Quercus alba
WHP	WHITE PINE	Pinus strobus
YEB	YELLOW BIRCH	Betula lutea
YEP	TULIP-POPLAR	Liriodendron tulipifera

REVISIONS :

DATA SOURCE : ASPLUNDH ENVIRONMENTAL SERVICES, aes, BLAIR MILL ROAD, WILLOW GROVE, PA 19090

FIELD SURVEY - AES, 1975, 76

This information is a part of the ESEERCO "STUDY OF ENVIRONMENTAL AND ECONOMIC ASPECTS OF CONTEMPORANEOUS ELECTRIC TRANSMISSION LINE RIGHT-OF-WAY MANAGEMENT TECHNIQUES"

MAP 15.2

SITE 15

MAPPED PLOTS

UTILITY : NIAGARA MOHAWK POWER CORP.

ROW DESCRIPTION : OSWEGO TO VOLNEY 115 KV.

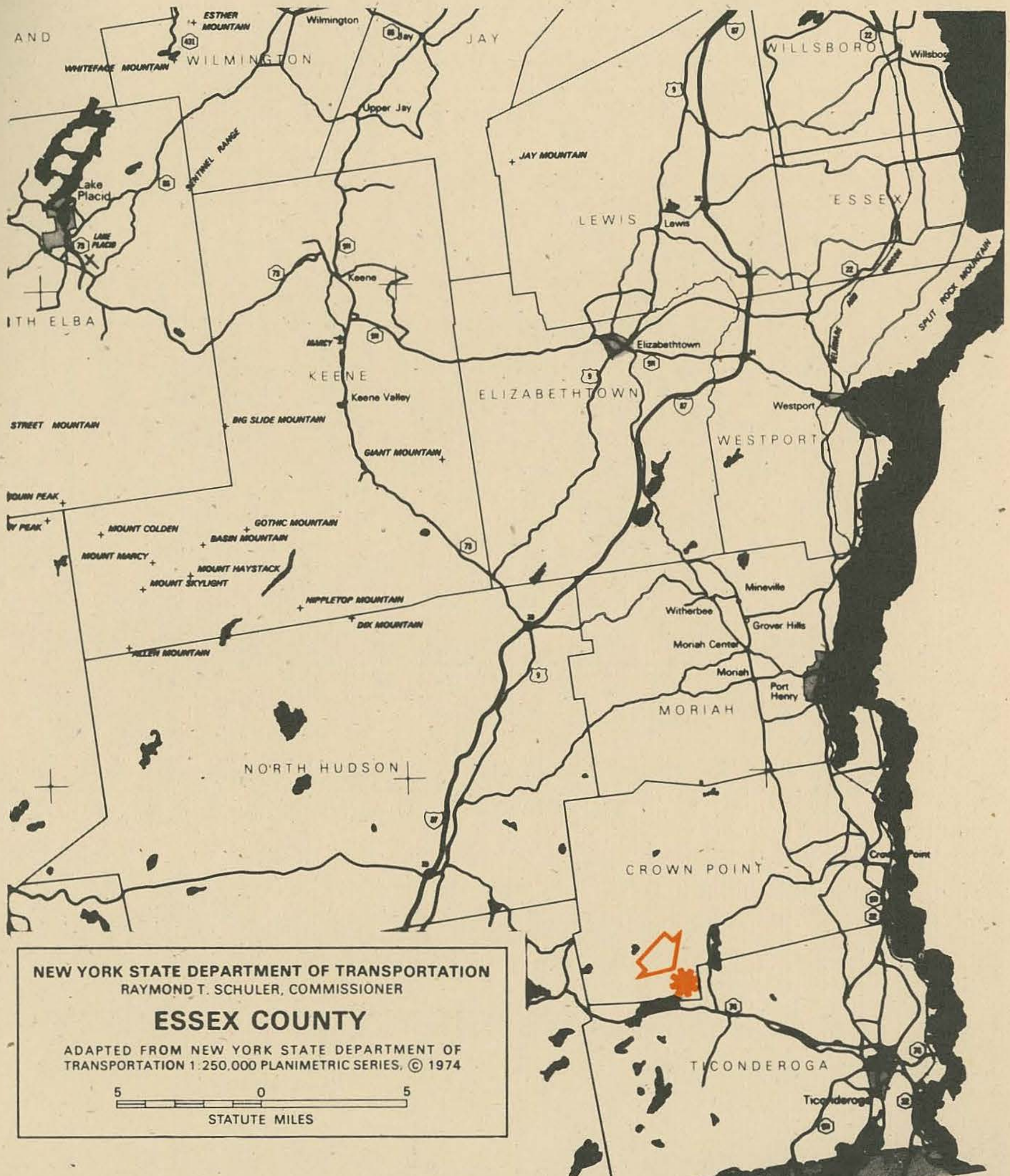
WOODEN POLE 'H' FRAME 250 ROW

SCALE: 1" = 10'-0"

10 5 0 5 10 20 40 50

SITE 16

NATIONAL LEAD LINE



Site 16 National Lead Line

Study area extends from structure 89 on the northwest side of the road to Crown Point Road to structure 82 on the southeast side of same, in the vicinity of Chilson. To reach the area, take route 87 north to route 73, then route 73 east; at Crown Point Road, take a left and proceed 1.5 miles on that road to the study area.

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1 Introduction

Site 16 is located in the Adirondack Highlands physiographic area of New York (Cline, 1970) in the White Pine and Northern Hardwoods forest type area (Stout, 1958). The general landscape of the ROW and adjacent areas is shown in Figs. 16.1.1 and 16.1.2.

The topography of the area ranges from rolling to moderately rough, with an occasional patch of mountainous landscape (Stout, 1958).

The typical forest types of the area are White Pine and Northern Hardwoods, and Pine-Oak-Northern Hardwoods(Stout, 1958). Located on the site are White Pine-Northern Hardwoods, Aspen-Gray Birch-Paper Birch, White-Pine and Elm-Red Maple forest types.

2 Location and Identification

Site 16 is located approximately 2 miles south of Ironville, in the town of Ticonderoga, Essex County, New York (73° 31' 30" W. Longitude; 43° 54' 30" N. Latitude

The site is owned and operated by the National Lead Industries, Inc. This 100-foot easement consists of 1 single circuit, 115 kV line, having wood pole H-frame structures. The project site is approximately 3,600 feet in length and extends from structure 89 west of Crown Point Road to include structure 82 east of said road.

3 Background

The following discussion outlines documentable management techniques of clearing, construction, restoration, and maintenance regarding site 16, as received from NMPC (information sent May 6, 1976, by Kenneth Finch and James Brogan, Niagara Mohawk Power Corporation, Syracuse, N.Y.; telephone conversations with James Brogan, December 14, 1976, NMPC, Syracuse, N.Y.). All available pertinent information and unit cost data are included under each operation of clearing, construction, restoration, and maintenance.

3.1 Clearing

The ROW was initially clear cut during the winter of 1941 and 1942. Work included the use of cross-cut saws, axes, and brush hooks. Brush was piled on either side of the ROW. Danger trees were also removed after conductors were in place. No information is available regarding initial chemical treatment or cost, except that the line was cleared on a cost-plus basis.

3.2 Construction

The line was cleared and constructed between late 1941 and the end of 1942. The poles were pulled into and along the ROW with horses and a small caterpillar tractor. While most of the pole holes were hand dug and/or dynamited, a rubber tired tractor equipped with a compressor and jack hammer was used on part of the line. The poles were erected using a "falling gin pole", and the caterpillar to pull them up into the holes. Once set, the structures were framed in the air. The caterpillar was then used to pull the conductor in.

3.3 Restoration

No information is available regarding restoration practices or cost.

3.4 Maintenance

In 1944, hand cutting was completed at a cost of $250.00 per mile. In 1950, hand cutting of the ROW was compelted, but no information regarding the cost thereof is available.

A selective basal spray, using a "Brushkiller" mixture of 2,4-Dichlorophenoxyacetic acid (2,4-D), and 2,4,5-Trichlorophenoxyacetic acid (2,4,5-T), mixed in fuel oil at a rate of 16 pounds of acid equivalent per 100 gallons of mixture, was applied with low pressure, hand-carried equipment in 1954. This was judged to have little or no effect.

In 1958, a NMPC patrol report shows the area between structures 60 and 80 as having 10- to 15-foot brush, and the area between structures 84 and 120 as having scattered brush. In 1959, a patrol path was cleared by hand cutting.

In 1960, a broadcast foliage treatment using high pressure sprayers with a 2,4,5-T mixed gallon concentrate in 100 gallons water was made. Approximately 300 gallons per acre were used. This treatment was judged effective. A NMPC note indicates that several danger trees still existed on the ROW following the operation.

In 1962, a selective broadcast foliage treatment using knapsack mistblowers and 2,4,5-T mixed in the proportion of 5 gallons concentrate in 55 gallons water was made and the treatment was judged effective.

In 1964, the 1962 treatment was repeated as a follow-up between structures 84 and 89.

In 1965, a follow-up to the 1962 treatment was conducted between structures 82 and 84 using a Tordon 101 mixture in place of the 2,4,5-T at the same concentration. This was judged very effective.

A selective dormant basal treatment using a Tordon 155 mixture in fuel oil was applied by knapsack mistblower in 1971. The concentration is not known and the results were judged to be poor.

In 1972, a selective basal application of Tordon 155 in fuel oil was applied during the growing season as a follow-up treatment. Results were deemed better than the previous application but not completely satisfactory. The site studied has not been treated since this time.

A NMPC report states that a 1973 spray program on this line missed the area from structures 70 to 83, and therefore should be either sprayed or cut. The report also noted numerous danger trees along the line.

4 General Reconnaissance

A general reconnaissance was made in accordance with the methodology and is set forth in Map 16.1 which shows site habitat conditions. In this reconnaissance it was noted that the major vegetational types correlated with the soil types on the hydric, mesic, and xeric habitats.

The existing visual character of the ROW is depicted during all seasons of the year, from important vantage points both on and off the ROW. These points are identified as photo stations and are located on Map 16.1 and described in Appendix 17. Specific reference is made to some of these photo stations throughout the report and illustrated in Fig. 16.1. With the exception of aerial photography used to identify land use, older photographs depicting the area are not available.

In the context of its location site 16 is generally pleasing to view during all seasons of the year. The ROW opens up a vista through an otherwise uniform forest cover, as well as a pleasantly rolling terrain which would otherwise be hidden from view. The ROW consists largely of grasses; with trees lining the ROW that are especially pleasing to view when in fall color. Features that may effect the sensitivity of the area to view include: Putnam Creek which flows through the area for some distance, a nearby Army practice range area, and recreational camps in the vicinity. The terrain is very hilly and pleasent to view. Crown Point Road which crosses the site does little to distract from the rural, not too heavily populated area. The site is generally visible from Crown Point Road. A series of hills on both sides of the ROW renders the structures visible to an extent, although they eventually disappear in the distance because of the dips of the terrain. The potential number of people viewing the ROW appears to be quite low.

5 Field Studies - Results and Discussion

5.1 Soils

5.1.1 Geology and Soils

Site 16, National Lead Line ROW, is located in Essex County in the Adirondack Highlands (Cline, 1970), also termed the Adirondack Upland region, Adirondack Low Mountains subdivision (Thompson, 1966). Drainage is into Lake Champlain (Stout, 1958). Bedrock geology is of Precambrian age, pre 1,100 to 570 million years ago, and consists predominantly of metasedimentary and metavolcanic rocks including gneisses, marble, and quartzite. Surficial geology is glacial drift, and soils in this area developed largely in glacial till (Broughton et al., 1973).

Soils on this site are generally classified in the order Spodosols, suborder Orthods (Becket, Peru, and Windsor soil series), reflecting leached surface horizons and accumulations of organic matter, iron, and aluminum in the subsurface horizons. One soil, Rumney, is in the order Entisols, suborder Aquents, which are mineral soils without natural genetic horizons or with only the beginning of such horizons (Buckman and Brady, 1969; Soil Survey Staff, 1975). The soil associations occupying the area are Gloucester-Essex-Rockland and Hermon-Becket-Rockland; soil series included in those associations and occurring on site 16 are Beckett and Windsor (Cline, 1970). Brief descriptions (Anon., 1972) of soil types occurring on the ROW study site (Map 16.1; Table 16.1) are:

Becket fine sandy loam (BeA, BeB, and Bec): These soils developed in firm glacial till that is dominated by granitic and schistose rocks, on gently sloping to steep areas of till plains in the Adirondack Mountains. These soils are deep and well drained, but internal drainage is impeded by the presence of a fragipan, generally at about 36 inches. Generally a strongly acid to very strongly acid soil it may vary from pH 4.5 to pH 6.0 in the surface 20 inches of a typical profile; soil reaction in the upper 3 inches on this site was pH 4.9. Assigned to Woodland Suitability Group 4o1, Becket soils have a moderate potential productivity for timber (Class 4), and no significant restrictions or limitations for woodland use or management (Subclass o). Where the slope exceeds 15%, it becomes a restriction, and is reflected in the classification 4r1.

Peru loam (PuA): Peru soils developed in compact glacial till derived from dark colored, fine-grained metamorphic and igneous rocks, on gently sloping to sloping terrain on till plain uplands and drumlins. Deep and moderately well drained, these soils nevertheless contain a firm to very firm, slowly permeable loam fragipan at about 23 inches. The depth to the seasonal water table ranges from 18 to 24 inches. The soil is generally strongly acid, ranging from pH 5.1 to pH 5.5 throughout a typical profile; it was pH 5.4 in the surface 3 inches on this site. Peru loam is in Woodland Suitability Group 3o, designating moderately high timber productivity and no significant restrictions or limitations for woodland use or management.

Rumney silt loam (RhA): These soils developed on bottomlands of alluvial flood plains, on nearly level to depressional areas in sediments that have washed from adjacent uplands. Rumney soils are poorly to somewhat poorly drained, and the depth to the seasonal water table varies from negligible to 6 inches. On this site, water occurred at the surface in many areas, and a mucky condition developed. Soil reaction is strongly acid, and ranges from pH 5.0 to pH 6.0 between the surface and 15 inches; on this site in the surface horizon it was pH 5.8. Rumney soils are in Woodland Suitability Group 4w1, indicating moderate woodland production and excessive wetness, due to a high water table and restricted drainage, causing management limitations.

Windsor loamy sand (WnA and WnB): Windsor soils formed in deep sandy deposits on glacial outwash terraces, and occupy nearly level or gently rolling areas and, in a few places, steep slopes. These soils are well drained and consist of loamy sand over sand; on this site on uplands they were generally excessively drained. They are strongly acid soils, ranging from pH 4.5 to pH 5.5 in the surface 26 inches; in the upper mineral horizon on this site, soil reaction was pH 5.4. Windsor loamy sand is assigned to Woodland Suitability Group 5s1, which is low for timber productivity, with restrictions for woodland use or management based upon limitations for use of equipment, low moisture-holding capacity, and scarcity of available plant nutrients.

5.1.2 Humus Types

Organic layers present on the soil surface of the ROW and adjacent woodland were measured on 2 mesic and 3 xeric locations. Average thickness of the organic layers and A1 horizon was based on 5 samples taken at each location (Table 16.2). The presence and thickness of these layers were used for humus type classification. The humus classification key is not adaptable to areas exhibiting prolonged water saturation in the surface soil; therefore, similar measurements were not made on the hydric sites. Part of the ROW, adjacent to an abandoned pasture and apple orchard off the ROW, may have been grazed in the past, but there is no evidence, as such, of plowing, grazing, or recent fires on this site.

All organic layers (litter, fermentation, and humus) plus an A1 horizon (mixed mineral and organic) were present at each site on both the ROW and woodland. Based on thickness of the fermentation, humus, and A1 layers, the predominant humus type was designated a "thin duff mull with shallow A1" on xeric sites. On mesic areas, the humus layer was slightly thicker on the ROW than in the adjacent forest. Otherwise, organic layers on the ROW were nearly equivalent to those in the woodland, but were composed of leaves and stems of grasses, herbs, and shrubs in contrast to the tree parts (leaves, twigs, and fruit) of the forest.

Based on these limited observations, it appears that ROW construction and periodic maintenance for brush control did not materially alter the surface organic layers of the soil. Elimination of the forest cover did result in a change in kind of organic material, but regrowth and persistence of a mixed grass-herb-shrub cover has resulted in annual litter depositions and continuation of a protective organic layer.

5.1.3 Soil Erosion

Current Active Erosion Observations of active soil erosion on the ROW and adjacent woodland were made on the National Lead Line study area in July, 1976. Active sheet erosion was evident on only one area in the woodland; a 20% slope segment of Becket fine sandy loam with light moss-herb cover on a soil slump around exposed boulders. No other erosion was observed, apparently due to the protective canopy of trees and shrubs and undisturbed organic layers present on the soil. Likewise, active sheet erosion on the general ROW was limited to 2 areas of Becket soil with 25% slopes; 1 on a soil slump around boulders invaded by grass and moss and the other in a grass community. Good vegetation cover, composed primarily of grasses, with herbs and shrubs, had developed on the ROW following chemical treatments for brush control and a protective litter mulch from these plant parts was present (Table 16.2).

Other eroding areas on the ROW and woodland were identified as to location, soil type, average slope, and present plant cover (Table 16.3). Erosion was classified as to kind (sheet, rill, gully) and class (slight, moderate, severe). No gullies were observed on this study site, but the locations of 2 significant eroding areas were plotted on the base map (Map 16.1). One area consisted of an equipment cut on the ROW (Fig. 16.1.3), the sediment from which may well leave the ROW via a stream located downhill (Fig. 16.1.4). The other is an excavated area, partially on the ROW and partially in the adjacent woodland, apparently not related to ROW construction. Also plotted was a small eroding section overlooking a ponded area where animals have apparently dug for box turtle eggs in the sandy soil, exposing the loamy sand soil to wind and water erosion. Sediment from this area through sheet and rill erosion is carried to the ponded area below.

There was no restoration in the form of seeding and planting following construction of this ROW, and denuded areas are therefore dependent upon natural plant invasion. Access roads have healed and are well covered with grass.

Natural plant invasion is occurring on all eroded areas of this ROW, but apparently is hindered by the progressive sheet erosion particularly evident at the excavation and equipment cut. The soil disturbed by animals appears to be subject to renewed assaults at regular intervals and invasion has little opportunity for success. No areas of mass land movement occurred where earth slipped from large boulders, as previously noted.

5.2 Vegetation

5.2.1 Habitat and Forest Types on the Site

Hydric Habitat There are 2 hydric, or wet, habitats on this site. Hydric 2 habitat was located in a stream bottom. Slope was negligible and aspect was flat. Drainage was impeded and wet conditions developed. The forest type was Elm-Red Maple, with American elm and red maple the dominant species, with white ash.

Hydric 4 habitat was located in a ponded area, also a stream bottom. Here, too, slope was negligible and aspect flat. Drainage was impeded and marsh conditions developed. The forest type was Elm-Red Maple, with red maple and American elm the dominant species, occurring with white ash.

Mesic Habitat There are 2 mesic, or medium moist, habitats located on the site. Mesic 1 habitat was located on the lower slope of a rounded hill. Slope varied from negligible to approximately 6% on a southeast-facing slope. Drainage was free but not excessive. The forest type was Aspen-Gray Birch-Paper Birch, which included large-toothed aspen, gray birch, white pine, quaking aspen, white birch, beech, and white ash.

Mesic 5 habitat was located on the nearly level upland flat rising from a ponded area. Slope was negligible and aspect was flat for most of the habitat, but toward the northeast slope was 9% on a northeast-facing slope. Drainage was free but not excessive. The forest here was White Pine-Northern Hardwoods, consisting of white pine, red maple, black cherry, beech, red spruce, white birch, aspen, and balsam-fir.

Xeric Habitat There are 2 xeric, or dry, habitats on site 16. Xeric 3 habitat was located on a nearly level upland area. Slope was negligible and aspect was flat. Drainage was excessive. The forest type was White Pine, with red maple, white birch, aspen, and red spruce occurring.

Xeric 6 habitat was located on the middle slope of a rounded hill in an upland setting. Slope was 8% on a southeast-facing slope. Drainage was excessive. The forest type here was also White Pine, the dominant species of which were white pine, red maple, black cherry, white birch, and a few white cedar.

5.2.2 Analysis of Forest Types and Associated ROW Vegetation

General Changes in Vegetation The primary impact of the ROW was to cause a change from a forest with a 4-layered structure to a shrub-herb-grass community. Obviously, removal of the trees caused this; and what was essentially a 2-layered ROW community developed, with the shrub layer consisting of shrubs and small trees not removed by maintenance spraying, or which have arisen since the last spray application (Fig. 16.2).

In order to more completely characterize the forest types, an analysis was made on the forest plots to derive importance values for tree species (Table 16.4). Obviously, large-toothed aspen, red maple, and white pine were important species on mesic plot 1, while balsam-fir and red maple were important on mesic plot 5. White pine was an important species on xeric plots 3 and 6. No importance values were determined for the hydric plots.

On the hydric habitats, an Elm-Red Maple forest type was changed to a Willow-Sensitive Fern plant community. On mesic 1 habitat, an Aspen-Gray Birch-Paper Birch forest type was changed to a Blackberry-Goldenrod plant community, while on mesic 5 habitat, a White Pine-Northern Hardwoods forest type was changed to a Blackberry-Goldenrod plant community. On xeric 3 habitat, a White Pine forest type was changed to a Blueberry-Bracken plant community. On xeric 6 habitat, a White Pine forest type was changed to a Blackberry-Bracken plant community (Map 16.1; Table 16.5).

Quantitative Changes On mesic 1 habitat, there was no major increase in the number of shrubs and herbs on the ROW as compared to the adjacent forest (Table 16.5; Figs. 16.3 and 16.4). However, on mesic 5 habitat, there was a notable increase in the amount of shrubs and herbs on the ROW as compared to the forest; there were 9 shrub species on the ROW and 1 shrub species in the forest, and 24 herb species on the ROW and 13 herb species in the forest (Table 16.5).

On hydric 2 habitat, the amounts of shrub species were similar on and off the ROW, with 6 shrubs on the ROW and 5 in the forest; however, the herb layer had a notable difference, with 25 herbs on the ROW and 10 in the forest. On hydric 4 habitat, no major increase in the number of shrubs and herbs was apparent on the ROW as compared to the adjacent forest (Table 16.5; Figs. 16.3 and 16.4).

On xeric 3 habitat, an equal number of shrubs existed both on and off the ROW. There was a notable difference in the number of herbs in the 2 areas, with 17 herbs on the ROW as compared to 8 in the forest. On xeric 6 habitat, there was a marked increase in the number of shrubs, with 7 occurring on the ROW and only 2 in the forest. There was a similar number of herbs both on and off the ROW, with 13 on the ROW and 11 in the forest (Table 16.5; Figs. 16.3 and 16.4).

Qualitative Changes On mesic 1 habitat, 2 species from the shrub and herb layers occurred both in the forest and on the ROW; 14 species occurred in the forest but not on the ROW, and 15 species were on the ROW but not in the forest (Fig. 16.5). Two of the 14 species which occurred in the forest were shrubs, namely, hazelnut and gooseberry, and of the 15 species which occurred on the ROW, only 3 were shrubs, namely, choke-cherry, raspberry, and ground-juniper (Tables 16.6 and 16.7). On mesic 5 habitat, 4 species from the shrub and herb layers occurred both in the forest and on the ROW; 10 species occurred in the forest but not on the ROW; and 29 species appeared on the ROW but not in the forest (Fig. 16.5). Of the 10 species that occurred in the forest, all were herbs, and of the 29 species that appeared on the ROW, 8 were shrubs (Tables 16.6 and 16.7).

On hydric 2 habitat, 12 species from the shrub and herb layers occurred both in the forest and on the ROW (Fig. 16.5). Three species were present in the forest but not on the ROW, and of these, 1, gray dogwood, was a shrub (Table 16.6). Of the 19 species which occurred only on the ROW, 2 were shrubs, i.e., choke-cherry and hazelnut (Table 16.7). On hydric 4 habitat, 11 species from the shrub and herb layers occurred both in the forest and on the ROW (Fig. 16.5). Thirteen species occurred only in the forest; of these, 5 were shrubs, the most abundant of which were gray dogwood and wild-raisin, while the most abundant of the herbs were sensitive fern and royal fern (Table 16.6). Three shrubs and 11 herbs occurred only on the ROW, and most abundant of these were mixed grass, spiked loosestrife, and arrowhead (Table 16.7).

On xeric 3 habitat, 9 species from the shrub and herb layers occurred both in the forest and on the ROW; 2 species occurred in the forest but not on the ROW, and 11 species were on the ROW but not in the forest (Fig. 16.5). Of the 2 species which occurred in the forest, 1 was a shrub, namely, ground-juniper, and of the 11 species which occurred on the ROW, 1 was a shrub, i.e., raspberry (Tables 16.6 and 16.7). On xeric 6 habitat, 9 species from the shrub and herb layers occurred both in the forest and on the ROW (Fig. 16.5). Seven herbs were present only in the forest, the most abundant of which was hypnum imponens (Table 16.6). Five shrubs, namely, choke-cherry, hazelnut, hawthorn, low blueberry, and spiraea, and 9 herbs, including mixed grass, trout-lily, and spreading dogbane, were present only on the ROW (Table 16.7).

In most cases it appears that the ROW had a notable impact on the number of species in the shrub and herb layers, as they were more numerous on the ROW than in the adjacent forest. There were more shrubs in the forest on hydric 4 habitat than on the ROW, and the same amount were present both on and off the ROW on xeric 3 habitat. There was a difference in the kind and abundance of species that occupied both the forest and the ROW.

5.2.3 Analysis of Plant Communities for On-ROW Mapped Vegetation Plots

Table 16.8 presents a breakdown of major communities for hydric, mesic, and xeric sites on the National Lead Line ROW. Much of the present composition of herbacious and woody plant communities on this area reflects the spraying history.

The ROW was hand cut twice in 1944 and 1950. Since that time it has had a history of herbicide maintenance varying from basal treatments to foliar applications. The last treatment was a basal treatment with Tordon 155 in 1972.

The major plant communities now dominating the hydric, mesic, and xeric locations of the ROW are Sedge-Mixed Grass-Herb, and Mixed Grass-Herb (Table 16.8). The majority of these species are not adversely affected by herbicides and will most likely play an important role in the continued development of this ROW. Those shrubs such as hazelnut, ground-juniper, alder, spiraea, and blueberry, among others, would likely become more important in the vegetational matrix of this ROW if a more selective approach to maintenance were adopted.

5.2.4 Comparison of Forest Type with ROW Vegetation

The ROW was clear cut during the winter of 1941 and 1942 and the brush piled. The ROW was hand cut in 1944 and 1950. In 1954 it received a basal spray with 2,4-D and 2,4,5-T mixed in fuel oil. A patrol path was cleared by hand cutting in 1959. The ROW received a foliar treatment in 1960 with 2,4,5-T and water. It was treated again in 1962 using knapsack mistblowers with 2,4,5-T and water; the same treatment was applied in 1964. In 1965, from structures 82 to 84 only, a follow-up treatment with Tordon 155 was used in place of 2,4,5-T. The ROW received a dormant basal treatment, using the Tordon mixture in fuel oil applied by knapsack mistblowers. Another follow-up treatment using the same method during the growing season was applied in 1972.

On the hydric habitats, which were formerly occupied by an Elm-Red Maple forest type, a Willow-Sensitive Fern community was produced. There was a slight difference in the total number of shrub and herb species on the ROW as compared with the forest, except for the herb layer of hydric 2 habitat, where more occurred. There was a qualitative difference in shrub and herb species on the ROW as compared to the forest, with some shrubs of the forest not on the ROW, and several important shrubs of the ROW lacking, or sparse, in the forest. The same was true for herbs, i.e., some herbs of the forest were not on the ROW, while some herbs of the ROW were not in the forest.

On the mesic habitats, which were formerly occupied by an Aspen-Gray Birch-Paper Birch forest type and White Pine-Northern Hardwoods forest type, a Blackberry-Goldenrod plant community developed. There was a slight difference in the total number of shrub and herb species on the ROW as compared with the forest on mesic 1 habitat. On mesic 4 habitat, there was a notable difference in the total number of shrub and herb species on the ROW as compared to the forest. There was a qualitative difference in shrub and herb species on the ROW as compared to the forest.

The xeric habitats, which were formerly occupied by a White Pine forest type, a Blueberry-Bracken plant community evolved. On xeric 3 habitat, the number of shrubs were similar both on and off the ROW, while there was a notable difference in the number of shrubs on xeric 6 habitat, although the number of herbs were similar.

5.3 Wildlife

The major game species for site 16, National Lead Line, were determined by Asplundh Environmental Services (AES) in conjunction with the New York State Department of Environmental Conservation (DEC). These species are ruffed grouse, muskrat, and beaver.

5.3.1 Actual use

Ruffed Grouse On April 21, 1976, from 5:30 a.m. to 7:00 a.m., a ruffed grouse drumming count was made at study area 16. The weather was clear, with no wind, and a temperature of 45 F.

One bird was noted drumming in the woods to the southwest of the ROW, south of structure 84, beyond the ROW on the southwest side of a large swamp. The bird was drumming at the edge of the swamp, in the adjacent woods.

Another drumming count was made on May 13, 1976, from 6:30 a.m. to 7:30 a.m. The weather was clear and calm with a temperature of 65 F. One bird was noted drumming in the same location as that of April 31, 1976.

In addition, 1 grouse had been flushed from the south edge of the ROW during the summer of 1975.

Muskrat Two muskrat paths were found in the bank of the stream near hydric plot 4 off the ROW. These paths appeared to be in active use. No other muskrat activity was noted.

Beaver Past beaver activity was noted toward the east of the study area, in and around the large marshy area between structures 84 and 85. Many stumps, mainly of aspen, remained from beaver activity in the area east of structure 84, in the summer of 1975.

Miscellaneous Wildlife Observations Various birds were seen and/or heard on the study area throughout the period of this study. Birds observed on the ROW and on the ROW edge are included in Table 16.9. During the summer of 1975, a yellowthroat's nest with fledglings was found on the ROW. A shoveler was observed flying across the ROW between structures 84 and 85 at this time. During the spring of 1976, great horned owl castings were found on the ROW at the foot of structure 84. The diversity of species may be attributed in part to the ecotone which is created due to the presence of the ROW.

Some field mice were seen scampering for "escape cover" on the ROW near structure 83 during the summer of 1975.

Various snakes were seen during the summer of 1975, and spring and summer of 1976. These snakes were observed in various activities, i.e., feeding, hunting, and sunning. Ribbon snakes, black snakes, green snakes, and northern water snakes were those observed during the study period.

White-tailed deer activity was slight to moderate throughout the entire ROW as evidenced by tracks, pellets, and browse during all visitations, except during the winter months. One deer bed was found in the wet area near hydric plot 1 during the summer of 1976.

One coyote scat was found off the ROW on the road parallel to the ROW near the marshy area between structures 84 and 83 in the summer of 1976.

Various frog activity was noted during the summer and fall of 1975. Bull frogs were heard and seen singing and feeding near the stream near structure 83 during the summer of 1975. One toad was observed jumping on the south edge of the ROW in the fall of 1975.

Preyed turtle nests were observed during all seasons of the year, except during the winter months, in the sandy soils near structure 84 (Fig. 16.1.5).

Crayfish activity was moderate on the ROW near the large stream at structure 84 during the summer of 1975. Also, 1 crayfish carcass was found in the same area during the spring of 1976.

One woodchuck was observed feeding off the ROW in an open meadow south of the ROW.

5.3.2 Potential Use

Potential wildlife use of the plant species present on site 16 for the 3 major game species, grouse, muskrat, and beaver, is contained in Table 16.10. In addition to asterisk ratings from New York, asterisk ratings from Pennsylvania were included for those plant species present on the study area that were not rated in the New York evaluation for grouse. This additional data should provide supplemental information to the ROW manager regarding those plant species that may be of potential value to those game species.

5.4 Water

Putnam Creek and a tributary were sampled for water quality on October

1, 1975, and February 19, May 13, and August 4, 1976 (Table 6, General Methods; Map 16.1).

5.4.1 Stream Description and Sampling Points

Putnam Creek is located in the Lake Champlain Basin. The creek generally flows north, but meanders on site 16. Gradient is less than 0.3% and the creek enters Penfield Pond about 0.2 miles north of the ROW. The creek is a third-order stream in the study area.

Sampling locations were sited as follows:

1. 100 yards upstream, south, of the ROW;
2. north of the ROW;
3. mid-ROW;
4. on a tributary 25 yards upstream, south, of the ROW;
5. 100 yards downstream, north, of the ROW (Map 16.1).

Substrate varies from boulders, rubble, and gravel upstream to gravel, sand, silt, and organic material downstream (Environmental Protection Agency, 1973). The substrate at location 4 is composed of organic material.

Upstream, rocks and pools, and downstream, vegetation trap sediment.

Upstream of the ROW the creek is well shaded by mixed hardwoods and evergreens. An open field is present upstream of location 2. Location 2 is off the ROW and the adjacent woods partially shade the stream. Near location 2 and continuing to Penfield Pond the creek traverses a marsh. Limited shading is provided by aquatic vegetation, and by herbs and scattered shrubs on the banks.

The tributary entering Putnam Creek between locations 3 and 5 is well shaded upstream of the ROW. On the ROW the stream flows through a pond believed to be the site of an abandoned beaver pond and a marsh before entering the creek. In the pond, aquatic plants and herbs and shrubs at the periphery furnish shade.

The character of Putnam Creek changes in the study area; it is swift and turbulent upstream of location 3 and deeper and slower downstream.

The creek and adjacent land is utilized by wildlife, anglers, and hunters. The New York Department of State "official classification" of Putman Creek and tributaries in the study area is Class C (T), Fishing (Trout Water).

5.4.2 Analysis of Water Quality

Site 16 was sampled on October 1, 1975 (Fig. 16.1.6), from 12:30 to 4:00 p.m.; the air temperature was 21 C and it was partly cloudy (Table 16.11). Depth at locations 1 through 5 was 15, 15, 72, 8, and 8 inches, and width was 26.0, 40.0, 30.0, 8.0, and 45.0 feet, respectively. Water temperature increased from 13.0 C at locations 1 and 2 to 13.5 C at locations 3 and 5. Water temperature at location 4 was 11.6 C. Dissolved oxygen concentration and percent saturation at locations 1, 2, 3, and 5 ranged from 10.5 to 11.3 ppm and 106 to 114%, respectively. At location 4, dissolved oxygen concentration was 11.7 ppm and the percent saturation was 114%. The pH was 5.0 at all locations. Sediment stakes were set at all locations.

Sampling was conducted during rain on February 19, 1976, from 12:40 to 1:45 p.m.; the air temperature was 2 C (Table 16.11). Ice covered the creek at locations 2, 3, and 5. Samples were not taken at location 4 because the stream was frozen solid. Water temperature was 0.0 C. Dissolved oxygen concentration and percent saturation ranged from 12.9 to 13.9 ppm and 96 to 102%, respectively. The pH was 6.5 at all locations.

Sampling was conducted on May 13, 1976, from 11:00 a.m. to 12:05 p.m.; it was sunny and the air temperature ranged from 22 to 24 C (Table 16.11). The water was clear following recent rain. Depth at locations 1 through 5 was 18, 17, 72, 10, and 60 inches, and width was 27.0, 41.5, 30.0, 28.0, and 45.0 feet, respectively. Water temperature was 10.0 C at location 1, 2, and 3, 10.8 C at location 5, and 12.0 C at location 4. Dissolved oxygen concentration ranged from 10.0 ppm at location 4 to 10.3 ppm at locations 1 and 2. Percent saturation ranged from 96% at location 3 to 100% at location 4. The pH ranged from 6.2 at locations 1 and 2 to 6.9 at location 4. The sediment stake was absent at location 1. No sediment was found at locations 2, 3, and 5. Ten inches of sediment, predominantly organic material, was measured at location 4.

On August 4, 1976, sampling was conducted from 12:20 to 1:40 p.m. (Table 16.11). It was sunny and the air temperature ranged from 23 to 24 C. Depth at locations 1 through 5 was 14, 17, 72, 12, and 48 inches, and width was 33.0, 38.0, 30.0, 8.0, and 45.0 feet, respectively. Water temperature was 17.0 C at locations 1 and 2, 18.0 C at locations 3 and 5, and 16.0 C at location 4. Dissolved oxygen concentration and percent saturation at locations 1, 2, 3, and 5 ranged from 8.4 to 9.3 ppm and 96 to 105%, respectively. At location 4, dissolved oxygen concentration was 9.9 ppm and percent saturation was 107%. The pH ranged from 5.8 at location 3 to 6.1 at locations 1 and 4. Sediment stakes were absent at location 1, 2, 4, and 5. No sediment was present at location 3.

5.5 Land Use

5.5.1 Location

Site 16 is located in a rural nonfarm section of the town of Ticonderoga, Essex County, New York. Between 1960 and 1970 there was a 1.9% decrease in population of Essex County with a 1970 distribution of 75.6% rural nonfarm, 22.0% urban, and 2.4% rural farm (U.S. Bureau of the Census, 1972). The closest community is Ironville which is approximately 2 miles to the north.

5.5.2 Land Use Near The Time of Construction

The ROW was constructed during 1941. Data prior to this date was unavailable. The earliest available data obtained from 1953 USGS Quadrangle Map indicates that the adjacent land to the ROW was primarily rural nonfarm (Table 16.12; Fig. 16.6). Land use distribution included the following subtypes:

Forest Land:
- Fc - Forest brushland
- Fn - Forest lands

Water Resources:
- Wn - Natural ponds and lakes
- Wb - Marshes, shrub wetlands, and bogs
- Ww - Wooded wetlands

5.5.3 Land Use After Construction

The adjacent land use to site 16 has not changed from the 1953 data. The land adjacent to the ROW is still rural nonfarm with the same land use distribution described above prior to construction (Section 5.5.2; Table 16.12; Fig. 16.6).

In addition to use of the ROW for the transmission of electrical power, portions of the ROW are currently being used for hunting and fishing.

6 Evaluation, Interpretation, and Summary of Results

6.1 Conditions Which Existed Prior to Establishment of the ROW

Soil, water, vegetation, and wildlife habitat conditions existing prior to ROW construction were based on observations made during the period of this study on adjacent undisturbed forest areas on both sides of the ROW.

6.1.1 Soils

This site is situated on undulating to hilly terrain in the eastern Adirondack Mountains. Surficial geology is glacial till and outwash overlying gneiss, marble, granite, and quartzite bedrock. Slopes range from 0 to 25% with northwest and southeast exposures. Surface mineral soils are strongly acid, pH 4.9 to 5.8. Four soil types, 3 Spodosols and 1 Entisol, present on the study area include well-drained Becket fine sandy loam and moderately well-drained Peru loam, which occur on gentle to steeply sloping till plains and drumlins; excessively drained Windsor loamy sand that formed in sandy outwash terraces on nearly level to gently rolling areas; and, poorly drained Rumney silt loam that developed in alluvial flood plains and depressions. Both Becket and Peru soils exhibit slowly permeable fragipans at depths of 36 and 23 inches, respectively, in their profiles.

Physical features, such as geology, soil types, and moisture regimes of the bordering forest, likely represent conditions at the time of ROW construction in 1941 to 1942. The excessively drained Windsor and steep-slope phase Becket soils are typically dry habitats rated low to moderate for timber production and on this site supported a White Pine forest type. The lower-slope phases of Becket soil express higher soil moisture relations associated with moist habitats and on this site supported mixed hardwood and conifer species of moderate productivity. The poorly drained Rumney soil, which has a high water table typical of hydric sites, is rated moderate for timber production and supported an Elm-Red Maple forest.

The forest floor consisted of tree litter, fermentation, and humus layers, collectively averaging 1.1 inches thick, on both mesic and xeric habitats. Soil incorporated organic mater (A1 horizon), however, was deeper on mesic than on xeric areas, 1.0 and 0.6 inches, respectively. The predominant humus type on both upland habitats was a "thin duff mull". The only active erosion noted in the undisturbed forest was moderate sheet erosion on a 20% slope of Becket fine sandy loam in a soil-slump around exposed boulders.

6.1.2 Vegetation

Most of this study area was forest land at the time of ROW establishment in 1941 to 1942. However, one section near the county road was in brushland, and hydric areas included a wet meadow.

On hydric sites, the wetlands contained scattered woody plants. These included willows, red osier dogwood, elderberry, red maple, and serviceberry. Xeric sites and some mesic sites supported stands of the white pine type. Red maple, black cherry, white birch, and balsam-fir were associates of these stands. Other mesic sites contained stands of the Aspen-Gray Birch-Paper Birch type.

6.1.3 Wildlife

Wildlife, being mobile species which may or may not be observed during site visitation, were reasonably imputed to this area by the composition of the forested areas adjacent to the ROW. It can be assumed that those species that currently utilize the site, i.e., ruffed grouse, muskrat, and beaver, utilized the habitat before ROW construction. Even though the presence of the ROW may influence current wildlife activity, it is likely that those species, designated by the DEC in conjunction with AES as major in this area, inhabited the vicinity prior to ROW construction. The degree of use is impossible to determine at this time.

6.1.4 Water

No information is available.

6.1.5 Land Use

The earliest data available near the time of construction of the ROW in 1941 is a 1953 USGS Quadrangle Map. The ROW and adjacent land area was rural nonfarm with land use distribution of forest land (91.3%) and water resources (8.7%).

6.2 Conditions Which Exist at Present

6.2.1 Soils

Soil types and associated parent material and relief conditions described for the general study area in Section 6.1.1 also were present on the ROW. Moisture regimes and dominant plant cover on the ROW were related to existing soil types. Xeric habitats occurred on well to excessively drained Windsor and steep-slope, more exposed, phases of Becket soils with sandy loam and loamy sand textures. Mesic sites occurred on the lower-slope phase of Becket sandy loam and on Peru loam; both soils possess firm pans in the subsoil that impede subsurface drainage and result in higher moisture conditions. Hydric habitats were associated with Rumney silt loam which has a seasonal water table at or near the soil surface.

Organic mulch from grass, herb, and shrub remains on the ROW was composed of litter, fermentation, and humus layers 1.8 and 1.2 inches thick on mesic and xeric sites, respectively. The predominant humus type was a "thin duff mull", with shallow A1 on mesic and very shallow A1 on xeric areas.

Slight to moderate sheet erosion was evident in 2 areas of Becket fine sandy loam with 25% slopes on the general ROW, 1 on a soil-slump around boulders and the other in grass cover. Moderate to severe sheet and rill erosion also occurred in 3 disturbed areas with light sandy soil on the ROW: an equipment cut, excavation on the ROW-forest edge, and a bank above the ponded area exposed by animal digging. Some sediment from erosion on disturbed areas was transported and deposited into the pond and stream crossing the ROW.

6.2.2 Vegetation

The present vegetation on hydric sites consists primarily of low herbaceous communities. Prominent plants are ostrich-fern, sensitive fern, sedges, and blue-joint grass. The scattered woody species include hazelnut, choke-cherry, willows, American hornbeam, and serviceberry.

On mesic sites the major herbaceous community is Mixed Grass-Herb. Small areas of bracken, hazelnut, and hay-scented fern are present. Some woody species are invading these communities. These include choke-cherry, hazelnut, quaking aspen, and large-toothed aspen.

Xeric sites are dominated by mixed grasses and herbs. Ground-juniper covers large areas, and hazelnut and choke-cherry are also invading. The largest number of woody plants occurs in the Blackberry-Mixed Grass-Herb community, where red maple, quaking aspen, and choke-cherry are seeding into this community.

6.2.3 Wildlife

Ruffed grouse, muskrat, and beaver are the major game species that probably currently utilize the study area. A ruffed grouse drumming count, made in the spring of 1976, revealed 1 bird drumming in the adjacent interior woods. In addition, 1 grouse was flushed from the ROW edge in the summer of 1975.

Indirect observations of muskrat activity, i.e., paths in the bank near the ponded area on the ROW, apparently currently in use, evidenced that species' presence on the ROW. Evidence of past beaver activity in the same vicinity in the form of aspen stumps was noted. No current activity was observed.

A variety of other animals were noted, directly or indirectly, to be utilizing either the ROW, the adjacent forest, or both. Potential wildlife use is evident from plant species present on the site.

6.2.4 Water

Putnam Creek and a smaller tributary were studied on the National Lead Line ROW. Approximately 600 feet of Putnam Creek and 150 feet of the tributary are located on the ROW. Both streams are well shaded by overstory vegetation upstream of the ROW. Once Putnam Creek enters the ROW, shading is limited to herbs and shrubs that border the Creek. The small tributary is shaded by herbs, scattered shrubs, and aquatic vegetation on the ROW. In Putnam Creek substrate varies from predominantly boulders, rubble, and gravel, to gravel, sand, and silt and organic material downstream. The substrate at location 4 is predominantly organic material. Fish were observed in the study area and turtle eggs and nests were observed on a sandy slope between locations 4 and 5.

Difference in water temperature between upstream and downstream locations ranged from 0.0 to 1.0 C. Water temperature at location 4 differed from creek temperature by 2.0 C or less. Water in this tributary was not consistently warmer or colder than that in the creek.

Dissolved oxygen concentration and percent saturation were greater than 8.3 ppm and 95% during this sampling program, indicating good water quality.

The pH ranged from 5.0 to 6.9, indicating the stream was acidic.

Sediment resulting from erosion on the ROW was not observed.

6.2.5 Land Use

Presently, the adjacent land uses to site 16 have not changed from the 1953 data. The land adjacent to the ROW is still considered to be rural nonfarm. In addition to use of the ROW for the transmission of electrical power, portions of the ROW are currently being used for hunting and fishing.

6.3 Environmental Effect and Probable Causes

6.3.1 Soils

Effects of ROW management on soils of this site were minimal, limited to sheet and rill erosion on disturbed areas resulting from an equipment cut and excavation and 1 steep slope portion of the general ROW in fine sandy loam with grass cover. Portions of these areas are being invaded by grass and herbs, but stabilization is retarded by continuing erosion. Some additional erosion occurred on a soil slump around exposed boulders and slope disturbed by animal digging; however, neither of these are related to ROW management activities. Access roads were well stabilized by natural grass cover. Some sediment from erosion on disturbed areas was deposited in the stream and pond on the ROW.

Organic layers on the ROW were equivalent to those in the bordering forest on xeric sites, and slightly thicker than comparable layers in the forest on mesic sites. Likewise, the characteristic "thin duff mull" humus type on the ROW was similar to that in the forest. The only difference was in origin of litter deposits, i.e., leaves and stems of grasses, herbs, and shrubs on the ROW versus tree parts in the forest.

6.3.2 Vegetation

The frequent broadcast herbicide treatments (1954 to 1962) and selective applications (1964 to 1971) have resulted in plant communites dominated by low herbaceous vegetation. Grasses and forbs are the major plant, and few woody species have survived the herbicide sprayings. Since the last herbicide treatment (1971) some woody species have invaded, particularly on xeric sites.

6.3.3 Wildlife

The presence of the ROW has encouraged the development of many different plant species, mainly light-loving, on the ROW proper, thus enhancing the habitat for wildlife use. The ecotone created by the presence of the ROW often produces a greater variety and density of life than is found otherwise (Leopold, 1936), and this phenomenon has been termed the "edge effect" (Smith, 1974).

6.3.4 Water

Maximum increase of 1.0 C in water temperature at downstream locations probably resulted from solar heating both on and off the ROW.

Sedimentation at location 4 was probably caused by reduced current velocity in the pond.

<u>Line Management Factors</u> Shading by overstory vegetation was limited on the ROW.

<u>Other Influences</u> None were noted.

6.3.5 Land Use

Based on the data obtained, the presence of the ROW had had no identifiable effect on the adjacent land uses.

Table 16.1. Soil series present on the National Lead Line study area.

Soil Series	Map Symbol[1]	Drainage Class[2]	Surface Soil pH	Surface Soil Texture	Woodland Suitability Group
Becket	BeA	G	4.9	fine sandy loam	4o1
Becket	BeB	G	4.9	fine sandy loam	4o1
Becket	BeC	G-E	4.9	fine sandy loam	4r1
Peru	PuA	MG	5.4	loam	3o
Rumney	RhA	SPD-PD	5.8	silt loam	4w1
Windsor	WnA	G-E	5.4	loamy sand	5s1
Windsor	WnB	G-E	5.4	loamy sand	5s1

[1] The third letter of the map symbol designates slope class:
A = 0-8%, B = 8-15%, C = 15-25%, D = 25-35%, E = 35-50%, F = 50-70%.

[2] Drainage Class: VPD = very poorly drained, PD = poorly drained, SPD = somewhat poorly drained, ID = imperfectly drained, MG = moderately good, G = good, E = excellent, (excessive).

Table 16.2. Average thickness of organic layers and A1 horizon and humus types for mesic and xeric sites on ROW and adjacent woodland of site 16.

Moisture Regime	Location	Layer Thickness (in.) L	F	H	A1	Humus Type
1. Mesic (1)[1]	ROW	.8	.2	.7	1.0	Thin duff mull with shallow A1
	Woodland	.6	.1	.3	.9	Thin duff mull with very shallow A1
2. Mesic	ROW	.8	.2	.8	1.0	Thin duff mull with shallow A1
	Woodland	.7	.1	.3	1.0	Thin duff mull with shallow A1
All Mesic Plots Combined	ROW	.8	.2	.8	1.0	Thin duff mull with shallow A1
	Woodland	.7	.1	.3	1.0	Thin duff mull with shallow A1
3. Xeric (3)	ROW	.4	.2	.4	.7	Thin duff mull with very shallow A1
	Woodland	.3	.1	.1	.2	Thin duff mull with very shallow A1
4. Xeric (5)	ROW	.3	.2	.7	1.3	Thin duff mull with shallow A1
	Woodland	.4	.5	.7	.4	Thick duff mull with very shallow A1
5. Xeric (6)	ROW	.7	.1	.5	1.3	Thin duff mull with shallow A1
	Woodland	.5	.2	.4	1.3	Thin duff mull with shallow A1
All Xeric Plots Combined	ROW	.5	.2	.5	.7	Thin duff mull with very shallow A1
	Woodland	.4	.3	.4	.6	Thin duff mull with very shallow A1

[1] Samples taken at vegetation study plots, the numbers of which are indicated by figures in parentheses.

Table 16.3. Areas exhibiting active erosion in July, 1976, on the National Lead Line ROW study area.

Location	Soil Type	Average Slope (%)	Plant Cover	Erosion on Site Kind	Erosion on Site Class	Erosion on Site Gully Depth (in.)
		ROW				
General ROW	Becket fine sandy loam	25	Grass	Sheet	Slight	-
General ROW	Becket fine sandy loam	25	Bare-grass-moss	Sheet	Moderate	-
Equipment Cut	Becket fine sandy loam	30	Bare-grass-herb	Sheet	Severe	-
Excavation	Windsor loamy sand	8	Bare-grass	Sheet & Rill	Moderate	-
Disturbance by Digging Animals	Windsor loamy sand	6	Bare-grass	Sheet & Rill	Moderate	-
		FOREST				
General Forest	Becket fine sandy loam	20	Bare-moss-herb	Sheet	Moderate	-
Excavation	Windsor loamy sand	8	Bare-grass	Sheet & Rill	Moderate	-

Table 16.4. Importance value of trees in the upper tree layer in the forest adjacent to the ROW.

Site	Species	Relative Dominance Basal Area (% of total) 1	Relative Density (% of total) 2	Importance Value 1+2
Mesic 1	Large-toothed Aspen	36.11	38	74.11
	Red Maple	30.64	31	61.64
	White Pine	29.82	15	44.82
	Beech	2.89	13	15.89
	White Birch	.54	3	3.54
Hydric 2	No importance values were determined for plot 2.			
Xeric 3	White Pine	87.50	50	137.50
	Quaking Aspen	11.40	40	51.40
	White Birch	1.10	10	11.10
Hydric 4	No importance values were determined for plot 4.			
Mesic 5	Balsam-Fir	43.30	30	73.30
	Red Maple	33.52	25	58.52
	Large-toothed Aspen	9.85	18	27.85
	White Cedar	5.25	9	14.25
	White Birch	3.74	9	12.74
	Black Cherry	4.21	6	10.21
	Beech	.13	3	3.13
Xeric 6	White Pine	87.18	67	154.18
	White Cedar	10.75	21	31.75
	Black Cherry	1.92	9	10.92
	Red Maple	.15	3	3.15

Table 16.5. Comparison of species composition, abundance and sociability (A.S.) in the tree, shrub, and herb layers, in the adjacent forest and on the ROW, on hydric, mesic, and xeric habitats.

Species	Mesic (1)		Hydric (2)		Xeric (3)		Hydric (4)		Mesic (5)		Xeric (6)	
	Forest A.S.	ROW A.S.	Forest A.S.	ROW A.S.	Forest A.S.	ROW A.S.	Forest A.S.	ROW A.S.	Forest A.S.	ROW A.S.	Forest A.S.	ROW A.S.
Tree Layer												
Red Maple	1.1	-	1.1	-	-	-	1.1	-	2.1	-	++.1	-
Beech	+.1	-	-	-	-	-	-	-	++.1	-	-	-
White Pine	+.1	-	-	-	1.1	-	-	-	-	-	2.1	-
Large-toothed Aspen	1.1	-	-	-	-	-	-	-	1.1	-	-	-
White Birch	++.1	-	-	-	++.1	-	(+.1)	-	+.1	-	-	-
American Elm	-	-	1.1	-	-	-	2.1	-	-	-	-	-
Black Walnut	-	-	+.1	-	-	-	-	-	-	-	-	-
White Ash	-	-	+.1	-	-	-	+.1	-	-	-	-	-
Quaking Aspen	-	-	-	-	1.1	-	-	-	-	-	-	-
Basswood	-	-	-	-	-	-	+.1	-	-	-	-	-
Hemlock	-	-	-	-	-	-	(+.1)	-	-	-	-	-
Black Cherry	-	-	-	-	-	-	-	-	+.1	-	+.1	-
Balsam-Fir	-	-	-	-	-	-	-	-	2.1	-	-	-
White Cedar	-	-	-	-	-	-	-	-	+.1	-	1.1	-
No. Species	5	0	4	0	3	0	6	0	7	0	4	0
Shrub Layer												
Hazelnut	2.4	-	-	2.3	-	-	-	-	-	1.3	-	1.1
Gooseberry	++.1	-	-	-	-	-	-	-	-	-	-	-
Raspberry	-	+.1	-	-	-	+.1	++.1	1.1	-	2.2	-	-
Ground-Juniper	-	(1.3)	-	-	+.2	-	-	-	-	-	3.4	3.4
Choke-Cherry	-	2.1	-	3.1	2.1	2.1	-	-	-	2.2	-	1.3
Common Alder	-	-	2.3	1.3	-	-	1.3	+.1	-	-	-	-
Willow spp.	-	-	1.3	1.1	-	-	3.3	1.3	-	-	-	-
Gray Dogwood	-	-	+.3	-	-	-	2.2	-	-	+.1	-	-
Red Osier Dogwood	-	-	(+.2)	1.3	-	-	+.3	1.1	-	-	-	-
Blackberry	-	-	-	-	2.1	+.1	-	+.1	-	+.1	++.1	2.3
Spiraea	-	-	-	-	-	-	1.2	+.1	-	1.2	-	++.1
Virgin's-bower	-	-	1.1	+.1	-	-	-	-	-	-	-	-

Table 16.5. Continued

Species	Mesic (1)		Hydric (2)		Xeric (3)		Hydric (4)		Mesic (5)		Xeric (6)	
	Forest A.S.	ROW A.S.	Forest A.S.	ROW A.S.	Forest A.S.	ROW A.S.	Forest A.S.	ROW A.S.	Forest A.S.	ROW A.S.	Forest A.S.	ROW A.S.
Wild-raisin	-	-	-	-	-	-	1.3	-	-	-	-	-
Winterberry	-	-	-	-	-	-	+.4	-	-	-	-	-
Arrow-wood	-	-	-	-	-	-	(+.3)	-	-	-	-	-
Smooth Sumac	-	-	-	-	-	-	-	1.1	-	-	-	-
Elderberry	-	-	-	-	-	-	-	+.1	-	-	-	-
Low Blueberry	-	-	-	-	-	-	-	-	++.2	1.3	-	++.2
Virginia Creeper	-	-	-	-	-	-	+.2	-	-	-	-	-
Hawthorn	-	-	-	-	-	-	-	-	-	+.1	-	1.1
Teaberry	-	-	-	-	-	-	-	-	-	2.3	-	-
No. Species	2	3	5	6	3	3	10	8	1	9	2	7

Trees in the Shrub Layer

Species	Mesic (1) Forest A.S.	Mesic (1) ROW A.S.	Hydric (2) Forest A.S.	Hydric (2) ROW A.S.	Xeric (3) Forest A.S.	Xeric (3) ROW A.S.	Hydric (4) Forest A.S.	Hydric (4) ROW A.S.	Mesic (5) Forest A.S.	Mesic (5) ROW A.S.	Xeric (6) Forest A.S.	Xeric (6) ROW A.S.
Red Maple	3.1	-	1.1	++.1	1.1	-	1.1	++.1	4.1	-	1.1	++.1
Beech	3.1	-	-	-	-	-	-	-	+.1	-	-	-
White Ash	2.1	-	+.1	++.1	-	-	+.1	-	-	-	-	++.1
American Elm	++.1	-	1.1	-	-	-	1.1	-	-	-	-	-
Balsam-Fir	++.1	-	-	-	-	-	-	-	3.1	-	-	-
White Cedar	++.1	++.1	-	-	-	-	-	-	-	-	+.1	-
Basswood	++.1	-	-	-	-	-	+.1	-	-	-	-	-
Black Cherry	1.1	-	-	-	-	-	-	-	-	-	2.1	-
Alternate-leaved Dogwood	1.2	-	-	-	-	-	-	-	1.1	-	-	-
Large-toothed Aspen	-	1.1	+.1	-	-	-	-	-	-	-	-	-
Quaking Aspen	-	+.1	-	-	3.1	1.1	-	-	-	2.2	-	2.2
Serviceberry	-	+.1	-	1.3	-	-	-	-	++.1	1.3	-	-
Black Walnut	-	-	-	+.1	-	-	-	-	-	-	-	-
White Pine	-	-	-	++.1	2.1	-	-	-	-	+.1	-	+.1
Red Spruce	-	-	-	-	1.1	-	-	-	+.1	++.1	-	-

Table 16.5. Continued

Species	Mesic (1) Forest A.S.	Mesic (1) ROW A.S.	Hydric (2) Forest A.S.	Hydric (2) ROW A.S.	Xeric (3) Forest A.S.	Xeric (3) ROW A.S.	Hydric (4) Forest A.S.	Hydric (4) ROW A.S.	Mesic (5) Forest A.S.	Mesic (5) ROW A.S.	Xeric (6) Forest A.S.	Xeric (6) ROW A.S.
Gray Birch	-	-	-	-	-	++.1	-	-	-	++.1	-	-
Hemlock	-	-	-	-	-	-	(+.1)	-	-	-	-	-
Pin-Cherry	-	-	-	-	-	-	-	-	-	-	-	3.3
Apple	-	-	-	-	-	-	-	-	-	++.1	-	-
Yellow Birch	-	-	-	-	-	-	-	-	-	++.1	-	-
Red Oak	-	-	-	-	-	-	-	-	-	++.1	-	-
Flowering Dogwood	-	-	-	-	-	-	-	-	-	++.1	+.2	-
No. Species	9	4	4	5	4	2	5	1	6	9	4	5
Herb Layer[1]												
Wild-Lily-of-the-valley	4.1	-	-	-	-	-	-	-	4.1	1.3	1.1	-
Hypnum imponens	+.2	-	-	-	-	-	-	-	-	-	2.2	-
Lady-Fern	++.2	-	-	1.2	-	-	-	-	-	-	-	-
Marginal Shield-Fern	+.2	-	-	-	-	-	-	-	+.2	-	+.2	-
Purple Trillium	+.2	-	-	(++.1)	-	-	-	-	-	-	-	-
Barren Strawberry	+.2	-	-	+.2	-	-	-	-	-	-	-	-
Mixed Grass	+.2	5.5	-	2.2	2.2	3.3	-	3.3	-	3.4	-	3.5
Sedge	+.2	-	1.2	2.4	-	-	3.2	3.5	1.2	1.2	+.2	1.2
American Dog-Violet	1.2	-	-	+.2	-	-	-	+.2	-	(++.2)	-	-
Long-spurred Violet	2.2	-	-	-	-	-	-	-	-	-	-	-
Solomon's-seal	1.1	-	-	-	-	-	-	-	2.1	-	-	-
Trout-Lily	+.1	-	-	2.1	-	-	-	-	-	-	-	3.1
Strawberry	+.2	+.2	-	-	1.2	1.2	-	+.3	-	3.4	1.2	+.2
Spreading Dogbane	-	2.1	-	-	-	2.2	-	-	-	2.4	-	2.1
Bracken	-	1.1	-	-	-	-	-	-	1.3	++.1	+.2	+.1
Goldenrod	-	1.2	-	1.3	-	1.2	-	-	-	2.3	-	-
Aster spp.	-	1.2	-	2.3	-	1.3	-	-	-	-	-	-
St. John's-wort	-	++.1	-	-	-	2.2	-	1.3	-	-	-	-

Table 16. 5. Continued

Species	Mesic (1) Forest A.S.	Mesic (1) ROW A.S.	Hydric (2) Forest A.S.	Hydric (2) ROW A.S.	Xeric (3) Forest A.S.	Xeric (3) ROW A.S.	Hydric (4) Forest A.S.	Hydric (4) ROW A.S.	Mesic (5) Forest A.S.	Mesic (5) ROW A.S.	Xeric (6) Forest A.S.	Xeric (6) ROW A.S.
Whorled Loosestrife	-	+.1	-	-	-	-	-	-	-	-	-	-
Black-eyed Susan	-	++.1	-	-	-	++.1	-	-	-	++.1	-	-
Wild Cranesbill	-	+.2	-	1.2	-	-	-	-	-	+.2	-	-
Ox-eye-Daisy	-	1.2	-	2.2	-	1.2	-	-	-	++.1	-	-
Yarrow	-	1.1	-	-	+.2	1.2	-	-	-	+.2	-	1.2
Mint	-	+.1	-	-	-	-	-	-	-	-	-	-
Sensitive Fern	-	-	3.2	4.2	-	-	2.2	-	-	-	-	-
Blue-joint Grass	-	-	1.4	3.4	-	-	1.3	1.3	-	-	-	-
False Hellebore	-	-	1.2	2.1	-	-	+.1	-	-	++.2	-	-
Spiked Loosestrife	-	-	4.4	1.1	-	-	-	2.4	-	-	-	-
Bloodroot	-	-	-	(++.1)	-	-	-	-	-	(1.3)	-	-
Iris sp.	-	-	-	+.3	-	-	-	-	-	-	-	-
Large-flowered Bell-wort	-	-	-	+.3	-	-	-	+.1	-	-	1.2	+.3
Marsh-Fern	-	-	1.2	1.2	-	-	1.2	-	-	-	-	-
Ostrich-Fern	-	-	2.2	1.2	-	-	-	-	-	-	-	-
Early Meadow-Rue	-	-	1.1	1.1	-	-	+.1	+.2	-	-	-	-
Rue-Anemone	-	-	-	+.1	-	-	-	-	-	-	-	-
Toothwort	-	-	-	1.1	-	-	-	-	-	-	-	-
Yellow Loosestrife	-	-	-	+.1	-	-	-	-	-	1.1	-	-
Fringed Loosestrife	-	-	-	2.1	-	-	-	-	-	-	-	-
Milkweed	-	-	1.1	-	3.1	1.1	-	-	-	-	-	-
Rough Bedstraw	-	-	1.2	-	-	-	1.2	-	-	-	-	-
Poverty-Grass	-	-	-	-	2.2	2.2	-	-	-	-	-	2.2
Common Cinquefoil	-	-	-	-	1.2	+.2	-	-	-	-	-	+.2
Field Cat's-foot	-	-	-	-	1.2	+.3	-	-	-	-	-	(+.2)
Common Mullein	-	-	-	-	+.1	-	-	-	-	-	-	++.2
Bouncing-Bet	-	-	-	-	-	1.3	-	-	-	-	-	-
Hair-cap Moss	-	-	-	-	-	1.2	-	-	-	+.4	+.2	-
Common Vetch	-	+.1	-	-	-	1.3	-	-	-	-	-	-
Horsetail	-	-	-	-	-	1.3	-	-	-	-	-	-
Arrowhead sp.	-	-	-	-	-	-	-	2.2	-	-	-	-

Table 16.5. Continued

Species	Mesic (1)		Hydric (2)		Xeric (3)		Hydric (4)		Mesic (5)		Xeric (6)	
	Forest A.S.	ROW A.S.	Forest A.S.	ROW A.S.	Forest A.S.	ROW A.S.	Forest A.S.	ROW A.S.	Forest A.S.	ROW A.S.	Forest A.S.	ROW A.S.
Joe-Pye-weed	-	-	-	-	-	-	1.3	2.4	-	-	-	-
Royal Fern	-	-	-	-	-	-	1.3	-	-	-	-	-
Skullcap sp.	-	-	-	-	-	-	++.1	-	-	-	-	-
Spotted Touch-me-not	-	-	-	-	-	-	+.1	-	-	-	-	-
American Marsh-Pennywort	-	-	-	-	-	-	+.2	-	-	-	-	-
Boneset	-	-	-	-	-	-	(+.2)	2.5	-	-	-	-
Square-stemmed Monkey flower	-	-	-	-	-	-	-	+.1	-	-	-	-
Bullhead-lily	-	-	-	-	-	-	-	1.2	-	-	-	-
Interrupted Fern	-	-	-	-	-	-	-	1.3	-	-	-	-
Pondweed sp.	-	-	-	-	-	-	+.2	1.1	-	-	-	-
Stonecrop sp.	-	-	-	-	-	-	-	++.2	-	++.2	-	-
Ground-Pine	-	-	-	-	-	-	-	-	2.2	-	-	-
Tree Club-moss	-	-	-	-	-	-	-	-	+.1	-	-	-
Partridge-berry	-	-	-	-	-	-	-	-	+.2	-	1.4	-
Painted Trillium	-	-	-	-	-	-	-	-	++.1	-	-	-
Rock-Polypody	-	-	-	-	-	-	-	-	+.2	-	-	-
False Spikenard	-	-	-	-	-	-	-	-	2.1	-	-	-
Woolly Blue Violet	-	-	-	-	-	-	-	-	+.2	-	-	-
Star-flower	-	-	-	-	-	-	-	-	+.1	-	+.1	-
Spinulose Wood-Fern	-	-	-	-	-	-	-	-	-	1.2	-	-
Hay-scented Fern	-	-	-	-	-	-	-	-	-	1.4	-	-
Schreber's Moss	-	-	-	-	-	-	-	-	-	2.3	-	-
Reindeer Lichen	-	-	-	-	-	-	-	-	-	+.2	-	+.2
Panic-Grass	-	-	-	-	-	-	-	-	-	1.2	-	-
Dandelion	-	-	-	-	-	-	-	-	-	+.2	-	-
Wild Sarsaparilla	-	-	-	-	-	-	-	-	-	+.1	-	-
Sweet-scented Bedstraw	-	-	-	-	-	-	-	-	-	-	++.2	-
No. Species	13	14	10	25	8	17	14	17	13	24	11	13

Table 16.5. Continued

Species	Mesic (1)		Hydric (2)		Xeric (3)		Hydric (4)		Mesic (5)		Xeric (6)	
	Forest A.S.	ROW A.S.	Forest A.S.	ROW A.S.	Forest A.S.	ROW A.S.	Forest A.S.	ROW A.S.	Forest A.S.	ROW A.S.	Forest A.S.	ROW A.S.
Total No. Species												
Trees[2]	12	4	5	5	5	2	6	1	10	9	5	5
Shrubs	2	3	5	6	3	3	10	8	1	9	2	7
Herbs	13	14	10	25	8	17	14	17	13	24	11	13
Totals	27	21	20	36	16	22	30	26	24	42	18	25

[1] For simplicity, herbs include all species of the layer.

[2] Those trees which occurred both in the tree and shrub layers were considered as one in determining the total number of species.

Table 16.6. Characteristic species with abundance and sociability ratings (A.S.) in the shrub and herb layers of the adjacent forest which did not occur on the ROW.

Species	Forest A.S.	ROW A.S.
	Mesic (1)	
Shrubs		
Hazelnut	2.4	-
Gooseberry	++.1	-
Herbs[1]		
Strawberry	+.2	-
Wild-Lily-of-the-valley	+.1	-
Hypnum imponens	+.2	-
Lady-Fern	++.2	-
Marginal Shield-Fern	+.2	-
Purple Trillium	+.2	-
Barren Strawberry	+.2	-
Sedge	+.2	-
American Dog-Violet	1.2	-
Long-spurred Violet	2.2	-
Solomon's-seal	1.1	-
Trout-Lily	+.1	-
No. Species	14	
	Hydric (2)	
Shrubs		
Gray Dogwood	+.3	-
Herbs		
Milkweed	1.1	-
Rough Bedstraw	1.2	-
No. Species	3	
	Xeric (3)	
Shrubs		
Ground-Juniper	+.2	-
Herbs		
Common Mullein	+.1	-
No. Species	2	

Table 16.6. Continued

Species	Forest A.S.	ROW A.S.
Hydric (4)		
Shrubs		
Gray Dogwood	2.2	-
Virginia Creeper	+.2	-
Wild-raisin	1.3	-
Winterberry	+.4	-
Arrow-wood	(+.3)	
Herbs		
Sensitive Fern	2.2	-
False Hellebore	+.1	-
Marsh-Fern	1.2	-
Rough Bedstraw	1.2	-
Royal Fern	1.3	-
Skullcap	++.1	-
Spotted Touch-me-not	+.1	-
American Marsh-Pennywort	+.2	-
No. Species	13	
Mesic (5)		
Shrubs		
Herbs		
Marginal Shield-Fern	+.2	-
Solomon's-seal	2.1	-
Ground-Pine	2.2	-
Tree Club-moss	+.1	-
Partridge-berry	+.2	-
Painted Trillium	++.1	-
Rock-Polypody	+.2	-
False Spikenard	2.1	-
Wooly Blue Violet	+.2	-
Star-flower	+.1	-
No. Species	10	
Xeric (6)		
Shrubs		

Table 16.6. Continued

Species	Forest A.S.	ROW A.S.
Herbs		
Hypnum imponens	2.2	-
Marginal Shield-Fern	+.2	-
Hair-cap Moss	+.2	-
Wild Lily-of-the-valley	1.1	-
Partridge-berry	1.4	-
Star-flower	+.1	-
Sweet-scented Bedstraw	++.2	-
No. Species	7	

[1] For simplicity, herbs include all species of the herb layer.

Table 16.7. Characteristic species with abundance and sociability ratings (A.S.) in the shrub and herb layers of the ROW which were not in the adjacent forest.

Species	ROW A.S.	Forest A.S.
Mesic (1)		
Shrubs		
Choke-Cherry	2.1	-
Raspberry	+.1	-
Ground-Juniper	(1.3)	-
Herbs[1]		
Spreading Dogbane	2.1	-
Bracken	1.1	-
Goldenrod	1.2	-
Aster spp.	1.2	-
St. John's-wort	++.1	-
Common Vetch	+.1	-
Whorled Loosestrife	+.1	-
Black-eyed Susan	++.1	-
Wild Cranesbill	+.2	-
Ox-eye-Daisy	1.2	-
Yarrow	1.1	-
Mint	+.1	-
No. Species	15	
Hydric (2)		
Shrubs		
Choke-Cherry	3.1	-
Hazelnut	2.3	-
Herbs		
Barren Strawberry	+.2	-
American Dog-Violet	+.2	-
Purple Trillium	(++.1)	-
Trout-Lily	2.1	-
Goldenrod	1.3	-
Aster spp.	2.3	-
Wild Cranesbill	1.2	-
Ox-eye-Daisy	2.2	-
Mixed Grass	2.2	-

Table 16.7. Continued

Species	ROW A.S.	Forest A.S.
Lady-Fern	1.2	-
Bloodroot	(++.1)	-
Iris	+.3	
Large-flowered Bellwort	+.3	-
Rue-Anemone	+.1	-
Toothwort	1.1	-
Yellow Loosestrife	+.1	-
Fringed Loosestrife	2.1	-
No. Species	19	
Xeric (3)		
Shrubs		
Raspberry	+.1	-
Herbs		
Spreading Dogbane	2.2	-
Goldenrod	1.2	-
Aster spp.	1.3	-
St. John's-wort	2.2	-
Black-eyed Susan	++.1	-
Ox-eye Daisy	1.2	-
Bouncing-Bet	1.3	-
Hair-cap Moss	1.2	-
Common Vetch	1.3	-
Horsetail	1.3	-
No. Species	11	
Hydric (4)		
Shrubs		
Blackberry	+.1	-
Smooth Sumac	1.1	-
Elderberry	+.1	-
Herbs		
American Dog-Violet	+.2	-
Strawberry	+.3	-
St. John's-wort	1.3	-
Mixed Grass	3.3	-

Table 16.7. Continued

Species	ROW A.S.	Forest A.S.
Spiked Loosestrife	2.4	-
Large-flowered Bellwort	+.1	-
Square-stemmed Monkey-flower	+.1	-
Bullhead-lily	1.2	-
Arrowhead	2.2	-
Interrupted Fern	1.3	-
Stonecrop sp.	++.2	-
No. Species	14	
	Mesic (5)	
Shrubs		
Hazelnut	1.3	-
Raspberry	2.2	-
Blackberry	+.1	-
Gray Dogwood	+.1	-
Hawthorn	+.1	-
Spiraea	1.2	-
Choke-Cherry	2.2	-
Teaberry	2.3	-
Herbs		
Mixed Grass	3.4	-
American Dog-Violet	(++.2)	-
Strawberry	3.4	-
Spreading Dogbane	2.4	-
Goldenrod	2.3	-
Black-eyed Susan	++.1	-
Wild Cranesbill	+.2	-
Ox-eye-Daisy	++.1	-
Yarrow	+.2	-
False Hellebore	++.2	-
Bloodroot	(1.3)	-
Yellow Loosestrife	1.1	-
Hair-cap Moss	+.4	-
Stonecrop sp.	++.2	-
Spinulose Wood-Fern	1.2	-
Hay-scented Fern	1.4	-
Schreber's Moss	2.3	-
Reindeer Lichen	+.2	-
Panic-Grass	1.2	-
Dandelion	+.2	-
Wild Sarsaparilla	+.1	-
No. Species	29	

Table 16.7. Continued

Species	ROW A.S.	Forest A.S.
	Xeric (6)	
Shrubs		
Hazelnut	1.1	-
Hawthorn	1.1	-
Low Blueberry	++.2	-
Spiraea	++.1	-
Choke-Cherry	1.3	-
Herbs		
Mixed Grass	3.5	-
Trout-Lily	3.1	-
Spreading Dogbane	2.1	-
Yarrow	1.2	-
Poverty-Grass	2.2	-
Common Cinquefoil	+.2	-
Field Cat's-foot	(+.2)	-
Common Mullein	++.2	-
Reindeer Lichen	+.2	-
No. Species	14	

Table 16.8. Major vegetational types for the National Lead Line study area based on percent of study plots occupied by each plant community and other components on the ROW.

Community	Site Classification					
	Mesic (1)	Hydric (2)	Xeric (3)	Hydric (4)	Mesic (5)	Xeric (6)
	Percent of Total Area					
Mixed Grass-Herb	94.40	15.52	71.98	6.04	40.84	60.54
Bracken-Mixed Grass-Herb	5.60					
Sedge-Mixed Grass-Herb		23.35		45.39	18.58	
Blue-joint Grass-Ostrich-Fern-Sensitive Fern-Herb		23.06				
Mixed Fern-Blue-joint Grass-Sedge-Mixed Herb		16.67				
Stream		12.07		6.19		
Ostrich-Fern-Sedge-Mixed Grass-Herb		6.61				
Choke-Cherry		1.44				
Common Alder		.57				
Iris		.29				
Red Osier Dogwood		.14				
Hazelnut		.14				
Serviceberry		.14				
Open			12.36			
Mixed Grass-Dogbane-Mixed Herb			8.33			
Mixed Grass-Blackberry			5.17			
Bouncing-Bet			1.73			
Ground-Juniper			.43			17.29
Sedge-Arrowhead-St. John's-wort				25.81		
Standing Water				9.07		
Bullhead-lily				3.74		
Willow				2.45		
Smooth Sumac-Willow				1.02		
Interrupted Fern				.29		
Wild Lily-of-the-valley-Teaberry-Mixed Grass-Herb					14.84	
Hazelnut					8.35	
Schreber's Moss-Wild Lily-of-the-valley-Teaberry-Mixed Grass-Herb					6.29	

Table 16.8. Continued

Community	Site Classification					
	Mesic (1)	Hydric (2)	Xeric (3)	Hydric (4)	Mesic (5)	Xeric (6)
	Percent of Total Area					
Hay-scented Fern					4.29	
Schreber's Moss-Mixed Herb					3.04	
Blueberry-Mixed Grass					2.89	
Chokeberry					.59	
Quaking Aspen					.29	
Blackberry-Mixed Grass-Herb						15.84
Chokeberry-Mixed Grass-<u>Rubus</u>						2.74
Pin-Cherry-Quaking Aspen						1.58
Rock						1.15
Pin-Cherry						.86
	100.00	100.00	100.00	100.00	100.00	100.00

Table 16.9. Birds observed and/or heard on the ROW and the ROW edge during the study period.

Species	Species
Black duck	Robin
Shoveler	Wood thrush
Ruffed grouse	Ruby-crowned kinglet
American woodcock	Cedar waxwing
Spotted sandpiper	Black and white warbler
Pileated woodpecker	Worm-eating warbler
Yellow-shafted flicker	Yellowthroat
Bank swallow	Baltimore oriole
Purple martin	Common grackle
Tree swallow	Red-winged blackbird
Blue jay	Song sparrow
Black-capped chickadee	White-throated sparrow
Catbird	Vesper sparrow

Table 16.10. Potential wildlife use of plant species[1] present on the ROW and adjacent woods for the major game species on the National Lead Line study area.

Species	Wildlife Species		
	Grouse	Muskrat	Beaver
<u>Trees</u>			
Large-toothed Aspen	***		***
White Birch	**		**
Quaking Aspen	***		***
Red Maple			*
White Ash			*
Black Cherry	*		
Gray Birch	*		
Serviceberry	+		
<u>Shrubs</u>			
Hazelnut	**		**
Raspberry	*		
Blackberry	*		
Choke-Cherry	*		
Willow	*	+	**
Red Osier Dogwood	+		
Low Blueberry	+		
Gray Dogwood	+		
Smooth Sumac	*		
Hawthorn	*		
Teaberry	+		
<u>Herbs</u>[2]			
Bullhead-lily			**
Arrowhead		*	
Horsetail		+	
Pondweed	*		
Strawberry	*		
Dandelion	+		
Sedge	+		

[1] Those plants not included in this table provide a certain amount of cover (Table 16.5) for the 3 major game species, and may also provide seasonal food value, specific information pertaining to which is not now available. This applies also with regard to non-game species.

[2] For simplicity, herbs include all species of the herb layer.

Table 16.11. Water Quality data collected from October 1, 1975, to August 4, 1976, at site 16, National Lead Line ROW, Essex County, New York.

Date	October 1, 1975					February 19, 1976					May 13, 1976					August 4, 1976				
Sampling Location	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Hour	1440	1520	1600	1400	1230	1240	1300	1320	1330	1345	1100	1120	1130	1205	1140	1220	1240	1305	1330	1340
Water Temp. (C)	13.0	13.0	13.5	11.6	13.5	0.0	0.0	0.0	ice	0.0	10.0	10.0	10.0	12.0	10.8	17.0	17.0	18.0	16.0	18.0
Dissolved Oxygen (ppm)	10.5	11.3	10.5	11.7	10.6	13.4	13.9	12.9	ice	13.4	10.3	10.3	10.1	10.0	10.2	8.5	9.0	8.4	9.9	9.3
% Saturation D.O.	106	114	108	114	109	99	102	96	-	99	97	97	96	100	99	96	100	96	107	105
pH	5.0	5.0	5.0	5.0	5.0	6.0	6.5	6.5	ice	6.5	6.2	6.2	6.4	6.9	6.6	6.1	5.9	5.8	6.1	6.0

		October 1, 1975	February 19, 1976	May 13, 1976	August 4, 1976
Water Temp. (C)	range	11.6-13.5	0.0	10.0-12.0	16.0-18.0
	mean	12.9	0.0	10.6	17.2
% Saturation D.O.	range	106-114	96-102	96-100	96-107
	mean	110	99	98	101
pH	range	5.0	6.5-6.6	6.2-6.9	5.8-6.1
	mean	5.0	6.5	6.5	6.0
		partly cloudy, air temp. 21 C	rain; air temp. 2 C; snow cover 2 to 3 ft deep; ice covering at sampling locations 2, 3, and 5 was broken to take measurements	clear, sunny, air temp. 22 to 24 C, water high from rain and melting snow, water very clear at all sampling locations	sunny, air temp. 23 to 24 C

Table 16.12. Comparison of land use near the time of and after construction of the ROW.[1]

	Land Use	Percent of Total Area Near the Time of (-) and After (*) Construction 0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
(A)	Agriculture	
(C,I)	Commercial & Industrial	
(F)	Forest Land	---91.3 ***91.3
(E)	Extractive Industry	
(N)	Non-productive	
(OR)	Outdoor Recreation	
(P)	Public & Semi-public	
(W)	Water Resources	------8.7 ******8.7
(U)	Urban Inactive	
(T)	Transportation	
(R)	Residential	

1 Source: ASCS-USDA, Salt Lake City, Utah, air photo No. 36031 374 87, Oct. 24, 1974

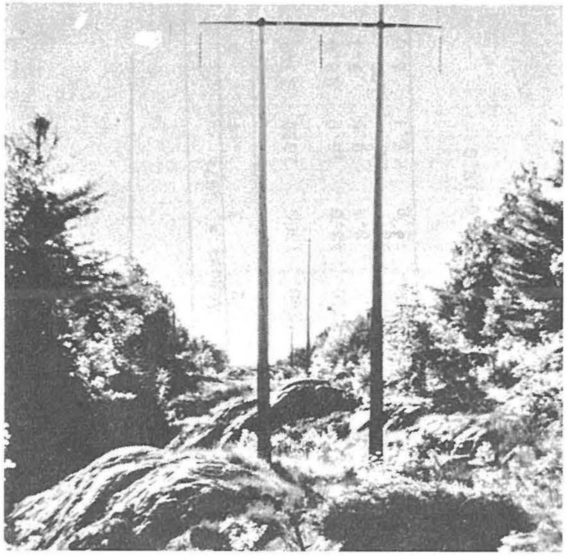


FIG. 16.1.1. General view of the ROW and the adjacent forest, looking west from Crown Point Road, in spring, 1976 (Photo Station 2).

FIG. 16.1.2. General view of the ROW and the adjacent forest, looking east, in spring, 1976 (Photo Station 5).

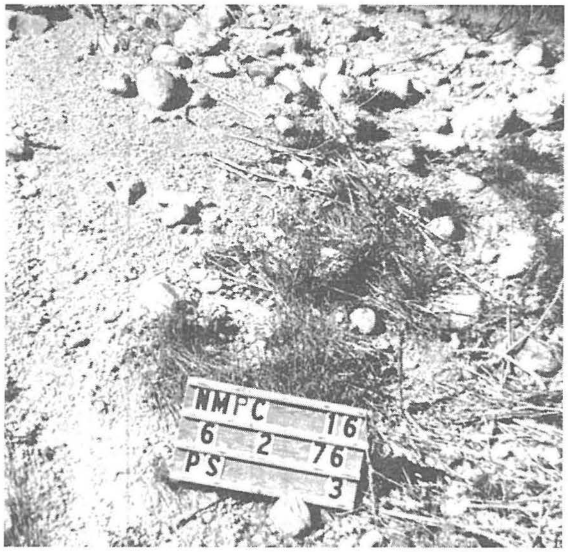


FIG. 16.1.3. Severe sheet erosion on ROW caused by equipment cut, in spring, 1976 (Photo Station 3).

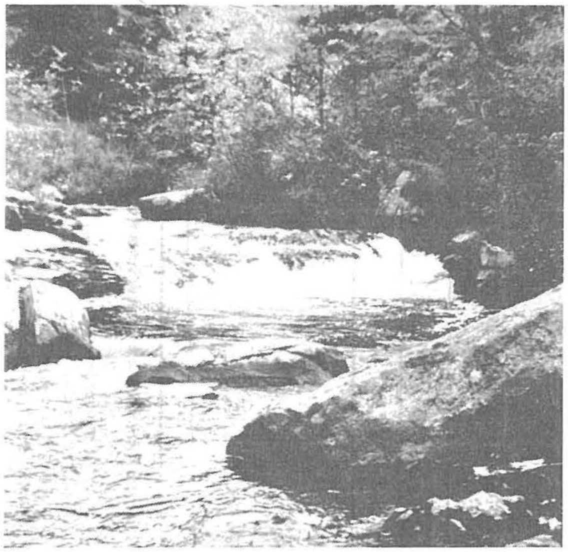


FIG. 16.1.4. Stream crossing ROW during the fall of 1975.

FIG. 16.1.5. Preyed turtle nest on ROW during the fall of 1975.

FIG. 16.1.6. Taking dissolved oxygen at sampling location 1 during the fall of 1975.

FIG. 16.1. Visual characteristics.

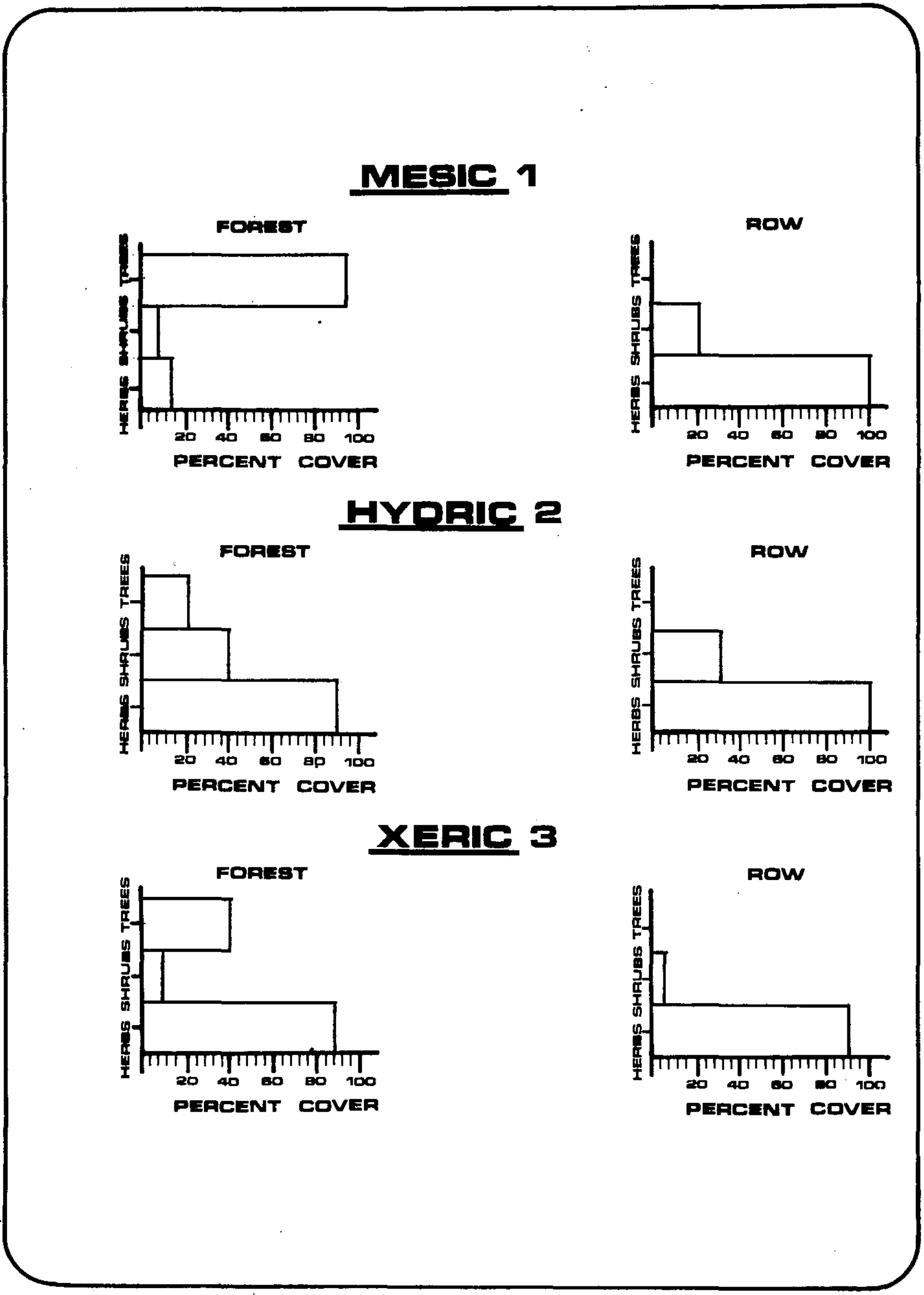


Fig. 16.2. Changes in cover value of tree, shrub, and herb layers from forest to ROW.

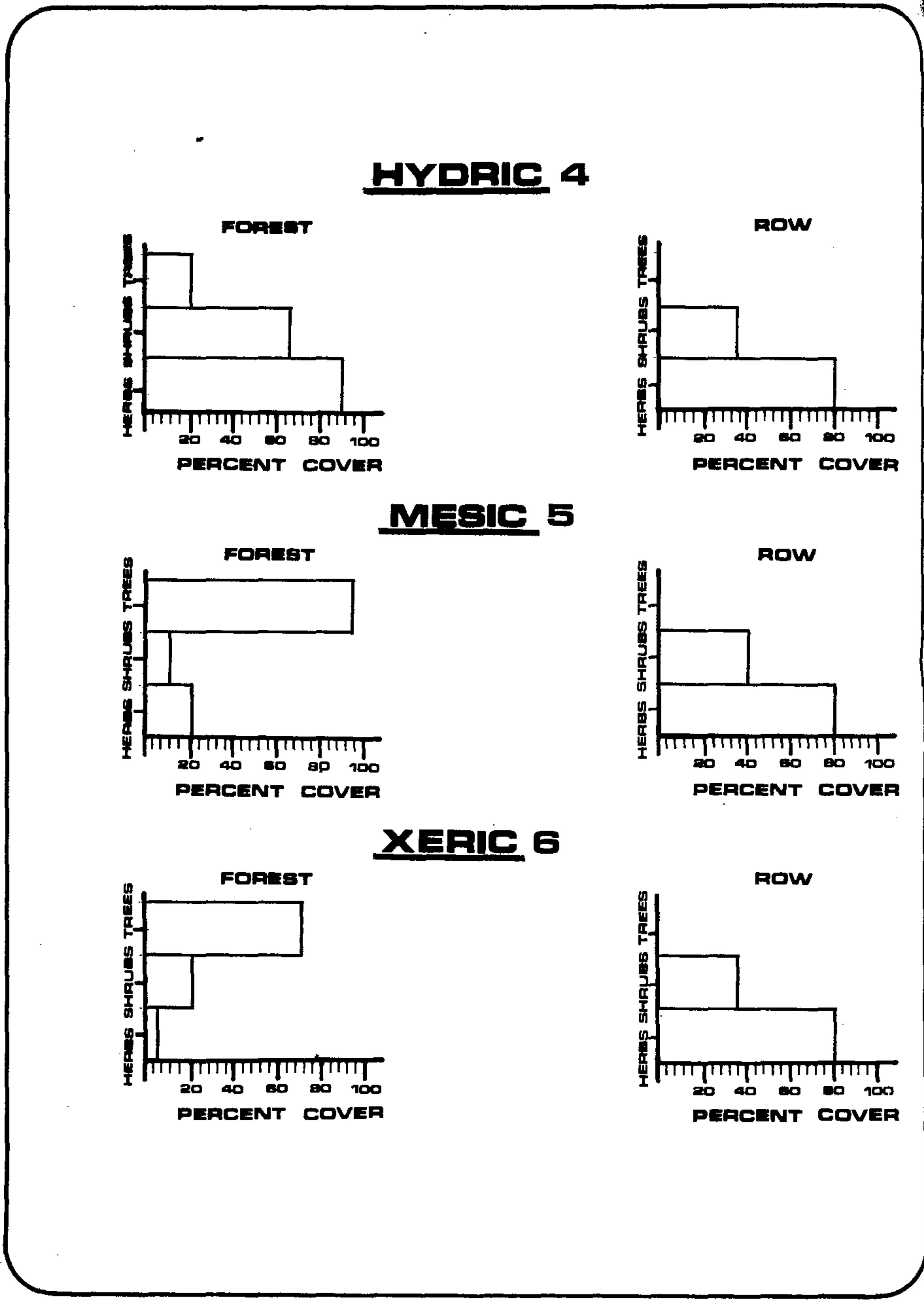


Fig. 16.2a. Changes in cover value of tree, shrub, and herb layers from forest to ROW.

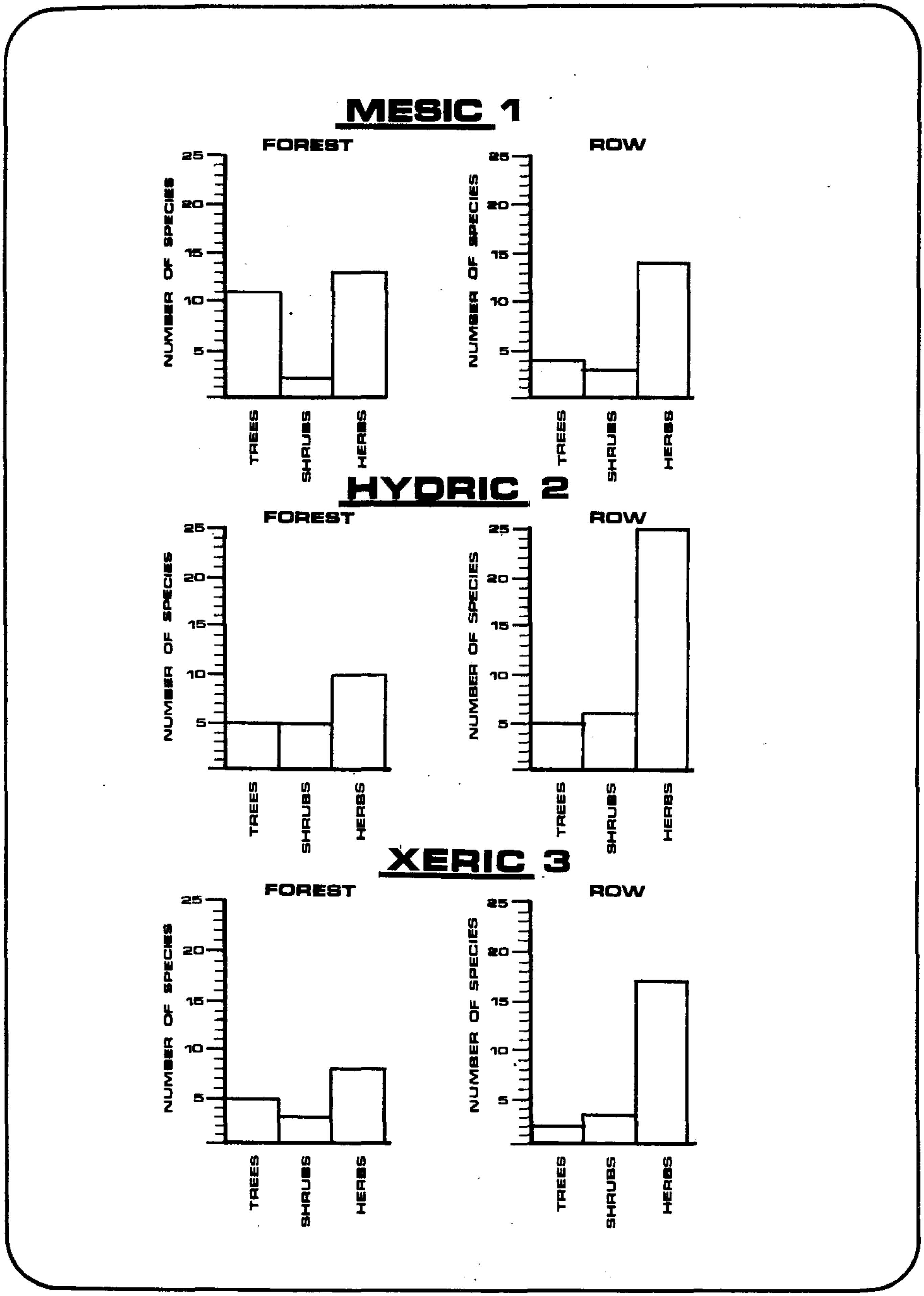


Fig. 16.3. Species diversity in the forest and on the ROW.

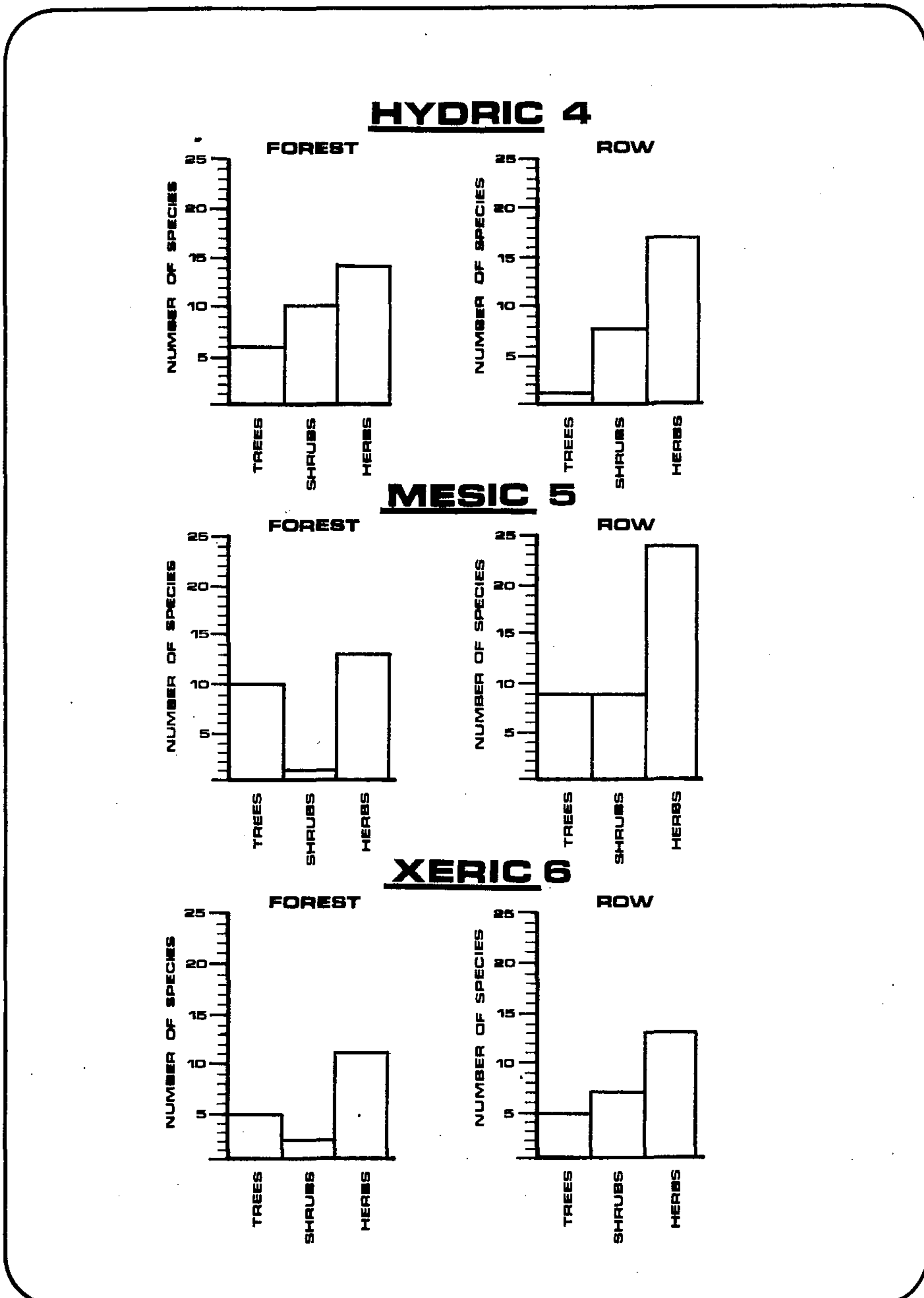


Fig. 16.3a. Species diversity in the forest and on the ROW.

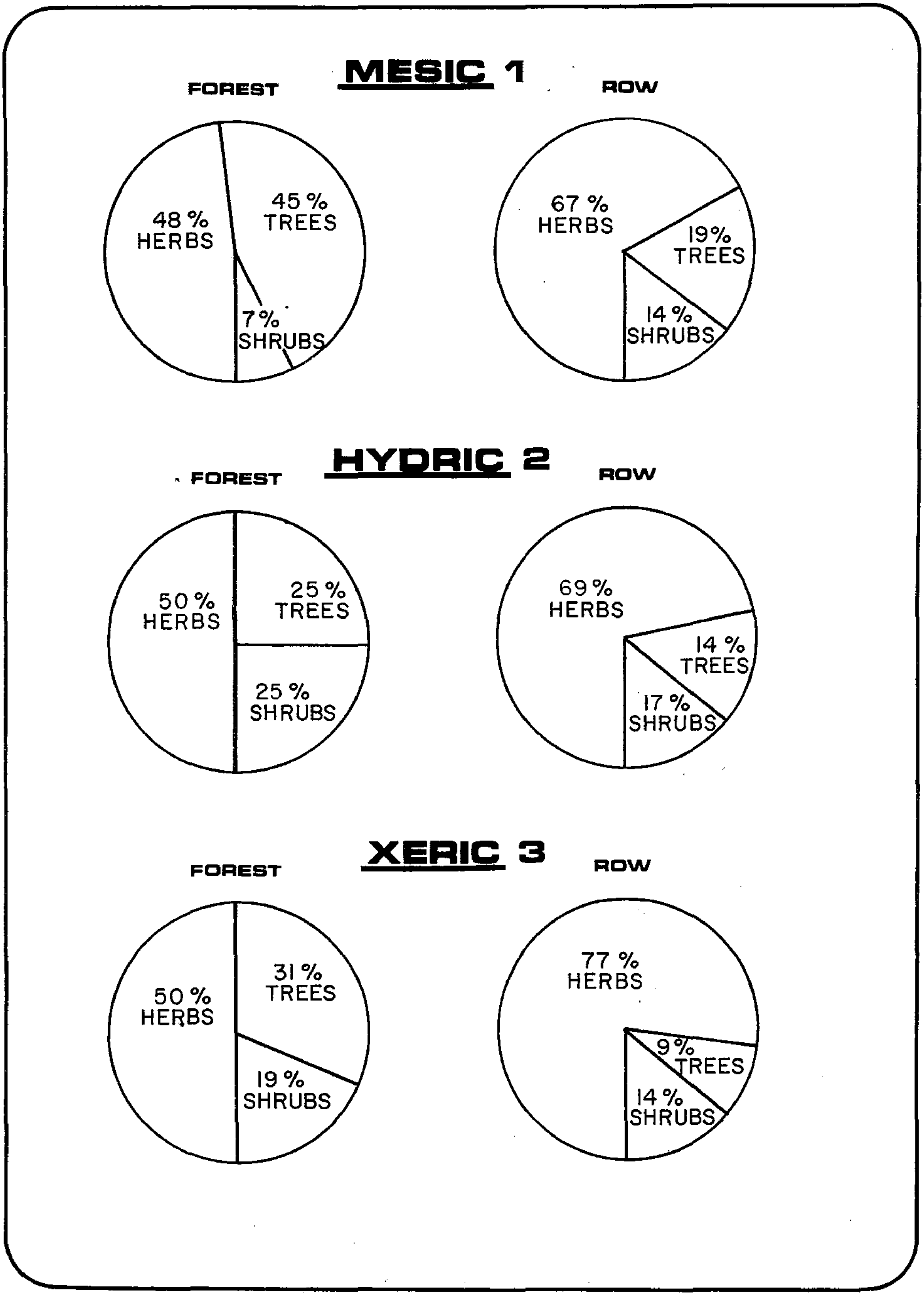


Fig. 16.4. Life form spectrum of the ROW as compared to the adjacent forest to compare species make-up of each, based on the number of species in each life form expressed as a percent of total species.

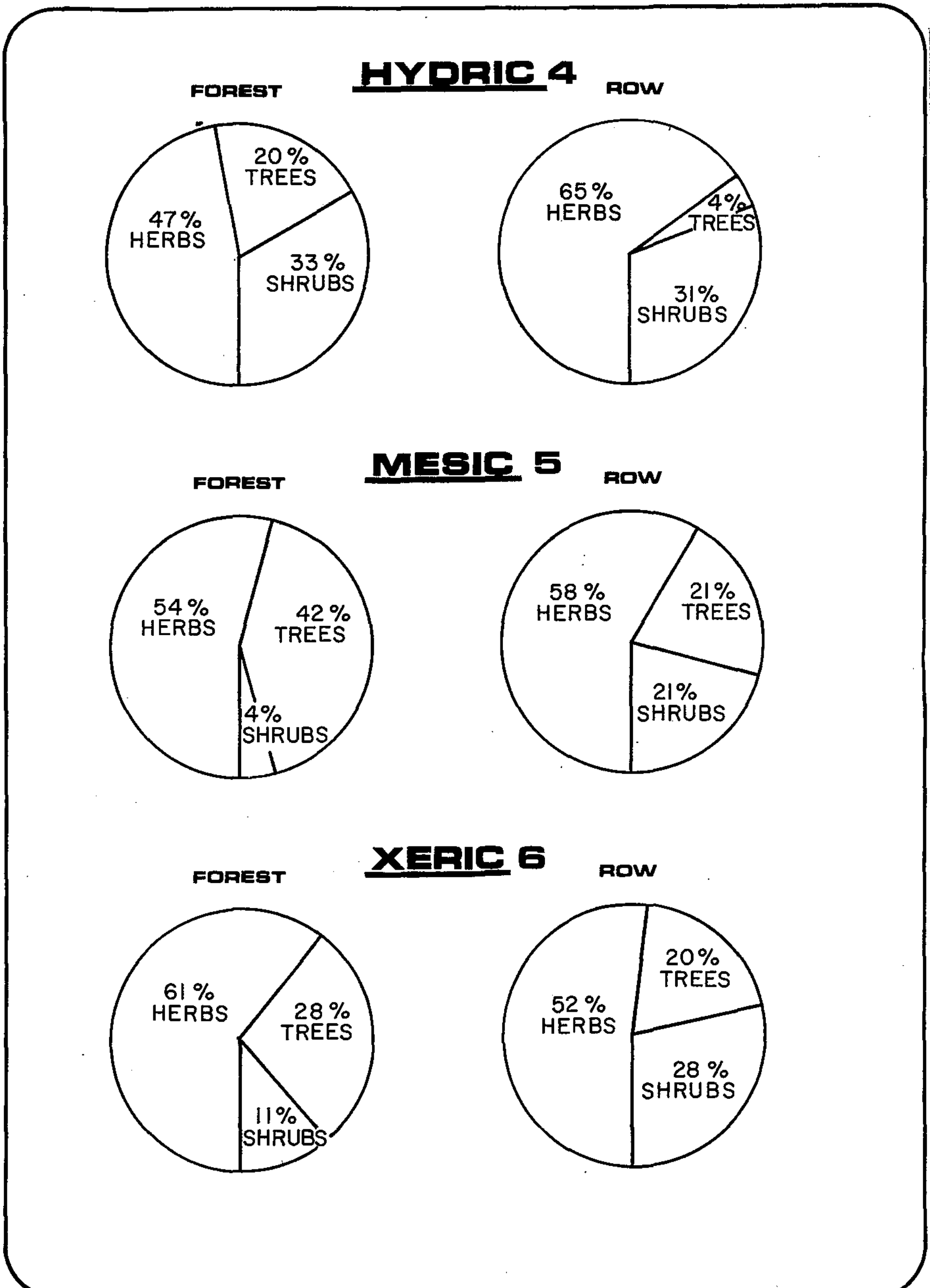


Fig. 16.4a. Life form spectrum of the ROW as compared to the adjacent forest to compare species make-up of each, based on the number of species in each life form expressed as a percent of total species.

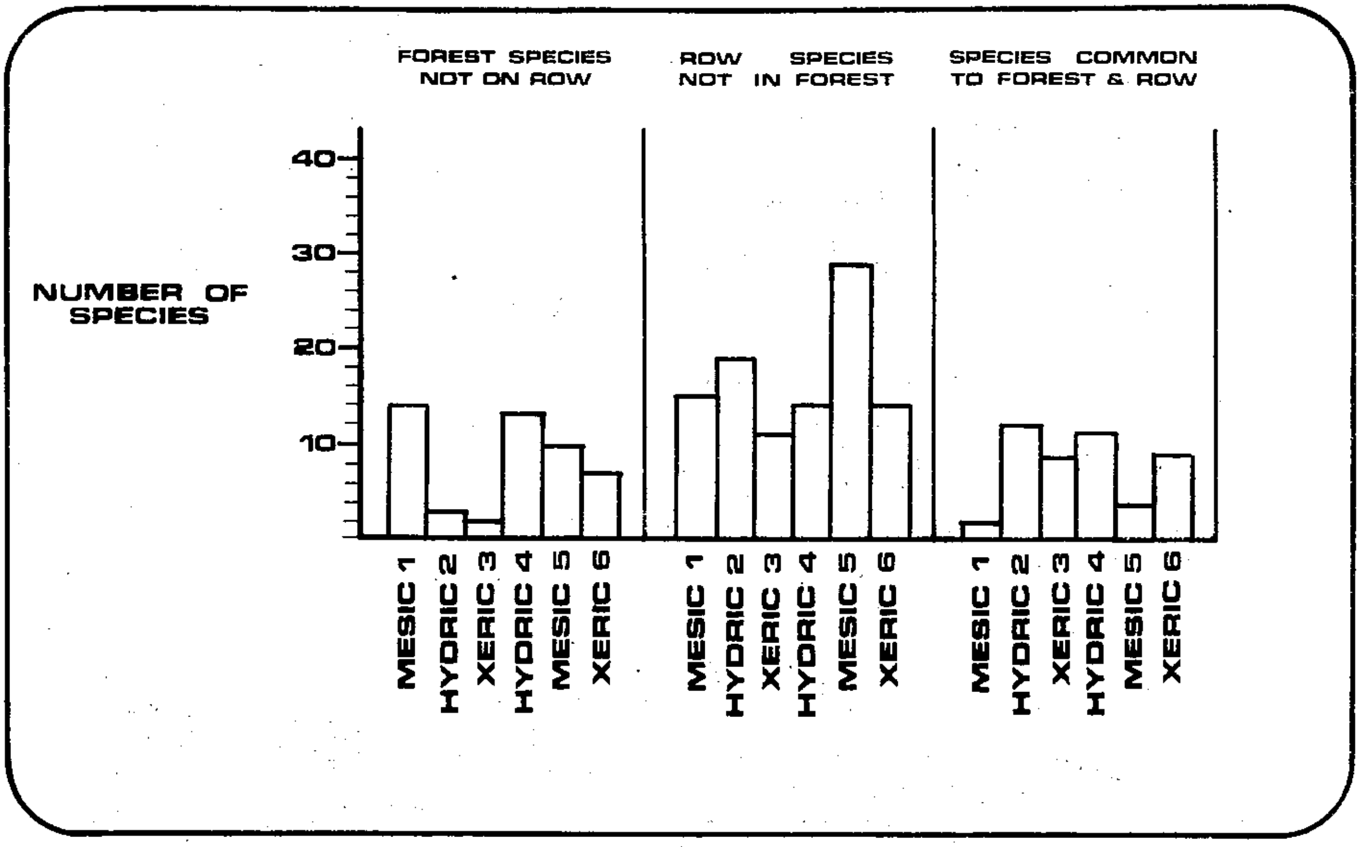
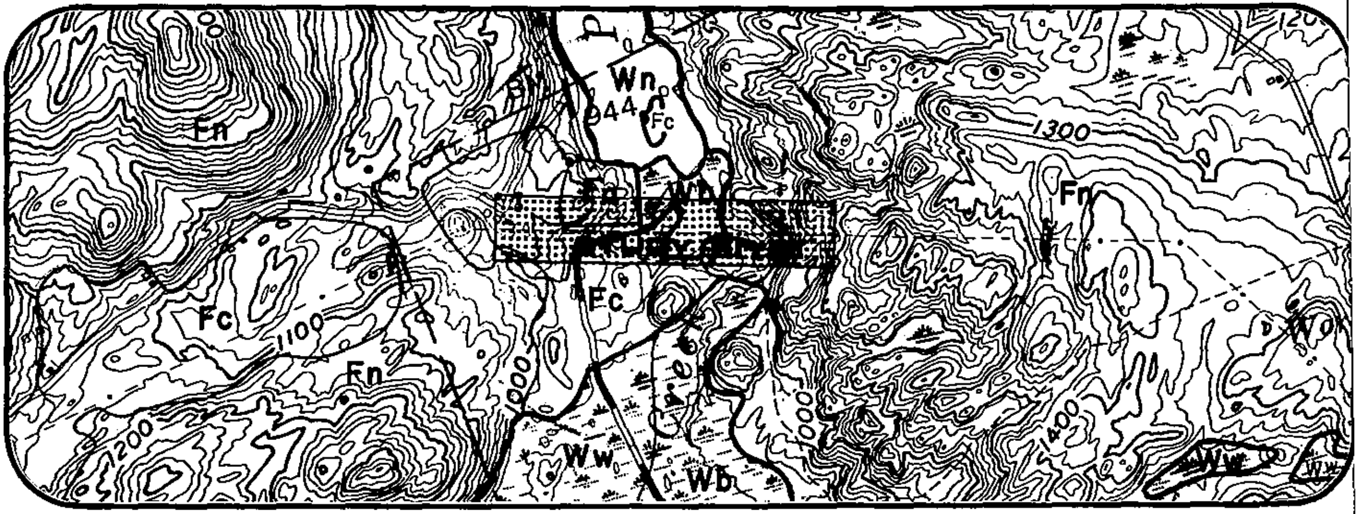
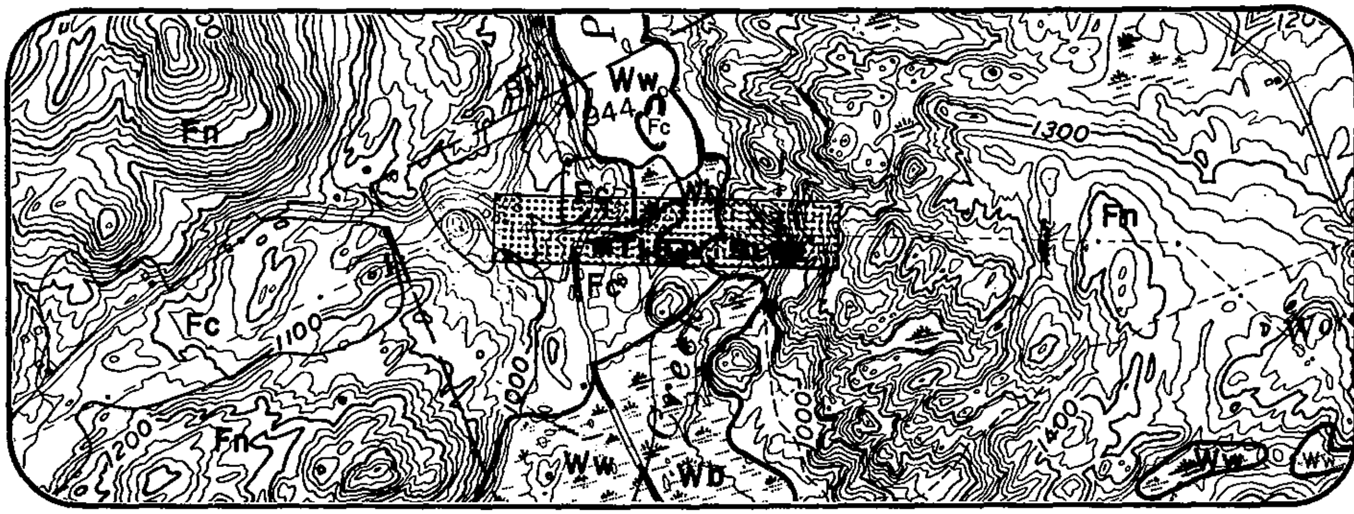


Fig. 16.5. Comparison of shrub and herb species in the forest and on the ROW.



LAND USE PRIOR TO ROW CONSTRUCTION (1954) SCALE 1"-2000



LAND USE AFTER CONSTRUTION OF ROW (1974) SCALE 1"-2000

LEGEND FOR LAND USE SYMBOLS

FOREST LAND
- Fc - Forest brushland
- Fn - Forest lands

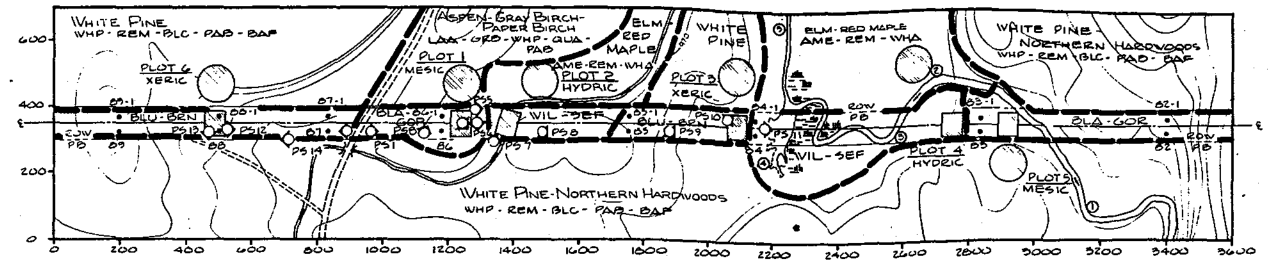
WATER RESOURCES
- Wb- Marshes, shrub wetlands and bogs
- Wn- Natural ponds and lakes
- Ww- Wooded wetlands

SOURCES:
- ASCS-USDA, Salt Lake City, Utah, air photo No. 36031 374 87 Oct. 24, 1974
- Area Land Use Map, LUNR, Cornell University, N.Y., 1974
- U. S. G. S. Topographic Map, Paradox Lake, N. Y., 1953

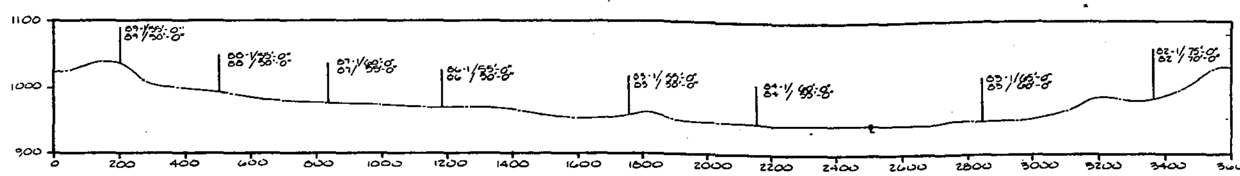
Fig. 16.6. Land use change.

ASPLUNDH ENVIRONMENTAL SERVICES

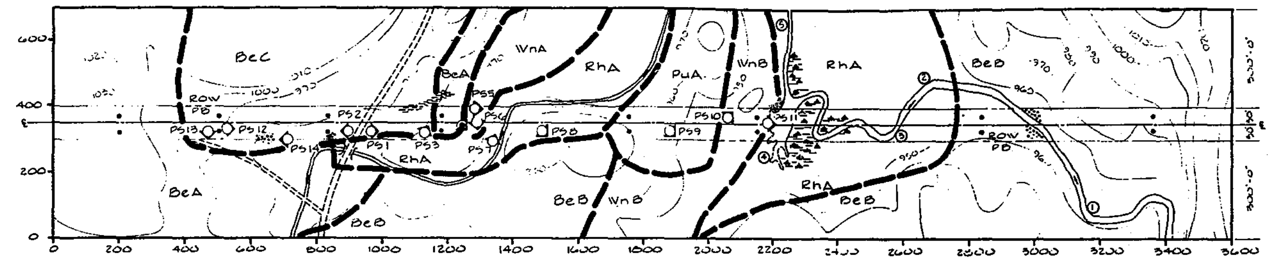
VEGETATION



CENTERLINE PROFILE



SOILS



NOTES:
(1) CONTOUR INTERVALS ARE 10'-0"
(2) VERTICAL AND HORIZONTAL SCALES ARE IN FEET

LEGEND

WORKS AND STRUCTURES

HIGHWAYS AND ROADS
HEAVY DUTY
MEDIUM DUTY
LIGHT DUTY
ACCESS ROAD
UNIMPROVED DIRT ROAD
NATIONAL INTERSTATE
US ROUTE
STATE OR COUNTY
SINGLE TRACK RAILROAD
MULTIPLE TRACK RAILROAD
ABANDONED RAILROAD TRACK
RAILROAD OVER
RAILROAD UNDER
FORD
ROAD CROSSING
BUILDING
EXCAVATION
MINE DUMP
PIPELINE
TRANSMISSION STRUCTURES
DAMS
CULVERT
TANKS
WELLS
BRUSH AND LOG DISPOSAL SITES
SMALL PARKS, CEMETERY, ETC
FENCE

BOUNDARIES

NATIONAL OR STATE
COUNTY
MINOR CIVIL DIVISION
RESERVATION, NATIONAL OR STATE
LAND GRANT
ROW PROPERTY BOUNDARY
ROW EASEMENT BOUNDARY
ROW CLEARING EDGING
SITE BOUNDARY
ROW CENTERLINE
VEGETATION OR SOIL BOUNDARY

SITE MARKERS

SAMPLE LOCATION
PHOTO STATIONS
MAPPED PLOT ON ROW
MAPPED PLOT OFF ROW
APPROX. LOCATION OF GROUSE DRUMMING LOG

WATER SYMBOLS

PERENNIAL STREAMS
INTERMITTENT STREAMS
SMALL RAPIDS
LARGE RAPIDS
DISAPPEARING STREAM
CANALS AND DITCHES
PERENNIAL LAKES AND PONDS
INTERMITTENT LAKES AND PONDS
SPRING
MARSH, SWAMP OR WET MEADOW
WET SPOT
ALLUVIAL FAN

TOPOGRAPHIC RELIEF

CONTOUR
DEPRESSION CONTOUR

SOIL SYMBOL AND NAME

BeA	BECKET	fine sandy loam (0 to 8% slope)
BeB	BECKET	" " " (8 to 15% slope)
BeC	BECKET	" " " (15 to 25% slope)
PuA	PERU	loam (0 to 8% slope)
RhA	RUMNEY	silt loam (0 to 8% slope)
WnA	WINDSOR	loamy sand (0 to 8% slope)
WnB	WINDSOR	" " (8 to 15% slope)

SOIL SYMBOLS

ROCK
SAND
SCATTERED ROCK
BARE AND ERODING (GULLY)
BARE AND ERODING (SHEET)
BARE AND INCREASING IN SIZE
BARE AND HEALING
ERODED BUT HEALED
CLAY AREA
WIND EROSION

PLANT COMMUNITY SYMBOLS

shrubs

ALR	ALDER	Alnus spp.
ARR	ARROW - WOOD	Viburnum recognitum
BAR	BARBERRY	Berberis spp.
BLA	BLACKBERRY	Rubus spp.
BLH	BLACK - VIBURNUM	Viburnum prunifolium
BLU	BLUEBERRY	Vaccinium spp.
BUT	BUTTONBUSH	Cephalanthus occidentalis
CAY	AMERICAN YEW	Taxus canadensis
CFH	FLY - HONEYSUCKLE	Lonicera canadensis
CHC	CHOKE - CHERRY	Prunus virginiana
CLB	CLIMBING BITTERSWEET	Celastrus scandens
CRA	GRAPE	Vitis spp.
DEY	DEWBERRY	Rubus spp.
ELD	ELDERBERRY	Sambucus canadensis
GRD	GRAY DOGWOOD	Cornus racemosa
GRJ	GROUND - JUNIPER	Juniperus communis
HAA	COMMON ALDER	Alnus serrulata
HAW	HAWTHORN	Crataegus spp.
HAZ	HAZELNUT	Corylus spp.
HUC	HUCKLEBERRY	Gaylussacia spp.
JAR	MULTIFLORA ROSE	Rosa multiflora
MAV	MAPLE - LEAVED VIBURNUM	Viburnum acerifolium
MOH	MOUNTAIN - HOLLY	Nemopanthus mucronata
MOL	MOUNTAIN - LAUREL	Kalmia latifolia
MOM	MOUNTAIN - MAPLE	Acer spicatum
NAN	NANNYBERRY	Viburnum Lentago
NJT	NEW JERSEY TEA	Ceanothus americanus
PIF	PINXTER - FLOWER	Rhododendron nudiflorum
POI	POISON IVY	Rhus radicans
POS	POISON SUMAC	Rhus vernix
PRA	NORTHERN PRICKLY ASH	Xanthoxylum americanum
PRU	BUCKTHORN	Rhamnus spp.
RIB	RIBES	Ribes spp.
ROD	RED OSIER DOGWOOD	Cornus stolonifera
SMC	SUMAC	Rhus spp.
SPA	SPECKLED ALDER	Alnus rugosa
SPB	SPICEBUSH	Lindera Benzoin
SPI	SPIRAEA	Spiraea spp.
SMS	SMOOTH SUMAC	Rhus glabra
STM	STRIPED MAPLE	Acer pensylvanicum
STS	STAGHORN - SUMAC	Rhus typhina
SWF	SWEET - FERN	Comptonia peregrina
TAH	TARTARIAN HONEYSUCKLE	Lonicera tatarica
WIH	WITCH - HAZEL	Hamamelis virginiana
WIL	WILLOW	Salix spp.
WIN	WINTERBERRY	Ilex verticillata
WIR	WILD - RAISIN	Viburnum cassinoides
ZBC	BLACK CHOKEBERRY	Pyrus melanocarpa

trees

ABU	BUTTERNUT	Juglans cinerea
AIL	TREE - OF - HEAVEN	Ailanthus altissima
ALD	ALTERNATE - LEAVED DOGWOOD	Cornus alternifolia
AMB	BEECH	Fagus grandifolia
AMC	CHESTNUT	Castanea dentata
AME	AMERICAN ELM	Ulmus americana
AMH	AMERICAN HORNBEAM	Carpinus caroliniana
APP	APPLE	Pyrus malus
BAF	BALSAM - FIR	Abies balsamea
BAS	BASSWOOD	Tilia americana
BIH	BITTERNUT HICKORY	Carya cordiformis
BLC	BLACK CHERRY	Prunus serotina
BLL	BLACK LOCUST	Robinia Pseudo-Acacia
BLW	BLACK WALNUT	Juglans nigra
CHO	CHESTNUT - OAK	Quercus prinus
COT	COTTONWOOD	Populus deltoides
EAH	HEMLOCK	Tsuga canadensis
ERC	RED CEDAR	Juniperus virginiana
FLD	FLOWERING DOGWOOD	Cornus florida
GRB	GRAY BIRCH	Betula populifolia
HOH	AMERICAN HOP-HORNBEAM	Ostrya virginiana
LAA	LARGE - TOOTHED ASPEN	Populus grandidentata
LAR	AMERICAN LARCH	Larix laricina
NWC	WHITE CEDAR	Thuja occidentalis
PAB	WHITE BIRCH	Betula papyrifera
PIC	PIN - CHERRY	Prunus pensylvanica
PIH	PIGNUT HICKORY	Carya glabra
PIP	PITCH - PINE	Pinus rigida
QUA	QUAKING ASPEN	Populus tremuloides
RED	RED OAK	Quercus rubra
REM	RED MAPLE	Acer rubrum
RES	RED SPRUCE	Picea rubens
SAS	WHITE SASSAFRAS	Sassafras albidum
SCO	SCRUB - OAK	Quercus ilicifolia
SCP	SCOTCH PINE	Pinus sylvestris
SHB	SERVICEBERRY	Amelanchier spp.
SHH	SHAGBARK - HICKORY	Carya ovata
SUM	SUGAR - MAPLE	Acer saccharum
SWB	SWEET BIRCH	Betula lenta
VIP	SCRUB - PINE	Pinus virginiana
WHA	WHITE ASH	Fraxinus americana
WHO	WHITE OAK	Quercus alba
WHP	WHITE PINE	Pinus strobus
YEB	YELLOW BIRCH	Betula lutea
YEP	TULIP - POPLAR	Liriodendron tulipifera

herbs

BLG	BLUE - JOINT GRASS	Calamagrostis canadensis
BON	BONESET	Eupatorium perfoliatum
BRN	BRACKEN	Pteridum aquilinum
BRO	BROOM - SEDGE	Artholophis virginicus
CAT	CAT-TAIL	Typha spp.
CHF	CHRISTMAS - FERN	Polystichum acrostichoides
CIF	CINNAMON - FERN	Osmunda cinnamomea
DEG	DEERTONGUE GRASS	Panicum clandestinum
GOR	GOLDENROD	Solidago spp.
HAF	HAY - SCENTED FERN	Dennstaedtia punctilobula
HOT	HORSETAIL	Equisetum spp.
INF	INTERRUPTED FERN	Osmunda Claytoniana
IRS	IRIS	Iris spp.
JAP	SMALL JACK-IN-THE-PULPIT	Arisaema triphyllum
LET	WILD LETTUCE	Lactuca canadensis
MSF	MARGINAL SHIELD-FERN	Dryopteris marginalis
NYF	NEW YORK FERN	Dryopteris noveboracensis
PEV	PEARLY EVERLASTING	Anaphalis margaritacea
PHR	PHRAGMITES	Pragmites spp.
POG	POVERTY - GRASS	Danthonia spicata
ROM	REINDEER LICHEN	Cladonia rangiferina
ROF	ROYAL FERN	Osmunda regalis
SEF	SENSITIVE FERN	Onoclea sensibilis
SPL	SPIKED LOOSESTRIFE	Lythrum Salicaria
SPM	SPHAGNUM MOSS	Sphagnum spp.
SSS	SOLOMON'S - SEAL	Polygonatum biflorum
SWA	SWAMP - BUTTERCUP	Ranunculus septentrionalis
WHS	WHITE SNAKEROOT	Eupatorium rugosum
YPL	BULLHEAD - LILY	Nuphar variegatum

REVISIONS :

DATA SOURCES :

ASPLUNDH ENVIRONMENTAL SERVICES
aes BLAIR MILL ROAD WILLOW GROVE, PA. 19090

NATIONAL LEAD COMPANY, TICONDEROGA - SANFORD LAKE TRANSMISSION LINE, PLAN & PROFILE 6/22/41

U.S.G.S. 7.5 MIN. TOPOGRAPHIC MAP, PARADOX, N.Y. 1953

USDA, S.C.S., IN COOPERATION WITH CORNELL UNIVERSITY AGR. EXP. STA. SOIL SURVEY OF ESSEX CO N.Y.
SOIL SURVEY INTERPRETATION OF SOILS IN NEW YORK STATE '73

A.S.C.S.-USDA SALT LAKE CITY, UTAH. ESSEX CO. AIR PHOTO NO. 36031 374 87 (SCALE 1:40,000) OCT. 24 '74

ASPLUNTH ENVIRONMENTAL SERVICES A.E.S. PROJECT NO. 61-0028 FIELD STUDIES 1975-76

This information is a part of the ESEERCO "STUDY OF ENVIRONMENTAL AND ECONOMIC ASPECTS OF CONTEMPORANEOUS ELECTRIC TRANSMISSION LINE RIGHT-OF-WAY MANAGEMENT TECHNIQUES"

MAP 16.1

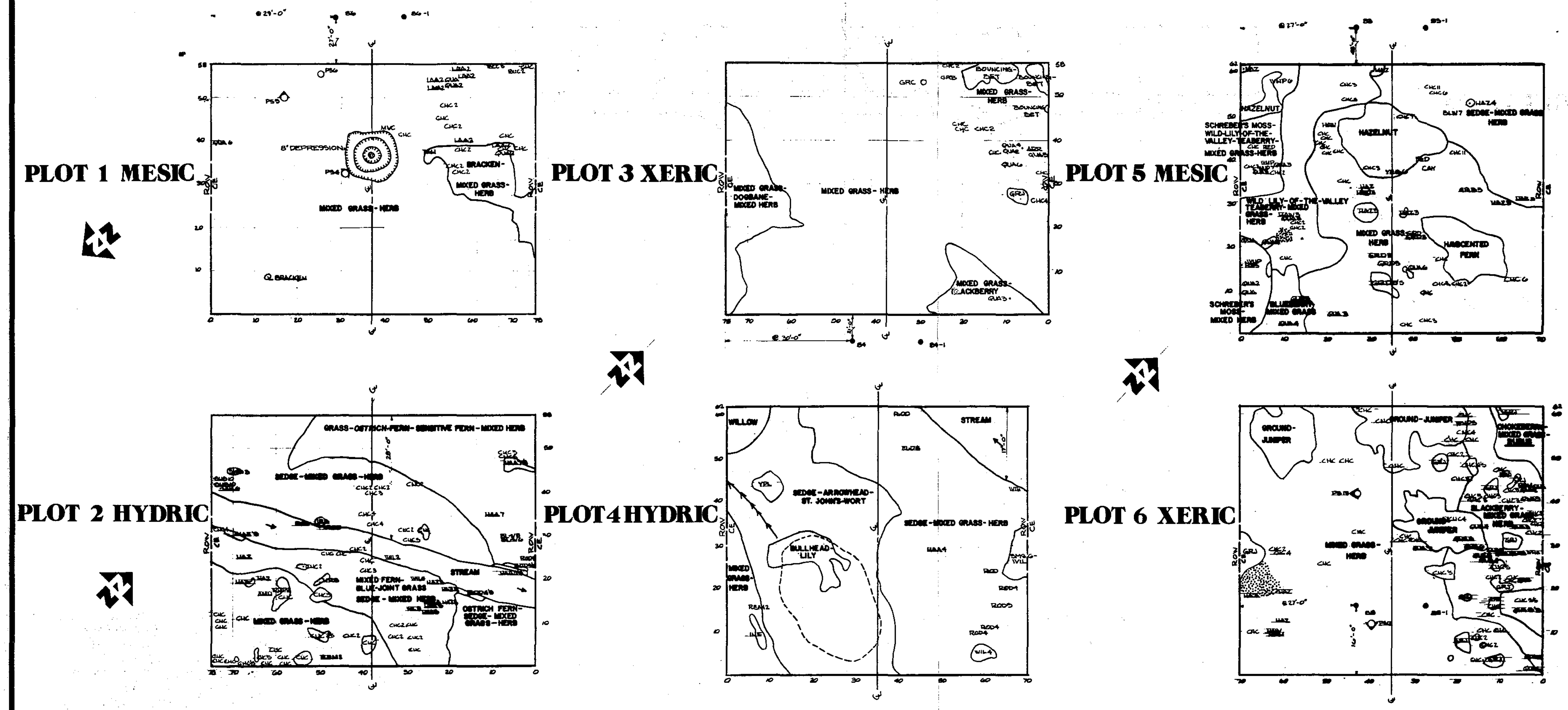
SITE 16 | HABITAT CONDITIONS

UTILITY: NATIONAL LEAD INDUSTRIES INC

ROW DESCRIPTION: NATIONAL LEAD LINE 115 KV
WOODEN POLE 'H' FRAME 100' ROW

SCALE: 1" = 200'-0"

200 100 0 100 200 400 800 1000



Notes:
-Vertical and Horizontal scale in feet

LEGEND

WORKS AND STRUCTURES

ACCESS ROAD
BRUSH AND LOG DISPOSAL SITES

BOUNDARIES

ROW CENTERLINE
ROW PROPERTY BOUNDARY
ROW EASEMENT BOUNDARY
EXISTING ROW CLEARING EDGE
DEPRESSION CONTOUR

SITE MARKERS

SAMPLE LOCATION
PHOTO STATION

WATER SYMBOLS

PERENNIAL STREAMS
INTERMITTENT STREAMS
SMALL RAPIDS
LARGE RAPIDS
DISAPPEARING STREAM
CANALS AND DITCHES
PERENNIAL LAKES AND PONDS
INTERMITTENT LAKES AND PONDS
SPRING
MARSH, SWAMP OR WET MEADOW
WET SPOT
ALLUVIAL FAN

SOIL SYMBOLS

ROCK
SCATTERED ROCK

PLANT COMMUNITY SYMBOLS

herbs

BLG	BLUE-JOINT GRASS	Calamagrostis canadensis
BON	BONESET	Eupatorium perfoliatum
BRN	BRACKEN	Pteridum aquilinum
BRO	BROOM-SEDGE	Artholophis virginicus
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SWA	SWAMP-BUTTERCUP	Ranunculus septentrionalis
WHS	WHITE SNAKEROOT	Eupatorium rugosum
YPL	BULLHEAD-LILY	Nuphar variegatum

shrubs

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NJT	NEW JERSEY TEA	Ceanothus americanus
PIF	PINXTER-FLOWER	Rhododendron nudiflorum
POI	POISON IVY	Rhus radicans
POS	POISON SUMAC	Rhus vernix
PRA	NORTHERN PRICKLY ASH	Xanthoxylum americanum
PRU	BUCKTHORN	Rhamnus spp.
RIB	RIBES	Ribes spp.
ROD	RED OSIER DOGWOOD	Cornus stolonifera
SMC	SUMAC	Rhus spp.
SPA	SPECKLED ALDER	Alnus rugosa
SPB	SPICEBUSH	Lindera Benzoin
SPI	SPIRAEA	Spiraea spp.
SMS	SMOOTH SUMAC	Rhus glabra
STM	STRIPED MAPLE	Acer pensylvanicum
STS	STAGHORN-SUMAC	Rhus typhina
SWF	SWEET-FERN	Comptonia peregrina
TAH	TARTARIAN HONEYSUCKLE	Lonicera tatarica
WIH	WITCH-HAZEL	Hamamelis virginiana
WIL	WILLOW	Salix spp.
WIN	WINTERBERRY	Ilex verticillata
WIR	WILD-RAISIN	Viburnum cassinoides
ZBC	BLACK CHOKEBERRY	Pyrus melanocarpa

trees

ABU	BUTTERNUT	Juglans cinerea
AIL	TREE-OF-HEAVEN	Ailanthus altissima
ALD	ALTERNATE-LEAVED DOGWOOD	Cornus alternifolia
AMB	BEECH	Fagus grandifolia
AMC	CHESTNUT	Castanea dentata
AME	AMERICAN ELM	Ulmus americana
AMH	AMERICAN HORNBEAM	Carpinus caroliniana
APP	APPLE	Pyrus malus
BAF	BALSAM-FIR	Abies balsamea
BAS	BASSWOOD	Tilia americana
BIH	BITTERNUT HICKORY	Carya cordiformis
BLC	BLACK CHERRY	Prunus serotina
BLL	BLACK LOCUST	Robinia Pseudo-Acacia
BLW	BLACK WALNUT	Juglans nigra
CHO	CHESTNUT-OAK	Quercus prinus
COT	COTTONWOOD	Populus deltoides
EAH	HEMLOCK	Tsuga canadensis
ERC	RED CEDAR	Juniperus virginiana
FLD	FLOWERING DOGWOOD	Cornus florida
GRB	GRAY BIRCH	Betula populifolia
HOH	AMERICAN HOP-HORNBEAM	Ostrya virginiana
LAA	LARGE-TOOTHED ASPEN	Populus grandidentata
LAR	AMERICAN LARCH	Larix laricina
NWC	WHITE CEDAR	Thuja occidentalis
PAB	WHITE BIRCH	Betula papyrifera
PIC	PIN-CHERRY	Prunus pensylvanica
PIH	PIGNUT HICKORY	Carya glabra
PIP	PITCH-PINE	Pinus rigida
QUA	QUAKING ASPEN	Populus tremuloides
RED	RED OAK	Quercus rubra
REM	RED MAPLE	Acer rubrum
RES	RED SPRUCE	Picea rubens
SAS	WHITE SASSAFRAS	Sassafras albidum
SCO	SCRUB-OAK	Quercus ilicifolia
SCP	SCOTCH PINE	Pinus sylvestris
SHB	SERVICEBERRY	Amelanchier spp.
SHH	SHAGBARK-HICKORY	Carya ovata
SUM	SUGAR-MAPLE	Acer saccharum
SWB	SWEET BIRCH	Betula lenta
VIP	SCRUB-PINE	Pinus virginiana
WHA	WHITE ASH	Fraxinus americana
WHO	WHITE OAK	Quercus alba
WHP	WHITE PINE	Pinus strobus
YEB	YELLOW BIRCH	Betula lutea
YEP	TULIP-POPLAR	Liriodendron tulipifera

REVISIONS :

DATA SOURCE : ASPLUNDH ENVIRONMENTAL SERVICES, BLAIR MILL ROAD, WILLOW GROVE, PA 19090

Field Survey - AES, 1975-76

This information is a part of the ESEERCO "STUDY OF ENVIRONMENTAL AND ECONOMIC ASPECTS OF CONTEMPORANEOUS ELECTRIC TRANSMISSION LINE RIGHT-OF-WAY MANAGEMENT TECHNIQUES"

MAP 16.2

SITE 16

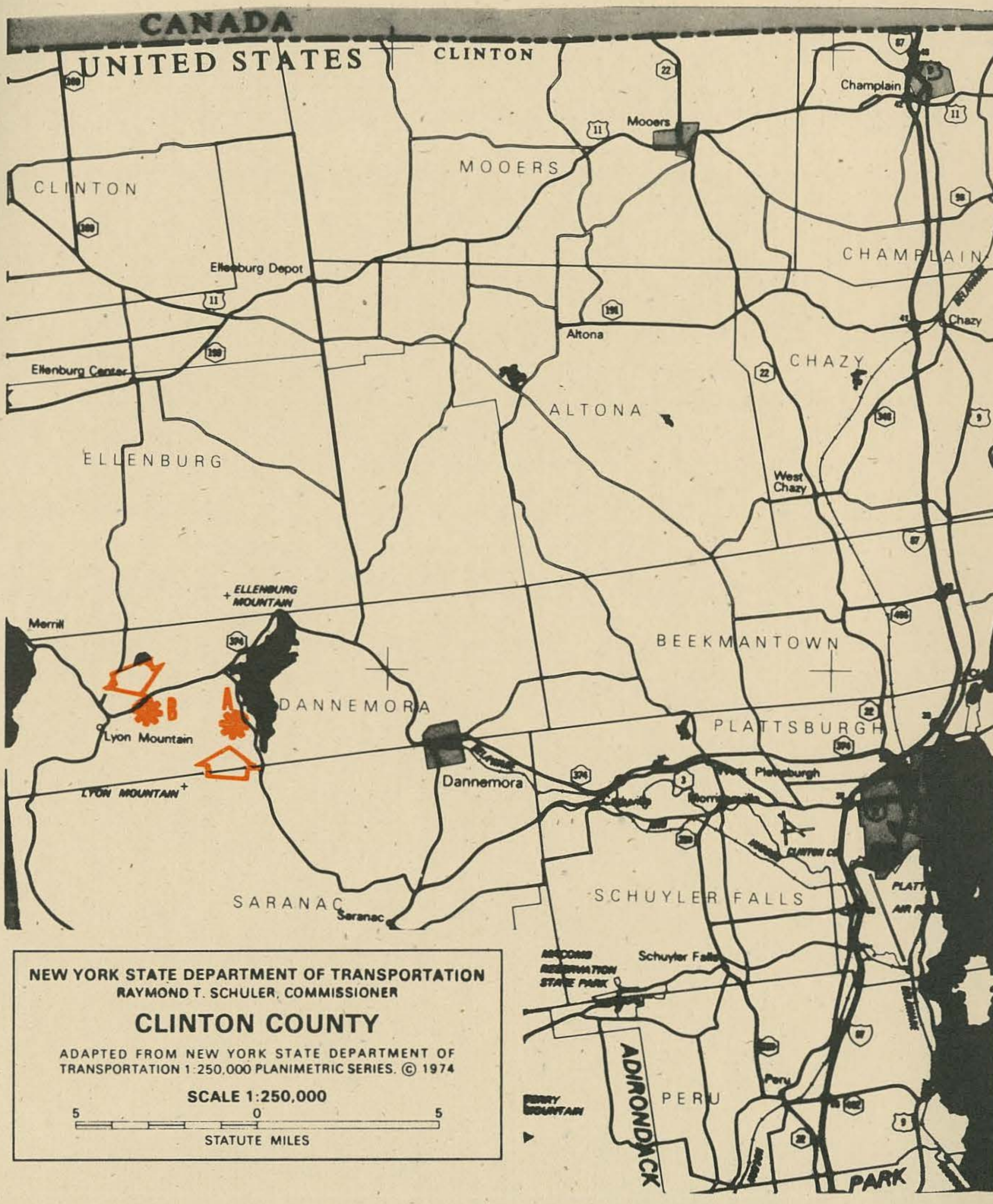
MAPPED PLOTS

UTILITY: Niagara Mohawk Power Corp.
ROW DESCRIPTION: National Lead Line 115 KV.
Wooden Pole 'H' Frame 100' ROW

SCALE: 1" = 10' - 0"
10 5 0 5 10 20 40 50

SITE 17

LYON MOUNTAIN to SARANAC



Site 17 Lyon Mountain to Saranac

Study area extends from route 374 to Chazy Lake Road and is located near Dannemora. To reach the area, take route 374 southeast past Lyon Mountain (town) to the substation. Site 17B extends from route 374 to include structure 4, and Site 17A which is east of Lyon Mountain, extends from structure 27 to structure 31.

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Site 17 Lyon Mountain to Saranac

1 Introduction

Site 17 is located in the Adirondack Highlands physiographic area of New York (Cline, 1970) in the Spruce-Fir and Northern Hardwoods forest type area (Stout, 1958). The general landscape of the ROW and adjacent areas is shown in Figs. 17.1.1 and 17.1.2.

The topography of the area is irregular. The terrain is gently sloping with occasional rough areas of rock outcroppings, (Stout, 1958).

Typical forest types of the region are Aspen-Gray Birch-Paper Brich, and Spruce-Fir and Northern Hardwoods (Stout, 1958). A Northern Hardwoods Spruce-Fir-Northern Hardwoods and Northern Hardwoods-Red Maple forest type occurred on the site.

2 Location and Identification

Site 17 occupied ROW segments on the east and west slopes of Lyon Mountain. Site 17A, on the east side, is located approximately 7 miles northwest of Moffitsville, in the town of Dannemora, Clinton County, New York (73^{o} 50' 00" W. Longitude; 44^{o} 43' 30" N. Latitude). Site 17B, on the west side, is located approximately 1 mile northeast of Lyon Mountain, in the town of Dannemora, Clinton County, New York (73^{o} 53' 00" W. Longitude; 44^{o} 43' 30" N. Latitude).

The site is on the Lyon Mountain to Saranac ROW which is operated by the New York State Electric and Gas Corporation (NYSEG). Site 17A is a 100-foot easement and site 17B is a 175-foot easement, each consisting of a single circuit, 115 kV line having wood-pole H-frame structures. Site 17B also includes a 44 kV line. The project site is approximately 4,800 feet in length. Site 17A extends from structure 31 east of Woods Road to structure 27 west of said road. Site 17B extends from structure 1, west of route 374, to structure 4, east of said road.

3 Background

The following discussion outlines documentable management techniques of clearing, construction, restoration, and maintenance regarding site 17, as received from NYSEG (letter dated March 11, 1976, from Richard H. Mider, New York State Electric & Gas Corporation, Binghamton, N.Y.). All available pertinent information and unit cost data are included under each operation of clearing, constuction, restoration, and maintenance.

3.1 Clearing

This ROW originally included a 44 kV line but was recleared and widened an additional 50 feet in 1958 to include a 115 kV facility. Brush was piled and burned. No additional information is available regarding clearing or unit cost data.

3.2 Construction

The 115 kV line was constructed in 1958. No additional information is available.

3.3 Restoration

No special restoration practices were conducted on this ROW.

3.4 Maintenance

During the fall and winter of 1958, a selective basal spray was applied by control crews; from the Lyon Mountain substation to structure 8. The chemical used was 2,4,5-Trichlorophenoxyacetic acid (2,4,5-T), 16 pounds of acid equivalent in oil diluent. Brush high enough to interfere with snow or ice-laden conductors was also cut and stumps sprayed. Cut brush was scattered along the edge of the ROW.

Also in 1958, a selective basal spray was applied by control crews from structure 8 to the Kents Falls substation. The chemical used was 2,4,5-T in a diesel oil carrier at a concentration of 16 pounds acid equivalent per 100 gallons solution. Power equipment was used with an average coverage of 40 gallons of solution per acre.

In 1964, a selective basal spray was applied by a control crew, from Lyon Mountain substation to the Kents Falls substation, at a cost of $49.25 per acre.

A stem foliage spray was applied by a control crew in 1969, from the Lyon Mountain substation to the Kents Falls substation. It is believed the chemical used was Tordon 101, mixed at a ratio of 1 part of acid equivalent to 99 parts water.

No additional information is available.

4 General Reconnaissance

A general reconnaissance was made in accordance with the methodology and is set forth in Map 17.1 which shows site habitat conditions. In this reconnaissance it was noted that the major vegetational types correlated with the soil types on the mesic and hydric habitats.

The existing visual character of ROW sites 17A and 17B are depicted during all seasons of the year, from important vantage points both on and off the ROW. These points are identified as photo stations and are located on Map 17.1 and described in Appendix 17. Specific reference is made to some of these photo stations throughout the report and illustrated in Fig. 17.1. With the exception of aerial photography used to identify land use, older photographs depicting the area are not available.

Site 17 which occupies ROW segments on the east (17A) and west (17B) slopes of Lyon Mountain, is not necessarily pleasing or objectionable to view in the context of this location. While the site in general does not have any noteworthy visual assests, it is no more unattractive to view than the surrounding area. There is a rugged and poor beauty about Lyon Mountain, which is reflected in the landscape revealed by the ROW. Site 17B is greatly influenced by black remnants of mining, and still would be to a great extent even without the presence of the ROW. One feature which dominates the sensitivity of the area near site 17B is this disturbance left by the past mining activities. Also long abandoned, near site 17A is a ski resort that apparently once flourished. The area is rural in character and appears to be used largely for recreation and lumbering. Site 17A is near Chazy Lake and can be seen from that angel. The site is visible from Chazy Lake Road but much less in summer than in winter due to the forest cover. Here also the line climbs Lyon Mountain and the terrain is quite steep. Site 17B is clearly visible from Route 374 especially since the ROW crosses the road. The potential number of people viewing the site is low because of the rural character of this area, even though Route 374 appears somewhat well traveled.

5 Field Studies - Results and Discussion

5.1 Soils

5.1.1 Geology and Soils

Site 17, Lyon Mountain to Saranac ROW, is located in Clinton County in the Adirondack Highlands (Cline, 1970), also referred to as the Adirondack Upland region, in the Adirondack Low Mountains subdivision (Thompson, 1966). Bedrock geology is of Precambrian age, pre 1,100 to 570 million years ago, consisting predominantly of igneous and metamorphic rocks such as granitic gneiss (Broughton et al., 1973). Soils in this area have developed in glacial till, a heterogeneous mixture of cobbles, gravel, sand, silt, and clay deposited directly by the ice sheet, and glaciofluvial outwash consisting of deep sands that were reworked by water following deposition by the glacier (Thompson, 1966; Broughton et al., 1973).

This site is comprised of 2 locations, site 17A, nearest Chazy Lake, having an east aspect, and site 17B, on the opposite side of Lyon Mountain, having a southwest aspect. In both instances, the terrain evidences a cradle-knoll topography. A diversity of soils of apparent glacial origin is found at both locations, and numerous surface boulders are present at the second location.

Soils on site 17A are largely classified in the order Spodosols, suborder Orthods (Canaan and Hinkley soil series), reflecting leached surface horizons and accumulations of organic matter and iron in the subsurface horizons. Dannemora soils are in the order Inceptisols, suborder Aquepts, indicating the absence of marked accumulation of clay and iron and aluminum oxides. Soils on 17B are classified in the order Spodosols, suborders Orthods (Empeyville soil series) and Aquods (Westbury soil series), the later of which exhibits characteristics associated with wetness.

Site 17 is located within the parameters of 2 major soils associations, namely, Rough Mountain Land, and Stony Land (Flach et al., 1959). On site 17A, the Canaan-Rock Outcrop Association also occurs, including in large part Canaan soils with areas of much rock outcrop, and some small inclusions of Hermon and Worth soils in some areas (Maine, 1973). Brief descriptions (Maine, Anon., 1972) of soil types occurring on the ROW study site (Map 17.1; Table 17.1) are:

Canaan-Rock Outcrop Association (CaB and CaC): This is an association and not a soil series; it consists of shallow, well-drained, thin mantled soils over bedrock areas. The Canaan soils have formed in a thin mantle of sandy till over hard granitic bedrock, on moderately steep and steep terrain. Texture consists mainly of rapidly permeable sandy loam, and depth ranges from 1 to 2 feet. Rock outcrop represents the greater percentage of this association, and minor inclusions of Worth and Hermon soils may occur, although none were noted. On this site the soil was strongly acid, and soil reaction was pH 4.7 in the surface 3 inches. The Woodland Suitability Group designations for Canaan soils with slopes of 8 to 15% and 15 to 35% are 5d1 and 5d2, respectively, designating low productivity for timber (Class 5) and restricted rooting depth (Subclass d), in this instance due to soils that are shallow to hard rock.

Dannemora sandy loam (DaA): Dannemora soils developed on medium-textured glacial till derived mainly from Potsdam sandstone, and occur mainly on nearly level areas to gentle slopes. Internal drainage is slow to very slow as these soils are underlain by a slowly permeable, firm to hard, fine sandy loam fragipan. The soil is generally acid and may range from pH 4.5 to pH 5.5 in the first 20 inches of typical profile; soil reaction in the upper 3 inches on this site was pH 5.4. Dannemora sandy loam is assigned to Woodland Suitability Group 5w1, indicating low productivity for timber and excessive wetness which evidences restricted drainage, a high water table, or a flooding hazard. On this site, water occurred within 3 inches of the surface.

Disturbed Area (DiA): This is a miscellaneous land type and not a soil series. A large area on site 17 is disturbed and had no recognizable characteristics of natural soil profiles. The remaining soil is predominantly sand, resulting from iron ore mining activities conducted in the Lyon Mountain vicinity from 1873 by the Chateaugay Ore and Iron Company (Anon., 1940).

Empeyville stony fine sandy loam (EaB): These soils developed on stony glacial till derived mainly from sandstone, on nearly level to moderately steep slopes. Internal drainage is slow, and there is a well-developed fragipan horizon at a depth of about 18 to 20 inches. The soils are nevertheless moderately well drained. Soil reaction is moderate to strongly acid throughout a typical profile and may range from pH 4.5 to pH 6.5; it is pH 4.4 in the surface mineral soil on this site. Empeyville stony fine sandy loam is assigned to Woodland Suitability Group 4o1, designating moderate productivity for timber, with no significant restrictions or limitations for woodland use or management.

Hinckley gravelly sandy loam (HdA): These soils developed on glaciofluvial materials derived mainly from gneiss and granite but containing some crystalline limestone, on nearly level to undulating topography. Internal drainage is good to excessive, and surface runoff is slow. Water-holding capacity generally is low due to the coarse soil texture. Soil reaction is strongly acid, ranging from pH 4.5 to pH 5.5 to a depth of 10 inches; it is pH 4.8 in the surface 3 inches on this site. Hinkley gravelly sandy loam is assigned to Woodland Suitability Group 5s1, designating low productivity for timber and sandy soils which impart low water-holding capacity and normally low availability of nutrient elements.

Westbury stony fine sandy loam (WdA and WdB): Westbury soils have developed on glacial till derived mainly from sandstone on nearly level to sloping terrain. Surface runoff ranges from slow to medium, depending on slope, and internal drainage is slow to very slow, depending upon the structural development of a fragipan.

These soils are poorly drained to somewhat poorly drained and are wet for most of the year. Westbury soils are moderately to strongly acid and range from pH 4.5 to pH 6.0 throught a typical profile; soil reaction was pH 4.2 in the upper 3 inches on this site. Westbury is in Woodland Suitability Group 4w2, designating moderate productivity and wet conditions.

The topography of site 17B is cradle-knoll in appearance, with depressions of the wetter Westbury soils, and elevations of the moderately well-drained Empeyville soils, both on the ROW and in the woods, which render any meaningful mapping of the 2 units, as well as any minor inclusions of other soil types, virtually impossible. Therefore, Empeyville-Westbury was used as a mapping unit to designate those areas as described. There were several large inclusions of predominantly Westbury soils and these were so mapped, but it should be noted that even here there were minor inclusions of the Empeyville soils.

5.1.2 Humus Types

Organic layers present on the soil surface of the ROW and adjacent woodland were measured on 2 mesic upland locations. Average thickness of the organic layers and A1 horizon was based on 5 samples taken at each location (Table 17.2). The presence and thickness of these layers were used for humus type classification. The humus classification key is not adaptable to areas exhibiting prolonged water saturation in the surface soil; therefore, similar measurements were not made on the hydric area. There is evidence of past mining activities on site 17B near the substation. No evidence of plowing, grazing, or recent fires were noted on this site.

At site 17A, all organic layers (litter, fermentation, and humus) plus an A1 horizon (mixed mineral and organic) were present at each site on both the ROW and woodland. Based on thickness of the fermentation, humus, and A1 layers, the predominant humus type was designated a "thin duff mull with very shallow A1" on the ROW and a "thick duff mull with very shallow A1" in the woodland. Organic layers on the ROW were nearly equivalent to those in the woodland, except for the humus layer that was thicker in the woods than on the ROW. Organic layers in the woods were composed primarily of leaves, twigs, and fruit of trees in contrast to the leaves and stems of grasses, herbs, and shrubs on the ROW.

At site 17B, all organic layers (litter, fermentation, and humus) were present; however, the A1 horizon was absent and the humus layer very thin, Based on thickness of the fermentation ahd humus layers, the predominant humus type was designated a "thin mor" on both the ROW and woodland areas. Other mesic locations were randomly sampled at both sites, and it was noted that the humus types apparent on the study plots were typical. Especially notable on site 17B was topography similar to that of cradle-knoll, and it appeared that the presence of a thin humus layer corresponded to the more elevated areas.

Based on these limited observations, it appears that ROW construction and periodic maintenance for brush control did result in some reduction of the humus layer on the ROW mesic area of site 17A, but otherwise exerted little influence on other organic layers. Elimination of the forest cover also resulted in a change in kind of organic material; however, regrowth and persistence of a mixed grass-herb-shrub cover has resulted in annual litter depositions and continuation of a protective organic layer.

5.1.3 Soil Erosion

Current Active Erosion Observations of active soil erosion on the ROW and adjacent woodland were made on the Lyon Mountain to Saranac study area in August, 1976. No active erosion was evident in the woodland on all soil types and slopes, apparently due to the protective canopy of trees and shrubs and undisturbed organic layers present on the soil. Likewise, no active or recent erosion was observed on the general ROW, areas on which woody brush was controlled but with little or no disturbance to the soil surface. Good vegetative cover, composed of grasses, herbs and low shrubs, had developed on the general ROW following chemical treatment for brush control and a protective litter mulch from these plant parts was present (Table 17.2).

Eroding areas were identified as to location on the ROW, soil type, average slope, and present plant cover (Table 17.3). Erosion was classified as to kind (sheet, rill, gully) and class (slight, moderate, severe); the average depth of 1 man-made ditch was recorded and the location plotted on the base map (Map 17.1). Active erosion on the ROW was limited to areas that had been subjected to past and/or recent mechanical disturbance of the soil, i.e., access roads, bank cuts, and disturbed areas from past iron mining activities (Fig. 17.1.3). Small amounts of sediment resulting from slight sheet erosion do leave the ROW via a stream at an access road crossing made by a track vehicle, which is expected to heal quickly; in all other locations of exposed soil, sediment remains on the ROW.

There were no restoration practices employed following construction of this ROW; therefore, denuded areas are dependent on natural plant invasion. The majority of the ROW cover consists of mixed grass-herb-shrubs. with a moderate to heavy density of sapling size hardwoods. Progressive sheet and rill erosion on the 2 major excavated areas (mined area and bank cut) apparently prevent natural plant succession. The soil on the disturbed mined area is being invaded by plants at a very slow rate.

5.2 Vegetation

5.2.1 Habitat and Forest Types on the Site

Hydric Habitat There were 2 hydric, or wet, habitats on site 17. Hydric 4 habitat was located on site 17A in a stream bottom on the lower slopes of Lyon Mountain. Slope was negligible and aspect was flat. Drainage was impeded and wet conditions resulted. The forest type was Northern Hardwoods-Red Maple, with associate species of quaking aspen, large-toothed aspen, and red spruce.

The hydric 1 habit was located on site 17B in a slightly depressed area, on the lower slopes of Lyon Mountain. Slope was negligible and aspect was flat. Drainage was impeded, and wet conditions resulted. The forest type was Northern Hardwoods-Red Maple, with associated species of large-toothed aspen, quaking aspen, gray birch, white birch, and balsam-fir.

Mesic Habitat There were 2 mesic, or medium moist, habitats on site 17. Mesic 3 habitat was located on site 17A on a nearly level upland area on the lower slopes of Lyon Mountain. Slope was negligible and aspect was flat. Drainage was free but not excessive. The forest type was Spruce-Fir-Northern Hardwoods, with aspen, birch, and red spruce the associated species.

The mesic 2 habitat was located on site 17B, on a nearly level upland area, on the lower slopes of Lyon Mountain. Slope was as much as 5% on a west-facing slope. Drainage was generally free but not excessive, and in a few depressed areas drainage was somewhat impeded. The forest type was Spruce-Fir-Northern Hardwoods with aspen, birch, and balsam-fir.

5.2.2 Analysis of Forest Types and Associated ROW Vegetation

General Changes in Vegetation The primary impact of the ROW was to cause a change from a forest with a 4-layered structure to a shrub-herb-grass community. Obviously, removal of the trees caused this; and what was essentially a 2-layered ROW community developed, with the shrub layer consisting of shrubs and small trees which were not removed by maintenance spraying, or which have arisen since the last spray application (Fig. 17.2).

In order to more completely characterize the forest types, an analysis was made on the forest plots to derive importance values for tree species (Table 17.4). Obviously, red maple was an important species on both hydric plots (1 and 4), while yellow birch was an important species on mesic plot 2, and beech was an important species on mesic plot 3.

On sites 17A and 17B, the east and west sides of Lyon Mountain, respectively, a Northern Hardwoods-Red Maple forest type was changed to a willow-Sensitive Fern plant community on the hydric habitats, and to a Blackberry-Goldenrod plant community on the mesic habitats (Map 17.1; Table 17.5).

Quantitative Changes On hydric habitats at site 17, there was a notable increase in the number of shrubs on the ROW as compared with the forest (Table 17.5; Figs. 17.3 and 17.4). On hydric 1 habitat, there were 5 shrubs on the ROW and 1 in the forest. On hydric 4 habitat, there were 4 shrubs on the ROW and 2 in the forest. There was no major increase in the number of herbs on the hydric habitats; there were 16 species on the ROW and 12 species in the forest on hydric 1 habitat, and 15 species on the ROW as compared to 13 in the forest on hydric 4 habitat (Table 17.5).

There was a notable increase in the shrub and herb layers on the mesic habitats as compared with the adjacent forest; on mesic 2 habitat, there were 5 shrubs on the ROW as compared to 3 in the forest; on mesic 3 habitat, there were 4 shrubs on the ROW as compared to 2 in the forest. In the herb layer, there were 17 species on the ROW as compared with 8 in the forest on mesic 2 habitat; on mesic 3 habitat, there were 18 species on the ROW, and 7 in the forest (Table 17.5).

Qualitative Changes On hydric 1 habitat, 7 shrub and herb species occurred both in the forest and on the ROW (Fig. 17.5). One shrub, striped maple, and 5 herbs appeared exclusively in the forest (Table 17.6), while 5 shrubs appeared exclusively on the ROW, among which willow, spiraea, and red osier dogwoods were prominent; 9 herbs were unique to the ROW (Table 17.7).

On mesic 2 habitat, 6 shrub and herb species occurred both in the forest and on the ROW (Fig. 17.5). Two shrubs, hazelnut and hobblebush, and 3 herbs appeared exclusively in the forest, while 4 shrubs and 12 herbs appeared exclusively on the ROW (Table 17.7).

On mesic 3 habitat, 6 shrub and herb species occurred both in the forest and on the ROW (Fig. 17.5). One shrub, hobblebush, and 2 herbs appeared exclusively in the forest, while 3 shrubs and 13 herbs appeared exclusively on the ROW (Tables 17.6 and 17.7).

On hydric 4 habitat, 4 shrub and herb species occurred both in the forest and on the ROW (Fig. 17.5). Two shrubs, striped maple and hobblebush, and 9 herbs appeared exclusively in the forest, while 4 shrubs and 11 herbs appeared on the ROW only (Tables 17.6 and 17.7).

It appears that the ROW had considerable impact on the number of species in the forest on the hydric and mesic habitats. Species abundance, in both shrub and herb layers, was much greater on the ROW than in the adjacent forest (Table 17.5).

5.2.3 Analysis of Plant Communities for On-ROW Mapped Vegetation Plots

Table 17.8 presents a breakdown of major vegetational communities (Map 17.2) for the hydric and mesic plots on the Lyon Mountain to Saranac ROW. Much of the present composition of herbaceous and woody plant communities on this area can be explained by the spraying history.

The ROW has had 2 selective basal treatments, 1 in 1958 and the other in 1964, with 2,4,5-T and oil. A stem foliar application, using Tordon 101, was performed in 1969.

The major plant communities now dominating the 4 plot locations on the hydric and mesic habitats are: Mixed Grass, Mixed Grass-Herb, Herb-Mixed Grass, and Sedge-Herb. The majority of these species are apparently not adversely affected by herbicides, and will most likely play an important part in the continued development of this ROW, especially with a more selective approach in line maintenance.

On hydric plot 4, an intermittent stream crossed the ROW. However, it was dry in October, 1975, when the mapped plot was established.

Blackberry and raspberry canes were quite prevalent on 1 mesic site and appear to have come in since the initial clearing and spread after the various chemical treatments of the ROW. Other shrubs, such as spiraea, willow, and red osier dogwood, are abundant on this ROW, but do not occur in the understory of the adjacent woods. These aesthetically desirable shrubs appear to have seeded-in since line clearing, and if not removed from the vegetational matrix during herbicide treatment, are likely to spread rapidly both by natural seeding and by underground root extension.

5.2.4 Comparison of Forest Type with ROW Vegetation

The 115 kV line was rebuilt in 1958. Prior to this time a 44 kV line existed which was approximately 50 feet in width. The original clearing date of the 44 kV line is not known. An additional 50 feet were cleared for construction of the new 115 kV line.

The ROW had a selective basal treatment in 1958 with 2,4,5-T in diesel oil carrier at a concentration of 16 pounds of acid per 100 gallons solution. The average ground application was approximately 40 gallons of solution per acre. The ROW was again selectively basal sprayed in 1969.

The general impact of the above treatments of the ROW was to change the forest type (Northern Hardwoods-Red Maple, and Spruce-Fir-Northern Hardwoods) to shrub-herb-grass communities. Some shrub and herb plants of the forest were replaced by plants favored by open conditions.

On the hydric habitats, a Willow-Sensitive Fern community developed. There was a significant increase in the total number of shrub and herb species on the ROW as compared with the forest. There was also a qualitative difference in the shrub and herb species on the ROW as compared to the forest, with some shrubs of the forest not on the ROW and some of the shrubs of the ROW lacking from, or sparse in, the forest. The same was true for herbs, i.e., some herbs of the forest were not on the ROW, while some herbs of the ROW were not in the forest.

On the mesic habitats, which were formerly occupied by a Spruce-Fir-Northern Hardwoods forest type, a Blackberry-Goldenrod community was produced. There was a significant increase in the total number of shrub and herb species on the ROW as compared with the forest. There was also a qualitative difference in the shrub and herb species both on and off the ROW.

In general, those species which occupied the ROW on the hydric and mesic habitats were light-loving plants of open fields such as blackberry, willow, goldenrods, and asters. Conversely, those plants that occurred in the forest were mainly forest-dwelling species that do well under considerable shade. Of course, some species were present both on the ROW and in the adjacent forest (Figs. 17.1.4 and 17.1.5).

5.3 Wildlife

The major game species for site 17, Lyon Mountain to Saranac, were determined by Asplundh Environmental Services (AES) in conjunction with the New York State Department of Environmental Conservation (DEC). These species are white-tailed deer, varying hare, and ruffed grouse.

5.3.1 Actual Use

White-tailed Deer White-tailed deer use was sparse on this study area, and consisted only of indirect observations, namely browse.

Browse Survey Eight browse transects were established on study area 17 (Tables 17.9 and 17.10; Fig. 17.6). Those transects were established at each permanent study plot location, on May 6, 1976, with 1 transect on each side of the ROW.

Overall browse utilization was low for all 3 areas, ROW, ROW edge, and woods. There were more stems available on the ROW and ROW edge than in the woods. The actual use was greater in the woods than on either the ROW edge or ROW; it was 28% in the woods, 25% at the ROW edge, and 16% on the ROW (Table 17.9; Fig. 17.6).

Raspberry, red maple, sugar-maple, and red osier dogwood were the most abundant plants present. Of those species, red osier dogwood had the highest percentage of use (Table 17.10).

Ruffed Grouse A ruffed grouse drumming census was made on the evening of May 5 and the morning of May 6, 1976. The weather was cloudy, the temperature was between 55 and 60 F, and the wind was 5 to 15 mph. No birds were heard drumming. This could indicate that there were no drumming birds in the area, or that the weather conditions curtailed normal drumming habits.

Grouse droppings were found both on the east and west sides of Lyon Mountain. On site 17A, a moderate amount of droppings were found in the forest south of structure 27, in the summer of 1975. On site 17B, droppings were slight on the ROW on mesic plot 2, in the spring of 1976.

Varying Hare No varying hare activity was noted during the length of the study period.

Miscellaneous Wildlife Observations Various birds were seen and/or heard on the study area throughout the period of this study. Birds observed on the ROW and on the ROW edge are included in Table 17.11.

One inactive hornet nest was observed on site 17B during the fall of 1975. In the summer of 1975, a pileated woodpecker was observed on site 17A flying in the adjacent woods. During the same visit, a dead tree off the ROW was noted, utilized by woodpeckers (Fig. 17.1.6). No wildlife activity was noted during the winter visitations, due mainly to the severe weather conditions which prevailed.

5.3.2 Potential Use

Potential wildlife use of the plant species present on site 17 for the 3 major game species, deer, hare, and grouse, is contained in Table 17.12. In addition to asterisk ratings from New York, asterisk ratings from Pennsylvania were included for those plant species present on the study area that were not rated in the New York evaluation for deer and grouse. The same was done for varying hare with the inclusion of some of the asterisk ratings for Minnesota. This additional data should provide supplemental information to the ROW manager regarding those plant species that may be of potential value to those game species (Martin et al., 1951).

5.4 Land Use

5.4.1 Location

Site 17A is located in a rural nonfarm section of the town of Dannemora, Clinton County, New York. Between 1960 and 1970 there was a .3% increase in population of Clinton County with a 1970 distribution of 40.5% urban, 54.9% rural nonfarm, 4.6% rural farm (U.S. Bureau of the Census, 1972). The closest community is Lyon Mountain, which is approximately 3 miles to the west.

Site 17B is located in a rural nonfarm section of the town of Dannemora, Clinton County, New York. Between 1960 and 1970 there was a .3% increase in population of Clinton County with a 1970 distribution of 40.5% urban, 54.9% rural nonfarm, 4.6% rural farm (U.S. Bureau of the Census, 1972). The closest community is Lyon Mountain, which is approximately 1 mile to the southwest.

5.4.2 Land Use Near the Time of Construction

The ROW was constructed during 1958. Data prior to this date was unavailable. The earliest available data obtained from 1968 USGS Quadrangle Map indicates that the land adjacent to the ROW was primarily rural nonfarm (Tables 17.13 and 17.14; Figs. 17A.7 and 17B.7). Land use distribution on site 17A included the following subtypes:

Commercial and Industrial:
Cs - Commercial strip development

Forest Land:
Fn - Forest lands

Outdoor Recreation:
Or - Outdoor recreation

Residential:
Rk - Shoreline development

Water Resources:
Wc - Artificial ponds

Land use distribution for site 17B included the following subtypes:

Commercial and Industrial:
Cs - Commercial strip development
Ih - Heavy manufacturing

Forest Land:
Fn - Forest lands

Public & Semi-Public:
P - Public and semi-public

Residential:
Rr - Rural hamlet
Rm - Medium density

Transportation:
Tt - Communications and Utilities

Water Resources:
Wb - Marshes, shrub wetlands, and bogs
Ww - Wooded wetlands

5.4.3 Land Use After Construction

The adjacent land use to site 17 has not changed from the 1968 data. The land adjacent to the ROW is still rural nonfarm with the same distribution described above prior to construction (Tables 17.13 and 17.14; Figs. 17A.7 and 17B.7).

In addition to the use of the ROW for the transmission of electrical power, portions of the ROW are currently being used for logging and hiking.

6 Evaluation, Interpretation, and Summary of Results

6.1 Conditions Which Existed Prior to Establishment of ROW

Soil, water, vegetation, and wildlife habitat conditions existing prior to ROW construction were based on observations made during the period of this study on adjacent undisturbed forest areas on both sides of the ROW.

6.1.1 Soils

This site is located on east and west slopes of Lyon Mountain on the northern edge of the Adirondack Uplands. Bedrock geology consists of granite, granitic gneiss, and sandstone covered with glacial outwash and till with numerous rock outcrops prominent on the east-facing slope. The area is characterized by cradle-knoll topography, nearly level to steep slopes with gradients up to 25%, and mostly east and southwest aspects. Surface mineral soils are very strongly acid sandy loams. Four soil types, 1 soil association, and 1 disturbed area from past iron ore mining operations were mapped on the site. The association consists of shallow, well-drained, Canaan sandy loam intermixed with rock outcrops on steep slopes. The poorly drained Dannemora sandy loam and Empeyville and Westbury stony fine sandy loams formed in glacial till on nearly level to moderate slopes; all have restricted drainage due to fragipans in the subsoil. The well-drained Hinckley gravelly sand loam developed in outwash deposits on nearly level to undulating areas.

Soils in the adjacent forest were occupied by a Spruce-Fir-Northern Hardwoods forest type, composed mostly of beech, yellow birch, red maple, and aspen on mesic Hinckley, Empeyville, and upper-slope phases of Westbury soils, and, red maple and yellow birch in the Northern Hardwoods-Red Maple forest type on hydric Dannemora and lower-slope phases of Westbury soils. All soils on this site were rated low to moderate for woodland production due to such limitations as shallow mantle over bedrock, wetness, or dry sandy conditions.

Humus types on mesic habitats in the forest varied with location and soil type. The eastern segment, site 17A, had a "thick duff mull" characterized by litter, fermentation, and humus layers, 1.6 inches thick, and a very shallow A1 horizon on Hinckley soil. In contrast, the western segment, site 17B, in Empeyville-Westbury soil, had a thin forest floor, 0.5 inches thick, and no A1 horizon, resulting in a "thin nor" humus type. No active erosion was observed in the undistrubed forest on any soil type or slope.

6.1.2 Vegetation

Although the exact date of corridor establishment is not known, the area in the vicinity of the present study area has been in forest for many years, and it can be presumed that this section of the ROW was cleared through forest land. Northern hardwood stands of red maple; yellow, white, and gray birch; white ash; aspen; black cherry; and balsam-fir were major species on the hydric and mesic sites now occupied by this corridor.

6.1.3 Wildlife

Wildlife, being mobile species which may or may not be observed during site visitation, were reasonably imputed to this area by the composition of the forested areas adjacent to the ROW. It can be assumed that those species currently occupying the site, i.e., white-tailed deer, ruffed grouse, and varying hare, occupied the habitat prior to ROW construction. Although current wildlife activity may be influenced by the presence of the ROW, it is likely that those species, designated by the DEC in conjunction with AES as major in this area, inhabited the vicinity even before ROW construction.

6.1.4 Land Use

The earliest data available for site 17A is the 1968 USGS Quadrangle Map. The ROW and adjacent land area was rural nonfarm with a land use distribution of commerical and industrial (0.2%), forest land (77.8%), outdoor recreation (2.7%), water resources (18.3%), and residential (1.0%). It can be assumed that prior to ROW construction the areas cleared were wooded wetlands and heavily forested.

The earliest data available for site 17B is the 1968 USGS Quadrangle Map. The ROW and adjacent land area was rural nonfarm with a land use distribution of commercial and industrial (7.5%), forest land (81.0%), public and semi-public (1.5%), water resources (6.8%), transportation (0.2%), and residential (3.0%). It appears that most of the area occupied by site 17B was forest land prior to ROW establishment.

6.2 Conditions Which Exist at Present

6.2.1 Soils

Soils and moisture regimes on the ROW coincided with those in the adjacent forest, since soil-type boundaries generally extended across the ROW and forest in association with topography and drainage patterns. Dominant plant communities on the ROW in 1976 were closely related to soil and moisture conditions; these were Blackberry-Goldenrod on mesic Empeyville-Westbury and Hinckley soils, and Willow-Sensitive Fern on hydric areas of Dannemora and Westbury soil series.

Organic layers on the ROW were composed of leaves and stems of the mixed grass-herb-shrub cover. Humus types on mesic habitats varied with the location on the ROW. A "thin duff mull", consisting of litter, fermentation, and humus layers, 1.0 inches thick, with a very shallow A1 horizon, was present on the eastern segment, while, a "thin mor" with all organic layers, 1.3 inches thick, but no A1 horizon, occurred on the western segment.

No active or recent erosion was observed on any part of the general ROW, but slight sheet and rill erosion occurred on 2 disturbed sandy loam areas on the eastern segment, site 17A, 1 on a road bank and the other on the access road. Also, some sheet, rill, and gully erosion was occurring on the western segment, site 17B, in a drainage ditch and disturbed area related to past mining operations. Small amounts of sediment from sheet erosion enter a stream crossing the ROW, but otherwise accumulate on lower slopes.

6.2.2 Vegetation

Sedge-Mixed Herb, and Mixed Grass communities are the most abundant herbaceous cover on hydric sites. Scattered colonies of blackberry and of spiraea occur on these sites. Sensitive, cinnamon-, and interrupted ferns, and horsetails are locally abundant. Some areas of hydric sites, particularly where the Mixed Grass community occurs, are being invaded by woody species. These include gray birch, willows, red maple, and yellow birch.

On mesic sites, mixtures of various grasses and herbs form the basic herbaceous community. Bracken-Mixed Herb, and Blackberry communities also occur on these sites. Mixed herb and grass communities are being invaded by woody species. There include red maple, quaking aspen, white ash, flowering dogwood, and willows.

6.2.3 Wildlife

White-tailed deer, ruffed grouse, and varying hare are the major game species that probably currently utilize the site. Indirect observations, i.e., browse, indicated their use of the ROW area. Browse surveys indicated that overall browse utilization was low on the site. Actual use was greatest in the forest, while more stems were available at the ROW edge than on the ROW or in the interior woods. Raspberry stems far surpassed all other species in total abundance, but were not greatly utilized. Sugar-maple, red maple, and red osier dogwood were also abundant. Red osier dogwood was the most heavily browsed of any plant species.

No drumming birds were revealed by a grouse drumming count in the spring of 1976. Grouse droppings, however, indicated that species' presence in the ROW vicinity.

No varying hare activity was observed during the length of the study period.

Several other animals were noted, directly or indirectly, to be utilizing either the ROW, the adjacent forest, or both. Potential wildlife use is evident from plant species present on the site.

6.2.4 Land Use

Presently, the adjacent land uses to site 17A have not changed from 1968 data. The land adjacent to the ROW is still considered to be rural nonfarm. In addition to use of the ROW for the transmission of electrical power, the ROW is being used for hiking and the potential exists for hunting.

The adjacent uses to site 17B have not changed from the 1968 data. The land adjacent to the ROW is still considered to be rural nonfarm. In addition to use of the ROW for the transmission of electrical power, the ROW is currently being used for logging operations along the access road. There is the potential for hunting.

6.3 Environmental Effect and Probable Causes

6.3.1 Soils

Detrimental effects of ROW management on soils of this site were minor and restricted to slight but containing erosion on disturbed areas such as a road bank cut and access road. Some sheet, rill, and gully erosion was also evident along a drainage ditch and exposed sand on an area disturbed by past mining operations that is not related to ROW activities. Small amounts of sediment were transported into a stream, but otherwise do not leave the ROW area.

Humus types on mesic habitats of the ROW were similar to those in the forest, namely, duff mulls on the eastern segment of Lyon Mountain and thin mors on the western segment. Organic layers were thicker in the woods than on the ROW where duff mulls occured, but thicker on the ROW where thin mors occurred; hence, no meaningful relationship could be determined. Removal of the forest cover for ROW construction, however, caused a change in litter composition from essentially tree parts to leaves and stems of the predominant ROW vegetation.

6.3.2 Vegetation

Selective herbicidal management during the past 18 years has produced a low cover of grasses and herbs. Although herbicide applications have periodically eliminated most woody species. they have failed to halt the invasion of woody plants. Many tree seedlings and shrubs have become established since the 1969 spraying, particularly where Mixed Grass communities occur on hydric sites and Mixed Herb-Mixed Grass communities occur on mesic sites.

6.3.3 Wildlife

The presence of the ROW has encouraged the development of many different plant species, mainly light-loving, on the ROW proper, thus enhancing the habitat for wildlife use. The ecotone created by the presence of the ROW often produces a greater variety and density of life than is found otherwise

(Leopold, 1936), and this phenomenon has been termed the "edge effect" (Smith, 1974).

6.3.4 Land Use

Based on the data obtained, the presence of the ROW has had no ifentifiable effect on the adjacent land uses, except that it has opened the area to to multiple uses such as hiking.

Table 17.1. Soil series present on the Lyon Mountain to Saranac study area.

Soil Series	Map Symbol[1]	Drainage Class[2]	Surface Soil pH	Surface Soil Texture	Woodland Suitability Group
Canaan-Rock Outcrop	CaB	MG	4.7	sandy loam	5d1
Canaan-Rock Outcrop	CaC	E	4.8	sandy loam	5d2
Dannemora	DaA	PD	5.4	sandy loam	5w1
Empeyville-Westbury	EaB-WdB	MG-SPD	4.4/4.2	stony fine sandy loam	4o1/4w2
Hinckley	HdA	MG	4.8	gravelly sandy loam	5s1
Westbury	WdA	PD	4.2	stony fine sandy loam	4w2
Disturbed Area	DiA	MG-SPD	---	sand	---

[1] The third letter of the map symbol designates slope class:
A = 0-8%, B = 8-15%, C = 15-25%, D = 25-35%, E = 35-50%, F = 50-70%.

[2] Drainage Class: VPD = very poorly drained, PD = poorly drained, SPD = somewhat poorly drained, ID = imperfectly drained, MG = moderately good, G = good, E = excellent (excessive).

Table 17.2. Average thickness of organic layers and A1 horizon and humus types for mesic sites on ROW and adjacent woodland of site 17.[1]

Moisture Regime	Location	Layer Thickness (in.)				Humus Type
		L	F	H	A1	
Mesic (3)[2] - 17A	ROW	.5	.1	.4	.7	Thin duff mull with very shallow A1
	Woodland	.6	.2	.8	.6	Thick duff mull with very shallow A1
Mesic (2) - 17B	ROW	1.0	.2	.1	0	Thin mor
	Woodland	.3	.1	.1	0	Thin mor

[1] Plot data was not combined because the sites reflected different aspects and humus types.

[2] Samples taken on vegetation study plots, the numbers of which are indicated by figures in parentheses.

Table 17.3. Areas exhibiting active erosion in August, 1976, on the Lyon Mountain to Saranac ROW study area.

				Erosion on ROW		
Location	Soil Type	Average Slope (%)	Plant Cover	Kind	Class	Gully Depth (in.)
		Site 17A				
Bank Cut for Road	Hinckley gravelly sandy loam	8	Moss-grass	Sheet & Rill	Slight	-
Access Road	Dannemora sandy loam	3	Grass-sedge	Sheet	Slight	-
		Site 17B				
Abandoned Mining Area	Disturbed-sand	3	Sedge-grass-herb	Sheet & Rill	Moderate	-
Ditch-Past Mining Use	Disturbed-sand	3	Bare	Sheet & Gully	Slight	36

Table 17.4. Importance value of trees in the upper tree layer in the forest adjacent to the ROW.

Site	Species	Relative Dominance Basal Area (% of total) 1	Relative Density (% of total) 2	Importance Value 1+2
Hydric 1	Red Maple	50.44	47	97.44
	Yellow Birch	39.18	33	72.18
	White Birch	4.56	8	12.56
	Quaking Aspen	4.56	6	10.56
	American Hop-Hornbeam	1.13	3	4.13
	Gray Birch	.13	3	3.13
Mesic 2	Yellow Birch	49.96	54	103.96
	Red Maple	30.82	17	47.82
	White Birch	6.72	11	17.72
	Quaking Aspen	9.52	9	18.52
	Gray Birch	2.98	9	11.98
Mesic 3	Beech	55.5893	48	103.5893
	Red Maple	27.7996	28	55.7996
	Quaking Aspen	15.8664	15	30.8664
	White Birch	.7425	6	6.7425
	Serviceberry	.0004	3	3.0004
Hydric 4	Red Maple	91.66	72	163.66
	Yellow Birch	3.31	10	13.31
	Balsam-Fir	2.84	6	8.84
	Quaking Aspen	2.04	6	8.04
	White Ash	.15	6	6.15

Table 17.5. Comparison of species composition, abundance and sociability (A.S.) in the tree, shrub, and herb layers in the adjacent forest and on the ROW, on hydric and mesic habitats.

Species	Hydric (1)		Mesic (2)		Mesic (3)		Hydric (4)	
	Forest A.S.	ROW A.S.	Forest A.S.	ROW A.S.	Forest A.S.	ROW A.S.	Forest A.S.	ROW A.S.
Tree Layer								
Yellow Birch	1.1	-	2.1	-	-	-	+.1	-
White Birch	+.1	-	+.1	-	+.1	-	-	-
Red Maple	2.1	-	1.1	-	1.1	-	2.1	-
American Hop-Hornbeam	++.1	-	-	-	-	-	-	-
Quaking Aspen	+.1	-	+.1	-	+.1	-	++.1	-
Gray Birch	++.1	-	+.1	-	-	-	-	-
Beech	-	-	-	-	2.1	-	-	-
Serviceberry	-	-	-	-	++.1	-	-	-
White Ash	-	-	-	-	-	-	++.1	-
Balsam-Fir	-	-	-	-	-	-	++.1	-
No. Species	6	0	5	0	5	0	5	0
Shrub Layer								
Striped Maple	1.1	-	3.1	1.1	3.1	1.1	2.1	-
Spiraea	-	2.1	-	1.2	-	-	-	1.2
Red Osier Dogwood	-	1.1	-	+.1	-	-	-	1.1
Blackberry	-	+.2	-	1.2	-	2.1	-	1.1
Witch-Hazel	-	++.1	-	-	-	-	-	-
Willow	-	3.1	-	2.1	-	+.1	-	+.1
Hazelnut	-	-	+.2	-	-	-	-	-
Hobblebush	-	-	+.1	-	1.4	-	1.2	-
Raspberry	-	-	-	-	-	4.1	-	-
No. Species	1	5	3	5	2	4	2	4

Table 17.5. Continued

Species	Hydric (1) Forest A.S.	Hydric (1) ROW A.S.	Mesic (2) Forest A.S.	Mesic (2) ROW A.S.	Mesic (3) Forest A.S.	Mesic (3) ROW A.S.	Hydric (4) Forest A.S.	Hydric (4) ROW A.S.
Trees in the Shrub Layer								
Alternate-leaved Dogwood	-	-	-	-	+.1	-	-	-
Yellow Birch	2.1	+.1	1.1	+.1	-	-	1.1	-
Red Maple	3.1	3.1	2.1	2.1	2.1	3.1	2.1	1.1
White Ash	++.1	1.1	1.1	1.1	-	+.1	1.1	1.1
American Hop-Hornbeam	+.1	-	-	-	-	-	-	-
Quaking Aspen	1.1	+.1	-	3.1	-	3.1	-	-
White Birch	1.1	-	-	-	-	-	-	-
Gray Birch	+.1	2.1	-	3.1	-	-	-	1.1
Basswood	-	++.1	-	+.1	-	-	++.1	-
Pin-Cherry	-	++.1	-	-	-	1.1	-	+.1
Balsam-Fir	-	-	+.1	-	-	-	++.1	-
American Elm	-	-	+.1	-	-	-	-	-
Black Cherry	-	-	+.1	-	-	+.1	-	+.1
Flowering Dogwood	-	-	-	+.1	-	-	-	-
Beech	-	-	-	-	3.1	-	1.1	+.1
Serviceberry	-	-	-	-	+.1	-	-	-
Apple	-	-	-	-	-	-	-	++.1
No. Species	7	7	6	7	4	5	6	7
Herb Layer[1]								
Wild Sarsaparilla	2.1	++.1	++.1	+.1	+.1	2.4	-	-
Spinulose Wood-Fern	1.2	-	-	-	-	-	-	-
Bluebead-Lily	3.1	1.2	+.1	1.3	1.1	1.4	2.1	-
Marginal Shield-Fern	1.2	-	2.2	-	-	-	+.2	-
Twisted-stalk	+.1	-	-	-	-	-	-	-
Mosses	3.2	1.2	3.3	-	-	-	+.2	-
Purple Trillium	+.1	-	-	-	-	-	1.1	-
Wild Lily-of-the-valley	1.1	+.3	1.1	1.1	4.4	4.2	3.4	-
Star-flowered Solomon's Seal	+.1	-	++.1	-	-	-	-	-
Trout-Lily	(4.4)	2.1	3.3	4.4	-	1.1	1.1	1.1
Sensitive Fern	2.2	2.3	-	+.3	-	-	-	2.4

Table 17.5. Continued

Species	Hydric (1) Forest A.S.	Hydric (1) ROW A.S.	Mesic (2) Forest A.S.	Mesic (2) ROW A.S.	Mesic (3) Forest A.S.	Mesic (3) ROW A.S.	Hydric (4) Forest A.S.	Hydric (4) ROW A.S.
Interrupted Fern	1.2	2.2	-	-	-	-	-	+.3
Horsetail	-	4.3	-	-	-	-	-	-
Dwarf Cornell	-	-	-	-	-	-	-	++.2
Sedge	-	2.3	-	-	-	++.2	-	3.2
Aster	-	2.3	-	2.3	-	2.2	-	2.2
Goldenrod	-	2.2	-	2.3	-	2.2	-	2.2
Fireweed	-	1.2	-	1.1	-	-	-	+.3
Strawberry	-	1.1	-	1.4	-	1.4	-	1.2
Pearly Everlasting	-	++.1	-	1.3	-	2.3	-	+.2
Hawkweed	-	++.1	-	2.2	-	-	-	-
Mixed Grass	-	4.3	-	3.3	-	2.3	-	-
Panic-Grass	-	-	-	-	-	+.4	-	-
Lady-Fern	-	-	+.2	++.2	-	-	-	-
False Spikenard	-	-	-	++.1	1.1	+.1	+.1	-
Spreading Dogbane	-	-	-	3.2	-	2.4	-	-
Bracken	-	-	-	1.2	-	2.2	-	1.1
Carolina Spring-Beauty	-	-	-	+.1	-	-	-	-
Ground-Pine	-	-	-	-	4.1	1.1	-	-
Painted Trillium	-	-	-	-	1.1	-	+.1	-
Indian Cucumber-root	-	-	-	-	++.1	-	-	-
Hair-cap Moss	-	-	-	-	-	3.2	-	-
Yarrow	-	-	-	-	-	1.2	-	-
Dandelion	-	-	-	-	-	+.1	-	-
Oak-Fern	-	-	-	-	-	-	2.4	-
Cinnamon-Fern	-	-	-	-	-	-	1.2	1.3
Spotted Touch-me-not	-	-	-	-	-	-	2.4	2.2
Wood-Anemone	-	-	-	-	-	-	1.2	-
Toothwort	-	-	-	-	-	-	2.2	1.2
Rue-Anemone	-	-	-	-	-	-	-	+.1
No. Species	12	16	8	17	7	18	13	15

Table 17.5. Continued

Species	Hydric (1) Forest A.S.	Hydric (1) ROW A.S.	Mesic (2) Forest A.S.	Mesic (2) ROW A.S.	Mesic (3) Forest A.S.	Mesic (3) ROW A.S.	Hydric (4) Forest A.S.	Hydric (4) ROW A.S.
Total No. Species								
Trees[2]	9	7	13	7	7	5	8	7
Shrubs	1	5	3	5	2	4	2	4
Herbs	12	16	8	17	7	18	13	15
Totals	22	28	24	29	16	27	23	26

[1] For simplicity, herbs include all species of the layer.

[2] Those trees which occurred both in the tree and shrub layers were considered as one in determining the total number of species.

Table 17.6. Characteristic species with abundance and sociability ratings (A.S.) in the shrub and herb layers of the adjacent forest which did not occur on the ROW.

Species	Forest A.S.	ROW A.S.
Hydric (1)		
Shrubs		
Striped Maple	1.1	-
Herbs[1]		
Spinulose Wood-Fern	1.2	-
Marginal Shield-Fern	1.2	-
Twisted-stalk	+.1	-
Purple Trillium	+.1	-
Star-flowered Solomon's Seal	+.1	-
No. Species	6	
Mesic (2)		
Shrubs		
Hazelnut	+.2	-
Hobblebush	+.1	-
Herbs		
Marginal Shield-Fern	2.2	-
Mosses	3.3	-
Star-flowered Solomon's Seal	++.1	-
No. Species	5	
Mesic (3)		
Shrubs		
Hobblebush	1.4	-
Herbs		
Painted Trillium	1.1	-
Indian Cucumber-root	++.1	-
No. Species	3	

Table 17.6. Continued

Species	Forest A.S.	ROW A.S.
	Hydric (4)	
Shrubs		
Striped Maple	2.1	-
Hobblebush	1.2	-
Herbs		
Bluebead-Lily	2.2	-
Marginal Shield-Fern	+.2	-
Mosses	+.2	-
Purple Trillium	1.1	-
Wild Lily-of-the-valley	3.4	-
False Spikenard	+.1	-
Painted Trillium	+.1	-
Oak-Fern	2.4	-
Wood-Anemone	1.2	-
No. Species	11	-

1 For simplicity, herbs include all species of the herb layer.

Table 17.7. Characteristic species with abundance and sociability ratings (A.S.) in the shrub and herb layers of the ROW which were not in the adjacent forest.

Species	ROW A.S.	Forest A.S.
Hydric (1)		
Shrubs		
Spiraea	2.1	-
Red Osier Dogwood	1.1	-
Blackberry	+.2	-
Witch-Hazel	++.1	-
Willow	3.1	-
Herbs[1]		
Horsetail	4.3	-
Sedge	2.3	-
Aster	2.3	-
Goldenrod	2.2	-
Fireweed	1.2	-
Strawberry	1.1	-
Pearly Everlasting	++.1	-
Hawkweed	++.1	-
Mixed Grass	4.3	-
No. Species	14	
Mesic (2)		
Shrubs		
Spiraea	1.2	-
Red Osier Dogwood	+.1	-
Blackberry	1.2	-
Willow	2.1	-
Herbs		
Sensitive Fern	+.3	-
Aster	2.3	-
Goldenrod	2.3	-
Fireweed	1.1	-
Strawberry	1.4	-
Pearly Everlasting	1.3	-
Hawkweed	2.2	-
Mixed Grass	3.3	-
False Spikenard	++.1	-
Spreading Dogbane	3.2	-

Table 17.7. Continued

Species	ROW A.S.	Forest A.S.
Bracken	1.2	-
Carolina Spring Beauty	+.1	-
No. Species	16	
Mesic (3)		
Shrubs		
Blackberry	2.1	-
Willow	+.1	-
Raspberry	4.1	-
Herbs		
Trout-Lily	1.1	-
Sedge	++.2	-
Aster	2.2	-
Goldenrod	2.2	-
Strawberry	1.4	-
Pearly Everlasting	2.3	-
Mixed Grass	2.3	-
Panic-Grass	+.4	-
Spreading Dogbane	2.4	-
Bracken	2.2	-
Hair-cap Moss	3.2	-
Yarrow	1.2	-
Dandelion	+.1	-
No. Species	16	-
Hydric (4)		
Shrubs		
Spiraea	1.2	-
Red Osier Dogwood	1.1	-
Blackberry	1.1	-
Willow	+.1	-
Herbs		
Sensitive Fern	2.4	-
Interrupted Fern	+.3	-
Dwarf Cornell	++.2	-
Sedge	3.2	-
Aster	2.2	-
Goldenrod	2.2	-
Fireweed	+.3	-

Table 17.7. Continued

Species	ROW A.S.	Forest A.S.
Strawberry	1.2	-
Pearly Everlasting	+.2	-
Bracken	1.1	-
Rue-Anemone	+.1	-
No. Species	15	

[1] For simplicity, herbs include all species of the herb layer.

Table 17.8. Major vegetational types for the Lyon Mountain to Saranac study area based on percent of study plots occupied by each major plant community and other components on the ROW.

Community	Site Classification			
	Hydric (1)	Mesic (2)	Mesic (3)	Hydric (4)
	Percent of Total Area			
Mixed Grass	57.58			
Mixed Grass-Herb	9.37	90.84		
Sensitive Fern-Mixed Herb	7.67			
Sedge-Mixed Grass-Herb	7.25			
Mixed Grass-Sedge-Horsetail	4.52			
Sensitive Fern-Sedge-Mixed Herb	3.67			
Sedge-Mixed Herb	3.44			78.17
Sedge-Sensitive Fern-Mixed Herb	3.44			
Spiraea	1.46			6.66
Interrupted Fern	1.46			
Sensitive Fern	.14			
Bracken-Mixed Herb		7.48		5.67
Blackberry		1.68		5.55
Mixed Herb-Mixed Grass			56.53	
Blackberry-Mixed Grass-Herb			22.58	
Bracken-Wild Lily-of-the-valley-Mixed Herb			8.68	
Pearly Everlasting-Mixed Herb			4.56	
Mixed Grass-Herb			4.12	
Panic-Grass			2.68	
Quaking Aspen-Mixed Herb-Mixed Grass			.85	
Red Osier Dogwood-Sedge-Mixed Herb				2.69
Cinnamon-Fern				.70
Red Osier Dogwood				.28
Pin-Cherry				.28
Total	100.00	100.00	100.00	100.00

Table 17.9. Browse survey showing plant species and number ratio of browsed to total stems with percent actual use for ROW, ROW edge, and woods.

Species	ROW		ROW Edge		Woods		Total	
	Ratio	%	Ratio	%	Ratio	%	Ratio	%
Raspberry	8/119	7	4/19	21			12/138	9
Red Maple	0/5	0	8/29	28	11/29	38	19/63	30
Quaking Aspen	1/2	50	2/7	29	0/5	0	3/14	21
Nannyberry			1/2	50			1/2	50
Gray Birch	0/1	0	0/3	0			0/4	0
White Birch			0/32	0			0/32	0
Fly-Honeysuckle			0/1	0	0/7	0	0/8	0
Sugar-Maple	1/2	50	0/9	0	11/56	20	12/67	18
Spiraea	8/9	89	0/10	0	5/16	31	13/35	37
Willow	0/1	0					0/1	0
Yellow Birch	1/1	100	0/6	0	1/5	20	2/13	17
Hobblebush			1/12	8	3/3	100	4/15	27
White Ash	0/1	0	0/2	0			0/3	0
Blackberry	5/20	25	0/7	0			5/27	19
Red Osier Dogwood	3/6	50	28/31	90	5/9	56	36/46	78
Striped Maple					0/3	0	0/3	0
Beech			0/2	0	1/3	33	1/5	20
Alternate-leaved Dogwood			2/6	33	2/2	100	4/8	50
Black Cherry			0/8	0	1/6	17	1/14	7
Total	27/167	16	46/186	25	40/144	28	113/497	23

Table 17.10. Browse survey showing most abundant plant species and number ratio of browsed to total stems with percent actual use for ROW, ROW edge, and woods.

	Species							
	Raspberry		Sugar-Maple		Red Maple		Red Osier Dogwood	
Location	Ratio	%	Ratio	%	Ratio	%	Ratio	%
ROW	19/93	20	34/108	31	0/27	0	1/15	7
ROW Edge	9/37	24	0/26	0	0/21	0	2/24	8
Woods	0/6	0			0/9	0	9/25	36
Total	28/136	21	34/134	35	0/57	0	12/64	54

Table 17.11. Birds observed and/or heard on the ROW and the ROW edge during the study period.

Species	Species
Canada goose	Eastern wood pewee
Red-shouldered hawk	Blue jay
Ruffed grouse	Black-capped chickadee
Killdeer	Robin
Pileated woodpecker	Brown-headed cowbird
Yellow-shafted flicker	White-throated sparrow

Table 17.12. Potential wildlife use of plant species[1] present on the ROW and adjacent woods for the major game species on the Lyon Mountain to Saranac study area.

Species	Wildlife Species		
	Deer	Hare	Grouse
Trees			
Red Maple	****		
Yellow Birch	*		**
White Birch	*	**	**
American Hop-Hornbeam	+		+
American Hornbeam	*		+
Quaking Aspen	**	**	***
Beech	+		
Serviceberry	+		+
White Ash	*		
Basswood	*		
Pin-Cherry	*	+	*
Black Cherry	*	+	*
American Elm	+		
Flowering Dogwood	*		+
Alternate-leaved Dogwood	*		
Apple	*		
Shrubs			
Willow	*	***	*
Hazelnut	+	**	**
Hobblebush	*		
Raspberry	+		*
Striped Maple	****		
Spiraea	+		
Red Osier Dogwood	*		
Blackberry	+		*
Witch-Hazel	**		
Herbs[2]			
Dwarf Cornell	*		
Ferns	*	**	
Goldenrod	+		
Strawberry		*	
Grasses	*	***	
Dandelion		*	+
Sedge			+

1 Those plants not included in this table provide a certain amount of cover (Table 17.5) for the 3 major game species, and may also provide seasonal food value, specific information pertaining to which is not now available. This applies also with regard to non-game species.

2 For simplicity, herbs include all species of the herb layer.

Table 17.13. Comparison of land use on site 17A near the time of and after construction of the ROW.[1]

	Land Use	Percent of Total Area Near the Time of (-) and After (*) Construction 0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
(A)	Agriculture	
(C,I)	Commercial & Industrial	-.2 *.2
(F)	Forest Land	--77.8 **77.8
(E)	Extractive Industry	
(N)	Non-productive	
(OR)	Outdoor Recreation	---2.7 ***2.7
(P)	Public & Semi-public	
(W)	Water Resources	------------18.3 ************18.3
(U)	Urban Inactive	
(T)	Transportation	
(R)	Residential	---1.0 ***1.0

1 Source: United Aerial Mapping, San Antonio, Texas, air photo No. 1-78, May 24, 1972

Table 17.14. Comparison of land use of site 17B near the time of and after construction of the ROW.[1]

	Land Use	Percent ot Total Area Near the Time of (-) and After (*) Construction 0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
(A)	Agriculture	
(C,I)	Commercial & Industrial	----7.5 ****7.5
(F)	Forest Land	--81.0 **81.0
(E)	Extractive Industry	
(N)	Non-productive	
(OR)	Outdoor Recreation	
(P)	Public & Semi-public	--1.5 **1.5
(W)	Water Resources	-----6.8 *****6.8
(U)	Urban Inactive	
(T)	Transportation	-.2 *.2
(R)	Residential	---3.0 ***3.0

[1] Source: United Aerial Mapping, San Antonio, Texas, air photo No. 1-44, May 24, 1972

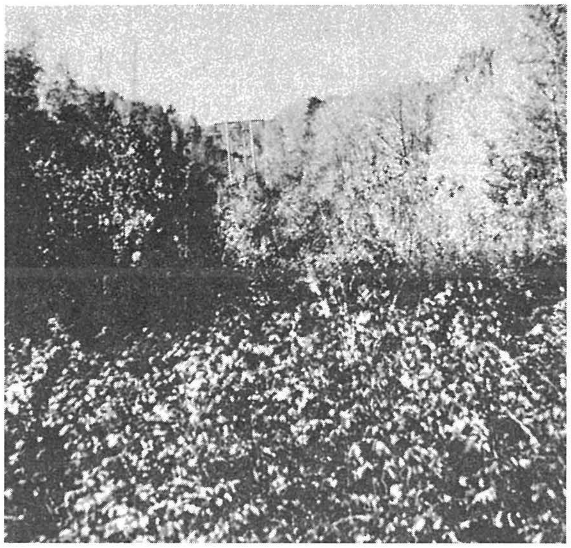


FIG. 17.1.1. General view of the ROW and adjacent forest, looking north-northwest, in fall, 1975 (Photo Station 4).

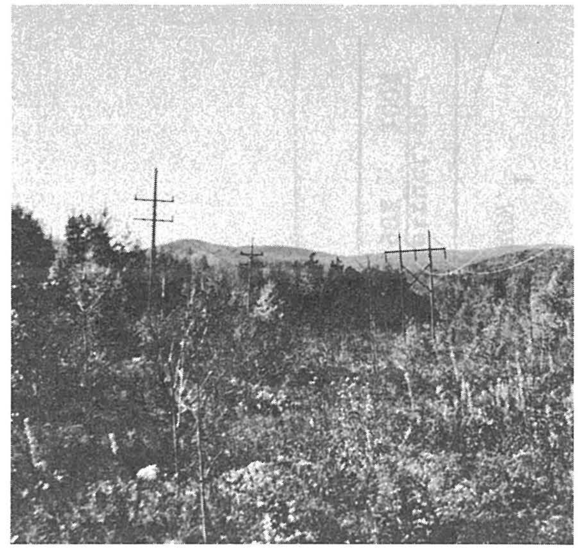


FIG. 17.1.2. General view of the ROW and adjacent forest, looking northwest, in fall, 1975 (Photo Station 11).

FIG. 17.1.3. Moderate sheet and rill erosion occurring on disturbed soil resulting from past mining activity on ROW, in fall, 1975 (Photo Station 9).

FIG. 17.1.4. Trout-lily on ROW, in the spring of 1976.

FIG. 17.1.5. Trout-lily off ROW, in the spring of 1976.

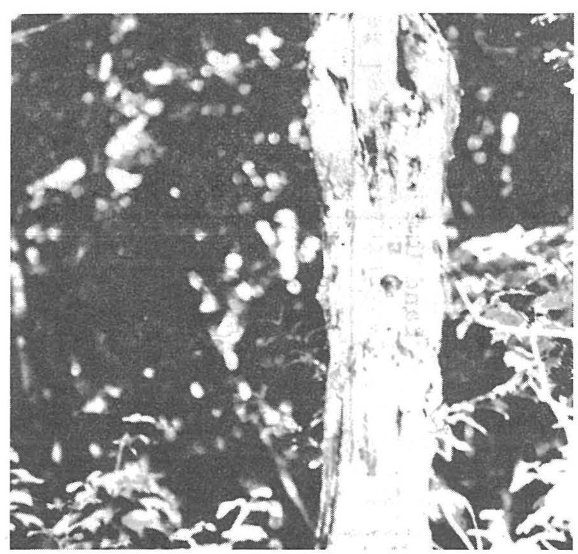


FIG. 17.1.6. Dead tree off ROW used by woodpeckers, in summer, 1975.

FIG. 17.1. Visual characteristics.

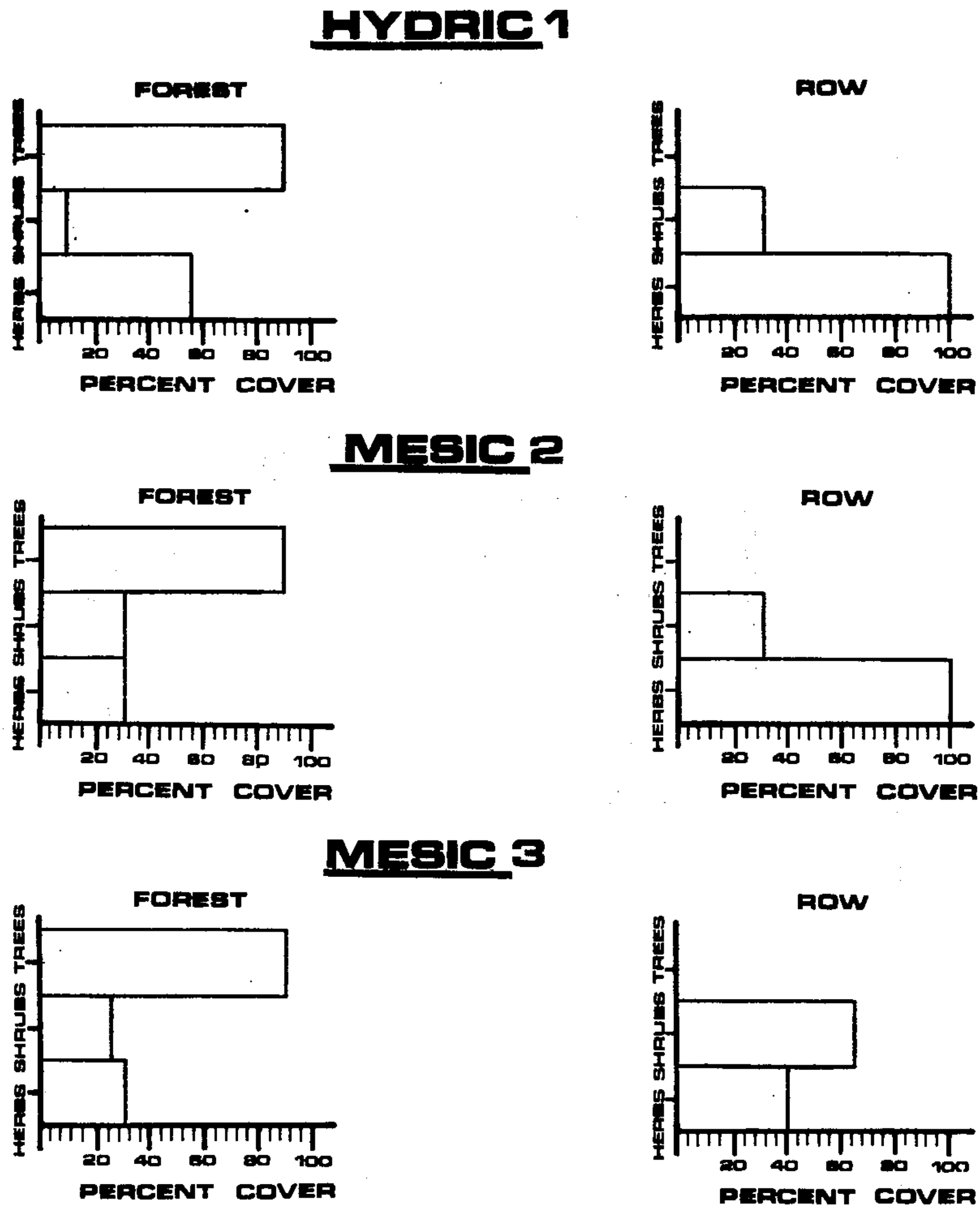


Fig. 17.2. Changes in cover value of tree, shrub, and herb layers from forest to ROW.

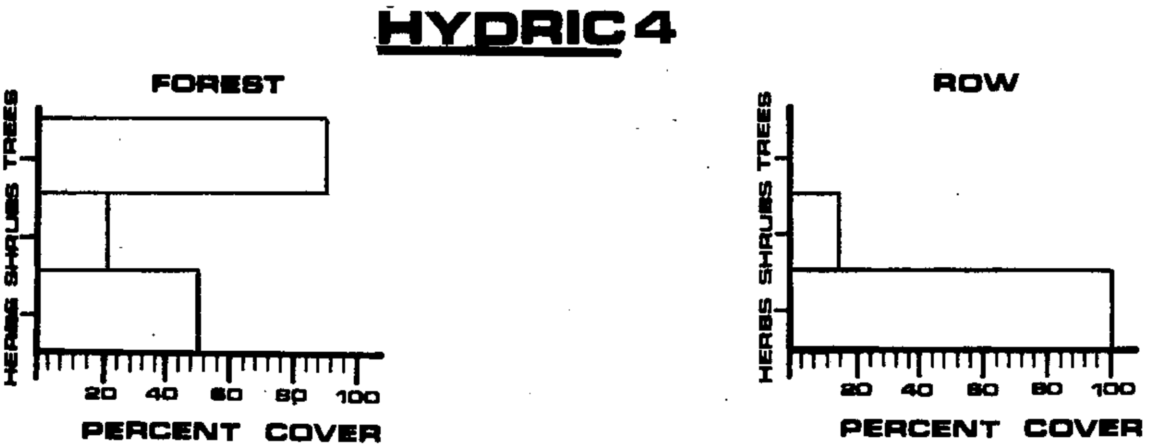


Fig. 17.2a. Changes in cover value of tree, shrub, and herb layers from forest to ROW.

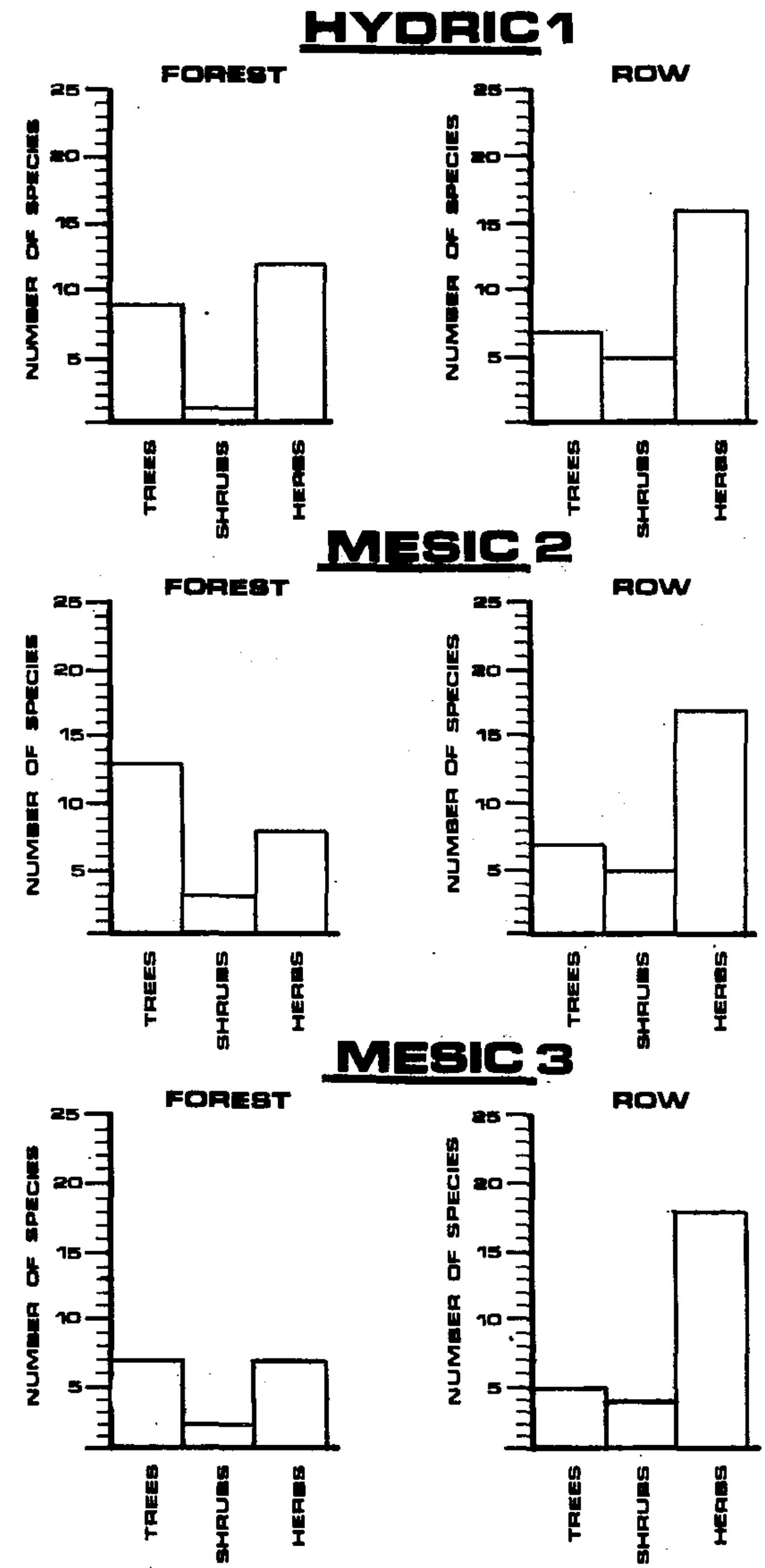


Fig. 17.3. Species diversity in the forest and on the ROW.

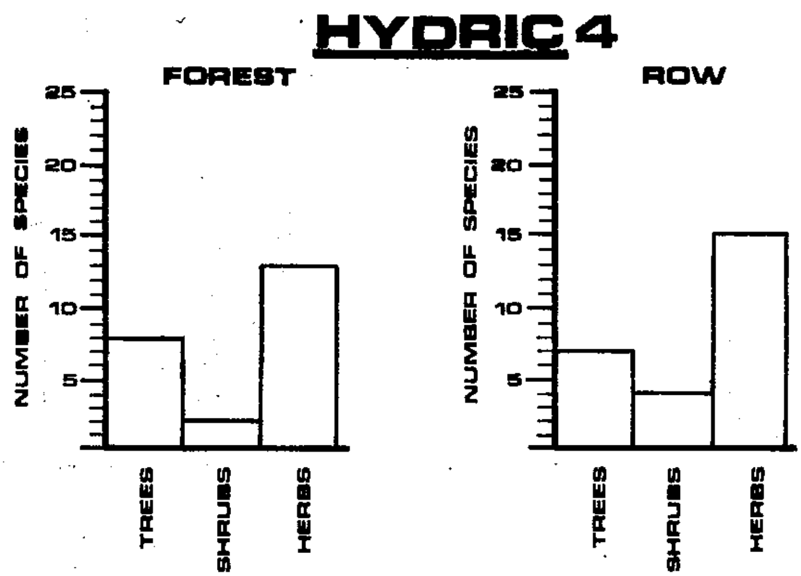


Fig. 17.3a. Species diversity in the forest and on the ROW.

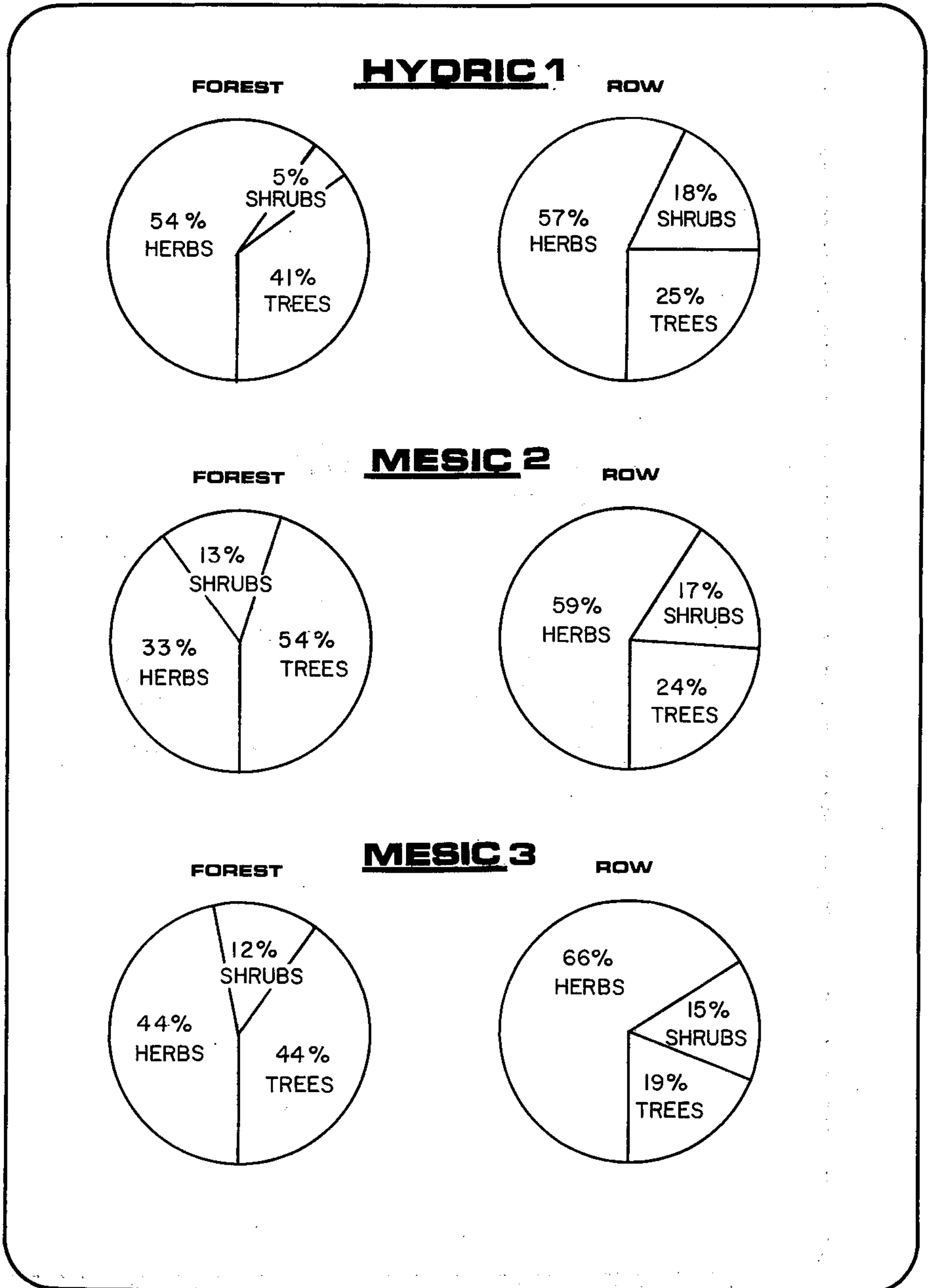


Fig. 17.4. Life form spectrum of the ROW as compared to the adjacent forest to compare species make-up of each, based on the number of species in each life form expressed as a percent of total species.

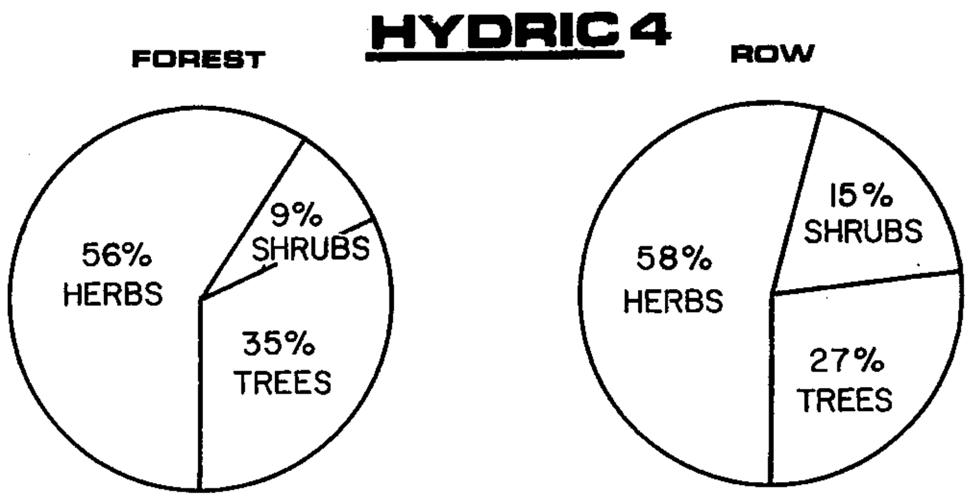


Fig. 17.4a. **Life form spectrum of the ROW as compared to the adjacent forest to compare species make-up of each, based on the number of species in each life form expressed as a percent of total species.**

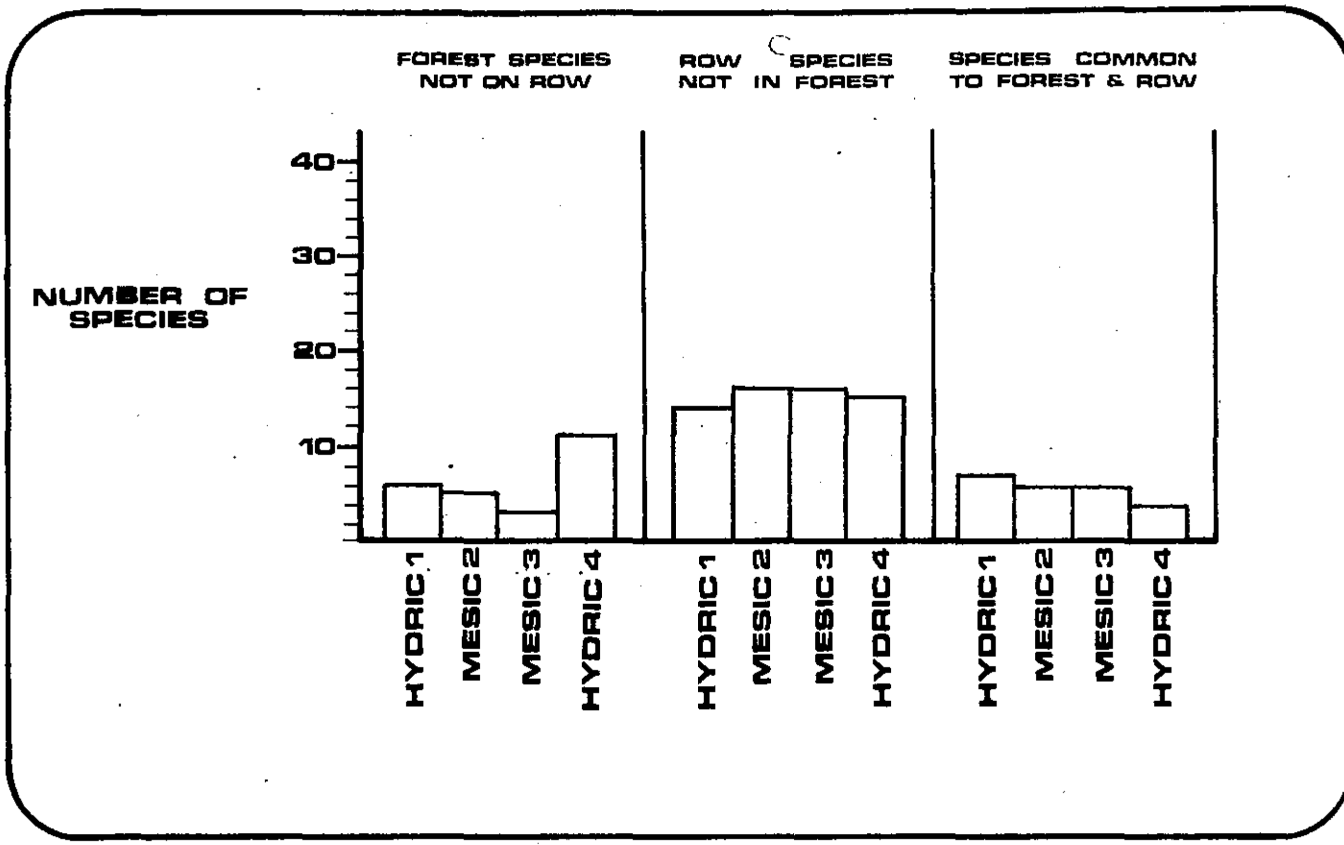


Fig. 17.5. Comparison of shrub and herb species in the forest and on the ROW.

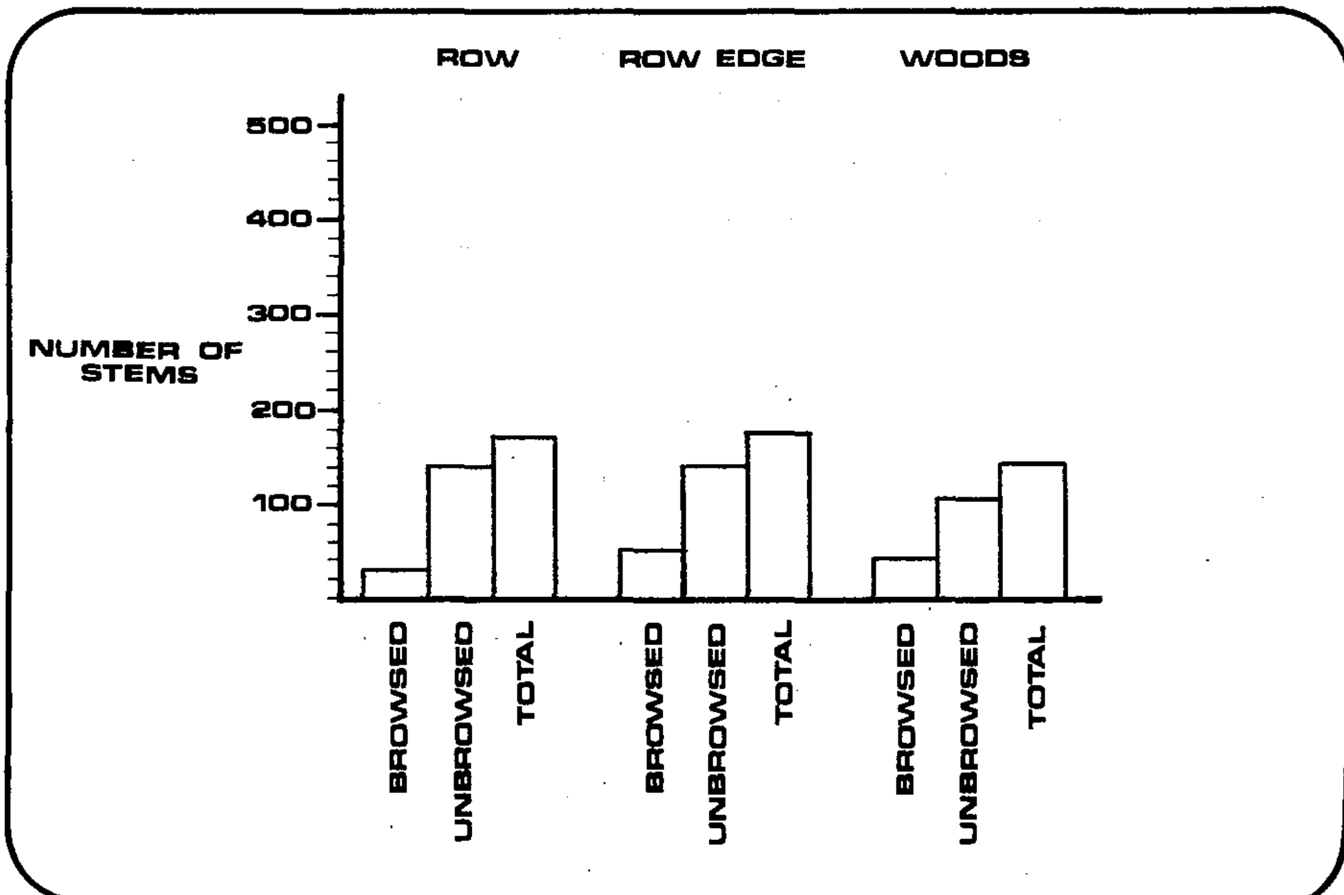
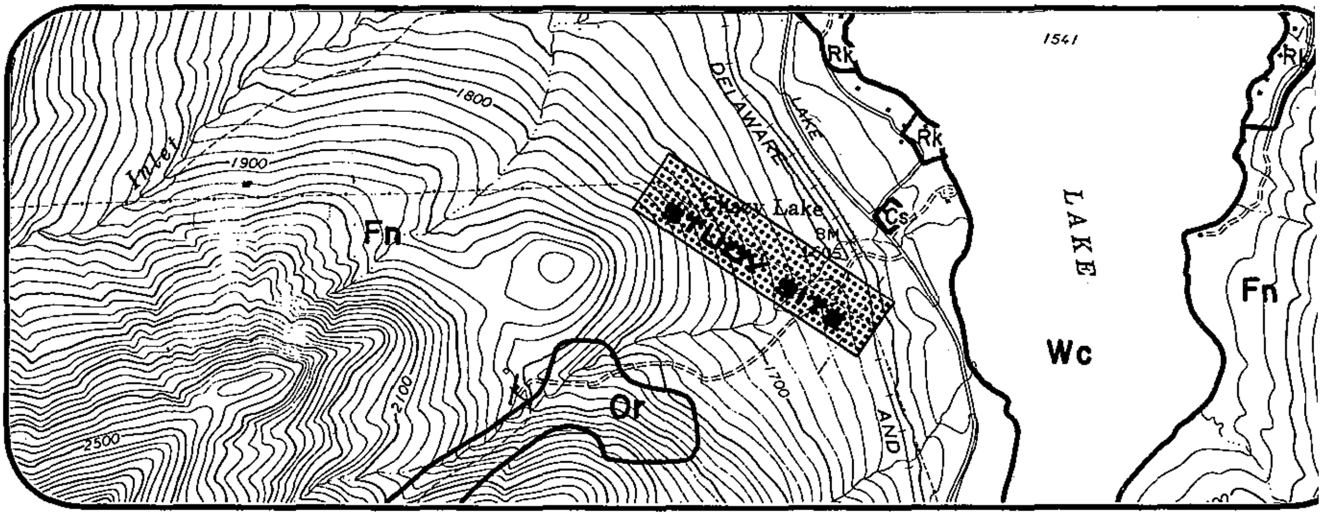
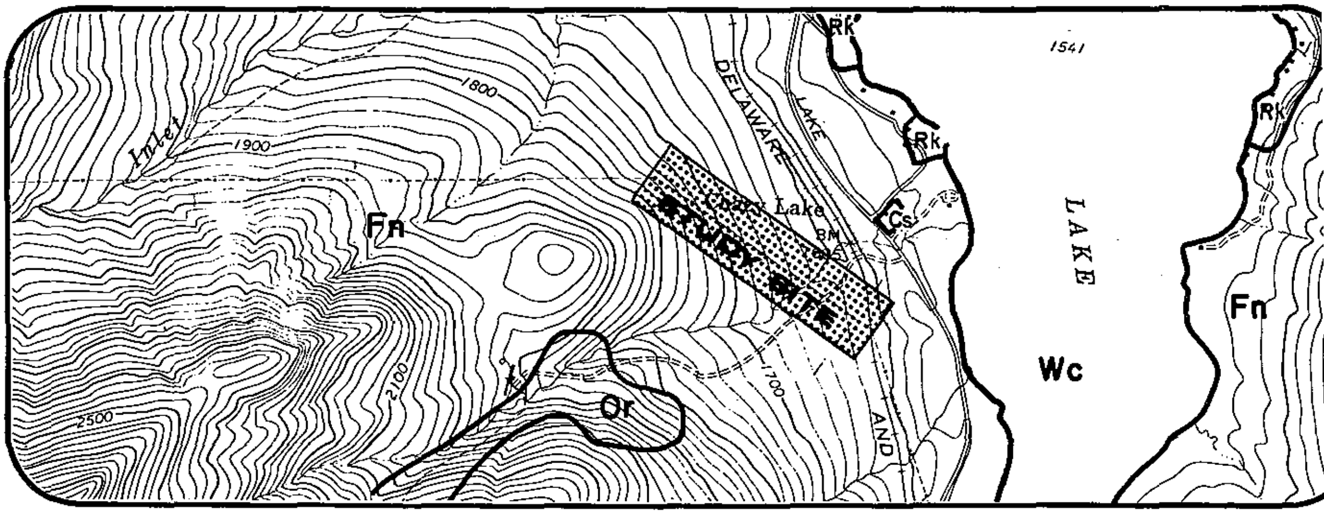


Fig. 17.6. Browse survey showing number of browsed, unbrowsed, and total stems for the ROW, ROW edge, and forest for 8 browse transects.



1968 DATA DEPICTING LAND USES NEAR THE TIME OF CONSTRUCTION

SCALE 1"-2000



LAND USE AFTER CONSTRUTION OF ROW (1974) SCALE 1"-2000

LEGEND FOR LAND USE SYMBOLS

COMMERCIAL AND INDUSTRIAL LAND USES
Cs - Commercial strip development

FOREST LAND
Fn - Forest lands

OUTDOOR RECREATION LAND USE
Or - Outdoor recreation

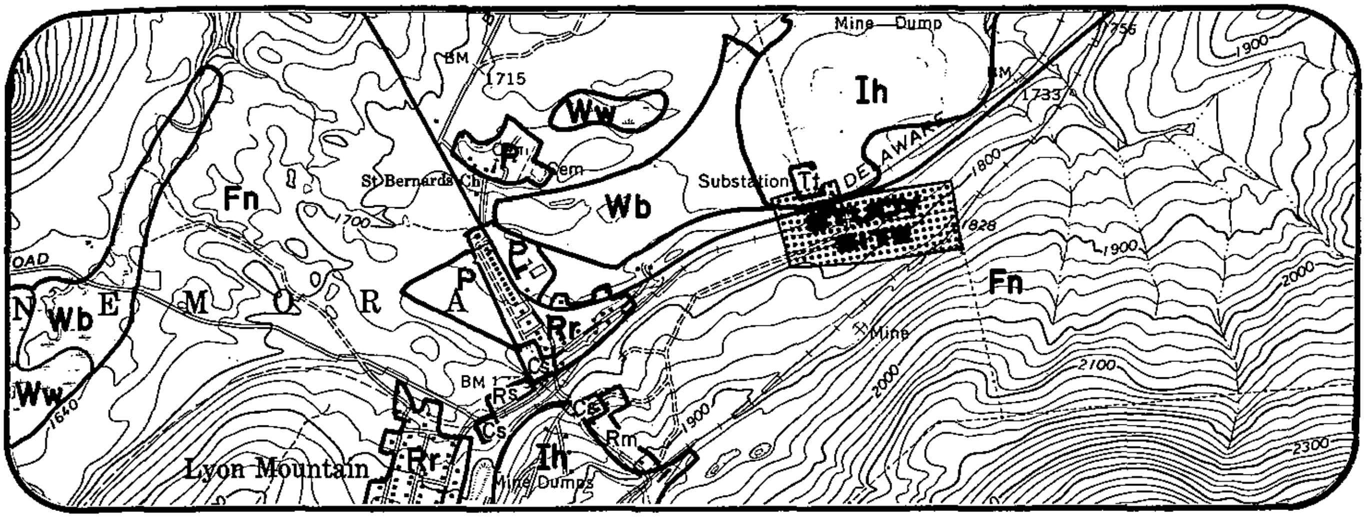
RESIDENTIAL LAND USE
Rk - Shoreline development

WATER RESOURCES
Wc - Artificial ponds

SOURCES:
1968 USGS QUADRANGLE MAP
United Aerial Mapping San Antonio, Texas, Photo No. 1-78, May 24, 1972
Area Land Use Map LUNR, Cornell University, N.Y., 1974
U. S. G. S. Topographic Map, Moffitsville, N. Y., 1968

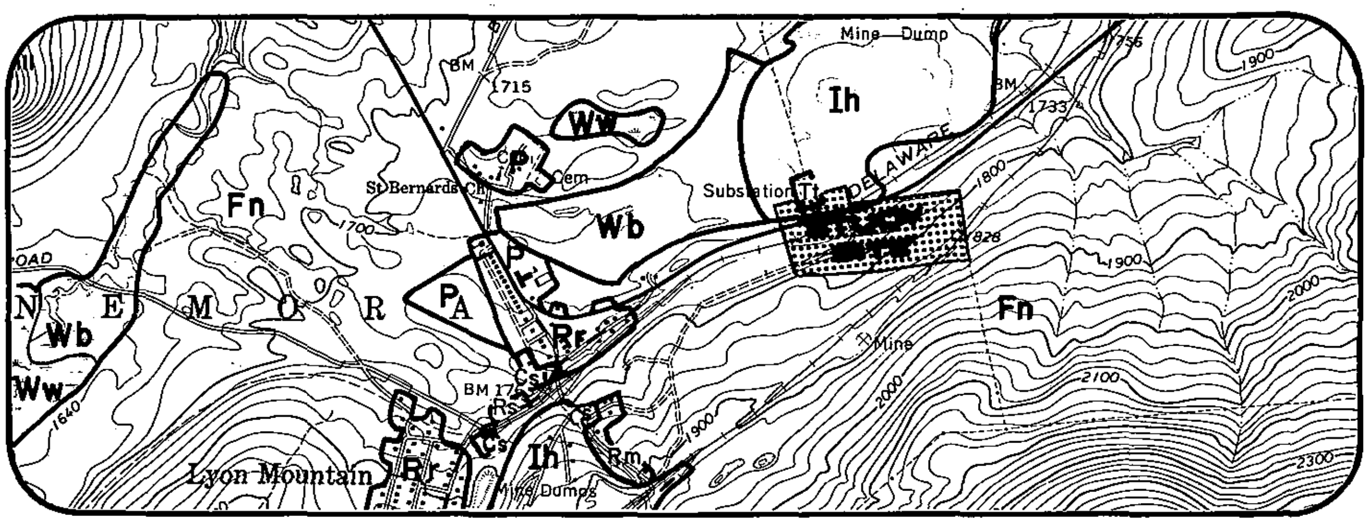
Fig. 17A.7. Land use change.

ASPLUNDH ENVIRONMENTAL SERVICES



1968 DATA DEPICTING LAND USES NEAR THE TIME OF CONSTRUCTION

SCALE 1"- 2000 N



LAND USE AFTER CONSTRUTION OF ROW (1974) SCALE 1"- 2000 N

LEGEND FOR LAND USE SYMBOLS

COMMERCIAL AND INDUSTRIAL LAND USES
- Cs - Commercial strip development
- Ih - Heavy manufacturing

FOREST LAND
- Fn - Forest lands

PUBLIC AND SEMI-PUBLIC LAND USES
- P - Public and semi-public land use

RESIDENTIAL LAND USE
- Rm- Medium density
- Rr - Rural hamlet

TRANSPORTATION LAND USES
- Tt - Utilities

WATER RESOURCES
- Wb- Marshes, shrub wetlands and bogs
- Ww - Wooded wetlands

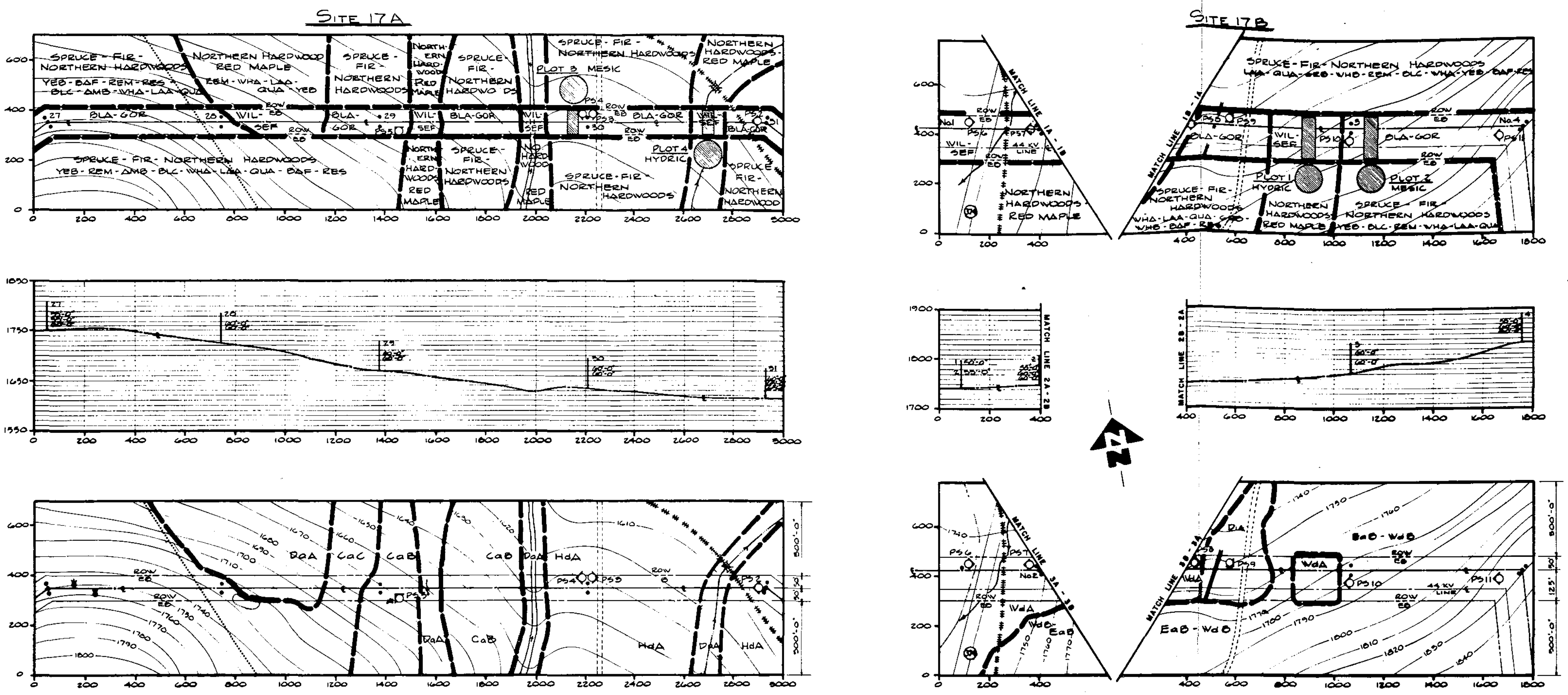
SOURCES:
- United Aerial Mapping, San Antonio, Texas, air photo No. 1-44, May 24, 1972
- Area Land Use Map LUNR, Cornell University, N.Y., 1974
- U. S. G. S. Topographic Map, Lyon Mountain, N. Y., 1968

Fig. 17B.7. Land use change.

VEGETATION

CENTERLINE PROFILE

SOILS



NOTES:
(1) CONTOUR INTERVALS ARE 10'-0"
(2) VERTICAL & HORIZONTAL SCALES ARE IN FEET.

LEGEND

WORKS AND STRUCTURES

- HIGHWAYS AND ROADS
- HEAVY DUTY
- MEDIUM DUTY
- LIGHT DUTY
- ACCESS ROAD
- UNIMPROVED DIRT ROAD
- NATIONAL INTERSTATE
- US ROUTE
- STATE OR COUNTY
- SINGLE TRACK RAILROAD
- MULTIPLE TRACK RAILROAD
- ABANDONED RAILROAD TRACK
- RAILROAD OVER
- RAILROAD UNDER
- FORD
- ROAD CROSSING
- BUILDING
- EXCAVATION
- MINE DUMP
- PIPELINE
- TRANSMISSION STRUCTURES
- DAMS
- CULVERT
- TANKS
- WELLS
- BRUSH AND LOG DISPOSAL SITES
- cem SMALL PARKS, CEMETERY, ETC.
- FENCE
- DITCH

BOUNDARIES

- NATIONAL OR STATE
- COUNTY
- MINOR CIVIL DIVISION
- RESERVATION, NATIONAL OR STATE
- LAND GRANT
- ROW PB ROW PROPERTY BOUNDARY
- ROW EB ROW EASEMENT BOUNDARY
- ROW CE ROW CLEARING EDGING
- SITE BOUNDARY
- ROW CENTERLINE
- VEGETATION OR SOIL BOUNDARY

SITE MARKERS

- SAMPLE LOCATION
- PHOTO STATIONS
- MAPPED PLOT ON ROW
- MAPPED PLOT OFF ROW

WATER SYMBOLS

- PERENNIAL STREAMS
- INTERMITTENT STREAMS
- SMALL RAPIDS
- LARGE RAPIDS
- DISAPPEARING STREAM
- CANALS AND DITCHES
- PERENNIAL LAKES AND PONDS
- INTERMITTENT LAKES AND PONDS
- SPRING
- MARSH, SWAMP OR WET MEADOW
- WET SPOT
- ALLUVIAL FAN

TOPOGRAPHIC RELIEF

- 23 CONTOUR
- DEPRESSION CONTOUR

SOIL SYMBOL AND NAME

CaB	CANAAN - ROCK OUTCROP sandy loam (8 to 15%)
CaC	CANAAN - ROCK OUTCROP sandy loam (15 to 25%)
DaA	DANNEMORA sandy loam (0 to 8% slope)
DIA	DISTURBED AREA sandy (0 to 8% slope)
EaB	EMPEYVILLE stony fine sandy loam (8 to 15%)
HdA	HINCKLEY gravelly sandy loam (0 to 8% slope)
WdA	WESTBURY stony fine sandy loam (0 to 8%)
WdB	WESTBURY " " " " (8 to 15%)

SOIL SYMBOLS

- ROCK
- SAND
- SCATTERED ROCK
- BARE AND ERODING (GULLY)
- BARE AND ERODING (SHEET)
- BARE AND INCREASING IN SIZE
- BARE AND HEALING
- ERODED BUT HEALED
- CLAY AREA
- WIND EROSION

PLANT COMMUNITY SYMBOLS

shrubs

ALR	ALDER	Alnus spp.
ARR	ARROW - WOOD	Viburnum recognitum
BAR	BARBERRY	Berberis spp.
BLA	BLACKBERRY	Rubus spp.
BLH	BLACK - VIBURNUM	Viburnum prunifolium
BLU	BLUEBERRY	Vaccinium spp.
BUT	BUTTONBUSH	Cephalanthus occidentalis
CAY	AMERICAN YEW	Taxus canadensis
CFH	FLY - HONEYSUCKLE	Lonicera canadensis
CHC	CHOKE - CHERRY	Prunus virginiana
CLB	CLIMBING BITTERSWEET	Celastrus scandens
CRA	GRAPE	Vitis spp.
DEY	DEWBERRY	Rubus spp.
ELD	ELDERBERRY	Sambucus canadensis
GRD	GRAY DOGWOOD	Cornus racemosa
GRJ	GROUND - JUNIPER	Juniperus communis
HAA	COMMON ALDER	Alnus serrulata
HAW	HAWTHORN	Crataegus spp.
HAZ	HAZELNUT	Corylus spp.
HUC	HUCKLEBERRY	Gaylussacia spp.
JAR	MULTIFLORA ROSE	Rosa multiflora
MAV	MAPLE - LEAVED VIBURNUM	Viburnum acerifolium
MOH	MOUNTAIN - HOLLY	Nemopanthus mucronata
MOL	MOUNTAIN - LAUREL	Kalmia latifolia
MOM	MOUNTAIN - MAPLE	Acer spicatum
NAN	NANNYBERRY	Viburnum Lentago
NJT	NEW JERSEY TEA	Ceanothus americanus
PIF	PINXTER - FLOWER	Rhododendron nudiflorum
POI	POISON IVY	Rhus radicans
POS	POISON SUMAC	Rhus vernix
PRA	NORTHERN PRICKLY ASH	Xanthoxylum americanum
PRU	BUCKTHORN	Rhamnus spp.
RIB	RIBES	Ribes spp.
ROD	RED OSIER DOGWOOD	Cornus stolonifera
SMC	SUMAC	Rhus spp.
SPA	SPECKLED ALDER	Alnus rugosa
SPB	SPICEBUSH	Lindera Benzoin
SPI	SPIRAEA	Spiraea spp.
SMS	SMOOTH SUMAC	Rhus glabra
STM	STRIPED MAPLE	Acer pensylvanicum
STS	STAGHORN - SUMAC	Rhus typhina
SWF	SWEET - FERN	Comptonia peregrina
TAH	TARTARIAN HONEYSUCKLE	Lonicera tatarica
WIH	WITCH - HAZEL	Hamamelis virginiana
WIL	WILLOW	Salix spp.
WIN	WINTERBERRY	Ilex verticillata
WIR	WILD - RAISIN	Viburnum cassinoides
ZBC	BLACK CHOKEBERRY	Pyrus melanocarpa

trees

ABU	BUTTERNUT	Juglans cinerea
AIL	TREE - OF - HEAVEN	Ailanthus altissima
ALD	ALTERNATE - LEAVED DOGWOOD	Cornus alternifolia
AMB	BEECH	Fagus grandifolia
AMC	CHESTNUT	Castanea dentata
AME	AMERICAN ELM	Ulmus americana
AMH	AMERICAN HORNBEAM	Carpinus caroliniana
APP	APPLE	Pyrus malus
BAF	BALSAM - FIR	Abies balsamea
BAS	BASSWOOD	Tilia americana
BIH	BITTERNUT HICKORY	Carya cordiformis
BLC	BLACK CHERRY	Prunus serotina
BLL	BLACK LOCUST	Robinia Pseudo-Acacia
BLW	BLACK WALNUT	Juglans nigra
CHO	CHESTNUT - OAK	Quercus prinus
COT	COTTONWOOD	Populus deltoides
EAH	HEMLOCK	Tsuga canadensis
ERC	RED CEDAR	Juniperus virginiana
FLD	FLOWERING DOGWOOD	Cornus florida
GRB	GRAY BIRCH	Betula populifolia
HOH	AMERICAN HOP-HORNBEAM	Ostrya virginiana
LAA	LARGE - TOOTHED ASPEN	Populus grandidentata
LAR	AMERICAN LARCH	Larix laricina
NWC	WHITE CEDAR	Thuja occidentalis
PAB	WHITE BIRCH	Betula papyrifera
PIC	PIN - CHERRY	Prunus pensylvanica
PIH	PIGNUT HICKORY	Carya glabra
PIP	PITCH - PINE	Pinus rigida
QUA	QUAKING ASPEN	Populus tremuloides
RED	RED OAK	Quercus rubra
REM	RED MAPLE	Acer rubrum
RES	RED SPRUCE	Picea rubens
SAS	WHITE SASSAFRAS	Sassafras albidum
SCO	SCRUB - OAK	Quercus ilicifolia
SCP	SCOTCH PINE	Pinus sylvestris
SHB	SERVICEBERRY	Amelanchier spp.
SHH	SHAGBARK - HICKORY	Carya ovata
SUM	SUGAR - MAPLE	Acer saccharum
SWB	SWEET BIRCH	Betula lenta
VIP	SCRUB - PINE	Pinus virginiana
WHA	WHITE ASH	Fraxinus americana
WHO	WHITE OAK	Quercus alba
WHP	WHITE PINE	Pinus strobus
YEB	YELLOW BIRCH	Betula lutea
YEP	TULIP - POPLAR	Liriodendron tulipifera

herbs

BLG	BLUE - JOINT GRASS	Calamagrostis canadensis
BON	BONESET	Eupatorium perfoliatum
BRN	BRACKEN	Pteridum aquilinum
BRO	BROOM - SEDGE	Artholophis virginicus
CAT	CAT-TAIL	Typha spp.
CHF	CHRISTMAS - FERN	Polystichum acrostichoides
CIF	CINNAMON - FERN	Osmunda cinnamomea
DEG	DEERTONGUE GRASS	Panicum clandestinum
GOR	GOLDENROD	Solidago spp.
HAF	HAY - SCENTED FERN	Dennstaedtia punctilobula
HOT	HORSETAIL	Equisetum spp.
INF	INTERRUPTED FERN	Osmunda Claytoniana
IRS	IRIS	Iris spp.
JAP	SMALL JACK-IN-THE-PULPIT	Arisaema triphyllum
LET	WILD LETTUCE	Lactuca canadensis
MSF	MARGINAL SHIELD FERN	Dryopteris marginalis
NYF	NEW YORK FERN	Dryopteris noveboracensis
PEV	PEARLY EVERLASTING	Anaphalis margaritacea
PHR	PHRAGMITES	Pragmites spp.
POG	POVERTY - GRASS	Danthonia spicata
ROM	REINDEER LICHEN	Cladonia rangiferina
ROF	ROYAL FERN	Osmunda regalis
SEF	SENSITIVE FERN	Onoclea sensibilis
SPL	SPIKED LOOSESTRIFE	Lythrum Salicaria
SPM	SPHAGNUM MOSS	Sphagnum spp.
SSS	SOLOMON'S - SEAL	Polygonatum biflorum
SWA	SWAMP - BUTTERCUP	Ranunculus septentrionalis
WHS	WHITE SNAKEROOT	Eupatorium rugosum
YPL	BULLHEAD - LILY	Nuphar variegatum

REVISIONS :

DATA SOURCES :

ASPLUNDH ENVIRONMENTAL SERVICES
aes BLAIR MILL ROAD WILLOW GROVE PA 19090

NYSE&G ENGINEERING PLAN & PROFILE REV. 11/30/71

U.S.G.S. 7.5 MIN TOPOGRAPHIC MAP, LYON MOUNTAIN, NY 1968
U.S.G.S. 7.5 MIN TOPOGRAPHIC MAP, MOFFITSVILLE, N.Y. 1968

U.S.D.A., S.C.S. IN COOPERATION WITH NEW YORK STATE COLLEGE OF AGRICULTURE GEN. SOILS '73

UNITED AERIAL MAPPING, SAN ANTONIO, TEXAS CLINTON CO. N.Y. PHOTO NO. 1-78, 1-44 SCALE 1:24,000 5/24/72

ASPLUNDH ENVIRONMENTAL SERVICES
AES PROJECT NO. 81-0028 FIELD STUDIES 1975-76

This information is a part of the ESEERCO "STUDY OF ENVIRONMENTAL AND ECONOMIC ASPECTS OF CONTEMPORANEOUS ELECTRIC TRANSMISSION LINE RIGHT-OF-WAY MANAGEMENT TECHNIQUES"

MAP 17.1

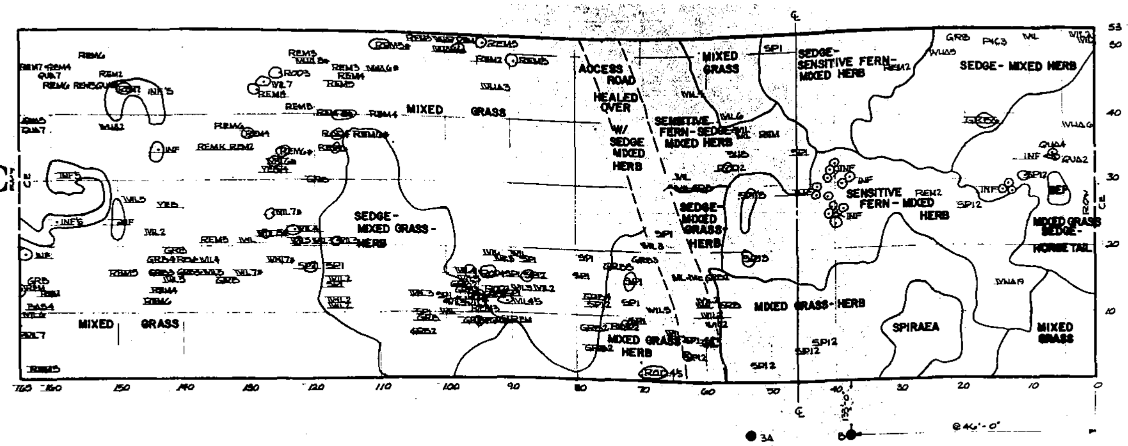
SITE 17 HABITAT CONDITIONS

UTILITY : NEW YORK STATE ELEC. & GAS CORP.
ROW DESCRIPTION : LYON MOUNTAIN TO SARANAC 115 KV
WOODEN POLE 'H' FRAME 100' & 175' ROW

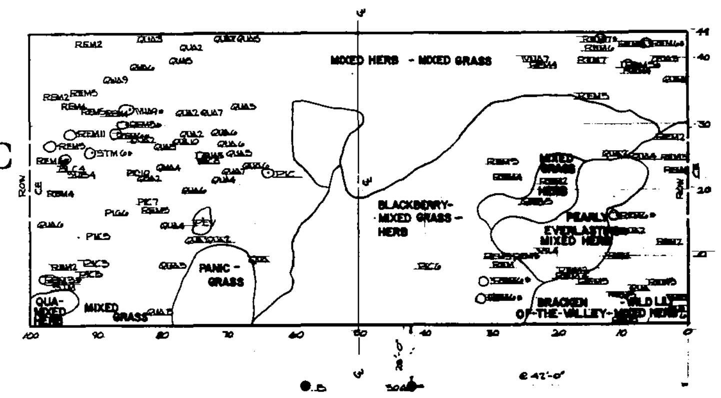
SCALE : 1" = 200'-0"

200 100 0 100 200 400 800 1000

PLOT 1 HYDRIC



PLOT 3 MESIC



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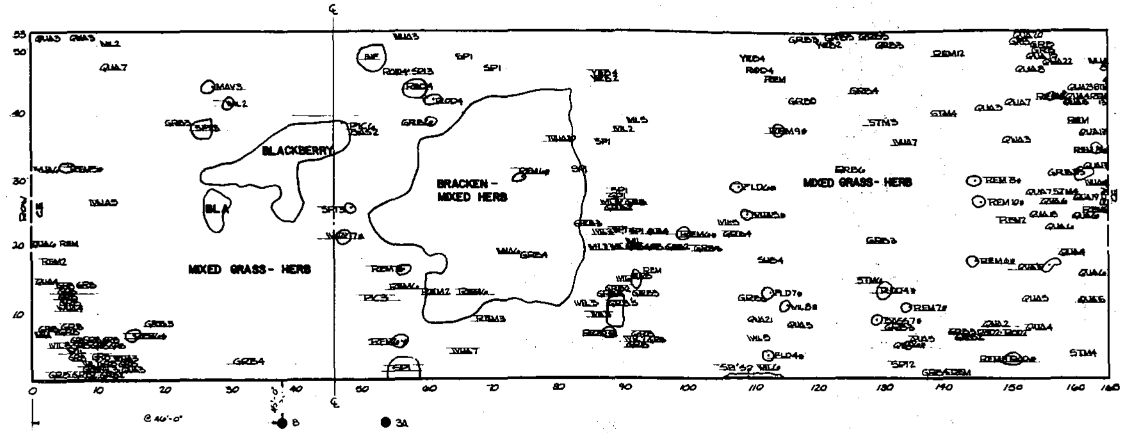
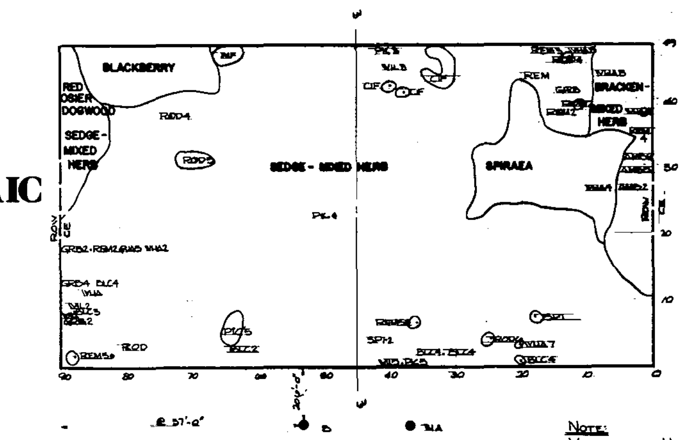


PLOT 4 HYDRIC



NOTE:
- VERTICAL AND HORIZONTAL SCALES IN FEET

LEGEND

WORKS AND STRUCTURES

ACCESS ROAD

BRUSH AND LOG DISPOSAL SITES

BOUNDARIES

ROW CENTERLINE

ROW PROPERTY BOUNDARY

ROW EASEMENT BOUNDARY

EXISTING ROW CLEARING EDGE

SITE MARKERS

SAMPLE LOCATION

PHOTO STATION

WATER SYMBOLS

PERENNIAL STREAMS

INTERMITTENT STREAMS

SMALL RAPIDS

LARGE RAPIDS

DISAPPEARING STREAM

CANALS AND DITCHES

PERENNIAL LAKES AND PONDS

INTERMITTENT LAKES AND PONDS

SPRING

MARSH, SWAMP OR WET MEADOW

WET SPOT

ALLUVIAL FAN

SOIL SYMBOLS

ROCK

SCATTERED ROCK

PLANT COMMUNITY SYMBOLS

herbs

BLG	BLUE-JOINT GRASS	Calamagrostis canadensis
BON	BONESET	Eupatorium perfoliatum
BRN	BRACKEN	Pteridum aquilinum
BRO	BROOM-SEDGE	Artholophis virginicus
CAT	CAT-TAIL	Typha spp.
CHF	CHRISTMAS-FERN	Polystichum acrostichoides
CIF	CINNAMON-FERN	Osmunda cinnamomea
DEG	DEERTONGUE GRASS	Panicum clandestinum
GOR	GOLDENROD	Solidago spp.
HAF	HAY-SCENTED FERN	Dennstaedtia punctilobula
HOT	HORSETAIL	Equisetum spp.
INF	INTERRUPTED FERN	Osmunda Claytoniana
IRS	IRIS	Iris spp.
JAP	SMALL JACK-IN-THE-PULPIT	Arisaema triphyllum
LET	WILD LETTUCE	Lactuca canadensis
MSF	MARGINAL SHIELD-FERN	Dryopteris marginalis
NYF	NEW YORK FERN	Dryopteris noveboracensis
PEV	PEARLY EVERLASTING	Anaphalis margaritacea
PHR	PHRAGMITES	Pragmites spp.
POG	POVERTY-GRASS	Danthonia spicata
RDM	REINDEER LICHEN	Cladonia rangiferina
ROF	ROYAL FERN	Osmunda regalis
SEF	SENSITIVE FERN	Onoclea sensibilis
SPL	SPIKED LOOSESTRIFE	Lythrum Salicaria
SPM	SPHAGNUM MOSS	Sphagnum spp.
SSS	SOLOMON'S-SEAL	Polygonatum biflorum
SWA	SWAMP-BUTTERCUP	Ranunculus septentrionalis
WHS	WHITE SNAKEROOT	Eupatorium rugosum
YPL	BULLHEAD-LILY	Nuphar variegatum

shrubs

ALR	ALDER	Alnus spp.
ARR	ARROW-WOOD	Viburnum recognitum
BAR	BARBERRY	Berberis spp.
BLA	BLACKBERRY	Rubus spp.
BLH	BLACK-VIBURNUM	Viburnum prunifolium
BLU	BLUEBERRY	Vaccinium spp.
BUT	BUTTONBUSH	Cephalanthus occidentalis
CAY	AMERICAN YEW	Taxus canadensis
CFH	FLY-HONEYSUCKLE	Lonicera canadensis
CHC	CHOKE-CHERRY	Prunus virginiana
CLB	CLIMBING BITTERSWEET	Celastrus scandens
CRA	GRAPE	Vitis spp.
DEY	DEWBERRY	Rubus spp.
ELD	ELDERBERRY	Sambucus canadensis
GRD	GRAY DOGWOOD	Cornus racemosa
GRJ	GROUND-JUNIPER	Juniperus communis
HAA	COMMON ALDER	Alnus serrulata
HAW	HAWTHORN	Crataegus spp.
HAZ	HAZELNUT	Corylus spp.
HUC	HUCKLEBERRY	Gaylussacia spp.
JAR	MULTIFLORA ROSE	Rosa multiflora
MAV	MAPLE-LEAVED VIBURNUM	Viburnum acerifolium
MOH	MOUNTAIN-HOLLY	Nemopanthus mucronata
MOL	MOUNTAIN-LAUREL	Kalmia latifolia
MOM	MOUNTAIN-MAPLE	Acer spicatum
NAN	NANNYBERRY	Viburnum Lentago
NJT	NEW JERSEY TEA	Ceanothus americanus
PIF	PINXTER-FLOWER	Rhododendron nudiflorum
POI	POISON IVY	Rhus radicans
POS	POISON SUMAC	Rhus vernix
PRA	NORTHERN PRICKLY ASH	Xanthoxylum americanum
PRU	BUCKTHORN	Rhamnus spp.
RIB	RIBES	Ribes spp.
ROD	RED OSIER DOGWOOD	Cornus stolonifera
SMC	SUMAC	Rhus spp.
SPA	SPECKLED ALDER	Alnus rugosa
SPB	SPICEBUSH	Lindera Benzoin
SPI	SPIRAEA	Spiraea spp.
SMS	SMOOTH SUMAC	Rhus glabra
STM	STRIPED MAPLE	Acer pensylvanicum
STS	STAGHORN-SUMAC	Rhus typhina
SWF	SWEET-FERN	Comptonia peregrina
TAH	TARTARIAN HONEYSUCKLE	Lonicera tatarica
WIH	WITCH-HAZEL	Hamamelis virginiana
WIL	WILLOW	Salix spp.
WIN	WINTERBERRY	Ilex verticillata
WIR	WILD-RAISIN	Viburnum cassinoides
ZBC	BLACK CHOKEBERRY	Pyrus melanocarpa

trees

ABU	BUTTERNUT	Juglans cinerea
AIL	TREE-OF-HEAVEN	Ailanthus altissima
ALD	ALTERNATE-LEAVED DOGWOOD	Cornus alternifolia
AMB	BEECH	Fagus grandifolia
AMC	CHESTNUT	Castanea dentata
AME	AMERICAN ELM	Ulmus americana
AMH	AMERICAN HORNBEAM	Carpinus caroliniana
APP	APPLE	Pyrus malus
BAF	BALSAM-FIR	Abies balsamea
BAS	BASSWOOD	Tilia americana
BIH	BITTERNUT HICKORY	Carya cordiformis
BLC	BLACK CHERRY	Prunus serotina
BLL	BLACK LOCUST	Robinia Pseudo-Acacia
BLW	BLACK WALNUT	Juglans nigra
CHO	CHESTNUT-OAK	Quercus prinus
COT	COTTONWOOD	Populus deltoides
EAH	HEMLOCK	Tsuga canadensis
ERC	RED CEDAR	Juniperus virginiana
FLD	FLOWERING DOGWOOD	Cornus florida
GRB	GRAY BIRCH	Betula populifolia
HOH	AMERICAN HOP-HORNBEAM	Ostrya virginiana
LAA	LARGE-TOOTHED ASPEN	Populus grandidentata
LAR	AMERICAN LARCH	Larix laricina
NWC	WHITE CEDAR	Thuja occidentalis
PAB	WHITE BIRCH	Betula papyrifera
PIC	PIN-CHERRY	Prunus pensylvanica
PIH	PIGNUT HICKORY	Carya glabra
PIP	PITCH-PINE	Pinus rigida
QUA	QUAKING ASPEN	Populus tremuloides
RED	RED OAK	Quercus rubra
REM	RED MAPLE	Acer rubrum
RES	RED SPRUCE	Picea rubens
SAS	WHITE SASSAFRAS	Sassafras albidum
SCO	SCRUB-OAK	Quercus ilicifolia
SCP	SCOTCH PINE	Pinus sylvestris
SHB	SERVICEBERRY	Amelanchier spp.
SHH	SHAGBARK-HICKORY	Carya ovata
SUM	SUGAR-MAPLE	Acer saccharum
SWB	SWEET BIRCH	Betula lenta
VIP	SCRUB-PINE	Pinus virginiana
WHA	WHITE ASH	Fraxinus americana
WHO	WHITE OAK	Quercus alba
WHP	WHITE PINE	Pinus strobus
YEB	YELLOW BIRCH	Betula lutea
YEP	TULIP-POPLAR	Liriodendron tulipifera

REVISIONS:

DATA SOURCE: ASPLUNDH ENVIRONMENTAL SERVICES, BLAIR MILL ROAD, WILLOW GROVE PA 19090

FIELD SURVEY - AES 2-75 76

This information is a part of the ESEERCO "STUDY OF ENVIRONMENTAL AND ECONOMIC ASPECTS OF CONTEMPORANEOUS ELECTRIC TRANSMISSION LINE RIGHT-OF-WAY MANAGEMENT TECHNIQUES"

MAP 17.2

SITE 17 MAPPED PLOTS

UTILITY: NY STATE ELECTRIC & GAS CORP.

ROW DESCRIPTION: LYON MOUNTAIN TO SARAMAC 115 K.V.

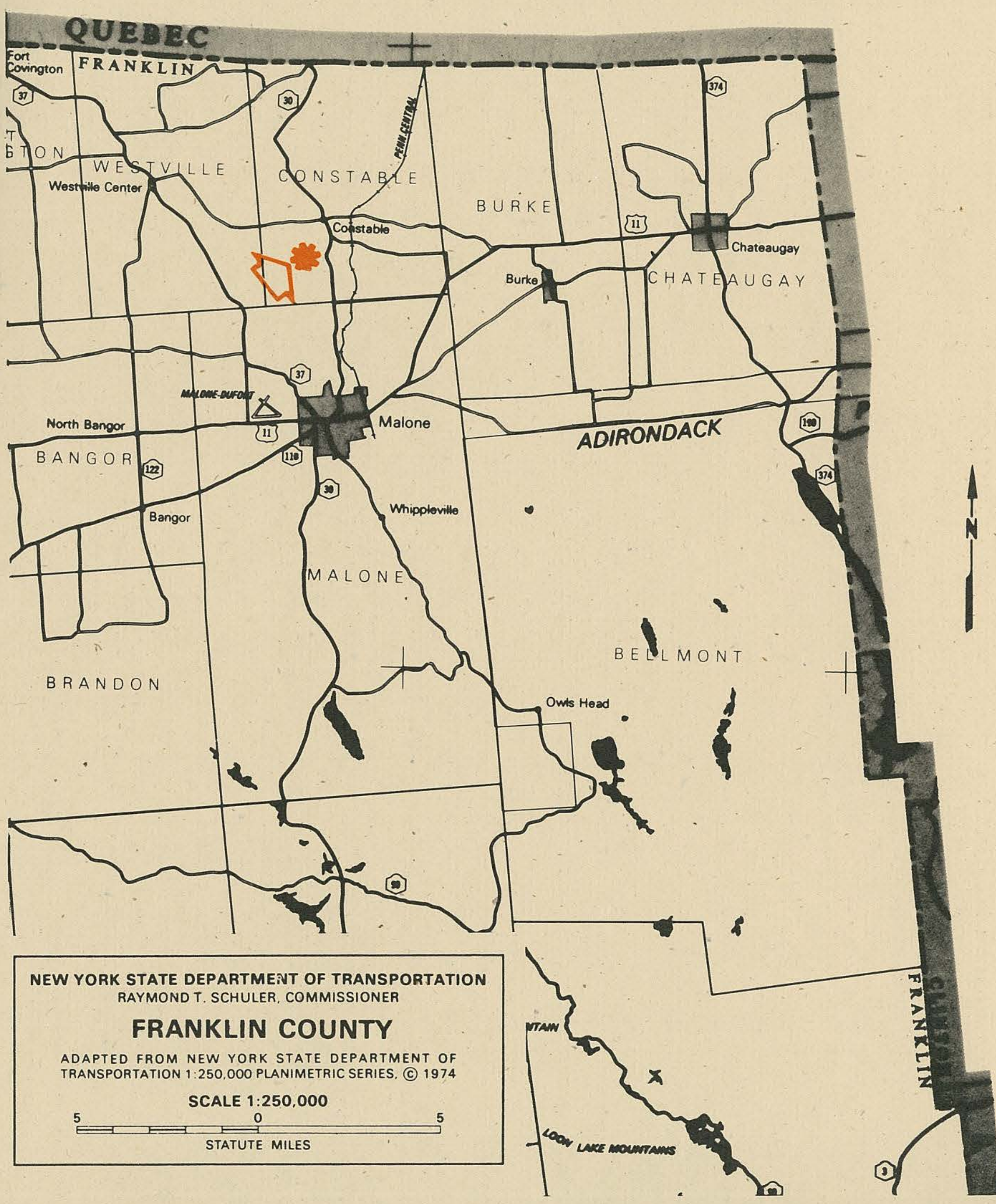
WOODEN POLE H FRAME 100'&175' ROW

SCALE: 1" = 10' - 0"

10 5 0 5 10 20 40 50

SITE 18

MOSES to PLATTSBURG



NEW YORK STATE DEPARTMENT OF TRANSPORTATION
RAYMOND T. SCHULER, COMMISSIONER

FRANKLIN COUNTY

ADAPTED FROM NEW YORK STATE DEPARTMENT OF TRANSPORTATION 1:250,000 PLANIMETRIC SERIES, © 1974

SCALE 1:250,000

5 0 5

STATUTE MILES

Site 18 Moses to Plattsburg

Study area extends from Bull Run Road to route 30 near Constable. To reach the area, take route 30 north towards Constable and study area is west of route 20.

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Site 18 Moses to Plattsburg

1 Introduction

Site 18 is located in the St. Lawrence Valley physiographic area of New York (Cline, 1970) in the Aspen-Gray Birch-Paper Birch forest type area (Stout, 1958). The general landscape of the ROW and adjacent areas is shown in Figs. 18.1.1 and 18.1.2.

The topography of the area is typically rolling, but terrain may vary from nearly level to rough and rolling. Rocky pasture lands abound, and swamps are numerous (Stout, 1958).

Typical forest types of the area are Aspen-Gray Birch-Paper Birch, Hemlock-Northern Hardwoods and Srpuce-Fir and Northern Hardwoods (Stout, 1958). Forest types occurring on the site are Scotch Pine, Elm-Red Maple, Northern Hardwoods, and Aspen Gray-Birch-Paper-Birch.

2 Location and Identification

Site 18 is approximately 1½ miles south of Constable, in the town of Constable, Franklin County, New York (74° 18' 00" W. Longitude; 44° 54' 30" N. Latitude).

The site is on the Moses to Plattsburg ROW which is operated by the Power Authority of the State of New York (PASNY). This 125-foot easement consists of 1 single circuit 230 kV line, with wood pole H-frame structures. The project site is approximately 6,200 feet in length and extends from Bull Run Road, northeast of structure 28-1, to Route 30, southeast of structure 29-2.

3 Background

The following discussion outlines documentable management techniques of clearing, construction, restoration, and maintenance for site 18, as received from PASNY (letter dated March 8, 1976 from John L. Osinski, the Power Authority of the State of New York, Massena, N.Y.). All available pertinent information and unit cost data are included under each operation of clearing, construction, restoration, and maintenance.

3.1 Clearing

The entire ROW was clear cut by April, 1957. Brush was either removed from the site or burned. No information is available regarding the type of equipment used or unit costs for work completed.

The contractor applied a basal spray of 2,4,5-Trichlorophenoxyacetic acid (2,4,5-T) with an oil cover to stumps and stubs of trees within the ROW. The 2,4,5-T concentrate was mixed with an oil carrier in the proportion of 4 gallons of concentrate to 96 gallons of carrier. The basal spray was applied by means of a low pressure nozzle. Application of the solution was intended to penetrate below the ground line and into the roots to inhibit resurgent growth. The chemical application was completed at a cost of $72 per acre.

3.2 Construction

No information is available.

3.3 Restoration

According to specifications, cuts and scars were to be obliterated, damage to ditches, terraces, roads, and other land features were to be corrected, and the land restored following clearing to its original condition, as nearly as practical. No information regarding equipment or unit costs of work is available.

3.4 Maintenance

A ground foliar application of 2,4,5-T was completed by contract crews between July 29 and August 26, 1960.

A ground foliar application of 2,4,5-T was completed by control crews in October, 1963.

By September 2, 1966, a ground foliar application of Tordon 101 was completed by contract.

A ground foliar application of Tordon 101 was completed between June 25 and August 14, 1970.

For all of the above, no additional information or cost data is available.

4 General Reconnaissance

A general reconnaissance was made in accordance with the methodology and is set forth in Map 18.1 which shows site habitat conditions. In this reconnaissance it was noted that the major vegetational types correlated with the soil types on hydric, mesic, and xeric habitats.

The existing visual character of the ROW is depicted during all seasons of the year, from important vantage points both on and off the ROW. These points are identified as photo stations and are located on Map 18.1 and described in Appendix 17. Specific reference is made to some of these photo stations throughout the report and illustrated in Fig. 18.1. With the exception of aerial photography used to identify land use, older photographs depicting the area are not available.

Within the surrounding landscape the site is not necessarily pleasing or objectionable to view. On one end of the ROW near Bull Run Road the ROW opens up a vista through a uniform forest cover. There is, however, a great deal of bare soil from sheet or wind erosion.. Much of the ROW has a combination of small trees, shrubs, grasses, and herbs. There are no distinct natural landforms or man-made features near the site which would make the ROW particularly sensitive to view. The area is used largely for agricultural purposes, with the site not unlike the nearby rolling pastures. The site can be seen from 2 roads, Route 30 which the ROW crosses and Bull Run Road on the other end of the site. The ROW is well screened by trees from the few residences that exist along Bull Run Road. Although Route 30 is moderately well traveled, the potential number of people viewing the ROW appears low.

5 Field Studies - Results and Discussion

5.1 Soils

5.1.1 Geology and Soils

Site 18, Moses to Plattsburg ROW, is located in Franklin County in that physiographic region termed the St. Lawrence Valley by Cline (1970), and the St. Lawrence Hills subdivision of the St. Lawrence-Champlain Lowland region by Thompson (1966). The site is in the St. Lawrence River drainage basin. Bedrock geology is of the Cambrian period, 570 to 500 million years ago, of the Paleozoic age, consisting predominantly of sandstone and quartzose dolostone (Broughton et al., 1973). During the Wisconsin stage of the Pleistocene epoch, this area was covered by a mantle of glacial drift, from which the soils have formed. In addition, some soils in this area were deposited in glacial lakes as the glacier retreated (Carlisle, 1958).

The majority of soils on this site are classified in the order Spodosols, suborder Orthods, reflecting leached surface horizons and accumulations of organic matter, iron, and aluminum in the subsurface horizons (Adams, Colton, Constable, Duane, Empeyville, Moira, and Nicholville soil series). Other soils are in the order Inceptisols, suborder Aquepts (Birdsall, Brayton, Scarboro, Sun, Wallington, and Walpole series), indicating the absence of marked accumulation of clay and iron and aluminum oxides in those wet soils (Buckman and Brady, 1969; Soil Survery Staff, 1975). Two major soil associations occupy this location, Adams-Colton and Adams-Walpole, the former of which developed on glacial deposits of outwash plains and deltas, and the latter, on coarse-textured glacial drift (Carlisle, 1958). Brief descriptions (Carlisle, 1958; Anon. 1972) of soil types occurring on the ROW study site (Map 18.1; Table 18.1) are:

Adams loamy fine sand (AbA and AbC): On this site, Adams soil occurred in close association with Colton soils, and the 2 were therefore mapped together. Adams soils developed on well-sorted glaciofluvial sands derived mainly from granitic gneiss and Potsdam sandstone, and occupy deltas and broad, nearly level to undulating sand plains. Drainage generally varies from good to somewhat excessive; however, internal drainage is rapid and these soils tend to be excessively drained in this area. Wind- and water-eroded areas are common. Available water-holding capacity generally is low. Soil reaction is very strongly acid, and may range from pH 4.0 to pH 5.0 in the first 10 inches of a typical profile; it was pH 4.6 in the mineral soil on this site. Adams loamy fine sand is assigned to Woodland Suitability Group 5s1 where slope is under 8% and 5s3 where slope ranged from 15 to 25%. In both instances there is low potential productivity for timber (Class 5) and sandy soils imparting low water-holding capacity and normally low availability of nutrient elements (Subclass s).

Birdsall loam (BdA): Birdsall loams developed on fine sand and silt of glaciolacustrine origin, and generally occur in small depressions. As both surface runoff and internal drainage are very slow, these soils are very poorly drained, and mottling begins at about 7 inches. Soil reaction is generally slightly acid, and in the first 15 inches of a typical profile varies from pH 5.0 to pH 6.0; on this site, soil reaction was pH 5.3 in the surface 3 inches. Birdsall loams are in Woodland Suitability Group 5w2, designating low timber productivity and limitations for management due to excessive wetness.

Brayton stony loam (BeA): These soils developed on weakly calcareous glacial till derived mainly from Potsdam sandstone, and partly from

Beekmantown limestone; they occupy broad, smooth till plains that range from nearly level to gently sloping. Brayton stony loams are somewhat poorly drained to very poorly drained, due in part to the presence of a firm, compact, slowly permeable sandy loam fragipan at about 12 to 24 inches. The depth to the seasonal water table ranges from 6 to 18 inches, and mottling is evident throughout the profile from about 6 inches. Basically a medium acid soil, ranging from pH 5.0 in the surface soil to pH 7.6 at about 60 inches; on this site soils reaction was pH 5.3 in the upper mineral horizon. Brayton is assigned to Woodland Suitability Group 4w2, indicating moderate productivity for timber and significant limitations for woodland use or management due to excessive wetness.

Colton gravelly loamy sand and cobbly loamy sand (CaA, CcA, CcB, and CcC): In Franklin County, Colton soils are often mapped with Adams soils as indicated in the Adams descriptive paragraph. In addition, they are mapped with Constable soils as they generally occupy areas of the same glacial deposit. Colton soils developed on gravelly glaciofluvial deposits derived mainly from Potsdam sandstone, granitic gneiss, and anorthosite; they occupy deltas, smooth outwash plains, and rolling kames, on nearly level to steep terrain. Well drained to excessively drained, the B2 horizon of these soils is a friable orterde. Soil reaction is very strongly acid, and ranges from pH 4.5 to pH 5.5 in the surface 22 inches of a typical profile; it was pH 4.6 and 4.7 on this site in the surface mineral soil. Assigned to Woodland Suitability Groups 4s2 and 4s6, these soils have a moderate productivity for timber, and sandy soils imparting low water-holding capacity and normally low availability of nutrient elements.

Constable gravelly and cobbly loamy sand (CaA, CcA, CcB, and CcC): These soils are similar to the Colton soils and the 2 are mapped together. The Constable soils vary from the Colton soils mainly in the consistence of the B2 horizon, which in the Constable soils is a well-cemented orstein, in contrast to the friable orterde of the Colton soils.

Duane sandy loam (DaA): Duane sandy loams developed on glaciofluvial materials derived mainly from Potsdam sandstone and granite rock. They occur mainly on the bottom-set beds of deltas and on outwash plains, on nearly level to gently sloping terrain. Surface runoff is slow; internal drainage is restricted by the naturally high water table, lenses of very fine sand or silt in the substratum, and slowly permeable glacial till at comparatively shallow depths below the solum. The soils are therefore moderately well drained. Soil reaction is strongly to extremely acid, and varies from pH 4.5 to pH 5.5 in the surface 14 inches of a typical profile; it was pH 4.6 in the surface 3 inches on this site. Duane sandy loam is assigned to Woodland Suitability Group 4o1, designating moderate timber productivity with no significant restrictions or limitations for woodland use or management.

Empeyville stony very fine sandy loam (EcC): Empeyville soils developed on medium-textured stony glacial till derived mainly from Potsdam sandstone but partly from Beekmantown limestone. They occupy nearly level to moderately steep terrain, particularly on till plains. These soils are moderately well drained, although the presence of a well-developed fragipan horizon at about 20 inches encourages slow internal drainage. The depth to the seasonal water table ranges from 18 to 24 inches. Soil reaction is strongly acid, pH 4.9 in the upper 3 inches on this site. Empeyville is in Woodland Suitability Group 4r1, designating moderate potential for timber productivity with restrictions or limitations for woodland use or management because of slope. Empeyville soils are mapped with the closely associated Moira soils under soil symbol EcC on this site.

Moira stony loam (MeA): Moira soils formed on medium-textured glacial till derived from Potsdam sandstone and Beekmantown limestone, and occupy gently sloping to nearly level topography. These soils are moderately well drained, although internal drainage is slow due to the presence of a fragipan beginning at about 24 inches. Strongly acid to very strongly acid, soil reaction was pH 5.1 in the upper mineral horizon on this site. Moira stony loam is assigned to Woodland Suitability Group 3o1, denoting moderately high productivity for timber and the absence of any significant restriction or limitation for woodland use or management.

Nicholville fine sandy loam (NaA): Nicholville soils developed on glaciolacustrine deposits of fine sand and silt derived mainly from granitic rock and sandstone, and occupy nearly level or gently undulating to sloping terrain. These are moderately well-drained soils, with medium surface runoff and medium to slow internal drainage. Soil reaction is typically strongly or very strongly acid, ranging from pH 4.5 to pH 5.5 throughout the upper 20 inches, and pH 4.8 on this site. Nicholville fine sandy loam is in Woodland Suitability Group 3o1, indicating moderately high timber productivity and no significant restrictions or limitations for woodland use or management.

Scarboro loam, neutral variant, and fine sandy loam (SgA and SeA): Scarboro soils developed on glaciolacustrine and glaciofulvial sands, and occur on level sandy plains or bottom-set beds or deltas, on nearly level to slightly depressed terrain. The Scarboro loam neutral variant resembles the profile for the more typical Scarboro sandy loam, except that it is neutral to slightly acid throughout, and is bathed in ground water that is high in bases. Scarboro soils are very poorly drained, due to the high water table which is seasonally at the surface. On this site, the soil reaction of the neutral variant was pH 6.3 and of the sandy loam was pH 4.8; Scarboro soils are normally strongly acid. These soils are assigned to Woodland Suitability Group 5w2, and have a low potential timber productivity, with a high water table adversely affecting stand development or management.

Sun very stony loam (SnA): These soils formed on medium-textured calcareous glacial till derived from Potsdam sandstone and Beekmantown limestone; they occur on level to very gently sloping areas. Sun soils are very poorly drained, with mottling beginning in the surface 7 inches and continuing throughout the profile to the firm stony fine sandy loam which occurs at about 33 inches. The water table is seasonally at the surface. Soil reaction was pH 6.2 on this site, and typically ranges from slightly acid to neutral. Its assignation to Woodland Suitability Group 4x2 evidences the moderate timber productivity of Sun very stony loam, and the presence of stones in numbers sufficient to cause restrictions or limitations for woodland use or management.

Wallington very fine sandy loam (WaA): Wallington soils developed on fine sand and silt of lacustrine origin, and occupy nearly level locations. A dense, firm fragipan occurs at about 12 to 18 inches, which impedes the internal drainage of these soils. The depth to the seasonal water table is 6 to 18 inches. A strongly acid soil in general, Wallington evidenced a pH 5.0 in the upper mineral horizon on this site. Assigned to Woodland Wuitability Group 3w2, these soils are moderately high in potential productivity for timber, but stand development and management are adversely affected by excessive water from restricted drainage and a seasonally high water table.

Walpole sandy loam and sandy loam, neutral variant (WcA and WfA): Walpole soils developed on sandy glaciofluvial and glaciolacustrine deposits, on nearly level to very gently sloping terrain. These soils are poorly drained, due mainly to a high water table restricting internal drainage in the fall, winter, and spring. Seasonally, the depth to the water table ranges from the surface to 6 inches. Soil reaction is strongly acid, and ranges from pH 4.5 to pH 5.5 in the surface 24 inches of a typical profile; it was pH 5.3 in the upper 3 inches on this site. Walpole sandy loam, neutral variant, is similar to the typical Walpole profile, but evidences a different soil reaction; it was pH 6.8 on this site in the upper mineral surface. Walpole soils are assigned to Woodland Suitability Group 4w1, designating a moderate productivity for timber and a seasonally high water table causing a significant limitation for woodland use or management.

5.1.2 Humus Types

Organic layers present on the soil surface of the ROW and adjacent woodland were measured on 2 mesic and 2 xeric locations. Average thickness of the organic layers and A1 horizon was based on 5 samples taken at each location (Table 18.2). The presence and thickness of these layers were used for humus type classification. The humus classification key is not adaptable to areas exhibiting prolonged water saturation in the surface soil; therefore, similar measurements were not made on the hydric site. The area was apparently grazed in the past; and, indeed, some limited grazing was evident during visits to the site. The area was apparently not plowed due to the sandy soil conditions, and there was no evidence of recent fires noted.

In general, all organic layers (litter, fermentation, and humus) were present at each location on both the ROW and woodland. On several subplots, however, the humus layer was missing from the ROW but was consistently present in the adjacent woodland. In practically all cases the humus layer in the woodland was thicker than that on the ROW. In most instances, no A1 horizon was present on either the ROW or woodland locations, but where it did occur on the ROW, it appears that grazing mixed the humus layer of the basically mor soil with mineral soil creating a mull-like condition. In such cases the soil was designated a "thin duff mull-G". Based on thickness of the fermentation and humus layers, and the general absence of an A1 horizon, the predominant humus type was designated a "thin mor" on the ROW mesic and xeric sites and the woodland xeric area. A "thick mor" occurred in the woodland on mesic locations.

Organic layers on the ROW xeric locations were nearly equivalent to those in the woodland; but, the humus layer on mesic sites was thinner, possibly due to grazing activities. Where an A1 horizon occurred (ROW mesic sites), it was shallow, less than ½ inch. Litter in the woods was composed primarily of tree parts (leaves, twigs, and fruit) in contrast to leaves and stems of grasses, herbs, and shrubs on the ROW.

Based on these limited observations, it appears that ROW construction and maintenance for brush control did not materially alter the surface organic layers of the soil, although humus layers on the mesic areas, and to a lesser extent on xeric areas, were thinner on the ROW than in the adjacent woodland. Elimination of the forest cover did result in a change in kind of organic material, but regrowth and persistence of a mixed grass-herb-shrub cover has resulted in annual litter depositions and the continuation of a protective organic layer.

5.1.3 Soil Erosion

Current Active Erosion Observations of active soil erosion on the ROW and adjacent woodland were made on the Moses to Plattsburg study area in July, 1976. No active erosion was evident in the woodland on any soil type or slope, apparently due to the protective canopy of trees and shrubs, and undisturbed organic layers present on the soil. Active erosion was noted on 2 locations of the general ROW, both in areas of loamy sand soil (Fig. 18.1.3). No active or recent erosion was observed on the remainder of the general ROW, areas where woody brush was controlled, apparently with little or no disturbance to the soil surface. Vegetation cover, composed of grasses, herbs, and low shrubs, had developed on the general ROW following chemical treatments for brush control and a protective litter mulch from these plant parts was present (Table 18.2).

Other eroding areas on the ROW were identified as to location, soil type, average slope, and present plant cover (Table 18.3). Erosion was classified as to kind (sheet, rill, gully) and class (slight, moderate, severe). No gullies were noted. Bare and eroding areas were recorded and locations of the larger ones plotted on the base map, as was 1 open area formed by an equipment cut (Map 18.1). It appears that most active erosion on the ROW was limited to areas that had been subjected to past and/or recent mechanical disturbance of the soil, as with the access road, tower sites, and the equipment cut (Table 18.3). It also appears that much of the erosion on the ROW resulted from or was encouraged by grazing and the use of farm euqipment. In addition, erosion was observed where the Adams-Colton loamy sand and Colton-Constable gravelly and cobbly loamy sands occurred. These soils are highly erosive by water and, in addition, are susceptible to wind erosion. In all cases, sediment resulting from erosion accumulated on lower slopes and did not leave the ROW via streams or collect in water impoundments, but to some extent may leave the ROW when carried by the wind.

There was no restoration in the form of seeding and planting following construction of this ROW. Denuded areas were therefore dependent on natural plant invasion. Grass and herb cover has developed on access roads, and only in 1 area has erosion been notable. Progressive sheet erosion on several areas, including the equipment cut, apparently prevent natural plant invasion as they are devoid of plant cover. Other areas appear to be slowly healing, predominantly with mosses and herbs. There were no areas of mass land movement such as landslides on this site.

5.2 Vegetation

5.2.1 Habitat and Forest Types on the Site

Hydric Habitat The hydric, or wet, habitat (1) was located on a very slightly depressed, lowland area. Slope was negligible and aspect was flat. As drainage was impeded, largely due to the presence of a high water table in the fall, winter, and spring, wet meadow conditions have developed. The forest type was typical Elm-Red Maple with American elm and red maple, as well as yellow birch.

Mesic Habitat The mesic, or medium moist, habitat (2) was located on a slight incline of a broad, rolling hill. Slope was approximately 5% on a west-facing slope. Drainage was free but not excessive. The forest type was Northern Hardwoods, with red maple, black cherry, and hemlock predominating, along with white birch, and sparse beech and yellow birch.

Xeric Habitat The xeric, or dry, habitat (3) was located on the nearly level top of a fairly broad, somewhat elevated, plateau area. Slope was negligible and aspect was flat. Drainage was generally excessive. The forest type was Aspen-Gray Birch-Paper Birch, and consisted mainly of quaking aspen, large-toothed aspen, and gray birch, with red maple, pin-cherry, white pine, and black oak.

5.2.2 Analysis of Forest Types and Associated ROW Vegetation

General Changes in Vegetation The primary impact of the ROW was to cause a change from a forest with a 4-layered structure to a shrub-herb-grass community. Obviously, removal of the trees caused this; and what was essentially a 2-layered ROW community developed, the shrub layer consisting of shrubs and small trees which were not removed by maintenance spraying, or which have arisen since the last spray application (Fig. 12.2).

In order to more completely characterize the forest types, an analysis was made on the forest plots to derive importance values for tree species (Table 18.4). Obviously, red maple and American elm were important species on the hydric plot; red maple, white birch, and gray birch were important species on the mesic plot; and red maple, gray birch, and black cherry were important sepcies on the xeric plot.

On the hydric habitat, an Elm-Red Maple forest type was changed to a Willow-Sensitive Fern plant community. On the mesic habitat, a Northern Hardwoods forest type was changed to a Blackberry-Goldenrod plant community. On the xeric habitat, an Aspen-Gray Birch-Paper Birch forest type was changed to a Blueberry-Bracken plant community.

Quantitative Changes There was a marked increase in the number of shrubs and herbs on the hydric habitat on the ROW as compared to the forest; there were 10 shrubs on the ROW as compared to 6 in the forest (Table 18.5; Figs. 18.3 and 18.4). There were 18 herbs on the ROW and 7 in the forest. A notable increase in the shrub and herb layers also occurred on the mesic habitat. There were 6 shrubs on the ROW as compared to 2 in the forest, and 17 herbs on the ROW, with 12 occurring in the forest. On the xeric habitat a notable change in the number of shrubs occurred, with 7 shrubs present on the ROW and only 3 in the forest. No major increase in the number of herbs was apparent on the ROW as there were 10 herbs present on the ROW as compared to 8 in the forest (Table 18.5).

Qualitative Changes On the hydric habitat, 11 species from the shrub and herb layers occurred both in the forest and on the ROW (Fig. 18.5), while 2 species occurred in the forest but not on the ROW (Table 18.6), and 17 species were on the ROW but not in the forest (Table 18.7). One of the 2 species which occurred only in the forest was a shrub, choke-cherry, which is typical of open shrub areas. Of the 17 species which occurred on the ROW, only 5 were shrubs, namely, spiraea, alder, black chokeberry, raspberry, and blackberry. In the herb layer on the hydric habitat, 1 species occurred in the forest alone and 12 were found on the ROW and not in the forest (Tables 18.6 and 18.7).

On the mesic habitat, 6 species from the shrub and herb layers occurred both in the forest and on the ROW, while 8 occurred in the forest only and 17 occurred on the ROW and not in the forest (Tables 18.6 and 18.7; Fig. 18.5). One shrub, alternate-leaved dogwood, was found in the forest alone, and 5 shrubs, willow, wild-raisin, winterberry, spiraea, and blackberry, occurred only on the ROW. In the herb layer, 7 species occurred in the forest alone and 12 were unique to the ROW (Tables 18.6 and 18.7).

On the xeric habitat, 7 species from the shrub and herb layers occurred both in the forest and on the ROW (Fig. 18.5), while 4 occurred in the forest only (Table 18.6), and 10 occurred on the ROW and not in the forest (Table 18.7). No shrubs were found in the forest alone, while 4 shrubs, wild-raisin, mountain-holly, (Fig. 18.1.4), teaberry, and hawthorn, occurred only on the ROW. In the herb layer, 4 species occurred in the forest alone, and 6 were found only on the ROW (Tables 18.6 and 18.7).

It appears that the ROW had a notable impact on the number of species in the shrub and herb layers, as species were more numerous on the ROW than in the adjacent forest. The 1 exception is the herb layer of the xeric habitat, as there was a similarily in number of species both on and off the ROW. There was a difference in the kind and abundance of species that occupied both the forest and the ROW.

5.2.3 Analysis of Plant Communities for On-ROW Mapped Vegetation Plots

Table 18.8 presents a breakdown of major vegetational communities (Map 18.2) for the hydric, mesic, and xeric plots on the Moses to Plattsburg ROW. Much of the present composition of herbaceous and woody plant communities on this area can be explained by the spraying history.

Foliar herbicide applications with 2,4,5-T were started in 1960 and repeated in 1963. In 1966 and 1970 foliar applications with Tordon 101 were applied from the ground. From the initial spraying in 1960, each successive foliar treatment was more selective.

The major plant communities now dominating the 3 plot locations, hydric, mesic, and xeric are: Sedge-Spiraea-Mixed Grass-Herb, Rubus-Mixed Fern-Mixed Grass-Herb, and Hair-cap Moss-Rubus-Mixed Grass-Herb, respectively. A number of these species do not appear to be adversely affected by herbicides, and will therefore most likely play an important part in the continued development of this ROW, especially with a more selective approach in line maintenance. Those shrub species that were seriously affected by sprays in the past may have a change to become an important part of the vegetational matrix of the ROW vegetation as selective sprays are used.

5.2.4 Comparison of Forest Type with ROW Vegetation

The ROW was clear cut in 1957 and the material was either removed from the site or piled and burned. Stumps were treated with 2,4,5-T mixed with oil during initial clearing. A foliar application of 2,4,5-T was applied in 1960. This treatment was mainly broadcast. Each successive treatment became more selective. Another ground foliar application of 2,4,5-T was applied in 1963. In 1966 and 1970 a ground foliar application of Tordon 101 was applied.

The general impact of the above treatments of the ROW was to change the forest types (Elm-Red Maple, Northern Hardwoods, and Aspen-Gray Birch-Paper Birch) to shrub-herb-grass communities.

On the hydric habitat, which was formerly occupied by an Elm-Red Maple forest type, a Willow-Sensitive Fern community was produced. There was a significant increase in total number of shrub and herb species on the ROW as compared with the forest. There was a qualitative difference in shrub and herb species on the ROW as compared to the forest, with some shrubs of the forest not on the ROW and several important shrubs of the ROW lacking from, or sparse in, the forest. The same was true for herbs; i.e., some herbs of the forest were not on the ROW, while some herbs of the ROW were not in the forest.

On the mesic habitat, which was formerly occupied by a Northern Hardwoods forest type, a Blackberry-Goldenrod community was produced. There was a significant increase in the total number of shrub and herb species on the ROW as compared with the forest. There was a qualitative difference in shrub and herb species on the ROW as compared to the forest, with some shrubs of the forest not on the ROW and several shrubs of the ROW lacking or sparse, in the forest. Some herbs of the forest, such as painted trillium (Fig. 18.1.5), were not on the ROW, while some herbs of the ROW were not in the forest.

On the xeric habitat, which was formerly occupied by an Aspen-Gray Birch-Paper Birch forest type, a Blueberry-Bracken plant community was produced. There was a significant increase in the total number of shrubs, while the number of herbs was similar on the ROW as compared with the forest. There was a qualitative difference in shrub and herb species on the ROW as compared to the forest, with no shrubs of the forest on the ROW, but several shrubs of the ROW lacking from the forest. Some herbs of the forest were not on the ROW, and the reverse is also true.

5.3 Wildlife

The major game species for site 18, Moses to Plattsburg, were determined by Asplundh Environmental Services (AES) in conjunction with the New York State Department of Environmental Conservation (DEC). These species are ring-necked pheasant, varying hare, and Hungarian partridge.

5.3.1 Actual Use

Ring-necked Pheasant No direct or indirect observations were made for ring-necked pheasant during the length of the study period.

Varying Hare Varying hare activity was moderate during the winter of 1975 to 1976, near structures 28-3 and 28-4, as evidenced by tracks crossing the ROW in the snow.

Hungarian Partridge No direct or indirect observations were made for Hungarian partridge during the length of the study period.

Miscellaneous Wildlife Observations Various birds were seen and/or heard on the study area throughout the period of this study. Birds observed on the ROW and on the ROW edge are included in Table 18.9.

During the summer of 1975, 1 gray squirrel was observed running across the ROW west of structure 28-5. Two active woodchuck burrows were located at this time, 1 near structure 28-4, to the north side of the ROW, and 1 west of that structure.

The same 2 woodchuck borrows were still in active use during the spring of 1976 (Fig. 18.1.6). Mole activity was slight southeast of structure 28-1, as indicated by tunnels. Two small game trails were located near mesic plot 2. White-tailed deer pellets were sparse on xeric plot 3 on the ROW.

It was observed that a home near the ROW, which was occupied by a family containing a number of small children and dogs, may have had a considerable affect on wildlife use of the ROW and adjacent woodland in the vicinity.

5.3.2 Potential Use

Potential wildlife use of plant species present on site 18 for the 3 major game species, ring-necked pheasant, varying hare, and Hungarian partridge, is contained in Table 18.10. In addition to asterisk ratings from New York, asterisk ratings from Minesota were included for those plant species present on the study area that were not rated in the New York evaluation for hare. Also, the asterisk ratings for the Northeast were included where applicable for pheasant and partridge. This additional data should provide supplemental information to the ROW manager regarding those plant species that may be of potential value to those game species (Martin et al., 1951).

5.4 Land Use

5.4.1 Location

Site 18 is located in a rural nonfarm section of the town of Constable, Franklin County, New York. Between 1960 and 1970 there was a 1.8% decrease in population of Franklin County with a 1970 distribution of 40.0% urban, 52.0% rural nonfarm, and 8.0% rural farm (U.S. Bureau of the Census, 1972). The closest community is Constable which is approximately 1½ miles to the northeast.

5.4.2 Land Use Near the Time of Construction

The ROW was constructed during 1957. The earliest available data obtained from 1958 aerial photography indicates that the location of the ROW and adjacent land to the ROW was primarily rural nonfarm (Table 18.11; Fig. 18.6). Land use distribution included the following subtypes:

Agriculture:
- Ac - Cropland and cropland pasture
- Ap - Pasture

Forest Land:
- Fc - Forest brushland
- Fn - Forest lands
- Fp - Plantations

Non-productive:
- Ns - Sand

Water Resources:
- Ws - Streams and rivers
- Wb - Marshes, shrub wetlands, and bogs
- Ww - Wooded wetlands

5.4.3 Land Use After Construction

The adjacent land use to site 18 has changed from the 1958 data, with increases in forest land, extractive industry, and public uses, and a decrease in agricultural use. The land adjacent to the ROW is still rural nonfarm (Table 18.11; Fig. 18.6), with a slightly different land use distribution that includes the following subtypes:

Agriculture:
- Ac - Cropland and cropland pasture
- Ap - Pasture
- Ai - Inactive agricultural land

Extractive Industry:
- Eg - Sand and gravel pits

Forest Land:
- Fc - Forest brushland
- Fn - Forest lands
- Fp - Plantations

Non-Productive:
- Ns - Sand

Public and Semi-Public:
- P - Public and semi-public

Water Resources:
- Ws - Streams and rivers
- Wb - Marshes, shrub wetlands, and bogs
- Ww - Wooded wetlands

In addition to use of the ROW for the transmission of electrical power, portions of the ROW are currently being used for such recreational uses as horseback riding and snowmobiling, as well as being used for pasture, agricultural uses, and an extension of adjacent backyard activities.

6 Evaluation, Interpretation, and Summary of Results

6.1 Conditions Which Existed Prior to Establishment of ROW

Soil, vegetation, and wildlife habitat conditions existing prior to ROW construction were based on observations made during the period of this study on adjacent undisturbed forest areas on both sides of the ROW.

6.1.1 Soils

This site is situated on undulating glacial till plains, outwash terraces, and deltas, and lake deposits over sandstone, dolostone, and some limestone bedrock. Topography varies from depressed areas, nearly level and long gentle slopes, to steeper slopes with gradients up to 25% on northwest and southeast exposures. Surface mineral soils are loam, sandy loam, and loamy sand textures containing stones, cobbles, and gravel in some phases. Soil reaction is strongly acid, pH 4.6 to pH 5.3, except in neutral variants influenced by calcareous till, alkaline ground water, or limestone, where soil is slightly acid to neutral. Thirteen soil series present on the site were separated into 18 mapping units based on slope, texture, and reaction variations. Several closely related series occur in intimate association, and thus, were mapped together. Soil mapping units related to topographic position and drainage are: well- to excessively drained Adams-Colton and Colton-Constable on gentle to steep upper slopes; moderately well-drained Duane, Empeyville, Moira, and Nicholville on nearly level to moderate slopes; and, poorly drained Birdsall, Brayton, Scarboro, Sun, Wallington, and Walpole on nearly level plains and depressed lake beds.

All mapping units occurred in adjacent land areas, which may reflect conditions at the time of ROW construction in 1957. Several units or parts of them were occupied by pasture and cropland (Adams-Colton, Birdsall, Brayton, Colton-Constable, Scarboro, and Wallington) and Scotch pine plantations (Colton-Constable). Other units supported natural mixed hardwoods, predominantly gray birch, aspen, and red maple on well-drained xeric habitats; red maple, white birch and hemlock on well- to moderately well-drained mesic habitats; and, red maple, American elm, and birch on poorly drained hydric sites. The moderately well-drained Moira loam and Nicholville sandy loam were rated moderately high with no restrictions for timber production; all other soil mapping units were rated low to moderate in woodland productivity with limitations due to wetness or dry sandy conditions.

The forest floor under natural hardwoods was composed of tree litter, fermentation, and humus layers 1.2 and 0.8 inches thick on mesic and xeric sites, respectively. Due to the absence of an A1 horizon, humus types were "thick mors" on mesic and "thin mors" on xeric areas. No active erosion occurred on any soil type or slope in the undisturbed hardwood forest.

6.1.2 Vegetation

Prior to corridor establishment (1957), the study area was in agricultural cropland, pasture, and forest. Most of the forest stands were of natural origin, but a small portion of the study area passes through a Scotch pine plantation which was planted prior to ROW clearing.

Forests of the Elm-Red Maple type dominated hydric sites. Some mesic sites supported stands of Northern Hardwoods where red maple, black cherry, basswood, and white pine were associates. Other mesic sites were in cropland or pasture. The Aspen-Gray Birch-Paper Birch type occupied xeric sites.

6.1.3 Wildlife

Wildlife, being mobile species which may or may not be observed during site visitation, were reasonably imputed to this area by the composition of the forest area adjacent to the ROW. It can be assumed that those species probably currently occupying the site, i.e., ring-necked pheasant, varying hare, and Hungarian partridge, occupied the habitat prior to ROW construction. Although current wildlife activity may be influenced by the presence of the ROW, it is likely that those species, designated by the DEC in conjunction with AES as major in this area, inhabited the vicinity even before ROW construction. The degree of use is impossible to determine at this time.

6.1.4 Land Use

The earliest data available near the time of construction of the ROW in 1957 is 1958 aerial photography. The ROW and adjacent land area was rural nonfarm with a land use distribution of agriculture (47.7%), forest land (47.0%), non-productive (0.7%), and water resources (4.6%).

6.2 Conditions Which Exist at Present

6.2.1 Soils

Thirteen soil mapping units summarized in Section 6.1.1 were present on the ROW, some as small inclusions, but most extending across both ROW and adjacent land in association with relief and drainage patterns. Prominent vegetation on the ROW in 1976 was closely related to existing soils and moisture regimes; these were Willow-Sensitive Fern on poorly drained soils of hydric sites, Blackberry-Goldenrod on moderately well-drained soils of mesic sites, and Blueberry-Bracken with mixed grass, moss, and lichens on well-drained soils of xeric habitats. In addition, portions of the ROW were occupied by pasture and cropland as previously discussed.

Organic layers composed of grass, herb, and shrub remains on the ROW consisted of litter, fermentation, and humus layers 0.6 and 0.4 inches thick on mesic and xeric sites, respectively. A shallow A1 horizon, possibly related to past grazing use, resulted in a "thin duff mull-G" humus type on the mesic habitat, while, a "thin mor", due to absence of the A1 horizon, occurred on the xeric habitat.

Slight sheet erosion was observed in 2 locations of loamy sand soil on the general ROW where mineral soil was bare or had light plant cover. Also, moderate to severe sheet and rill erosion occurred on a disturbed portion of the access road, 2 tower sites, and an equipment cut, all in bare or lightly vegetated loamy sand. When exposed, these light loamy sand soils are highly erosive by water and wind. Most erosion sediments collected on lower slopes, but some likely was transported out of the area by wind.

6.2.2 Vegetation

The major plant community on hydric sites is Sedge-Spiraea-Mixed Grass-Herb. Willows, black chokeberry, red maple, aspen, and wild-raisin are conspicuous woody plants in this community. On mesic sites, the Rubus-Mixed Fern-Mixed Grass-Herb community is the major cover with seedling red maple, red oak, aspen, willow, and yellow birch invading.

Xeric sites contain a number of communities. The most abundant is Hair-cap Moss-Rubus-Mixed Grass-Herb. Scattered thickets of spiraea and mountain-holly are found on these sites, and red maple and white birch seedlings have become established.

Some areas of the corridor are used for grazing. In addition, the ROW was being used as an extension of backyard activities by local residents.

6.2.3 Wildlife

Ring-necked pheasant, varying hare, and Hungarian partridge are the major game species that are likely to currently utilize the study area. No direct or indirect observations were made of ring-necked pheasant or Hungarian partridge during the length of the study. Indirect observations (tracks) of varying hare indicated that species' presence on the ROW.

Several other animals were noted, directly or indirectly, to be utilizing either the ROW, the adjacent forest, or both. Potential wildlife use is evident from plant species present on the site.

6.2.4 Land Use

Recent land use of the ROW and adjacent land area has shifted from the 1958 percentages. The area is classified primarily as rural nonfarm with a distribution of agriculture (26.6%), forest land (67.7%), extractive industry (0.2%), non-productive (0.7%), public and semi-public (0.2%), and water resources (4.6%). With reference to the area involved, shifts in land use are noted as follows:

Agriculture	-	-21.1%
Forest Land	-	+20.7%
Extractive Industry	-	+ 0.2%
Non-productive	-	no change
Public and Semi-public	-	+ 0.2%
Water Resources	-	no change

Land uses of public and semi-public areas and extractive industry are new types which were not present in 1958. In addition to the use of the ROW for the transmission of electrical power, portions of the ROW are currently being used for pasture, agricultural uses, horseback riding, snowmobiling, and an extension of adjacent backyard activities.

6.3 Environmental Effect and Probable Causes

6.3.1 Soils

Impacts of ROW management on soils of this site are primarily related to removal of plant cover and disturbance of surface soil resulting in slight to sever sheet and rill erosion. Some erosion occurred on the general ROW, but most was related to disturbed areas of the access road, tower sites, and equipment cuts. The loamy sand soils on the area are fragile and highly susceptible to erosion when exposed. No restoration seeding was done following ROW construction, so denuded areas were dependent on natural plant invasion which is being interrupted by continuing erosion. It is probable that some of the soil disturbance leading to erosion was caused by past grazing and use of farm equipment in the area. Other than that transported by wind, erosion sediments collected on lower slopes of the ROW.

It also appears that the ROW had some affect on organic layers, which were only ½ as thick on the ROW as in the forest on both mesic and xeric sites. Some of this affect may be due to past grazing, especially on the mesic habitat where a "duff mull-G" humus type occurred, while "mor" humus types were common on other areas. Also, annual litter deposits were changed from tree parts in the forest to mostly leaves and stems of grasses, herbs, and shrubs on the ROW.

6.3.2 Vegetation

Regular herbicide treatment has eliminated most of the original woody component on this corridor and allowed low communities of herbs and grasses to dominate the ROW area. Present plant communities are composed of grasses, ferns and herbs that are moderately resistant to the herbicides used on this corridor. Most woody vegetation occurring on the study plots has become established since the last herbicide treatment (1970), and is 1 to 4 feet in height, indicating the effectiveness of the herbicide program in removing woody vegetation.

6.3.3 Wildlife

The presence of the ROW has encouraged the development of many different plant species, mainly light-loving, on the ROW proper, thus enhancing the habitat for wildlife use. The ecotone created by the presence ot the ROW often produces a greater variety and density of life than is found otherwise (Leopold, 1936), and this phenomenon has been termed the "edge effect" (Smith, 1974).

6.3.4 Land Use

It is not possible to attribute changes in land use adjacent to the ROW to the construction of the transmission ROW. Changes within the area may be attributed to other changing land use characteristics in Franklin County. The area is more predominantly rural nonfarm than before. It is apparent that adjacent residences are using the additional open spaces of the ROW as an extension of their properties.

Table 18.1. Soil series present on the Moses to Plattsburg study area.

Soil Series	Map Symbol[1]	Drainage Class[2]	Surface Soil pH	Surface Soil Texture	Woodland Suitability Group
Adams-Colton	AbA	G-E	4.6	loamy fine sand	5s1
Adams-Colton	AbC	G-E	4.6	loamy fine sand	5s3
Birdsall	BdA	VPD	5.3	loam	5w2
Brayton	BeA	SPD-PD	5.3	stony loam	4w2
Colton-Constable	CaA	G-E	4.6	gravelly loamy sand	4s2
Colton-Constable	CcA	G-E	4.7	gravelly and cobbly loamy sands	4s2
Colton-Constable	CcB	G-E	4.7	gravelly and cobbly loamy sands	4s2
Colton-Constable	CcC	G-E	4.6	gravelly and cobbly loamy sands	4s6
Duane	DaA	MG	4.6	sandy loam	4o1
Empeyville-Moira	EcC	MG	4.9	stony very fine sandy loam	4r1
Moira	MeA	MG	5.1	stony loam	3o1
Nicholville	NaA	MG	4.8	fine sandy loam	3o1
Scarboro	SgA	VPD	6.3	loam, neutral variant	5w2
Scarboro	SeA	VPD	4.8	fine sandy loam	5w2
Sun	SnA	VPD	6.2	very stony loam	4x2
Wallington	WaA	PD	5.0	very fine sandy loam	3w2
Walpole	WcA	PD	5.3	sandy loam	4w1
Walpole	WfA	PD	6.8	sandy loam, neutral variant	4w1

[1] The third letter of the map symbol designates slope class:
A = 0-8%, B = 8-15%, C = 15-25%, D = 25-35%, E = 35-50%, F = 50-70%.

[2] Drainage Class: VPD = very poorly drained, PD = poorly drained, SPD = somewhat poorly drained, ID = imperfectly drained, MG = moderately good, G = good, E = excellent (excessive).

Table 18.2. Average thickness of organic layers and A1 horizon and humus types for mesic and xeric sites on ROW and adjacent woodland of site 18.

Moisture Regime	Location	Layer Thickness (in.) L	F	H	A1	Humus Type
1. Mesic (2)[1]	ROW	.3	.1	.2	.3	Thin duff mull-G with very shallow A1
	Woodland	.3	.2	.7	0	Thick mor
2. Mesic	ROW	.3	.1	.2	0	Thin mor
	Woodland	.3	.1	.7	0	Thick mor
All Mesic Plots Combined	ROW	.3	.1	.2	.1	Thin duff mull-G with very shallow A1
	Woodland	.3	.2	.7	0	Thick mor
3. Xeric (3)	ROW	.2	.1	.1	0	Thin mor
	Woodland	.4	.1	.3	0	Thin mor
4. Xeric	ROW	.2	.1	.1	0	Thin mor
	Woodland	.4	.1	.2	0	Thin mor
All Xeric Plots Combined	ROW	.2	.1	.1	0	Thin mor
	Woodland	.4	.1	.3	0	Thin mor

[1] Samples taken at vegetation study plots, the numbers of which are indicated by figures in parentheses.

Table 18.3. Areas exhibiting active erosion in July, 1976, on the Moses to Plattsburg ROW study area.

Location	Soil Type	Average Slope (%)	Plant Cover	Erosion on ROW: Kind	Erosion on ROW: Class	Erosion on ROW: Gully Depth (in.)
General ROW	Colton-Constable gravelly loamy sand	2	Hair-cap moss-mixed grass-herb	Sheet	Slight	-
General ROW	Adams-Colton loamy sand	3	Bare	Sheet	Slight	-
Tower Site	Colton-Constable gravelly loamy sand	2	Bare-moss-grass	Sheet & Rill	Moderate	-
Tower Site	Colton-Constable gravelly loamy sand	2	Grass	Sheet	Slight	-
Access Road	Colton-Constable gravelly loamy sand	2	Bare-moss-grass	Sheet & Rill	Moderate	-
Equipment Cut	Colton-Constable gravelly loamy sand	25	Bare	Sheet & Rill	Severe	-

Table 18.4. Importance value of trees in the upper tree layer in the forest adjacent to the ROW.

Site	Species	Relative Dominance Basal Area (% of total) 1	Relative Density (% of total) 2	Importance Value 1+2
Hydric 1	Red Maple	92.97	88	180.97
	American Elm	5.09	6	11.09
	White Birch	1.94	6	7.94
Mesic 2	Red Maple	97.17	57	154.17
	White Birch	1.88	22	23.88
	Gray Birch	.83	15	15.83
	Hemlock	.12	6	6.12
Xeric 3	Red Maple	48.61	43	91.61
	Gray Birch	27.18	40	67.18
	Black Cherry	24.21	17	41.21

Table 18.5. Comparison of species composition, abundance and sociability (A.S.) in the tree, shrub, and herb layers, in the adjacent forest and on the ROW, on hydric, mesic, and xeric habitats.

Species	Hydric (1)		Mesic (2)		Xeric (3)	
	Forest A.S.	ROW A.S.	Forest A.S.	ROW A.S.	Forest A.S.	ROW A.S.
Tree Layer						
Red Maple	3.1	-	3.1	-	1.1	-
American Elm	+.1	-	-	-	-	-
White Birch	+.1	-	+.1	-	-	-
Gray Birch	-	-	++.1	-	2.1	-
Hemlock	-	-	++.1	-	+.1	-
White Pine	-	-	-	-	+.1	-
Pin-Cherry	-	-	-	-	1.1	-
Black Oak	-	-	-	-	+.1	-
Large-toothed Aspen	-	-	-	-	1.1	-
No. Species	3	0	4	0	7	0
Shrub Layer						
Winterberry	1.1	1.1	-	+.1	-	-
Wild-raisin	2.1	+.1	-	++.1	-	++.1
Choke-Cherry	+.1	-	-	-	-	-
Common Alder	-	+.1	-	-	-	-
Willow	1.2	2.1	-	+.1	-	-
Dewberry	1.1	1.1	-	-	-	-
Black Chokeberry	-	1.1	-	-	-	-
Mountain-Holly	-	-	-	-	-	+.3
Witch-Hazel	-	-	1.1	1.1	-	-
Alternate-leaved Dogwood	-	-	++.1	-	-	-
Spiraea spp.	-	2.3	-	+.2	1.1	2.2
Raspberry	-	1.1	-	-	-	-
Blackberry	-	+.2	-	4.3	3.1	1.2
Low Blueberry	-	-	-	-	+.4	1.2
Teaberry	-	-	-	-	-	(1.3)
Virginia Creeper	3.2	1.1	-	-	-	-
Hawthorn	-	-	-	-	-	++.1
No. Species	6	10	2	6	3	7
Trees in the Shrub Layer						
Red Maple	2.1	3.1	2.1	3.1	1.1	2.1
Yellow Birch	+.1	-	++.1	+.1	-	-
Pin-Cherry	-	+.1	-	1.1	+.1	1.1
American Elm	-	++.1	-	++.1	-	-
White Birch	-	1.1	-	1.1	-	-
Quaking Aspen	-	1.1	-	2.1	-	-

Table 18.5. Continued

Species	Hydric (1) Forest A.S.	Hydric (1) ROW A.S.	Mesic (2) Forest A.S.	Mesic (2) ROW A.S.	Xeric (3) Forest A.S.	Xeric (3) ROW A.S.
Black Cherry	-	-	2.1	-	-	-
Hemlock	-	-	2.1	+.1	-	++.1
Beech	-	-	++.1	-	-	-
American Hornbeam	-	-	++.1	++.1	-	-
White Pine	-	-	-	+.1	+.1	1.1
White Ash	-	-	-	+.1	-	-
Red Oak	-	-	-	+.1	-	+.1
Gray Birch	-	-	-	-	1.1	1.1
Large-toothed Aspen	-	-	-	-	1.1	-
Serviceberry	-	-	++.1	-	-	-
No. Species	2	5	7	11	5	6
Herb Layer[1]						
Wild Lily-of-the-valley	4.3	1.3	5.4	3.3	-	-
Horsetail	3.1	3.1	-	-	-	-
Sensitive Fern	4.3	4.2	-	2.3	-	-
Lady-Fern	2.2	2.2	-	-	-	-
Cinnamon-Fern	1.2	1.2	4.2	1.2	-	-
Hypnum imponens	2.2	1.2	-	-	-	-
Common Fern Moss	1.2	-	-	+.2	-	-
Sedge	-	4.4	-	1.3	-	-
St. John's-wort	-	3.2	-	-	+.1	-
Royal Fern	-	+.2	-	++.2	-	-
Rush	-	2.2	-	-	-	-
Strawberry	-	2.2	-	-	1.2	-
Dandelion	-	++.1	-	-	-	-
Joe-Pye-weed	-	1.2	-	-	-	-
Boneset	-	1.1	-	-	-	-
Goldenrod	-	2.3	-	1.2	-	1.1
Aster	-	2.3	-	2.2	-	-
Bugle-weed	-	+.1	-	-	-	-
Ground-Pine	-	-	2.4	-	-	1.3
Shining Club-Moss	-	-	1.1	-	-	-
Tree Club-Moss	-	-	3.1	-	-	-
Bluebead-Lily	-	-	3.2	1.2	-	-
Painted Trillium	-	-	1.1	-	-	-
Goldthread	-	-	+.3	-	-	-
Marginal Shield-Fern		-	+.2	-	-	-
Bracken	-	-	++.2	3.4	-	2.1
Wild Sarsaparilla	-	-	+.1	-	-	-
New York Fern	-	-	1.2	2.3	-	-
Star-flowered Solomon's Seal	-	-	-	++.1	-	-
Wild-oats	-	-	-	1.3	-	-
False Spikenard	-	-	-	++.1	-	-

Table 18.5. Continued

Species	Hydric (1)		Mesic (2)		Xeric (3)	
	Forest A.S.	ROW A.S.	Forest A.S.	ROW A.S.	Forest A.S.	ROW A.S.
Milkweed	-	-	-	++.1	-	-
Interrupted Fern	-	-	-	1.2	-	-
Hair-cap Moss	-	-	-	-	2.4	3.4
Reindeer Lichen	-	-	-	-	2.3	2.2
Poverty-Grass	-	-	-	-	1.2	2.2
Mixed Grass	-	1.2	-	2.3	2.4	2.3
Hawkweed	-	-	-	-	1.2	-
Sheep-Sorrel	-	-	-	-	1.2	-
Field Cat's-foot	-	-	-	-	-	(+.2)
Spreading Dogbane	-	-	-	-	-	++.1
Stemless Lady's-slipper	-	-	-	-	-	+.2
No. Species	7	18	12	17	8	10
Total No. Species						
Trees[2]	4	5	8	11	7	6
Shrubs	6	10	2	6	3	7
Herbs	7	18	12	17	8	10
Totals	17	33	22	34	18	23

1 For simplicity, herbs include all species of the layer.

2 Those trees which occurred both in the tree and shrub layers were considered as one in determining the total number of species.

Table 18.6. Characteristic species with abundance and sociability ratings (A.S.) in the shrub and herb layers of the adjacent forest which did not occur on the ROW.

Species	Forest A.S.	ROW A.S.
Hydric (1)		
Shrubs		
Choke-Cherry	+.1	-
Herbs[1]		
Common Fern Moss	1.2	-
No. Species	2	
Mesic (2)		
Shrubs		
Alternate-leaved Dogwood	++.1	-
Herbs		
Ground-Pine	2.4	-
Shining Club-moss	1.1	-
Tree Club-moss	3.1	-
Painted Trillium	1.1	-
Goldthread	+.3	-
Marginal Shield-Fern	+.2	-
Wild Sarsaparilla	+.1	-
No. Species	8	
Xeric (3)		
Shrubs		
	-	-
Herbs		
St. John's-wort	+.1	-
Strawberry	1.2	-
Hawkweed	1.2	-
Sheep-Sorrel	1.2	-
No. Species	4	

[1] For simplicity, herbs include all species of the herb layer.

Table 18.7. Characteristic species with abundance and sociability ratings (A.S.) in the shrub and herb layers of the ROW which were not in the adjacent forest.

Species	ROW A.S.	Forest A.S.
Hydric (1)		
Shrubs		
Raspberry	1.1	-
Spiraea spp.	2.3	-
Blackberry	+.2	-
Black Chokeberry	1.1	-
Common Alder	+.1	-
Herbs[1]		
Sedge	4.4	-
St. John's-wort	3.2	-
Royal Fern	+.2	-
Rush	2.2	-
Strawberry	2.2	-
Dandelion	++.1	-
Joe-Pye-weed	1.2	-
Boneset	1.1	-
Goldenrod	2.3	-
Aster	2.3	-
Bugle-weed	+.1	-
Mixed Grass	1.2	-
No. Species	17	
Mesic (2)		
Shrubs		
Willow	+.1	-
Wild-raisin	++.1	-
Winterberry	+.1	-
Spiraea spp.	+.2	-
Blackberry	4.3	-
Herbs		
Sensitive Fern	2.3	-
Common Fern Moss	+.2	-
Sedge	1.3	-
Royal Fern	++.2	-
Goldenrod	1.2	-

Table 18.7. Continued

Species	ROW A.S.	Forest A.S.
Aster	2.2	-
Star-flowered Solomon's Seal	++.1	-
Wild-oats	1.3	-
False Spikenard	++.1	-
Milkweed	++.1	-
Interrupted Fern	1.2	-
Mixed Grass	2.3	-
No. Species	17	
Xeric (3)		
Shrubs		
Wild-raisin	++.1	-
Mountain-Holly	+.3	-
Teaberry	(1.3)	-
Hawthorn	++.1	-
Herbs		
Goldenrod	1.1	-
Ground-Pine	1.3	-
Bracken	2.1	-
Field Cat's-foot	(+.2)	-
Spreading Dogbane	++.1	-
Stemless Lady's-slipper	+.2	-
No. Species	10	

[1] For simplicity, herbs include all species of the herb layer.

Table 18.8. Major vegetational types for the Moses to Plattsburg study area based on percent of study plots occupied by each plant community and other components on the ROW.

Community	Site Classification		
	Hydric (1)	Mesic (2)	Xeric (3)
	Percent of Total Area		
Sedge-Spiraea-Mixed Grass-Herb	96.81		
Winterberry	1.23		
Black Chokeberry	.65		
Chokeberry-White Birch	.65		
Willow	.36		
Red Maple	.14	.08	
Common Alder	.08		
Wild-raisin	.08		
Rubus-Mixed Fern-Mixed Grass-Herb		99.50	
Quaking Aspen		.28	
Winterberry		.14	
Hair-cap Moss-Rubus-Mixed Grass-Herb			78.62
Hair-cap Moss-Mixed Grass-Herb			9.66
Spiraea-Blackberry-Mixed Grass-Herb			6.32
Hair-cap Moss-Blueberry-Mixed Grass-Herb			2.98
Spiraea			.85
Mountain-Holly			.85
Spiraea-Mixed Herb			.50
Spiraea-Blackberry-Hair-cap Moss-Mixed Grass-Herb			.22
Total	100.00	100.00	100.00

Table 18.9. Birds observed and/or heard on the ROW and on the ROW edge during the study period.

Species	Species
Canada goose	Black-capped chickadee
Ruby-throated hummingbird	Catbird
Downy woodpecker	Eastern Bluebird
Hairy woodpecker	Robin
Pileated woodpecker	Brown-headed cowbird
Yellow-shafted flicker	Red-winged blackbird
Eastern kingbird	Chipping sparrow
Eastern wood pewee	Field sparrow
Barn swallow	White-throated sparrow
Blue jay	Rufus-sided towhee
Common crow	

Table 18.10. Potential wildlife use of plant species[1] present on the ROW and adjacent woods for the major game species on the Moses to Plattsburg study area.

Species	Wildlife Species		
	Pheasant	Hare	Partridge
Trees			
White Birch		**	
Large-toothed Aspen		**	
Black Oak	*		
Pin-Cherry	*	+	
White Pine		+	
Shrubs			
Alder		*	
Willow		***	
Blackberry	***		
Raspberry	***		
Herbs[2]			
Ferns		**	*
Dandelion		*	
Grasses		***	***
Sedge	+		
Strawberry	+		

1 Those plants not included in this table provide a certain amount of cover (Table 18.5) for the 3 major game species, and may also provide seasonal food value, specific information pertaining to which is not now available. This applies also with regard to non-game species.

2 For simplicity, herbs include all species of the herb layer.

Table 18.11. Comparison of land use near the time of and after construction of the ROW.[1]

	Land Use	Percent of Total Area Near the Time of (-) and After (*) Construction 0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
(A)	Agriculture	-------------------------------47.7 ******************26.6
(C,I)	Commercial & Industrial	
(F)	Forest Land	-------------------------------47.0 ***67.7
(E)	Extractive Industry	*.2
(N)	Non-productive	-.7 *.7
(OR)	Outdoor Recreation	
(P)	Public & Semi-public	*.2
(W)	Water Resources	----4.6 ****4.6
(U)	Urban Inactive	
(T)	Transportation	
(R)	Residential	

[1] Source: Franklin Co., Real Property Tax Services, Malone, N.Y., air photo No. FCCLT-3-107, May 24, 1972
Franklin County, air photo, May 1958

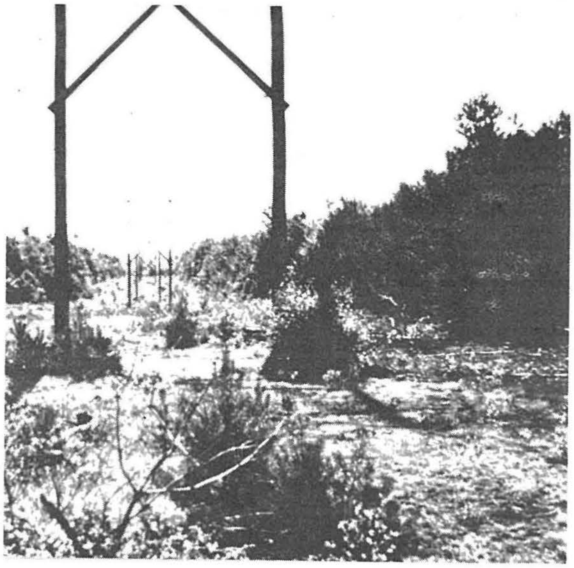


FIG. 18.1.1. General view of the ROW and adjacent forest, looking southeast, in the summer, 1975 (Photo Station 1).

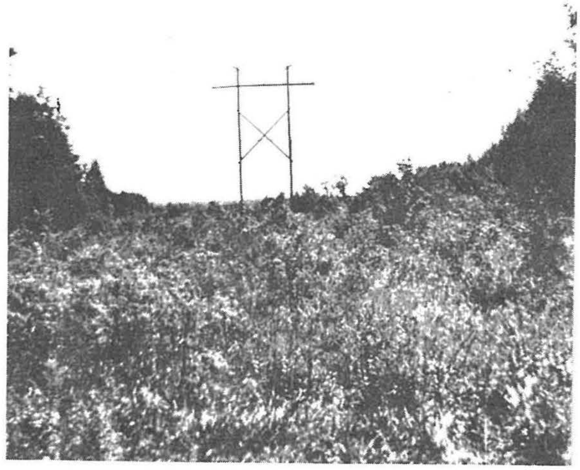


FIG. 18.1.2. General view of the ROW and adjacent forest, looking southeast, in summer, 1975 (Photo Station 9).

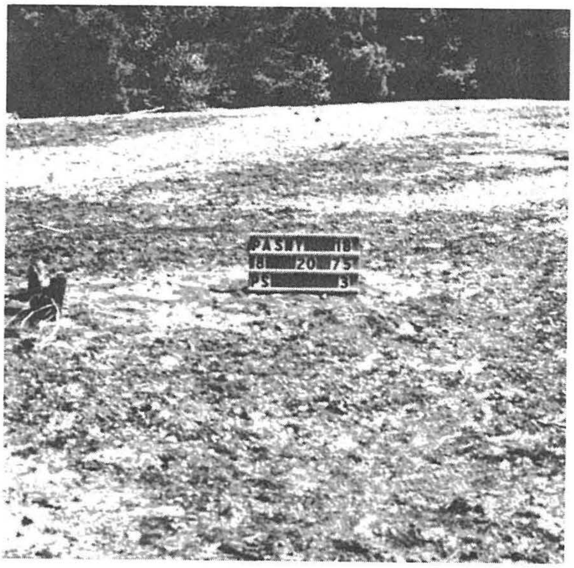


FIG. 18.1.3. Slight sheet erosion on open sandy soil on ROW, in summer, 1975 (Photo Station 3).

FIG. 18.1.4. Mountain-holly, a desirable shrub, on ROW, in summer of 1975 (Photo Station 6).

FIG. 18.1.5. Painted trillium off ROW, in spring of 1976.

FIG. 18.1.6. Active woodchuck burrow on ROW, in spring of 1976.

FIG. 18.1. Visual characteristics

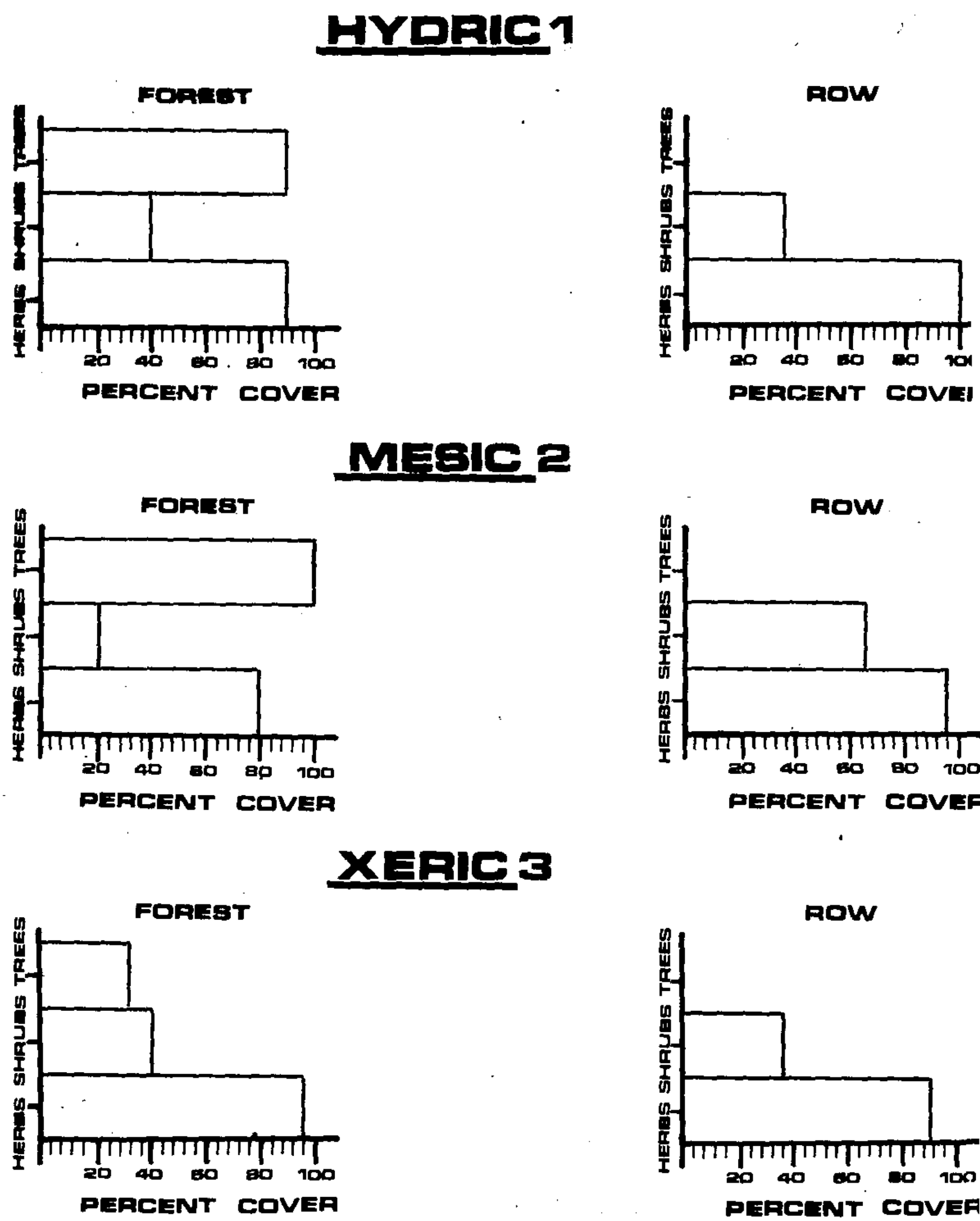


Fig. 18.2. Changes in cover value of tree, shrub, and herb layers from forest to ROW.

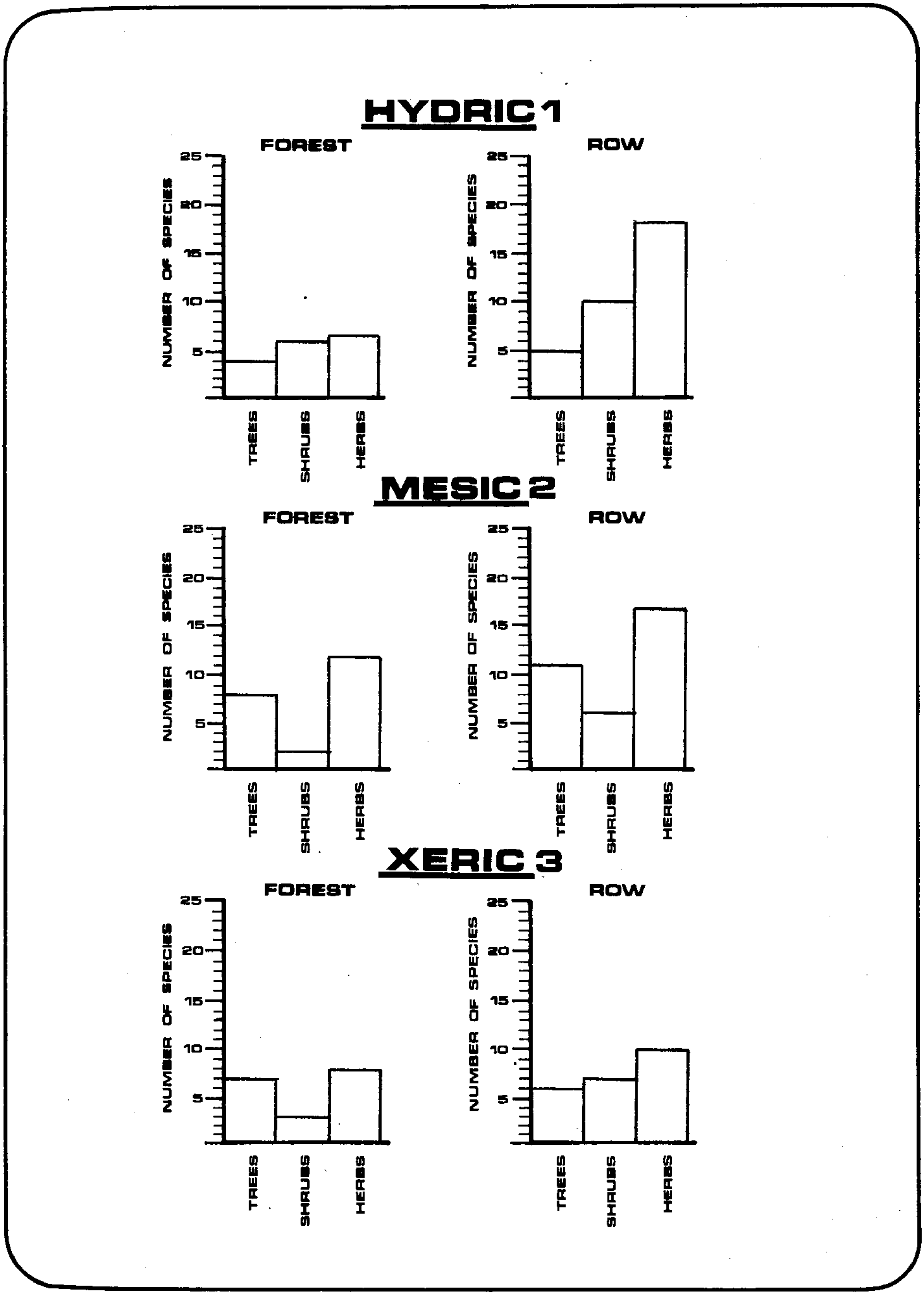


Fig. 18.3. Species diversity in the forest and on the ROW.

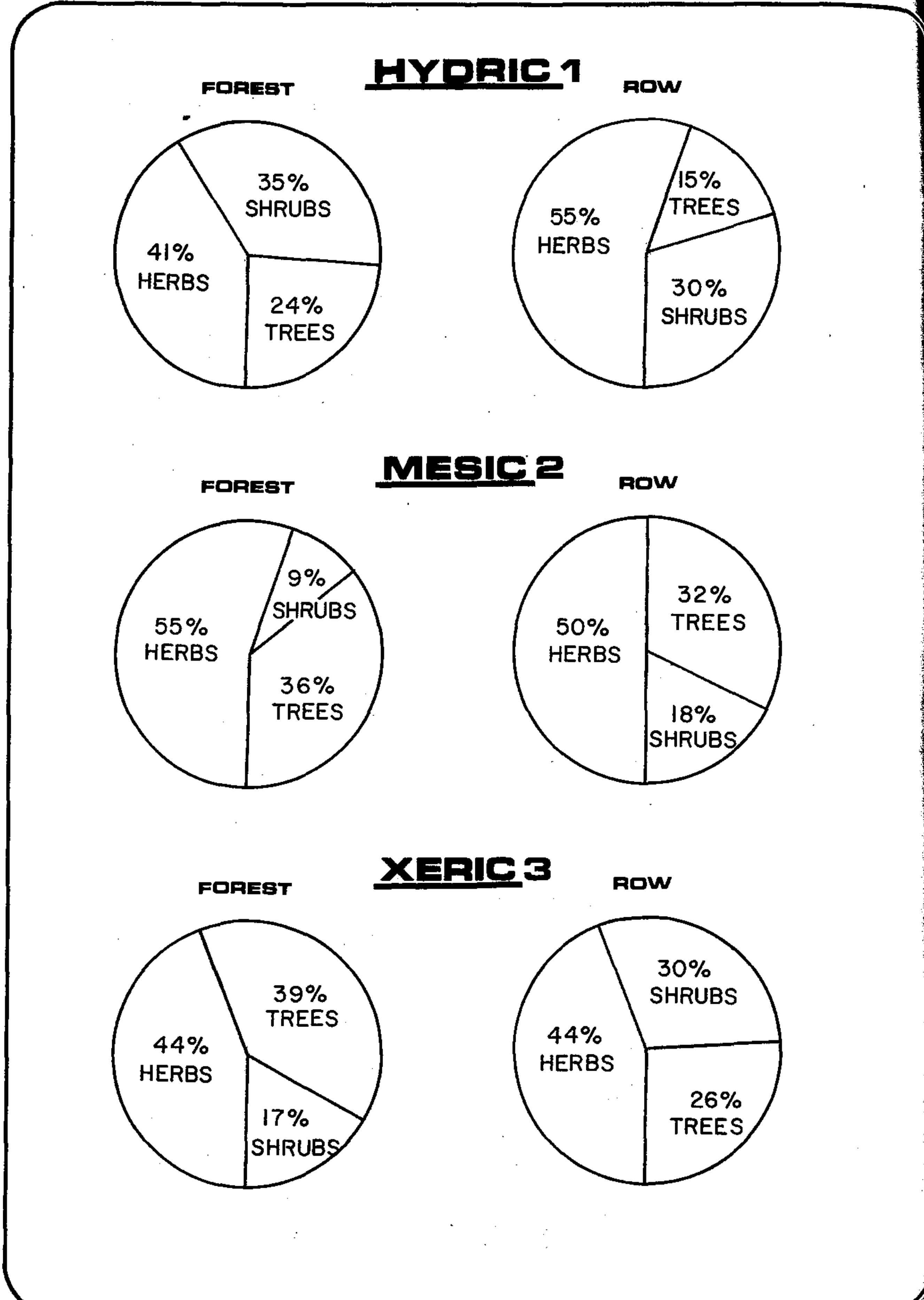


Fig. 18.4. Life form spectrum of the ROW as compared to the adjacent forest to compare species make-up of each, based on the number of species in each life form expressed as a percent of total species.

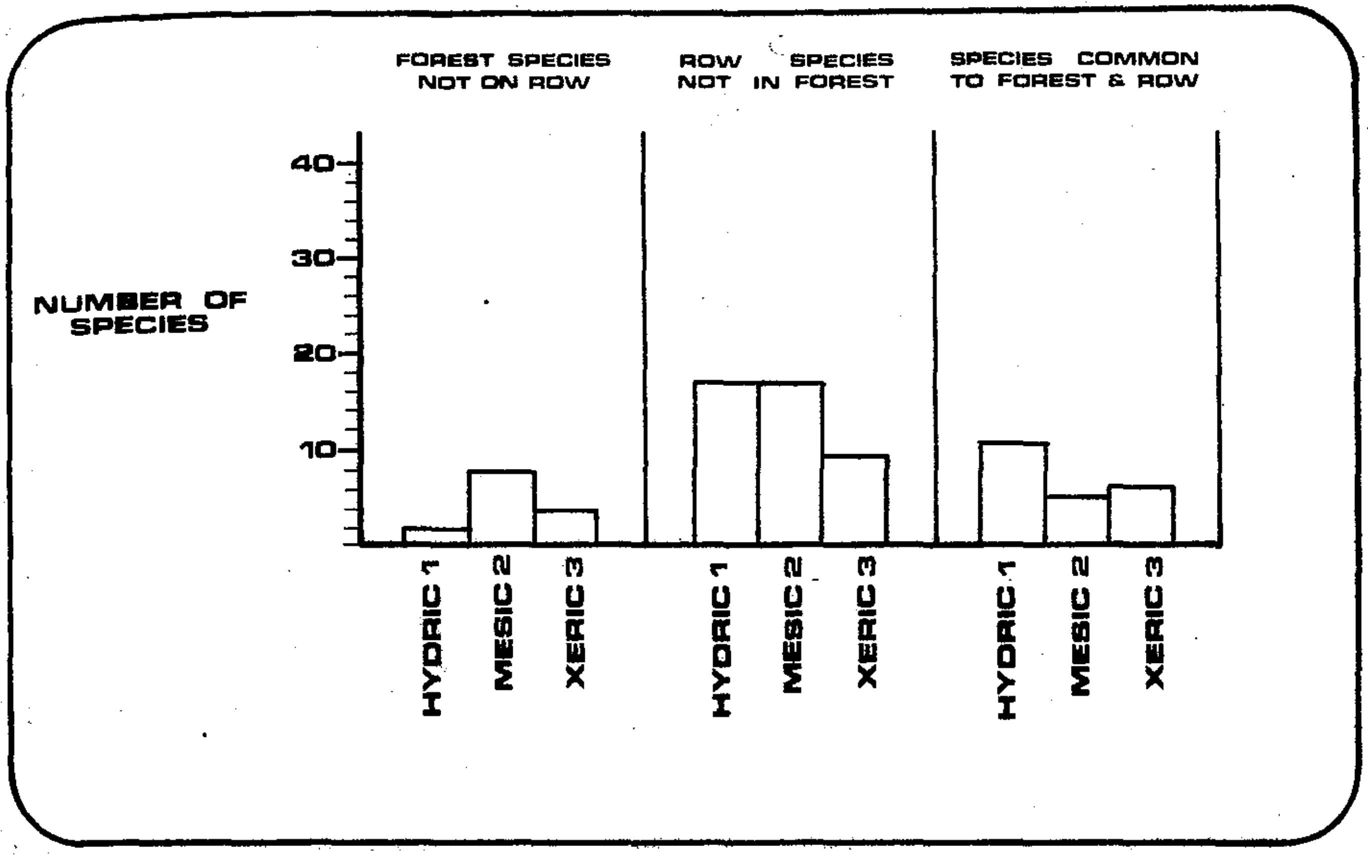
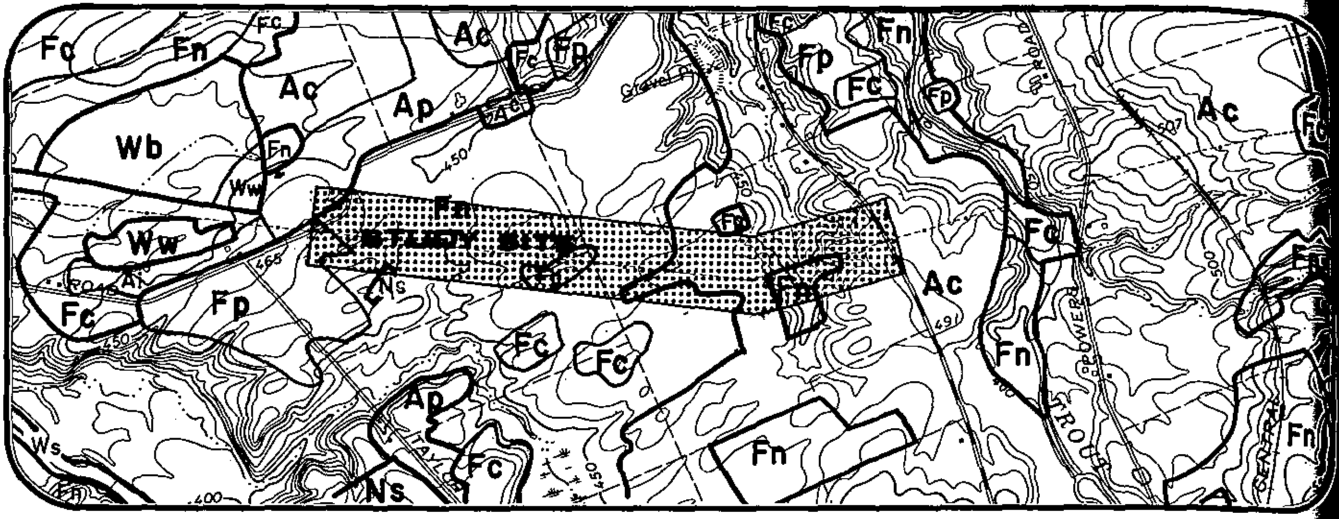
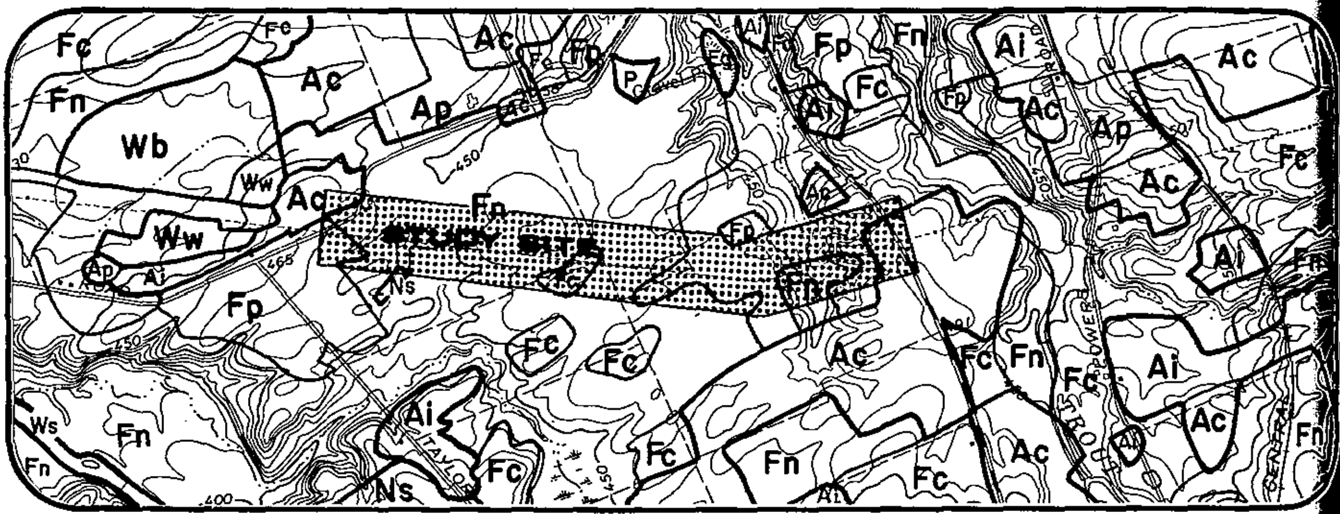


Fig. 18.5. Comparison of shrub and herb species in the forest and on the ROW.



LAND USE PRIOR TO ROW CONSTRUCTION SCALE 1"-2000



LAND USE AFTER CONSTRUTION OF ROW SCALE 1"-2000

LEGEND FOR LAND USE SYMBOLS

AGRICULTURE
- Ac - Cropland and cropland pasture
- Ai - Inactive agricultural land
- Ap - Pasture

EXTRACTIVE INDUSTRY LAND USE
- Eg - Sand and gravel pits

FOREST LAND
- Fc - Forest brushland
- Fn - Forest lands
- Fp - Plantations

NON-PRODUCTIVE LAND
- Ns - Sand

PUBLIC AND SEMI-PUBLIC LAND USES
- P - Public and semi-public land uses

WATER RESOURCES
- Wb - Marshes, shrub wetlands and bogs
- Ws - Streams and rivers
- Ww - Wooded wetlands

SOURCES:
- Franklin Co., Real Property Tax Services, Malone, N.Y., air photo No. FCCLT-3-107, May 25, 1972
- Franklin County, air photo, May 1958
- Area Land Use Map LUNR, Cornell University, N.Y., 1974
- U. S. G. S. Topographic Map, Constable, N. Y. - Que., 1964

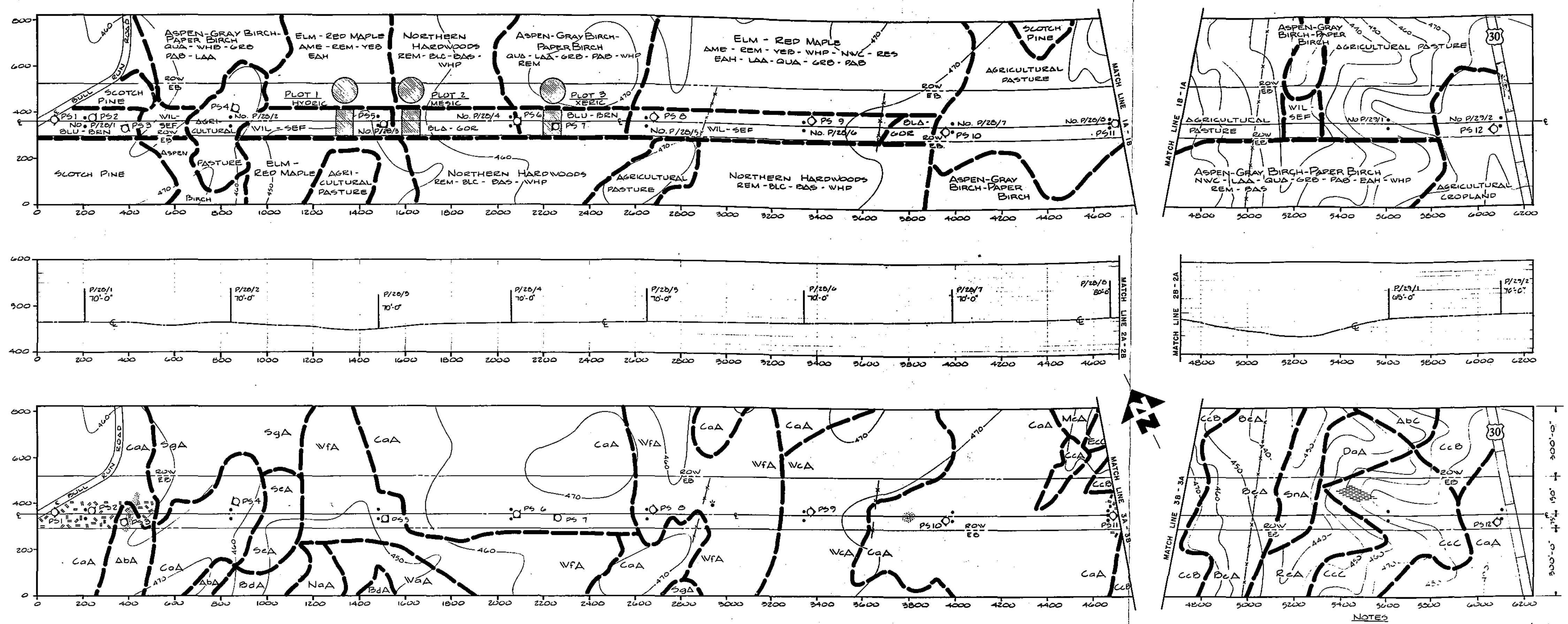
Fig. 18.6. Land use change.

ASPLUNDH ENVIRONMENTAL SERVICES

VEGETATION

CENTERLINE PROFILE

SOILS



NOTES
(1) CONTOUR INTERVALS ARE 10'-0"
(2) VERTICAL AND HORIZONTAL SCALES ARE IN FEET

LEGEND

WORKS AND STRUCTURES

- HIGHWAYS AND ROADS
- HEAVY DUTY
- MEDIUM DUTY
- LIGHT DUTY
- ACCESS ROAD
- UNIMPROVED DIRT ROAD
- NATIONAL INTERSTATE
- U.S. ROUTE
- STATE OR COUNTY
- SINGLE TRACK RAILROAD
- MULTIPLE TRACK RAILROAD
- ABANDONED RAILROAD TRACK
- RAILROAD OVER
- RAILROAD UNDER
- FORD
- ROAD CROSSING
- BUILDING
- EXCAVATION
- MINE DUMP
- PIPELINE
- TRANSMISSION STRUCTURES
- DAMS
- CULVERT
- TANKS
- WELLS
- BRUSH AND LOG DISPOSAL SITES
- SMALL PARKS, CEMETERY, ETC. (cem)
- FENCE

BOUNDARIES

- NATIONAL OR STATE
- COUNTY
- MINOR CIVIL DIVISION
- RESERVATION, NATIONAL OR STATE
- LAND GRANT
- ROW PROPERTY BOUNDARY (ROW PB)
- ROW EASEMENT BOUNDARY (ROW EB)
- ROW CLEARING EDGING (ROW CE)
- SITE BOUNDARY
- THE CENTERLINE OF STRUCTURE
- VEGETATION OR SOIL BOUNDARY

SITE MARKERS

- SAMPLE LOCATION
- PHOTO STATIONS
- MAPPED PLOT ON ROW
- MAPPED PLOT OFF ROW

WATER SYMBOLS

- PERENNIAL STREAMS
- INTERMITTENT STREAMS
- SMALL RAPIDS
- LARGE RAPIDS
- DISAPPEARING STREAM
- CANALS AND DITCHES
- PERENNIAL LAKES AND PONDS
- INTERMITTENT LAKES AND PONDS
- SPRING
- MARSH, SWAMP OR WET MEADOW
- WET SPOT
- ALLUVIAL FAN

TOPOGRAPHIC RELIEF

- CONTOUR
- DEPRESSION CONTOUR

SOIL SYMBOL AND NAME

AbA	ADAMS - COLTON loamy fine sand (0 to 8%)
AbC	ADAMS - COLTON loamy fine sand (15 to 25%)
BdA	BIRDSALL loam (0 to 8% slope)
BeA	BRAYTON stony loam (0 to 8% slope)
CaA	COLTON - CONSTABLE grav. loamy sand (0 to 8%)
CcA	COLTON - CONSTABLE gravelly and cobbly loamy sand (0 to 25% slope)
CcB	COLTON - CONSTABLE gravelly and cobbly loamy sand (0 to 25% slope)
CcC	COLTON - CONSTABLE gravelly and cobbly loamy sand (0 to 25% slope)
DaA	DUANE sandy loam (0 to 8% slope)
EcC	EMPEYVILLE - MOIRA stony very fine sandy loam (15 to 25% slope)
MeA	MOIRA stony loam (0 to 8% slope)
NaA	NICHOLVILLE fine sandy loam (0 to 8% slope)
SgA	SCARBORO loam, neutral variant (0 to 8% slope)
SeA	SCARBORO fine sandy loam (0 to 8% slope)
SnA	SUN very stony loam (0 to 8% slope)
WaA	WALLINGTON very fine sandy loam (0 to 8% slope)
WcA	WALPOLE sandy loam (0 to 8% slope)
WfA	WALPOLE sandy loam, neutral variant (0 to 8%)

SOIL SYMBOLS

- ROCK
- SAND
- SCATTERED ROCK
- BARE AND ERODING (GULLY)
- BARE AND ERODING (SHEET)
- BARE AND INCREASING IN SIZE
- BARE AND HEALING
- ERODED BUT HEALED
- CLAY AREA
- WIND EROSION

PLANT COMMUNITY SYMBOLS

shrubs

ALR	ALDER	Alnus spp.
ARR	ARROW - WOOD	Viburnum recognitum
BAR	BARBERRY	Berberis spp.
BLA	BLACKBERRY	Rubus spp.
BLH	BLACK - VIBURNUM	Viburnum prunifolium
BLU	BLUEBERRY	Vaccinium spp.
BUT	BUTTONBUSH	Cephalanthus occidentalis
CAY	AMERICAN YEW	Taxus canadensis
CFH	FLY - HONEYSUCKLE	Lonicera canadensis
CHC	CHOKE - CHERRY	Prunus virginiana
CLB	CLIMBING BITTERSWEET	Celastrus scandens
CRA	GRAPE	Vitis spp.
DEY	DEWBERRY	Rubus spp.
ELD	ELDERBERRY	Sambucus canadensis
GRD	GRAY DOGWOOD	Cornus racemosa
GRJ	GROUND - JUNIPER	Juniperus communis
HAA	COMMON ALDER	Alnus serrulata
HAW	HAWTHORN	Crataegus spp.
HAZ	HAZELNUT	Corylus spp.
HUC	HUCKLEBERRY	Gaylussacia spp.
JAR	MULTIFLORA ROSE	Rosa multiflora
MAV	MAPLE - LEAVED VIBURNUM	Viburnum acerifolium
MOH	MOUNTAIN - HOLLY	Nemopanthus mucronata
MOL	MOUNTAIN - LAUREL	Kalmia latifolia
MOM	MOUNTAIN - MAPLE	Acer spicatum
NAN	NANNYBERRY	Viburnum Lentago
NJT	NEW JERSEY TEA	Ceanothus americanus
PIF	PINXTER - FLOWER	Rhododendron nudiflorum
POI	POISON IVY	Rhus radicans
POS	POISON SUMAC	Rhus vernix
PRA	NORTHERN PRICKLY ASH	Xanthoxylum americanum
PRU	BUCKTHORN	Rhamnus spp.
RIB	RIBES	Ribes spp.
ROD	RED OSIER DOGWOOD	Cornus stolonifera
SMC	SUMAC	Rhus spp.
SPA	SPECKLED ALDER	Alnus rugosa
SPB	SPICEBUSH	Lindera Benzoin
SPI	SPIRAEA	Spiraea spp.
SMS	SMOOTH SUMAC	Rhus glabra
STM	STRIPED MAPLE	Acer pensylvanicum
STS	STAGHORN - SUMAC	Rhus typhina
SWF	SWEET - FERN	Comptonia peregrina
TAH	TARTARIAN HONEYSUCKLE	Lonicera tatarica
WIH	WITCH - HAZEL	Hamamelis virginiana
WIL	WILLOW	Salix spp.
WIN	WINTERBERRY	Ilex verticillata
WIR	WILD RAISIN	Viburnum cassinoides
ZBC	BLACK CHOKEBERRY	Pyrus melanocarpa

trees

ABU	BUTTERNUT	Juglans cinerea
AIL	TREE - OF - HEAVEN	Ailanthus altissima
ALD	ALTERNATE - LEAVED DOGWOOD	Cornus alternifolia
AMB	BEECH	Fagus grandifolia
AMC	CHESTNUT	Castanea dentata
AME	AMERICAN ELM	Ulmus americana
AMH	AMERICAN HORNBEAM	Carpinus caroliniana
APP	APPLE	Pyrus malus
BAF	BALSAM - FIR	Abies balsamea
BAS	BASSWOOD	Tilia americana
BIH	BITTERNUT HICKORY	Carya cordiformis
BLC	BLACK CHERRY	Prunus serotina
BLL	BLACK LOCUST	Robinia Pseudo-Acacia
BLW	BLACK WALNUT	Juglans nigra
CHO	CHESTNUT - OAK	Quercus prinus
COT	COTTONWOOD	Populus deltoides
EAH	HEMLOCK	Tsuga canadensis
ERC	RED CEDAR	Juniperus virginiana
FLD	FLOWERING DOGWOOD	Cornus florida
GRB	GRAY BIRCH	Betula populifolia
HOH	AMERICAN HOP-HORNBEAM	Ostrya virginiana
LAA	LARGE - TOOTHED ASPEN	Populus grandidentata
LAR	AMERICAN LARCH	Larix laricina
NWC	WHITE CEDAR	Thuja occidentalis
PAB	WHITE BIRCH	Betula papyrifera
PIC	PIN - CHERRY	Prunus pensylvanica
PIH	PIGNUT HICKORY	Carya glabra
PIP	PITCH - PINE	Pinus rigida
QUA	QUAKING ASPEN	Populus tremuloides
RED	RED OAK	Quercus rubra
REM	RED MAPLE	Acer rubrum
RES	RED SPRUCE	Picea rubens
SAS	WHITE SASSAFRAS	Sassafras albidum
SCO	SCRUB - OAK	Quercus ilicifolia
SCP	SCOTCH PINE	Pinus sylvestris
SHB	SERVICEBERRY	Amelanchier spp.
SHH	SHAGBARK - HICKORY	Carya ovata
SUM	SUGAR - MAPLE	Acer saccharum
SWB	SWEET BIRCH	Betula lenta
VIP	SCRUB - PINE	Pinus virginiana
WHA	WHITE ASH	Fraxinus americana
WHO	WHITE OAK	Quercus alba
WHP	WHITE PINE	Pinus strobus
YEB	YELLOW BIRCH	Betula lutea
YEP	TULIP - POPLAR	Liriodendron tulipifera

herbs

BLG	BLUE - JOINT GRASS	Calamagrostis canadensis
BON	BONESET	Eupatorium perfoliatum
BRN	BRACKEN	Pteridum aquilinum
BRO	BROOM - SEDGE	Artholophis virginicus
CAT	CAT-TAIL	Typha spp.
CHF	CHRISTMAS FERN	Polystichum acrostichoides
CIF	CINNAMON - FERN	Osmunda cinnamomea
DEG	DEERTONGUE GRASS	Panicum clandestinum
GOR	GOLDENROD	Solidago spp.
HAF	HAY - SCENTED FERN	Dennstaedtia punctilobula
HOT	HORSETAIL	Equisetum spp.
INF	INTERRUPTED FERN	Osmunda Claytoniana
IRS	IRIS	Iris spp.
JAP	SMALL JACK-IN-THE-PULPIT	Arisaema triphyllum
LET	WILD LETTUCE	Lactuca canadensis
MSF	MARGINAL SHIELD FERN	Dryopteris marginalis
NYF	NEW YORK FERN	Dryopteris noveboracensis
PEV	PEARLY EVERLASTING	Anaphalis margaritacea
PHR	PHRAGMITES	Pragmites spp.
POG	POVERTY - GRASS	Danthonia spicata
RDM	REINDEER LICHEN	Cladonia rangiferina
ROF	ROYAL FERN	Osmunda regalis
SEF	SENSITIVE FERN	Onoclea sensibilis
SPL	SPIKED LOOSESTRIFE	Lythrum Salicaria
SPM	SPHAGNUM MOSS	Sphagnum spp.
SSS	SOLOMON'S - SEAL	Polygonatum biflorum
SWA	SWAMP - BUTTERCUP	Ranunculus septentrionalis
WHS	WHITE SNAKEROOT	Eupatorium rugosum
YPL	BULLHEAD - LILY	Nuphar variegatum

REVISIONS :

DATA SOURCES :

ASPLUNDH ENVIRONMENTAL SERVICES
aes
BLAIR MILL ROAD
WILLOW GROVE, PA. 19090

P.A.S.N.Y. ENGINEERING PLAN AND PROFILE, MOSES - PLATTSBURG LINE, (NO DATE)

U.S.G.S. 7.5 MIN. TOPOGRAPHIC MAP, CONSTABLE, N.Y., 1964

U.S.G.S., S.C.S. IN COOPERATION WITH CORNELL UNIV. AGR. EXP. STA. SOIL SURVEY OF FRANKLIN COUNTY, N.Y. U.S.G.S., 1952 No 1

REAL PROPERTY TAX SERVICES, MALONE, N.Y. FRANKLIN CO. AIR PHOTO No. FCCLT-3-107 (SCALE 1:24,000) MAY 25, 1972.

SCALE: 1" = 200'-0"

200 100 0 100 200 400 800 1000

MAP 18.1

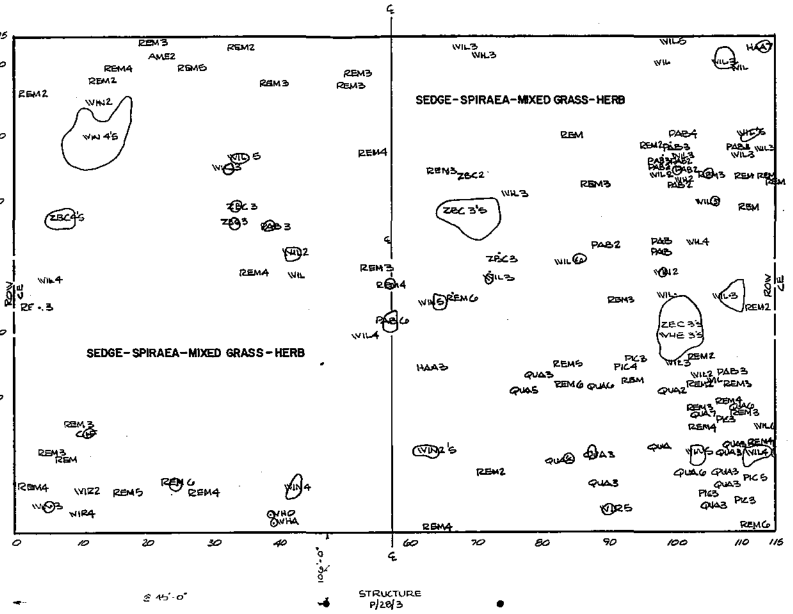
SITE 18 HABITAT CONDITIONS

UTILITY: POWER AUTHORITY - STATE OF N.Y.

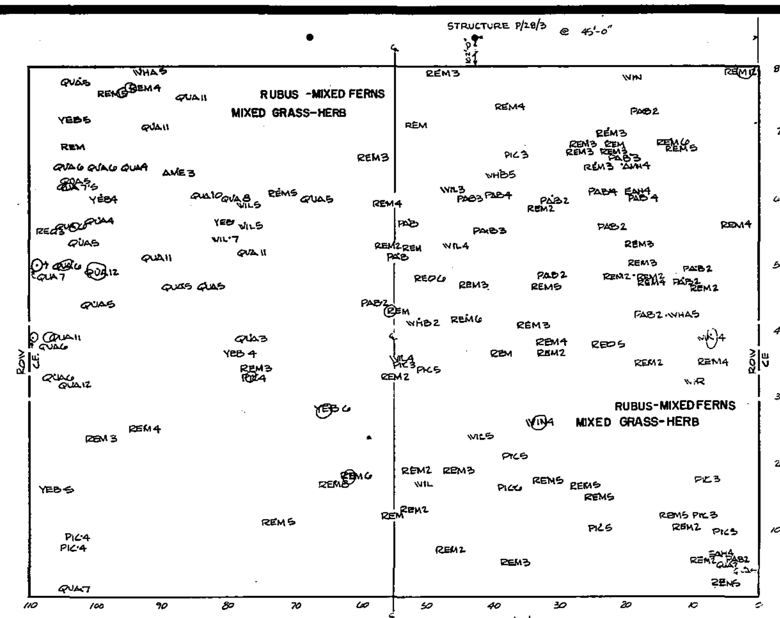
ROW DESCRIPTION: MOSES TO PLATTSBURG 230 KV

WOODEN POLE 'H' FRAME 225' ROW

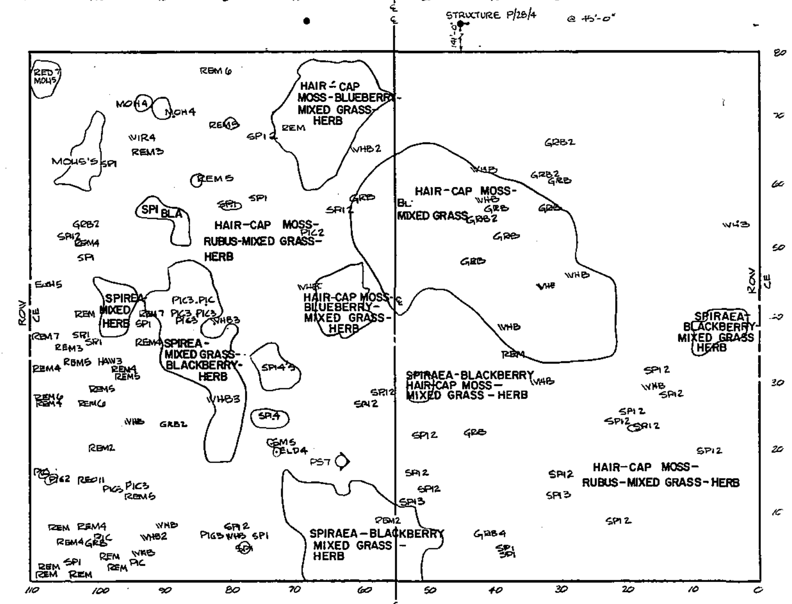
PLOT 1 HYDRIC



PLOT 2 MESIC



PLOT 3 XERIC



NOTES
- VERTICAL AND HORIZONTAL SCALES IN FEET

LEGEND

WORKS AND STRUCTURES
- ACCESS ROAD
- BRUSH AND LOG DISPOSAL SITES

BOUNDARIES
- THE CENTERLINE OF STRUCTURE
- ROW PROPERTY BOUNDARY
- ROW EASEMENT BOUNDARY
- EXISTING ROW CLEARING EDGE

SITE MARKERS
- SAMPLE LOCATION
- PHOTO STATION

WATER SYMBOLS
- PERENNIAL STREAMS
- INTERMITTENT STREAMS
- SMALL RAPIDS
- LARGE RAPIDS
- DISAPPEARING STREAM
- CANALS AND DITCHES
- PERENNIAL LAKES AND PONDS
- INTERMITTENT LAKES AND PONDS
- SPRING
- MARSH, SWAMP OR WET MEADOW
- WET SPOT
- ALLUVIAL FAN

SOIL SYMBOLS
- ROCK
- SCATTERED ROCK

PLANT COMMUNITY SYMBOLS

herbs

BLG	BLUE-JOINT GRASS	Calamagrostis canadensis
BON	BONESET	Eupatorium perfoliatum
BRN	BRACKEN	Pteridum aquilinum
BRO	BROOM-SEDGE	Artholophis virginicus
CAT	CAT-TAIL	Typha spp.
CHF	CHRISTMAS-FERN	Polystichum acrostichoides
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SPM	SPHAGNUM MOSS	Sphagnum spp.
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SWA	SWAMP-BUTTERCUP	Ranunculus septentrionalis
WHS	WHITE SNAKEROOT	Eupatorium rugosum
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HAZ	HAZELNUT	Corylus spp.
HUC	HUCKLEBERRY	Gaylussacia spp.
JAR	MULTIFLORA ROSE	Rosa multiflora
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NAN	NANNYBERRY	Viburnum Lentago
NJT	NEW JERSEY TEA	Ceanothus americanus
PIF	PINXTER-FLOWER	Rhododendron nudiflorum
POI	POISON IVY	Rhus radicans
POS	POISON SUMAC	Rhus vernix
PRA	NORTHERN PRICKLY ASH	Xanthoxylum americanum
PRU	BUCKTHORN	Rhamnus spp.
RIB	RIBES	Ribes spp.
ROD	RED OSIER DOGWOOD	Cornus stolonifera
SMC	SUMAC	Rhus spp.
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SPB	SPICEBUSH	Lindera Benzoin
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SMS	SMOOTH SUMAC	Rhus glabra
STM	STRIPED MAPLE	Acer pensylvanicum
STS	STAGHORN-SUMAC	Rhus typhina
SWF	SWEET-FERN	Comptonia peregrina
TAH	TARTARIAN HONEYSUCKLE	Lonicera tatarica
WIH	WITCH-HAZEL	Hamamelis virginiana
WIL	WILLOW	Salix spp.
WIN	WINTERBERRY	Ilex verticillata
WIR	WILD-RAISIN	Viburnum cassinoides
ZBC	BLACK CHOKEBERRY	Pyrus melanocarpa

trees

ABU	BUTTERNUT	Juglans cinerea
AIL	TREE-OF-HEAVEN	Ailanthus altissima
ALD	ALTERNATE-LEAVED DOGWOOD	Cornus alternifolia
AMB	BEECH	Fagus grandifolia
AMC	CHESTNUT	Castanea dentata
AME	AMERICAN ELM	Ulmus americana
AMH	AMERICAN HORNBEAM	Carpinus caroliniana
APP	APPLE	Pyrus malus
BAF	BALSAM-FIR	Abies balsamea
BAS	BASSWOOD	Tilia americana
BIH	BITTERNUT HICKORY	Carya cordiformis
BLC	BLACK CHERRY	Prunus serotina
BLL	BLACK LOCUST	Robinia Pseudo-Acacia
BLW	BLACK WALNUT	Juglans nigra
CHO	CHESTNUT-OAK	Quercus prinus
COT	COTTONWOOD	Populus deltoides
EAH	HEMLOCK	Tsuga canadensis
ERC	RED CEDAR	Juniperus virginiana
FLD	FLOWERING DOGWOOD	Cornus florida
GRB	GRAY BIRCH	Betula populifolia
HOH	AMERICAN HOP-HORNBEAM	Ostrya virginiana
LAA	LARGE-TOOTHED ASPEN	Populus grandidentata
LAR	AMERICAN LARCH	Larix laricina
NWC	WHITE CEDAR	Thuja occidentalis
PAB	WHITE BIRCH	Betula papyrifera
PIC	PIN-CHERRY	Prunus pensylvanica
PIH	PIGNUT HICKORY	Carya glabra
PIP	PITCH-PINE	Pinus rigida
QUA	QUAKING ASPEN	Populus tremuloides
RED	RED OAK	Quercus rubra
REM	RED MAPLE	Acer rubrum
RES	RED SPRUCE	Picea rubens
SAS	WHITE SASSAFRAS	Sassafras albidum
SCO	SCRUB-OAK	Quercus ilicifolia
SCP	SCOTCH PINE	Pinus sylvestris
SHB	SERVICEBERRY	Amelanchier spp.
SHH	SHAGBARK-HICKORY	Carya ovata
SUM	SUGAR-MAPLE	Acer saccharum
SWB	SWEET BIRCH	Betula lenta
VIP	SCRUB-PINE	Pinus virginiana
WHA	WHITE ASH	Fraxinus americana
WHO	WHITE OAK	Quercus alba
WHP	WHITE PINE	Pinus strobus
YEB	YELLOW BIRCH	Betula lutea
YEP	TULIP-POPLAR	Liriodendron tulipifera

REVISIONS :

DATA SOURCE : ASPLUNDH ENVIRONMENTAL SERVICES, BLAIR MILL ROAD, WILLOW GROVE, PA 19090

FIELD SURVEY - AES, 1978, 79

This information is a part of the ESEERCO "STUDY OF ENVIRONMENTAL AND ECONOMIC ASPECTS OF CONTEMPORANEOUS ELECTRIC TRANSMISSION LINE RIGHT-OF-WAY MANAGEMENT TECHNIQUES"

MAP 18.2

SITE 18

MAPPED PLOTS

UTILITY : POWER AUTHORITY - STATE OF N.Y.

ROW DESCRIPTION : MOSES TO PLATTSBURGH 230 K.V.

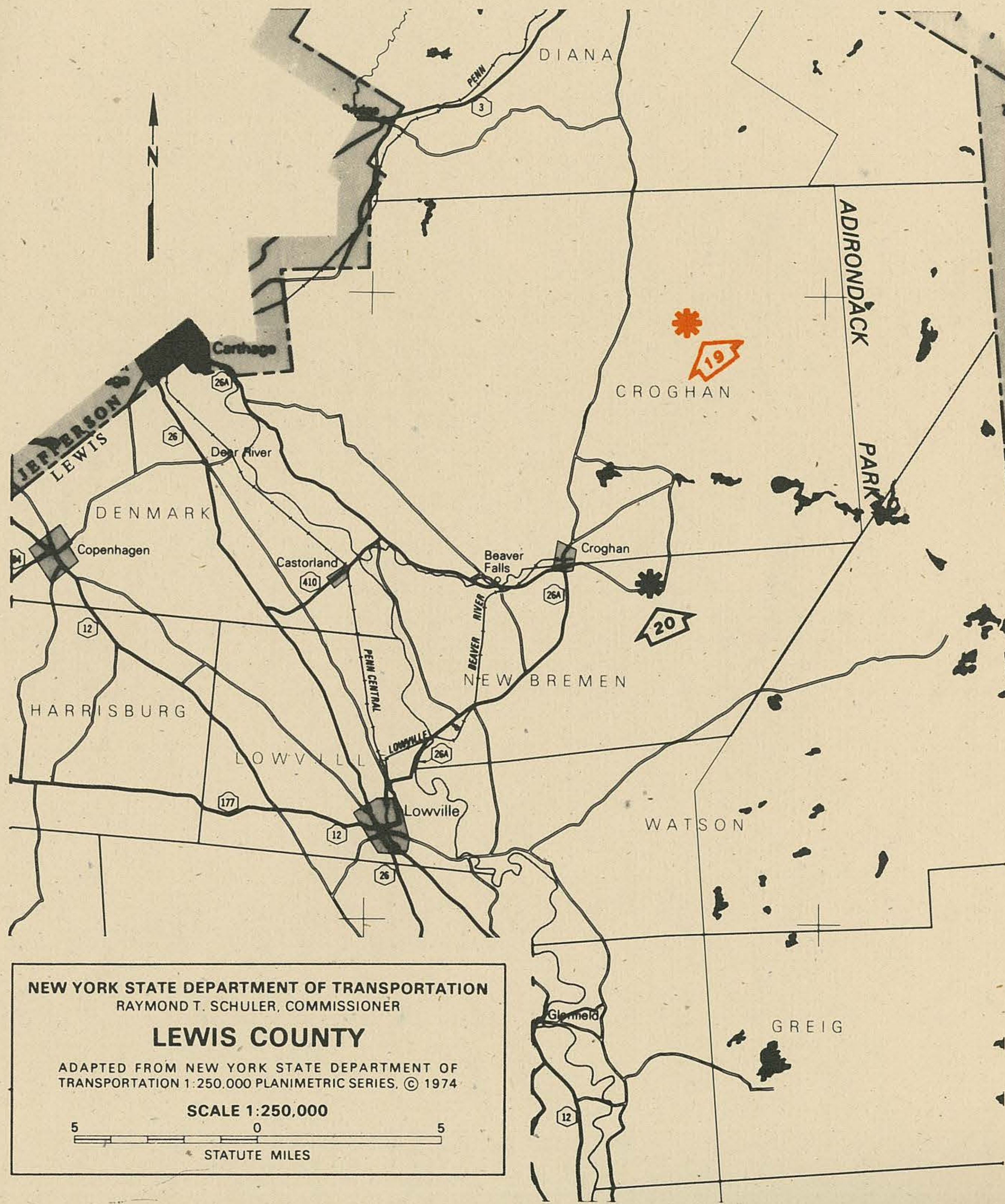
WOODEN POLE H FRAME 225' ROW

SCALE : 1" = 10' - 0"

10 5 0 5 10 20 40 50

SITE 19

MOSES to ADIRONDACK



Site 19 Moses to Adironack

Study area extends from structures 75/9W and 75/8E south of Carthage Reservoir Road to include structures 74/10W and 74/7E north of Carthage Reservoir Road. To reach the study area, proceed north from Lowville on 26A through Crogham, then on Belfort Road to Belfort. Then proceed through Belfort continuing NE on Long Pond Road to Bisha Road. Take Bisha Road north for approximately 3/4 mile to Carthage Reservoir Road and continue approximately 2 miles to the study area.

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Site 19 Moses to Adirondack

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Site 19 Moses to Adirondack

1 Introduction

Site 19 is located in the Adirondack Highlands physiographic area of New York (Cline, 1970) in the Spruce-Fir and Northern Hardwoods forest type area (Stout, 1958). The general landscape of the ROW and adjacent areas is shown in Figs. 19.1.1 and 19.1.2.

The topography of the area is typically rugged mountains surrounded by lesser mountains and rolling hills which are dissected by streams. Numerous lakes of glacial origin occur in the area (Stout, 1958).

Typical forest types of the region are Spruce-Fir and Nothern Hardwoods, White Pine and Northern Hardwoods, Northern Hardwoods, and Aspen-Gray Birch-White Birch (Stout, 1958). Located on the study area are Northern Hardwoods, Spruce-Fir, and Northern Hardwoods-Oak-Aspen forest types.

2 Location and Identification

Site 19 is approximately 3½ miles north of Belfort, in the town of Croghan Lewis County, New York 75° 18' 30" W. Longitude; 43° 59' 00" N. Latitude).

The site is on the Moses to Adirondack ROW which is operated by the Power Authority of the State of New York (PASNY). This 250-foot easement consists of 2 single circuit, 230 kV lines, each having wood pole H-frame structures. The project site is approximately 5,800 feet in length and extends from structure 75/8E and 75/9W south of Carthage Reservoir Road to include structures 74/7E and 74/10W north of the said road.

3 Background

The following discussion outlines documentable management techniques of clearing, construction, restoration, and maintenance regarding site 19, as received from PASNY (letter dated March 8, 1976, from John L. Osinski, the Power Authority of the State of New York, Massena, N.Y.; telephone conversations December 7 and 8, 1976, with John L. Osinski, PASNY, Massena, N.Y.). All available pertinent information and unit cost data are included under each operation of clearing, construction, restoration, and maintenance.

3.1 Clearing

The ROW was clear cut to a width of 250 feet. Brush and trees were cut, and all danger trees removed. All trees, brush, and debris cleared within the ROW were burned. No information is available for initial chemical treatment or cost of operations.

3.2 Construction

The Moses to Adirondack ROW, originally designated Massena to Taylorville, was built by the War Department in 1942.

3.3 Restoration

No information is available with regard to restoration.

3.4 Maintenance

Maintenance has been on an "as needed" basis. Prior to January, 1952, brush control had been accomplished by hand cutting. A cover type map of the area on the west circuit between structures 75/10 and 74/11 was made (November 24, 1951) as a basis for future maintenance. No cost information is available.

Selective basal spray using 2,4-Dichlorophenoxyacetic acid (2,4-D) and 2,4,5-Trichlorophenoxyacetic acid (2,4,5-T) in oil diluent, was used between October 24, 1951, and January, 1952, and completed by the contractor. The effectiveness of this treatment is reported in 2 follow-up inspections dated September 19, 1952, and July 20, 1953. No additional maintenance records were found for this study area until 1962.

Aerial foliar application using Invert 2,4,5-T was completed by August 24, 1962.

Broadcast foliar ground application using Tordon 101 was completed between June 7 and September 2, 1965.

Selective basal application of Tordon 155 and fuel oil was applied between June 7 and September 5, 1969.

Broadcast ground foliar application of Tordon 101 was completed between June 8 and September 3, 1971.

4 General Reconnaissance

A general reconnaissance was made in accordance with the methodology and is set forth in Map 19.1 which shows site habitat conditions. In this reconnaissance it was noted that the major vegetational types correlated with the soil types on the mesic and hydric habitats.

The existing visual character of the ROW is depicted during all seasons of the year, from important vantage points both on and off the ROW. These points are identified as photo stations and are located on Map 19.1 and described in Appendix 17. Specific reference is made to some of these photo stations throughout the report and illustrated in Fig. 19.1. With the exception of aerial photography used to identify land use, older photographs depicting the area are not available.

In the context of its location site 19 is not necessarily pleasing or objectionable to view and blends quite well with the surrounding landscape. The ROW opens up a vista through the forest, and the terrain and vegetation is interesting to view, certainly not unattractive. There are no distinct natural or man-made features within the area which may make the ROW sensitive to view. The ROW and structures are quite visible for some distance from Carthage Reservoir Road, but the site is in a very remote area and usually only viewed by members of a game club who use the area. For this reason the potential number of people viewing the ROW is very low especially since the site is located in a rural area of the peripheral adirondacks, and is not densely populated. The site is accessible through a series of dirt roads wandering though private hunting lands.

5 Field Studies - Results and Discussion

5.1 Soils

5.1.1 Geology and Soils

Site 19, Moses to Adirondack ROW, is located in Lewis County in the western foothills of the Adirondack Highlands (Cline 1970), termed the Adirondack

Upland region, Western Adirondack Hills subdivision by Thompson (1966), in the Black River and Oswegatchie River drainage basins. Bedrock geology is of Precambrian age, pre 1,100 to 570 million years ago, consisting predominantly of igneous and metamorphic rocks such as granite and granitic gneiss. Surficial geology is glacial drift deposited about 11,000 years ago during the most recent substage of the Wisconsin period of glaciation. Soils in this area have developed in both glacial till, a heterogeneous mixture of cobbles, gravel, sand, silt, and clay deposited directly by the ice sheet, and glaciofluvial outwash consisting of deep sands that were reworked by water following deposition by the glacier (Broughton et al., 1973; Pearson et al., 1960).

Soils on this site are classified in the order Spodosols, suborders Orthods (Adams, Croghan, and Glouchester series), reflecting leached surface horizons and accumulations of organic matter, iron, and aluminum in the subsurface horizons; and suborder Aquods (Saugatuck series), which has developed in wet areas (Soil Survey Staff, 1975). They were formerly classified in the Podzol great soil group. Soil series comprising the association on site 19 are Adams-Croghan-Saugatuck-Scarboro (Cline, 1970). Brief descriptions (Pearson et al., 1960) of soil types occurring on the ROW study site (Map 19.1; Table 19.1) are:

Adams loamy fine sand (AaA): These soils developed on glaciofluvial fine sands derived from granite, gneiss and syenite on nearly level to gently sloping terrain. Internal drainage is moderately good to good depending on occurrence of discontinuous cemented zones in the subsurface due to accumulations of iron and humus. Available water-holding capacity generally is low due to the coarse soil texture. Soil reaction is moderate to strongly acid, ranging from pH 4.0 to pH 5.5 throughout a typical profile; however, on this site it was pH 5.8 in the surface mineral soil. Adams loamy fine sand is assigned to Woodland Suitability Group 5s1, designating low productivity for timber (Class 5) and sandy soils (Subclass s) which impart low water-holding capacity and normally low availability of nutrient elements.

Croghan loamy fine sand (CoA): Croghan soils developed on deltaic sands derived from granite and gneiss on level to gently undulating depressional areas. These soils are somewhat poorly drained due to the presence of a high water table. They are similar to Adams soils except for mottling due to poor drainage in the subsoil. The soil is generally strongly acid, and was pH 4.6 in the surface 3 inches on this site. As with the Adams soil, Croghan is in Woodland Suitability Group 5s2, designating low productivity and sandy soil conditions.

Gloucester sandy loam (GkB and GoC): These soils formed on loose, stony glacial till composed mainly of gneiss and some granite and syenite, on rolling to steep slopes. Surface stones and rock outcrops are prominent. Internal drainage is good to excellent. The soil is moderate to strongly acid; it was pH 4.7 in the surface horizon on this site. Gloucester soils are in Woodland Suitability Group 4s5, indicating moderate productivity for woodland and coarse soil texture. Where there is a high stone content on the surface of some Gloucester soils, which may cause additional management limitations and restrictions, they are assigned to Woodland Suitability Group 4x4.

Rockland (ReC): This is a miscellaneous land type, not a soil series, that designated large outcrops of bare gneiss bedrock. Areas between and adjacent to the rocks are occupied by well-drained Gloucester soil. Tree growth on this land type is normally poor due to droughty conditions and shallow rooting depth.

Saugatuck loamy fine sand (SbA): This soil developed in glacio-lacustrine sands composed mainly of gneiss, and occurs mostly in low depressional areas between higher ridges of Adams and Croghan soils. Strongly cemented material, due to iron and humus accumulations, is present in places within 4 inches of the surface. Internal drainage is poor, with a high water table near the surface in the spring and at 24 to 36 inches in the summer. Mottling due to poor drainage occurs from 4 to 6 inches below the surface. It is a strongly acid soil, being pH 4.7 in the upper mineral horizon on this site. Saugatuck is assigned to Woodland Suitability Group 4w1, which is moderate for woodland production with management limitations related to poor drainage and high water table.

5.1.2 Humus Types

Organic layers present on the soil surface of the ROW and adjacent woodland were measured on 3 mesic upland locations. Average thickness of the organic layers and A1 horizon was based on 5 samples taken at each location (Table 19.2). The presence and thickness of these layers were used for humus type classification. The humus classification key is not adaptable to areas exhibiting prolonged water saturation in the surface soil; therefore, similar measurements were not made on the hydric site. There is no evidence of plowing, grazing, or recent fires on this site.

All organic layers (litter, fermentation, and humus) plus an A1 horizon (mixed mineral and organic) were present at each site on both the ROW and woodland. Based on thickness of the fermentation, humus, and A1 layers, the predominant humus type was designated a "thin duff mull with shallow to very shallow A1". Organic layers on the ROW were nearly equivalent to those in the woodland exept on 1 mesic site where thicker organic and A1 layers in the woodland resulted in a "thick duff mull with deep A1". Organic layers in the woods were composed primarily of tree parts (leaves, twigs, and fruit) in contrast to the leaves and stems of grasses, herbs, and shrubs on the ROW.

Based on these limited observations, it appears that ROW construction and periodic maintenance for brush control did not materially alter the thickness of surface organic layers of the soil. Elimination of the forest cover did result in a change in kind of organic material; however, regrowth and persistence of a mixed grass-herb-shrub cover has resulted in annual litter depositions and continuation of a protective organic layer.

5.1.3 Soil Erosion

Current Active Erosion Observations of active soil erosion on the ROW and adjacent woodland were made on the Moses to Adirondack study area in May, 1976. Except for the stream bed of flowing streams, no active erosion was evident in the woodland on all soils types and slopes, apparently due to the protective canopy of trees and shrubs and undisturbed organic layers present on the soil. Likewise, no active or recent erosion was observed on the general ROW, areas on which woody brush was controlled, but with little or no disturbance to the soil surface. Good vegetation cover, composed of grasses, herbs, and low shrubs, had developed on the general ROW following chemical treatments for brush control, and a protective litter mulch from these plant parts was present (Table 19.2).

Eroding areas were identified as to location on the ROW, soil type, average slope, and present plant cover (Table 19.3). Erosion was classified as to kind (sheet, rill, gully) and class (slight, moderate, severe); average depth of gullies was recorded and locations plotted on the site habitat conditions map (Map 19.1). Active erosion on the ROW was limited to areas that had been subjected to past and/or recent mechanical disturbance of the soil, i.e., access roads and borrow pit excavations to procure soil material used in recent tower construction in wet areas (Figs. 19.1.3 and 19.1.4) on this site (Table 19.3). Sediment resulting from erosion on the general ROW accumulated on lower slopes and did not leave the ROW via streams or collect in water impoundments. Erosion and sedimentation on stream banks and floodplains is discussed in the section on water quality.

There was no restoration in the form of seeding and planting following construction of this ROW; therefore, denuded areas are dependent on natural plant invasion. Some grass cover has developed on access roads; however, recent use by "off-the-road" vehicles has resulted in rutting which provides runoff channels and subsequent gully erosion on sloping segments of the road. Progressive sheet erosion on the 2 major excavated areas (Fig.19.1.4) apparently prevents natural plant invasion, since these areas generally were devoid of plant cover. There presently is 1 active sand borrow pit in Adams loamy sand soil on the ROW, presumably used by local residents. There were no areas of mass land movement such as landslides on this site.

5.2 Vegetation

5.2.1 Habitat and Forest Types on the Site

Mesic Habitat The mesic, or medium moist, hatitat (2) was located on the upper to lower slopes of a low rounded hill. Slope was approximately 5% on a north slope and up to 20% on a south-facing slope. Drainage was free but not excessive, except on a small rocky outcrop which approached xeric conditions. The forest type was a typical Northern Hardwoods with black cherry a dominant species and a few red spruce.

Hydric Habitat The hydric, or wet, habitat (1), was located in a stream bottom. Slope was negligible and aspect was flat. Drainage was impeded and swamp conditions have developed. The forest type was typical Spruce-Fir with sparse hemlock, yellow birch, gray birch, and red maple.

5.2.2 Analysis of Forest Types and Associated ROW Vegetation

General Changes in Vegetation. The primary impact of the ROW was to cause a change from a forest with a 4-layered structure to a shrub-herb-grass community. Obviously, removal of the trees caused this; and what was essentially a 2-layered ROW community developed, with the shrub layer consisting of shrubs and small trees not removed by maintenance spraying, or which have arisen since the last spray application (Fig. 19.2).

In order to more completely characterize the forest types, an analysis was made on the forest plots to derive importance values for tree species (Table 19.4). Obviously, balsam-fir and hemlock were important species on the hydric plot, and black cherry, red maple, sugar-maple, yellow birch, and red spruce were important species on the mesic plot.

On the hydric habitat, a Spruce-Fir forest type was changed to a Willow-Sensitive Fern plant community with cat-tail prominent. On the mesic habitat, a Northern Hardwoods forest type was changed to a Blackberry-Goldenrod plant community (Map 19.1; Table 19.5).

Quantitative Changes No major increase in the number of shrub species on hydric and mesic habitats was apparent on the ROW as compared with the adjacent forest (Table 19.5; Figs. 19.3 and 19.4). On the hydric habitat, there was a marked increase in the number of herb species on the ROW, 15 species in the forest as compared to 24 on the ROW. On the mesic habitat, there were about the same number of total species on the ROW, 22, as compared to 24 in the forest (Table 19.5).

Qualitative Changes On the hydric habitat, 15 shrubs and herb species occurred both in the forest and on the ROW (Fig. 19.5), while 3 shrubs appeared in the forest but were absent from the ROW (Table 19.6). On the other hand, 3 shrubs, spiraea, black chokeberry, and blackberry, occurred on the ROW but not in the forest (Table 19.7). In the herb layer on the hydric habitat, 5 species occurred in the forest but not on the ROW; 13 species appeared on the ROW but not in the forest (Tables 19.6 and 19.7). The important alder was very sparse on the ROW as compared to its presence as a prominent shrub in the forest (Table 19.5).

On the mesic habitat, 3 shrub species occurred in the forest and not on the ROW (Table 19.6). Spiraea occurred only on the ROW (Table 19.7); blackberry was more abundant and grew in large patches on the ROW while in the forest it grew in small patches (Table 19.5). However, in the herb layer on the mesic habitat, 9 forest species did not occur on the ROW (Table 19.6). On the other hand, such plants of the open field as aster, goldenrod, and haircap moss, were prominent on the ROW (Table 19.7). Bracken was sparse in the forest on the mesic habitat, but covered ¼ to ½ of the area on the ROW. Troutlily covered ½ to 3/4 of the ROW area but was sparse in the forest (Table 19.5).

5.2.3 Analysis of Plant Communities for On-ROW Mapped Vegetation Plots

Table 19.8 presents a breakdown of major vegetational communities (Map 19.2) for hydric and mesic plots on the Moses to Adirondack ROW. Much of the present composition of herbaceous and woody plant communities reflects the spraying history. The last 2 herbicide treatments on this line area were selective spraying, the 1969, a basal application of Tordon 155, and the 1971, a foliar application of Tordon 101. Target vegetation was primarily woody plants, particularly tree seedlings and saplings. Earlier herbicide treatments were broadcast foliage sprayings using phenoxies or Tordon 101. These sprayings covered all vegetation and eliminated many woody plants as well as broadleaf herbs.

Blackberry is a dominant plant on the mesic sites, occurring as Blackberry communities or in mixtures with bracken, mixed grasses, and various broadleaf herbs. On hydric sites, Sphagnum, sedges, and various grasses, plants moderately resistant to herbicide treatment, now dominate the vegetation.

Herbaceous perennials present on the ROW area that do not occur in the understory of the adjacent woods include goldenrods, asters, St. John's-wort, and ox-eye-daisy. These are plants which have invaded the line area due to the open conditions afforded by line clearing.

Sphagnum and Hair-cap Moss communities are not affected by herbicides, and the change from broadcast to selective spraying apparently has not directly affected these communities. Both of these mosses occurred to a limited extent on the forest floor before ROW clearing. Hair-cap moss is a primary invader of open soil, covering exposed areas quickly when they are not subjected to compaction from vehicles or foot travel. On mesic sites Hair-cap Moss communities are gradually displaced by other herbaceous plants. On the wettest parts of the hydric sites, however, both Sphagnum and hair-cap moss are expected to continue to dominate, since they outgrow and crowd out invading vegetation.

Spiraeas, both meadow-sweet and hardhack, are abundant shrubs on the ROW, and do not occur in the understory of the adjacent woods. These aesthetically desirable shrubs have seeded-in due to the open conditions, and if not removed from the vegetation complex during herbicide treatment, are expected to spread rapidly both by natural seeding and by underground root extension.

5.2.4 Comparison of Forest Type with ROW Vegetation

The ROW was clear cut in 1942 and maintained by chemical sprays. In 1951 the line was treated basally with 2,4-D and 2,4,5-T in oil. The second maintenance treatment was an aerial foliar application of 2,4,5-T in August, 1962; the third treatment was a ground foliar application of Tordon 101 in September, 1965; the fourth treatment was a basal application of Tordon 155 and fuel oil in June, 1969; and the fifth chemical treatment was a ground foliar application of Tordon 101 in September, 1971.

The general impact of the above treatments of the ROW was to change the forest types (Spruce-Fir, Northern Hardwoods-Oak-Aspen, and Northern Hardwoods) to shrub-herb-grass communities. Some shrubs of the forest were replaced by plants favored by open conditions.

On the mesic habitat, which was formerly occupied by a Northern Hardwoods forest type, a Blackberry-Goldenrod community was produced. There was no significant change in total number of shrub and herb species on the ROW as compared with the forest. There was a qualitative difference in shrub and herb species on the ROW as compared to the forest, with some shrubs of the forest not on the ROW and several important shrubs of the ROW lacking or sparse, in the forest. The same was true for herbs; some herbs of the forest were not on the ROW, while some herbs of the ROW were not in the forest (Table 19.5).

On the hydric habitat, formerly occupied by a Spruce-Fir forest type, a Willow-Sensitive Fern community was produced. There was a significant increase in the number of species on the ROW as compared to the adjacent forest. There was a qualitative difference in the species of shrubs and herbs on the ROW as compared to the forest. While most species of the forest did also occur on the ROW, some forest species were replaced by species favored by open conditions (Table 19.5).

5.2.5 Changes in ROW Vegetation from 1951 to 1976

In 1951, PASNY prepared a cover type map of the area on the west circuit, between structures 75/10 and 74/11. In 1976, a general reconnaissance was made of the area, and as a part thereof, the section from structure 75/9 to structure 75/1 was reviewed in a similar manner and the results set forth in Table 19.15.

The ROW was 9-years-old in 1951 and had been maintained by hand cutting since 1942. On the mesic habitat area in 1951, the dominant herbs were goldenrod and grass; bracken was prominent in a few areas, while blackberry and spiraea were dominant shrubs. On the hydric habitat area in 1951, grass and goldenrod were dominant herbs. The dominant shrub was alder, with blackberry common.

Some 25 years later in 1976, and after 5 herbicide spray treatments, the dominant shrub on the mesic habitat was still blackberry, with raspberry and spiraea commonly present. The dominant herbs were grasses and sedges along with goldenrods and aster. Bracken was also still prominent in some areas while trout-lily and hair-cap moss were common. Therefore, it appears that little change has occurred in dominant shrubs and herbs on the mesic habitat area from 1951 to 1976 after 5 herbicide sprays.

On the hydric habitat area, however, alder was restricted to the ROW edges and the dominant shrubs were spiraea, blackberry, mountain-holly, and willow. The dominant herbs were cat-tail, Sphagnum, aster, grasses, and bracken. This mixture of herbs was owing to the irregular terrain, and moisture varied from wet to well-drained. Stemless lady's-slipper was common under the protection of shrubs and tree regrowth.

It appears, therefore, that marked changes have occurred in the vegetation of the hydric habitat from 1951 to 1976. Alder was nearly eliminated and a cat-tail Sphagnum marsh had developed on much of the habitat area where drainage was impeded by access road. Spiraea had become an important shrub in 1976.

5.3 Wildlife

The major game species for site 19, Moses to Adirondack, as determined by Asplundh Environmental Services (AES) in conjunction with the New York State Department of Environmental Conservation (DEC), are white-tailed deer, varying hare, and ruffed grouse.

5.3.1 Actual Use

White-tailed Deer White-tailed deer observations consisted mainly of signs, i.e., tracks, browse, and pellet groups. Deer tracks were observed both on and off the ROW throughout the period of this study, approximately 18 months. More deer tracks were found on the ROW on the hydric area during the winter months. There was also heavy browsing on the shrubs, mainly mountain-holly, in the hydric area during the winter (Fig. 19.1.5). More deer pellets were found in the woods than on the ROW during the study. One deer was observed during September 1, 1975, in the woods on the east side of the ROW from which it was flushed.

Browse Survey Four browse transects were established on study area 19 (Tables 19.9 and 19.10; Fig. 19.6). These transects were established at each permanent study plot location, with 1 transect on each side of the ROW, on May 4, 1976.

Overall browse utilization by percent actual use was highest in the woods, 43%, medium at the ROW edge, 35%, and lowest on ROW, 27%. However, more stems were available on the ROW than in either the interior woods or on the edge.

There were more stems available at the ROW edge than in the interior woods, and more stems were taken at the ROW edge than in the woods (Table 19.9; Fig. 19.6).

Stems of the genus Rubus far surpassed all other species as far as total abundance is concerned and were heavily browsed (Table 19.10).

Those species that were highly utilized by deer were mountain-holly, black chokeberry, speckled alder, nannyberry, wild-raisin, and red maple (Table 19.9).

Ruffed Grouse A ruffed grouse drumming count was made on April 18, 1976, from 5:30 a.m. to 6:30 a.m., on study area 19. The weather was clear, with a temperature of 55 F and winds were from 0 to 5 miles per hour. Four birds were noted drumming in the woods immediately adjacent to the ROW, 3 on the east side, and 1 in the woods to the west (Map 19.1). In addition, 2 ruffed grouse were flushed from the adjacent woods to the east, on September 19, 1975.

Varying Hare Varying hare observations on this site were limited to indirect evidence of hare activity. Occasional hare browse was found on black chokeberry and black cherry. Varying hare tracks and pellets were noted throughout the study area, but were sparse.

Miscellaneous Wildlife Observations Various birds were seen and/or heard on the study area throughout the period of this study. The diversity of species may be attributed to the ecotone which is created due to the presence of the ROW. Birds observed on the ROW and on the ROW edge are included in Table 19.11.

Raccoon activity was high in the ROW area during the spring of 1976. Remains of spotted salamanders were found along the edge of and on the access road near some of the wet areas, and these appeared to be the preyed remains of raccoon feeding.

Mating activity was high in the spring of 1976 on the ROW for toads and frogs. Several mating pairs were observed in wet areas along the ROW. Spring peeper activity was moderate off the ROW in that period.

Chipmunk activity was moderate throughout all mesic sections of the ROW during the spring of 1976. Woodchuck activity was sparse on the study area with only 1 active den found.

5.3.2 Potential Use

Potential wildlife use of the plant species present on site 19 for the 3 major game species, deer, hare, and grouse, is contained in Table 19.12. In addition to asterisk ratings from New York, asterisk ratings from Pennsylvania were included for those plant species present on the study that were not rated in the New York evaluation for deer and grouse. The same was done for varying hare with the inclusion of asterisk ratings for Minnesota. This additional data should provide supplemental information to the ROW manager regarding those plant species that may be of potential value to those game species (Martin et al., 1951).

5.4 Water

A small stream traversing a swamp and wet meadow on the Moses to Adirondack site was sampled for water quality on September 30, 1975, and

February 18, May 20, and August 1, 1976 (Table 6, General Methods; Map 19.1).

5.4.1 Stream Description and Sampling Points

The small stream originates in a swamp west of the ROW and flows northeast, and the gradient is less than 1 percent. This watershed drains into the West Branch Oswegatchie River 3/4 mile northeast of the ROW and is located in the St. Lawrence River Basin.

The sampling locations were sited as follows:

1. in a swamp 100 yards upstream, west of the ROW clearing edge
2. in a wet meadow at the upstream, west, edge of the ROW;
3. in a wet meadow at the downstream, east, edge of the ROW;
4. in a swamp 50 yards downstream, east of the ROW clearing edge (Map

The stream and swamp bottom was covered by organic material, and fallen logs and vegetation-trapped sediment. Several channels were present in the swamp both upstream and downstream of the ROW, and on the ROW 1 main channel was observed.

Vegetation at sampling locations 1 and 4 was similar, and overstory vegetation shaded the stream. Hemlock, balsam-fir, alder, nannyberry, and mosses and ferns were common. Vegetation at locations 2 and 3 was similar; trees and shrubs were sparse; low growing vegetation was abundant and shaded the stream on the ROW (Map 19.2).

An abandoned logging road with a collapsed wooden bridge is located immediately upstream of location 1 (Map 19.1). Between locations 2 and 3, the stream flows through a single culvert under the ROW access road.

The stream, wet meadow, and surrounding area are utilized by wildlife and hunters. The New York Department of State has no "official classification" for the water contained in the swamp or wet meadow.

5.4.2 Analysis of Water Quality

Site 19 was surveyed on September 30, 1975, from 12:00 noon to 1:25 p.m. Air temperature was 20 C and it was partly cloudy (Table 19.13). Water temperature ranged from 10.0 C at location 3 to 10.5 C at locations 1 and 2. Dissolved oxygen concentration and percent saturation ranged from 3.3 to 5.7 ppm and 32 to 55%, respectively. The pH was low, mean 4.7, and the water was dark brown. Stream width and depth at locations 1, 2, 3, and 4 were 32, 13; 46, 10; 24, 15; and 24, 10 inches, respectively. Sediment stakes were placed at all sampling locations.

The survey on February 18, 1976, from 2:45 to 3:40 p.m., was conducted during rain (Table 19.13). Two to 3 feet of snow covered the study area and the ice was broken to collect water data. Water temperature was near freezing at all sampling locations. Both dissolved oxygen concentration, 7.7 to 8.9 ppm, and percent saturation, 55 to 66%, were higher than those on September 30, 1975. The pH was near neutral and averaged 6.8.

Samples on May 20, 1976, from 12:35 to 1:35 p.m., were collected during rain, and air temperature averaged 7 C (Table 19.13). The stream was flooding and most of the swamp and meadow was inundated following 4 days of rain. Stream depth at locations 1, 2, 3, and 4 was 15, 31, 19, and 13 inches, respectively. Water temperature was constant, 6.0 C. Dissolved oxygen concentration and percent saturation were the highest during this sampling program and ranged from 10.5 to 11.0 ppm, and 91 to 95%, respectively. The pH ranged from 4.9 to 5.5. Sediment, predominantly detritus, was 4 inches thick at the control, and ranged from 0.5 inches at location 4 to 2.0 inches at location 3.

On August 1, 1976, from 1:40 to 2:05 p.m. the weather was partly cloudy and air temperature was 21 C (Table 19.13). Water temperature at location 3 was 1.0 C warmer than at locations 1, 2, and 4. Dissolved oxygen concentration and percent saturation ranged from 2.6 to 5.7 ppm and 27 to 63%, respectively. The pH was the lowest recorded and averaged 4.0. Stream width and depth at locations 1, 2, 3, and 4 were 48, 6½; 46, 11; 53, 12; and 24, 12 inches, respectively. One inch of detritus was present at all sampling locations.

5.5 Land Use

5.5.1 Location

Site 19 is located in a rural nonfarm section of the town of Croghan, Lewis County, New York. Between 1960 and 1970 there was a 1.7% increase in population of Lewis County with a 1970 distribution of 15.5% urban, 65.4% rural nonfarm, and 19.1% rural farm (U.S. Bureau of the Census, 1972). The closest community is Belfort which is approximately 3½ miles to the south.

5.5.2 Land Use Near the Time of Construction

The ROW was constructed during 1942. The earliest available data obtained from 1949 aerial photography indicates that the location of the ROW and adjacent land to the ROW was primarily rural nonfarm (Table 19.14; Fig. 19.7). Land use distribution included the following subtypes:

Agriculture:
- Ac - Agricultural cropland

Forest Land:
- Fc - Forest brushland
- Fn - Forest lands
- Fp - Plantations

Water Resources
- Wb - Marshes, shrub wetlands, and bogs
- Ww - Wooded wetlands

5.5.3 Land Use After Construction

The adjacent land use to site 19 has not changed from 1949 data. The land adjacent to the ROW is still rural nonfarm with the same distribution described above near the time of construction (Section 5.5.2; Table 19.14; Fig. 19.7).

In addition to use of the ROW for the transmission of electrical power, portions of the ROW are currently being used by a hunt club, and for recreational purposes such as snowmobiling. (Fig. 19.1.6).

6 Evaluation, Interpretation, and Summary of Results

6.1 Conditions Which Existed Prior to Establishment of ROW

Soil, water, vegetation, and wildlife habitat conditions existing prior to ROW construction were based on observations made during the period of this study on adjacent undisturbed forest areas on both sides of the ROW.

6.1.1 Soil

This study area is located in the western foothills of the Adirondacks; bedrock geology is mostly granite and granitic gneiss covered with unsorted glacial till and stratified outwash. Topography is nearly level to steep with slope gradients of 0 to 25% on north and south exposures. Surface mineral soils are predominantly acid loamy fine sands and sandy loams. Four soil types and 1 miscellaneous land type were present on the site; the well- to excessively drained Gloucester sandy loam, with numerous rock outcrops, and Rockland occurred in glacial till on rolling to steep terrain; moderately well-drained Adams loamy fine sand developed in glacial outwash on nearly level areas; and, poorly drained Croghan and Saugatuck loamy fine sand formed in deltaic sands and depressional lake deposits, respectively. The depressional soils exhibited cemented zones or orstein in the upper subsoil.

No soil erosion was evident, except in stream beds, in the undisturbed forest. Due to the coarse soil texture, high water table, and poor drainage, these soils are rated low to moderate for woodland productivity. Soil types correlated well with topography and forest type, the Northern Hardwoods forest on upland mesic sites and the Spruce-Fir forest on lowland hydric sites.

The forest floor consisted of fresh and decomposed organic materials, 1.5 inches thick, made up mostly of tree foliage, twigs, and branches in distinct litter, fermentation, and humus layers. Decomposed organic matter was incorporated with the mineral soil in a prominent A1 horizon. The predominant humus type on the mesic sites of the adjacent forest was a "thin duff mull with shallow A1".

6.1.2 Vegetation

There is no indication that any part of the study area was agricultural land or old field in 1942, at the time the ROW was cleared. The age and structure of the stands now bordering the ROW suggest that the ROW area supported similar stands in 1942.

Thus, on the mesic sites, pole-stage northern hardwood mixtures, including sugar- and red maple, yellow birch, American beech, and black cherry, formerly dominated the ROW area. On hydric sites, red spruce and balsam-fir were dominant species. Understory shrubs and herbs in these stands were probably similar to those presently occurring in the adjacent stands.

6.1.3 Wildlife

Wildlife, being mobile species which may or may not be observed during site visitation, were reasonably imputed to this area by the make up of the forested area adjacent to the ROW. It can be assumed that those species that currently occupy the site, i.e., white-tailed deer, varying hare, and ruffed grouse, also were utilizing the habitat before ROW construction. The degree of use is impossible to determine at this time.

6.1.4 Water

No information is available.

6.1.5 Land Use

The earliest data available near the time of construction of the ROW in 1942 is 1949 aerial photography. The ROW and adjacent land area was rural non-farm with a land use distribution of agriculture (.5%), forest land (70.3%), and water resources (29.2%). It can be assumed that prior to construction of the ROW, the areas cleared for it were once wooded wetlands and heavily forested.

6.2 Conditions Which Exist at Present

6.2.1 Soils

Soil types identified in the adjacent forest generally extended across the present ROW in association with topographic configurations. Several small isolated areas of poorly drained depressional soils occur sporadically on the ROW and in the forest. Soils on the ROW relate closely to the mesic Blackberry-Goldenrod plant community and the hydric Willow-Sensitive Fern plant community. Soil disturbance on the ROW was limited to access road construction, including installation of culverts and some earth fill in low areas, grading for tower sites, and excavations to procure road and tower site fill material. An active sand borrow pit presently exists on the ROW at the south end of the study area; however, it is probable that this is used by local residents and not for ROW management.

Some active sheet and rill erosion is evident in 2 borrow pit excavations on 6 to 10% slopes that are devoid of vegetation. Moderate to severe gully erosion, with gullies 4 to 14 inches deep, is present on 4 access road locations having gradients of 5 to 12 percent. Other segments of the access road have been stabilized by natural invasion of grasses and herbaceous plants. No active erosion is evident on the general ROW.

Surface organic layers, averaging 1.2 inches thick, are present on the general ROW mesic sites. The original forest litter is no longer evident, but has been replaced by litter from ROW plants (shrubs, grasses, herbs, and ferns). The predominant humus type on the ROW is a "thin duff mull with very shallow A1".

6.2.2 Vegetation

The ROW area is presently dominated by a low cover of mixed herbs, grasses, ferns, and blackberry with scattered shrubs and tree seedlings. Many diverse plant communities form an intricate pattern throughout the ROW area.

On mesic sites, pure stands of blackberry are dominant over much of the area. In other situtations, blackberry occurs in mixture with bracken and mixed grasses. Hair-cap moss covers small areas where soil disturbance has recently occurred or where the soil is too shallow, or too poor, to allow rapid invasion of higher plants.

ROW management policies have curtailed the number of woody tree seedlings and shrubs, although black cherry and black chokeberry are seeding in, particularly where Bracken-Blackberry-Mixed Grass communities dominate. The competition from blackberry in the pure Blackberry communities may well discourage the invasion of woody species, since woody plants are far less abundant in these areas.

On hydric sites, sedges, *Sphagnum*, mixed herbs, and various grasses are the major vegetation. In areas dominated by *Sphagnum*, sedges, and mixed herbs, there has been little invasion of hardwood tree seedlings and shrubs, except for willows and black chokeberry. Where drainage is somewhat better, Blackberry-Blueberry-Bracken communities form the major cover. Here gray birch, red spruce, balsam-fir, mountain-holly, and black chokeberry are slowly invading.

6.2.3 Wildlife

White-tailed deer, varying hare, and ruffed grouse are the major game species that currently occupy the site. Indirect observations for deer, i.e., pellets, tracks, and browse, indicated deer using the ROW area. Deer were also seen on the site. Browse surveys indicated that more stems were available on the ROW than in either the interior woods or on the ROW edge. Stems of the genus Rubus far surpassed all other species as far as total abundance is concerned and were heavily browsed. Those species that were highly utilized by deer were mountain-holly, black chokeberry, speckled alder, nannyberry, wild-raisin, and red maple. Potential wildlife use is evident from plant species present on the site.

6.2.4 Water

Off the ROW several stream channels and water in depressions are observed in a Spruce-Fir forest. The shading is provided by a multistory canopy. The stream is on the ROW for approximately 250 feet. Flow is predominantly via one main stream through a Willow-Sensitive Fern community. Shade is provided by herbs and shrubs and aquatic plants were common throughout the study area.

Low pH and dissolved oxygen concentration and percent saturation were attributed to the abundant decaying organic material (Hynes, 1970). In addition, buffering agents are lacking in this geologic region, thus lowering the pH.

During the sampling program, average water temperature and pH were nearly equal for all sampling locations. Dissolved oxygen concentration averaged 15% greater at locations 3 and 4 than at 1 and 2, probably due to increased photosynthesis by aquatic vegetation on the ROW.

August 1, 1976, is the only date when solar heating presumably occurred. Water temperature was 1 C warmer at location 3 than at all other locations. However, water temperature returned to ambient before reaching location 4. Seepage may moderate water temperature on the site.

Erosion occurred on the access road and sedimentation was local. No other accelerated erosion was observed in the study area.

6.2.5 Land Use

Presently, the adjacent land uses to site 19 have not changed from the 1949 data. The land adjacent to the ROW is still considered to be rural nonfarm. In addition to use of the ROW for the transmission of electrical power, portions of the ROW are currently being used for hunting and snowmobiling.

6.3 Environmental Effect and Probable Causes

6.3.1 Soils

The major impact of ROW management on soils of the Moses to Adirondack study area is related to construction activities that removed all vegetation and disturbed or removed the topsoil. On graded and excavated sites and access roads this resulted in soil erosion and delayed stabilization through natural plant invasion. Gully erosion on steeper gradients of the access road has been accelerated by recent vehicular use. It is not known whether this use is related to ROW management or to other uses not associated with ROW functions. Sediment resulting from current active erosion is deposited on lower slopes and does not enter streams leaving the ROW.

6.3.2 Vegetation

The general impact of ROW management on the Northern Hardwoods forest type (mesic) was to convert it into a low, shrub-herb-fern-grass community which has been designated as a Blackberry-Goldenrod community. The Spruce-Fir forest type (hydric) was similarly converted into a low plant community which has been designated as a Willow-Sensitive Fern community.

Regarding the number of species (species diversity) found on the mesic site, there was no significant difference between the forest and ROW. On the hydric site, however, there was a significant increase in the number of species on the ROW as compared with the adjacent forest.

There were important differences in kinds of species found on the ROW and in the forest in both forest types. Some important herbs and shrubs of the forest were lacking on the ROW; also several important herbs and shrubs on the ROW were absent from the forest.

The initial basal sprayings in 1951 and 1952 removed most of the woody plants which had persisted after corridor clearing in 1942. Broadcast sprayings with Invert 2,4,5-T in 1962 and Tordon 101 in 1965 continued to suppress invading woody species, and resulted in line vegetation largely of grasses, mixed herbs, ferns, and sedges, species largely resistant to herbicides.

Blackberry is not seriously damaged by the herbicides used on this line area; thus blackberry canes, which invaded after line clearing, have persisted. Blackberry communities discourage the invasion of wood plants, since when they mat down in the late fall and winter under the weight of snow they pull down and deform or smother many invading seedlings.

Black cherry seedlings, common on the line area, are probably from seed disseminated by birds, since there are large amounts of black cherry in the adjacent stands.

On hydric sites, the Sedge-Mixed Herb-*Sphagnum* community is evidently unsuitable for woody plant invasion with the exception of willows. On the periphery of this community, where drainage is somewhat better, gray birch and mountain-holly are becoming established.

Most of the tree species on the hydric sites are seedlings or small saplings, indicating that they have become established since the last herbicide spraying.

A cover type map was made of the west circuit on site 19 in 1951, and the data obtained therefrom was compared with information obtained during the general reconnaissance in 1976.

6.3.3 Wildlife

The presence of the ROW has encouraged many different plant species, mainly light-loving, on the ROW proper, to become an important part of the vegetation on this site, thus enhancing the habitat for wildlife use. The ecotone created by the presence of the ROW often produces a greater variety and density of life than is found otherwise (Leopold, 1936), and this phenomenon has been termed the "edge effect" (Smith, 1974).

6.3.4 Water

Insignificant solar heating of the stream occurred on the ROW; water temperature returned to ambient 50 yards downstream of the ROW. Increase in water temperature, 1 C, at sampling location 3 on August 1, 1976, had no downstream effect and probably resulted from solar heating on the ROW.

Average dissolved oxygen concentration was greater downstream, probably as a result of increased photosynthesis by aquatic vegetation on the ROW.

Local sedimentation on the ROW near the access road probably results from the combination of use of the road by "off-the-road" vehicles and the culvert being too short for the width of the road.

Line Management Factors Shading by overstory vegetation was limited on the ROW.

The undersized culvert allowed material from the access road to enter the stream.

Other Influences Use of the access road by "off-the-road" vehicles increased the possibility of erosion and subsequent sedimentation.

The swamp present to the east and west of the ROW presumably changed to a wet meadow on the ROW after construction.

6.3.5 Land Use

The presence of the ROW has had no identifiable effect on the adjacent land use. The presence of the ROW has opened the area to wildlife and sportsmen utilizing the area to hunt.

On the hydric habitat, an Elm-Red Maple forest type was changed to a Willow-Sensitive Fern plant community. On the mesic habitat, a Northern Hardwoods forest type was changed to a Blackberry-Goldenrod plant community. On the xeric habitat, an Aspen-Gray Birch-Paper Birch forest type was changed to a Blueberry-Bracken plant community.

Quantitative Changes There was a marked increase in the number of shrubs and herbs on the hydric habitat on the ROW as compared to the forest; there were 10 shrubs on the ROW as compared to 6 in the forest (Table 18.5; Figs. 18.3 and 18.4). There were 18 herbs on the ROW and 7 in the forest. A notable increase in the shrub and herb layers also occurred on the mesic habitat. There were 6 shrubs on the ROW as compared to 2 in the forest, and 17 herbs on the ROW, with 12 occurring in the forest. On the xeric habitat a notable change in the number of shrubs occurred, with 7 shrubs present on the ROW and only 3 in the forest. No major increase in the number of herbs was apparent on the ROW as there were 10 herbs present on the ROW as compared to 8 in the forest (Table 18.5).

Qualitative Changes On the hydric habitat, 11 species from the shrub and herb layers occurred both in the forest and on the ROW (Fig. 18.5), while 2 species occurred in the forest but not on the ROW (Table 18.6), and 17 species were on the ROW but not in the forest (Table 18.7). One of the 2 species which occurred only in the forest was a shrub, choke-cherry, which is typical of open shrub areas. Of the 17 species which occurred on the ROW, only 5 were shrubs, namely, spiraea, alder, black chokeberry, raspberry, and blackberry. In the herb layer on the hydric habitat, 1 species occurred in the forest alone and 12 were found on the ROW and not in the forest (Tables 18.6 and 18.7).

On the mesic habitat, 6 species from the shrub and herb layers occurred both in the forest and on the ROW, while 8 occurred in the forest only and 17 occurred on the ROW and not in the forest (Tables 18.6 and 18.7; Fig. 18.5). One shrub, alternate-leaved dogwood, was found in the forest alone, and 5 shrubs, willow, wild-raisin, winterberry, spiraea, and blackberry, occurred only on the ROW. In the herb layer, 7 species occurred in the forest alone and 12 were unique to the ROW (Tables 18.6 and 18.7).

On the xeric habitat, 7 species from the shrub and herb layers occurred both in the forest and on the ROW (Fig. 18.5), while 4 occurred in the forest only (Table 18.6), and 10 occurred on the ROW and not in the forest (Table 18.7). No shrubs were found in the forest alone, while 4 shrubs, wild-raisin, mountain-holly, (Fig. 18.1.4), teaberry, and hawthorn, occurred only on the ROW. In the herb layer, 4 species occurred in the forest alone, and 6 were found only on the ROW (Tables 18.6 and 18.7).

It appears that the ROW had a notable impact on the number of species in the shrub and herb layers, as species were more numerous on the ROW than in the adjacent forest. The 1 exception is the herb layer of the xeric habitat, as there was a similarily in number of species both on and off the ROW. There was a difference in the kind and abundance of species that occupied both the forest and the ROW.

5.2.3 Analysis of Plant Communities for On-ROW Mapped Vegetation Plots

Table 18.8 presents a breakdown of major vegetational communities (Map 18.2) for the hydric, mesic, and xeric plots on the Moses to Plattsburg ROW. Much of the present composition of herbaceous and woody plant communities on this area can be explained by the spraying history.

Foliar herbicide applications with 2,4,5-T were started in 1960 and repeated in 1963. In 1966 and 1970 foliar applications with Tordon 101 were applied from the ground. From the initial spraying in 1960, each successive foliar treatment was more selective.

The major plant communities now dominating the 3 plot locations, hydric, mesic, and xeric are: Sedge-Spiraea-Mixed Grass-Herb, Rubus-Mixed Fern-Mixed Grass-Herb, and Hair-cap Moss-Rubus-Mixed Grass-Herb, respectively. A number of these species do not appear to be adversely affected by herbicides, and will therefore most likely play an important part in the continued development of this ROW, especially with a more selective approach in line maintenance. Those shrub species that were seriously affected by sprays in the past may have a change to become an important part of the vegetational matrix of the ROW vegetation as selective sprays are used.

5.2.4 Comparison of Forest Type with ROW Vegetation

The ROW was clear cut in 1957 and the material was either removed from the site or piled and burned. Stumps were treated with 2,4,5-T mixed with oil during initial clearing. A foliar application of 2,4,5-T was applied in 1960. This treatment was mainly broadcast. Each successive treatment became more selective. Another ground foliar application of 2,4,5-T was applied in 1963. In 1966 and 1970 a ground foliar application of Tordon 101 was applied.

The general impact of the above treatments of the ROW was to change the forest types (Elm-Red Maple, Northern Hardwoods, and Aspen-Gray Birch-Paper Birch) to shrub-herb-grass communities.

On the hydric habitat, which was formerly occupied by an Elm-Red Maple forest type, a Willow-Sensitive Fern community was produced. There was a significant increase in total number of shrub and herb species on the ROW as compared with the forest. There was a qualitative difference in shrub and herb species on the ROW as compared to the forest, with some shrubs of the forest not on the ROW and several important shrubs of the ROW lacking from, or sparse in, the forest. The same was true for herbs; i.e., some herbs of the forest were not on the ROW, while some herbs of the ROW were not in the forest.

On the mesic habitat, which was formerly occupied by a Northern Hardwoods forest type, a Blackberry-Goldenrod community was produced. There was a significant increase in the total number of shrub and herb species on the ROW as compared with the forest. There was a qualitative difference in shrub and herb species on the ROW as compared to the forest, with some shrubs of the forest not on the ROW and several shrubs of the ROW lacking or sparse, in the forest. Some herbs of the forest, such as painted trillium (Fig. 18.1.5), were not on the ROW, while some herbs of the ROW were not in the forest.

On the xeric habitat, which was formerly occupied by an Aspen-Gray Birch-Paper Birch forest type, a Blueberry-Bracken plant community was produced. There was a significant increase in the total number of shrubs, while the number of herbs was similar on the ROW as compared with the forest. There was a qualitative difference in shrub and herb species on the ROW as compared to the forest, with no shrubs of the forest on the ROW, but several shrubs of the ROW lacking from the forest. Some herbs of the forest were not on the ROW, and the reverse is also true.

5.3 Wildlife

The major game species for site 18, Moses to Plattsburg, were determined by Asplundh Environmental Services (AES) in conjunction with the New York State Department of Environmental Conservation (DEC). These species are ring-necked pheasant, varying hare, and Hungarian partridge.

5.3.1 Actual Use

Ring-necked Pheasant No direct or indirect observations were made for ring-necked pheasant during the length of the study period.

Varying Hare Varying hare activity was moderate during the winter of 1975 to 1976, near structures 28-3 and 28-4, as evidenced by tracks crossing the ROW in the snow.

Hungarian Partridge No direct or indirect observations were made for Hungarian partridge during the length of the study period.

Miscellaneous Wildlife Observations Various birds were seen and/or heard on the study area throughout the period of this study. Birds observed on the ROW and on the ROW edge are included in Table 18.9.

During the summer of 1975, 1 gray squirrel was observed running across the ROW west of structure 28-5. Two active woodchuck burrows were located at this time, 1 near structure 28-4, to the north side of the ROW, and 1 west of that structure.

The same 2 woodchuck borrows were still in active use during the spring of 1976 (Fig. 18.1.6). Mole activity was slight southeast of structure 28-1, as indicated by tunnels. Two small game trails were located near mesic plot 2. White-tailed deer pellets were sparse on xeric plot 3 on the ROW.

It was observed that a home near the ROW, which was occupied by a family containing a number of small children and dogs, may have had a considerable affect on wildlife use of the ROW and adjacent woodland in the vicinity.

5.3.2 Potential Use

Potential wildlife use of plant species present on site 18 for the 3 major game species, ring-necked pheasant, varying hare, and Hungarian partridge, is contained in Table 18.10. In addition to asterisk ratings from New York, asterisk ratings from Minesota were included for those plant species present on the study area that were not rated in the New York evaluation for hare. Also, the asterisk ratings for the Northeast were included where applicable for pheasant and partridge. This additional data should provide supplemental information to the ROW manager regarding those plant species that may be of potential value to those game species (Martin et al., 1951).

5.4 Land Use

5.4.1 Location

Site 18 is located in a rural nonfarm section of the town of Constable, Franklin County, New York. Between 1960 and 1970 there was a 1.8% decrease in population of Franklin County with a 1970 distribution of 40.0% urban, 52.0% rural nonfarm, and 8.0% rural farm (U.S. Bureau of the Census, 1972). The closest community is Constable which is approximately 1½ miles to the northeast.

5.4.2 Land Use Near the Time of Construction

The ROW was constructed during 1957. The earliest available data obtained from 1958 aerial photography indicates that the location of the ROW and adjacent land to the ROW was primarily rural nonfarm (Table 18.11; Fig. 18.6). Land use distribution included the following subtypes:

Agriculture:
- Ac - Cropland and cropland pasture
- Ap - Pasture

Forest Land:
- Fc - Forest brushland
- Fn - Forest lands
- Fp - Plantations

Non-productive:
- Ns - Sand

Water Resources:
- Ws - Streams and rivers
- Wb - Marshes, shrub wetlands, and bogs
- Ww - Wooded wetlands

5.4.3 Land Use After Construction

The adjacent land use to site 18 has changed from the 1958 data, with increases in forest land, extractive industry, and public uses, and a decrease in agricultural use. The land adjacent to the ROW is still rural nonfarm (Table 18.11; Fig. 18.6), with a slightly different land use distribution that includes the following subtypes:

Agriculture:
- Ac - Cropland and cropland pasture
- Ap - Pasture
- Ai - Inactive agricultural land

Extractive Industry:
- Eg - Sand and gravel pits

Forest Land:
- Fc - Forest brushland
- Fn - Forest lands
- Fp - Plantations

Non-Productive:
- Ns - Sand

Public and Semi-Public:
- P - Public and semi-public

Water Resources:
- Ws - Streams and rivers
- Wb - Marshes, shrub wetlands, and bogs
- Ww - Wooded wetlands

In addition to use of the ROW for the transmission of electrical power, portions of the ROW are currently being used for such recreational uses as horseback riding and snowmobiling, as well as being used for pasture, agricultural uses, and an extension of adjacent backyard activities.

6 Evaluation, Interpretation, and Summary of Results

6.1 Conditions Which Existed Prior to Establishment of ROW

Soil, vegetation, and wildlife habitat conditions existing prior to ROW construction were based on observations made during the period of this study on adjacent undisturbed forest areas on both sides of the ROW.

6.1.1 Soils

This site is situated on undulating glacial till plains, outwash terraces, and deltas, and lake deposits over sandstone, dolostone, and some limestone bedrock. Topography varies from depressed areas, nearly level and long gentle slopes, to steeper slopes with gradients up to 25% on northwest and southeast exposures. Surface mineral soils are loam, sandy loam, and loamy sand textures containing stones, cobbles, and gravel in some phases. Soil reaction is strongly acid, pH 4.6 to pH 5.3, except in neutral variants influenced by calcareous till, alkaline ground water, or limestone, where soil is slightly acid to neutral. Thirteen soil series present on the site were separated into 18 mapping units based on slope, texture, and reaction variations. Several closely related series occur in intimate association, and thus, were mapped together. Soil mapping units related to topographic position and drainage are: well- to excessively drained Adams-Colton and Colton-Constable on gentle to steep upper slopes; moderately well-drained Duane, Empeyville, Moira, and Nicholville on nearly level to moderate slopes; and, poorly drained Birdsall, Brayton, Scarboro, Sun, Wallington, and Walpole on nearly level plains and depressed lake beds.

All mapping units occurred in adjacent land areas, which may reflect conditions at the time of ROW construction in 1957. Several units or parts of them were occupied by pasture and cropland (Adams-Colton, Birdsall, Brayton, Colton-Constable, Scarboro, and Wallington) and Scotch pine plantations (Colton-Constable). Other units supported natural mixed hardwoods, predominantly gray birch, aspen, and red maple on well-drained xeric habitats; red maple, white birch and hemlock on well- to moderately well-drained mesic habitats; and, red maple, American elm, and birch on poorly drained hydric sites. The moderately well-drained Moira loam and Nicholville sandy loam were rated moderately high with no restrictions for timber production; all other soil mapping units were rated low to moderate in woodland productivity with limitations due to wetness or dry sandy conditions.

The forest floor under natural hardwoods was composed of tree litter, fermentation, and humus layers 1.2 and 0.8 inches thick on mesic and xeric sites, respectively. Due to the absence of an A1 horizon, humus types were "thick mors" on mesic and "thin mors" on xeric areas. No active erosion occurred on any soil type or slope in the undisturbed hardwood forest.

6.1.2 Vegetation

Prior to corridor establishment (1957), the study area was in agricultural cropland, pasture, and forest. Most of the forest stands were of natural origin, but a small portion of the study area passes through a Scotch pine plantation which was planted prior to ROW clearing.

Forests of the Elm-Red Maple type dominated hydric sites. Some mesic sites supported stands of Northern Hardwoods where red maple, black cherry, basswood, and white pine were associates. Other mesic sites were in cropland or pasture. The Aspen-Gray Birch-Paper Birch type occupied xeric sites.

6.1.3 Wildlife

Wildlife, being mobile species which may or may not be observed during site visitation, were reasonably imputed to this area by the composition of the forest area adjacent to the ROW. It can be assumed that those species probably currently occupying the site, i.e., ring-necked pheasant, varying hare, and Hungarian partridge, occupied the habitat prior to ROW construction. Although current wildlife activity may be influenced by the presence of the ROW, it is likely that those species, designated by the DEC in conjunction with AES as major in this area, inhabited the vicinity even before ROW construction. The degree of use is impossible to determine at this time.

6.1.4 Land Use

The earliest data available near the time of construction of the ROW in 1957 is 1958 aerial photography. The ROW and adjacent land area was rural nonfarm with a land use distribution of agriculture (47.7%), forest land (47.0%), non-productive (0.7%), and water resources (4.6%).

6.2 Conditions Which Exist at Present

6.2.1 Soils

Thirteen soil mapping units summarized in Section 6.1.1 were present on the ROW, some as small inclusions, but most extending across both ROW and adjacent land in association with relief and drainage patterns. Prominent vegetation on the ROW in 1976 was closely related to existing soils and moisture regimes; these were Willow-Sensitive Fern on poorly drained soils of hydric sites, Blackberry-Goldenrod on moderately well-drained soils of mesic sites, and Blueberry-Bracken with mixed grass, moss, and lichens on well-drained soils of xeric habitats. In addition, portions of the ROW were occupied by pasture and cropland as previously discussed.

Organic layers composed of grass, herb, and shrub remains on the ROW consisted of litter, fermentation, and humus layers 0.6 and 0.4 inches thick on mesic and xeric sites, respectively. A shallow A1 horizon, possibly related to past grazing use, resulted in a "thin duff mull-G" humus type on the mesic habitat, while, a "thin mor", due to absence of the A1 horizon, occurred on the xeric habitat.

Slight sheet erosion was observed in 2 locations of loamy sand soil on the general ROW where mineral soil was bare or had light plant cover. Also, moderate to severe sheet and rill erosion occurred on a disturbed portion of the access road, 2 tower sites, and an equipment cut, all in bare or lightly vegetated loamy sand. When exposed, these light loamy sand soils are highly erosive by water and wind. Most erosion sediments collected on lower slopes, but some likely was transported out of the area by wind.

6.2.2 Vegetation

The major plant community on hydric sites is Sedge-Spiraea-Mixed Grass-Herb. Willows, black chokeberry, red maple, aspen, and wild-raisin are conspicuous woody plants in this community. On mesic sites, the *Rubus*-Mixed Fern-Mixed Grass-Herb community is the major cover with seedling red maple, red oak, aspen, willow, and yellow birch invading.

Xeric sites contain a number of communities. The most abundant is Hair-cap Moss-Rubus-Mixed Grass-Herb. Scattered thickets of spiraea and mountain-holly are found on these sites, and red maple and white birch seedlings have become established.

Some areas of the corridor are used for grazing. In addition, the ROW was being used as an extension of backyard activities by local residents.

6.2.3 Wildlife

Ring-necked pheasant, varying hare, and Hungarian partridge are the major game species that are likely to currently utilize the study area. No direct or indirect observations were made of ring-necked pheasant or Hungarian partridge during the length of the study. Indirect observations (tracks) of varying hare indicated that species' presence on the ROW.

Several other animals were noted, directly or indirectly, to be utilizing either the ROW, the adjacent forest, or both. Potential wildlife use is evident from plant species present on the site.

6.2.4 Land Use

Recent land use of the ROW and adjacent land area has shifted from the 1958 percentages. The area is classified primarily as rural nonfarm with a distribution of agriculture (26.6%), forest land (67.7%), extractive industry (0.2%), non-productive (0.7%), public and semi-public (0.2%), and water resources (4.6%). With reference to the area involved, shifts in land use are noted as follows:

Agriculture	-	-21.1%
Forest Land	-	+20.7%
Extractive Industry	-	+ 0.2%
Non-productive	-	no change
Public and Semi-public	-	+ 0.2%
Water Resources	-	no change

Land uses of public and semi-public areas and extractive industry are new types which were not present in 1958. In addition to the use of the ROW for the transmission of electrical power, portions of the ROW are currently being used for pasture, agricultural uses, horseback riding, snowmobiling, and an extension of adjacent backyard activities.

6.3 Environmental Effect and Probable Causes

6.3.1 Soils

Impacts of ROW management on soils of this site are primarily related to removal of plant cover and disturbance of surface soil resulting in slight to sever sheet and rill erosion. Some erosion occurred on the general ROW, but most was related to disturbed areas of the access road, tower sites, and equipment cuts. The loamy sand soils on the area are fragile and highly susceptible to erosion when exposed. No restoration seeding was done following ROW construction, so denuded areas were dependent on natural plant invasion which is being interrupted by continuing erosion. It is probable that some of the soil disturbance leading to erosion was caused by past grazing and use of farm equipment in the area. Other than that transported by wind, erosion sediments collected on lower slopes of the ROW.

It also appears that the ROW had some affect on organic layers, which were only ½ as thick on the ROW as in the forest on both mesic and xeric sites. Some of this affect may be due to past grazing, especially on the mesic habitat where a "duff mull-G" humus type occurred, while "mor" humus types were common on other areas. Also, annual litter deposits were changed from tree parts in the forest to mostly leaves and stems of grasses, herbs, and shrubs on the ROW.

6.3.2 Vegetation

Regular herbicide treatment has eliminated most of the original woody component on this corridor and allowed low communities of herbs and grasses to dominate the ROW area. Present plant communities are composed of grasses, ferns and herbs that are moderately resistant to the herbicides used on this corridor. Most woody vegetation occurring on the study plots has become established since the last herbicide treatment (1970), and is 1 to 4 feet in height, indicating the effectiveness of the herbicide program in removing woody vegetation.

6.3.3 Wildlife

The presence of the ROW has encouraged the development of many different plant species, mainly light-loving, on the ROW proper, thus enhancing the habitat for wildlife use. The ecotone created by the presence ot the ROW often produces a greater variety and density of life than is found otherwise (Leopold, 1936), and this phenomenon has been termed the "edge effect" (Smith, 1974).

6.3.4 Land Use

It is not possible to attribute changes in land use adjacent to the ROW to the construction of the transmission ROW. Changes within the area may be attributed to other changing land use characteristics in Franklin County. The area is more predominantly rural nonfarm than before. It is apparent that adjacent residences are using the additional open spaces of the ROW as an extension of their properties.

Table 19.7. Characteristic species with abundance and sociability ratings (A.S.) in the shrub and herb layers of the ROW which were not in the adjacent forest.

Species	ROW A.S.	Forest A.S.
	Hydric (1)	
Shrubs		
Spiraea	3.2	-
Black Chokeberry	1.3	-
Blackberry	2.4	-
Herbs[1]		
Cat-tail	3.2	-
Blue-joint Grass	2.4	-
St. John's-wort	1.2	-
Daisy	1.2	-
Strawberry	+.1	-
Closed Gentian	+.1	-
Tree Club-moss	+.1	-
Aster spp.	3.2	-
Goldenrod spp.	1.2	-
Horsetail	+.1	-
Reindeer Lichen	+.2	-
False Hellebore	(+.1)	-
Partridge-berry	(++.1)	-
No. Species	16	
	Mesic (2)	
Shrubs		
Spiraea	1.2	-
Sour-top-Blueberry	(+.3)	-
Black Chokeberry	+.3	-
Herbs		
Violet	++.1	-
Sedge	1.2	-
Strawberry	1.2	-
Aster spp.	2.2	-
Goldenrod spp.	2.2	-
Hair-cap Moss	2.3	-
Sheep-Sorrel	1.2	-
Mixed Grass	2.2	-
Tree Club-moss	+.1	-
No. Species	12	

[1] For simplicity, herbs include all species of the herb layer.

Table 19.8. Major vegetational types for the Moses to Adirondack study area based on percent of study plots occupied by each plant community and other components on the ROW.

Community	Site Classification	
	Hydric (1)	Mesic (2)
	Percent of Total Area	
Rubus		48.7
Sphagnum-Sedge-Mixed Grass-Herb	33.1	
Sphagnum-Sedge-Mixed Herb	27.1	
Bracken-Rubus-Mixed Grass-Herb		24.9
Blue-joint Grass-Sphagnum	19.6	
Rubus-Blueberry-Bracken	14.9	
Rubus-Mixed Herb		5.2
Mixed Grass-Herb		5.0
Hair-cap Moss-Mixed Grass-Herb		4.5
Sedge-Mixed Grass-Herb		2.4
Sedge-Mixed Fern	0.6	
Mixed Herb	0.3	
Open and invading		5.5
Access Road	4.4	3.8
Total	100.0	100.0

Table 19.9. Browse survey showing plant species and number ratio of browsed to total stems with percent actual use for ROW, ROW edge, and woods.

Species	ROW		ROW Edge		Woods		Total	
	Ratio	%	Ratio	%	Ratio	%	Ratio	%
Balsam-Fir	0/5	0	2/10	20	0/7	0	2/22	9
Blackberry	19/93	20	9/37	24	0/6	0	28/136	21
Black Cherry	1/1	100	11/18	61	2/7	29	14/26	54
Black Chokeberry			18/19	95			18/19	95
Dewberry	34/108	31	0/26	0			34/134	25
Gray Birch	6/6	100	3/3	100			9/9	100
Blueberry	0/27	0	0/21	0	0/9	0	0/57	0
Mountain-Holly	6/6	100					6/6	100
Nannyberry			3/4	75	5/5	100	8/9	89
White Cedar			1/1	100			1/1	100
Raspberry	1/15	7	2/24	8	9/25	36	14/64	54
Red Maple			3/3	100			3/3	100
Red Spruce	2/3	67	0/8	0	1/6	17	3/17	18
Serviceberry	2/2	100					2/2	100
Speckled Alder			2/4	50	6/6	100	8/10	80
Spiraea	8/30	27	10/10	100			18/40	45
Sugar-Maple			2/3	67	0/1	0	2/4	50
Wild-raisin			1/1	100	16/19	84	17/20	85
Total	79/296	27	67/192	35	39/91	43	187/579	32

Table 19.10. Browse survey showing most abundant plant species and number ratio of browsed to total stems with percent actual use for ROW, ROW edge, and woods.

	Species							
	Blackberry		Dewberry		Raspberry		Blueberry	
Location	Ratio	%	Ratio	%	Ratio	%	Ratio	%
ROW	19/93	20	34/108	31	1/15	7	0/27	0
ROW Edge	9/37	24	0/26	0	2/24	8	0/21	0
Woods	0/6	0			9/25	36	0/9	0
Total	28/136	21	34/134	25	12/64	54	0/57	0

Table 19.11. Birds observed and/or heard on the ROW and on the ROW edge during the study period.

Species	Species
Canada goose	Wood thrush
Red-shouldered hawk	Magnolia warbler
Ruffed grouse	Myrtle warbler
Spotted sandpiper	Yellowthroat
Mourning dove	Brown-headed cowbird
Belted kingfisher	Red-winged blackbird
Pileated woodpecker	Scarlet tanager
Yellow-shafted flicker	Indigo bunting
Eastern kingbird	Evening grosbeak
Olive-sided flycatcher	Chipping sparrow
Blue jay	Song sparrow
Black-capped chickadee	White-throated sparrow
White-breasted nuthatch	Rufous-sided towhee
Catbird	Slate-colored junco
Robin	

Table 19.12. Potential wildlife use of plant species[1] present on the ROW and adjacent woods for the major game species on the Moses to Adirondack study area.

Species	Wildlife Species		
	Deer	Hare	Grouse
<u>Trees</u>			
Black Cherry		*	
Gray Birch	*	*	**
Red Maple	****	+	**
Sugar-Maple	****		*
Yellow Birch	*	*	**
<u>Shrubs</u>			
Alder		*	
Blackberry	+		*
Black Chokeberry	+		
Fly-Honeysuckle	+		
Dewberry	+		
Hobblebush	*		
Maple-leaved Viburnum	*		
Raspberry	+		*
Sour-top-Blueberry	+		+
Willow spp.	*	***	*
Wild-raisin	*		
<u>Herbs</u>[2]			
Bracken	*	**	
Ferns		**	*
Foamflower			*
Goldenrod	+		
Goldthread			+
Grasses	*	***	
Sedge			+
Sheep-Sorrel			+
Strawberry		*	*

[1] Those plants not included in this table provide a certain amount of cover (Table 19.5) for the 3 major game species, and may also provide seasonal food value, specific information pertaining to which is not now available. This applies also with regard to non-game species.

[2] For simplicity, herbs include all species of the herb layer.

Table 19.13. Water data collected from September 30, 1975, to August 1, 1976, at site 19, Moses to Adirondack ROW, Lewis County, New York.

Date		September 30, 1975				February 18, 1976				May 20, 1976				August 1, 1976			
Sampling Location		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Hour		1200	1230	1300	1325	1520	1540	1445	1500	1255	1235	1315	1335	1345	1340	1355	1405
Water Temp. (C)		10.5	10.5	10.0	10.2	-1.0	0.0	-0.5	0.0	6.0	6.0	6.0	6.0	15.0	15.0	16.0	15.0
Dissolved Oxygen (ppm)		3.3	3.4	5.7	5.7	7.7	8.1	8.6	8.9	10.5	10.6	11.0	10.8	2.6	3.0	5.7	4.6
% Saturation D.O.		32	33	54	55	55	59	63	66	91	91	95	93	27.0	32.0	63.0	49.0
pH		4.7	4.7	4.7	4.8	6.8	6.8	6.8	6.9	4.9	5.5	5.0	5.2	3.8	4.0	4.0	4.0
Water temp. (C)	range	10.0-10.5				-1.0-0.0				6.0				15.0-16.0			
	mean	10.3				-0.4				6.0				15.2			
% Saturation D.O.	range	32-55				55-66				91-95				27-63			
	mean	44				61				93				43			
pH	range	4.7-4.8				6.8-6.9				4.9-5.5				3.8-4.0			
	mean	4.7				6.8				5.2				4.0			
Comments		partly cloudy, air temp. 20C, water very brown, sand eroding from logging road and access road				rain, 2 ft. to 3 ft. snow cover on ground				rain, ave. air temp. 7C intermittent rain for four days preceding sampling, water very high				partly cloudy, air temp. 21C			

Table 19.14. Comparison of land use near the time of and after construction of the ROW.[1]

Land Use	Percent of Total Area Near the Time of (-) and After (*) Construction (0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%)
(A) Agriculture	.5% .5%
(C,I) Commercial & Industrial	
(F) Forest Land	-- 70.3% ** 70.3%
(E) Extractive Industry	
(N) Non-productive	
(OR) Outdoor Recreation	
(P) Public & Semi-public	
(W) Water Resources	------------------------ 29.2% ************************ 29.2%
(U) Urban Inactive	
(T) Transportation	
(R) Residential	

[1] Source: Aero Service Corp., Philadelphia, Pa. air photo No. 920-177 May 13, 1972.
USDA Soil Conservation Service air photo No. 3, 1949.

Table 19.15. Comparison[1] of 1951 PASNY cover map with reconnaissance data obtained in 1976.

Habitat	Tower No.	1951 PASNY Cover Map of ROW	1976 ROW Recon.
Mesic	75/9W to 75/8W	CAB[2] / SGSo	BLA[3]-RAS-SPI*[4] / SED-GRA-GOR*
	75/8W to 75/7W	CBAM / GSSo	
	75/7W to 75/6W	CBW / SSoGBL	BLA*-SPI*-RAS / GRA-FOR-AST-HAM-DOV
	75/6W to 75/5W	CBW / SGSoBL BWC / BISSo	
	75/5W	BWC / SoFG	
Hydric	to 75/4W	Alder BWM / SoBL	SPI-BLA*-MOH-WIL*-ZBC-ALR* / CAT-SPH-AST-GRA*BRN-PLS
	75/4W to	Alder W / SoGBl	
Mesic	75/3W	BWMC / GBLS	BLA*-SPI* / STR-GRA-GOR*HAM-ZHA
	75/3W to 75/2W	BWMC / GBlSo CBM / GSF	BLA*-RAS-SPI* / BRN*AST-GRA*GOR*DOV
	75/2W to 75/1W	CMWB / GBlSo MCBW / GSoB	BLA*-RAS-DEW / GOR*GRA*SED-DOV-BRN-WIO
	75/1W to 74/11W	CWM / GSo MCB / GF CMB / G	
	74/11W to 74/10W	CMB / So ACM / So CM / GSo	
	74/10W to 74/9W	MBAC / GBSo	

Table 19.15. Continued

Habitat	Tower No.	1951 PASNY Cover Map of ROW	1976 ROW Recon.
	74/9W to 74/8W	MCB / GBlSo	

1 Means by which data is compared:

Example: BA / SSo = birch and aspen with a ground cover of spiraea and grass sod.

2 Legend to 1951 cover map species.

A - Aspen
B - Birch
Be- Beech
C - Cherry
M - Maple
P - Pine
W - Willow
Bl- Blackberry
S - Spiraea
F - Fern
G - Goldenrod
So- Grass Sod
Gp- Ground pine

3 Legend to 1976 reconnaissance species:

ALR - Alder
AST - Aster
BLA - Blackberry
BRN - Bracken
ZBC - Black Chokeberry
CAT - Cat-tail
DOV - Trout-Lily
DEY - Dewberry
GOR - Goldenrod
GRA - Grasses
PLS - Stemless Lady's-slipper
HAM - Hair-cap Moss
ZHA - Hawkweed
WIO - Wild-oats
MOH - Mountain-Holly
RAS - Raspberry
SPI - Spiraea
STR - Strawberry
SED - Sedge
SPH - Sphagnum
WIL - Willow

4 *Species which also occur in 1951 cover map of PASNY.

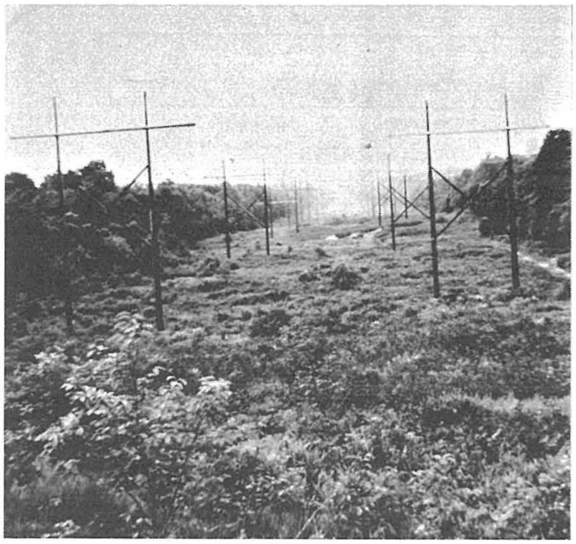


FIG. 19.1.1. General view of the ROW and adjacent forest, looking south, in summer, 1975 (Photo Station 5).

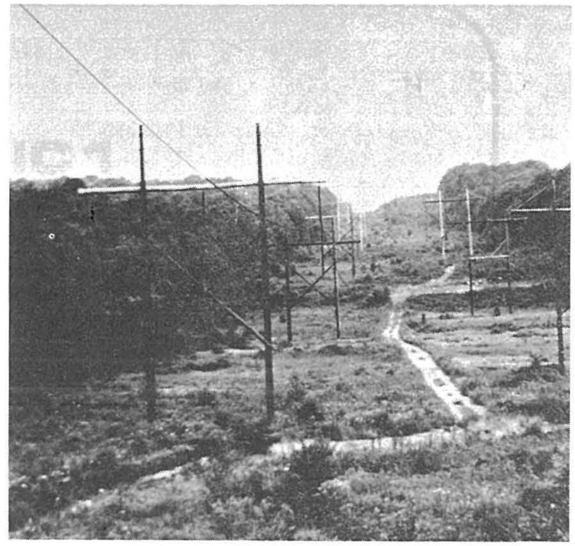


FIG. 19.1.2. General view of the ROW and adjacent forest, looking north, in summer, 1975 (Photo Station 6).

FIG. 19.1.3. Severe gully erosion on access road on ROW, in summer, 1975 (Photo Station 10).

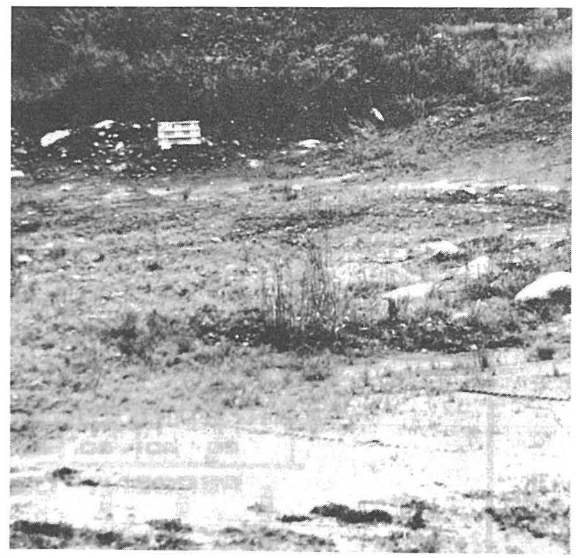


FIG. 19.1.4. Barrow pit excavation on ROW, in summer, 1975 (Photo Station 7).

FIG. 19.1.5. Winter deer browse of mountain-holly on ROW in 1976.

FIG. 19.1.6. Snowmobiling on ROW during the winter of 1976.

FIG. 19.1. Visual characteristics.

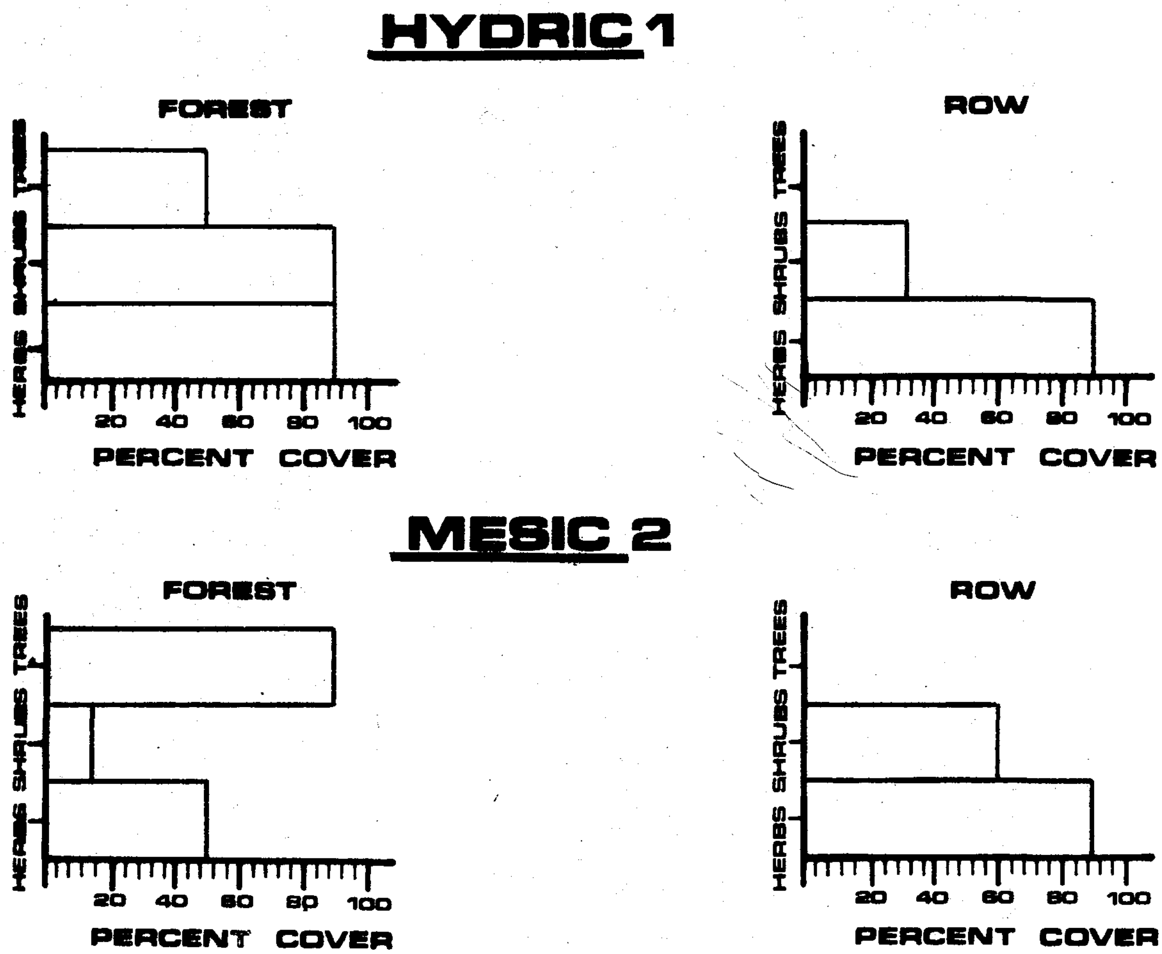


Fig. 19.2. Changes in cover value of tree, shrub, and herb layers from forest to ROW.

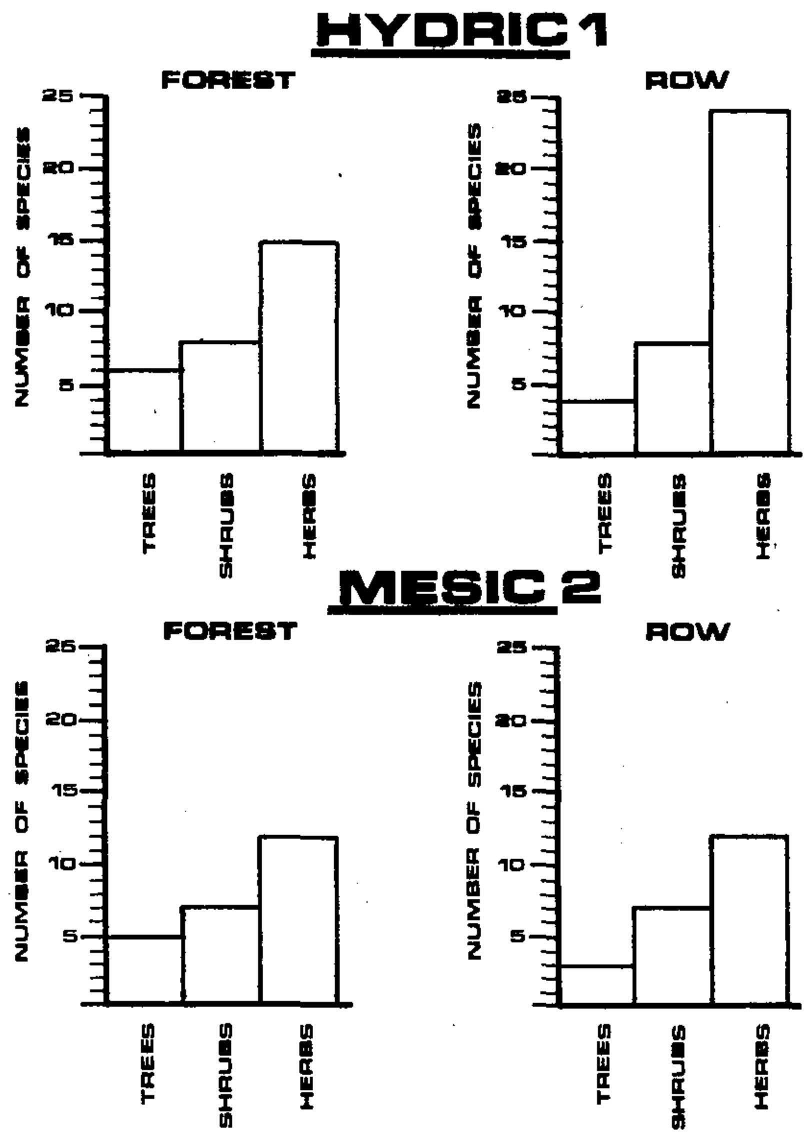


Fig. 19.3. Species diversity in the forest and on the ROW.

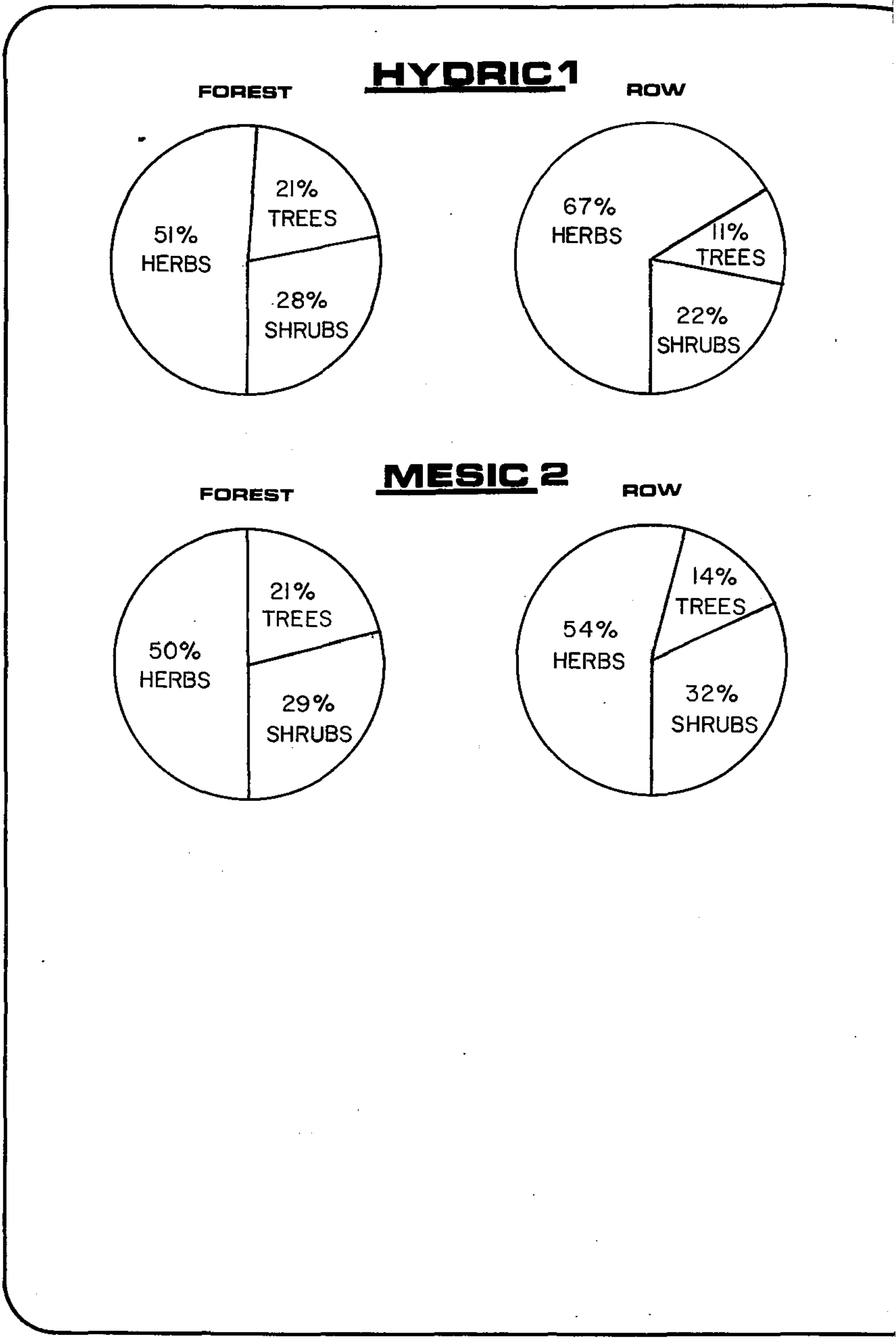


Fig. 19.4. Life form spectrum of the ROW as compared to the adjacent forest to compare speci make-up of each, based on the number of species in each life form expressed as a percent of total species.

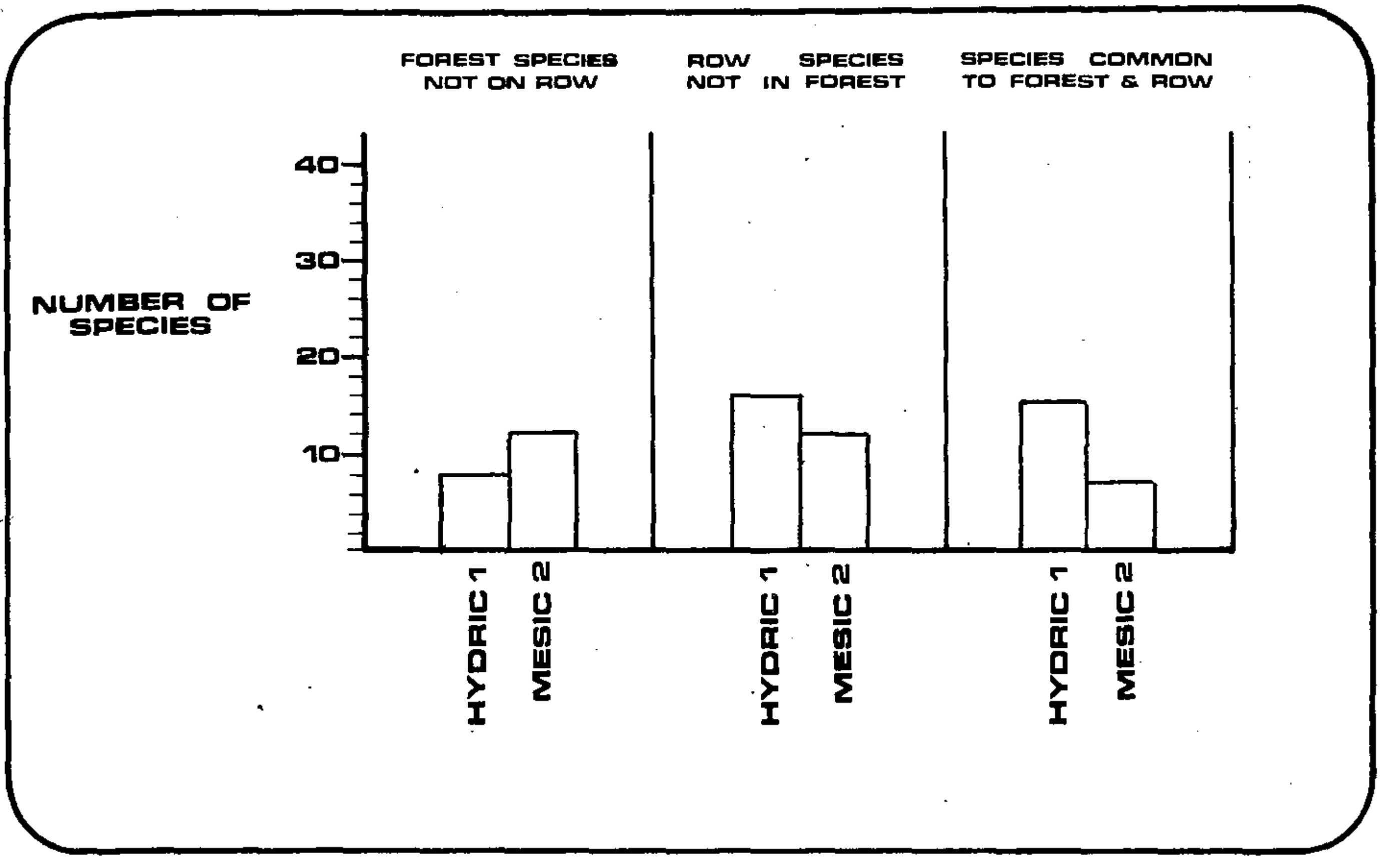


Fig. 19.5. Comparison of shrub and herb species in the forest and on the ROW.

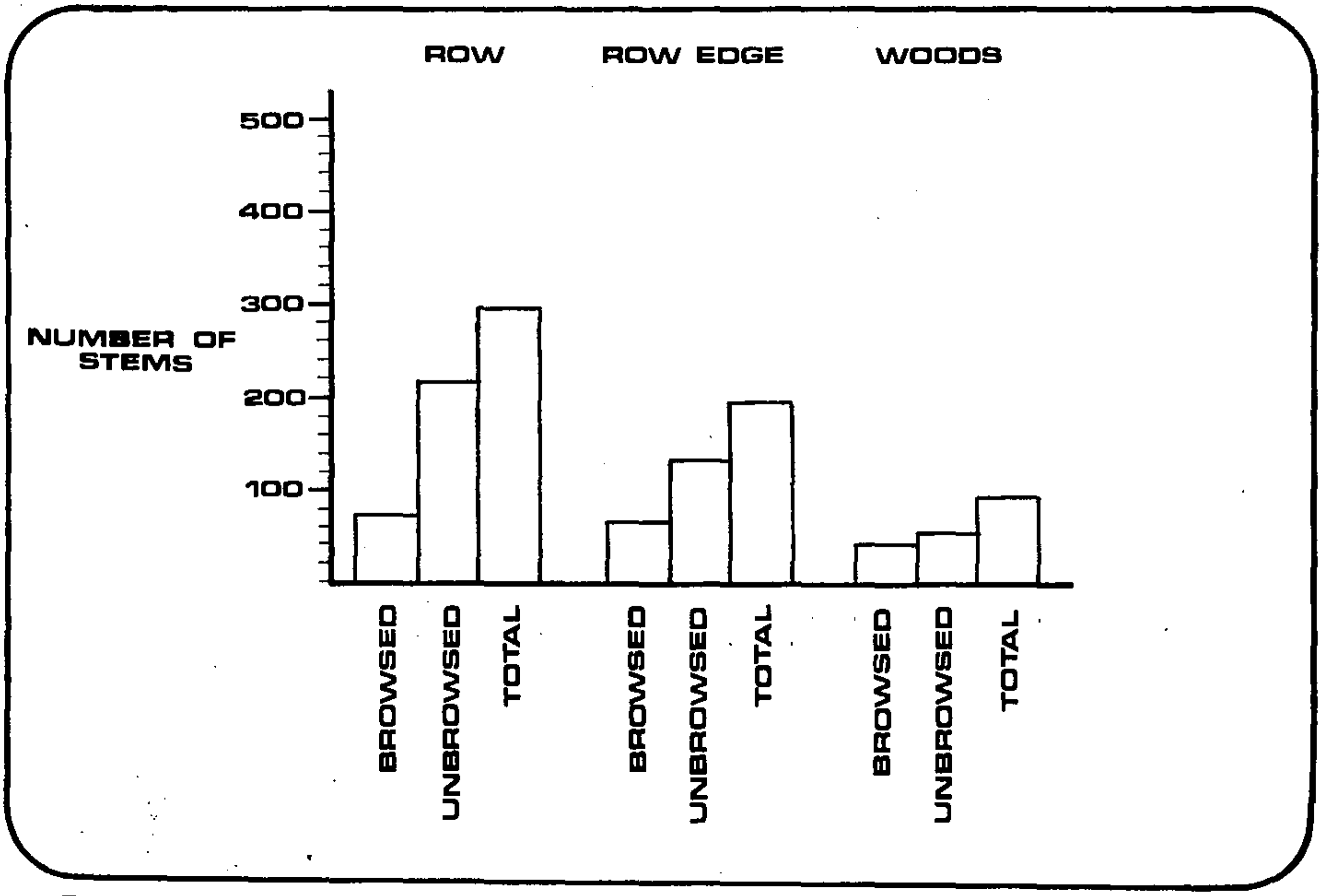
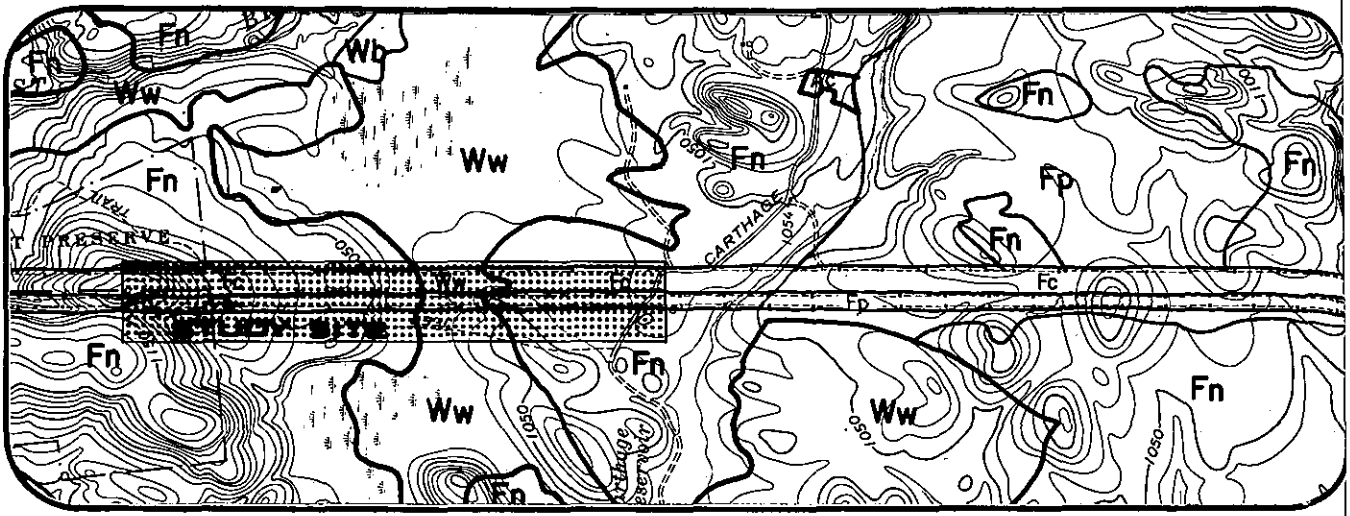
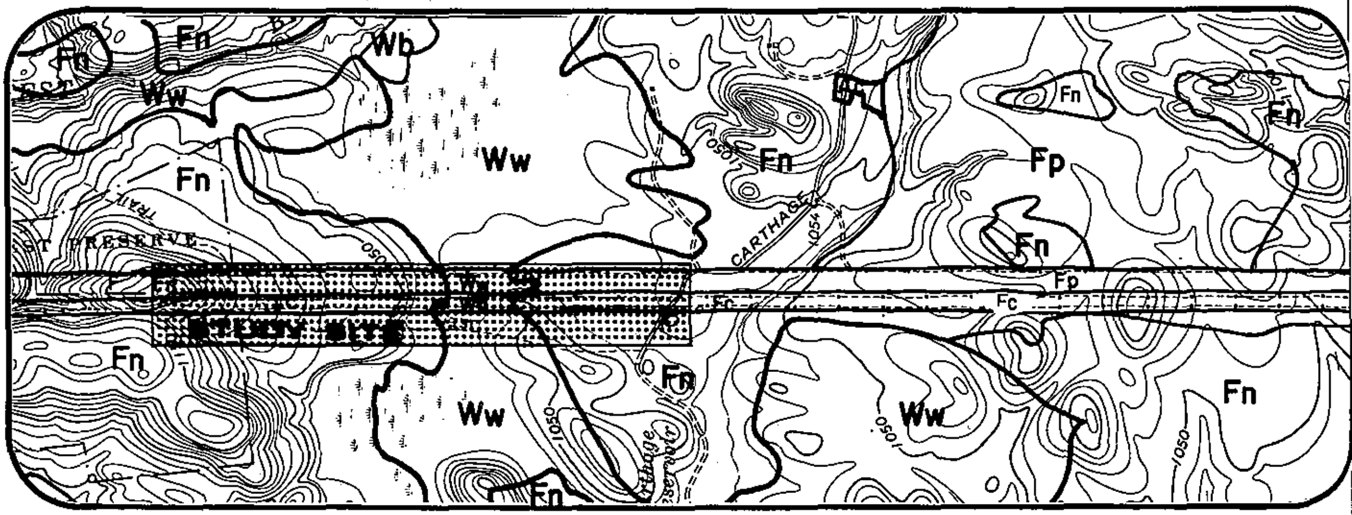


Fig. 19.6. Browse survey showing number of browsed, unbrowsed, and total stems for the ROW, ROW edge, and forest for 4 browse transects.



LAND USE PRIOR TO ROW CONSTRUCTION SCALE 1"-2000



LAND USE AFTER CONSTRUTION OF ROW SCALE 1"-2000

LEGEND FOR LAND USE SYMBOLS

FOREST LAND
- Fc - Forest Brushland
- Fn - Forest Lands
- Fp - - Plantations

WATER RESOURCES
- Wb - Marshes, Shrub Wetlands and Bogs
- Ww - Wooded Wetlands

SOURCES:
- Aero Service, Phila., Pa., air photo No. 920-177 May 13,1972
- USDA Soil Conservation Service air photo No. 3, 1949
- Area Land Use Map, LUNR, Cornell University, N.Y., 1974
- U. S. G. S. Topographic Map, Belfort, N.Y., 1966

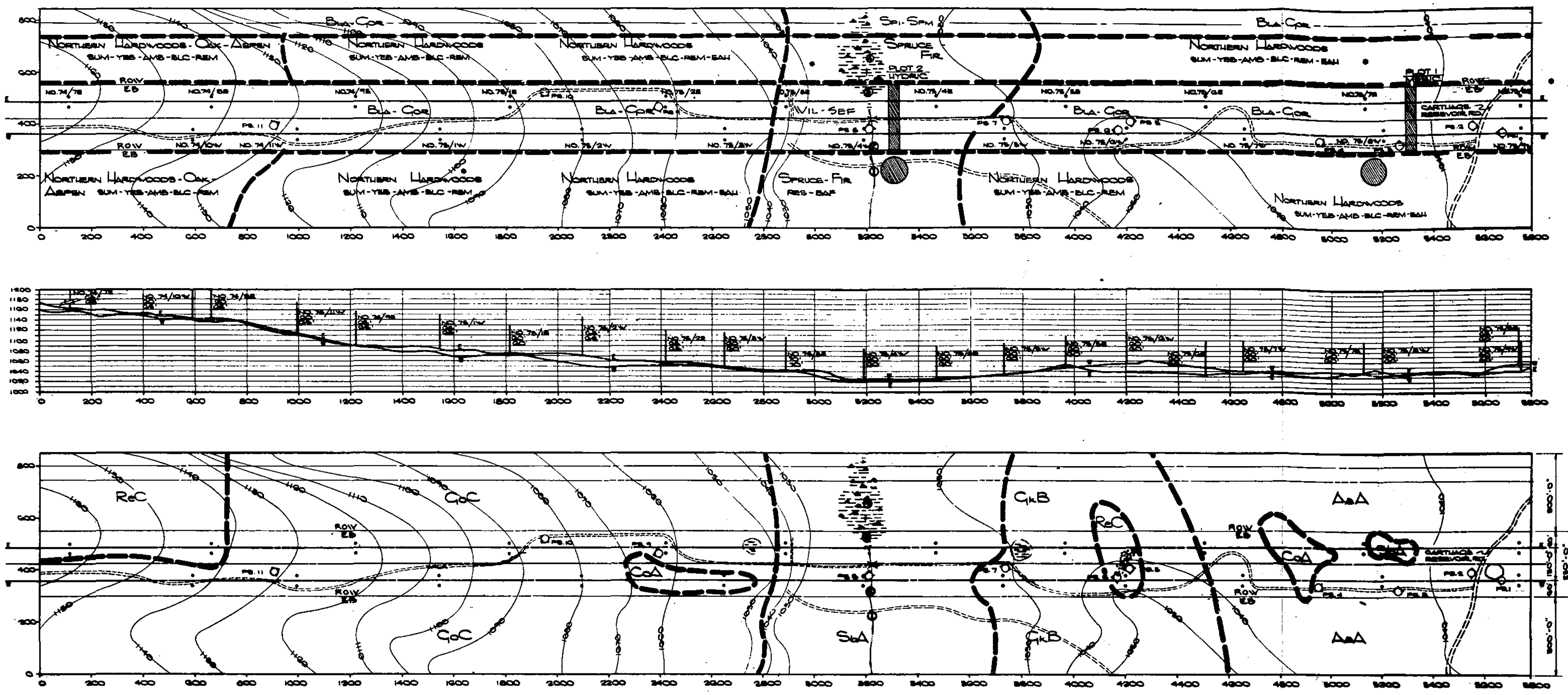
Fig. 19.7. Land use change.

ASPLUNDH ENVIRONMENTAL SERVICES
BLAIR MILL ROAD WILLOW GROVE, PA

VEGETATION

CENTERLINE PROFILE

SOILS



Location of Grouse Drumming Area approx. 600' south of Study Area

Notes:
- Vertical and Horizontal Scale in Feet
- 10 Foot Contour Intervals

LEGEND

WORKS AND STRUCTURES

- HIGHWAYS AND ROADS
- HEAVY DUTY
- MEDIUM DUTY
- LIGHT DUTY
- ACCESS ROAD
- UNIMPROVED DIRT ROAD
- NATIONAL INTERSTATE
- US ROUTE
- STATE OR COUNTY
- SINGLE TRACK RAILROAD
- MULTIPLE TRACK RAILROAD
- ABANDONED RAILROAD TRACK
- RAILROAD OVER
- RAILROAD UNDER
- FORD
- ROAD CROSSING
- BUILDING
- EXCAVATION
- MINE DUMP
- PIPELINE
- TRANSMISSION STRUCTURES
- DAMS
- CULVERT
- TANKS
- WELLS
- BRUSH AND LOG DISPOSAL SITES
- SMALL PARKS, CEMETERY, ETC. (cem)
- FENCE

BOUNDARIES

- NATIONAL OR STATE
- COUNTY
- MINOR CIVIL DIVISION
- RESERVATION, NATIONAL OR STATE
- LAND GRANT
- ROW PROPERTY BOUNDARY (ROW PB)
- ROW EASEMENT BOUNDARY (ROW EB)
- ROW CLEARING EDGING (ROW CE)
- SITE BOUNDARY
- ROW CENTERLINE
- VEGETATION OR SOIL BOUNDARY
- STRUCTURE CENTERLINE (E/W)

SITE MARKERS

- SAMPLE LOCATION
- PHOTO STATIONS
- MAPPED PLOT ON ROW
- MAPPED PLOT OFF ROW
- APPROX. LOCATION OF GROUSE DRUMMING LOG

WATER SYMBOLS

- PERENNIAL STREAMS
- INTERMITTENT STREAMS
- SMALL RAPIDS
- LARGE RAPIDS
- DISAPPEARING STREAM
- CANALS AND DITCHES
- PERENNIAL LAKES AND PONDS
- INTERMITTENT LAKES AND PONDS
- SPRING
- MARSH, SWAMP OR WET MEADOW
- WET SPOT
- ALLUVIAL FAN

TOPOGRAPHIC RELIEF

- CONTOUR (23)
- DEPRESSION CONTOUR

SOIL SYMBOL AND NAME

AaA	ADAMS	loamy fine sand (0 to 8% slope)
GkB	GLOUCESTER	sandy loam (8 to 15% slope)
SbA	SAUGATUCK	loamy fine sand (0 to 8% slope)
GoC	GLOUCESTER	stony fine sandy loam (15 to 25% slope)
ReC	ROCKLAND	(15 to 25% slope)
CoA	CROGHAN	loamy fine sand (0 to 8% slope)

SOIL SYMBOLS

- ROCK
- SAND
- SCATTERED ROCK
- BARE AND ERODING (GULLY)
- BARE AND ERODING (SHEET)
- BARE AND INCREASING IN SIZE
- BARE AND HEALING
- ERODED BUT HEALED
- CLAY AREA
- WIND EROSION

PLANT COMMUNITY SYMBOLS

shrubs

ALR	ALDER	Alnus spp.
ARR	ARROW - WOOD	Viburnum recognitum
BAR	BARBERRY	Berberis spp.
BLA	BLACKBERRY	Rubus spp.
BLH	BLACK - VIBURNUM	Viburnum prunifolium
BLU	BLUEBERRY	Vaccinium spp.
BUT	BUTTONBUSH	Cephalanthus occidentalis
CAY	AMERICAN YEW	Taxus canadensis
CFH	FLY - HONEYSUCKLE	Lonicera canadensis
CHC	CHOKE - CHERRY	Prunus virginiana
CLB	CLIMBING BITTERSWEET	Celastrus scandens
CRA	GRAPE	Vitis spp.
DEY	DEWBERRY	Rubus spp.
ELD	ELDERBERRY	Sambucus canadensis
GRD	GRAY DOGWOOD	Cornus racemosa
GRJ	GROUND - JUNIPER	Juniperus communis
HAA	COMMON ALDER	Alnus serrulata
HAW	HAWTHORN	Crataegus spp.
HAZ	HAZELNUT	Corylus spp.
HUC	HUCKLEBERRY	Gaylussacia spp.
JAR	MULTIFLORA ROSE	Rosa multiflora
MAV	MAPLE - LEAVED VIBURNUM	Viburnum acerifolium
MOH	MOUNTAIN - HOLLY	Nemopanthus mucronata
MOL	MOUNTAIN - LAUREL	Kalmia latifolia
MOM	MOUNTAIN - MAPLE	Acer spicatum
NAN	NANNYBERRY	Viburnum Lentago
NJT	NEW JERSEY TEA	Ceanothus americanus
PIF	PINXTER - FLOWER	Rhododendron nudiflorum
POI	POISON IVY	Rhus radicans
POS	POISON SUMAC	Rhus vernix
PRA	NORTHERN PRICKLY ASH	Xanthoxylum americanum
PRU	BUCKTHORN	Rhamnus spp.
RIB	RIBES	Ribes spp.
ROD	RED OSIER DOGWOOD	Cornus stolonifera
SMC	SUMAC	Rhus spp.
SPA	SPECKLED ALDER	Alnus rugosa
SPB	SPICEBUSH	Lindera Benzoin
SPI	SPIRAEA	Spiraea spp.
SMS	SMOOTH SUMAC	Rhus glabra
STM	STRIPED MAPLE	Acer pensylvanicum
STS	STAGHORN - SUMAC	Rhus typhina
SWF	SWEET - FERN	Comptonia peregrina
TAH	TARTARIAN HONEYSUCKLE	Lonicera tatarica
WIH	WITCH - HAZEL	Hamamelis virginiana
WIL	WILLOW	Salix spp.
WIN	WINTERBERRY	Ilex verticillata
WIR	WILD - RAISIN	Viburnum cassinoides
ZBC	BLACK CHOKEBERRY	Pyrus melanocarpa

trees

ABU	BUTTERNUT	Juglans cinerea
AIL	TREE - OF - HEAVEN	Ailanthus altissima
ALD	ALTERNATE - LEAVED DOGWOOD	Cornus alternifolia
AMB	BEECH	Fagus grandifolia
AMC	CHESTNUT	Castanea dentata
AME	AMERICAN ELM	Ulmus americana
AMH	AMERICAN HORNBEAM	Carpinus caroliniana
APP	APPLE	Pyrus malus
BAF	BALSAM - FIR	Abies balsamea
BAS	BASSWOOD	Tilia americana
BIH	BITTERNUT HICKORY	Carya cordiformis
BLC	BLACK CHERRY	Prunus serotina
BLL	BLACK LOCUST	Robinia Pseudo-Acacia
BLW	BLACK WALNUT	Juglans nigra
CHO	CHESTNUT - OAK	Quercus prinus
COT	COTTONWOOD	Populus deltoides
EAH	HEMLOCK	Tsuga canadensis
ERC	RED CEDAR	Juniperus virginiana
FLD	FLOWERING DOGWOOD	Cornus florida
GRB	GRAY BIRCH	Betula populifolia
HOH	AMERICAN HOP-HORNBEAM	Ostrya virginiana
LAA	LARGE - TOOTHED ASPEN	Populus grandidentata
LAR	AMERICAN LARCH	Larix laricina
NWC	WHITE CEDAR	Thuja occidentalis
PAB	WHITE BIRCH	Betula papyrifera
PIC	PIN - CHERRY	Prunus pensylvanica
PIH	PIGNUT HICKORY	Carya glabra
PIP	PITCH - PINE	Pinus rigida
QUA	QUAKING ASPEN	Populus tremuloides
RED	RED OAK	Quercus rubra
REM	RED MAPLE	Acer rubrum
RES	RED SPRUCE	Picea rubens
SAS	WHITE SASSAFRAS	Sassafras albidum
SCO	SCRUB - OAK	Quercus ilicifolia
SCP	SCOTCH PINE	Pinus sylvestris
SHB	SERVICEBERRY	Amelanchier spp.
SHH	SHAGBARK - HICKORY	Carya ovata
SUM	SUGAR - MAPLE	Acer saccharum
SWB	SWEET BIRCH	Betula lenta
VIP	SCRUB - PINE	Pinus virginiana
WHA	WHITE ASH	Fraxinus americana
WHO	WHITE OAK	Quercus alba
WHP	WHITE PINE	Pinus strobus
YEB	YELLOW BIRCH	Betula lutea
YEP	TULIP - POPLAR	Liriodendron tulipifera

herbs

BLG	BLUE - JOINT GRASS	Calamagrostis canadensis
BON	BONESET	Eupatorium perfoliatum
BRN	BRACKEN	Pteridum aquilinum
BRO	BROOM - SEDGE	Artholophis virginicus
CAT	CAT - TAIL	Typha spp.
CHF	CHRISTMAS - FERN	Polystichum acrostichoides
CIF	CINNAMON - FERN	Osmunda cinnamomea
DEG	DEERTONGUE GRASS	Panicum clandestinum
GOR	GOLDENROD	Solidago spp.
HAF	HAY - SCENTED FERN	Dennstaedtia punctilobula
HOT	HORSETAIL	Equisetum spp.
INF	INTERRUPTED FERN	Osmunda Claytoniana
IRS	IRIS	Iris spp.
JAP	SMALL JACK-IN-THE-PULPIT	Arisaema triphyllum
LET	WILD LETTUCE	Lactuca canadensis
MSF	MARGINAL SHIELD-FERN	Dryopteris marginalis
NYF	NEW YORK FERN	Dryopteris noveboracensis
PEV	PEARLY EVERLASTING	Anaphalis margaritacea
PHR	PHRAGMITES	Pragmites spp.
POG	POVERTY - GRASS	Danthonia spicata
RDM	REINDEER LICHEN	Cladonia rangiferina
ROF	ROYAL FERN	Osmunda regalis
SEF	SENSITIVE FERN	Onoclea sensibilis
SPL	SPIKED LOOSESTRIFE	Lythrum Salicaria
SPM	SPHAGNUM MOSS	Sphagnum spp.
SSS	SOLOMON'S - SEAL	Polygonatum biflorum
SWA	SWAMP - BUTTERCUP	Ranunculus septentrionalis
WHS	WHITE SNAKEROOT	Eupatorium rugosum
YPL	BULLHEAD - LILY	Nuphar variegatum

REVISIONS :

ASPLUNDH ENVIRONMENTAL SERVICES
BLAIR MILL ROAD
WILLOW GROVE PA 19090

DATA SOURCES :

Ebasco Engineering Plan & Profile, Rev 3/22/42

USGS 15 Min. Topographic Map Belfort N.Y. 1952

USDA, SCS in cooperation with Cornell Univ Agr Exp Sta Soil Survey for Lewis County NY US Gov't. Services 1954, No 10

Aero Service Corp Phila Pa Lewis Co air photo No 920-179 (Scale 1:24,000) May 8, 1972

Asplundh Environmental Services
AES Project No. 81-0028 Field Studies 1975-76

This information is a part of the ESEERCO "STUDY OF ENVIRONMENTAL AND ECONOMIC ASPECTS OF CONTEMPORANEOUS ELECTRIC TRANSMISSION LINE RIGHT-OF-WAY MANAGEMENT TECHNIQUES"

MAP 19.1

SITE 19 HABITAT CONDITIONS

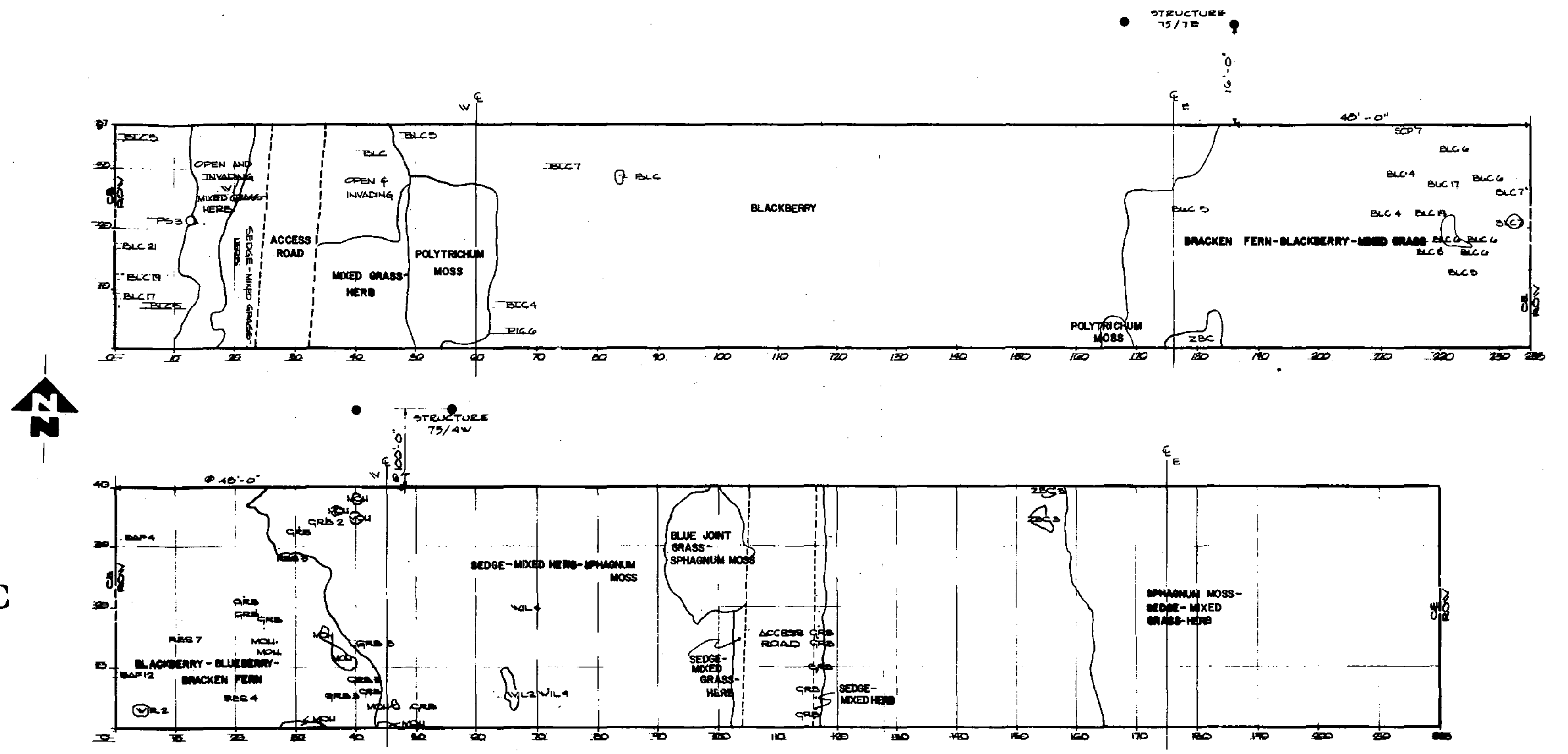
UTILITY: Power Authority State of New York
ROW DESCRIPTION: Moses to Adirondack 230 Kv.
Wooden Pole H-Frame - 250 Row.

SCALE: 1" = 200'-0"

200 100 0 100 200 400 800 1000

PLOT 1 MESIC

PLOT 2 HYDRIC



LEGEND

WORKS AND STRUCTURES

ACCESS ROAD

BRUSH AND LOG DISPOSAL SITES

BOUNDARIES

ROW CENTERLINE

ROW PROPERTY BOUNDARY

ROW EASEMENT BOUNDARY

EXISTING ROW CLEARING EDGE

STRUCTURE CENTERLINE

SITE MARKERS

SAMPLE LOCATION

PHOTO STATION

WATER SYMBOLS

PERENNIAL STREAMS

INTERMITTENT STREAMS

SMALL RAPIDS

LARGE RAPIDS

DISAPPEARING STREAM

CANALS AND DITCHES

PERENNIAL LAKES AND PONDS

INTERMITTENT LAKES AND PONDS

SPRING

MARSH, SWAMP OR WET MEADOW

WET SPOT

ALLUVIAL FAN

SOIL SYMBOLS

ROCK

SCATTERED ROCK

herbs

BLG	BLUE-JOINT GRASS	Calamagrostis canadensis
BON	BONESET	Eupatorium perfoliatum
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PLANT COMMUNITY SYMBOLS

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ELD	ELDERBERRY	Sambucus canadensis
GRD	GRAY DOGWOOD	Cornus racemosa
GRJ	GROUND-JUNIPER	Juniperus communis
HAA	COMMON ALDER	Alnus serrulata
HAW	HAWTHORN	Crataegus spp.
HAZ	HAZELNUT	Corylus spp.
HUC	HUCKLEBERRY	Gaylussacia spp.
JAR	MULTIFLORA ROSE	Rosa multiflora
MAV	MAPLE-LEAVED VIBURNUM	Viburnum acerifolium
MOH	MOUNTAIN-HOLLY	Nemopanthus mucronata
MOL	MOUNTAIN-LAUREL	Kalmia latifolia
MOM	MOUNTAIN-MAPLE	Acer spicatum
NAN	NANNYBERRY	Viburnum Lentago
NJT	NEW JERSEY TEA	Ceanothus americanus
PIF	PINXTER-FLOWER	Rhododendron nudiflorum
POI	POISON IVY	Rhus radicans
POS	POISON SUMAC	Rhus vernix
PRA	NORTHERN PRICKLY ASH	Xanthoxylum americanum
PRU	BUCKTHORN	Rhamnus spp.
RIB	RIBES	Ribes spp.

trees

ABU	BUTTERNUT	Juglans cinerea
AIL	TREE-OF-HEAVEN	Ailanthus altissima
ALD	ALTERNATE-LEAVED DOGWOOD	Cornus alternifolia
AMB	BEECH	Fagus grandifolia
AMC	CHESTNUT	Castanea dentata
AME	AMERICAN ELM	Ulmus americana
AMH	AMERICAN HORNBEAM	Carpinus caroliniana
APP	APPLE	Pyrus malus
BAF	BALSAM-FIR	Abies balsamea
BAS	BASSWOOD	Tilia americana
BIH	BITTERNUT HICKORY	Carya cordiformis
BLC	BLACK CHERRY	Prunus serotina
BLL	BLACK LOCUST	Robinia Pseudo-Acacia
BLW	BLACK WALNUT	Juglans nigra
CHO	CHESTNUT-OAK	Quercus prinus
COT	COTTONWOOD	Populus deltoides
EAH	HEMLOCK	Tsuga canadensis
ERC	RED CEDAR	Juniperus virginiana
FLD	FLOWERING DOGWOOD	Cornus florida
GRB	GRAY BIRCH	Betula populifolia
HOH	AMERICAN HOP-HORNBEAM	Ostrya virginiana
ROD	RED OSIER DOGWOOD	Cornus stolonifera
SMC	SUMAC	Rhus spp.
SPA	SPECKLED ALDER	Alnus rugosa
SPB	SPICEBUSH	Lindera Benzoin
SPI	SPIRAEA	Spiraea spp.
SMS	SMOOTH SUMAC	Rhus glabra
STM	STRIPED MAPLE	Acer pensylvanicum
STS	STAGHORN-SUMAC	Rhus typhina
SWF	SWEET-FERN	Comptonia peregrina
TAH	TARTARIAN HONEYSUCKLE	Lonicera tatarica
WIH	WITCH-HAZEL	Hamamelis virginiana
WIL	WILLOW	Salix spp.
WIN	WINTERBERRY	Ilex verticillata
WIR	WILD-RAISIN	Viburnum cassinoides
ZBC	BLACK CHOKEBERRY	Pyrus melanocarpa
LAA	LARGE-TOOTHED ASPEN	Populus grandidentata
LAR	AMERICAN LARCH	Larix laricina
NWC	WHITE CEDAR	Thuja occidentalis
PAB	WHITE BIRCH	Betula papyrifera
PIC	PIN-CHERRY	Prunus pensylvanica
PIH	PIGNUT HICKORY	Carya glabra
PIP	PITCH-PINE	Pinus rigida
QUA	QUAKING ASPEN	Populus tremuloides
RED	RED OAK	Quercus rubra
REM	RED MAPLE	Acer rubrum
RES	RED SPRUCE	Picea rubens
SAS	WHITE SASSAFRAS	Sassafras albidum
SCO	SCRUB-OAK	Quercus ilicifolia
SCP	SCOTCH PINE	Pinus sylvestris
SHB	SERVICEBERRY	Amelanchier spp.
SHH	SHAGBARK-HICKORY	Carya ovata
SUM	SUGAR-MAPLE	Acer saccharum
SWB	SWEET BIRCH	Betula lenta
VIP	SCRUB-PINE	Pinus virginiana
WHA	WHITE ASH	Fraxinus americana
WHO	WHITE OAK	Quercus alba
WHP	WHITE PINE	Pinus strobus
YEB	YELLOW BIRCH	Betula lutea
YEP	TULIP-POPLAR	Liriodendron tulipifera

REVISIONS:

9-20-76 PLOT #1 ALTERED

DATA SOURCE:

ASPLUNDH ENVIRONMENTAL SERVICES
BLAIR MILL ROAD
WILLOW GROVE PA 19090

This information is a part of the ESEERCO "STUDY OF ENVIRONMENTAL AND ECONOMIC ASPECTS OF CONTEMPORANEOUS ELECTRIC TRANSMISSION LINE RIGHT-OF-WAY MANAGEMENT TECHNIQUES"

UTILITY:

ROW DESCRIPTION: 230 KV

SCALE: 1" = 10'-0"

10 5 0 5 10 20 40 50

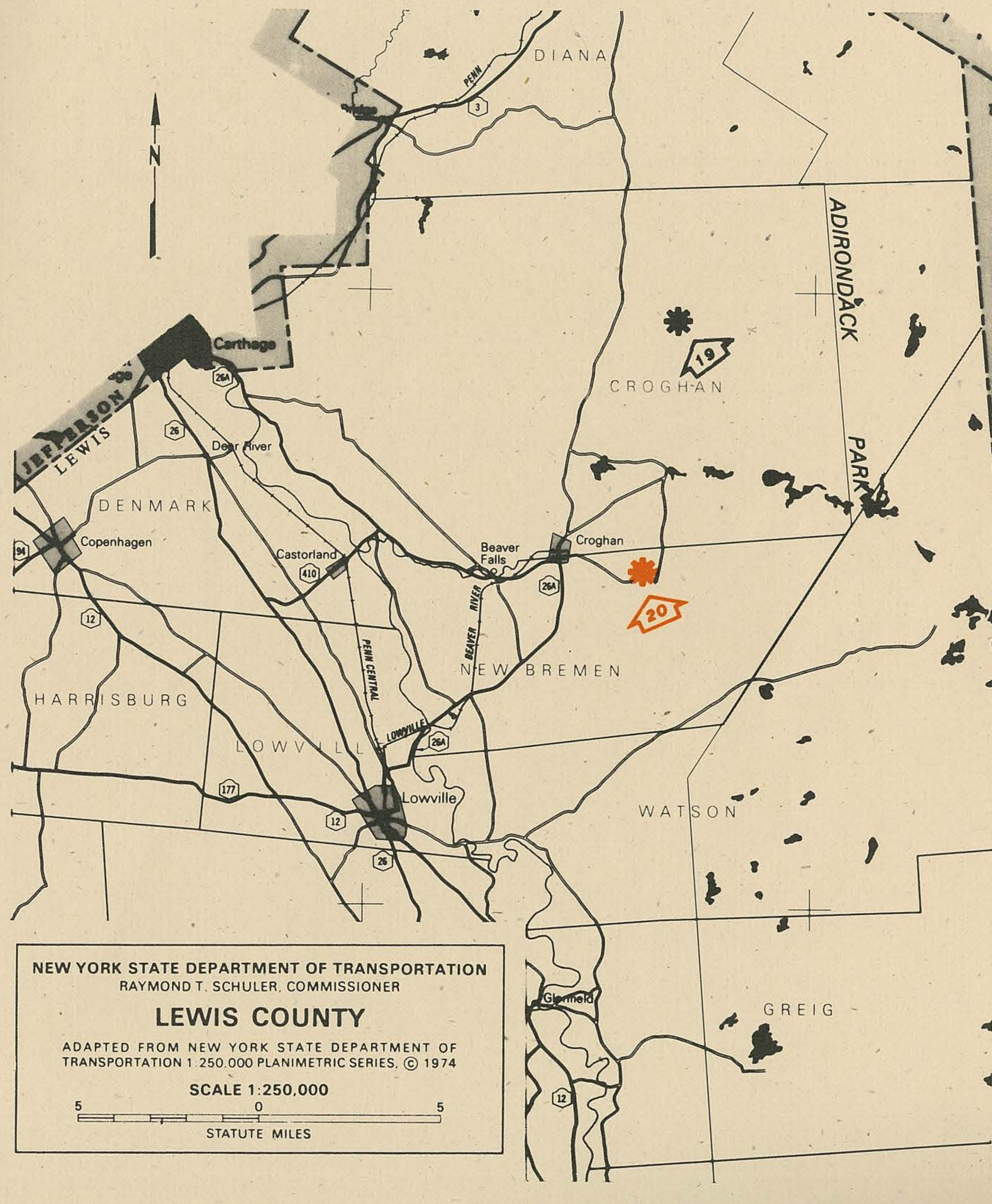
MAP 19.2

SITE 19

MAPPED PLOTS

SITE 20

ADIRONDACK to PORTER



Site 20 Adirondack to Porter

Study area extends from the barbed wire fence north of structure 35 to the fence on the south side of Kirch Road south of structure 39, in the vicinity of Croughan. To reach the area, take route 81 north to route 177. Proceed on route 177 east to route 12. Take route 12 south to (Lowville) route 26A, route 26A to (Crogham) Kirshnerville Road, then take Kirshnerville Road to Erie Canal Road and Erie Canal Road to Kirsh Road. Study area is on north and south sides of Kirsh Road.

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Site 20 Adirondack to Porter

1 Introduction

Site 20 is located in the Adirondack Highlands physiographic area of New York (Cline, 1970) in the Northern Hardwoods forest type area (Stout, 1958). The general landscape of the ROW and adjacent area is shown in Figs. 20.1.1 and 20.1.2.

The topography of the area is typically a long narrow plain with infertile, sandy, acid soils and natural forests of poor quality and low productivity. Streams flow into this area from the higher Adirondack Mountains to the east, and numerous lakes of glacial origin occur in the area (Stout, 1958).

Typical forest types of the region are Spruce-Fir and Northern Hardwoods, White Pine and Northern Hardwoods, Northern Hardwoods, and Aspen-Gray Birch-Paper Birch (Stout, 1958). Forest types present on the site were White Pine-Northern Hardwoods, Spruce-Fir and Aspen-Gray Birch-Paper Birch.

2 Location and Identification

Site 20 is approximately 6 miles north of Crystal Dale, in the town of New Bremen, Lewis County, New York (75° 19' 30" W. Longitude; 43° 51' 30" N. Latitude).

The site is on the Adirondack to Porter ROW which is operated by the Niagara Mohawk Power Corporation (NMPC). This 500-foot easement consists of 2 single circuit, 230 kV lines, each having wood pole H-frame structures. The project site is approximately 2,600 feet in length and extends from structure 34/E, north of Kirsh Road, to include structure 39/E and 39/W south of the said road.

3 Background

The following discussion outlines documentable management techniques of clearing, construction, restoration, and maintenance regarding site 20, as received from NMPC (information received May 6, 1976, from James Brogan and Kenneth Finch, Niagara Mohawk Power Corporation, Syracuse, N.Y.; telephone conversations with James Brogan, December 14, 1976, Syracuse, N.Y.). All available pertinent information and cost data are included under each operation of clearing, construction, restoration and maintenance.

3.1 Clearing

The center 250 feet of the 500-foot ROW was clear cut between mid-April and July, 1957. Brush was collected using a bulldozer with a brush rake, and burned on the ROW. No herbicide was applied at the time of clearing. The cost of clearing was $347.37 per brush acre, for approximately 519 brush acres.

3.2 Construction

Construction started on or about July, 1957, and was completed in December, 1958, or early 1959. Bulldozers were used to skid poles from road crossings to structure sites and to erect structures. Structures were framed on the ground with pole holes dur and/or dynamited. Wherever possible, the pole holes were dug with a large, heavy duty anger. Construction was contracted at an approximate cost of $421,060.00 for the northern segment. No other cost information is available.

3.3 Restoration

Access roads were not formally designated unless it became necessary for the contractor to travel off-ROW or traverse cultivated fields. The contractor was required to repair immediately any damages to these lands. Aside from this, there was no formal restoration or erosion control effort along the ROW.

3.4 Maintenance

A broadcast foliar application was completed between July 10 and July 17, 1960, using Esteron in water. Fuel oil may have been added to the spray mixture at a rate of 1 gallon of fuel oil to 99 gallons of mixture. Nine to 12 men, 3 10-wheel spray trucks with 300 to 500 gallon spray tanks, and a 500-gallon resupply tank truck were used. No unit cost data is available.

In 1970, the ROW was heliocopter treated with Tordon 101 mixed with Norbak particulating agent and water, at a rate of approximately 1.3 gallons per brush acre. Approximately 712 brush acres were treated at a total cost of $70,000.00.

4 General Reconnaissance

A general reconnaissance was made in accordance with the methodology and is set forth in Map 20.1 which shows site habitat conditions. In this reconnaissance it was noted that the major vegetational types correlated with the soil types on the mesic and hydric habitats.

The existing visual character of the ROW is depicted during all seasons of the year, from important vantage points both on and off the ROW. These points are identified as photo stations and are located on Map 20.1 and described in Appendix 17. Specific reference is made to some of these photo stations throughout the report and illustrated in Fig. 20.1. With the exception of aerial photography used to identify land use, older photographs depicting the area are not available.

Within the surrounding landscape the ROW site is generally pleasing to view. In season, the adjacent swamp to Kirch Road evidences unusual plants and the ROW opens a vista exposing pleasant, rolling and broad landscapes. The appearance of the existing ROW is in general harmony with the surrounding area. The area is fairly remote with one gravel road crossing the site (Kirch Road) which is apparently not well traveled. The area immediately adjacent to, and to the north of, Kirch Road is a Sphagnum swamp or bog. Landscape beyond the ROW is characterized by some agricultural use. The ROW is clearly visible from Kirch Road. The terrain is basically flat, although it is gently rolling and structures can therefore be seen for some distance. The potential number of people viewing the ROW is low. The site is located in a rural area with no residences near the study area.

5 Field Studies - Results and Discussion

5.1 Soils

5.1.1 Geology and Soils

Site 20, Adirondack to Porter ROW, is located in Lewis County in that physiographic region termed the Adirondack Highlands by Cline (1970), and the Western Adirondack Hills subdivision of the Adirondack Upland land form region by Thompson (1966), in the Black River drainage basin. Bedrock geology is of Precambrain age, pre 1,100 to 570 million years ago, consisting predominantly of metamorphic rocks such as granitic gneiss. In this area glacial drift was deposited, and soils developed in glacial till, a heterogeneous mixture of cobbles, gravel, and sand, silt, and clay deposited directly by the ice sheet, and glaciofluvial outwash consisting of deep sands that were reworked by water following deposition by the glacier (Broughton et al., 1973; Pearson et al., 1960).

Several of the soils on this site are classified in the order Spodosols, suborder Orthods, indicating their leached surface horizons, and accumulations of organic matter, iron and aluminum in the subsurface horizons (Adams, Colton, and Duane soil series). Walpole and Ridgebury soils are in the order Inceptisols, suborder Aquepts, indicating the absence of horizons of marked accumulation of clay, and iron and aluminum oxides (Buckman and Brady, 1969; Soil Survey Staff, 1975). The major soil association on site 20 is Adams-Colton, which is dominated by coarse-textured soils on gravel or sand, with soils easily shifted by wind (Pearson et al., 1960). Brief descriptions (Pearson et al., 1960; Anon., 1972) of soil types occurring on the ROW study site (Map 20.1; Table 20.1) follow:

Adams loamy sand (AbB): These soils developed on glaciofluvial fine sands derived mainly from gneiss, granite, and syenite, and occupy level to steep topography. Generally deep and excessively drained on this site even with the presence of cemented zones, the Adams soils are commonly subject to blow-outs where the original forest cover has been removed. Soil reaction was pH 4.6 on this site in the surface mineral soil, and the soil is typically very strongly acid, ranging from pH 4.0 to pH 5.0 in the upper 10 inches of a typical profile. Assigned to Woodland Suitability Group 5s1, Adams soils evidence low potential productivity for timber (Class 5) and sandy soils which impart low water-holding capacity and normally low availability of nutrient elements (Subclass s). On this site Adams loamy sand occurs in close association with Colton loamy sand, and the 2 are mapped together.

Colton loamy sand (AbB): Colton soils developed on sandy and gravelly glacial outwash and deltaic deposits derived chiefly from gneiss and granite, and occur on nearly level to steep terrain. These soils are well drained despite the presence of discontinuous cemented zones in the subsurface, and where variations with gravel occur, drainage may be excessive. Very strongly acid in general, although soil reaction may range from pH 4.5 to pH 6.0 throughout a typical profile, on this site it was pH 4.6 in the surface 3 inches. Colton loamy sand is assigned to Woodland Suitability

Group 4s2, designating moderate productivity for timber, and sandy soils acting as a restriction or limitation for woodland use or management. Again, Colton loamy sand occurs on this site in close association with Adams loamy sand, and the 2 are accordingly mapped together.

Duane sandy loam (DcA): Duane soils developed on glaciofluvial materials derived mainly from gneiss and granite, and occupy the level terraces or benches at the bases of slopes. Generally moderately well drained, on this site slight cementation restricted water drainage in most instances to cause imperfect drainage. Depth to the seasonal water table is 1 to 1½ feet. Ranging in soil reaction from strongly to extremely acid, normally it is pH 4.5 to pH 5.5 in the surface 14 inches, but here it was pH 4.0 in the upper mineral horizon. Duane is assigned to Woodland Suitability Group 4o1, which is moderate for woodland production with no significant restrictions for woodland use or management.

Ridgebury stony loam (RbA): These soils formed on glacial till of Late Wisconsin age which were derived from gneiss and granite, and which occupy level to gently sloping, slightly depressional areas in the uplands. Ridgebury soils are poorly drained, are mottled, and are underlain by a fragipan at about 18 to 30 inches. Depth to the seasonal water table ranged from ½ foot to 1½ feet. The soil is generally strongly acid, and ranges from pH 4.5 to pH 5.5 in the upper 14 inches of a typical profile; it was pH 4.7 in the surface horizon on this site. Ridgebury soils are in Woodland Suitability Group 4w3, denoting moderate timber productivity and excessive wetness causing significant limitations for woodland use or management, in this case in the form of restricted drainage and a high water table.

Walpole loam (WbA): These soils formed on sandy and gravelly outwash composed mainly of gneiss and granite, and occupy nearly level to slightly depressed terrain. Poorly drained, Walpole loam evidences mottling beginning at 4 inches. In winter and spring, the water table is at the surface, but the permanent water table never drops below depths of 3 to 4 feet. It is a strongly acid soil, and generally ranges from pH 4.5 to pH 5.5 in the surface 24 inches of a typical profile; soil reaction was pH 5.0 in the upper 3 inches on this site. Walpole is in Woodland Suitability Group 4w3, which is moderate for woodland production with management limitations related to poor drainage and a high water table.

5.1.2 Humus Types

Organic layers present on the soil surface of the ROW and adjacent woodland were measured on 1 mesic upland location, the mesic vegetation plot. Average thickness of the organic layers and A1 horizon was based on 5 samples taken at the edges, mid-point, and center of both the woods and ROW study plots (Table 20.2). The presence and thickness of these layers were used for humus type classification. Other mesic locations were observed at random both in the adjacent forest and on the ROW, and, as it was determined that the soils of the mesic vegetation plot were typical, no second site was recorded. In addition, the humus classification key is not adaptable to areas exhibiting prolonged water saturation in the surface soil, and thus similar measurements were not made on the hydric site.

All organic layers (litter, fermentation, and humus) and an A1 horizon (mixed mineral and organic) were present on both the ROW and woodland. Based on thickness of the fermentation, humus, and A1 layers, the predominant humus type was designated a "thin duff mull with very shallow A1". Both litter and humus layers were thinner on the ROW than in the woodland, but differences were not great. Organic layers in the woods were composed primarily of tree parts (leaves, twigs, and fruit) in contrast to the leaves and stems of grasses, herbs, and shrubs on the ROW.

The area may have been plowed in the past; if so, the A1 horizon noted is developing in an old A1 horizon. The same area may have been grazed in the past, but there is no evidence of recent fires. The adjacent woodland may well have been cleared in the past, as trees in the area appear to be approximately 30 years old.

Based on these limited observations, it appears that ROW construction and periodic maintenance for brush control and possible cultivation did exert some influence on organic matter accumulations. Elimination of the forest cover also resulted in a change in kind of organic material. However, regrowth and persistence of a mixed grass-herb-shrub cover has produced annual litter depositions and continuation of a protective organic layer.

5.1.3 Soil Erosion

Current Active Erosion Observations of active soil erosion on the ROW and adjacent woodland were made on the Adirondack to Porter study area in May, 1976. No active erosion was evident in the woodland on any soil type or slope, apparently due to the protective canopy of trees and shrubs and undisturbed organic layers present on the soil. However, active erosion was observed on 3 locations on the general ROW, where the soil surface had evidently been disturbed by man; the ground cover consisted of moss on 1 location (Fig. 20.13), poverty-grass-dewberry on the second, and the third was bare and eroding. It should be noted that this erosion occurs in the Adams-Colton loamy sands, soils that are highly susceptible to wind erosion where the original forest cover has been removed. On the remainder of the ROW, good vegetation cover, composed of grasses, herbs, and low shrubs, had developed on the general ROW following chemical treatments for brush control, and a protective litter mulch from these plant parts was present (Table 20.2).

Other eroding areas on the ROW were identified as to location on the ROW, soil type, average slope, and present plant cover (Table 20.3). Erosion was classified as to kind (sheet, rill, gully) and class (slight, moderate, severe); no gullies were noted, but the locations of an excavation and a large eroding area, along with several open areas of sand, were plotted on the base map (Map 20.1). Other than some sheet and rill erosion on the general ROW, noted above, additional erosion was limited to areas that had been subjected to past and/or recent mechanical disturbance of the soil, particularly access roads and an excavation (Fig. 20.1.4). The areas subject to sheet erosion and wind blowing had their protective vegetation covers removed. Sediment frequently left the ROW via wind erosion, but sand from the open area above the northernmost stream, and sediment from the adjacent bare and eroding area, left the ROW via that stream.

There was no restoration in the form of seeding and planting following construction of this ROW. Denuded areas are therefore dependent upon natural plant invasion for stabilization. Access roads had generally healed, and in the areas where erosion occurred, had acquired a covering of poverty-grass and a developing cover of hair-cap moss. Sheet and rill as well as wind erosion on several areas apparently prevent natural plant invasion, since these areas generally were devoid of plant cover. Invasion of several open areas by moss, poverty-grass, and dewberry is apparently occurring slowly. There were no areas of mass land movement such as landslides on this site.

5.2 Vegetation

5.2.1 Habitat and Forest Types on the Site

Hydric Habitat The hydric, or wet, habitat (1) was located in a slightly depressed, upland area, where the slope was negligible and aspect was flat. Drainage was impeded and a *Sphagnum* bog developed. The forest type was typical Spruce-Fir with sparse white pine, white birch, and gray birch.

Mesic Habitat The mesic, or medium moist, habitat (2) was located on a low knoll which rises at about a 5% slope. The plot itself is located on a nearly level section, and slope is negligible and aspect is flat. Drainage was free to somewhat excessive, and the area approached xeric conditions. The forest type was Aspen-Gray Birch-Paper Birch, with quaking aspen, gray birch, and white birch the predominant species. Some Northern Hardwoods type species occurred in the shrub layer, including beech, red spruce, and black cherry.

5.2.2 Analysis of Forest Types and Associated ROW Vegetation

General Changes in Vegetation The primary impact of the ROW was to cause a change from a forest with a 4-layered structure to a shrub-herb-grass community. Obviously, removal of the trees caused this; and what was essentially a 2-layered ROW community developed, with the shrub layer consisting of shrubs and small trees which were not removed by maintenance spraying, or which have arisen since the last spray application (Fig. 20.2).

In order to more completely characterize the forest types, an analysis was made on the forest plots to derive importance values for the species (Table 20.4). Obviously, black cherry, quaking aspen, white pine, and red maple are important species on the mesic plot. No importance values were determined for the hydric plot.

On the hydric habitat, a Spruce-Fir forest type was changed to a Willow-*Sphagnum* plant community. On the mesic habitat, an Aspen-Gray Birch-Paper Birch forest type was changed to a Blackberry-Goldenrod plant community (Map 20.1; Table 20.5).

Quantitative Changes No major increase in the number of shrub species on the hydric and mesic habitats was apparent on the ROW as compared to the adjacent forest (Table 20.5; Figs. 20.3 and 20.4).

An increase in the amount of herbs occurred on the hydric habitat on the ROW as compared to the forest; there were 11 forest species as compared to 16 on the ROW. On the mesic habitat, there was a notable increase in the number of herb species on the ROW, 22, as compared to the forest, 17 (Table 20.5).

Qualitative Changes On the hydric habitat, 9 species from the shrub and herb layers occurred both in the forest and on the ROW (Fig. 20.5), while 9 species occurred in the forest but not on ROW (Table 20.6), and 14 species were on the ROW but not in the forest (Table 20.7). Three of the 9 species which occurred in the forest were shrubs, namely, mountain-holly, winterberry, and teaberry (Table 20.6). Shrub willow, spirae and blackberry occurred on the ROW, only (Table 20.7). In the herb layer on the hydric habitat, 6 species occurred in the forest alone and 11 were found on the ROW and not in the forest (Tables 20.6 and 20.7). Of those 11 herbs, such unique plants as round-leaved sundew and rose pogonia were present.

On the mesic habitat, 12 species from the shrub and herb layers occurred both in the forest and on the ROW, while 9 species occurred in the forest only, and 15 occurred on the ROW and not in the forest (Fig. 20.5). One shrub, sour-top-blueberry, was found in the forest alone, and 2 shrubs, black chokeberry and arrow-wood, occurred on the ROW only. Sour-top-blueberry was found both on the ROW and in the forest on the hydric site. In the herb layer, 8 species occurred in the forest alone and 13 were unique to the ROW (Tables 20.6 and 20.7). Plants such as goldenrod and aster were prominent on the mesic habitat, with goldenrod occurring only sparsely in the woods (Table 20.5).

In general it appears that the ROW had an impact on the number of species on the ROW and the forest, and there was a difference in the kind of species that occupied both the forest and the ROW; that is, light-loving species of open areas occurred mainly on the ROW, while shade tolerant plants occurred mainly in the forest.

5.2.3 Analysis of Plant Communities for On-ROW Mapped Vegetation Plots

Table 20.8 presents a breakdown of major vegetational communities (Map 20.2) for hydric and mesic sites on the Adirondack to Porter ROW. Much of the present composition of herbaceous and woody plant communities on this area can be explained by the spraying history.

The last 2 herbicide treatments on this ROW area consisted of broadcast spraying, the most recent an aerial application with Tordon 101 in 1970.

A Sphagnum-Sedge-Mixed Grass-Herb community occupies the majority of the hydric site. These are species that apparently are not generally damaged by herbicides, and appear to have expanded greatly since clearing and line maintenance. Also, round-leaved sundew and rose pogonia were quite prolific throughout the hydric areas and apparently had not been adversely affected by the herbicide application.

Bracken-Mixed Grass-Herb alone and in combination with dewberry, blackberry, and spiraea, occupied the majority of the mesic site. These shrubs and herbaceous species apparently have seeded-in since line clearing and maintenance. If broadcast foliar treatment is continued, a reduction in the shrubs present on the ROW may be expected. Grasses do not appear to be damaged by herbicides or directly affected by the broadcast spray; they occupy a large portion of the herbaceous plant material on this ROW.

Certain shrubs that occur in the understory of the adjacent woods are not found on the ROW area of the mesic site. These include mountain-holly, winterberry, and sour-top-blueberry. It may be that these were eliminated from the line area, either from the initial clearing by not being able to adapt to the new light conditions, or from repeated broadcast sprays.

5.2.4 Comparison of Forest Type with ROW Vegetation

The ROW was clear cut during the spring and summer of 1957 and all trees, brush, and debris were burned on the site. No herbicide was applied at the time of clearing. In 1960 a broadcast foliar application was made in the study area between July 10 and July 17, using Esteron in water. It appears that fuel oil may have been added to the spray mixture at a rate of about 1 gallon of fuel oil per 99 gallons of mixture. In 1970 the ROW was aerially sprayed by helicopter with Tordon 101 mixed with Norbak particulating agent and water.

The general impact of the above treatments of the ROW was to change the forest types (Spruce-Fir, Aspen-Gray Birch-Paper Birch, White Pine-Northern Hardwoods) to shrub-herb-grass communities. In various areas of the ROW, desirable and undesirable species were present, some from stump sprouts (Fig. 20.1.5), and some which apparently seeded-in or were left after maintenance (Fig. 20.1.6).

On the hydric habitat, which was formerly occupied by a Spruce-Fir forest type, a Willow-Sphagnum plant community was produced. There was no significant change in the total number of shrub and herb species on the ROW as compared with the forest. There was a qualitative difference in shrub and herb species on the ROW as compared to the forest, with some shrubs of the forest not on the ROW, and several important shrubs of the ROW lacking, or sparse, in the forest. The same was true for herbs, i.e., some herbs of the forest were not on the ROW, while some herbs of the ROW were not in the forest.

On the mesic habitat, formerly occupied by an Aspen-Gray Birch-Paper Birch type, a Blackberry-Goldenrod community was produced. There was no significant change in the total number of shrub and herb species on and off the ROW, although there was a qualitative change in the kind of species present.

5.3 Wildlife

The major game species for site 20, Adirondack to Porter, were determined by Asplundh Environmental Services (AES) in conjunction with the New York State Department of Environmental Conservation (DEC). These species are white-tailed deer, varying hare, and ruffed grouse.

5.3.1 Actual Use

White-tailed Deer White-tailed deer observations consisted exclusively of signs, i.e., tracks, browse, and pellets. Deer tracks were slight throughout the entire study area. Deer browse and pellets were found in moderate abundance in the woods west of mesic plot 2.

Browse Survey Four browse transects were established on study area 20 (Tables 20.9 and 20.10; Fig. 20.6). These study transects were established at each permanent study plot location, with 1 transect on each side of the ROW, on May 3, 1976.

Overall browse utilization was low, 8% in the woods, 3% on the ROW, and 2% at the ROW edge. This may be an indication that the deer population is not large in this area. Browse utilization by percent actual use was highest in the woods. More stems were available on the ROW edge than on the ROW or in the adjacent woods, and more in the woods than on the ROW (Table 20.9; Fig. 20.6).

Teaberry was by far the most abundant plant species available, but it was not browsed. Dewberry, spiraea, and black cherry were the next most abundant species, in that order (Table 20.10).

Blackberry, black chokeberry, spiraea, and pin-cherry were utilized more than any other species (Table 20.9).

Ruffed Grouse On April 17, 1976, from 6:45 a.m. to 7:30 a.m., a ruffed grouse drumming count was made at site 20. The weather was sunny, with winds of 10 to 15 mph, and a temperature of 55 F.

One bird was noted drumming in the woods immediately adjacent to the ROW on the west side, near structure 36. It is possible that a second bird was also drumming near structure 37, but due to wind conditions, a positive finding was not made.

Another count was made on May 3, 1976, and the 1 bird was again heard drumming off the ROW near structure 36.

Additionally, a brood of grouse was observed immediately adjacent to the ROW on the west, crossing Kirch Road, during the spring of 1975. One grouse was flushed during the fall of 1975 from the forest on the west side of the ROW near structure 36.

Varying Hare Varying hare observations consisted exclusively of signs, i.e., tracks, browse, and pellets. Hare activity on the ROW was slight to moderate as evidenced by tracks and pellets. Hare activity was slight in the woods east of the ROW at hydric plot 1, as indicated by the presence of pellets. Heavy hare activity was noted in the woods to the east of mesic plot 2, as evidenced by numerous pellets and browse, particularly on blackberry.

Miscellaneous Wildlife Observations Various birds were seen and/or heard on the study area throughout the period of this study. Birds observed on the ROW and on the ROW edge are included in Table 20.11.

During the summer of 1975, 1 bullfrog was seen floating in a small pond on the south side of Kirch Road. A field mouse was observed running on the ROW near structure 38, and 1 ribbon snake was seen hunting on ROW.

No wildlife was noted during the winter months on this ROW. However, each time the ROW was visited the weather was very severe with blizzard conditions prevailing.

Spring peepers were heard in moderate chorus during the spring of 1976. Also noted were 2 active woodchuck burrows.

5.3.2 Potential Use

Potential wildlife use of the plant species present on site 20 for the 3 major game species, deer, hare, and grouse, is contained in Table 20.12. In addition to asterisk ratings from New York, asterisk ratings from Pennsylvania were included for those plant species present on the study area that were not rated in the New York evaluation for deer; both Pennsylvania and Maine ratings were included for grouse; and ratings from Minnesota were included for hare. This additional data should provide supplemental information to the ROW manager regarding those plant species that may be of potential value to those game species (Martin et al., 1951).

5.4 Land Use

5.4.1 Location

Site 20 is located in a rural nonfarm section of the town of New Bremen, Lewis County, New York. Between 1960 and 1970 there was a 1.7% increase in population of Lewis County with a 1970 distribution of 15.5% urban, 65.4% rural nonfarm, and 19.1% rural farm (U.S. Bureau of the Census, 1972). The closest community is Crystal Dale which is approximately 6 miles to the north.

5.4.2 Land Use Prior to Construction

The ROW was constructed during 1957. The earliest available data obtained from 1949 aerial photography indicates that the location of the ROW and adjacent land to the ROW was primarily rural nonfarm (Table 20.13; Fig. 20.7). Land use distribution included the following subtypes:

Agriculture:
- Ac - Cropland and cropland pasture
- Ap - Pasture

Forest Land:
- Fc - Forest brushland
- Fn - Forest lands
- Fp - Plantations

Non-Productive:
- Ns - Sand

Residential:
- Rl - Low density

Water Resources:
- Wb - Marshes, shrub wetlands, and bogs
- Ww - Wooded wetlands

5.4.3 Land Use After Construction

The adjacent land use to site 20 has had a minimal change from the 1949 data, with an increase in extractive industry uses and a decrease in agricultural uses. The land adjacent to the ROW is still rural nonfarm (Table 20.13; Fig. 20.7), with a land use distribution that includes the following subtypes:

Agriculture:
- Ac - Cropland and cropland pasture
- Ap - Pasture
- Ai - Inactive agricultural land

Extractive Industry:
- Eg - Sand and gravel pits

Forest Land:
- Fn - Forest lands
- Fp - Plantations

Non-Productive:
- Ns - Sand

Residential:
- Rl - Low density

Water Resources:
- Wb - Marshes, shrub wetlands, and bogs
- Ww - Wooded wetlands

In addition to the use of the ROW for the transmission of electrical power, portions of the ROW are currently being used for hunting.

6 Evaluation, Interpretation, and Summary of Results

6.1 Conditions Which Existed Prior to Establishment of ROW

Soil, vegetation, and wildlife habitat conditions existing prior to ROW construction were based on observations made during the period of this study on adjacent undisturbed forest areas on both sides of the ROW.

6.1.1 Soils

This site is located on a gently rolling plain dominated by glacial outwash terraces and deltas and glacial till over granite and granitic gneiss bedrock. Topography includes slight depressions, nearly level benches, and gentle slopes with gradients generally less than 8% on north and south aspects. Surface mineral soils are very strongly acid and predominantly loamy sands and loams, with a small inclusion of sandy loam. Soils present on the site include the well- to excessively drained Adams-Colton loamy sand, 2 series which are closely associated on level to gently sloping outwash deposits; moderately well-drained Duane sandy loam on level outwash terraces and benches; and, poorly drained Ridgebury and Walpole loams on slightly depressed upland till and depressed outwash, respectively.

Landforms, soil types, and associated drainage conditions described above were present in the adjacent forest and likely are similar to conditions present at the time of ROW construction in 1958 to 1959. Predominant tree species occurring on these soil and moisture regimes were black cherry, quaking aspen, white pine, and red maple on the well-drained mesic soils, and red spruce, white pine, aspen, and gray birch on imperfect to poorly drained hydric soils. All soil types were rated low to moderate for woodland production with management limitations due to wetness or sandy conditions, except Duane sandy loam, which has no restrictions.

The forest floor on mesic habitats, based on measurements at 1 plot plus random checks, was composed of all organic layers, 1.1 inches thick, and shallow incorporation of organic matter in mineral soil (Al horizon). The predominant humus type was a "thin duff mull". Litter deposits were mostely from tree leaves, needles, twigs, and fruit. No active erosion was observed on any soil type or slope in the forest.

6.1.2 Vegetation

Prior to ROW establishment (1957) much of this area was forest brushland. The woody cover had probably seeded-in on fields previously in agriculture. Many of these young forest stands were of the Aspen-Gray-Birch-Paper Brich type. On mesic and xeric sites the Spruce-Fir type also occurred. Here paper birch, white pine, and gray birch were associate species.

6.1.3 Wildlife

Wildlife, being mobile species which may or may not be observed during site visitation, were reasonably imputed to this area by the composition of the forested areas adjacent to the ROW. It can be assumed that those species currently occupying the site, i.e., white-tailed deer, ruffed grouse, and varying hare, utilized the habitat prior to ROW construction. Although current wildlife activity may be influenced by the presence of the ROW, it is likely that those species, designated by the DEC in conjunction with AES as major in this area, inhabited the vicinity before ROW construction. The degree of use is impossible to determine at this time.

6.1.4 Land Use

The earliest data available prior to construction of the ROW in 1957 is 1949 aerial photography. The ROW and adjacent land area was rural non-farm with a land use distribution of agriculture (24.6%), forest land (68.8%), non-productive (2.4%), water resources (3.8%), and residential (.4%).

6.2 Conditions Which Exist at Present

6.2.1 Soils

The 4 soil types summarized and described in Section 6.1.1 also occurred on the ROW and had similar relationships to relief and drainage patterns. Prominent plants associated with these soils and moisture regimes on the ROW included bracken, dewberry, blackberry, spiraea, and goldenrod on well-drained soils of mesic habitats, and Sphagnum, spiraea, willow, black chokeberry, and marsh-fern on poorly drained soils of hydric habitats.

The typical humus type on the ROW, based on measurements at 1 mesic plot and random checks, was a "thin duff mull". All organic layers, 0.5 inches thick, were present on the ROW and decomposed organic matter was incorporated to a depth of 0.9 inches in the mineral soil. It is possible that some areas of the ROW were plowed and/or grazed in the past, and this may have caused some mixing of organic matter with mineral soil.

Slight to moderate sheet and rill erosion was occurring on 3 areas of the general ROW that were either bare or had sparse plant cover. In addition, slight to moderate sheet erosion was noted on a disturbed segment of the access road and an excavation on the ROW. All areas of erosion were located on loamy sand soil which is highly susceptible to erosion by water and wind when mineral soils are exposed. Some erosion sediments were deposited in a stream crossing the ROW and some sand was carried off the ROW by wind.

6.2.2 Vegetation

At present the wettest portions of hydric sites support a low herbaceous cover dominated by Sphagnum-Sedge-Mixed Grass-Herb communities. Dewberry, various grasses, and herbs occupy other areas of hydric sites. Gray birch, black chokeberry, red maple, and willow are scattered throughout hydric site communities.

On mesic-xeric sites, bracken, mixed grasses, and various herbaceous plants are the major species. Dewberry is locally abundant. Shrubs and tree seedlings invading these low communities include black cherry, black chokeberry, spiraea, gray birch, red maple, aspen, and pin cherry.

6.2.3 Wildlife

White-tailed deer, ruffed grouse, and varying hare are the major game animals that currently utilize the study area. Indirect observations for deer, i.e., tracks, browse, and pellets, indicated deer using the ROW area. Browse surveys indicated that more stems were available on the ROW edge than on the ROW or in the adjacent forest, while overall browse utilization by percent actual use was highest in the forest. Teaberry was by far the most abundant plant species available, but it was not utilized. Dewberry, spiraea, and black cherry were also abundant, while blackberry, black chokeberry, spiraea, and pin-cherry were the most heavily browsed. Overall browse was low on this site.

Ruffed grouse drumming counts indicated that species' utilization of the ROW vicinity. In addition, grouse were observed on the ROW edge and in the adjacent forest. Varying hare observations were solely indirect, and consisted of tracks, browse, and pellets.

A variety of other animals were noted, directly or indirectly, to be utilizing either the ROW, the adjacent forest, or both. Potential wildlife use is evident from plant species present on the site.

6.2.4 Land Use

Presently, the adjacent land uses to site 20 have had a minimal change from the 1949 data. The ROW and the adjacent land area is still considered to be rural farm with a distribution of agriculture (24.0%), forest land (68.3%), extractive industry (1.1%), non-productive (2.4%), water resources (3.8%), and residential (.4%). With reference to the total area involved, shifts in land use are noted as follows:

Agriculture -	-0.6%
Forest Land -	-0.5%
Extractive Industry -	+1.1%
Non-productive -	no change
Water Resources -	no change
Residential -	no change

Land use of extractive industry (1.1%) is a new type which was not present in 1949. In addition to use of the ROW for the transmission of electrical power, the ROW has potential for hunting.

6.3 Environmental Effect and Probable Causes

6.3.1 Soils

The major effect of ROW management on this site is related to destruction of plant cover, disturbance of the organic mulch, and exposure of mineral soils in areas of loamy sand texture, thus subsequently leading to soil erosion by water and wind. These conditions were evident at several locations on the general ROW, access road, and excavation on the ROW. Stabilization of these areas was dependent on natural plant invasion that was retarded by continuing erosion. Some soil particles dislodged by water erosion were deposited in a stream at the north end of the study area, and some sand particles were carried off the ROW by wind.

The predominant humus type on the ROW, "thin duff mull", was similar to that in the bordering forest, but organic layers were only ½ as thick as comparable alyers in the forest. Soil organic matter was incorporated in mineral soil to a greater depth on the ROW; however, this greater mixing may be due to past plowing and/or grazing activities and not related to ROW management. Litter deposits on the ROW were mostly from leaves and stems of the mixed grass-herb-shrub cover in contrast to tree parts in the woodland.

6.3.2 Vegetation

Each broadcast spraying has eliminated most of the woody plants on the study area. This has allowed ferns, herbaceous plants, and grasses, resistant to these herbicides, to spread and form low communities. The present woody component consists of plants that have invaded since the last aerial spraying (1970). These have not reached sufficient height, as yet, to justify further herbicide treatment. All of the communities present on the study area contain invading woody species except on hydric sites where large amounts of *Sphagnum* moss exist.

6.3.3 Wildlife

The presence of the ROW has encouraged the development of many different plant species, mainly light-loving, on the ROW proper, thus enhancing the habitat for wildlife use. The ecotone created by the presence of the ROW often produces a greater variety and density of life than is found otherwise (Leopold, 1936), and this phenomenon has been termed the "edge effect" (Smith, 1974).

6.3.4 Land Use

Based on the data obtained, the presence of the ROW has had no indentifiable effect on the adjacent land uses. The presence of the ROW, however, has opened the area to sportsmen utilizing the area to hunt.

Table 20.1. Soil series present on the Adirondack to Porter study area.

Soil Series	Map Symbol[1]	Drainage Class[2]	pH	Surface Soil Texture	Woodland Suitability Group
Adams-Colton	AbB	G-E	4.6	loamy sand	5s1/4s2
Duane	DcA	ID-MG	4.0	sandy loam	4o1
Ridgebury	RbA	PD	5.0	stony loam	4w3
Walpole	WbA	PD	4.7	loam	4w3

1 The third letter of the map symbol designates slope class:
A = 0-8%, B = 8-15%, C = 15-25%, D = 25-35%, E = 35-50%, F = 50-70%.

2 Drainage Class: VPD = very poorly drained, PD = poorly drained, SPD = somewhat poorly drained, ID = imperfectly drained, MG = moderately good, G = good, E = excellent (excessive).

Table 20.2. Average thickness of organic layers and A1 horizon and humus types for mesic site on ROW and adjacent woodland of site 20.

Moisture Regime	Location	Layer Thickness (in.) L	F	H	A1	Humus Type
Mesic (2)[1]	ROW	.3	.1	.1	.9	Thin duff mull with very shallow A1
	Woodland	.5	.2	.4	.5	Thin duff mull with very shallow A1

[1] Samples taken at vegetation study plot; the number of which is indicated by figure in parentheses.

Table 20.3. Areas exhibiting active erosion in May, 1976, on the Adirondack to Porter ROW study area.

Location	Soil Type	Average Slope (%)	Plant Cover	Erosion on ROW: Kind	Erosion on ROW: Class	Erosion on ROW: Gully Depth (in.)
General ROW	Adams-Colton loamy sand	11	Poverty-grass-dewberry	Sheet	Slight	-
General ROW	Adams-Colton loamy sand	25	Bare	Sheet & Rill	Moderate	-
General ROW	Adams-Colton loamy sand	5	Moss	Sheet	Slight	-
Access Road	Adams-Colton loamy sand	4	Poverty-grass developing hair-cap moss	Sheet	Slight	-
Excavation	Adams-Colton loamy sand	10	Bare	Sheet	Moderate	-

Table 20.4. Importance value of trees in the upper tree layer in the forest adjacent to the ROW.

Site	Species	Relative Dominance Basal Area (% of total) 1	Relative Density (% of total) 2	Importance Value 1+2
Hydric 1	No importance values were determined for hydric plot 1.			
Mesic 2	Black Cherry	75.32	44	119.32
	Quaking Aspen	21.98	44	56.98
	White Pine	1.93	6	7.93
	Red Maple	.77	6	6.77

Table 20.5. Comparison of species composition, abundance and sociability (A.S.) in the tree, shrub, and herb layers, in the adjacent forest and on the ROW, on hydric and mesic habitats.

Species	Hydric (1) Forest A.S.	Hydric (1) ROW A.S.	Mesic (2) Forest A.S.	Mesic (2) ROW A.S.
Tree Layer				
Red Spruce	1.1	-	-	-
White Pine	1.1	-	+.1	-
Quaking Aspen	+.1	-	2.1	-
Gray Birch	+.1	-	-	-
Black Cherry	-	-	2.1	-
Red Maple	-	-	+.1	-
No. Species	4	0	4	0
Shrub Layer				
Sour-top-Blueberry	+.2	+.2	+.3	-
Wild-raisin	+.1	1.1	-	-
Mountain-Holly	+.1	-	-	-
Winterberry	(+.1)	-		-
Black Chokeberry	+.1	2.2	-	(+.3)
Dewberry	+.1	1.3	2.1	3.4
Teaberry	+.1	-	-	-
Willow spp.	-	1.1	-	-
Spiraea	-	2.3	+.2	3.3
Blackberry	-	1.1	+.3	2.3
Arrow-wood	-	-	-	++.1
No. Species	7	7	4	5
Trees in the Shrub Layer				
Red Spruce	+.1	1.1	++.1	-
White Pine	1.1	++.1	-	-
Gray Birch	+.1	3.1	1.1	2.1
Quaking Aspen	+.1	1.1	3.1	++.1
Red Maple	-	2.1	1.1	+.1
Pin-Cherry	-	+.1	-	3.1
Black Cherry	-	+.1	1.1	2.1
Serviceberry	-	1.1	2.1	-
Beech	-	-	+.1	-
Red Cedar	-	-	-	+.4
No. Species	4	8	7	6
Herb Layer[1]				
Ground-Pine	+.2	-	2.4	1.2

Table 20.5. Continued

Species	Hydric (1) Forest A.S.	Hydric (1) ROW A.S.	Mesic (2) Forest A.S.	Mesic (2) ROW A.S.
Tree Club-moss	+.2	-	-	+.3
Painted Trillium	+.1	-	-	-
Cinnamon-Fern	2.2	1.2	-	-
Sphagnum	3.3	4.5	-	-
Goldthread	1.1	-	-	-
Sedge	1.2	1.2	-	-
Dwarf Cornell	1.1	-	-	-
Bluebead-Lily	+.3	-	-	-
Violet spp. (white)	1.1	1.2	-	-
Marsh-Fern	-	2.2	-	-
Marsh-St. John's-wort	-	1.1	-	-
Violet spp. (purple)	-	+.1	(+.1)	-
Goldenrod spp.	-	1.1	+.1	2.2
Royal Fern	-	+.2	-	-
Round-leaved Sundew	-	+.2	-	-
Closed Gentian	-	++.1	--	++.1
Trout-Lily	-	1.4	(+.3)	(2.5)
Hair-cap M[illegible]		+.3	2.2	3.5
Bracken	-	-	2.2	3.5
Bristly Club-moss	-	-	3.4	-
Solomon's-seal	-	-	+.1	-
False Spikenard	-	-	+.1	-
Strawberry	-	-	+.1	+.2
Wild Lily-of-the-valley	1.1	1.1	2.4	-
Poverty-Grass	-	-	2.2	3.2
Stemless Lady's-slipper	-	-	1.1	-
Partridge-berry	-	-	+.3	-
Wild-oats	-	-	+.1	-
Hawkweed spp.	-	-	(+.1)	+.1
Cinquefoil	-	-	-	2.4
St. John's-wort	-	-	-	1.2
Partridge-Pea	-	-	-	1.2
Field Cat's-foot	-	-	-	+.1
Sheep-Sorrel	-	-	-	+.1
Heal-all	-	-	-	2.3
Yarrow	-	-	-	+.1
Reindeer Lichen	-	-	-	+.2
Spreading Dogbane	-	-	-	+.1
Aster spp.	-	-	-	2.2
Bluets	-	-	-	+.2
Rose Pogonia	-	2.1	-	-
Mixed Grass	-	+.3	+.2	2.2
No. Species	11	16	17	22

Table 20.5. Continued

Species	Hydric (1) Forest A.S.	Hydric (1) ROW A.S.	Mesic (2) Forest A.S.	Mesic (2) ROW A.S.
Total No. Species				
Trees[2]	4	8	8	6
Shrubs	7	7	4	5
Herbs	11	16	17	22
Totals	22	31	29	33

1 For simplicity, herbs include all species of the layer.

2 Those trees which occurred both in the tree and shrub layers were considered as one in determining the total number of species.

Table 20.6. Characteristic species with abundance and sociability ratings (A.S.) in the shrub and herb layers of the adjacent forest which did not occur on the ROW.

Species	Forest A.S.	ROW A.S.
Hydric (1)		
Shrubs		
Mountain-Holly	+.1	-
Winterberry	(+.1)	-
Teaberry	+.1	-
Herbs[1]		
Ground-Pine	+.2	-
Tree Club-moss	+.2	-
Painted Trillium	+.1	-
Goldthread	1.1	-
Dwarf Cornell	1.1	-
Bluebead-Lily	+.3	-
No. Species	9	
Mesic (2)		
Shrubs		
Sour-top-Blueberry	+.3	-
Herbs		
Violet spp. (purple)	(+.1)	-
Bristly Club-moss	3.4	-
Solomon's-seal	+.1	-
False Spikenard	+.1	-
Wild Lily-of-the-valley	2.4	-
Stemless Lady's-slipper	1.1	-
Partridge-berry	+.3	-
Wild-oats	+.1	-
No. Species	9	

[1] For simplicity, herbs include all species of the herb layer.

Table 20.7. Characteristic species with abundance and sociability ratings (A.S.) in the shrub and herb layers of the ROW which were not in the adjacent forest.

Species	ROW A.S.	Forest A.S.
	Hydric (1)	
Shrubs		
Willow spp.	1.1	-
Spiraea	2.3	-
Blackberry	1.1	-
Herbs[1]		
Marsh-Fern	2.2	-
Marsh-St. John's-wort	1.1	-
Violet spp. (purple)	+.1	-
Goldenrod spp.	1.1	-
Royal Fern	+.2	-
Round-leaved Sundew	+.2	-
Closed Gentian	++.1	-
Trout-Lily	1.4	-
Rose Pogonia	2.1	-
Hair-cap Moss	+.3	-
Mixed Grass	+.3	-
No. Species	14	
	Mesic (2)	
Shrubs		
Black Chokeberry	(+.3)	-
Arrow-wood	++.1	-
Herbs		
Tree Club-moss	+.3	-
Closed Gentian	++.1	-
Cinquefoil	2.4	-
St. John's-wort	1.2	-
Partridge-Pea	1.2	-
Field Cat's-foot	+.1	-
Sheep-Sorrel	+.1	-
Heal-all	2.3	-
Yarrow	+.1	-
Reindeer Lichen	+.2	-
Spreading Dogbane	+.1	-

Table 20.7. Continued

Species	ROW A.S.	Forest A.S.
Aster spp.	2.2	-
Bluets	+.2	-
No. Species	15	

1 For simplicity, herbs include all species of the herb layer.

Table 20.8. Major vegetational types for the Adirondack to Porter study area based on percent of study plots occupied by each plant community and other components on the ROW.

Community	Site Classification	
	Hydric (1)	Mesic (2)
	Percent of Total Area	
Sphagnum-Sedge-Mixed Grass-Herb	64.29	
Dewberry-Mixed Grass-Herb	11.50	
Gray Birch-Mixed Grass-Herb	6.28	
Dewberry-Black Chokeberry-Mixed Grass-Herb	5.59	
Black Chokeberry-*Sphagnum*-Sedge-Mixed Herb	4.36	
Black Chokeberry-Mixed Grass-Herb	3.35	
Mixed Grass-Hair-cap Moss-Mixed Herb	2.08	
Sphagnum-Sedge-Gray Birch-Mixed Herb	1.49	
Gray Birch	.59	.14
Cinnamon-Fern	.37	
Wild-raisin	.05	
Red Maple	.05	
Bracken-Mixed Grass-Herb		39.21
Dewberry-Spiraea-Bracken-Mixed Grass-Herb		26.60
Mixed Grass-Herb-Bracken		17.96
Mixed Grass-Herb		7.58
Spiraea-Bracken-Mixed Herb		5.15
Spiraea		1.01
Red Cedar		1.01
Spiraea-Dewberry-Mixed Herb		.68
Bracken-Mixed Grass-Herb-Black Cherry		.59
Pin-Cherry		.07
Total	100.00	100.00

Table 20.9. Browse survey showing plant species and number ratio of browsed to total stems with percent actual use for ROW, ROW edge, and woods.

Species	ROW		ROW Edge		Woods		Total	
	Ratio	%	Ratio	%	Ratio	%	Ratio	%
Blackberry	2/25	8			7/21	33	9/46	20
Black Cherry	1/2	50	0/35	0	2/18	11	3/56	5
Black Chokeberry	3/27	11	6/23	26	1/3	33	10/53	19
Dewberry	0/56	0	0/65	0	0/10	0	0/131	0
Dwarf Cornell			0/1	0			0/1	0
Pin-Cherry	0/2	0	0/2	0	1/3	33	1/7	14
Gray Birch	1/9	11	0/16	0	0/2	0	1/27	4
Ground-Juniper	0/1	0					0/1	0
Hemlock			0/3	0			0/3	0
Serviceberry			0/1	0			0/1	0
Red Maple	0/5	0	2/12	17	1/9	11	3/26	12
Red Spruce			0/9	0	0/7	0	0/16	0
Spiraea	2/11	18	2/36	6	12/41	29	16/88	18
Teaberry	0/142	0	0/226	0	0/200	0	0/568	0
Quaking Aspen			0/2	0	0/2	0	0/4	0
Total	9/280	3	10/431	2	24/316	8	43/1028	4

Table 20.10. Browse survey showing most abundant plant species and number ratio of browsed to total stems with percent actual use for ROW, ROW edge, and woods.

	Species							
	Teaberry		Dewberry		Spiraea		Black Cherry	
Location	Ratio	%	Ratio	%	Ratio	%	Ratio	%
ROW	0/142	0	0/56	0	2/11	18	1/2	50
ROW Edge	0/226	0	0/65	0	2/36	6	0/35	0
Woods	0/200	0	0/10	0	12/41	29	2/19	11
Total	0/568	0	0/131	0	16/88	18	3/56	5

Table 20.11. Birds observed and/or heard on the ROW and on the ROW edge during the study period.

Species	Species
Hawk spp.	Black-capped chickadee
Ruffed grouse	Catbird
Mourning dove	Robin
Downy woodpecker	Wood thrush
Yellow-shafted flicker	Cedar waxwing
Eastern kingbird	Field sparrow
Blue jay	Song sparrow
Common crow	Rufus-sided towhee

Table 20.12. Potential wildlife use of plant species[1] present on the ROW and adjacent woods for the major game species on the Adirondack to Porter study area.

Species	Wildlife Species		
	Deer	Hare	Grouse
Trees			
White Pine	+	****	
Quaking Aspen	**	**	***
Gray Birch	*	**	**
Red Maple	****	+	
Black Cherry	*		
Pin-Cherry	*	+	*
Beech	+	+	*
Serviceberry	+		+
Shrubs			
Willow	*	***	*
Wild-raisin	*		
Black Chokeberry	+		
Blueberry	+		
Spiraea	+		
Blackberry	+		*
Arrow-wood	*		
Herbs[2]			
Strawberry			*
Sheep-Sorrel			+
Hawkweed			+
Sedge			+
Goldthread			+
Grasses	*	***	
Ferns	*	**	
Goldenrod	+		

[1] Those plants not included in this table provide a certain amount of cover (Table 20.5) for the 3 major game species, and may also provide seasonal food value, specific information pertaining to which is not now available. This applies also with regard to nongame species.

[2] For simplicity, herbs include all species of the herb layer.

Table 20.13. Comparison of land use prior to and after construction of the ROW.[1]

	Land Use	Percent of Total Area Prior to (-) and After (*) Construction 0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
(A)	Agriculture	------------------24.6 *****************24.0
(C,I)	Commercial & Industrial	
(F)	Forest Land	---68.8 ***68.3
(E)	Extractive Industry	**1.4
(N)	Non-productive	---2.4 ***2.4
(OR)	Outdoor Recreation	
(P)	Public & Semi-public	
(W)	Water Resources	----3.8 ****3.8
(U)	Urban Inactive	
(T)	Transportation	
(R)	Residential	-.4 *.4

1 Source: Aero Service Crop., Phila., Pa., air photo No. 920-179, May 13, 1972
USDA-SCS, Lewis County air photo No. 3, 1949

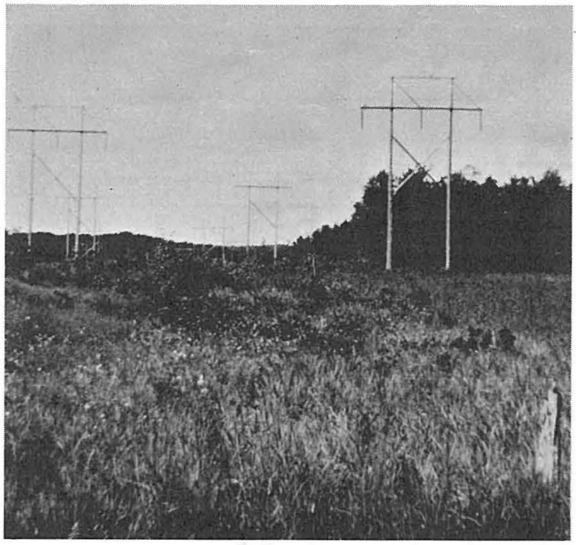


FIG. 20.1.1. General view of the ROW and adjacent forest, looking north, from the south side of Kirch Road, in summer, 1975 (Photo Station 1).

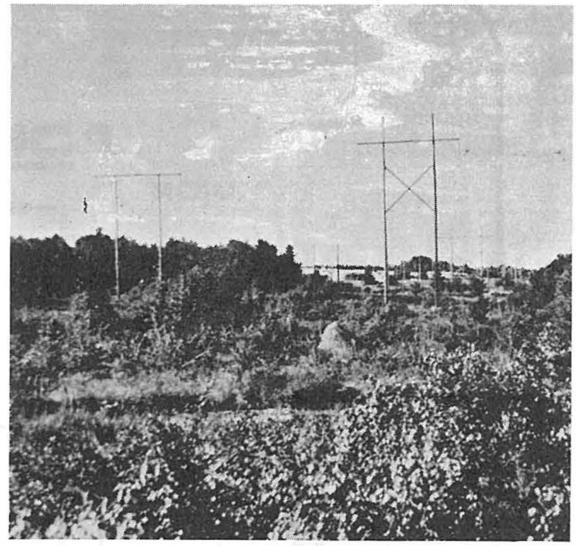


FIG. 20.1.2. General view of the ROW and adjacent forest, looking south, in summer, 1975 (Photo Station 9).

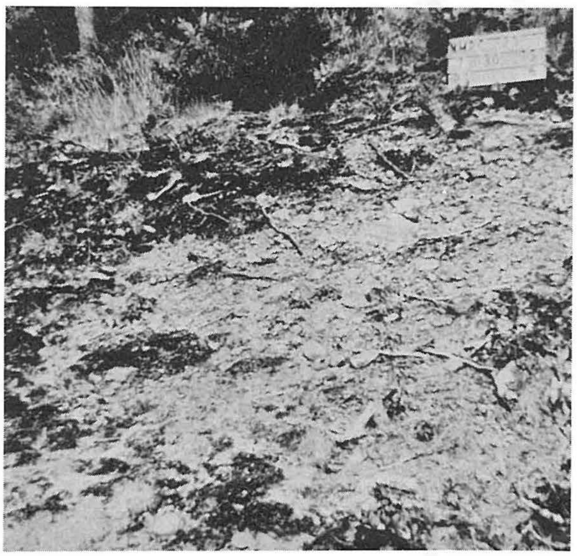


FIG. 20.1.3. Slight sheet erosion on ROW, in summer of 1975 (Photo Station 6).

FIG. 20.1.4. Moderate sheet erosion occurring on ROW from excavated area, in summer, 1975 (Photo Station 7).

FIG. 20.1.5. Stump sprouts of black cherry and red maple on ROW, in fall, 1975 (Photo Station 12).

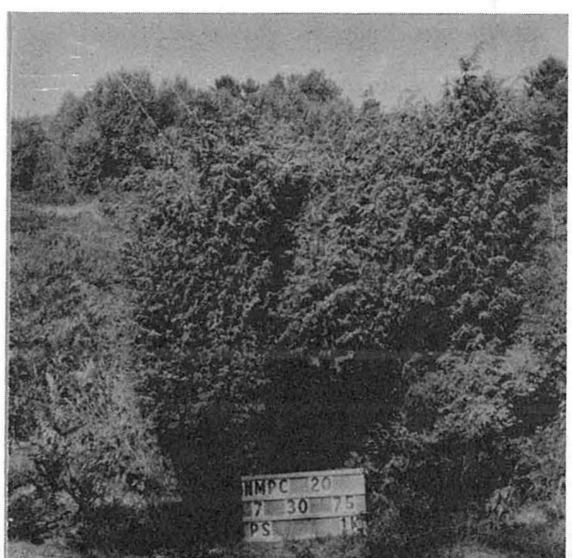


FIG. 20.1.6. Juniper, a desirable species, on ROW, in summer, 1975 (Photo Station 11).

FIG. 20.1. Visual characteristics.

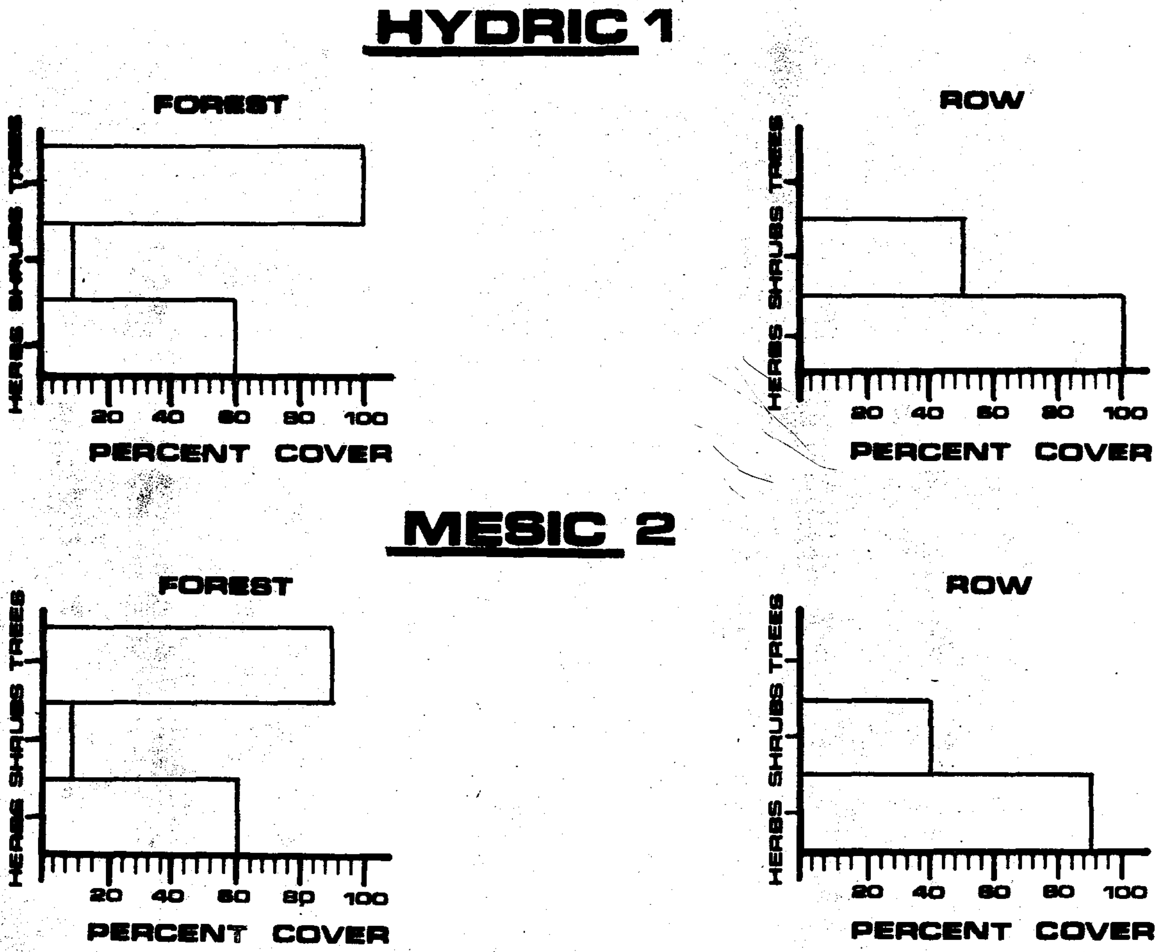


Fig. 20.2. Changes in cover value of tree, shrub, and herb layers from forest to ROW.

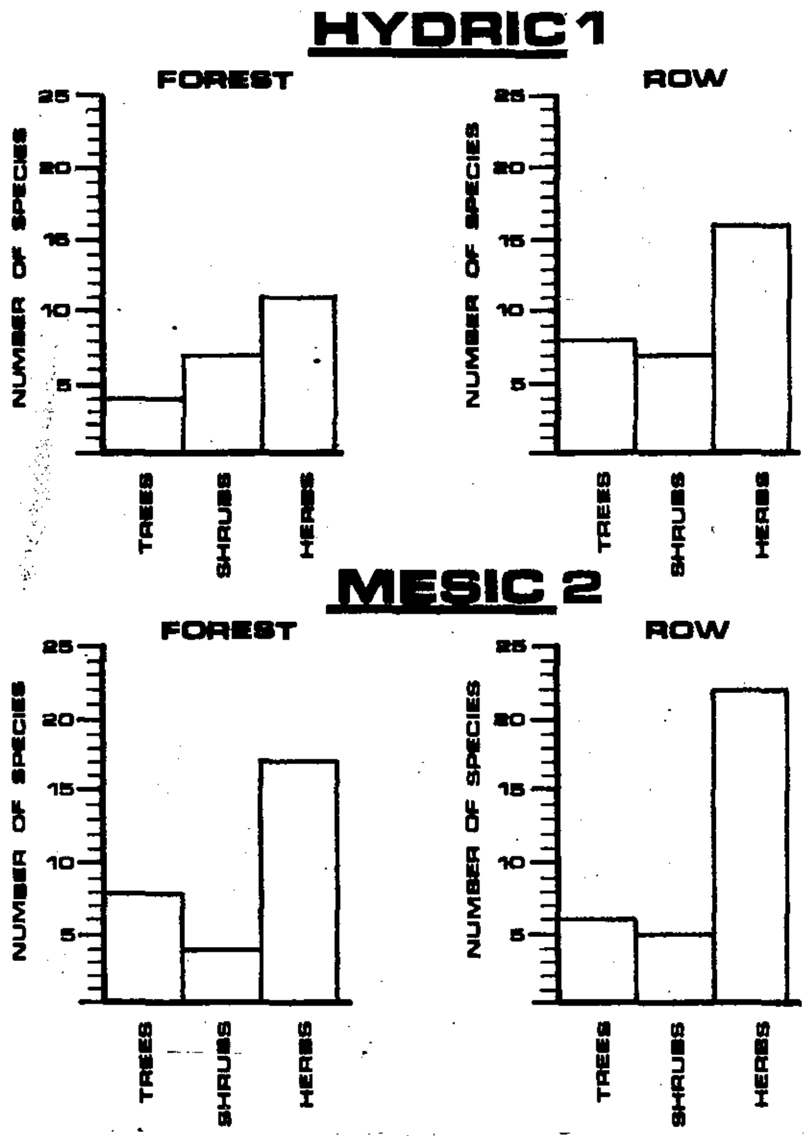


Fig. 20.3. Species diversity in the forest and on the ROW.

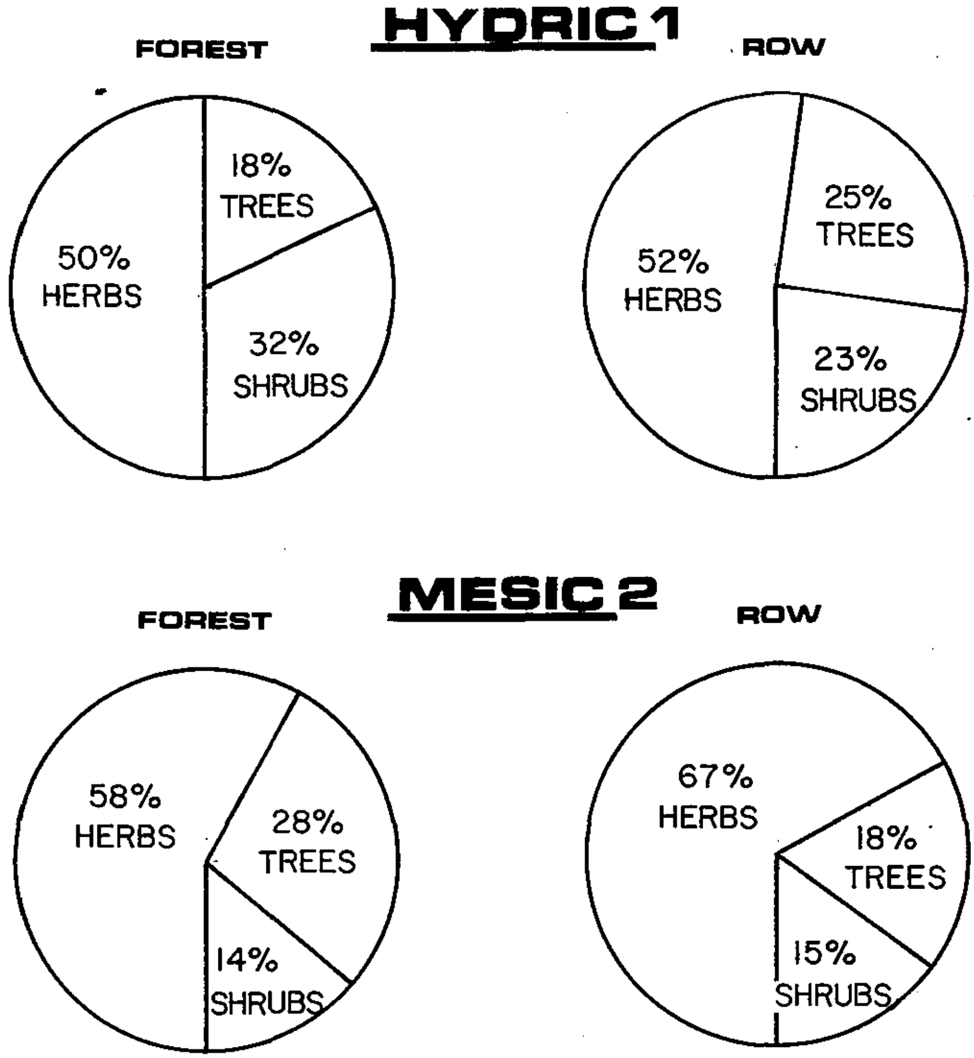


Fig. 20.4. Life form spectrum of the ROW as compared to the adjacent forest to compare species make-up of each, based on the number of species in each life form expressed as a percent of total species.

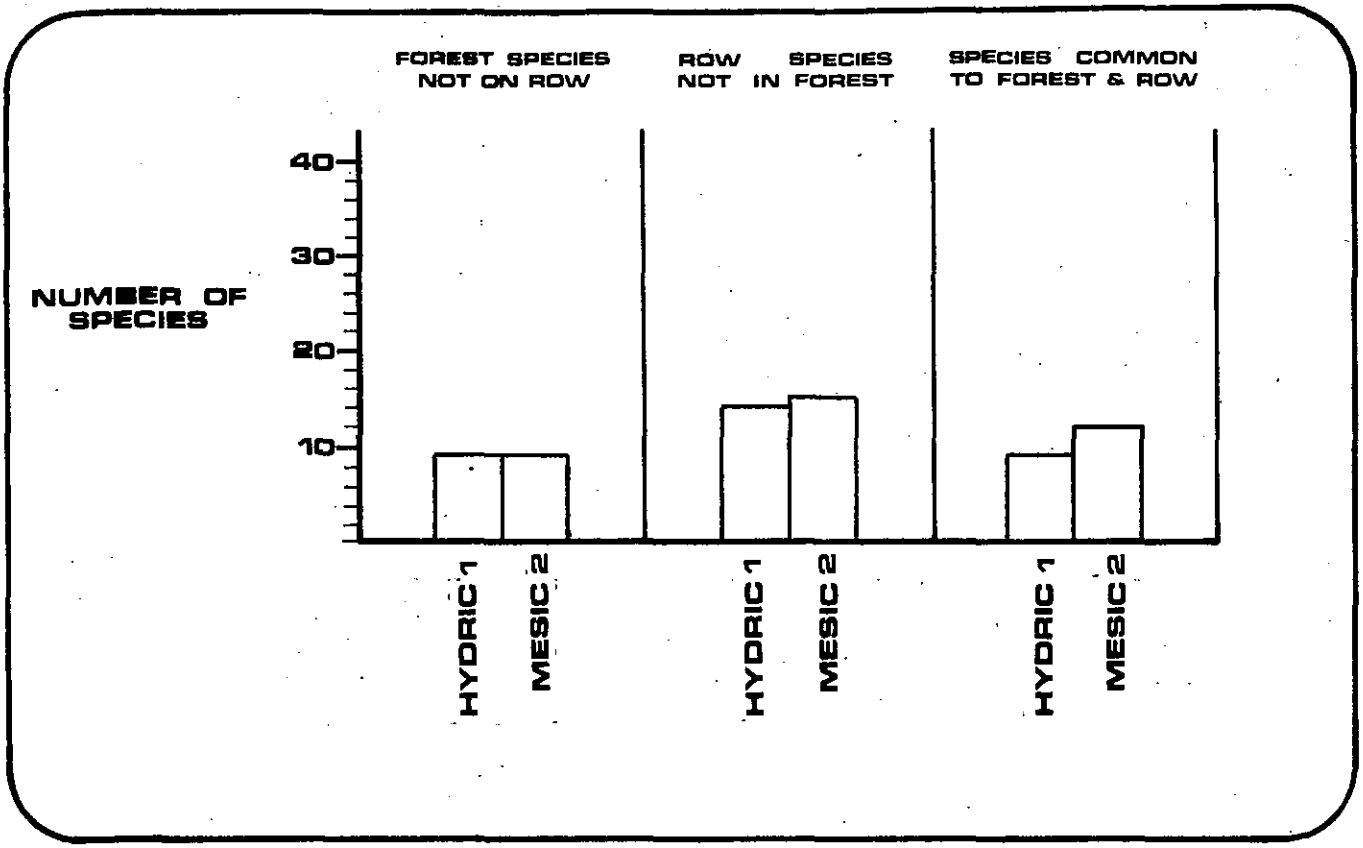


Fig. 20.5. Comparison of shrub and herb species in the forest and on the ROW.

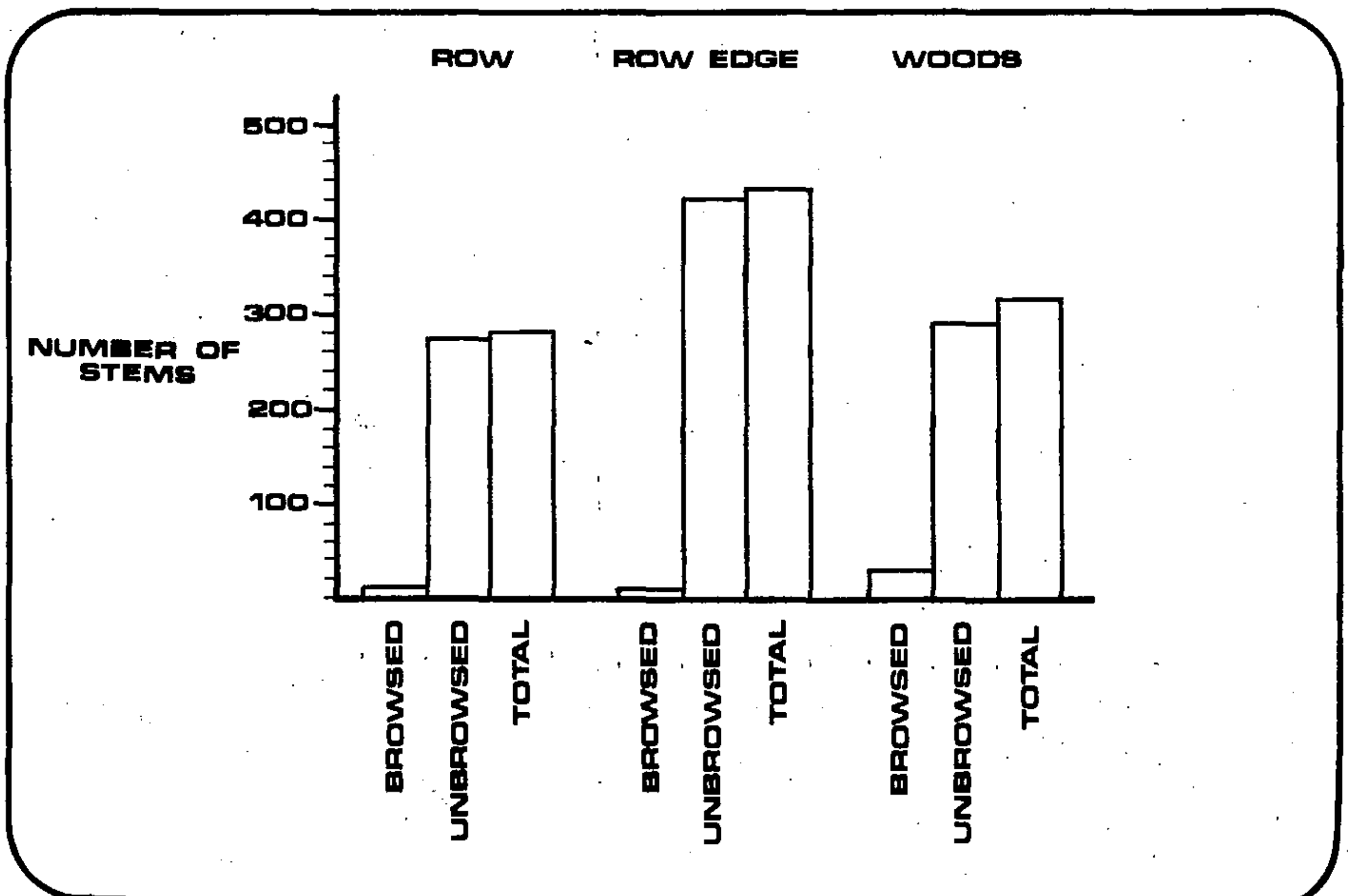
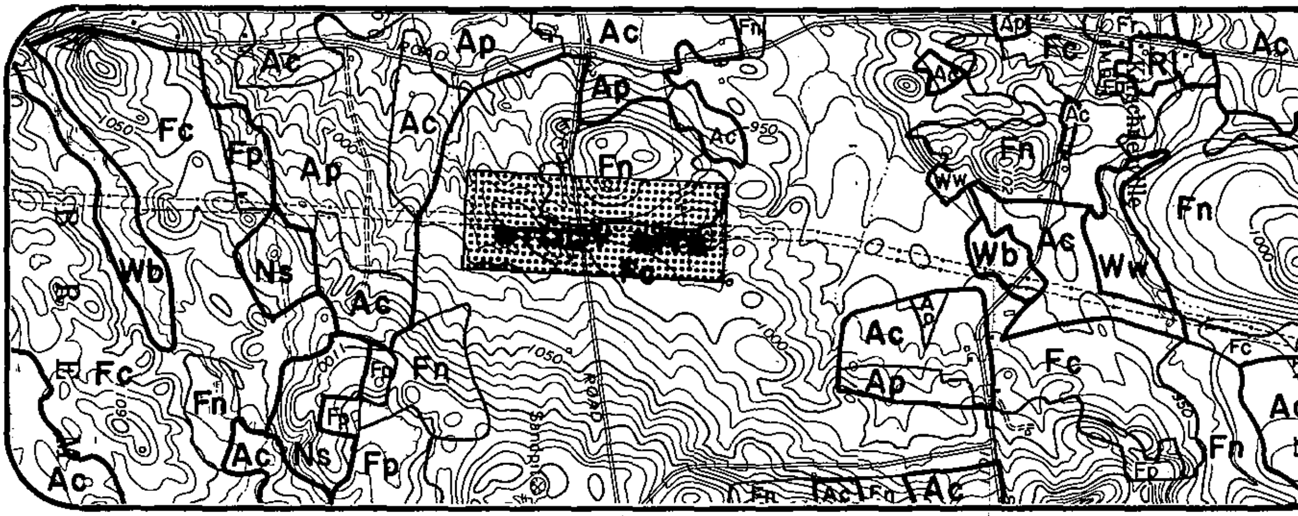
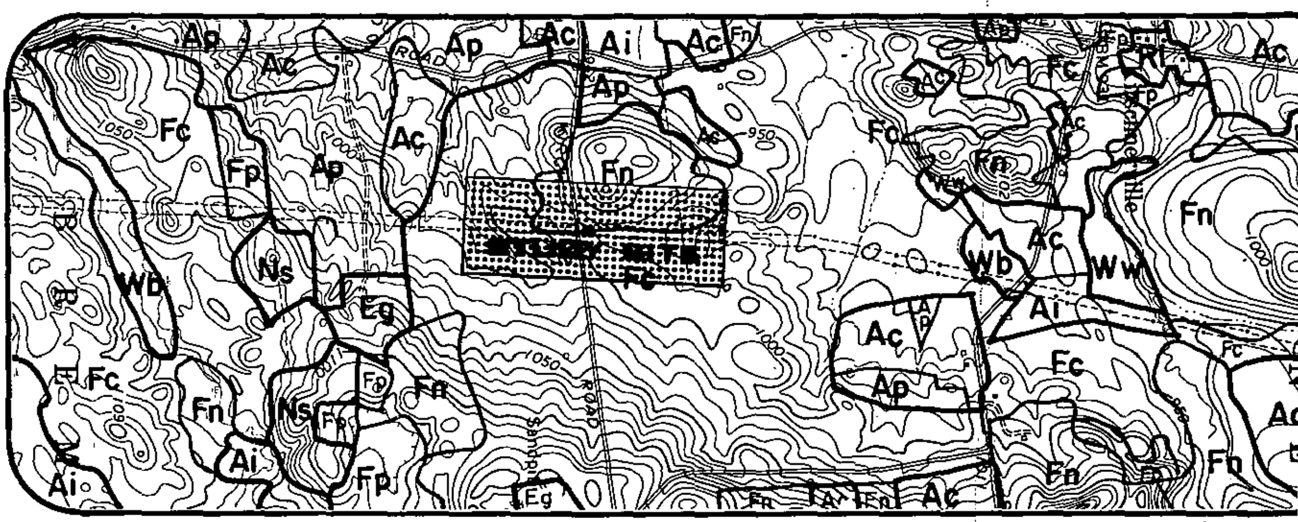


Fig. 20.6. Browse survey showing number of browsed, unbrowsed, and total stems for the ROW, ROW edge, and forest for 4 browse transects.



LAND USE PRIOR TO ROW CONSTRUCTION (1949) SCALE 1"-2000



LAND USE AFTER CONSTRUTION OF ROW (1974) SCALE 1"-2000

LEGEND FOR LAND USE SYMBOLS

AGRICULTURE
- Ac - Cropland and cropland pasture
- Ai - Inactive agricultural land
- Ap - Pasture

EXTRACTIVE INDUSTRY LAND USE
- Eg - Sand and gravel pits

FOREST LAND
- Fc - Forest brush land
- Fn - Forest lands
- Fp - Plantations

NON-PRODUCTIVE LAND
- Ns - Sand

RESIDENTIAL LAND USE
- Rl - Low density

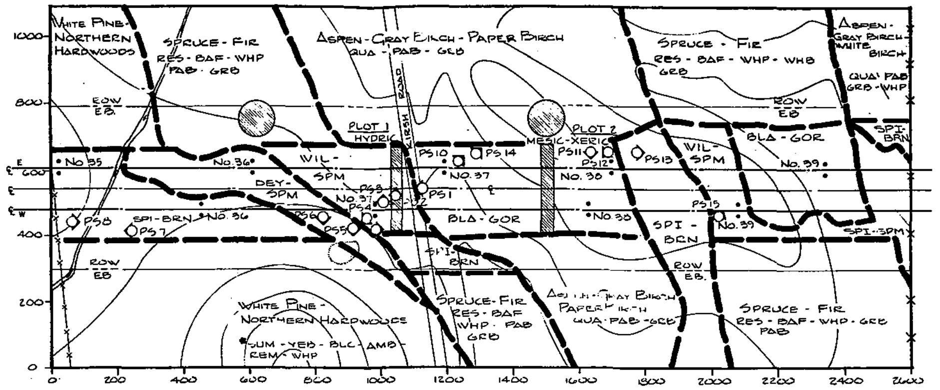
WATER RESOURCES
- Wb- Marshes, shrub wetlands and bogs
- Ww- Wooded wetlands

SOURCES:
- Aero Service Corp., Phila., Pa., air photo No. 920-179, May 13, 1972
- USDA-SCS, Lewis County, air photo No. 3 1949
- Area Land Use Map LUNR, Cornell University, N.Y., 1974
- U. S. G. S. Topographic Map, Crystal Dale, N. Y., 1968

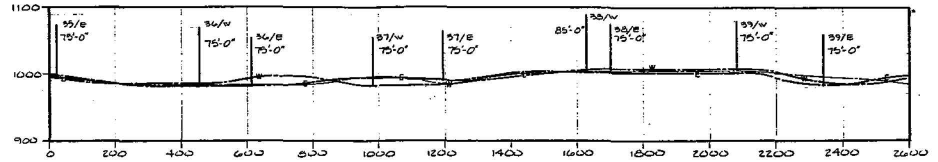
Fig. 20.7. Land use change.

ASPLUNDH ENVIRONMENTAL SERVICES BLAIR MILL ROAD WILLOW GROVE, PA.

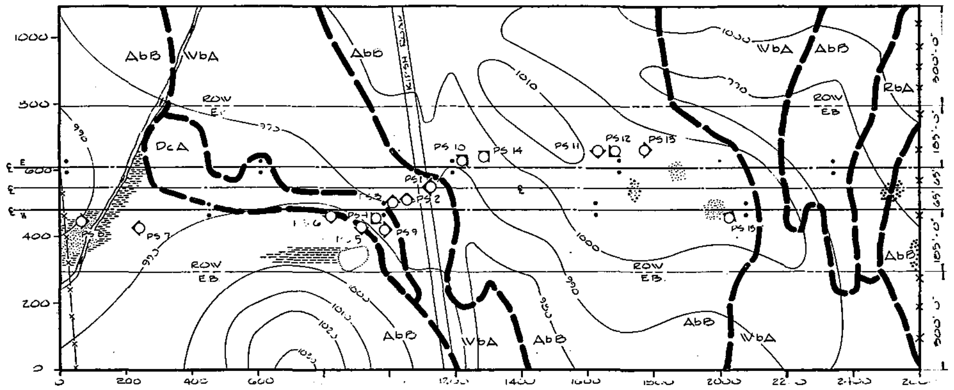
VEGETATION



CENTERLINE PROFILE



SOILS



NOTES
(1) VERTICAL AND HORIZONTAL SCALES ARE IN FEET
(2) 10' CONTOUR INTERVALS

LEGEND

WORKS AND STRUCTURES

- HIGHWAYS AND ROADS
- HEAVY DUTY
- MEDIUM DUTY
- LIGHT DUTY
- ACCESS ROAD
- UNIMPROVED DIRT ROAD
- NATIONAL INTERSTATE
- U.S. ROUTE
- STATE OR COUNTY
- SINGLE TRACK RAILROAD
- MULTIPLE TRACK RAILROAD
- ABANDONED RAILROAD TRACK
- RAILROAD OVER
- RAILROAD UNDER
- FORD
- ROAD CROSSING
- BUILDING
- EXCAVATION
- MINE DUMP
- PIPELINE
- TRANSMISSION STRUCTURES
- DAMS
- CULVERT
- TANKS
- WELLS
- BRUSH AND LOG DISPOSAL SITES
- SMALL PARKS, CEMETERY, ETC.
- FENCE

BOUNDARIES

- NATIONAL OR STATE
- COUNTY
- MINOR CIVIL DIVISION
- RESERVATION, NATIONAL OR STATE
- LAND GRANT
- ROW PROPERTY BOUNDARY
- ROW EASEMENT BOUNDARY
- ROW CLEARING EDGING
- SITE BOUNDARY
- ROW CENTERLINE
- VEGETATION OR SOIL BOUNDARY
- STRUCTURE CENTERLINE

SITE MARKERS

- SAMPLE LOCATION
- PHOTO STATIONS
- MAPPED PLOT ON ROW
- MAPPED PLOT OFF ROW
- APPROX. LOCATION OF GROUSE DRUMMING LOG

WATER SYMBOLS

- PERENNIAL STREAMS
- INTERMITTENT STREAMS
- SMALL RAPIDS
- LARGE RAPIDS
- DISAPPEARING STREAM
- CANALS AND DITCHES
- PERENNIAL LAKES AND PONDS
- INTERMITTENT LAKES AND PONDS
- SPRING
- MARSH, SWAMP OR WET MEADOW
- WET SPOT
- ALLUVIAL FAN

TOPOGRAPHIC RELIEF

- CONTOUR
- DEPRESSION CONTOUR

SOIL SYMBOL AND NAME

AbB	ADAMS - COLTON	loamy sand (8 to 15% slope)
DcA	DUANE	sandy loam (0 to 8% slope)
WbA	WALPOLE	loam (0 to 8% slope)
RbA	RIDGEBURY	stony loam (0 to 8% slope)

SOIL SYMBOLS

- ROCK
- SAND
- SCATTERED ROCK
- BARE AND ERODING (GULLY)
- BARE AND ERODING (SHEET)
- BARE AND INCREASING IN SIZE
- BARE AND HEALING
- ERODED BUT HEALED
- CLAY AREA
- WIND EROSION

PLANT COMMUNITY SYMBOLS

shrubs

ALR	ALDER	Alnus spp.
ARR	ARROW - WOOD	Viburnum recognitum
BAR	BARBERRY	Berberis spp.
BLA	BLACKBERRY	Rubus spp.
BLH	BLACK - VIBURNUM	Viburnum prunifolium
BLU	BLUEBERRY	Vaccinium spp.
BUT	BUTTONBUSH	Cephalanthus occidentalis
CAY	AMERICAN YEW	Taxus canadensis
CFH	FLY - HONEYSUCKLE	Lonicera canadensis
CHC	CHOKE - CHERRY	Prunus virginiana
CLB	CLIMBING BITTERSWEET	Celastrus scandens
CRA	GRAPE	Vitis spp.
DEY	DEWBERRY	Rubus spp.
ELD	ELDERBERRY	Sambucus canadensis
GRD	GRAY DOGWOOD	Cornus racemosa
GRJ	GROUND - JUNIPER	Juniperus communis
HAA	COMMON ALDER	Alnus serrulata
HAW	HAWTHORN	Crataegus spp.
HAZ	HAZELNUT	Corylus spp.
HUC	HUCKLEBERRY	Gaylussacia spp.
JAR	MULTIFLORA ROSE	Rosa multiflora
MAV	MAPLE - LEAVED VIBURNUM	Viburnum acerifolium
MOH	MOUNTAIN - HOLLY	Nemopanthus mucronata
MOL	MOUNTAIN - LAUREL	Kalmia latifolia
MOM	MOUNTAIN - MAPLE	Acer spicatum
NAN	NANNYBERRY	Viburnum Lentago
NJT	NEW JERSEY TEA	Ceanothus americanus
PIF	PINXTER - FLOWER	Rhododendron nudiflorum
POI	POISON IVY	Rhus radicans
POS	POISON SUMAC	Rhus vernix
PRA	NORTHERN PRICKLY ASH	Xanthoxylum americanum
PRU	BUCKTHORN	Rhamnus spp.
RIB	RIBES	Ribes spp.
ROD	RED - OSIER DOGWOOD	Cornus stolonifera
SMC	SUMAC	Rhus spp.
SPA	SPECKLED ALDER	Alnus rugosa
SPB	SPICEBUSH	Lindera Benzoin
SPI	SPIRAEA	Spiraea spp.
SMS	SMOOTH SUMAC	Rhus glabra
STM	STRIPED MAPLE	Acer pensylvanicum
STS	STAGHORN - SUMAC	Rhus typhina
SWF	SWEET - FERN	Comptonia peregrina
TAH	TARTARIAN HONEYSUCKLE	Lonicera tatarica
WIH	WITCH - HAZEL	Hamamelis virginiana
WIL	WILLOW	Salix spp.
WIN	WINTERBERRY	Ilex verticillata
WIR	WILD - RAISIN	Viburnum cassinoides
ZBC	BLACK CHOKEBERRY	Pyrus melanocarpa

trees

ABU	BUTTERNUT	Juglans cinerea
AIL	TREE - OF - HEAVEN	Ailanthus altissima
ALD	ALTERNATE - LEAVED DOGWOOD	Cornus alternifolia
AMB	BEECH	Fagus grandifolia
AMC	CHESTNUT	Castanea dentata
AME	AMERICAN ELM	Ulmus americana
AMH	AMERICAN HORNBEAM	Carpinus caroliniana
APP	APPLE	Pyrus malus
BAF	BALSAM - FIR	Abies balsamea
BAS	BASSWOOD	Tilia americana
BIH	BITTERNUT HICKORY	Carya cordiformis
BLC	BLACK CHERRY	Prunus serotina
BLL	BLACK LOCUST	Robinia Pseudo-Acacia
BLW	BLACK WALNUT	Juglans nigra
CHO	CHESTNUT - OAK	Quercus prinus
COT	COTTONWOOD	Populus deltoides
EAH	HEMLOCK	Tsuga canadensis
ERC	RED CEDAR	Juniperus virginiana
FLD	FLOWERING DOGWOOD	Cornus florida
GRB	GRAY BIRCH	Betula populifolia
HOH	AMERICAN HOP-HORNBEAM	Ostrya virginiana
LAA	LARGE - TOOTHED ASPEN	Populus grandidentata
LAR	AMERICAN LARCH	Larix laricina
NWC	WHITE CEDAR	Thuja occidentalis
PAB	WHITE BIRCH	Betula papyrifera
PIC	PIN - CHERRY	Prunus pensylvanica
PIH	PIGNUT HICKORY	Carya glabra
PIP	PITCH - PINE	Pinus rigida
QUA	QUAKING ASPEN	Populus tremuloides
RED	RED OAK	Quercus rubra
REM	RED MAPLE	Acer rubrum
RES	RED SPRUCE	Picea rubens
SAS	WHITE SASSAFRAS	Sassafras albidum
SCO	SCRUB - OAK	Quercus ilicifolia
SCP	SCOTCH PINE	Pinus sylvestris
SHB	SERVICEBERRY	Amelanchier spp.
SHH	SHAGBARK - HICKORY	Carya ovata
SUM	SUGAR - MAPLE	Acer saccharum
SWB	SWEET BIRCH	Betula lenta
VIP	SCRUB - PINE	Pinus virginiana
WHA	WHITE ASH	Fraxinus americana
WHO	WHITE OAK	Quercus alba
WHP	WHITE PINE	Pinus strobus
YEB	YELLOW BIRCH	Betula lutea
YEP	TULIP - POPLAR	Liriodendron tulipifera

herbs

BLG	BLUE - JOINT GRASS	Calamagrostis canadensis
BON	BONESET	Eupatorium perfoliatum
BRN	BRACKEN	Pteridum aquilinum
BRO	BROOM - SEDGE	Artholophis virginicus
CAT	CAT-TAIL	Typha spp.
CHF	CHRISTMAS - FERN	Polystichum acrostichoides
CIF	CINNAMON - FERN	Osmunda cinnamomea
DEG	DEERTONGUE GRASS	Panicum clandestinum
GOR	GOLDENROD	Solidago spp.
HAF	HAY - SCENTED FERN	Dennstaedtia punctilobula
HOT	HORSETAIL	Equisetum spp.
INF	INTERRUPTED FERN	Osmunda Claytoniana
IRS	IRIS	Iris spp.
JAP	SMALL JACK-IN-THE-PULPIT	Arisaema triphyllum
LET	WILD LETTUCE	Lactuca canadensis
MSF	MARGINAL SHIELD-FERN	Dryopteris marginalis
NYF	NEW YORK FERN	Dryopteris noveboracensis
PEV	PEARLY EVERLASTING	Anaphalis margaritacea
PHR	PHRAGMITES	Pragmites spp.
POG	POVERTY - GRASS	Danthonia spicata
RDM	REINDEER LICHEN	Cladonia rangiferina
ROF	ROYAL FERN	Osmunda regalis
SEF	SENSITIVE FERN	Onoclea sensibilis
SPL	SPIKED LOOSESTRIFE	Lythrum Salicaria
SPM	SPHAGNUM MOSS	Sphagnum spp.
SSS	SOLOMON'S - SEAL	Polygonatum biflorum
SWA	SWAMP - BUTTERCUP	Ranunculus septentrionalis
WHS	WHITE SNAKEROOT	Eupatorium rugosum
YPL	BULLHEAD - LILY	Nuphar variegatum

REVISIONS :

DATA SOURCES :

ASPLUNDH ENVIRONMENTAL SERVICES
BLAIR MILL ROAD
WILLOW GROVE, PA. 19090

NIAGARA MOHAWK POWER CORP. PLAN & PROFILE MAPS, ADIRONDACK - PORTER #11,12. REV 2/1958

U.S.G.S. 7.5 MIN. TOPOGRAPHIC MAP CRYSTAL DALE NEW YORK, 1966

U.S.D.A., SCS IN COOPERATION WITH CORNELL UNIV. AGR. EXP STA SOIL SURVEY FOR LEWIS COUNTY N.Y. U.S. GOV'T SERVICE 1964 NO. 10

AERO SERVICES CORP., PHILA. PA., LEWIS CO., AIR PHOTO NO 920-179 (SCALE 1:24,000, MAY 13, 1976)

ASPLUNDH ENVIRONMENTAL SERVICES, A.E.S. PROJECT NO. 81-0028 FIELD STUDIES 1976-76

This information is a part of the ESEERCO "STUDY OF ENVIRONMENTAL AND ECONOMIC ASPECTS OF CONTEMPORANEOUS ELECTRIC TRANSMISSION LINE RIGHT-OF-WAY MANAGEMENT TECHNIQUES"

MAP 20.1

SITE 20 HABITAT CONDITIONS

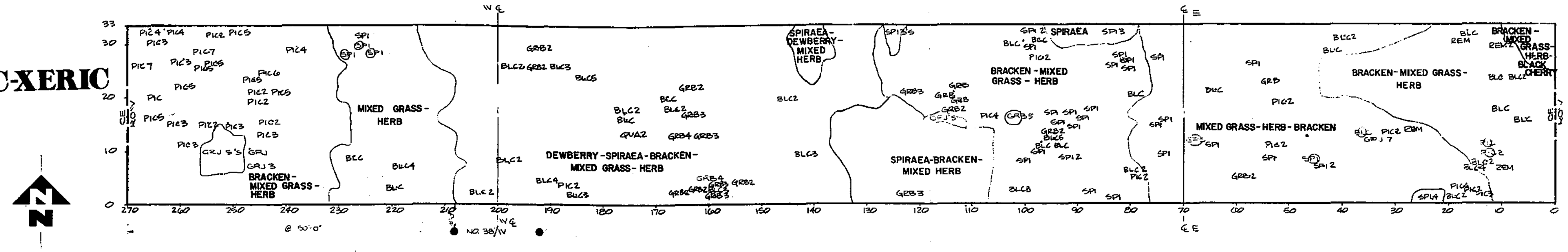
UTILITY :
NIAGARA MOHAWK POWER CORPORATION

ROW DESCRIPTION :
ADIRONDACK TO PORTER 230 KV.
WOODEN POLE 'H' FRAME 250' ROW

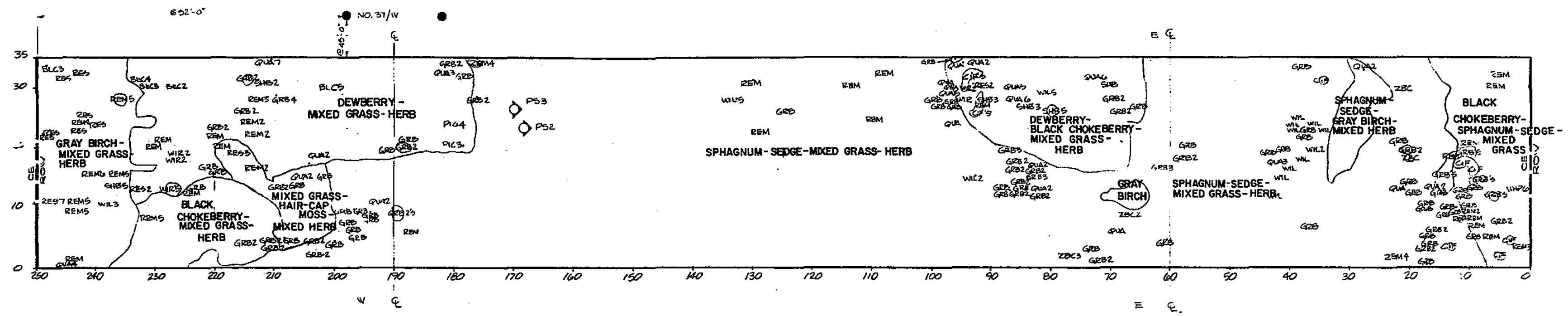
SCALE : 1" = 200'-0"

200 100 0 100 200 400 800 1000

PLOT 2 MESIC-XERIC



PLOT 1 HYDRIC



NOTES:
- VERTICAL AND HORIZONTAL SCALE IN FEET

LEGEND

WORKS AND STRUCTURES

ACCESS ROAD
BRUSH AND LOG DISPOSAL SITES

BOUNDARIES

ROW CENTERLINE
ROW PROPERTY BOUNDARY
ROW EASEMENT BOUNDARY
EXISTING ROW CLEARING EDGE
STRUCTURE CENTERLINE

SITE MARKERS

SAMPLE LOCATION
PHOTO STATION

WATER SYMBOLS

PERENNIAL STREAMS
INTERMITTENT STREAMS
SMALL RAPIDS
LARGE RAPIDS
DISAPPEARING STREAM
CANALS AND DITCHES
PERENNIAL LAKES AND PONDS
INTERMITTENT LAKES AND PONDS
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MARSH, SWAMP OR WET MEADOW
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SCATTERED ROCK

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ZBC	BLACK CHOKEBERRY	Pyrus melanocarpa

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AMC	CHESTNUT	Castanea dentata
AME	AMERICAN ELM	Ulmus americana
AMH	AMERICAN HORNBEAM	Carpinus caroliniana
APP	APPLE	Pyrus malus
BAF	BALSAM-FIR	Abies balsamea
BAS	BASSWOOD	Tilia americana
BIH	BITTERNUT HICKORY	Carya cordiformis
BLC	BLACK CHERRY	Prunus serotina
BLL	BLACK LOCUST	Robinia Pseudo-Acacia
BLW	BLACK WALNUT	Juglans nigra
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FLD	FLOWERING DOGWOOD	Cornus florida
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PIC	PIN-CHERRY	Prunus pensylvanica
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PIP	PITCH-PINE	Pinus rigida
QUA	QUAKING ASPEN	Populus tremuloides
RED	RED OAK	Quercus rubra
REM	RED MAPLE	Acer rubrum
RES	RED SPRUCE	Picea rubens
SAS	WHITE SASSAFRAS	Sassafras albidum
SCO	SCRUB-OAK	Quercus ilicifolia
SCP	SCOTCH PINE	Pinus sylvestris
SHB	SERVICEBERRY	Amelanchier spp.
SHH	SHAGBARK-HICKORY	Carya ovata
SUM	SUGAR-MAPLE	Acer saccharum
SWB	SWEET BIRCH	Betula lenta
VIP	SCRUB-PINE	Pinus virginiana
WHA	WHITE ASH	Fraxinus americana
WHO	WHITE OAK	Quercus alba
WHP	WHITE PINE	Pinus strobus
YEB	YELLOW BIRCH	Betula lutea
YEP	TULIP-POPLAR	Liriodendron tulipifera

REVISIONS:

DATA SOURCE: ASPLUNDH ENVIRONMENTAL SERVICES, BLAIR MILL ROAD, WILLOW GROVE, PA. 19090

FIELD SURVEY - AES, 1975, 76

This information is a part of the ESEERCO "STUDY OF ENVIRONMENTAL AND ECONOMIC ASPECTS OF CONTEMPORANEOUS ELECTRIC TRANSMISSION LINE RIGHT-OF-WAY MANAGEMENT TECHNIQUES"

MAP 20.2

SITE 20

MAPPED PLOTS

UTILITY: POWER AUTHORITY - STATE OF N.Y.

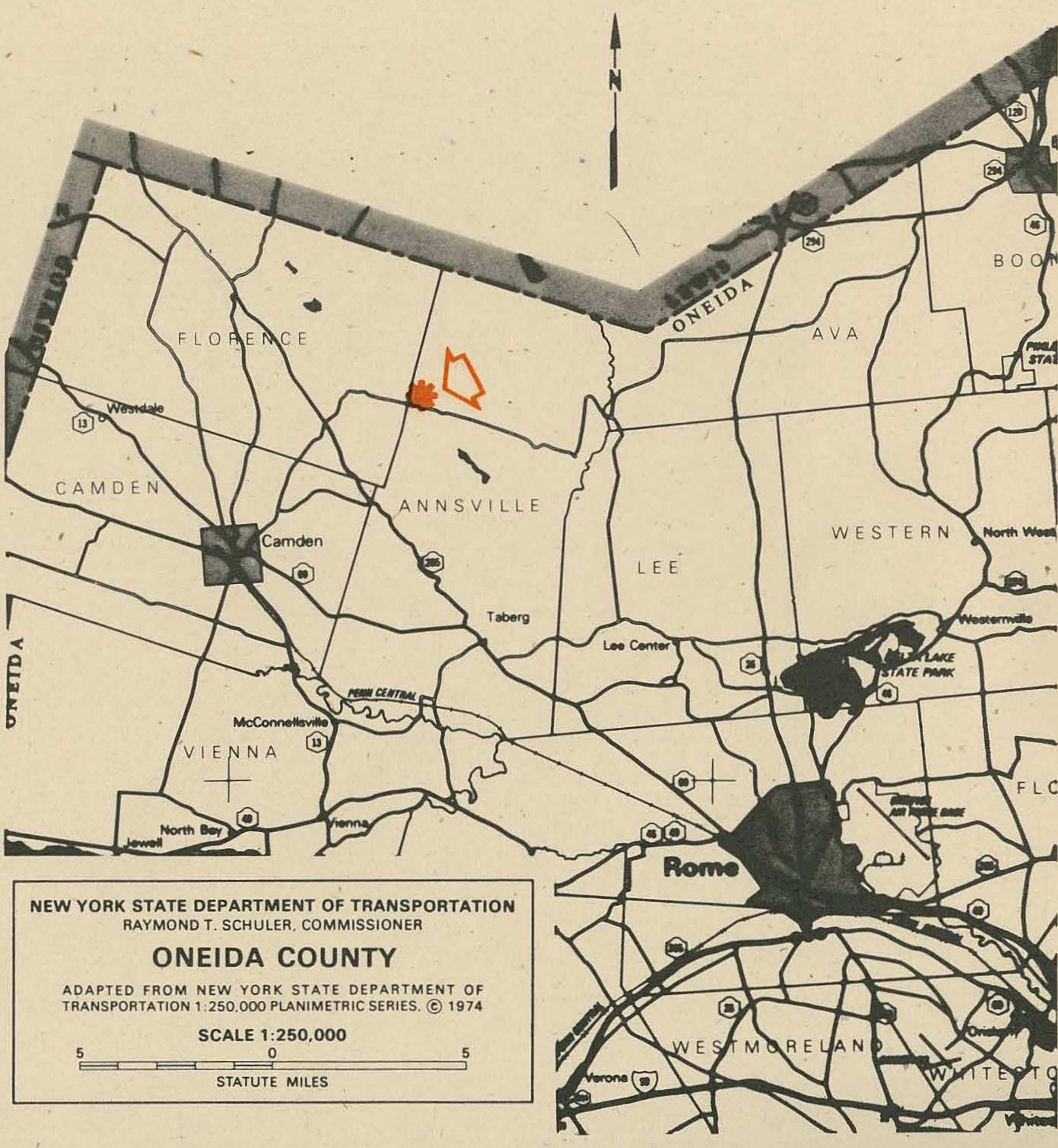
ROW DESCRIPTION: ADIRONDACK TO PORTER 230 KV.

WOODEN POLE 'H' FRAME 500' ROW

SCALE: 1" = 10' - 0"

10 5 0 5 10 20 40 50

SITE 21
FITZPATRICK to EDIC



Site 21 Fitzpatrick to Edic

Study area extends from Blake Road, structure 42-5 to structure 42-1, and is near Empeyville. To reach study area, take route north out of Camden to Thompson's Corners, then 67A through Empeyville to Blake Road. Proceed on Blake Road south to study area which is less than one mile on the right side.

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Site 21 Fitzpatrick to Edic

1 Introduction

Site 21 is located in the Tug Hill Plateau physiographic area of New York (Cline, 1970) in the Northern Hardwoods forest type area (Stout, 1958). The general landscape of the ROW and adjacent areas is shown in Figs. 21.1.1 and 21.1.2.

The topography of the area is typically flat to low rolling hills, at an elevation of 1,000 to 2,000 feet above sea level, frequently with swamps along meandering streams. The glacial till soils are generally very stony, and drainage is poor (Stout, 1958).

Typical forest types of the region are Northern Hardwoods, Hemlock-Northern Hardwoods, and Elm-Red Maple and Northern Hardwoods (Stout, 1958). Also located on the site are Red Pine and Scotch Pine forest types.

2 Location and Identification

Site 21 is approximately 2¼ miles southeast of Empeyville, in the town of Annsville, Oneida County, New York (75° 38' 30" W. Longitude; 43° 23' 00" N. Latitude).

The site is on the Fitzpatrick to Edic ROW which is operated by the Power Authority of the State of New York (PASNY). This 150-foot easement consists of 1 single circuit, 345 kV line. The project site is approximately 5,000 feet in length and extends from Blake Road and structure 42/5 to structure 42/1.

3 Background

The following discussion outlines documentable management techniques of clearing, construction, restoration, and maintenance regarding site 21, as received from PASNY (letter dated March 5, 1976, from Kevin T. McLoughlin, the Power Authority of the State of New York, Massena, N.Y.). Available cost information is provided in Table 21.1. All other available pertinent information and cost data are included under each operation of clearing, construction, restoration, and maintenance.

3.1 Clearing

The Fitzpatrick to Edic line was cleared between June, 1971, and July, 1971. The ROW was cleared at a width of 150 feet with the exception of excluded areas and state reforestation areas. Areas under the jurisdiction of the New York State Department of Environmental Conservation (DEC), called state reforestation areas, were designated to preserve the existing vegetation and otherwise maintain suitable aesthetic effects. Other areas were also designated as excluded areas. The width of access route clearing was 20 feet.

Clearing included the removal and disposal of trees, brush over 3 feet high, slash, dead timber, fences, and rubbish. Desirable woody species, as listed below, were not cleared except at tower sites and on access routes. Clearing also included the removal and disposal of small farm buildings such as chicken coops, pig stys, corn cribs, tool sheds, and outhouses, within the clearing limits. Large farm buildings such as homes, garages, barns, and silos were removed by others.

Brush, trees, and stumps were cut off as close to the ground as practicable but not more than 6 inches above the ground, with the exception of designated access routes, where they were cut off not more than 3 inches above the ground.

Desirable woody species generally not removed included the following:

Apple	Mountain-Laurel
Azalea	Ninebark
Barberry	Pussy-Willow
Bayberry	Raspberry
Crab-Apple	Rhododendron
Dogwood	Serviceberry
Sweet-fern	Spiraea
Hawthorn	Sumac
Honeysuckle	Summer-sweet
Juniper	Viburnum
Mountain-Ash	Witch-Hazel

3.1.1 Selective Clearing

The excluded areas were selectively cleared on both a per acre and per tree basis. The state reforestation areas were selectively cleared on a per acre basis only, and generally consisted of the removal of all trees within a 60-foot-wide strip down the centerline of the ROW, and selective removal of trees along the edges of the cleared strip. Selective clearing included removal and disposal of all trees, bushes, slash, dead timber, fences, small farm buildings, and rubbish at tower sites and in other portions of the excluded and state reforestation areas. Desirable woody species, listed above, were not cleared except at tower sites.

Brush, trees, and stumps were cut off as close to the ground as practicable, but not more than 3 inches above the ground in excluded areas and not more than 6 inches above the ground in state reforestation areas. Danger trees were removed and disposed of following the clearing and selective clearing operations.

Selective trimming of trees was completed in excluded areas adjacent to areas selectively cleared.

Brush was disposed of in August, 1971; the equipment used included a small dozer, rubber-tired skidder, and a small and a large chipper. Materials from clearing, selective clearing, removing danger trees, and selective trimming were removed from the site, chipped, or burned. No burning was done in excluded or state reforestation areas. Materials to be burned were first piled. Combustible materials, which were not burned, and noncombustible materials, were removed from the site.

In excluded and state reforestation areas, materials which could be were chipped. Materials which could not be chipped were removed for disposal. All American elm and wild-cherry chippings were removed from the areas for disposal. Salvage timber in state reforestation areas was in excess of 4 inches in diameter and 8 feet in length. Salvage timber was transported and machine-piled at points within the limits of the ROW in each state reforestation area.

3.1.2 Initial Chemical Treatment

With the exception of state reforestation areas, stumps and brush cut were chemically treated. Chemical treatment was not used within 100 feet of any river, stream, or other body of water. Reasonable care was exercised not to chemically treat desirable species or small trees and low growing plants that were left within the limits of the ROW.

Chemical treatment consisted of application of a basal spray of low volatile esters of Tordon acid and Trichlorophenoxyacetic acid (2,4,5-T) in an oil carrier. The basal spray was prepared in the proportion of 1½ gallons of Tordon 155 concentrate to 98½ gallons of carrier.

In state reforestation areas, immediately after cutting, the cut surfaces of all softwood stumps were saturated with a 20% aqueous solution of urea containing a sufficient additon of red iron oxide to color the stump. No separate or direct payment was made for the treating of stumps on state reforestation areas, but the costs were included in the contract prices for clearing (Table 21.1).

3.2 Construction

The towers were constructed in June and July, 1972. Towers were furnished by PASNY completely dismantled. The contractor furnished all labor, material, and equipment required to assemble and erect all steel tower structures.

3.3 Restoration

The contractor performed the following work in July and August, 1973, to obliterate ruts and scars on the ROW and easements resulting from clearing operations, including those caused by PASNY or the engineer in routine travel:

1. Removal from the ROW or burial of stumps and roots. No burial was allowed in excluded and state reforestation areas;

2. Grading of areas used by the contractor, except in swamps or heavy woods, to remove ruts. When such areas were heavily sodded, a heavy disc plow or rototiller was used to restore and seed these areas with perennial rye-grass, at the rate of 5 pounds of seed per 1,000 square feet;

3. Grading of sever ruts which would hamper access in swamps and heavily wooded areas. Existing access roads in these areas were also restored;

4. Grading and seeding of embankments that required a cut or fill in excess of 3 feet above or below the original ground line;

5. Construction of terraces, culverts, or other control devices to provide adequate drainage and erosion control. The contractor also restored drainage ditches and culverts which were damaged.

3.4 Maintenance

To date, a maintenance schedule has not been established, and nothing was done prior to establishment of ROW study plots.

Selective cutting and/or spraying was done in August, 1975, to all areas outside state lands and excluded areas. Where spraying occurred, the mixture included about 1 gallon of Tordon 155 applied with 70 gallons of fuel oil. The cost was about $75 per acre for labor and materials, for a stem basal application with backpack sprayer.

4 General Reconnaissance

A general reconnaissance was made in accordance with the methodology and is set forth in Map 21.1 which shows its habitat conditions. In this reconnaissance it was noted that the major vegetational types correlated with the soil types on the hydric and mesic habitats.

The existing visual character of the ROW is depicted during all seasons of the year, from important vantage points both on and off the ROW. These points are identified as photo stations and are located on Map 21.1 and described in Appendix 17. Specific reference is made to some of these photo stations throughout the report and illustrated in Fig. 21.1. With the exception of aerial photography used to identify land use, older photographs depicting the area are not available.

In the context of its location the ROW site is generally pleasing to view. The vista opened up by the ROW is beautiful, and shows an attractive contrast between the forest edge and the lower-growing ROW vegetation. The region is remote, and is used larely by hunters and fishermen. Florence Creek, a clear and attractive trout stream, crosses the ROW, as does a more sluggish and less attractive stream. The ROW crosses Blake Road and can easily be seen from that vantage point, as the ROW opens a vista through a uniform forest. Although the terrain is basically flat, the ROW turns beyond structure 42/5, and the trees and brush serve to screen the remainder of the ROW fairly well. The potential number of people viewing the ROW is low. The site is located in a rural area of New York, in the sparsely populated Tug Hill Plateau region. No residences are located in the immediate vicinity, although some farms are found nearby. Although Blake Road crosses the ROW, it does not appear to be heavily traveled.

5 Field Studies - Results and Discussion

5.1 Soils

5.1.1 Geology and Soils

Site 21, Fitzpatrick to Edic ROW, is located in Oneida County in that physiographic region termed Tug Hill Plateau (Cline, 1970) and Tug Hill Upland (Thompson, 1966), and lies west of the Black River. The sector is an outlier of the Appalachian Upland Region, and is underlain by Paleozoic sandstones, limestones, and shales (Thompson, 1966). More specifically, bedrock geology is of the Ordovician period, 500 to 435 million years ago, consisting mainly of shale and sandstone in the upper part, and limestone and dolostone in the lower (Broughton et al., 1973). The area was glaciated, which produced stony conditions and left a deposit of glacial till (Thompson, 1966).

Several of the soils on this site are classified in the order Spodosols, suborder Orthods (Empeyville and Worth soil series), reflecting leached surface horizons and accumulations of organic matter, iron and aluminum in the subsurface horizons; Westbury soils are in the order Spodosols, suborder Aquods, indicating, additionally, seasonal saturation with water and its attendant characteristics. Alton soils are in the order Inceptisols, suborder Ochrepts, reflecting the absence of horizons of marked accumulations of clay, iron, and aluminum oxides; Tughill soils are in the order Inceptisols, suborder Aquepts, indicating, additionally, the presence of water. Adrian soils are in the order Histisols, suborder Saprists, reflecting their development in water-saturated environments (Buckman and Brady, 1969; Soil Survey Staff, 1975). The study area is comprised of soils in the Worth-Empeyville association, which is noted for its stony qualities (Pearson et al., 1960). Brief descriptions (Pearson et al., 1960; Heffner and Goodman, 1973; Anon., 1972) of soil types occurring on the ROW study site (Map 21.1; Table 21.2) are:

Alton gravelly sandy loam (AgA): These soils developed in glacial outwash and beach deposits dominated by fragments of red or mixed red and gray sandstone, and occupy broad, nearly level terraces, short moderate to steep slopes or terrace faces or beach ridges, and kame topography. Internal drainage is good, and these soils in general are well drained to somewhat excessively drained. Soil reaction is strongly to medium acid, although it may vary from pH 5.0 at the surface to pH 7.0 at 41 inches; in the surface mineral soil on this site, it was pH 4.0. Assigned to Woodland Suitability Group 3o1, Alton soils evidence moderately high potential productivity for timber (Class 3), and have no significant restrictions or limitations for woodland use or management (Subclass o).

Adrian loam (AdA): These soils are poorly-drained, and generally consist of from 15 to 40 inches of muck over sand. The underlying sand is usually firm and water-tight. On this site, soil reaction was medium acid, being pH 5.4 in the surface 3 inches. Adrian muck is assigned to Woodland Suitability Group 5w (personal communication with William Hanna, 1976, Soil Conservation Service, N.Y.), designating low productivity for timber and the presence of excessive water causing significant limitations for woodland use and management.

Empeyville stony sandy loam (EdA): Empeyville soils formed from glacial till, and occupy undulating to rolling or sloping terrain. Internal drainage is generally slow because of the presence of a dense fragipan, but surface drainage is moderately good. The soil is strongly acid and is pH 4.5 in the surface horizon on this site; throughout a typical profile, it ranges from pH 4.5 to pH 5.5 in the first 49 inches. Assigned to Woodland Suitability Group 4o1, these soils have a moderate productivity for timber, and no significant restrictions or limitations for woodland use or management.

Tughill stony silt loam (TaA): These soils developed in strongly acid, stony, sandy glacial till, in nearly level areas and wet depressions. Tughill soils are very poorly drained and internal drainage is very slow. The seasonal water table is at the surface. Soil reaction is strongly to extremely acid, ranging from pH 4.5 to pH 5.5 throughout a typical profile in the first 30 inches, and was pH 5.3 in the upper 3 inches on this site. Tughill soils are assigned to Woodland Suitability Group 5w2, designating low potential productivity for timber, with excessive water causing significant limitations for woodland use and management.

Westbury stony loam (WdA): Westbury soils developed in glacial till, and occupy nearly level to gently sloping terrain. Drainage varies from somewhat poor to poor, and internal drainage is slow to very slow, as it is restricted by a compact subsoil and substratum. The depth to the seasonal water table is ½ to 1 foot. These soils are generally strongly acid, although throughout a typical profile they range from pH 4.5 to pH 6.0; in the surface horizon on this site they were pH 4.4. Assigned to Woodland Suitability Group 4w2, Westbury soils have a moderate timber productivity, and woodland use and management are limited by the excessive water.

Worth stony loam (WmB): These soils formed in glacical till, and are located on undulating till plains, and local hilly or steep areas. While internal drainage is medium to slow due to the presence of a firm to very firm fragipan, Worth soils are basically well drained. Soil reaction ranges from pH 4.5 to pH 6.0 throughout a typical profile; it was strongly acid in the surface horizon on this site, pH 4.5. In Woodland Suitability Group 3ol, these soils have a moderately high potential for timber productivity, and no significant restrictions or limitations for woodland use or management.

5.1.2 Humus Types

Organic layers present on the soil surface of the ROW and adjacent woodland were measured on 2 mesic upland locations. Average thickness of the organic layers and A1 horizon was based on 5 samples taken at each location (Table 21.3). The presence and thickness of these layers were used for humus type classification. As the humus classification key is not adaptable to areas exhibiting prolonged water saturation in the surface soil, similar measurements were not made on the hydric site.

There is some evidence that several areas on the ROW were grazed at one time, and remnants of 2 stone walls remain on the study area. No evidence of plowing was noted, but the surface soil on the ROW had apparently been mechanically disturbed, and evidence of fire was noted in the form of charcoal on the ROW edge at a red pine plantation.

All organic layers (litter, fermentation, and humus) plus an A1 horizon (mixed mineral and organic) were present at each site on both the ROW and woodland. Based on thickness of the fermentation, humus, and A1 layers, the predominant humus type was designated a "thin duff mull with very shallow A1" on the ROW and a "thick duff mull with very shallow A1" in the forest. Organic layers were thicker in the forest than on the ROW resulting in a "thick duff mull" in the woodland, except for the south forest at 1 mesic site (2), where a "thin duff mull", nearly equivalent to that found on the ROW, was located. Organic layers in the woods were composed primarily of tree parts (leaves and needles, twigs, and fruit) in contrast to the leaves and stems of grasses, herbs, and shrubs on the ROW.

Based on these limited observations, it appears that organic layers on the ROW are thinner than those in the forest, but it is not known whether this resulted from ROW construction and maintenance activities or to past grazing and other agricultural uses. A change in source of litter deposits, however, did result from elimination of the forest cover, but regrowth and persistence of a mixed grass-herb-shrub cover has produced annual depositions and continuation of a protective organic layer on the ROW.

5.1.3 Soil Erosion

Current Active Erosion Observations of active soil erosion on the ROW and adjacent woodland were made on the Fitzpatric to Edic study area in June, 1976. No active erosion was evident in the woodland on all soil types and slopes, apparently due to the protective canopy of trees and shrubs and undisturbed organic layers present on the soil. Likewise, no active or recent erosion was observed on the general ROW, in areas on which woody brush was controlled with little or no disturbance to the soil surface after initial clearing. Good vegetative covering, composed of grasses, herbs, and low shrubs, had developed on the general ROW after initial clearing and subsequent brush control, and protective litter mulch from these plants was present (Table 21.3).

Eroding areas were identified as to location on the ROW, soil type, average slope, and present plant cover (Table 21.4). Erosion was classified as to kind (sheet, rill, gully) and class (slight, moderate, severe); the average depth of gullies occurring was recorded, but the location was not noted on the base map as such erosion was limited to 1 small section of the ROW on the access road. Active erosion on the ROW was limited to areas that had been subjected to past and/or recent mechanical disturbances of the soil, i.e., tower sites and access roads (Table 21.4 and Fig. 21.1.3). Some sediment resulting from erosion accumulated on lower slopes and did not leave the ROW. In 2 locations, however, sediment left the ROW via streams, and on 1 area sediment collected in a water impoundment but left the ROW via a stream during wet seasons.

Restoration in this area consisted mainly of seeding around tower sites, but to a great extent natural plant invasion has occurred. Some grass cover has developed on access roads but infrequent use by equipment and utility-related vehicles has resulted in rutting in some areas and a sufficient dearth of plant cover for sheet, rill, and gully erosion to occur. One tower site is bare with a grass cover developing, and another consists of wood chips and grass; in both instances, sheet erosion is occurring. There were no areas of mass land movement such as landslides on this site.

5.2 Vegetation

5.2.1 Habitat and Forest Types On the Site

Mesic Habitat Two mesic, or medium moist, habitats were located on this site. Mesic 2 habitat was located on the lower slope of a long, low hill. Slope was negligible and aspect was flat. Drainage was free but normally not excessive, even though the habitat borders Florence Creek. The forest type was Hemlock-Northern Hardwoods, with hemlock a dominant species, accompanied by yellow birch, sugar-maple, and red maple. A second mesic habitat (3) occupied the middle and upper slopes of a long, gently rolling hill. For the most part, slope was neglibible and aspect was flat. Slope was approximately 8% in the northeast section, on a basically south-facing slope. Here the forest type is a Scotch Pine plantation with hemlock, red maple, sugar-maple, and beech prominent in the shrub layer.

Hydric Habitat The hydric, or wet, habitat (1) was located in a slightly depressed area between 2 long, gently rolling hills. Slope was negligible and aspect was flat. Drainage was impeded and marshy conditions have developed. The forest type was Elm-Red Maple, with American elm and red maple dominant, accompanied by sugar-maple, black cherry, and yellow birch.

5.2.2 Analysis of Forest Types and Associated ROW Vegetation

General Changes in Vegetation The primary impact of the ROW was to cause a change from a forest with a 4-layered structure to a shrub-herb-grass community. Obviously, this was caused by removal of the trees; and what was essentially a 2-layered ROW community developed, composed primarily of shrubs, herbs, and mixed grasses. Trees remain as a part of the existing shrub community and consist of seedling and sapling-sized material, either not removed by maintenance spraying or established since the last treatment (Fig. 21.2).

In order to more completely characterize the forest types, an analysis was made on the mesic forest plots to derive importance values for the tree species located thereon (Table 21.5). Obviously, hemlock, yellow birch, sugar-maple, and red maple were important species on mesic plot 2; and Scotch pine and red pine were important species on mesic plot 3.

On the hydric habitat, an Elm-Red Maple forest type was changed to a Willow-Sensitive Fern plant community. On the mesic habitats, a Hemlock-Northern Hardwoods forest type, and a Scotch Pine forest type with a northern hardwoods understory, were changed to Blackberry-Goldenrod plant communities (Map 21.1; Table 21.6).

Quantitative Changes A notable increase in the number of shrub species on the hydric habitat was apparent on the ROW as compared with the adjacent forest; there were 5 species on the ROW as compared with 1 in the forest (Table 21.6; Figs. 21.3 and 21.4). The mesic habitats were similar in number of shrubs, with 6 species on the ROW on mesic 2 habitat and 5 in the forest (3 in the north forest and 2 in the south forest), and with 3 species on the ROW as compared to 3 in the forest on mesic 3 habitat. There was also a marked change in the herb layer on hydric 1 habitat; there were 17 species on the ROW as compared to 7 in the woods. The mesic habitats were similar. There were 24 herb species on the ROW, and 22 in the north forest and 18 in the south forest on mesic 2 habitat; on mesic 3 habitat, there were 24 herb species on the ROW as compared to 15 in the forest (Table 21.6).

Qualitative Changes On the hydric 1 habitat, 6 shrub and herb species occurred in the forest and on the ROW (Fig. 21.5). One shrub, raspberry, occurred exclusively in the forest (Table 21.7), and 5 species, namely willow, mountain-maple, arrow-wood, elderberry, and spiraea, appeared only on the ROW (Table 21.8). In the herb layer of the hydric habitat, 11 species occurred on the ROW only (Table 21.8), while 1 species appeared in the forest but not on the ROW (Table 21.7).

On mesic 2 habitat, there were 8 and 7 shrub and herb species both in the forest and on the ROW, respectively, comparing the north and south forests to the ROW (Fig. 21.5). Three shrubs, hobblebush, fly-honeysuckle, and dewberry, occurred only in the forest (Table 21.7); and 4 shrub species, most notably bristly sarsaparilla, occurred on the ROW but not in the forest (Table 21.8). In the north forest of mesic 2 habitat, 15 herb species occurred, and in the south forest 12 such species occurred, which were not found on the ROW (Table 21.7); of these, a total of 22 different species occurred. Sixteen herb species occurred only on the ROW of mesic 2 habitat (Table 21.8).

On mesic 3 habitat, there were 8 shrub and herb species that occurred both in the adjacent forest and on the ROW (Fig. 21.5). In the shrub layer, arrow-wood, witch-hazel, and American yew were present only in the forest (Table 21.7), while spiraea, blackberry, and chokecherry were present only on the ROW (Table 21.8). Seven herbs were found exclusively in the forest, particularly the abundant partridge-berry and bristly club-moss, while 16 occurred solely on the ROW, notable among which are goldenrod, sheep-sorrel, sedge, and panic-grass (Tables 21.7 and 21.8).

In general, those species which occupied the ROW on the hydric and mesic habitats were light-loving plants of open areas such as blackberry, willow, goldenrod, aster, cat-tail, and swamp-buttercup. Conversely, those plants that occurred in the forest were mainly forest-dwelling species that do well under shade (Table 21.6).

5.2.3 Analysis of Plant Communities for On-ROW Mapped Vegetation Plots

Table 21.9 presents a breakdown of major vegetational communities (Map 21.2) for hydric and mesic plots on the Fitzpatrick to Edic ROW. Much of the present compostion of herbaceous and woody plant communities reflects the clearing and maintenance history.

This is a relatively new ROW which was clear cut and has had only 1 maintenance treatment since initial clearing, which consisted of selective cutting and/or spraying with Tordon 155 in oil.

Blackberries are prolific on both mesic sites. They have invaded and spread since clearing. In some instances, blackberry canes can present an inconvenience in line maintenance and inspection activities. Extensive colonies, such as occur here on the mesic areas, may be considered undesirable from this standpoint in spite of their value for browse. There is no indication that these communities are diminishing in area at this time.

Herbaceous perennials present on the ROW area that do not occur in the understory of the adjacent woods include goldenrods, asters, sedge, and boneset. These are plants which have probably invaded the line are due to the increased sunlight offered by line clearing.

Certain spring wild flowers, such as trillium, wild-lily-of-the-valley, Indian cucumber-root, Solomon's-seal, and bluebead-lily, occurred in the forest, and either not at all, or to a much lesser extent, on the ROW.

The majority of shrub and herb species that occurred in the forest were eliminated from the ROW since the initial clearing on all 3 study sites. This may be tempered by the fact that the ROW clearing is new, and certain species now occurring only in the forest may readjust to ROW conditions in the future.

Certain species, such as ostrich-fern, occur in limited areas of the ROW, but are not located on the mapped plot (Fig. 21.1.4).

Willow has become a prominent shrub in the hydric site since line clearing and will most likely remain as a major shrub on the hydric sites under the present selective maintenance program. Pin-cherry had invaded the mesic sites and was quite abundant until maintenance was performed on this line in August of 1975. Under the present maintenance program, pin-cherry may well become much less abundant.

5.2.4 Comparison of Forest Type with ROW Vegetation

The ROW was clear cut in the spring and summer of 1971, and has had 1 maintenance treatment since that time, in August of 1975. This treatment occurred after establishment of study plots, and consisted of selective cutting and/or spraying. The herbicide used was approximately 1 gallon of Tordon 155 applied with 70 gallons of fuel oil.

The general impact of the above clearing and treatment of the ROW was to change the forest types (Hemlock-Northern Hardwoods, Scotch Pine, Red Pine, Northern Hardwoods, and Elm-Red Maple) to shrub-herb-grass communities. Some shrub and herb plants of the forest were replaced by plants favored by open conditions.

On the hydric habitat, formerly occupied by an Elm-Red Maple forest type, a Willow-Sensitive Fern plant community was produced. There was a significant difference in the number and kind of species on the ROW as compared to the adjacent forest. In most cases when forest species occurred on the ROW, they were less abundant than in the forest. The same is true of species of the open ROW when they occurred under the forest canopy.

On the mesic habitats, which were formerly occupied by Hemlock-Northern Hardwoods and Scotch Pine forest types, Blackberry-Goldenrod plant communities developed. There was a quantitative and qualitative change in the shrub and herb species on the ROW as compared to the forest.

5.3 Wildlife

The major game species for site 21, Fitzpatrick to Edic, as determined by Asplundh Environmental Services (AES) in conjunction with the DEC, are white-tailed deer, varying hare, and ruffed grouse.

5.3.1 Actual Use

White-tailed Deer White-tailed deer observations consisted mainly of signs, i.e., tracks, pellets, and browse. Deer browse and tracks were moderate both on and off the ROW, during the spring of 1975, on hydric plot 1 and in the vicinity thereof.

Two deer were sighted feeding on twigs and bark of apple trees off the ROW during the winter of 1976. Upon approach, the deer fled through the woods across the ROW to "escape cover" on the other side. Deer tracks were numerous off the ROW in the vicinity of the apple trees, located in the south forest. Heavy snow cover on the ROW greatly limited food availability, but a moderate number of tracks were noted on the ROW. Deer tracks were found in moderate abundance both on and off the ROW near the hydric plot in the spring of 1976.

Browse Survey Six browse transects were established on study area 21 (Tables 21.10 and 21.11). These transects were established at each permanent study plot location, with 1 transect on each side of the ROW, on April 30, 1976.

Overall browse utilization by percent actual use was higher in the woods, 29%, than at the ROW edge, 7%, or on ROW, 5%. This may be due to the fact that heavy snows blanketed the ground during the winter and the stems were not accessible on the open ROW edge, and more stems were available at the ROW edge than in the interior woods (Table 21.10 and Fig. 21.6).

Stems of the genus Rubus far surpassed all other species with regard to total abundance; however, the percent of actual use was low (Tables 21.10 and 21.11).

Willow, elderberry, and alternate-leaved dogwood were those species highly utilized by deer (Table 21.10).

Overall actual use was low for this study area. It may be that the deer population is small in this area as compared to other areas of the state.

Ruffed Grouse A ruffed grouse drumming count was made on April 30, 1976, from 6:30 a.m. to 7:30 a.m., on site 21. The weather was clear, with a temperature of 60 F, and winds were from 0 to 5 miles per hour. Two birds were noted drumming in the woods immediately adjacent to the ROW, 1 on the north side and 1 in the forest to the south (Map 21.1).

In addition, 1 grouse nest was found during the spring of 1976 in the woods north of mesic plot 2 in a heavy stand of hemlock (Fig. 21.1.5). This nest was watched closely, and successfully hatched. However, only 3 eggs hatched out of 8 laid. The other 5 eggs appeared to have been rolled or moved from the nest for a distance of 6 to 10 feet. A brood of grouse consisting of 10 to 12 chicks was spotted off the ROW to the south. The mother hen made threatening displays at the observers in defense of her young.

Varying Hare No varying hare activity was observed during the period of study on this ROW.

Miscellaneous Wildlife Observations Various birds were seen and/or heard on the study area throughout the period of this study. The diversity of species may be attributed to the ecotone which is created due to the presence of the ROW. Birds observed on the ROW and on the ROW edge are included in Table 21.12.

Two Blanding's turtles were observed feeding on the ROW during the spring and summer of 1976. One turtle was feeding on leaves from the genus Rubus.

During the spring of 1976, 1 red squirrel was observed feeding at the ROW edge in a stand of Scotch pine. Moderate red squirrel activity, in the form of cone cuttings, was noted in the woods near hydric plot 1, and in the Scotch pine stand at mesic plot 3.

Numerous frog eggs were noted in the water-filled ruts of the access road on the ROW, and numerous tadpoles occupied standing water, also on the ROW. Throughout the ROW, frogs were noted in standing water, in the spring of 1976. Red spotted newts were also observed in standing water near the hydric plot. One crayfish carcass was found in Florence Creek, on the ROW.

Also during the spring of 1976, a small amount of fox scat was observed throughout the ROW. Raccoon activity was moderate in wet areas off the ROW, as indicated by tracks.

5.3.2 Potential Use

Potential wildlife use of the plant species present on site 21 for the 3 major game species (deer, hare, and grouse) is contained in Table 21.13. In addition to asterisk ratings from New York, asterisk ratings from Pennsylvania were included for those plant species present on the study area that were not rated in the New York evaluation for deer and grouse. The same was done for varying hare with the inclusion of some of the asterisk ratings for Minnesota. This additional data should provide supplemental information to the ROW manager regarding those plant species that may be of potential value to those game species (Martin et al., 1951).

5.4 Water

Two streams on the Fitzpatric to Edic site were sampled for water quality on September 29, 1975, and February 17, May 20, and August 1, 1976 (Table 21.14, Map 21.1).

5.4.1 Stream Descriptions and Sampling Points

Florence Creek Florence Creek (Fig. 21.1.6) is a third-order stream in the study area and flows southeast at a gradient of 0.4%. This watershed is located in the Oneida Lake Basin.

Sampling locations 1 through 4 were sited on Florence Creek as follows:

1. 100 yards upstream, north, of the ROW;
2. the upstream, north, edge of the ROW;
3. the downstream, south, edge of the ROW;
4. 100 yards downstream, south, of the ROW (Map 21.1).

Boulders, rubble, gravel, and sand compose the substrate (Environmental Protection Agency, 1973). Boulders, fallen logs, and vegetation trap sediment.

Vegetation at locations 1 and 4 is similar, and overstory vegetation includes hemlock, yellow birch, sugar-maple, and red maple. The canopy provides heavy shade. However, the canopies on the east and west banks do no overlap. Locations 2 and 3, located at the edge of the ROW, receive partial shading from the adjacent woods. Saplings are more abundant at location 3 than at location 2, and blackberry, sheep-sorrel, boneset, Joe-Pye-weed, and mixed grasses are found on the ROW. Near the stream, selected trees were left for shading purposes.

Between locations 2 and 3, the access road fords the creek. Several small islands are located in the study area. Locations 1, 2, and 3 are sited in the mainstream, and location 4 is sited in a pool separated from the mainstream by an island.

Florence Creek is presently utilized by wildlife, anglers, and hunters in the study area. The New York Department of State "official classification" of Florence Creek is AA(T) Domestic Water Supply, Unfiltered (Trout Water).

Stream Located Between Structure 42/1 and Structure 42/2 The second stream studied is located about 3/4 miles west of Florence Creek. This stream is first-order in the study area and flows southeast at a gradient of 0.8%. The stream is in the Oneida Lake Basin.

Sampling locations 5, 6, and 7 were sited as follows:

5. 100 yards upstream, north, of the ROW;
6. mid ROW;
7. 100 yards downstream, south of the ROW (Map 21.1).

Upstream of the ROW the stream flows through a swamp. Overstory vegetation, such as hemlock, basswood, red maple, and yellow birch, provides shade. Elderberry, yew, ferns, and mosses are also present. On the ROW the stream is ponded and overstory vegetation is lacking. Willow, rush, sedge, arrowwood, and mosses and ferns provide partial shading, and algae is present. The stream flows through a swamp downstream of the ROW. Common vegetation is willow, sedge, rush, goldenrod, aster, Joe-Pye-weed, water-purslane, and ferns and mosses.

Vegetation and fallen logs and branches trap sediment. In addition, the pond on the ROW functions as a sediment basin.

The pond on the ROW is formed by a man-made stone wall which acted as a dam; it obviously is older than the ROW. The access road on the ROW fords the stream at the pond. A single lane dirt road and culvert are located immediately upstream of location 7.

The stream is presently utilized by wildlife and hunters. No anglers were observed. However, fish were observed in the stream. The New York Department of State "official classification" for this stream is Class C(T), Fishing (Trout Water).

5.4.2 Analysis of Water Quality

Florence Creek Florence Creek was surveyed on September 29, 1975, from 10:30 a.m. to 3:10 p.m.; it was clear and sunny and the air temperature was 24 C (Table 21.14). Considerable time elapsed between some sampling. Depth at locations 1 through 4 was 14, 12, 14, and 18 inches, and width was 41.0, 24.0, 38.0, and 23.5 feet, respectively. Water temperature varied 2.0 C, from 8.5 C at locations 1 and 2 to 10.0 C at location 3 and 10.5 C at location 4. Dissolved oxygen concentration and percent saturation ranged from 12.7 to 13.1 ppm and 116 to 125%, respectively. The pH at location 1 was 6.0. Sediment stakes were set at all locations.

On February 17, 1976, from 10:30 to 11:20 a.m., the air temperature was 2 C and sampling was conducted during rain (Table 21.14). Water temperature was 0.0 C at all locations. Dissolved oxygen concentration and percent saturation ranged from 11.9 to 13.3 ppm and 87 to 98%, respectively. The pH was 7.3. Ice was present in the creek and along the banks, and from 2 to 3 feet of snow covered the site.

Sampling on May 20, 1976, was conducted from 5:00 to 5:40 p.m.; it was cloudy and the air temperature was 13 C (Table 21.14). Depth at locations 1 through 4 was 24, 18, 22, and 22 inches, and width was 41.0, 26.0, 40.0, and 26.0 feet, respectively. Water temperature ranged from 7.0 to 7.3 C. Dissolved oxygen concentration and percent saturation ranged from 10.0 to 10.8 ppm and 88 to 96%, respectively. The creek was slightly acidic and pH ranged from 6.8 to 6.9. No sediment was present.

On August 1, 1976, from 9:10 to 9:50 a.m., sampling was conducted during light rain and the air temperature was 18 C (Table 21.14). Depth at locations 1 through 4 was 8 3/4, 10, 18, and 16 inches, and width was 39.0, 24.0, 38.0, and 24.0 feet, respectively. Water temperature varied 2.0 C, from 15.0 C at location 1 to 17.0 C at locations 3 and 4. Dissolved oxygen concentration and percent saturation ranged from 9.4 to 9.8 ppm and 101 to 109%, respectively. The pH ranged from 6.9 to 7.2. At location 3, 2½ inches of gravel was deposited. Brook trout were observed at locations 1, 3, and 4.

Stream Located Between Structure 42/1 and Structure 42/2 On September 29, 1975, sampling was conducted from 3:45 to 4:45 p.m.; the air temperature was 24 C and it was sunny (Table 21.14). Depth at locations 5, 6, and 7 was 14, 18, and 12 inches, and width was 8.0, 91.0, and 8.0 feet, respectively. Water temperature varied 4.0 C, from 11.5 C at location 5 to 15.5 C at location 6. Dissolved oxygen concentration and percent saturation ranged from 5.5 to 8.1 ppm and 59 to 83%, respectively. Sediment stakes were placed at all locations.

On February 17, 1976, from 11:50 a.m. to 12:35 p.m., air temperature was 2 C and it was raining (Table 21.14). Water temperature was 0.0 C. Dissolved oxygen concentration and percent saturation ranged from 10.7 to 10.9 ppm and 78 to 80%, respectively. The pH ranged from 7.1 to 7.2.

On May 20, 1976, from 6:05 to 6:35 p.m., it was cloudy and the air temperature was 13 C (Table 21.14). Stream depth at locations 5, 6, and 7 was 16, 15, and 15 inches, and width was 9.0, 92.0, and 8.5 feet, respectively. Water temperature ranged from 7.0 C at locations 6 and 7 to 7.1 C at location 5. Dissolved oxygen concentration and percent saturation ranged from 10.0 to 10.6 ppm and 87 to 93%, respectively. The pH fluctuated from 6.9 to 7.1. One half inch and 1 inch of sediment, predominantly organic material, was measured at locations 5 and 6, respectively.

Sampling on August 1, 1976, from 10:25 to 11:05 a.m., was conducted during rain, and the air temperature was 20 C (Table 21.14). Depth at locations 5, 6, and 7 was 8, 15, and 19 inches, and width was 10.0, 92.0, and 8.5 feet, respectively. Water temperature ranged from 15.5 C at location 7 to 16.5 C at location 5. Dissolved oxygen concentration and percent saturation ranged from 6.4 to 7.6 ppm and 70 to 85%, respectively. The pH was 5.7 at location 5, 5.9 at location 6, and 6.5 at location 7. At locations 5, 6, and 7, 1, 1½, and 5½ inches of sediment were measured, respectively. Fish were observed at location 7.

5.5 Land Use

5.5.1 Location

Site 21 is located in a rural nonfarm section of the town of Annsville, Oneida County, New York. Between 1960 and 1970 there was a 3.3% increase in population of Oneida County with a 1970 distribution of 68.3% urban, 29.0% rural nonfarm, and 2.7% rural farm (U.S. Bureau of the Census, 1972). The closest community is Empeyville which is approximately 2½ miles to the southeast.

5.5.2 Land Use Prior to Construction

The ROW was constructed during 1971 to 1972. The earliest available data obtained from 1966 aerial photography indicates that the land adjacent to the ROW was primarily rural nonfarm (Table 21.15; Fig. 21.6). Land use distribution included the following subtypes:

Agriculture:
- Ac - Cropland and cropland pasture
- Ap - Pasture

Forest Land:
- Fc - Forest brushland
- Fn - Forest lands
- Fp - Plantations

Water Resources:
- Wc - Artificial ponds
- Wb - Marshes, shrub wetlands, and bogs
- Ww - Wooded wetlands

5.5.3 Land Use After Construction

The adjacent land use to site 21 has had a minimal change from the 1966 data. The land adjacent to the ROW is still rural nonfarm (Table 21.15; Fig. 21.6), with a land use distribution which includes the following subtypes:

Agriculture:
- Ac - Cropland and cropland pasture
- Ap - Pasture
- Ai - Inactive agricultural land

Forest Land:
- Fc - Forest brushland
- Fn - Forest lands
- Fp - Plantations

Water Resources:
- Wc - Artificial ponds
- Wb - Marshes, shrub wetlands, and bogs
- Ww - Wooded wetlands

In addition to use of the ROW for the transmission of electrical power, portions of the ROW have the potential for hunting, fishing, and snowmobiling.

6 Evaluation, Interpretation, and Summary of Results

6.1 Conditions Which Existed Prior to Establishment of ROW

Soil, water, vegetation, and wildlife habitat conditions existing prior to ROW construction were based on observations made during the period of this study on adjacent undisturbed forest areas on both sides of the ROW.

6.1.1 Soils

This site is located on gently sloping to hilly terrain dominated by glacial till and some outwash deposits over sandstone and shale bedrock. Slopes range from 0 to 12% on predominant east and west exposures. Surface mineral soils are strongly to very strongly acid, pH 4.0 to pH 5.4, with loam, sandy loam, and silt loam textures. Surface soils exhibit high stone content, and internal drainage on most soil types is impeded by fragipans in the subsoil. Six soil types mapped on the study area include well- to excessively drained Alton gravelly sandy loam and Worth stony loam that formed in outwash terraces and till plains, respectively; moderately well-drained Empeyville stony sandy loam on glacial till; and, poor to very poorly drained Adrian loam over sand, Tughill stony silt loam, and Westbury stony loam which formed on gently sloping and depressed till areas.

The general physiography, soil types, and moisture regimes described above were present in the bordering forest and likely represent conditions on the study area at the time of ROW construction in 1971. The major natural forest types associated with these soil and moisture regimes were: Hemlock-Northern Hardwoods and Northern Hardwoods on mesic sites with well- and moderately well-drained Alton, Empeyville, and Worth soils which are rated moderate to moderately high for woodland productivity with no management limitations; and, Elm-Red Maple on hydric sites with poorly drained Tughill and Westbury soils that are rated low to moderate for timber production with management restrictions due to wetness. Two major sections of Westbury, Worth, and Empeyville soils were occupied by small-pole-size red and Scotch pine plantations on areas that appear to be abandoned agricultural land.

The predominant humus type on mesic sites in the forest was a "thick duff mull", consisting of tree litter, fermentation, and humus layers, averaging 1.6 inches thick, and a shallow A1 horizon. No active erosion was noted in adjacent woodland areas on any slope or soil type.

6.1.2 Vegetation

The land now occupied by the study area was in forest prior to corridor establishment (1971). On hydric sites, stands of the Elm-Red-Maple type were the forest cover. On mesic sites, mature stands of the Hemlock-Northern Hardwoods type and pole-stage stands of the Northern Hardwoods type were present over much of this area. The hardwoods in these stands were primarily sugar-maple, red maple, and yellow birch.

Dense Scotch pine and red pine plantations, established on old fields during the early fifties, were also present on large areas of mesic sites.

6.1.3 Wildlife

Wildlife, being mobile species which may or may not be observed during site visitation, were reasonably imputed to this area by the composition of the forested areas adjacent to the ROW. It can be assumed that those species that probably currently utilize the site, i.e., white-tailed deer, ruffed grouse, and varying hare, occupied the habitat prior to ROW construction. Although current wildlife activity may be influenced by the presence of the ROW, it is likely that those species, designated by the DEC in conjunction with AES as major in this areas, inhabited the vicinity before ROW construction. The degree of use is impossible to determine at this time.

6.1.4 Water

Florence Creek No information is available.

Stream Located Between Structure 42/1 and Structure 42/2 No information is available. However, the pond present on the ROW was probably present prior to ROW construction.

6.1.5 Land Use

Prior to construction of the ROW in 1971 to 1972, the ROW and adjacent land area was rural nonfarm with a land use distribution of agriculture (13.8%), forest land (80.4%), and water resources (5.8%).

6.2 Conditions Which Exist at Present

6.2.1 Soils

All soil types described for the general study area in Section 6.1.1 also occurred on the ROW in association with topography and drainage patterns. Dominant plant species occupying these soils on the ROW include blackberry, goldenrod, sedge, and mixed herbs on the mesic Alton, Empeyville, and Worth soils, and, horsetail, swamp-buttercup, sensitive fern, willow, and cat-tail on hydric Adrain and Tughill soil series.

The typical humus type on the ROW was a "thin duff mull" comprised of litter, fermentation, and humus layers, 0.7 inches thick, and very shallow A1 horizon. The source of litter was leaves and stems of the predominant mixed grass-herb-shrub vegetation. There is evidence of past farming on the ROW, particularly those areas where surface stones were collected and piled and where red and Scotch pine plantations were established. Also, charcoal fragments in the surface soil in the vicinity of pine plantations indicate that some areas had been burned at one time.

There was no active or recent soil erosion evident on the general ROW, but slight to moderate sheet and some gully erosion was occurring at 6 access road locations and 2 tower sites. Mineral soil on these areas was either bare or only partially covered with grass and/or wood chips from brush disposal on the ROW. Restoration of these disturbed sites, by seeded grass and natural plant invasion, is occurring slowly but with interruptions due to continuing erosion and periodic vehicular traffic on the ROW.

6.2.2 Vegetation

Most of the hydric sites are presently covered with the Sedge-Rush-Cattail-Mixed Herb community; however, in some areas horsetail or mixed grass-herb communities are present. Clumps of cinnamon- and interrupted ferns occur through these communities, and willows, elderberry, black cherry, elm, red maple, and aspen occur throughout. These woody plants have become established since corridor clearing, and few woody species persist from the understory of the previous stand in spite of efforts to leave many understory shrubs during the selective clearing of this corridor.

On mesic sites the most common community is Blackberry; however, areas of Bracken-Mixed Grass and Bracken-Mixed Grass-Herb also accur. Clumps of interrupted fern are present in these communities. Shrubs and tree seedlings are extremely abundant. These include pin-cherry, gray birch, elderberry, willow, and red maple.

Areas of seeded grasses are still visible around tower sites and in other locations where soil was disturbed during ROW establishment.

6.2.3 Wildlife

White-tailed deer, varying hare, and ruffed grouse are the major game animals that probably currently utilize the study area. Indirect observations of deer, i.e., tracks, pellets, and browse, indicated their use of the ROW area. Deer were also seen on the site. Browse surveys indicated that overall utilization by percent of actual use was higher in the interior woods than either on the ROW or the ROW edge, while more stems were available on the ROW than in the other locations. Stems of the genus Rubus far surpassed all other species with regard to total abundance, but were only slightly browsed. Willow, elderberry, and alternate-leaved dogwood were heavily utilized by deer.

A ruffed grouse drumming count revealed 2 birds drumming in the forest adjacent to the ROW in the spring of 1976. In addition, 3 eggs hatched from a nest located in the adjaeent forest, and a brood of chicks was observed during the period of this study.

No varying hare were observed.

A variety of other animals were noted, directly or indirectly, to be utilizing either the ROW, the adjacent forest, or both. Potential wildlife use is evident from plant species present on the site.

6.2.4 Water

Florence Creek Florence Creek flows perpendicularly through the 150-foot wide Fitzpatrick to Edic ROW. Off the ROW the stream flows through a Northern Hardwoods-Hemlock forest and is shaded by overstory vegetation present on each bank. Substrate in the study area was predominately boulder, rubble, gravel, and sand. The access road fords the creek at mid-ROW. Selective cutting near the stream has left a few saplings that provide shade, and herbs stabilize the stream banks on the ROW. Fish were observed in both creeks sampled at site 21.

Stream Located Between Structure 42/1 and Structure 42/2 A 150-foot segment of this first-order stream is located on the Fitzpatrick to Edic ROW. Off the ROW the stream flows through an Elm-Red Maple swamp. The shade is heavy upstream and partial downstream of the ROW. On the ROW the stream is ponded by a man-made stone wall. The pond is partially shaded by shrubs, herbs, and aquatic vegetation. The access road fords the pond at mid-ROW.

6.2.5 Land Use

Presently, the adjacent land uses to site 21 have had a minimal change from the 1966 data. The land adjacent to the ROW is still rural nonfarm with a distribution of agriculture (12.2%), forest land (82.0%), and water resources (5.8%). With reference to the total area involved, shifts in land use are noted as follows:

Agriculture -	-1.6%
Forest Land -	+1.6%
Water Resources -	no change

In addition to use of the ROW for the transmission of electrical power, the ROW has the potential for hunting and snowmobiling as multiple uses.

6.3 Environmental Effect and Probable Causes

6.3.1 Soils

The major impact of ROW management on soils of this site is the occurrence of active erosion on areas where plant cover was removed and surface soils disturbed, i.e., access roads and tower sites. Restoration seeding, natural plant invasion, and application of wood chips on critical areas has partially stabilized the soil. However, continuing erosion and periodic disturbande of access roads by "off-the-road" vehicles prevents complete healing and stabilization of the disturbed sites. Sediments from erosion on several disturbed areas were deposited in streams and a water impoundment on the ROW.

Organic layers present on the ROW were less than ½ as thick as those in the adjacent forest, 0.7 versus 1.6 inches, respectively. This resulted in a "thin duff mull" humus type on the ROW and "thick duff mull" in the forest. This could be a short term effect, since the ROW was only 4 years old, and may change in future years with full development of low plant cover. In addition to reduction in accumulated organic matter, clearance of the ROW caused a change in litter origin from tree parts to leaves and stems of mixed grasses, herbs, and shrubs.

6.3.2 Vegetation

The general impact of ROW management was to convert an Elm-Red Maple forest type (hydric) to a Willow Sensitive Fern community, and both a Hemlock-Northern Hardwoods forest type (mesic) and a Scotch Pine plantation type (mesic) to a Blackberry-Goldenrod community.

A marked increase occurred in the number of species (species diversity) of shrubs and herbs on the ROW of the hydric habitat as compared with the forest. On the mesic habitats, however, there was little difference in numbers of shrub and herb species between the ROW and forest.

On the hydric habitat, a few species occurred only in the forest; while in contrast to this, 5 shrubs and 11 herbs appeared on the ROW but not in the forest. On the mesic habitats, 3 shrubs appeared in the forest, only, and 4 shrubs on the ROW but not in the forest. However, numberous herbs only occurred in the forest or on the ROW.

6.3.3 Wildlife

The presence of the ROW has encouraged the development of many different plant species, mainly light-loving, on the ROW proper, thus enhancing the habitat for wildlife use. The ecotone created by the presence of the ROW often produces a greater variety and density of life than is found otherwise (Leopold, 1936), and this phenomenon has been termed the "edge effect" (Smith, 1974).

6.3.4 Water

Florence Creek Increase in water temperature between upstream and downstream sampling locations was probably due to the combination of solar heating on the ROW and time elapsed between sampling on September 29, 1975.

On August 1, 1976, an unexpected increase of 2.0 C occurred between locations 1 and 4. Sampling on this date was conducted during rain.

Line Management Factors Shading by overstory vegetation was limited on the ROW.

Other Influences Use of the access road by "off-the-road" recreation vehicles increases the possibility of erosion and subsequent sedimentation.

Stream Located Between Structure 42/1 and Structure 42/2 The 4.0 C increase in water temperature between locations 5 and 6 on September 29, 1975, was probably due to solar heating of water in the pond.

The water was probably less than saturated with dissolved oxygen because oxygen was utilized by decaying organic material.

Line Management Factors The existence of the access road through the pond increases the surface area subject to solar heating.

Other Influences The single lane dirt road present to the south of the ROW is used by "off-the-road" recreation vehicles and is eroded.

6.3.5 Land Use

Based on the data obtained, the presence of the ROW has had no identifiable effect on the adjacent land uses. Changes in land use within the area indicate a slight shift from agriculture to forest land. The presence of the ROW has helped to open the area to recreational uses.

Table 21.1. Cost of clearing operation for the Fitzpatrick to Edic ROW per line mile, per mile, per acre, per tree, per crew hour, or per log.

Clearing Operation	Cost of Operation					
	Per Line Mile	Per Mile	Per Acre	Per Tree	Per Crew Hour	Per Log
Clearing 150 foot-wide ROW	$5285.00					
Clearing 60 foot-wide ROW	$5000.00					
Clearing 20 foot-wide access		$2500.00				
Selective Clearing			$1500.00			
Selective Clearing, isolated trees, circumference 30 inches or less				$10.00		
Selective Clearing, isolated trees, circumference greater than 30 inches but not more than 60 inches				$15.00		
Selective Clearing, isolated trees, circumference greater than 60 inches but not more than 100 inches				$25.00		
Selective Clearing, isolated trees, circumference greater than 100 inches				$35.00		
Selective Clearing, state reforestation areas			$2000.00			
Selective Trimming utilizing aerial lift equipment					$50.00	
Selective Trimming NOT utilizing aerial lift equipment					$50.00	
Chemical Treatment			$ 50.00			
Danger trees, circumference 30 inches or less adjacent to clear cut ROW				$ 5.00		
Danger trees, circumference greater than 30 inches but not more than 60 inches adjacent to clear cut ROW				$10.00		

Table 21.1. Continued

Clearing Operation	Cost of Operation					
	Per Line Mile	Per Mile	Per Acre	Per Tree	Per Crew Hour	Per Log
Danger trees, circumference greater than 60 inches but not more than 100 inches, adjacent to clear cut ROW				$20.00		
Danger trees, circumference greater than 100 inches adjacent to clear cut ROW				$30.00		
Danger trees, circumference 30 inches or less adjacent to excluded areas				$10.00		
Danger trees, circumference greater than 30 inches but not more than 60 inches adjacent to excluded areas				$15.00		
Danger trees, circumference greater than 60 inches but not more than 100 inches, adjacent to excluded areas				$25.00		
Danger trees, circumference greater than 100 inches, adjacent to excluded areas				$40.00		
Danger trees, circumference 30 inches or less, adjacent to state reforestation areas				$20.00		
Danger trees, circumference greater than 30 inches but not more than 60 inches adjacent to state reforestation areas				$30.00		
Danger trees, circumference greater than 60 inches but not more than 100 inches adjacent to state reforestation areas				$40.00		
Danger trees, circumference greater than 100 inches, adjacent to state reforestation areas				$50.00		
Salvage Timber, except on state reforestation areas						$2.00
Salvage Timber on state reforestation areas						$2.00

Table 21.2. Soil series present on the Fitzpatrick to Edic study area.

Soil Series	Map Symbol[1]	Drainage Class[2]	Surface Soil pH	Surface Soil Texture	Woodland Suitability Group
Alton	AgA	G-E	4.0	gravelly sandy loam	3o1
Adrian	AdA	PD	5.4	loam	5w
Empeyville	EdA	MG	4.5	stony sandy loam	4o1
Tughill	TaA	VPD	5.3	stony silt loam	5w2
Westbury	WdA	SPD-PD	4.4	stony loam	4w2
Worth	WmB	G	4.5	stony loam	3o1

[1] The third letter of the map symbol designates slope class:
A = 0-8%, B = 8-15%, C = 15-25%, D = 25-35%, E = 35-50%, F = 50-70%.

[2] Drainage Class: VPD = very poorly drained, PD = poorly drained, SPD = somewhat poorly drained, ID = imperfectly drained, MG = moderately good, G = good, E = excellent (excessive).

Table 21.3. Average thickness of organic layers and A1 horizon and humus types for mesic sites on the ROW and adjacent woodland of site 21.

Moisture Regime	Location	Layer Thickness (in.) L	F	H	A1	Humus Type
1. Mesic (2)[1]	ROW	.2	.1	.4	.3	Thin duff mull with very shallow A1
	Woodland-N	.3	.3	1.0	.6	Thick duff mull with very shallow A1
	Woodland-S	.6	.3	.6	.3	Thin duff mull with very shallow A1
2. Mesic (3)	ROW	.4	.1	.1	.4	Thin duff mull with very shallow A1
	Woodland	.6	.5	.5	.3	Thick duff mull with very shallow A1
All Plots Combined	ROW	.3	.1	.3	.4	Thin duff mull with very shallow A1
	Woodland	.5	.4	.7	.4	Thick duff mull with very shallow A1

[1] Samples taken at vegetation study plots, the numbers of which are indicated by figures in parentheses.

Table 21.4. Areas exhibiting active erosion in June, 1976, on the Fitzpatrick to Edic ROW study area.

				Erosion on ROW		
Location	Soil Type	Average Slope (%)	Plant Cover	Kind	Class	Gully Depth (in.)
Tower Site	Alton gravelly sandy loam	2	Bare-grass	Sheet	Slight	-
Tower Site	Worth stony loam	1	Wood chips-grass	Sheet	Moderate	-
Access Road	Alton gravelly sandy loam	3	Bare	Sheet	Slight	-
Access Road	Empeyville stony sandy loam	4	Bare-grass	Sheet	Slight	-
Access Road	Empeyville stony sandy loam	9	Grass	Sheet & Gully	Moderate	4
Access Road	Worth stony loam	11	Wood chips-grass	Sheet	Moderate	-
Access Road	Worth stony loam	12	Bare	Sheet & Rill	Moderate	-
Access Road	Worth stony loam	4	Grass	Sheet	Slight	-

Table 21.5. Importance value of trees in the upper tree layer in the forest adjacent to the ROW.

Site	Species	Relative Dominance Basal Area (% of total) 1	Relative Density (% of total) 2	Importance Value 1+2
Hydric 1	No importance values were determined for hydric plot 1.			
Mesic 2				
North	Hemlock	66.11	53	119.11
	Yellow Birch	21.22	19	40.22
	Red Maple	8.69	11	19.69
	Black Cherry	2.60	5	7.60
	Basswood	.86	3	3.86
	White Ash	.31	3	3.31
	American Hornbeam	.14	3	3.14
	American Hop-Hornbeam	.07	3	3.07
South	Yellow Birch	63.15	31	94.15
	Sugar-Maple	23.49	36	59.49
	American Elm	10.13	13	23.13
	Hemlock	1.13	5	6.13
	White Ash	1,13	5	6.13
	Black Cherry	.59	5	5.59
	American Hornbeam	.38	5	5.38
Mesic 3	Scotch Pine	61.54	72	133.54
	Red Pine	20.38	14	34.38
	Black Cherry	17.96	12	29.96
	American Elm	.12	2	2.12

Table 21.6. Comparison of species composition, abundance and sociability (A.S.) in the tree, shrub, and herb layers, in the adjacent forest and on the ROW, on hydric and mesic habitats.

Species	Hydric (1) Forest A.S.	Hydric (1) ROW A.S.	Mesic (2) Forest A.S. (N)	Mesic (2) ROW A.S.	Mesic (2) Forest A.S. (S)	Mesic (3) Forest A.S.	Mesic (3) ROW A.S.
Tree Layer							
Scotch Pine	+.1	-	-	-	-	3.1	-
Red Maple	2.1	-	1.1	-	-	-	-
Sugar-Maple	1.1	-	-	-	1.1	-	-
Black Cherry	+.1	-	+.1	-	++.1	1.1	-
Yellow Birch	+.1	-	1.1	-	1.1	-	-
White Ash	++.1	-	++.1	-	++.1	-	-
American Elm	-	-	-	-	+.1	++.1	-
Hemlock	-	-	2.1	-	-	-	-
American Hornbeam	-	-	++.1	-	-	-	-
Basswood	-	-	++.1	-	-	-	-
American Hop-Hornbeam	-	-	++.1	-	-	-	-
Pin-Cherry	-	-	-	-	-	-	-
Gray Birch	-	-	-	-	-	-	-
Red Pine	-	-	-	-	-	1.1	-
No. Species	6	0	8	0	5	4	0
Shrub Layer							
Raspberry	1.1	-	-	-	-	-	-
Willow spp.	-	3.1	-	+.1	-	-	-
Mountain-Maple	-	++.1	-	-	-	-	-
Arrow-wood	-	++.1	-	-	-	+.1	-
Elderberry	-	1.1	-	+.1	+.1	-	-
Spiraea	-	+.2	-	++.1	-	-	++.1
Hobblebush	-	-	1.3	-	-	-	-
Blackberry	-	-	+.2	4.1	-	-	3.2
Fly-Honeysuckle	-	-	+.2	-	-	-	-
Dewberry	-	-	-	-	+.1	-	-
Staghorn-Sumac	-	-	-	+.1	-	-	-
Bristly Sarsaparilla	-	-	-	2.4	-	-	-
Witch-Hazel	-	-	-	-	-	+.1	-
American Yew	-	-	-	-	-	(++.1)	-
Choke-Cherry	-	-	-	-	-	-	+.1
No. Species	1	5	3	6	2	3	3
Trees in the Shrub Layer							
American Hornbeam	+.1	-	+.1	+.2	1.1	1.1	+.1
White Ash	++.1	-	-	-	-	-	-
Red Maple	1.1	1.1	-	1.1	-	3.1	2.1
Sugar-Maple	1.1	-	-	-	3.1	1.1	+.1

Table 21.6. Continued

Species	Hydric (1) Forest A.S.	Hydric (1) ROW A.S.	Mesic (2) Forest A.S. (N)	Mesic (2) ROW A.S.	Mesic (2) Forest A.S. (S)	Mesic (3) Forest A.S.	Mesic (3) ROW A.S.
Alternate-leaved Dogwood	+.1	-	-	-	+.1	+.1	-
Serviceberry	1.1	-	-	-	-	-	+.1
Black Cherry	-	2.1	-	1.1	-	-	3.1
Gray Birch	-	1.1	-	1.1	-	-	2.1
Pin-Cherry	-	1.1	-	4.1	-	-	3.1
Flowering Dogwood	-	1.1	-	-	-	-	++.1
Quaking Aspen	-	1.1	-	1.1	-	-	1.1
American Elm	-	++.1	-	-	-	+.1	-
American Hop-Hornbeam	-	-	+.1	-	-	-	-
Yellow Birch	-	-	2.1	3.1	2.1	-	+.1
Hemlock	-	-	2.1	+.1	-	3.1	++.1
Large-toothed Aspen	-	-	-	++.1	-	-	-
Beech	-	-	-	-	-	+.1	+.1
Scotch Pine	-	-	-	-	-	-	+.1
No. Species	6	7	4	9	4	7	13

<u>Herb Layer</u>[1]

Species	Hydric (1) Forest A.S.	Hydric (1) ROW A.S.	Mesic (2) Forest A.S. (N)	Mesic (2) ROW A.S.	Mesic (2) Forest A.S. (S)	Mesic (3) Forest A.S.	Mesic (3) ROW A.S.
New York Fern	3.4	++.2	-	-	+.2	+.3	-
Spotted Touch-me-not	2.3	1.3	-	-	-	-	-
Royal Fern	+.2	1.2	-	-	-	-	-
False Hellebore	2.2	++.1	-	-	+.2	-	-
Goldthread	2.2	-	3.3	-	-	-	+.2
Sphagnum	2.3	1.2	-	-	-	-	-
Swamp-Buttercup	1.1	2.2	-	-	-	-	-
Cinnamon-Fern	-	-	++.2	-	3.3	1.2	1.3
Horsetail	-	3.4	-	-	-	-	-
Sedge	-	3.3	-	2.2	-	-	2.2
Sensitive Fern	-	1.3	-	-	++.2	-	-
Rush	-	1.2	-	++.1	-	-	-
Cat-tail	-	1.3	-	-	-	-	-
Boneset	-	1.2	-	+.2	-	-	1.1
Goldenrod spp.	-	3.3	-	1.2	-	-	2.2
New York Aster	-	2.2	-	-	-	-	++.1
Marsh-St. John's-wort	-	1.3	-	-	-	-	+.2
Joe-Pye-weed	-	1.2	-	-	-	-	-
Cowslip	-	1.2	-	-	-	-	-
Marginal Shield-Fern	-	-	3.2	-	-	+.2	-
Indian Cucumber-root	-	-	+.3	+.1	(+.1)	-	-
Painted Trillium	-	-	1.1	1.1	(+.1)	++.1	-
Bluebead-Lily	-	-	1.2	-	-	+.1	-

Table 21.6. Continued

Species	Hydric (1) Forest A.S.	Hydric (1) ROW A.S.	Mesic (2) Forest A.S. (N)	Mesic (2) ROW A.S.	Mesic (2) Forest A.S. (S)	Mesic (3) Forest A.S.	Mesic (3) ROW A.S.
Shining Club-moss	-	-	+.2	-	-	-	-
Partridge-berry	-	-	2.2	-	+.3	2.3	-
Wild Lily-of-the-valley	-	-	2.1	+.2	2.4	3.5	+.2
Rue-Anemone	-	-	(+.1)	+.2	1.2	-	-
Hair-cap Moss	-	-	1.2	2.2	-	-	1.4
Wild-oats	-	-	+.1	-	-	-	-
Carolina Spring Beauty	-	-	++.1	-	1.1	-	-
Tree Club-moss	-	-	++.1	-	-	-	-
Solomon's-seal	-	-	+.1	-	(+.1)	-	-
Sharp-lobed Hepatica	-	-	(+.1)	-	-	-	-
Trout-Lily	-	-	1.1	+.2	3.4	1.3	1.2
Purple Trillium	-	-	(1.1)	-	+.1	+.2	1.1
Mosses	-	-	1.3	-	-	-	-
Wood-Anemone	-	-	+.2	-	-	-	-
Common Wood-Sorrel	-	-	3.4	-	-	-	-
Wild Sarsaparilla	-	-	+.1	+.2	-	-	-
Hay-scented Fern	-	-	-	+.2	3.3	-	-
Christmas Fern	-	-	-	-	++.2	-	-
Large-flowered Bell-wort	-	-	-	-	1.1	+.1	-
Twisted-stalk	-	-	-	-	+.1	-	-
Dwarf Ginseng	-	-	-	-	(1.1)	-	-
Upright Yellow Wood-sorrel	-	-	-	1.2	-	-	-
Cinquefoil	-	-	-	1.2	-	-	1.2
Sheep-Sorrel	-	-	-	1.2	-	-	2.2
Panic-Grass	-	-	-	2.2	-	-	2.2
Knotweed	-	-	-	+.2	-	-	-
Mixed Grass	-	-	-	2.3	-	+.2	1.4
Dandelion	-	-	-	+.1	-	-	-
Bindweed	-	-	-	1.1	-	-	-
Hawkweed sp. (yel-low)	-	-	-	++.1	-	-	1.1
Buttercup sp.	-	-	-	++.1	-	-	-
Violet sp. (white)	-	-	-	++.2	-	-	-
Strawberry	-	-	-	+.1	-	-	-
Interrupted Fern	-	-	-	-	-	2.3	3.3
Bracken	-	-	-	-	-	1.3	2.3
Bristly Club-moss	-	-	-	-	-	1.3	-
False Spikenard	-	-	-	-	-	+.1	++.1
Blue-eyed Grass	-	-	-	-	-	-	++.1
St. John's-wort	-	-	-	-	-	-	1.2

Table 21.6. Continued

Species	Hydric (1)		Mesic (2)			Mesic (3)	
	Forest A.S.	ROW A.S.	Forest A.S. (N)	ROW A.S.	Forest A.S. (S)	Forest A.S.	ROW A.S.
Indian-tobacco	-	-	-	-	-	-	1.1
Stonecrop sp.	-	-	-	-	-	-	+.2
Devil's Paint-brush	-	-	-	-	-	-	+.2
No. Species	7	17	22	24	18	15	24
Total No. Species							
Trees[2]	9	7	8	9	7	10	13
Shrubs	1	5	3	6	2	3	3
Herbs	7	17	22	24	18	15	24
Totals	17	29	33	39	27	28	40

[1] For simplicity, herbs include all species of the layer.

[2] The trees which occurred both in the tree and shrub layers were considered as one in determining the total number of species.

Table 21.7. Characteristic species with abundance and sociability ratings (A.S.) in the shrub and herb layers of the adjacent forest which did not occur on the ROW.

Species	Forest A.S.		ROW A.S.
Hydric (1)			
Shrubs			
Raspberry	1.1		-
Herbs [1]			
Goldthread	2.2		-
No. Species	2		
Mesic (2)			
Shrubs	North	South	
Hobblebush	1.3	-	-
Fly-Honeysuckle	+.2	-	-
Dewberry	-	+.1	-
Herbs			
Carolina Spring Beauty	++.1	1.1	-
New York Fern	-	+.2	-
False Hellebore	-	+.2	-
Goldthread	3.3	-	-
Cinnamon-Fern	++.2	3.3	-
Sensitive Fern	-	++.2	-
Marginal Shield-Fern	3.2	-	-
Bluebead-Lily	1.2	-	-
Shining Club-moss	+.2	-	-
Partridge-berry	2.2	+.3	-
Wild-oats	+.1	-	-
Tree Club-moss	++.1	-	-
Solomon's-seal	+.1	(+.1)	-
Sharp-lobed Hepaticia	(+.1)	-	-
Purple Trillium	(1.1)	+.1	-
Mosses	1.3	-	-
Wood-Anemone	+.2	-	-
Common Wood-Sorrel	3.4	-	-
Christmas-Fern	-	++.2	-
Large-flowered Bellwort	-	1.1	-
Twisted-stalk	-	+.1	-
Dwarf Ginseng	-	(1.1)	-
No. Species	17	13	

Table 21.7. Continued

Species	Forest A.S.	ROW A.S.
Mesic (3)		
Shrubs		
Arrow-wood	+.1	-
Witch-Hazel	+.1	-
American Yew	(++.1)	-
Herbs		
New York Fern	+.3	-
Marginal Shield-Fern	+.2	-
Painted Trillium	++.1	-
Bluebead-Lily	+.1	-
Partridge-berry	2.3	-
Large-flowered Bellwort	+.1	-
Bristly Club-moss	1.3	-
No. Species	10	

1 For simplicity, herbs include all species of the herb layer.

Table 21.8. Characteristic species with abundance and sociability ratings (A.S.) in the shrub and herb layers of the ROW which were not in the adjacent forest.

Species	ROW A.S.	Forest A.S.	
Hydric (1)			
Shrubs			
Willow sp.	3.1		-
Mountain-Maple	++.1		-
Arrow-wood	++.1		-
Elderberry	1.1		-
Spiraea	+.2		-
Herbs[1]			
Horsetail	3.4		-
Sedge	3.3		-
Sensitive Fern	1.3		-
Rush	1.2		-
Cat-tail	1.3		-
Boneset	1.2		-
Goldenrod sp.	3.3		-
New York Aster	2.2		-
Marsh-St. John's-wort	1.3		-
Joe-Pye-weed	1.2		-
Cowslip	1.2		-
No. Species	16		
Mesic (2)			
Shrubs		North	South
Willow sp.	+.1	-	-
Spiraea	++.1	-	-
Staghorn-Sumac	+.1	-	-
Bristly Sarsaparilla	2.4	-	-
Herbs			
Sedge	2.2	-	-
Rush	++.1	-	-
Boneset	+.2	-	-
Goldenrod sp.	1.2	-	-
Upright Yellow Wood-Sorrel	1.2	-	-
Cinquefoil	1.2	-	-
Sheep-Sorrel	1.2	-	-
Panic-Grass	2.2	-	-
Knotweed	+.2	-	-
Mixed Grass	2.3	-	-

Table 21.8. Continued

Species	ROW A.S	Forest A.S North	Forest A.S South
Dandelion	+.1	-	-
Bindweed	1.1	-	-
Hawkweed spp. (yellow)	++.1	-	-
Buttercup spp.	++.1	-	-
Violet spp. (white)	++.2	-	-
Strawberry	+.1	-	-
No. Species	20		
Mesic (3)			
Shrubs			
Spiraea	++.1		-
Blackberry	3.2		-
Choke-Cherry	+.1		-
Herbs			
Marsh-St. John's-wort	+.2		-
Goldthread	+.2		-
Sedge	2.2		-
Boneset	1.1		-
Goldenrod spp.	2.2		-
New York Aster	++.1		-
Hair-cap Moss	1.4		-
Cinquefoil	1.2		-
Sheep-Sorrel	2.2		-
Panic Grass	2.2		-
Hawkweed spp. (yellow)	1.1		-
Blue-eyed Grass	++.1		-
St. John's-wort	+.2		-
Indian-tobacco	1.1		-
Stonecrop spp.	+.2		-
Devil's Paint-brush	+.2		-
No. Species	19		

[1] For simplicity, herbs include all species of the herb layer.

Table 21.9. Major vegetational types for the Fitzpatrick to Edic study area based on percent of study plots occupied by each plant community and other components on the ROW.

Community	Site Classification Hydric (1)	Mesic (2)	Mesic (3)
	Percent of Total Area		
Sedge-Rush-Cat-tail-Mixed Herb	70.3		
Mixed Grass-Herb	12.5		26.4
Horsetail	6.8		
Seeded Grasses	5.5		
Access Road (seeded)	1.4		
Stream	1.1		
Standing Water	.9		
Cinnamon-Fern	.7		
Interrupted Fern	.3		
Elderberry	.3	.6	
Mountain-Maple	.1		
Spiraea	.1		
Blackberry		75.2	
Open-Panic-Grass-Sheep-Sorrel-Blackberry		17.9	
Open-Panic-Grass-Blackberry		3.2	
Bristly Sarsaparilla-Blackberry		2.8	
American Hornbeam		.1	
Bristly Sarsaparilla		.1	
Quaking Aspen		.1	1.1
Bracken-Mixed Grass-Herb			34.4
Access Road (Panic Grass-Sedge-Mixed Herb)			8.9
Bracken-Mixed Grass			29.2
Total	100.0	100.0	100.0

Table 21.10. Browse survey showing plant species and number ratio of browsed to total stems with percent actual use for ROW, ROW edge, and woods.

Species	ROW		ROW Edge		Woods		Total	
	Ratio	%	Ratio	%	Ratio	%	Ratio	%
Alternate-leaved Dogwood					20/26	77	20/26	77
American Hornbeam			0/5	0			0/5	0
American Elm					0/1	0	0/1	0
Blackberry	6/151	4	1/75	1	0/19	0	7/245	3
Black Cherry	1/8	13	0/27	0	11/29	38	12/64	19
Elderberry	1/1	100			1/1	100	2/2	100
Pin-Cherry	1/11	9	2/9	22	0/1	0	3/21	14
Hemlock			0/1	0	0/10	0	0/11	0
Hobblebush			0/1	0	0/1	0	0/2	0
Serviceberry			0/1	0	1/4	25	1/5	20
Raspberry	2/23	9	5/38	13	4/8	50	11/59	14
Red Maple	0/2	0	4/13	31	2/19	11	6/34	18
Scotch Pine			0/1	0			0/1	0
Sugar-Maple	0/1	0	1/6	17	1/15	7	2/22	9
Quaking Aspen	0/1	0	0/1	0			0/2	0
White Ash			0/1	0	0/1	0	0/2	0
Willow	9/9	100					9/9	100
Yellow Birch	0/7	0	0/9	0	1/6	0	1/22	5
Total	20/214	5	13/188	7	41/141	29	74/533	14

Table 21.11. Browse survey showing most abundant plant species and number ratio of browsed to total stems with percent actual use for ROW, ROW edge, and woods.

Location	Species							
	Blackberry		Dewberry		Raspberry		Blueberry	
	Ratio	%	Ratio	%	Ratio	%	Ratio	%
ROW	6/151	4	2/23	9	0/2	0	1/8	13
ROW Edge	1/75	1	5/38	13	4/13	31	0/27	0
Woods	0/19	0	4/8	50	2/19	11	11/29	38
Total	7/245	3	11/69	14	6/34	18	12/64	19

Table 21.12. Birds observed and/or heard on the ROW and the ROW edge during the study period.

Species	Species
Great blue heron	Catbird
Green heron	Robin
Canada goose	Wood thrush
Coopers hawk	Cedar waxwing
Ruffed grouse	Chestnut-sided warbler
Spotted sandpiper	Myrtle warbler
Mourning dove	Yellow warbler
Belted kingfisher	Brown-headed cowbird
Pileated woodpecker	Common grackle
Yellow-shafted flicker	Red-winged blackbird
Eastern kingbird	Chipping sparrow
Eastern phoebe	Fox sparrow
Eastern wood pewee	Song sparrow
Blue jay	White-throated sparrow
Black-capped chickadee	

Table 21.13. Potential wildlife use of plant species[1] present on the ROW and adjacent woods for the major game species on the Fitzpatrick to Edic study area.

Species	Wildlife Species		
	Deer	Hare	Grouse
Trees			
Red Maple	****	+	
Sugar-Maple	****	+	
Quaking Aspen	**	**	***
Willow	*	***	*
Black Cherry	*	+	*
Gray Birch	*	**	**
Pin-Cherry	*	+	*
Flowering Dogwood	*		
Yellow Birch	*		
White Ash	*		
American Elm	+		
Basswood	*		
American Hornbeam	*		+
American Hop-Hornbeam	+		+
Large-toothed Aspen	**	**	***
Hemlock	+		
Beech	+		
Serviceberry	+		+
Pine	+	****	
Shrubs			
Mountain-Maple	****		
Alternate-leaved Dogwood	*		
Raspberry	+		*
Blackberry	+		*
Elderberry	+		
Spiraea	+		
Hobblebush	*		
Fly-Honeysuckle	+		
Arrow-wood	*		
Staghorn-Sumac	**	*	*
Witch-Hazel	**		
Choke-Cherry	*		
Herbs[2]			
Ferns	*	**	
Grasses	*	***	

Table 21.13. Continued

Species	Wildlife Species		
	Deer	Hare	Grouse
Goldenrod	+		
Strawberry		*	*
Sedge			+
Sheep-Sorrel			+

1 Those plants not included in this table provide a certain amount of cover (Table 21.6) for the 3 major game species, and may also provide seasonal food value, specific information pertaining to which is not now available. This applies also with regard to non-game species.

2 For simplicity, herbs include all species of the herb layer.

Table 21.14. Water data collected from September 29, 1975, to August 1, 1976, at site 21, Fitzpatrick to Edic ROW, Oneida County, New York.

Date		September 29, 1975							February 17, 1976						
Sampling Location		1	2	3	4	5	6	7	1	2	3	4	5	6	7
Hour		1030	1145	1430	1510	1545	1615	1645	1030	1045	1100	1120	1150	1215	1235
Water Temp. (C)		8.5	8.5	10.0	10.5	11.5	15.5	14.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dissolved Oxygen (ppm)		12.7	12.9	13.0	13.1	7.5	5.5	8.1	13.1	13.0	13.3	11.9	10.9	10.7	10.9
% of Saturation D.O.		116	118	123	125	73	59	83	96	96	98	87	80	78	80
pH		6.0	-	-	-	-	-	-	7.3	7.3	7.3	7.3	7.1	7.2	7.2
Water Temp. (C)	range			8.5-10.5			11.5-15.5				0.0			0.0	
	mean			9.4			13.7				0.0			0.0	
% Saturation D.O.	range			116-125			59-83				87-98			78-80	
	mean			120			72				94			79	
pH	range			6.0			-				7.3			7.1-7.2	
	mean			6.0			-				7.3			7.2	
Comments		clear, sunny, air temp. 24 C							rain, windy, air temp. 2 C, snow cover of 2 to 3 ft., stream bottom frozen, layer of ice on the surface and along much of bank						

Date		May 20, 1976							August 1, 1976						
Sampling Location		1	2	3	4	5	6	7	1	2	3	4	5	6	7
Hour		1700	-	1730	1740	1835	1820	1805	0910	0920	0940	0950	1105	1050	1025
Water Temp. (C)		7.3	7.0	7.2	7.1	7.1	7.0	7.0	15.0	15.2	17.0	17.0	16.5	16.0	15.5
Dissolved Oxygen (ppm)		10.3	10.8	10.0	10.8	10.0	10.2	10.6	9.4	9.6	9.6	9.8	7.6	6.4	6.8
% of Saturation D.O.		91	96	88	96	87	89	93	101	102	107	109	85	70	75
pH		6.9	6.8	6.8	6.9	6.9	7.1	6.9	7.2	7.3	6.9	7.2	5.7	5.9	6.5
Water Temp. (C)	range			7.0-7.3			7.0-7.1				15.0-17.0			15.5-16.5	
	mean			7.2			7.0				16.0			16.0	
% Saturation D.O.	range			88-96			87-93				101-109			70-85	
	mean			93			90				105			77	
pH	range			6.8-6.9			6.9-7.1				6.9-7.3			5.7-6.5	
	mean			6.8			7.0				7.2			6.0	
Comments		cloudy, air temp. 13 C							overcast with light rain, air temp. 18 C				air temp. 20 C		

Table 21.15. Comparison of land use prior to and after construction of the ROW.[1]

	Land Use	Percent of Total Area Prior to (-) and After (*) Construction 0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
(A)	Agriculture	-----------13.8 **********12.2
(C,I)	Commercial & Industrial	
(F)	Forest Land	---80.4 **82.0
(E)	Extractive Industry	
(N)	Non-productive	
(OR)	Outdoor Recreation	
(P)	Public & Semi-public	
(W)	Water Resources	-----5.8 *****5.8
(U)	Urban Inactive	
(T)	Transportation	
(R)	Residential	

[1] Source: Kucera & Associates, Mentor, Ohio, air photo No. 13200-4-084, May 7, 1975
USDA, Oneida County, air photo No. AR2-8EE-19, June 30, 1966

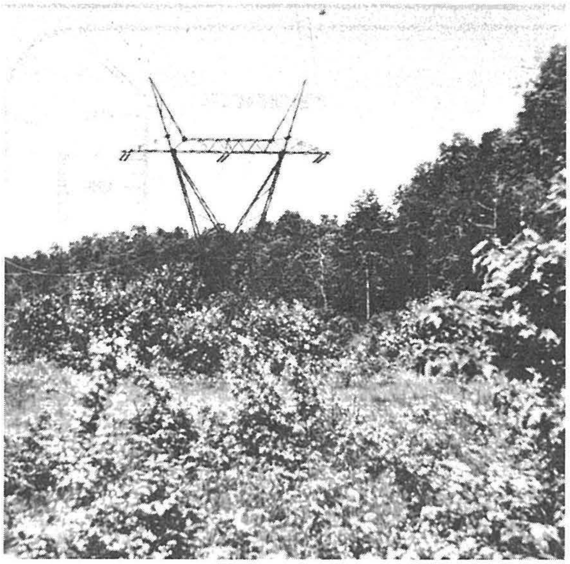


FIG. 21.1.1. General view of the ROW and adjacent forest, looking northwest, in the spring, 1975 (Photo Station 1).

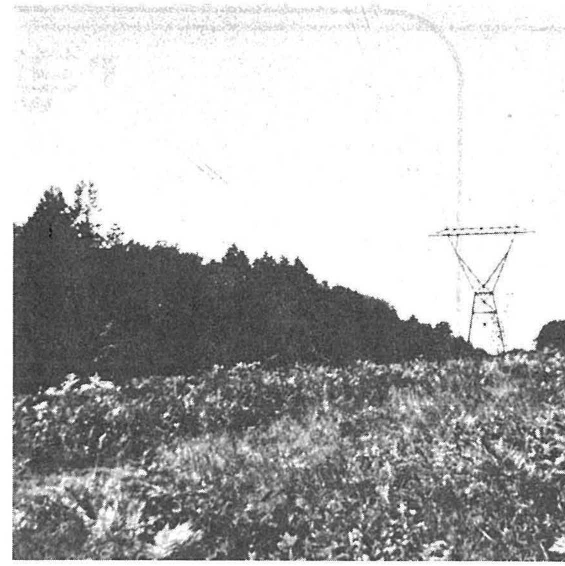


FIG. 21.1.2. General view of the ROW and adjacent forest, looking west, in the summer, 1975 (Photo Station 9).

FIG. 21.1.3. Equipment cut exhibiting severe sheet and rill erosion on the ROW, in the spring, 1975 (Photo Station 7).

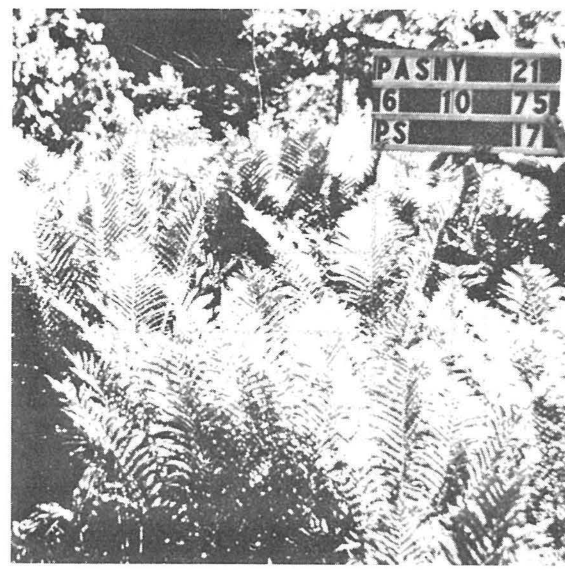


FIG. 21.1.4. Ostrich-fern on the ROW in the summer, 1975 (Photo Station 17).

FIG. 21.1.5. Grouse nest at the base of a tree adjacent to the ROW, in the spring of 1976.

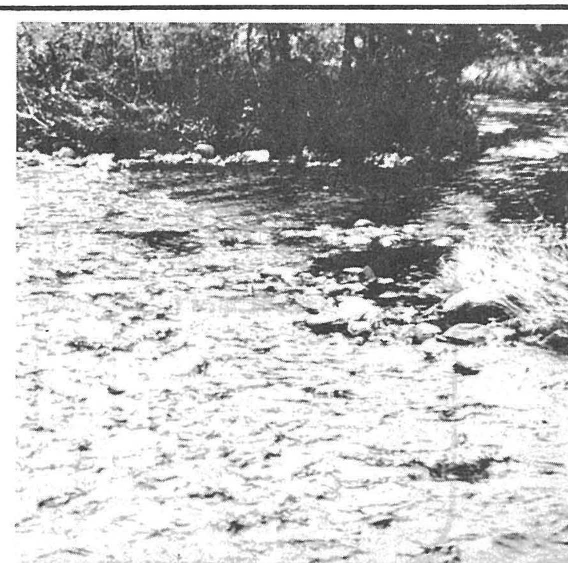


FIG. 21.1.6. Stream crossing the ROW during the fall of 1975 (Photo Station 3).

FIG. 21.1. Visual characteristics.

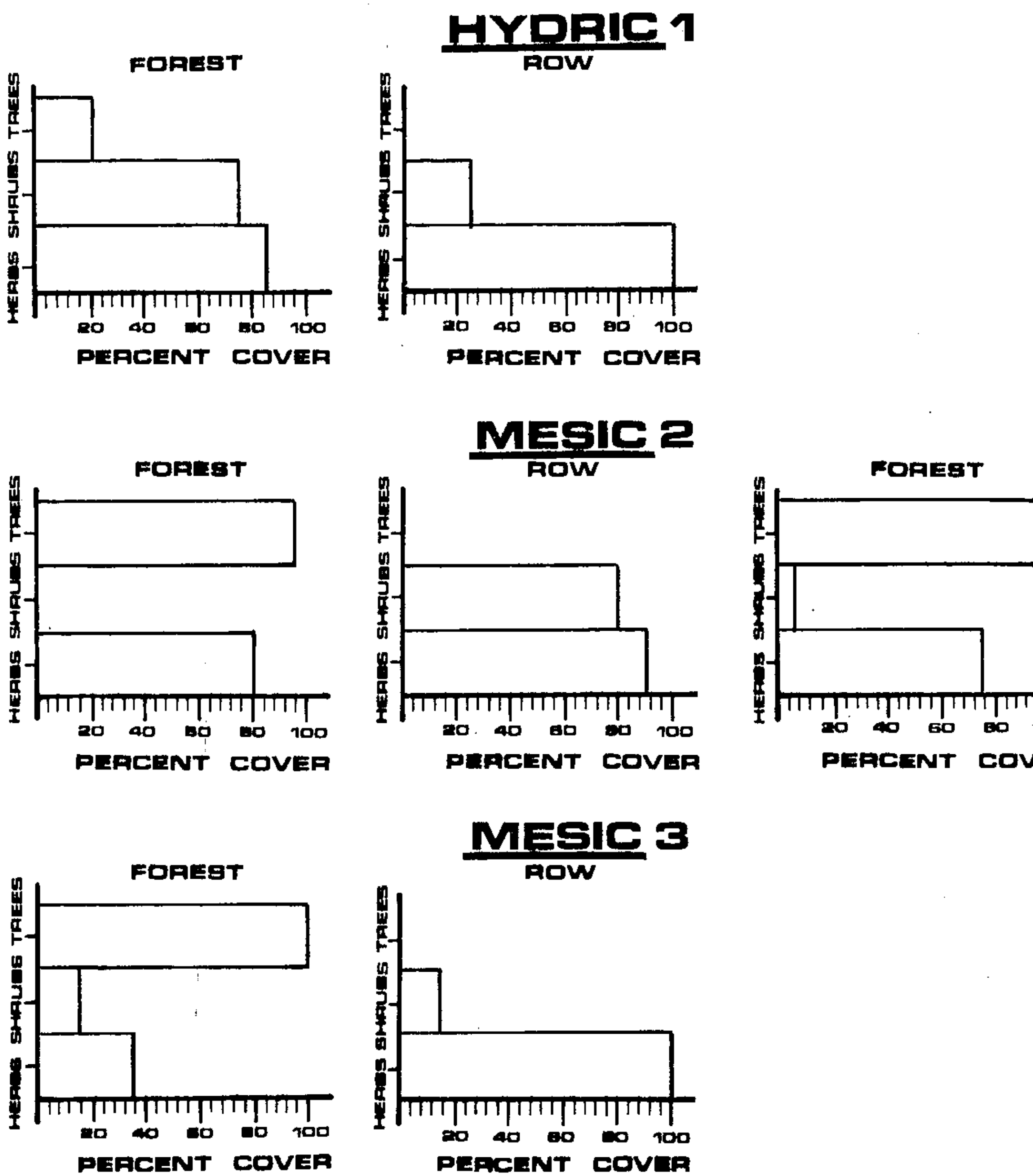


Fig. 21.2. Changes in cover value of tree, shrub, and herb layers from forest to ROW.

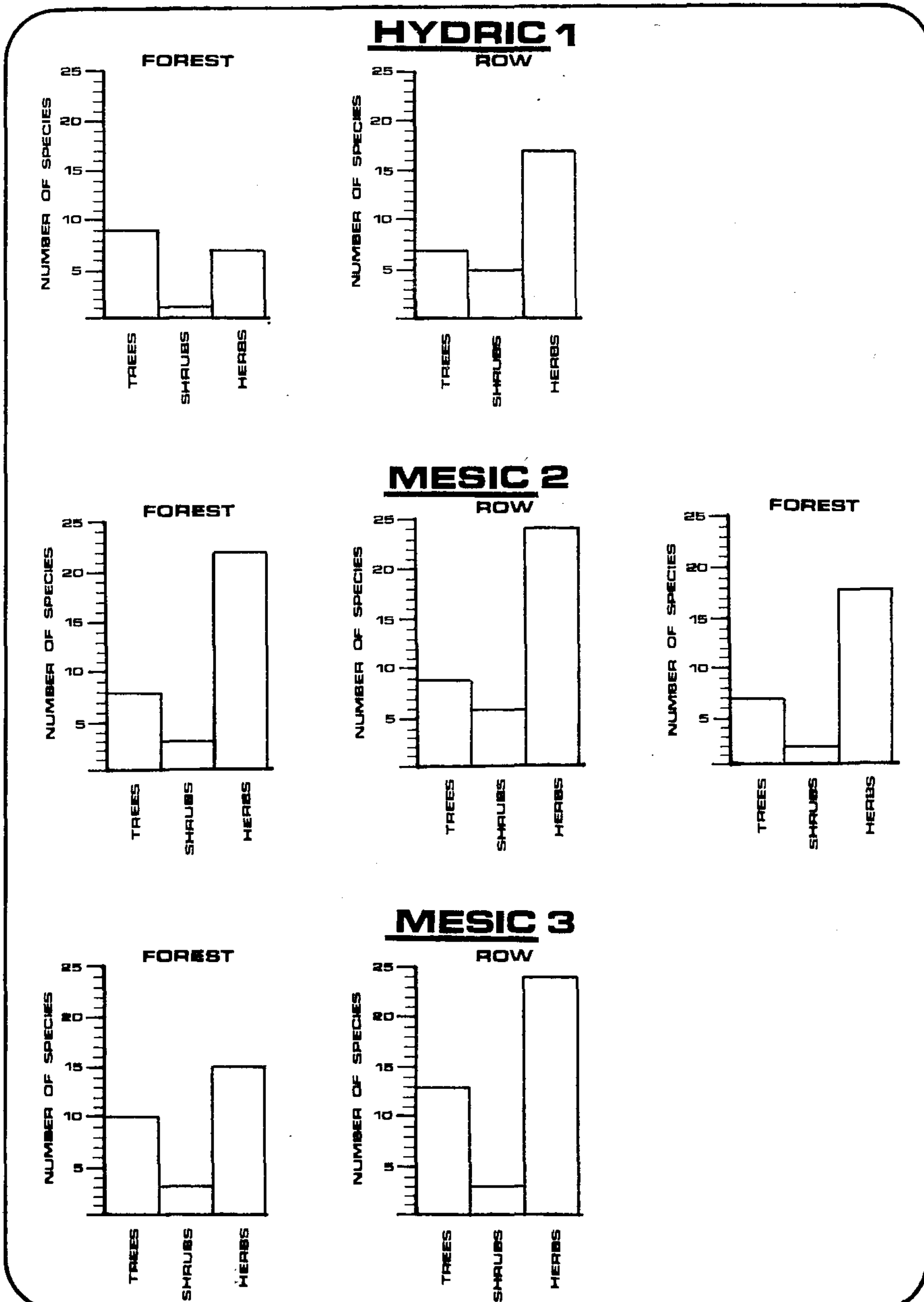


Fig. 21.3. Species diversity in the forest and on the ROW.

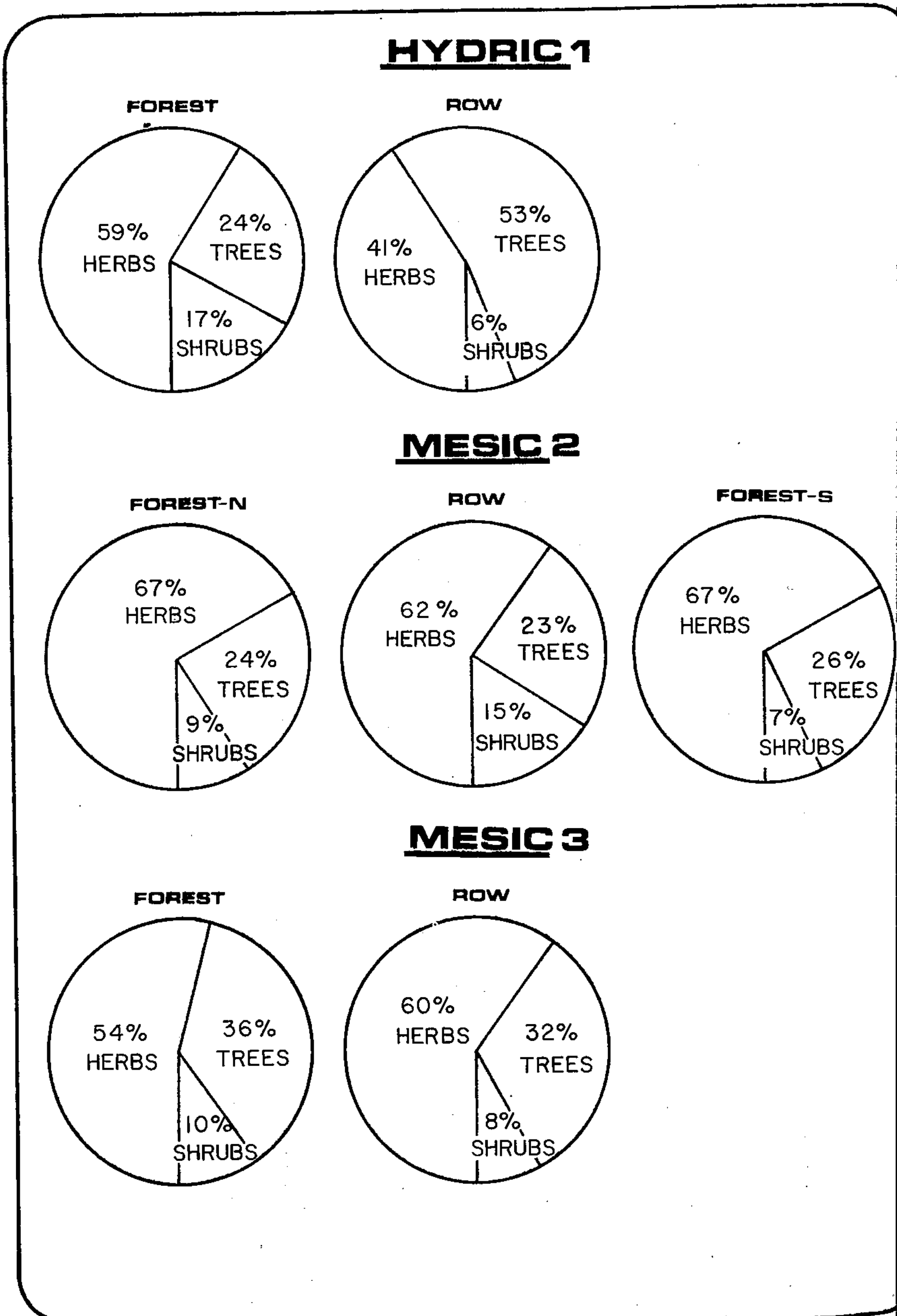


Fig. 21.4. Life form spectrum of the ROW as compared to the adjacent forest to compare species make-up of each, based on the number of species in each life form expressed as a percent of total species.

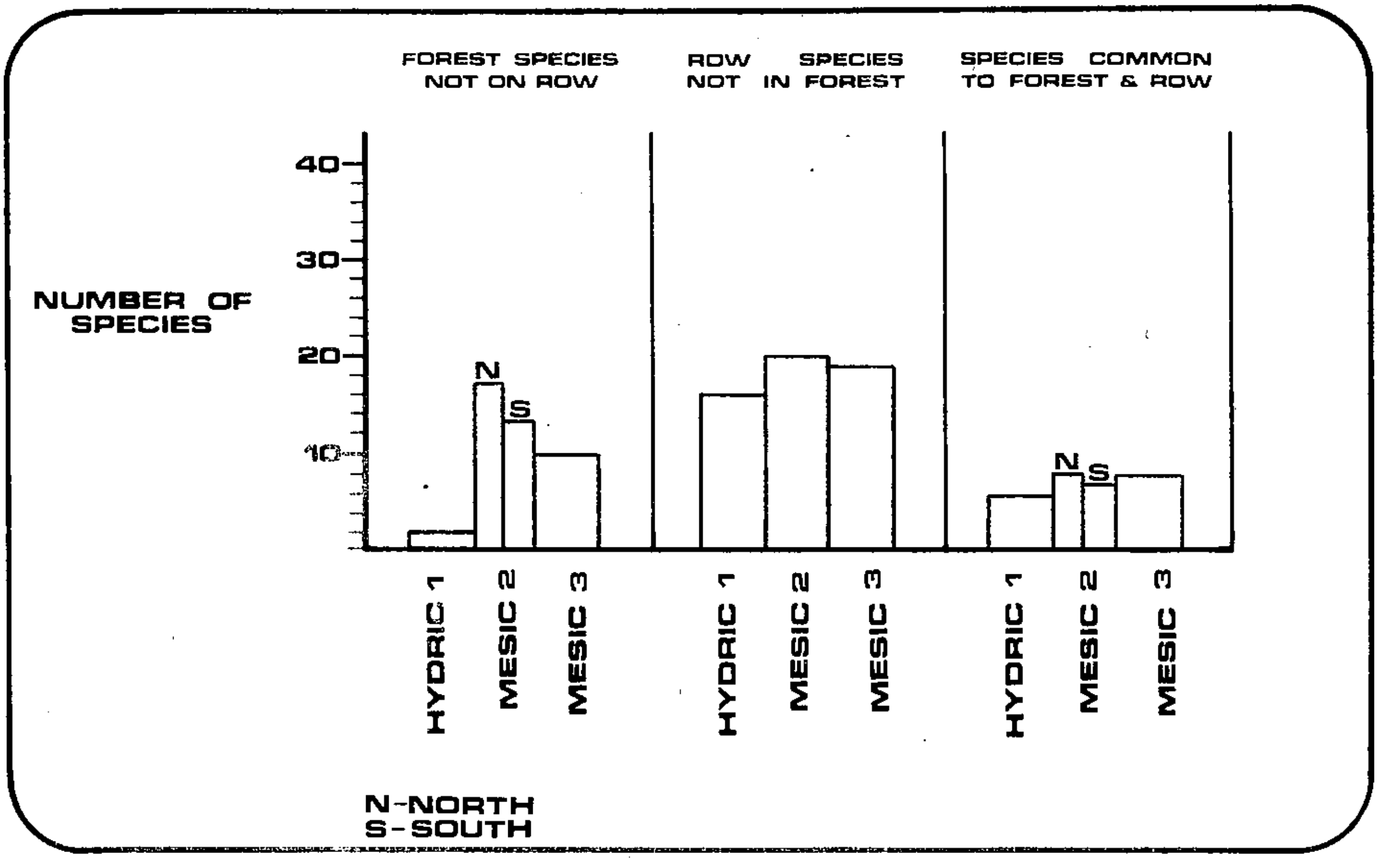


Fig. 21.5. Comparison of shrub and herb species in the forest and on the ROW.

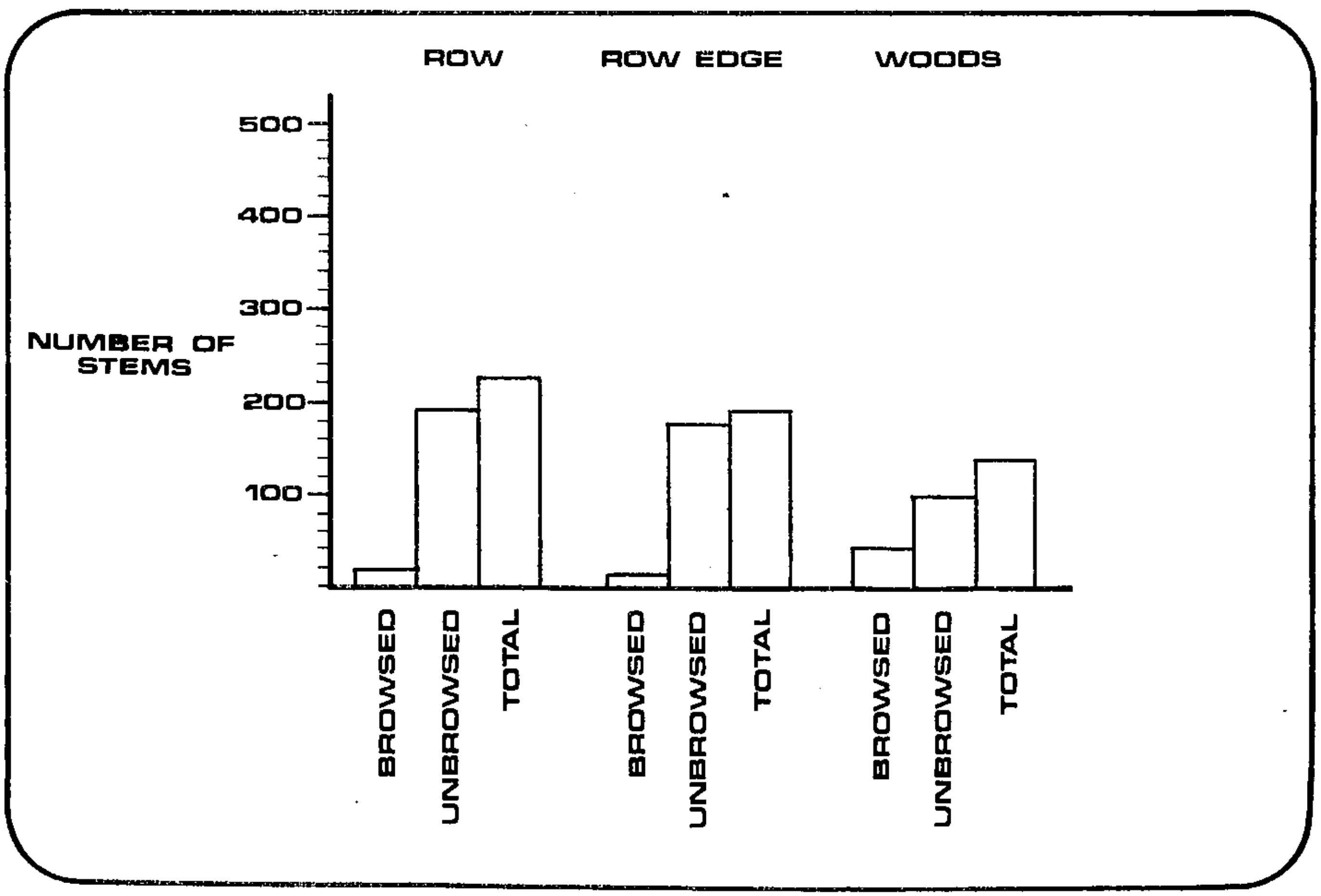
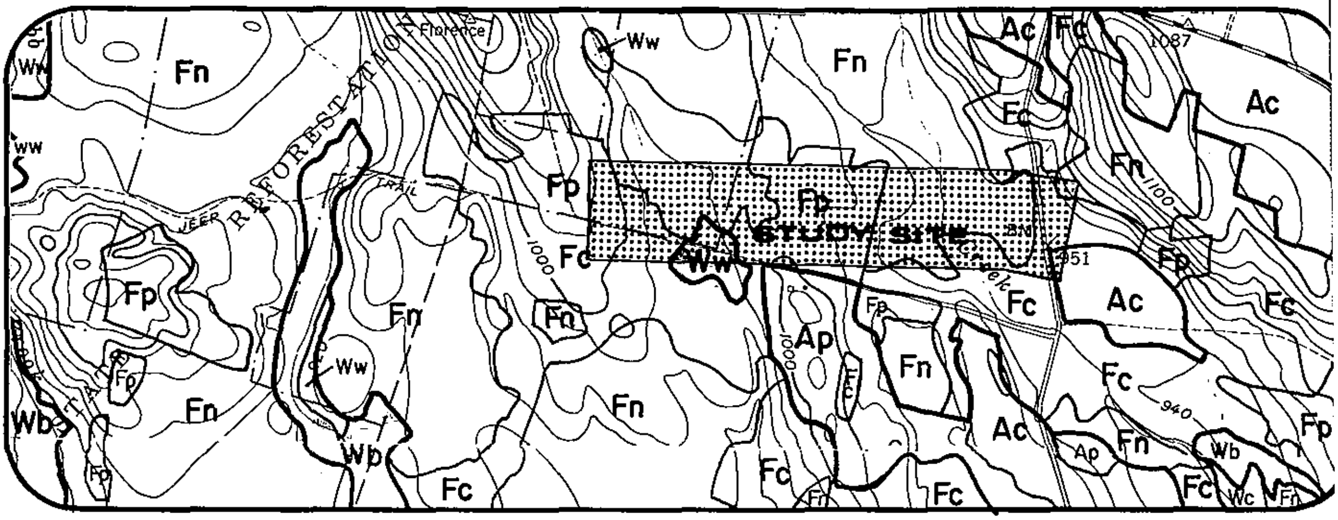
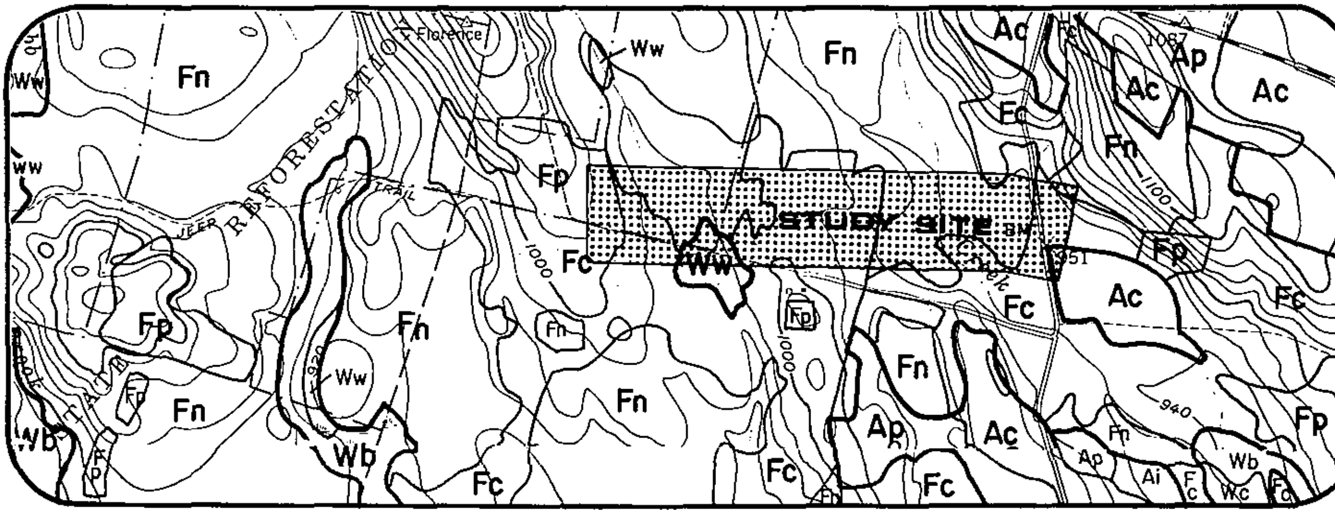


Fig. 21.6. Browse survey showing number of browsed, unbrowsed, and total stems for the ROW, ROW edge, and forest for 6 browse transects.



LAND USE PRIOR TO ROW CONSTRUCTION SCALE 1"- 2000



LAND USE AFTER CONSTRUTION OF ROW SCALE 1"- 2000

LEGEND FOR LAND USE SYMBOLS

AGRICULTURE
- Ac - Cropland and cropland pasture
- Ai - Inactive agricultural land
- Ap - Pasture

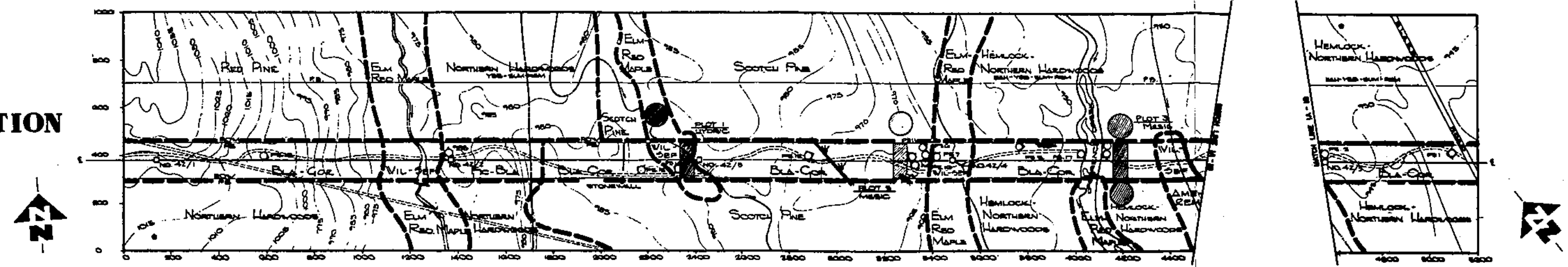
FOREST LAND
- Fc - Forest brush land
- Fn - Forest lands
- Fp - Plantations

WATER RESOURCES
- Wb - Marshes, shrub wetlands and bogs
- Wc - Artificial ponds
- Ww - Wooded wetlands

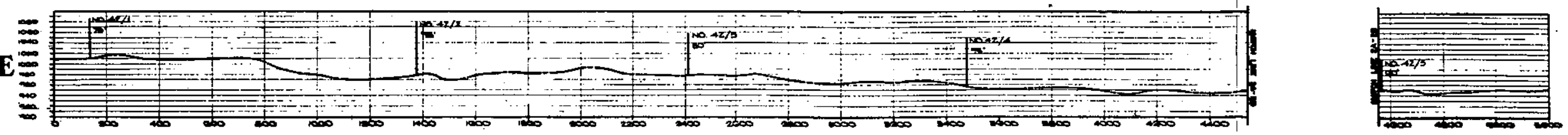
SOURCES:
- Kucera & Associates, Mantor, Ohio, air photo No. 13200-4-084, May 7, 1975
- USDA, Oneida County, air photo No. AR2-8EE-19, June 30, 1966
- Area Land Use Map LUNR, Cornell University, N.Y., 1974
- U. S. G. S. Topographic Map, Florence, N. Y., 1955

Fig. 21.7. Land use change.

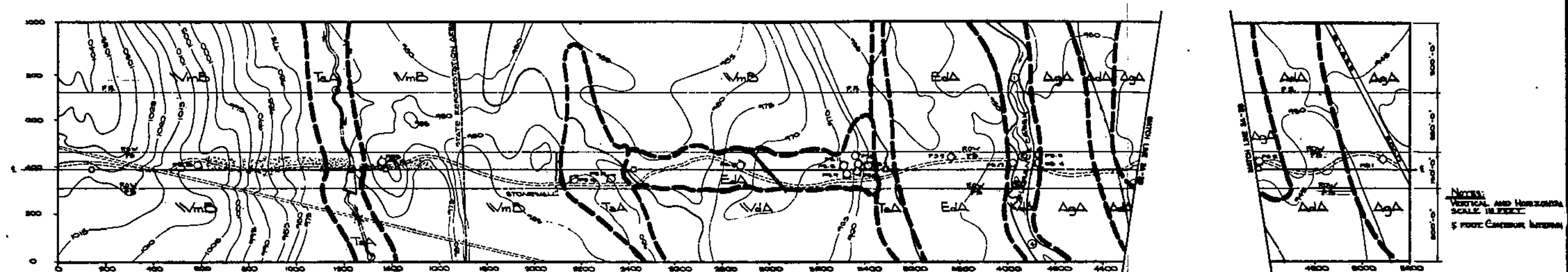
VEGETATION



CENTERLINE PROFILE



SOILS



LEGEND

WORKS AND STRUCTURES

- HIGHWAYS AND ROADS
- HEAVY DUTY
- MEDIUM DUTY
- LIGHT DUTY
- ACCESS ROAD
- UNIMPROVED DIRT ROAD
- NATIONAL INTERSTATE
- U.S. ROUTE
- STATE OR COUNTY
- SINGLE TRACK RAILROAD
- MULTIPLE TRACK RAILROAD
- ABANDONED RAILROAD TRACK
- RAILROAD OVER
- RAILROAD UNDER
- FORD
- ROAD CROSSING
- BUILDING
- EXCAVATION
- MINE DUMP
- PIPELINE
- TRANSMISSION STRUCTURES
- DAMS
- CULVERT
- TANKS
- WELLS
- BRUSH AND LOG DISPOSAL SITES
- SMALL PARKS, CEMETERY, ETC.
- DITCH

BOUNDARIES

- NATIONAL OR STATE
- COUNTY
- MINOR CIVIL DIVISION
- RESERVATION, NATIONAL OR STATE
- LAND GRANT
- ROW PROPERTY BOUNDARY
- ROW EASEMENT BOUNDARY
- ROW CLEARING EDGING
- SITE BOUNDARY
- ROW CENTERLINE
- VEGETATION OR SOIL BOUNDARY

SITE MARKERS

- SAMPLE LOCATION
- PHOTO STATIONS
- MAPPED PLOT ON ROW
- MAPPED PLOT OFF ROW
- APPROX. LOCATION OF GROUSE DRUMMING LOG

WATER SYMBOLS

- PERENNIAL STREAMS
- INTERMITTENT STREAMS
- SMALL RAPIDS
- LARGE RAPIDS
- DISAPPEARING STREAM
- CANALS AND DITCHES
- PERENNIAL LAKES AND PONDS
- INTERMITTENT LAKES AND PONDS
- SPRING
- MARSH, SWAMP OR WET MEADOW
- WET SPOT
- ALLUVIAL FAN

TOPOGRAPHIC RELIEF

- CONTOUR
- DEPRESSION CONTOUR

SOIL SYMBOL AND NAME

WmB	WORTH	stony loam (8 to 15 slope)
EdA	EMPEYVILLE	stony sandy loam (0 to 8% slope)
WdA	WESTBURY	stony loam (0 to 8% slope)
TeA	TUGHILL	stony silt loam (0 to 8% slope)
AgA	ALTON	gravelly sandy loam (0 to 8% slope)
AdA	ADRIAN	loam (0 to 5% slope)

SOIL SYMBOLS

- ROCK
- SAND
- SCATTERED ROCK
- BARE AND ERODING (GULLY)
- BARE AND ERODING (SHEET)
- BARE AND INCREASING IN SIZE
- BARE AND HEALING
- ERODED BUT HEALED
- CLAY AREA
- WIND EROSION

PLANT COMMUNITY SYMBOLS

shrubs

ALR	ALDER	*Alnus spp.*
ARR	ARROW - WOOD	*Viburnum recognitum*
BAR	BARBERRY	*Berberis spp.*
BLA	BLACKBERRY	*Rubus spp.*
BLH	BLACK - VIBURNUM	*Viburnum prunifolium*
BLU	BLUEBERRY	*Vaccinium spp.*
BUT	BUTTONBUSH	*Cephalanthus occidentalis*
CAY	AMERICAN YEW	*Taxus canadensis*
CFH	FLY - HONEYSUCKLE	*Lonicera canadensis*
CHC	CHOKE - CHERRY	*Prunus virginiana*
CLB	CLIMBING BITTERSWEET	*Celastrus scandens*
CRA	GRAPE	*Vitis spp.*
DEY	DEWBERRY	*Rubus spp.*
ELD	ELDERBERRY	*Sambucus canadensis*
GRD	GRAY DOGWOOD	*Cornus racemosa*
GRJ	GROUND - JUNIPER	*Juniperus communis*
HAA	COMMON ALDER	*Alnus serrulata*
HAW	HAWTHORN	*Crataegus spp.*
HAZ	HAZELNUT	*Corylus spp.*
HUC	HUCKLEBERRY	*Gaylussacia spp.*
JAR	MULTIFLORA ROSE	*Rosa multiflora*
MAV	MAPLE - LEAVED VIBURNUM	*Viburnum acerifolium*
MOH	MOUNTAIN - HOLLY	*Nemopanthus mucronata*
MOL	MOUNTAIN - LAUREL	*Kalmia latifolia*
MOM	MOUNTAIN - MAPLE	*Acer spicatum*
NAN	NANNYBERRY	*Viburnum Lentago*
NJT	NEW JERSEY TEA	*Ceanothus americanus*
PIF	PINXTER - FLOWER	*Rhododendron nudiflorum*
POI	POISON IVY	*Rhus radicans*
POS	POISON SUMAC	*Rhus vernix*
PRA	NORTHERN PRICKLY ASH	*Xanthoxylum americanum*
PRU	BUCKTHORN	*Rhamnus spp.*
RIB	RIBES	*Ribes spp.*
ROD	RED OSIER DOGWOOD	*Cornus stolonifera*
SMC	SUMAC	*Rhus spp.*
SPA	SPECKLED ALDER	*Alnus rugosa*
SPB	SPICEBUSH	*Lindera Benzoin*
SPI	SPIRAEA	*Spiraea spp.*
SMS	SMOOTH SUMAC	*Rhus glabra*
STM	STRIPED MAPLE	*Acer pensylvanicum*
STS	STAGHORN - SUMAC	*Rhus typhina*
SWF	SWEET - FERN	*Comptonia peregrina*
TAH	TARTARIAN HONEYSUCKLE	*Lonicera tatarica*
WIH	WITCH - HAZEL	*Hamamelis virginiana*
WIL	WILLOW	*Salix spp.*
WIN	WINTERBERRY	*Ilex verticillata*
WIR	WILD - RAISIN	*Viburnum cassinoides*
ZBC	BLACK CHOKEBERRY	*Pyrus melanocarpa*

trees

ABU	BUTTERNUT	*Juglans cinerea*
AIL	TREE - OF - HEAVEN	*Ailanthus altissima*
ALD	ALTERNATE - LEAVED DOGWOOD	*Cornus alternifolia*
AMB	BEECH	*Fagus grandifolia*
AMC	CHESTNUT	*Castanea dentata*
AME	AMERICAN ELM	*Ulmus americana*
AMH	AMERICAN HORNBEAM	*Carpinus caroliniana*
APP	APPLE	*Pyrus malus*
BAF	BALSAM - FIR	*Abies balsamea*
BAS	BASSWOOD	*Tilia americana*
BIH	BITTERNUT HICKORY	*Carya cordiformis*
BLC	BLACK CHERRY	*Prunus serotina*
BLL	BLACK LOCUST	*Robinia Pseudo-Acacia*
BLW	BLACK WALNUT	*Juglans nigra*
CHO	CHESTNUT - OAK	*Quercus prinus*
COT	COTTONWOOD	*Populus deltoides*
EAH	HEMLOCK	*Tsuga canadensis*
ERC	RED CEDAR	*Juniperus virginiana*
FLD	FLOWERING DOGWOOD	*Cornus florida*
GRB	GRAY BIRCH	*Betula populifolia*
HOH	AMERICAN HOP-HORNBEAM	*Ostrya virginiana*
LAA	LARGE - TOOTHED ASPEN	*Populus grandidentata*
LAR	AMERICAN LARCH	*Larix laricina*
NWC	WHITE CEDAR	*Thuja occidentalis*
PAB	WHITE BIRCH	*Betula papyrifera*
PIC	PIN - CHERRY	*Prunus pensylvanica*
PIH	PIGNUT HICKORY	*Carya glabra*
PIP	PITCH - PINE	*Pinus rigida*
QUA	QUAKING ASPEN	*Populus tremuloides*
RED	RED OAK	*Quercus rubra*
REM	RED MAPLE	*Acer rubrum*
REP	RED PINE	*Pinus rubra*
RES	RED SPRUCE	*Picea rubens*
SAS	WHITE SASSAFRAS	*Sassafras albidum*
SCO	SCRUB - OAK	*Quercus ilicifolia*
SCP	SCOTCH PINE	*Pinus sylvestris*
SHB	SERVICEBERRY	*Amelanchier spp.*
SHH	SHAGBARK - HICKORY	*Carya ovata*
SUM	SUGAR - MAPLE	*Acer saccharum*
SWB	SWEET BIRCH	*Betula lenta*
VIP	SCRUB - PINE	*Pinus virginiana*
WHA	WHITE ASH	*Fraxinus americana*
WHO	WHITE OAK	*Quercus alba*
WHP	WHITE PINE	*Pinus strobus*
YEB	YELLOW BIRCH	*Betula lutea*
YEP	TULIP - POPLAR	*Liriodendron tulipifera*

herbs

BLG	BLUE - JOINT GRASS	*Calamagrostis canadensis*
BON	BONESET	*Eupatorium perfoliatum*
BRN	BRACKEN	*Pteridium aquilinum*
BRO	BROOM - SEDGE	*Andropogon virginicus*
CAT	CAT-TAIL	*Typha spp.*
CHF	CHRISTMAS - FERN	*Polystichum acrostichoides*
CIF	CINNAMON - FERN	*Osmunda cinnamomea*
DEG	DEERTONGUE GRASS	*Panicum clandestinum*
GOR	GOLDENROD	*Solidago spp.*
HAF	HAY - SCENTED FERN	*Dennstaedtia punctilobula*
HOT	HORSETAIL	*Equisetum spp.*
INF	INTERRUPTED FERN	*Osmunda Claytoniana*
IRS	IRIS	*Iris spp.*
JAP	SMALL JACK-IN-THE-PULPIT	*Arisaema triphyllum*
LET	WILD LETTUCE	*Lactuca canadensis*
MSF	MARGINAL SHIELD-FERN	*Dryopteris marginalis*
NYF	NEW YORK FERN	*Dryopteris noveboracensis*
PEV	PEARLY EVERLASTING	*Anaphalis margaritacea*
PHR	PHRAGMITES	*Phragmites spp.*
POG	POVERTY - GRASS	*Danthonia spicata*
RDM	REINDEER LICHEN	*Cladonia rangiferina*
ROF	ROYAL FERN	*Osmunda regalis*
SEF	SENSITIVE FERN	*Onoclea sensibilis*
SPL	SPIKED LOOSESTRIFE	*Lythrum Salicaria*
SPM	SPHAGNUM MOSS	*Sphagnum spp.*
SSS	SOLOMON'S - SEAL	*Polygonatum biflorum*
SWA	SWAMP - BUTTERCUP	*Ranunculus septentrionalis*
WHS	WHITE SNAKEROOT	*Eupatorium rugosum*
YPL	BULLHEAD - LILY	*Nuphar variegatum*

REVISIONS :

DATA SOURCES :

ASPLUNDH ENVIRONMENTAL SERVICES
BLAIR MILL ROAD
WILLOW GROVE, PA

Fitzpatrick - Edic Trans Line Sheet no. 56-4,

USGS 7.5 min Topographic Map Florence N.Y. 1955

USDA SCS, District Conservation, RC Bradley, New Hartford N.Y., Soil types, 10-9-76

Kurgan and Associates, Mentor Ohio, Oneida Co, Air Photo no. 00342 (2x5) (scale: 24000) 5-7-75

Asplundh Environmental Services
AES Project no. 61-0026 Field Studies 1975-76

SCALE: 1" = 200'-0"

200 100 0 100 200 400 800 1000

This information is a part of the ESEERCO "STUDY OF ENVIRONMENTAL AND ECONOMIC ASPECTS OF CONTEMPORANEOUS ELECTRIC TRANSMISSION LINE RIGHT-OF-WAY MANAGEMENT TECHNIQUES"

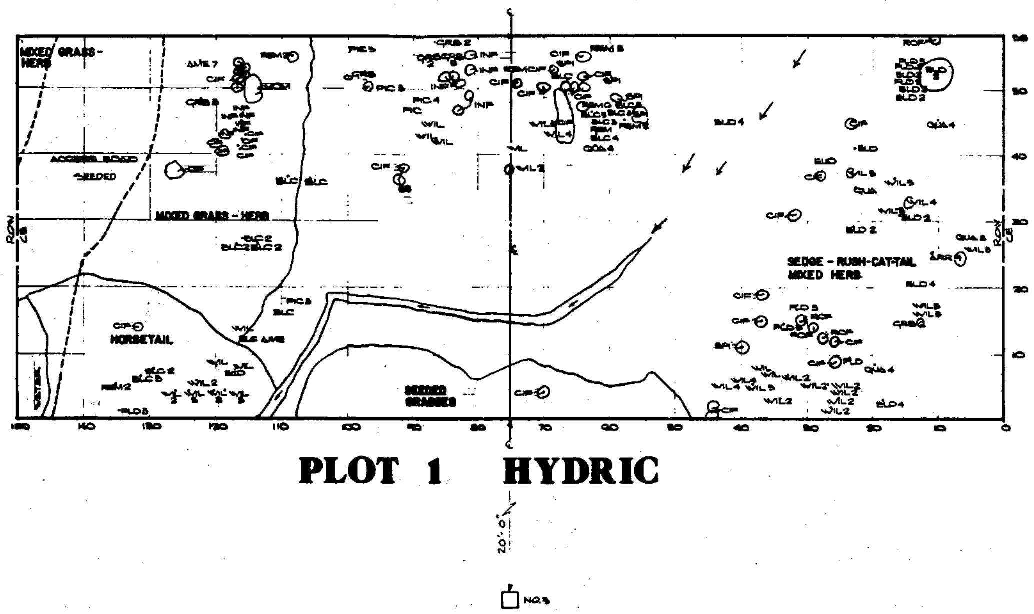
MAP 21.1

SITE 21 HABITAT CONDITIONS

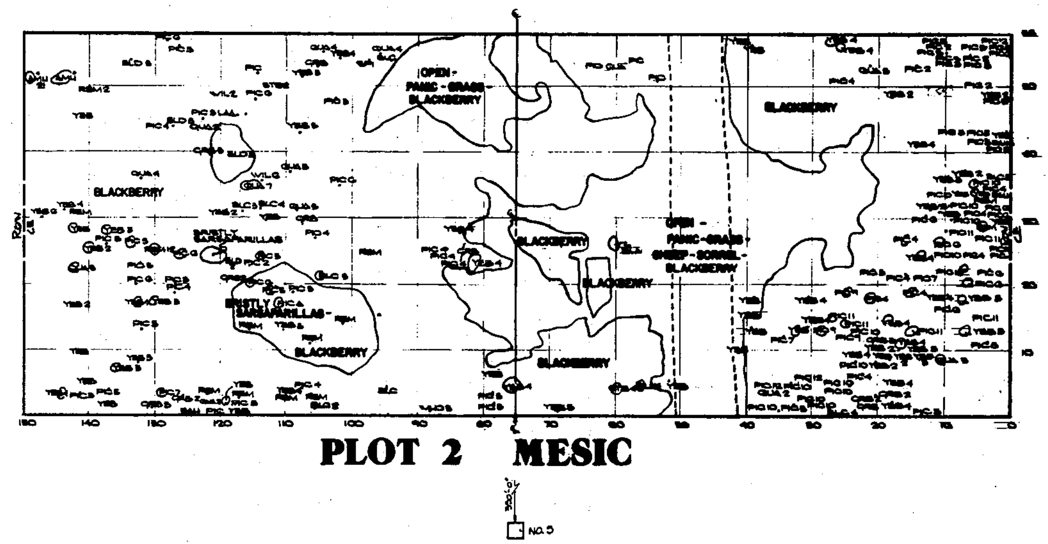
UTILITY: Power Authority - State of N.Y.

ROW DESCRIPTION: Fitzpatrick to Edic 345 KV

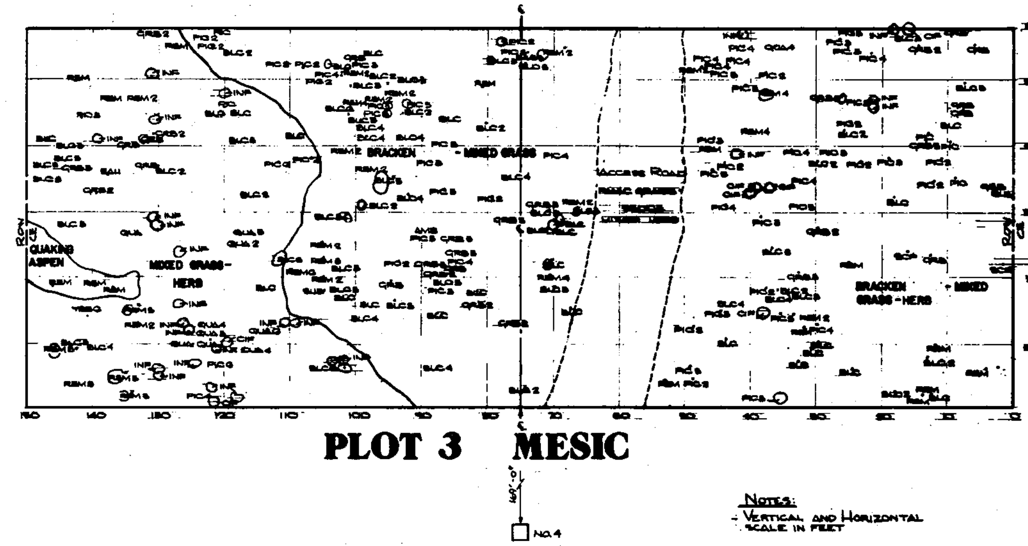
Steel Lattice Structure 150' ROW



PLOT 1 HYDRIC



PLOT 2 MESIC



PLOT 3 MESIC

Notes:
- Vertical and Horizontal scale in feet

LEGEND

WORKS AND STRUCTURES

- ACCESS ROAD
- BRUSH AND LOG DISPOSAL SITES

BOUNDARIES

- ROW CENTERLINE
- ROW PROPERTY BOUNDARY
- ROW EASEMENT BOUNDARY
- EXISTING ROW CLEARING EDGE

WATER SYMBOLS

- PERENNIAL STREAMS
- INTERMITTENT STREAMS
- SMALL RAPIDS
- LARGE RAPIDS
- DISAPPEARING STREAM
- CANALS AND DITCHES
- PERENNIAL LAKES AND PONDS
- INTERMITTENT LAKES AND PONDS
- SPRING
- MARSH, SWAMP OR WET MEADOW
- WET SPOT
- ALLUVIAL FAN

SITE MARKERS

- SAMPLE LOCATION
- PHOTO STATION

SOIL SYMBOLS

- ROCK
- SCATTERED ROCK

herbs

BLG	BLUE-JOINT GRASS	Calamagrostis canadensis
BON	BONESET	Eupatorium perfoliatum
BRN	BRACKEN	Pteridum aquilinum
BRO	BROOM-SEDGE	Artholophis virginicus
CAT	CAT-TAIL	Typha spp.
CHF	CHRISTMAS-FERN	Polystichum acrostichoides
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DEG	DEERTONGUE GRASS	Panicum clandestinum
GOR	GOLDENROD	Solidago spp.
HAF	HAY-SCENTED FERN	Dennstaedtia punctilobula
HOT	HORSETAIL	Equisetum spp.
INF	INTERRUPTED FERN	Osmunda Claytoniana
IRS	IRIS	Iris spp.
JAP	SMALL JACK-IN-THE-PULPIT	Arisaema triphylum
LET	WILD LETTUCE	Lactuca canadensis
MSF	MARGINAL SHIELD-FERN	Dryopteris marginalis
NYF	NEW YORK FERN	Dryopteris noveboracensis
PEV	PEARLY EVERLASTING	Anaphalis margaritacea
PHR	PHRAGMITES	Pragmites spp.
POG	POVERTY-GRASS	Danthonia spicata
RDM	REINDEER LICHEN	Cladonia rangiferina
ROF	ROYAL FERN	Osmunda regalis
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SPL	SPIKED LOOSESTRIFE	Lythrum Salicaria
SPM	SPHAGNUM MOSS	Sphagnum spp.
SSS	SOLOMON'S-SEAL	Polygonatum biflorum
SWA	SWAMP-BUTTERCUP	Ranunculus septentrionalis
WHS	WHITE SNAKEROOT	Eupatorium rugosum
YPL	BULLHEAD-LILY	Nuphar variegatum

PLANT COMMUNITY SYMBOLS

shrubs

ALR	ALDER	Alnus spp.
ARR	ARROW-WOOD	Viburnum recognitum
BAR	BARBERRY	Berberis spp.
BLA	BLACKBERRY	Rubus spp.
BLH	BLACK-VIBURNUM	Viburnum prunifolium
BLU	BLUEBERRY	Vaccinium spp.
BUT	BUTTONBUSH	Cephalanthus occidentalis
CAY	AMERICAN YEW	Taxus canadensis
CFH	FLY-HONEYSUCKLE	Lonicera canadensis
CHC	CHOKE-CHERRY	Prunus virginiana
CLB	CLIMBING BITTERSWEET	Celastrus scandens
CRA	GRAPE	Vitis spp.
DEY	DEWBERRY	Rubus spp.
ELD	ELDERBERRY	Sambucus canadensis
GRD	GRAY DOGWOOD	Cornus racemosa
GRJ	GROUND-JUNIPER	Juniperus communis
HAA	COMMON ALDER	Alnus serrulata
HAW	HAWTHORN	Crataegus spp.
HAZ	HAZELNUT	Corylus spp.
HUC	HUCKLEBERRY	Gaylussacia spp.
JAR	MULTIFLORA ROSE	Rosa multiflora
MAV	MAPLE-LEAVED VIBURNUM	Viburnum acerifolium
MOH	MOUNTAIN-HOLLY	Nemopanthus mucronata
MOL	MOUNTAIN-LAUREL	Kalmia latifolia
MOM	MOUNTAIN-MAPLE	Acer spicatum
NAN	NANNYBERRY	Viburnum Lentago
NJT	NEW JERSEY TEA	Ceanothus americanus
PIF	PINXTER-FLOWER	Rhododendron nudiflorum
POI	POISON IVY	Rhus radicans
POS	POISON SUMAC	Rhus vernix
PRA	NORTHERN PRICKLY ASH	Xanthoxylum americanum
PRU	BUCKTHORN	Rhamnus spp.
RIB	RIBES	Ribes spp.
ROD	RED OSIER DOGWOOD	Cornus stolonifera
SMC	SUMAC	Rhus spp.
SPA	SPECKLED ALDER	Alnus rugosa
SPB	SPICEBUSH	Lindera Benzoin
SPI	SPIRAEA	Spiraea spp.
SMS	SMOOTH SUMAC	Rhus glabra
STM	STRIPED MAPLE	Acer pensylvanicum
STS	STAGHORN-SUMAC	Rhus typhina
SWF	SWEET-FERN	Comptonia peregrina
TAH	TARTARIAN HONEYSUCKLE	Lonicera tatarica
WIH	WITCH-HAZEL	Hamamelis virginiana
WIL	WILLOW	Salix spp.
WIN	WINTERBERRY	Ilex verticillata
WIR	WILD-RAISIN	Viburnum cassinoides
ZBC	BLACK CHOKEBERRY	Pyrus melanocarpa

trees

ABU	BUTTERNUT	Juglans cinerea
AIL	TREE-OF-HEAVEN	Ailanthus altissima
ALD	ALTERNATE-LEAVED DOGWOOD	Cornus alternifolia
AMB	BEECH	Fagus grandifolia
AMC	CHESTNUT	Castanea dentata
AME	AMERICAN ELM	Ulmus americana
AMH	AMERICAN HORNBEAM	Carpinus caroliniana
APP	APPLE	Pyrus malus
BAF	BALSAM-FIR	Abies balsamea
BAS	BASSWOOD	Tilia americana
BIH	BITTERNUT HICKORY	Carya cordiformis
BLC	BLACK CHERRY	Prunus serotina
BLL	BLACK LOCUST	Robinia Pseudo-Acacia
BLW	BLACK WALNUT	Juglans nigra
CHO	CHESTNUT-OAK	Quercus prinus
COT	COTTONWOOD	Populus deltoides
EAH	HEMLOCK	Tsuga canadensis
ERC	RED CEDAR	Juniperus virginiana
FLD	FLOWERING DOGWOOD	Cornus florida
GRB	GRAY BIRCH	Betula populifolia
HOH	AMERICAN HOP-HORNBEAM	Ostrya virginiana
LAA	LARGE-TOOTHED ASPEN	Populus grandidentata
LAR	AMERICAN LARCH	Larix laricina
NWC	WHITE CEDAR	Thuja occidentalis
PAB	WHITE BIRCH	Betula papyrifera
PIC	PIN-CHERRY	Prunus pensylvanica
PIH	PIGNUT HICKORY	Carya glabra
PIP	PITCH-PINE	Pinus rigida
QUA	QUAKING ASPEN	Populus tremuloides
RED	RED OAK	Quercus rubra
REM	RED MAPLE	Acer rubrum
RES	RED SPRUCE	Picea rubens
SAS	WHITE SASSAFRAS	Sassafras albidum
SCO	SCRUB-OAK	Quercus ilicifolia
SCP	SCOTCH PINE	Pinus sylvestris
SHB	SERVICEBERRY	Amelanchier spp.
SHH	SHAGBARK-HICKORY	Carya ovata
SUM	SUGAR-MAPLE	Acer saccharum
SWB	SWEET BIRCH	Betula lenta
VIP	SCRUB-PINE	Pinus virginiana
WHA	WHITE ASH	Fraxinus americana
WHO	WHITE OAK	Quercus alba
WHP	WHITE PINE	Pinus strobus
YEB	YELLOW BIRCH	Betula lutea
YEP	TULIP-POPLAR	Liriodendron tulipifera

REVISIONS:

DATA SOURCE: ASPLUNDH ENVIRONMENTAL SERVICES, BLAIR MILL ROAD, WILLOW GROVE, PA. 19090

Field Survey - AES, 1975, 76

This information is a part of the ESEERCO "STUDY OF ENVIRONMENTAL AND ECONOMIC ASPECTS OF CONTEMPORANEOUS ELECTRIC TRANSMISSION LINE RIGHT-OF-WAY MANAGEMENT TECHNIQUES"

MAP 21.2

SITE 21

MAPPED PLOTS

UTILITY: Power Authority - State of N.Y.

ROW DESCRIPTION: Fitzpatrick to Edic 345 KV.

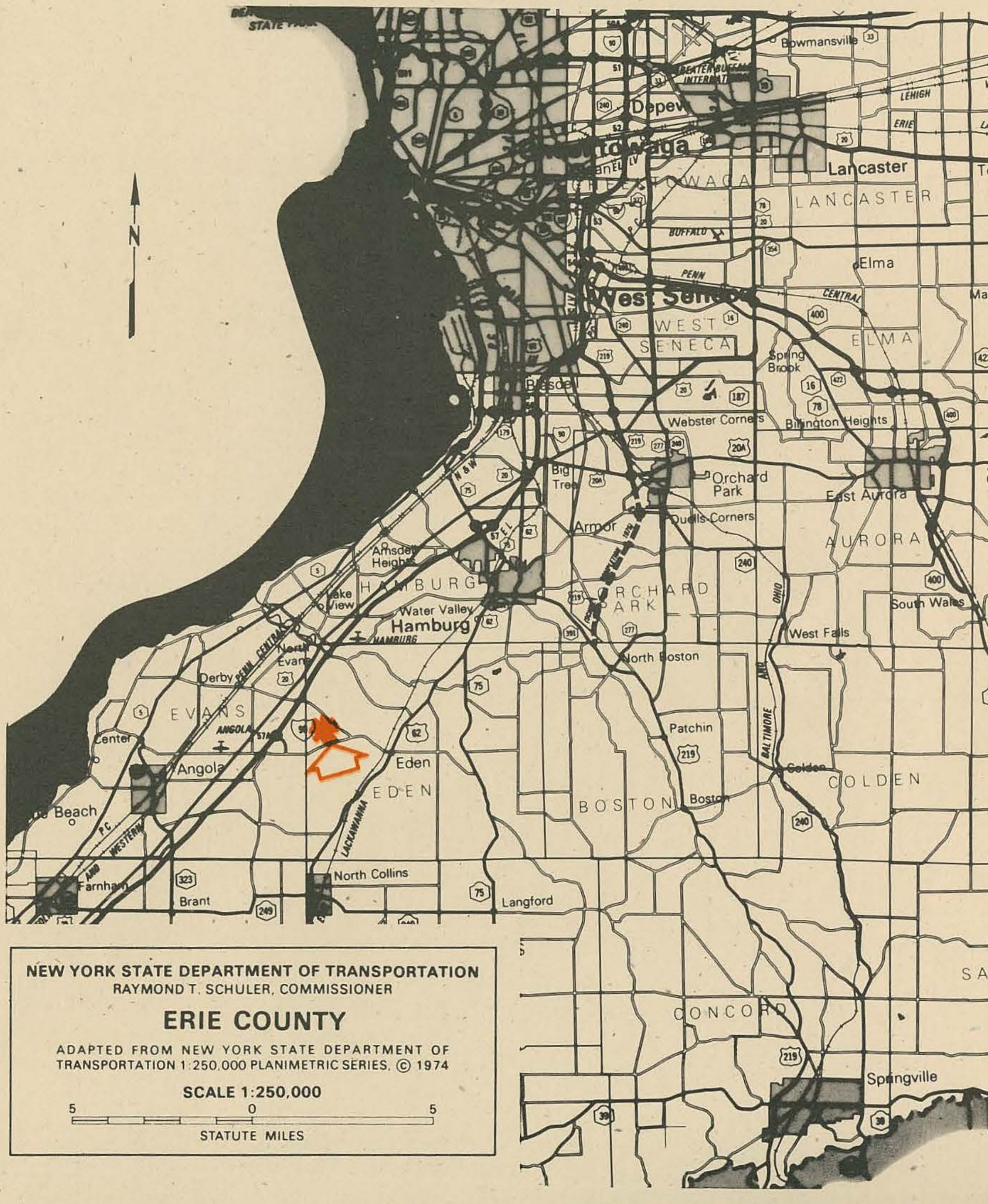
Steel Lattice 150' ROW

SCALE: 1" = 10' - 0"

10 5 0 5 10 20 40 50

SITE 22

GARDENVILLE to DUNKIRK



Site 22 Gardenville to Dunkirk

Study area extends from Derby Road (structure 142 and structure 142A) to Town Line Road (structure 147 and structure 147A), and is located near Eden. To reach the area, proceed west on route 90 to Exit 57A and take a left. Proceed to Derby Road and take Derby Road to study area.

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Site 22 Gardenville to Dunkirk

1 Introduction

Site 22 is located in the Erie-Ontario Plain physiographic area of New York (Cline, 1970) in the Elm-Red Maple and Northern Hardwoods forest type area (Stout, 1958). The general landscape of the ROW and adjacent area is shown in Figs. 22.1.1 and 22.1.2.

The topography of the area is typically flat plains, dissected by streams flowing north into Lake Erie (Stout, 1958).

Typical forest types of the region are Northern Hardwoods, and Elm-Red Maple and Northern Hardwoods (Stout, 1958). Located on the site are Northern Hardwoods-Pine, Elm-Red Maple and Northern Hardwoods forest types.

2 Location and Identification

Site 22 is located approximately 2 miles northwest of Eden, in the town of Eden, Erie County, New York (78° 56' 30" W. Longitude; 42° 39' 30" N. Latitude).

The site is on the Gardenville to Dunkirk ROW which is operated by the Niagara Mohawk Power Corporation (NMPC). This 250-foot easement consists of 2 single circuit 230 kV lines, each having wood pole H-frame structures. The project site is approximately 3,200 feet in length and extends from structure 147/S and 147/N, east of Town Road, to include structures 142/S and 142/N.

3 Background

The following discussion outlines documentable management techniques of clearing, construction, restoration, and maintenance regarding site 22, as received from NMPC (letter dated May 6, 1976, from James Brogan and Kenneth Finch, Niagara Mohawk Power Corporation, Syracuse, N.Y.; telephone conversation with James Brogan, December 14, 1976, NMPC, Syracuse, N.Y.). All available pertinent information and unit cost data are included under each operation of clearing, construction, restoration, and maintenance.

3.1 Clearing

The ROW was clear cut to a width of 250 feet between October, 1958, and the spring of 1959; all danger trees were removed. Brush and trees under 4 inches in diameter were piled and burned on the ROW.

Initial chemical treatment of stumps was completed to prevent resprouting or resurgent growth. The chemical used was 2,4-Dichlorophenoxyacetic acid (2,4-D), and 2,4,5-Trichlorophenoxyacetic acid (2,4,5-T), and Turchlorophenoxy low volatile propylene glycol butyl ether esters or butoxy ethanol ester. This was mixed with a solution of diesel oil or No. 2 fuel oil. No information is available regarding cost of clearing or initial chemical treatments.

3.2 Construction

The NMPC forces constructed a portion of the line through the study area with work beginning during the winter of 1959 and being completed in the summer of 1961. Bulldozers were used to move poles along the ROW to the structure sites. A rubber-tire digger was used to dig holes and bulldozers were used to individually set each structure. Bulldozers were also used along with tensioning equipment for assembling wire structures in the air.

3.3 Restoration

There was no formal erosion control effort implemented following construction.

3.4 Maintenance

Maintenance on the ROW is limited, with no unit cost information available.

A broadcast foliage application with Ammate was completed in 1961.

A selective broadcast foliage application with Ammate was completed by NMPC personnel in 1971.

4 General Reconnaissance

A general reconnaissance was made in accordance with the methodology and is set forth in Map 22.1 which shows site habitat conditions. In this reconnaissance it was noted that the major vegetational types correlated with the soil types on the mesic and hydric habitats.

The existing visual character of the ROW is depicted during all seasons of the year, from important vantage points both on and off the ROW. These points are identified as photo stations and are located on Map 22.1 and described in Appendix 17. Specific reference is made to some of these photo stations throughout the report and illustrated in Fig. 22.1. With the exception of aerial photography used to identify land use, older photographs depicting the area are not available.

Within the surrounding landscape, site 22 is not necessarily pleasing or objectionable to view. The ROW site fits in well with the surrounding fallow fields that occur in the vicinity, although by itself it has no particular visual assets. There are no distinct natural landforms, historic, or man-made features near the site which may make the ROW somewhat sensitive to view. Although Derby and Town Line Roads cross the site, neither is a major thoroughfare. The site is located in the Welch's grape production area south of Buffalo, but no fields actively used were located in the vicinity of the ROW. It could seem that the presence of the sanitary landfill which occupys the area off the ROW to the north, toward Town Line Road, would obviate any potential sensitivity of the area. The landfill has been increasing in size, causing flooding in the ROW proper and the woods to the south. The ROW site is very visible and structures can easily be seen within the flat landscape from either Derby or Town Line Roads. One residence is located near the ROW, but is screened from the ROW by trees. The potential number of people viewing the ROW is low.

5 Field Studies - Results and Discussion

5.1 Soils

5.1.1 Geology and Soils

Site 22, Gardenville to Dunkirk ROW, is located in Erie County in the Erie-Ontario Plain (Cline, 1970), also known as the Erie-Ontario Lowland region in the Erie Lake Plan subdivision (Thompson, 1966). This area rises approximately 100 feet above Lake Erie and lies on its southern shore. Noted for its grape production this area, in general, evidences the effects of post-glacial levels of Lake Erie (Thompson, 1966). Bedrock geology is of Early Upper Devonian, from 395 to 345 million years ago. Surficial geology is both glacial till, deposited directly by the ice sheet, and calcareous glacial lake deposits (Broughton et al., 1973).

Soils on this site are largely classified in the order Alfisol, suborder Aqualf (Brockport, Madalin, and Remsen soil series), reflecting the gray to brown surface horizon and illuvial horizon in which silicate clays have accumulated. One soil, Orpark, is in the order Inceptisols, suborder Aquepts, indicating the absence of horizons of marked accumulation of clay and iron and aluminum oxides (Buckman and Brady, 1969; Soil Survey Staff, 1975). This site is located in the area occupied by the broad soil association termed Fulton-Toledo, noted for the wetness and fine texture which severely limit usage of these nearly level areas of lake-laid clays and silts (Cline, 1970). Brief descriptions (Taylor et al., 1929; Anon., 1972) of soil types occuring on the ROW study site (Map 22.1; Table 22.1) are:

Madalin silt loam (MaA): These soils developed in calcareous glacial lake deposits, on flat to slightly depressed areas. Madalin soils are poorly drained, with 1 to 2 feet of slowly permeable silt loam or silty clay loam over very slowly permeable silty clay or clay, and are underlain by shaly glacial till at a depth of 2 to 4 feet. The depth to the seasonal water table is 0 to 6 inches, and in fact parts of the site were covered by standing water. Soil reaction ranges from pH 6.1 to pH 7.3 throughout a typical profile, but it was pH 6.1 in the surface mineral soil on this site. Madalin silt loam is assigned to Woodland Suitability Group 5w2, designating low productivity for timber (Class 5) and excessive wetness as a restriction or limitation (Subclass w).

Orpark silt loam (OrA): Orpark soils developed in glacial till, and generally occupy broad hills of glaciated uplands. These soils are somewhat poorly drained, with a layer of silty clay loam underlying the surface of silt loam. These soils range in depth from 18 to 30 inches to bedrock, and from 6 to 18 inches to the seasonal water table. These soils are generally strongly acid, and are pH 4.6 in the surface 3 inches on this site. Orpark is in Woodland Suitability Group 3w, designating moderately high productivity for timber, but with limitations for woodland use or management due to excessive wetness.

Remsen silt loam (ReA): These soils formed in glacial till with frequently occurring reworked clayey lacustrine material, on nearly level to sloping till plains. Somewhat poorly drained, these soils have 12 to 18 inches of slowly permeable silty clay or silty clay loam over slowly permeable silty clay or clay calcareous till, and a seasonal water table 6 to 18 inches from the surface. These soils are strongly acid, with pH 5.1 in the upper mineral horizon. Remsen is assigned to Woodland Suitability

Group 3w1, which is moderately high for woodland production with management limitations related to poor drainage and a high water table.

Brockport silty clay loam (BrA): These soils developed in glacial till that is 20 to 40 inches deep to calcareous shale bedrock, and are found on nearly level to gently sloping areas. Brockport soils are somewhat poorly drained, with 6 to 12 inches of moderately permeable silt loam to silty clay loam over 18 to 30 inches of slowly permeable clay loam or clay till. Soil reaction ranges from pH 6.0 to pH 7.5 throughout a typical profile, but pH 6.1 in the surface mineral soil on this site. Brockport silty clay loam is assigned to Woodland Suitability Group 3w1, designating moderately high woodland production with management limitations related to poor drainage and a high water table.

5.1.2 Humus Types

Organic layers present on the soil surface of the ROW and adjacent woodland were measured on 2 mesic locations. Average thickness of the organic layers and A1 horizon was based on 5 samples taken at each location (Table 22.2). The presence and thickness of these layers were used for humus type classification. The humus classification key is not adaptable to areas exhibiting prolonged water saturation in the surface soil; therefore, similar measurements were not made on the hydric site. There is evidence of plowing at both ends of the study area with evidence of an A1 horizon developing.

All organic layers (litter, fermentation, and humus) plus an A1 horizon (mixed mineral and organic) were present at each area on both the ROW and woodland. Based on thickness of the fermentation, humus, and A1 layers, the predominant humus type was designated a "thin duff mull with shallow A1". The organic litter layer of the ROW was consistently thicker than that which occurred in the woodland. Organic layers on the ROW were composed of the leaves and stems of herbs and shrubs in contrast to the leaves, twigs, and fruit of hardwoods and shrubs in the adjacent woods.

Based on these limited observations, it appears that the ROW construction and periodic maintenance for brush control did not alter depth of the surface organic layers of the soil; in fact, litter accumulation was greater on the ROW. Elimination of the forest cover did result in a change in kind of organic material; however, regrowth and persistence of a mixed grass-herb-shrub cover has resulted in annaul litter depositions and continuation of a protective organic layer that is somewhat thicker than comparable layers in the adjacent woodland.

5.1.3 Soil Erosion

Current Active Erosion Observations of active soil erosion on the ROW and adjacent woodland were made on the Gardenville to Dunkirk study area in August, 1976. In general, good vegetative cover, composed of grasses, herbs, and low shrubs, have developed on the general ROW following chemical treatment with Ammate for brush control, and a protective litter mulch from these plant parts was present (Table 22.2).

Eroding areas were identified as to location on the ROW and adjacent woodland, soil type, average slope, and present plant cover (Table 22.3). Erosion was classified as to kind (sheet, rill, gully) and class (slight, moderate, severe); average depths of gullies on the sanitary landfill were recorded but none were mapped. Slight sheet erosion occurred both in general on the ROW and in the woodland. Sediment did not leave the ROW but remained in the smaller depressions. There was some moderate sheet, rill, and gully erosion occurring off the ROW at a sanitary landfill immediately adjacent to the ROW. Sediment appeared to be leaving this area and some was deposited on the ROW. Also, it appears that the landfill has interferred with normal drainage patterns, and the water level has risen perceptively.

As there was no restoration in the form of seeding and planting, denuded areas and tower and access road sites were dependent on natural plant invasion. Good grass, sedge, and herb cover has developed on the ROW, access roads, and tower sites. There were no areas of mass land movement except off the ROW at the sanitary landfill.

5.2 Vegetation

5.2.1 Habitat and Forest Types on the Site

Mesic Habitat The mesic, or medium moist, habitat (1) was located on a nearly level lowland area where slope never excedded 8% and the habitat was basically flat. Drainage was free but not excessive, except as affected by a seasonally high water table which made the habitat wet in the spring season. The forest type was Northern Hardwoods, with red maple the dominant species.

Hydric Habitat The hydric, or wet, habitat (2), was located on a basically level area, where the slope was negligible and aspect was flat. Drainage was impeded, and a normally high water table was apparently increased by enlargement of an adjacent sanitary landfill, which served to render drainage poor. The forest type was Elm-Red Maple with sparse white ash, white oak, and shagbark-hickory.

5.2.2 Analysis of Forest Types and Associated ROW Vegetation

General Changes in Vegetation The primary impact of the ROW was to cause a change from a forest with a 4-layered structure to a shrub-herb-grass community. Obviously, removal of the trees caused this; and what was essentially a 2-layered ROW community developed, with the shrub layer consisting of shrubs and small trees not removed by maintenance treatment, or which have arisen since the last maintenance cycle (Fig. 22.2), and an herb layer.

In order to more completely characterize the forest types, an analysis was made on the forest plots to derive importance values for tree species (Table 22.4). Obviously, red maple was an important species on the mesic plot, and shagbark-hickory, white ash, and red maple were important species on the hydric plot.

On the hydric habitat, an Elm-Red Maple forest type was changed to a Willow-Sensitive Fern plant community. On the mesic habitat, a Northern Hardwoods forest type was changed to a Blackberry-Goldenrod plant community (Map 22.1; Table 22.5).

Quantitative Changes A notable increase in the number of shrub species on mesic and hydric habitats was apparent on the ROW as compared with the adjacent forest (Table 22.5; Figs. 22.3 and 22.4). On the mesic habitat, there were 6 species on the ROW as compared to 2 in the forest; on the hydric habitat there were 8 species on the ROW as compared to 4 in the forest. There was also a marked change in the herb layer on the mesic and hydric habitats, with 13 species on the ROW and 8 species in the forest, and 18 species on the ROW and 9 species in the forest, respectively (Table 22.5).

Qualitative Changes On the mesic 1 habitat, 11 shrub and herb species occurred both in the forest and on the ROW (Fig. 22.5). No shrubs appeared exclusively in the forest (Table 22.6), but 4 species, blackberry, elderberry, button bush, and red osier dogwood, appeared only on the ROW (Table 22.7). In the herb layer on the mesic habitat, 5 species occurred in the forest but not on the ROW, while 10 species appeared on the ROW but not in the forest (Tables 22.6 and 22.7).

On the hydric 2 habitat, 10 shrub and herb species appeared both in the forest and on the ROW (Fig. 11.5). Two shrub species, witch-hazel and nannyberry, occurred only in the forest, while 6 occurred only on the ROW. Of these 6 species, 3 are important, namely, willow, buttonbush, and elderberry. In the herb layer, 6 species occurred in the forest but not on the ROW, while 15 species occurred on the ROW but not in the forest (Tables 22.6 and 22.7).

In general, on the mesic habitat such plants as goldenrod, aster, strawberry, and mixed grasses, normally found in open fields and forest openings, occurred on the ROW alone, while trout-lily was present in both areas but was much more prominent on the ROW. Blackberry was also an abundant shrub on the ROW and did not occur in the forest. On the hydric habitat, such plants as cat-tail, sedge, sensitive-fern, water plants, boneset, and nightshade, normally found in wet areas, were prominent throughout the area. Goldenrods and asters were quite abundant in the later summer and fall months (Table 22.5).

It appears that the ROW had considerable positive impact on the number of species in the forest on the mesic and hydric habitats. Species abundance in both shrub and herb layers was much greater on the ROW than in the adjacent forest (Table 22.5).

5.2.3 Analysis of Plant Communities for On-ROW Mapped Vegetation Plots

Table 22.8 presents a breakdown of major vegetational communities for mesic and hydric plots on the Gardenville to Dunkirk ROW. Much of the present composition of herbaceous and woody plant communities on this area can be explained by the spraying history.

Existing knowledge indicates a past history of broadcast foliar applications with Ammate with a 10-year spraying cycle, 1961 to 1971.

Blackberries occur mainly on the mesic areas, and have spread, now occupying approximately 20% of the plot. Arrow-wood occurs in great abundance on both the mesic and hydric areas, in some instances from 25% to 50%. Both of these species are important for many different kinds of wildlife; in addition, the fruits of blackberry provide a potential for human consumption. Blackberry and arrow-wood are also low growing desireable plants that are not likely to interfere with future maintenance practices. Blackberry is not dense enough at this time to be considered undesireable in regard to line maintenance.

Herbaceous perennials present on the ROW, that do not occur in the understory of the adjacent woods, include goldenrods and asters. These are plants which have invaded the line area due to the increased sunlight afforded by line clearing. Under the present spraying program these plants can be expected to be drastically reduced immediately after maintenance treatment, with a gradual increase in abundance to the next maintenance cycle. A more drastic effect would probably occur if a herbicide other than Ammate was utilized. Selective foliar spray with Ammate would probably be even more desirable than the present method of maintenance.

Grasses ans sedges do not appear to be damaged by herbicides; therefore, the broadcast spray has not directly affected these communities and they occupy a large portion of the herbaceous plant material on this ROW.

Certain shrubs that occur in the understory of the adjacent woods are not found on the line area. These include witch-hazel and nannyberry, which are forest-dwelling species. It is assumed that these species were eliminated from the line area, either from an inability to adapt to new light conditions created by the initial clearing, or from repeated broadcast spraying.

5.2.4 Comparison of Forest Type with ROW Vegetation

The ROW was clear cut in the winter of 1958 to 1959, and a herbicide application of 2,4,-D and 2,4,5-T in oil was applied to the stumps. The ROW was broadcast foliar sprayed, presumably with Ammate, in 1961 and again in 1971.

The general impact of the above treatments of the ROW was to change the forest types (Northern Hardwoods, and Elm-Red Maple) to shrub-herb-grass communities. Some shrubs occurred on the ROW which did not formerly exist in the forest (Fig. 22.1.3).

On the mesic habitat, which was formerly occupied by a Northern Hardwoods forest type, a Blackberry-Goldenrod community has evolved. There was a significant quantitative change in the shrub and herb species on the ROW as compared to the forest. There was a qualitative difference in the shrub and herb species on the ROW as compared to the forest with blackberry, an important shrub, occurring on the ROW, but lacking in the forest. This qualitative difference is most evident in the herb layer, i.e., some of the herbs of the forest were not on the ROW, while some of the herbs of the ROW were not in the forest (Table 22.5). Some species occurred on both (Figs. 22.1.4 and 22.1.5).

On the hydric habitat, formerly occupied by an Elm-Red Maple forest type, a Willow-Sensitive Fern community was produced. There was a significant increase in the number of species on the ROW as compared to the adjacent forest. While some shrub and herb species of the forest did also occur on the ROW, a number of forest species were replaced by those favored by open conditions, although a few species of the forest also occurred on the ROW.

5.3 Wildlife

The major game species for site 22, Gardenville to Dunkirk, as determined by Asplundh Environmental Services (AES) in conjunction with the New

York State Department of Environmental Conservation (DEC), are white-tailed deer, gray squirrel, and raccoon.

5.3.1 Actual Use

White-tailed Deer White-tailed deer use was sparse on this study area, and consisted mainly of browse. One dead deer was found approximately 230 feet east of hydric plot 2, the head infested with a large number of carrion beetles (Figs. 22.1.6).

Browse Survey Four browse transects were established on study area 11 (Tables 22.9 and 22.10; Fig. 22.6). These transects were established at each permanent study plot location with 1 transect on each side of the ROW, on April 14, 1976.

Overall browse utilization by percentage of actual use was comparable between the ROW edge and the woods, with use along the edge being slightly higher. Browse utilization was lowest on the ROW, with a 10% actual use value. However, more stems were available on the ROW than either in the interior woods or on the edge. More stems were available and were taken on the ROW edge than in the interior woods, although these numbers were very similar (Table 22.9; Fig. 22.6).

The most abundant available browse plants were maple-leaved viburnum, dewberry, red maple, and American hornbeam (Table 22.10). Maple-leaved viburnum, American hornbeam, American hop-hornbeam, and red maple were moderately browsed. Nannyberry and bitternut hickory were scarse but were heavily utilized. (Table 22.9).

Gray Squirrel No gray squirrel activity was noted during the period of observation on this study area.

Raccoon No raccoon activity was noted during the period of observation on the study area.

Miscellaneous Wildlife Observations Various song birds were seen and/or heard on the study area throughout the period of this study. Birds observed on the ROW and on the ROW edge are included in Table 22.11.

Fox activity was slight during the spring of 1976, as evidenced by small amounts of scat located on the ROW.

Spring peeper activity was moderate off the ROW in the spring of 1976.

5.3.2 Potential Use

Potential wildlife use of the plant species present on site 22 for the 3 major game species, deer, squirrel, and raccoon, is contained in Table 22.12. In addition to asterisk ratings from New York, asterisk ratings from Pennsylvania were included for those plant species present on the study area that were not rated in the New York evaluation for deer. This additional data should provide supplemental information to the ROW manager regarding those plant species that may be of potential value to those game species (Martin et al., 1951).

5.4 Land Use

5.4.1 Location

Site 22 is located in a rural farm section of the town of Eden, Erie

County, New York. Between 1960 and 1970, there was a 4.6% increase in population of Erie County with a 1970 distribution of 87.9% urban, 11.6% rural nonfarm, and .5% rural farm (U.S. Bureau of the Census, 1972). The closest community is Eden (2,962) which is approximately 2 miles to the northwest.

5.4.2 Land Use Prior to Construction

The ROW was constructed during 1958 and 1959. The earliest available data obtained from 1938 aerial photography indicates that the location of the ROW and adjacent land to the ROW was primarily rural farm (Table 22.13; Fig. 22.7). Land use distribution included the following subtypes:

Agriculture:
- Ac - Cropland and cropland pasture

Forest Land:
- Fn - Forest lands

Outdoor Recreation:
- Or - Outdoor recreation

Water Resources:
- Wc - Artificial ponds
- Wb - Marshes, shrub wetlands, and bogs
- Ww - Wooded wetlands

5.4.3 Land Use After Construction

The adjacent land use to site 22 has changed from 1939 data with an increase in forested areas and an increase in agricultural uses. With the increase in population of Erie County, it has been defined as urban, though the area adjacent to site 22 is defined as rural farm (Table 22.13; Fig. 22.7). Land use distribution includes the following subtypes:

Agriculture:
- Av - Vineyards
- At - High intensity cropland
- Ac - Cropland and cropland pasture
- Ap - Pasture
- Ai - Inactive agricultural land

Extractive Industry:
- Eg - Sand and gravel pits

Forest Land:
- Fc - Forest brushland
- Fn - forest lands
- Fp - Plantations

Outdoor Recreation:
- Or - Outdoor recreation

Residential:
- Rl - Low density

Transportation:
- Th - Highway

Water Resources:
- Wc - Artificial ponds
- Wb - Marshes, shrub wetlands, and bogs
- Ww - Wooded wetlands

In addition to use of the ROW for the transmission of electrical power, portions of the ROW are currently being used for agriculture and hunting.

6 Evaluation, Interpretation, and Summary of Results

6.1 Conditions Which Existed Prior to Establishment of ROW

Soil, vegetation, and wildlife habitat conditions existing prior to ROW construction were based on observations made during the period of this study on adjacent undisturbed forest areas on both sides of the ROW.

6.1.1 Soils

The study area is situated on a nearly level to gently sloping segment of the Erie Lake Plain dominated by glacial till and calcareous glacial lake deposits over calcareous shale bedrock. Maximum slopes are less than 8% and drainage is impeded. Somewhat poorly drained Brockport silty clay loam and Orpark and Remsen silt loam soils formed in glacial till on gently sloping areas; all exhibit high seasonal water tables. Poorly drained Madalin silt loam developed in calcareous lake deposits, on broad flats and depressions underlain with clay and shaly glacial till; the water table normally occurs within 6 inches of the surface.

The 2 major soil series on this site, Madalin and Orpark, are present in the bordering forest and likely represent conditions prior to ROW clearance in 1958. The moist Orpark soil supports lowland hardwoods dominated by red maple and is rated moderately high for timber production. The wet Madalin soil is rated low in woodland productivity and on this site was occupied by such lowland species as shagbark-hickory, white ash, and red maple.

Average thickness of organic layers (litter, fermentation, and humus combined) on mesic woodland sites was 0.9 inches and decomposed organic matter was incorporated to a depth of 1.0 inch in the mineral soil, thus resulting in a "thin duff mull with shallow A1" humus type. Active erosion in the undisturbed forest was limited to slight sheet erosion on 2 areas with thin litter cover on 2% slopes of silt loam and silty clay loam soils.

6.1.2 Vegetation

Some portions of the study area were in agricultural crops at the time of corridor establishment (1958 to 1959). Most of the study area, however, was in forest land. The 1938 aerial photograph shows the area later penetrated by this corridor as mature forest, but the 1974 photograph shows the area as forest brushland. There is no indication as to whether this stand was cutover before or after ROW establishment.

6.1.3 Wildlife

Wildlife, being mobile species which may or may not be observed during site visitation, were reasonably imputed to this area by the composition of the forested areas adjacent ot the ROW. It can be assumed that those species currently occupying the site, i.e., white-tailed deer, gray squirrel, and raccoon, occupied the habitat prior to ROW construction. Although current wildlife activity may be influenced by the presence of the ROW, it is likely that those species, designated by the DEC in conjunction with AES as major in this area, inhabited the vicinity before ROW construction. The degree of use is impossible to determine at this time.

6.1.4 Land Use

The earliest data available prior to construction of the ROW in 1958 and 1959 is 1938 aerial photography. The ROW and adjacent land area was rural with a land use distribution of agriculture (68.9%), forest land (28.8%), water resources (2.2%), and outdoor recreation (.1%).

6.2 Conditions Which Exist at Present

6.2.1 Soils

The 4 soil types described for the overall study area also were present on the ROW. Brockport and Remsen soils occur on a small segment of the northeast end of the site currently occupied by abandoned agricultural land. Also, a sanitary landfill was located on Brockport soil immediately north of the ROW and a portion of the Madalin soil on the west end of the study area was in cropland in 1976. Natural plant communities had developed on other segments of the ROW, Blackberry-Goldenrod on the moist Orpark soil, and Willow-Sensitive Fern on the wet Madalin soil.

Organic mulch on mesic ROW habitats consisted of litter, fermentation, and humus layers, averaging 1.7 inches thick, with soil incorporation of decomposed organic matter (A1 horizon) to a depth of 1.1 inches. The "thin duff mull with shallow A1" humus type on the ROW was similar to that in the woodland, but the major source of litter was leaves and stems of the dominant herb-shrub plant community. Active erosion on the ROW in 1976 was limited to slight sheet erosion on 2 areas of silt loam and silty clay loam soil where plant cover was thin and some mineral soil exposed. Although not related to either ROW or forest conditions, moderate sheet, rill, and gully erosion was observed on the sanitary landfill adjoining the ROW.

6.2.2 Vegetation

On hydric sites, the Sedge-Mixed Grass-Herb community is the major herbaceous cover with Cat-tail-Sedge on the wettest portions. The Sedge-Mixed Grass-Herb community is being invaded by woody plants, particularly by American elm, shagbark-hickory, red maple, willow, and arrow-wood. Cat-tail-Sedge areas are being invaded to a lesser extent by willow, ash, and elm.

On mesic sites, the Mixed Grass-Sedge-Mixed Herb community is the dominant cover, but is broken by dense thickets of arrow-wood. Herbaceous communities are being invaded by white ash, quaking aspen, elder and pin-cherry. Arrow-wood communities have little invasion of other woody species and appear to resist encroachment of other species.

6.2.3 Wildlife

White-tailed deer, gray squirrel, and raccoon are the major game animals that probably currently utilize the study area. Indirect observations for deer, i.e., browse and a carcass, indicated their use of the ROW. Browse surveys indicated that more stems were available on the ROW than either on the ROW edge or in the interior adjacent woods. Overall, browse utilization by percent of actual use was lowest on the ROW, and comparable between the ROW edge and interior woods. Stems of maple-leaved viburnum, dewberry, red maple, and American hornbeam were most abundant, and of these, maple-leaved viburnum and American hornbeam were moderately browsed. Although scarse, nannyberry and bitternut hickory were heavily utilized.

No gray squirrel or raccoon activity was observed during site visitation. A variety of other animals were noted, directly or indirectly, to be utilizing either the ROW, the adjacent forest, or both. Potential wildlife use is evident from plant species present on the site.

6.2.4 Land Use

Recent land use of the ROW and adjacent land area has shifted from 1938 percentages. The area is still classified primarily as rural farm with a distribution of agriculture (47.4%), forest land (45.2%), extractive industry (1.2%), outdoor recreation (.1%), water resources (1.9%), transportation (1.4%), and residential (2.8%). With reference to the total inventory area, percentage shifts in the distribution of land use are noted as follows:

Agriculture -	-21.5%
Forest land -	+16.4%
Water resources -	- 0.3%
Extractive industry -	+ 1.2%
Outdoor recreation -	no change
Transportation -	+ 1.4%
Residential -	+ 2.8%

Land uses of extractive industry, transportation, and residential are new types which were not present in 1938.

In addition to use of the ROW for the transmission of electrical power, portions of the ROW are currently being used for agriculture and hunting.

6.3 Environmental Effect and Probable Causes

6.3.1 Soils

There was no apprent detrimental effect of ROW management on soils of this site in 1976. The slight sheet erosion occuring on the general ROW was also typical in the undisturbed forest on these soil and drainage conditions. Sediments from this sheet erosion collected in downslope depressions on the ROW and forest. More severe erosion and sedimentation was observed on the adjacent sanitary landfill area which also had no relation to ROW management.

The humus type on the ROW, "a thin duff mull", was comparable to that in the forest. Litter deposits consisting of leaves and stems of herbs and shrubs on the ROW, however, were twice as thick as those from tree leaves and twigs in the forest, 1.1 versus 0.5 inches, respectively.

6.3.2 Vegetation

The general impact of ROW management was to convert a Northern Hardwoods forest type (mesic) to a Blackberry-Goldenrod community, and an Elm-Red Maple forest type (hydric) to a Willow-Sensitive Fern community.

On both the mesic and hydric habitats, there was a considerable increase in total number of shrub and herb species on the ROW, as compared with the forest (species diversity).

An important shrub, blackberry, was abundant on the ROW but not in the forest, on the mesic habitat. Striking differences occurred in herb species in the forest and on the ROW. On the hydric habitat, while arrow-wood was abundant both in the forest and on the ROW, several important shrubs occurred only in the forest or on the ROW. A few herbs occurred only in the forest on the hydric habitat, while a large number of species occurred on the ROW only.

6.3.3 Wildlife

The presence of the ROW has encouraged the development of many different plant species, mainly light-loving, on the ROW proper, thus enhancing the habitat for wildlife use. The ecotone created by the presence of the ROW often produces a greater variety and density of life than is found otherwise (Leopold, 1936), and this phenomenon has been termed the "edge effect" (Smith, 1974).

6.3.4 Land Use

Because 1938 data was used to identify classifications prior to construction in 1958 and 1959, many of the changes noted as having occurred since the ROW was constructed may have actually occurred during the 20 years prior to construction. Without additional information, it is not known what changes actually took place since 1958.

Changes within the area may be attributed to other changing land use characteristics in Erie County. The inventoried area has remained rural farm, though the county has changed to urban in character. Portions of the ROW and the adjacent land to the ROW are being utilized for agricultural purposes. The ROW has opened the area for hunting.

Table 22.1. Soil series present on the Gardenville to Dunkirk study area.

Soil Series	Map Symbol[1]	Drainage Class[2]	Surface Soil pH	Surface Soil Texture	Woodland Suitability Group
Brockport	BrA	SPD	6.1	silty clay loam	3w1
Madalin	MaA	PD	6.1	silt loam	5w2
Orpark	OrA	SPD	4.6	silt loam	3w
Remsen	ReA	SPD-MG	5.1	silt loam	3w1

[1] The third letter of the map symbol designates slope class:
A = 0-8%, B = 8-15%, C = 15-25%, D = 25-35%, E = 35-50%, F = 50-70%.

[2] Drainage Class: VPD = very poorly drained, PD = poorly drained, SPD = somewhat poorly drained, ID = imperfectly drained, MG = moderately good, G = good, E = excellent (excessive).

Table 22.2. Average thickness of organic layers and A1 horizon and humus types for mesic sites on ROW and adjacent woodland of site 22.

Moisture Regime	Location	Layer Thickness (in.) L	F	H	A1	Humus Type
1. Mesic (1)[1]	ROW	1.2	.2	.3	1.2	Thin duff mull with shallow A1
	Woodland	.5	.2	.3	1.1	Thin duff mull with shallow A1
2. Mesic	ROW	1.0	.3	.3	.9	Thin duff mull with very shallow A1
	Woodland	.6	.2	.1	.8	Thin duff mull with very shallow A1
All Plots Combined	ROW	1.1	.3	.3	1.1	Thin duff mull with shallow A1
	Woodland	.5	.2	.2	1.0	Thin duff mull with shallow A1

[1] Samples taken at vegetation study plots, the numbers of which are indicated by figures in parentheses.

Table 22.3. Areas exhibiting active erosion in August, 1976, on the Gardenville to Dunkirk ROW study area.

Location	Soil Type	Average Slope (%)	Plant Cover	Erosion on Site: Kind	Erosion on Site: Class	Erosion on Site: Gully Depth (in.)
		ROW				
General ROW	Orpark silt loam	1	Bare-grass-herb	Sheet	Slight	-
General ROW	Brockport silty clay loam	1	Bare-sedge-herb	Sheet	Slight	-
		FOREST				
General Forest	Orpark silt loam	2	Bare-litter	Sheet	Slight	-
General Forest	Brockport silty clay loam	2	Bare-litter (leaves)	Sheet	Slight	-
Sanitary Landfill	Brockport silty clay loam	3	Bare-garbage	Sheet, Rill & Gully	Moderate	1-8

22.4. Importance value of trees in the upper tree layer in the forest adjacent to the ROW.

Site	Species	Relative Dominance Basal Area (% of total) 1	Relative Density (% of total) 2	Importance Value 1+2
Mesic 1	Red-Maple	100.00	100	200.00
Hydric 2	Shagbark-Hickory	57.46	31	88.46
	White Ash	26.58	31	57.58
	Red Maple	6.66	17	23.66
	Scotch Pine	7.45	14	21.45
	White Oak	1.85	7	8.85

Table 22.5. Comparison of species composition, abundance and sociability (A.S.) in the tree, shrub, and herb layers, in the adjacent forest and on the ROW, on hydric and mesic habitats.

Species	Mesic (1) Forest A.S.	Mesic (1) ROW A.S.	Hydric (2) Forest A.S.	Hydric (2) ROW A.S.
Tree Layer				
Red Maple	3.1	-	1.1	-
Scotch Pine	-	-	+.1	-
White Oak	-	-	+.1	-
White Ash	-	-	1.1	-
Shagbark-Hickory	-	-	1.1	-
No. Species	1	0	5	0
Shrub Layer				
Gray Dogwood	2.2	+.3	-	-
Arrow-wood	2.2	4.3	2.3	3.1
Elderberry	-	++.1	-	1.1
Red Osier Dogwood	-	++.1	-	-
Willow	-	1.1	-	3.1
Witch-Hazel	-	-	1.1	-
Nannyberry	-	-	+.1	-
Tartarian Honeysuckle	-	-	-	++.3
Rose	-	-	-	+.3
Poison Ivy	-	-	3.4	++.1
Blackberry	-	2.2	-	++.1
Buttonbush	-	-	-	1.1
No. Species	2	6	4	8
Trees in the Shrub Layer				
White Ash	3.1	3.1	1.3	3.1
Red Maple	2.1	2.1	1.3	2.1
Pin-Cherry	-	1.1	-	-
Red Oak	-	++.1	+.1	++.1
Serviceberry	-	++.1	-	-
Quaking Aspen	-	2.1	-	-
Bitternut Hickory	-	+.1	-	-
White Oak	-	++.1	-	-
Beech	-	-	+.1	-
American Hornbeam	-	-	1.3	-
Apple	-	-	++.1	++.1
Shagbark-Hickory	-	-	1.2	+.1
American Elm	-	-	(1.1)	1.1
Basswood	-	-	-	++.1
Pignut Hickory	-	-	-	++.1
No. Species	2	8	8	8

Table 22.5. Continued

Species	Mesic (1) Forest A.S.	Mesic (1) ROW A.S.	Hydric (2) Forest A.S.	Hydric (2) ROW A.S.
Herb[1] Layer				
Sensitive Fern	+.2	-	-	1.2
False Spikenard	++.1	-	-	-
Cinquefoil	+.1	-	+.2	-
May-apple	+.1	(+.4)	-	-
Twisted stalk	3.4	-	1.3	-
Barren Strawberry	3.3	-	-	-
Trout-Lily	2.4	4.4	3.4	2.4
Carolina Spring Beauty	1.2	1.2	2.2	2.2
Spotted Touch-me-not	-	-	1.1	1.3
Hair-cap Moss	-	-	+.2	-
Hypnum spp.	-	-	3.3	-
Hepatica	-	-	(++.2)	-
Sedge	-	1.2	-	4.2
Mixed Grass	-	3.3	-	-
Strawberry	-	1.2	-	-
Boneset	-	1.2	-	1.2
Goldenrod spp.	-	2.3	-	3.3
Aster spp.	-	2.2	-	2.3
Yarrow	-	+.2	-	-
Elecampane	-	-	-	++.1
Milkweed	-	-	-	+.2
Cat-tail	-	-	-	2.3
Spreading Dogbone	-	-	-	1.2
Tearthumb	-	-	-	++.2
Northern Water Plantain	-	-	-	1.2
Wild Yam	-	-	-	++.1
Spring-Cress	-	-	-	(1.1)
False Hellebore	-	-	-	(++.2)
Violet spp.	-	(1.2)	-	-
Winter-Cress	-	+.2	-	-
Large-flowered Wake-robin	-	(+.2)	-	-
Climacium dendroides	-	-	1.2	-
Nightshade	-	-	-	1.2
No. Species	8	13	9	18

Table 22.5. Continued

Species	Mesic Forest A.S.	Mesic ROW A.S.	Hydric Forest A.S.	Hydric ROW A.S.
Total No. Species				
Trees [2]	2	8	10	8
Shrubs	2	6	4	8
Herbs	8	13	9	18
Totals	12	27	23	34

[1] For simplicity, herbs include all species of the layer.

[2] Those trees which occurred both in the tree and shrub layers were considered as one in determining the total number of species.

Table 22.6. Characteristic species with abundance and sociability ratings (A.S.) in the shrub and herb layers of the adjacent forest which did not occur on the ROW.

Species	Forest A.S.	ROW A.S.
	Mesic (1)	
Shrubs		
	-	-
Herbs[1]		
Barren Strawberry	3.3	-
Twisted-stalk	3.4	-
False Spikenard	++.1	-
Cinquefoil	+.1	-
Sensitive Fern	+.2	-
No. Species	5	-
	Hydric (2)	
Shrubs		
Witch-Hazel	1.1	-
Nannyberry	+.1	-
Herbs		
Twisted-stalk	1.3	-
Climacium dendroides	1.2	-
Hypnum spp.	3.3	-
Hair-cap Moss	+.2	-
Hepatica	(++.2)	-
Cinquefoil	+.2	-
No. Species	8	

[1] For simplicity, herbs include all species of the herb layer.

Table 22.7. Characteristic species with abundance and sociability ratings (A.S.) in the shrub and herb layers of the ROW which were not in the adjacent forest.

Species	ROW A.S.	Forest A.S.
	Mesic (1)	
Shrubs		
Blackberry	2.2	-
Elderberry	++.1	-
Red Osier Dogwood	++.1	-
Buttonbush	2.2	-
Herbs[1]		
Goldenrod spp.	2.3	-
Aster spp.	2.2	-
Mixed Grass	3.3	-
Boneset	1.2	-
Strawberry	1.2	-
Sedge	1.2	-
Violet	(1.2)	-
Winter-Cress	+.2	-
Large-flowered Wake-robin	(+.2)	-
Yarrow	+.2	-
No. Species	14	
	Hydric (2)	
Shrubs		
Blackberry	++.1	-
Willow	3.1	-
Tartarian Honeysuckle	++.3	-
Rose	+.3	-
Elderberry	1.1	-
Buttonbush	1.1	-
Herbs		
Sensitive Fern	1.2	-
Goldenrod spp.	3.3	-
Aster spp.	2.3	-
Boneset	1.2	-
Sedge	4.2	-
Cat-tail	2.3	-
Spreading Dogbane	1.2	-

Table 22.7. Continued

Species	ROW A.S.	Forest A.S.
Nightshade	1.2	-
Wild Yam-root	++.1	-
Northern Water Plantain	1.2	-
Tearthumb	++.2	-
Elecampane	++.1	-
Spring-Cress	(1.1)	-
False Hellebore	(++.2)	-
Milkweed	+.2	-
No. Species	21	

[1] For simplicity, herbs include all species of the layer.

22.8. Major vegetational types for the Gardenville to Dunkirk study area based on percent of study plots occupied by each plant community and other components on the ROW.

Community	Site Classification Mesic (1)	Hydric (2)
	Percent of Total	
Mixed Grass-Sedge-Herb	85.51	
Arrow-wood	14.49	.43
Sedge-Mixed Herb		90.27
Cat-tail-Sedge		8.24
Rose		.50
Tartarian Honeysuckle		.28
White Ash		.21
Red Maple		.07
Total	100.00	100.00

Table 22.9. Browse survey showing plant species and number ratio of browsed to total stems with percent actual use for ROW, ROW edge, and woods.

Species	ROW		ROW Edge		Woods		Total	
	Ratio	%	Ratio	%	Ratio	%	Ratio	%
American Hornbeam	1/4	25	1/7	14	6/8	75	8/19	42
Apple			1/4	25			1/4	25
Basswood	0/3	0	1/1	100			1/4	25
Bitternut Hickory					2/2	100	2/2	100
Blackberry			1/1	100			1/1	100
Black Cherry			1/1	100	0/2	0	1/3	33
Dewberry	0/70	0					0/70	0
American Hop-Hornbeam	0/2	0	7/11	64	0/2	0	7/15	47
Maple-leaved Viburnum	9/15	60	11/26	42	13/44	30	33/85	39
Nannyberry			2/2	100	4/4	100	6/6	100
Raspberry	0/5	0					0/5	0
Red Maple	1/5	20	4/26	15	4/20	35	9/51	18
Serviceberry			0/1	0			0/1	0
Shagbark-Hickory			1/2	50			1/2	50
Tartarian Honeysuckle					0/1	0	0/1	0
White Ash	0/1	0	3/8	38	1/5	20	4/14	29
Total	11/105	10	33/90	37	30/88	34	74/283	26

Table 22.10. Browse survey showing most abundant plant species and number ratio of browsed to total stems with percent actual use for ROW, ROW edge, and woods.

	Species							
	Maple-leaved Vib.		Dewberry		Red Maple		American Hornbeam	
Location	Ratio	%	Ratio	%	Ratio	%	Ratio	%
ROW	9/15	60	0/70	0	1/5	20	1/4	25
ROW Edge	11/26	42			4/26	15	1/7	14
Woods	13/44	30			4/20	35	6/8	75
Total	33/85	39	0/70	0	9/51	18	8/19	42

Table 22.11. Birds observed and/or heard on the ROW and on the ROW edge during the study period.

Species	Species
Red-tailed hawk	Cedar waxwing
Herring gull	Worm-eating warbler
Eastern wood pewee	Common grackle
Blue jay	Red-winged blackbird
Common crow	Field sparrow
Black-capped chickadee	Song sparrow
Catbird	Rufus-sided towhee
Robin	

Table 22.12. Potential wildlife use of plant species[1] present on the ROW and adjacent woods for the major game species on the Gardenville to Dunkirk study area.

Species	Wildlife Species		
	Deer	Squirrel	Raccoon
Trees			
Red Maple	****	**	
Quaking Aspen	**		
White Ash	*		
Pin-Cherry	*	+	
White Oak	*	****	****
Red Oak	*	****	****
Serviceberry	+		
American Elm	+	+	
Scotch Pine	+	*	
Beech	+	**	+
Apple	*		
Basswood	*		
Hickory		***	+
Shrubs			
Blackberry	+	+	
Arrow-wood	*		
Red Osier Dogwood	*		
Witch-Hazel	**		
Nannyberry	*		
Willow	*		
Tartarian Honeysuckle	+		
Herbs[2]			
Grasses	*		
Goldenrod	+		
Sensitive Fern	*		
Sedge		+	

[1] Those plants not included in this table provide a certain amount of cover (Table 22.5) for the 3 major game species, and may also provide seasonal food value, specific information pertaining to which is not now available. This applies also with regard to non-game species.

[2] For simplicity, herbs include all species of the herb layer.

Table 22.13. Comparison of land use prior to and after construction of the ROW.[1]

	Land Use	Percent of Total Area Prior to (-) and After (*) Construction 0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
(A)	Agriculture	--68.9 *********************************47.4
(C,1)	Commercial & Industrial	
(F)	Forest Land	-------------------28.8 ********************************45.2
(E)	Extractive Industry	**1.2
(N)	Non-productive	
(OR)	Outdoor Recreation	-.1 *.1
(P)	Public & Semi-public	
(W)	Water Resources	---2.2 **1.9
(U)	Urban Inactive	
(T)	Transportation	**1.4
(R)	Residential	***2.8

1 Source: National Cattographic Info. Center, Reston, Va., air photo No. 1-238 GS-VDLA, Apr. 17, 1974
USDA-SCS, Erie County, air photo No. ARF 8-46, Aug. 29, 1938

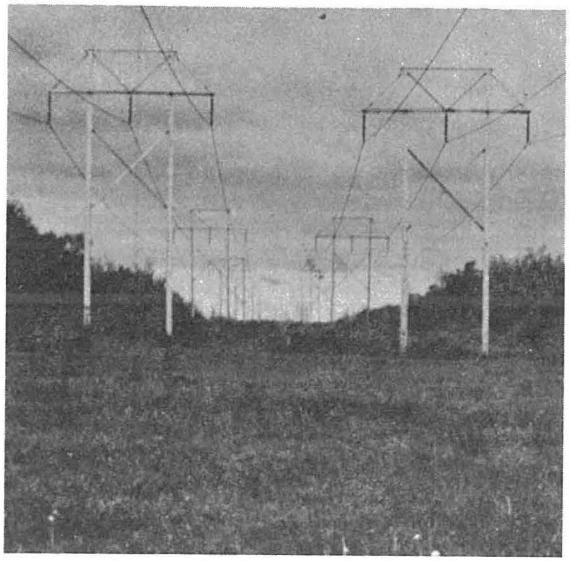


FIG. 22.1.1. General view of the ROW, and adjacent area, looking west, in spring, 1976 (Photo Station 1).

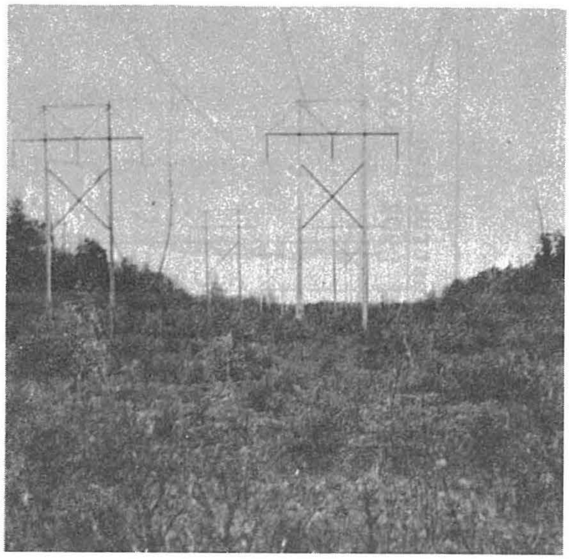


FIG. 22.1.2. General view of the ROW and adjacent forest, looking west, in spring, 1976 (Photo Station 5).

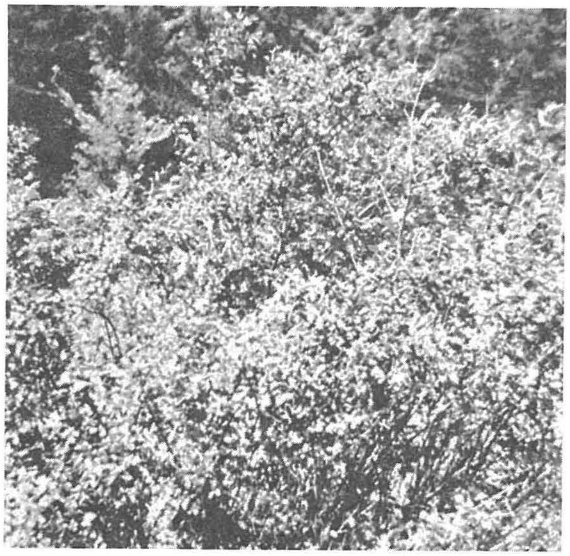


FIG. 22.1.3. Tartarian honeysuckle on the ROW during the summer of 1976 (Photo Station 2).

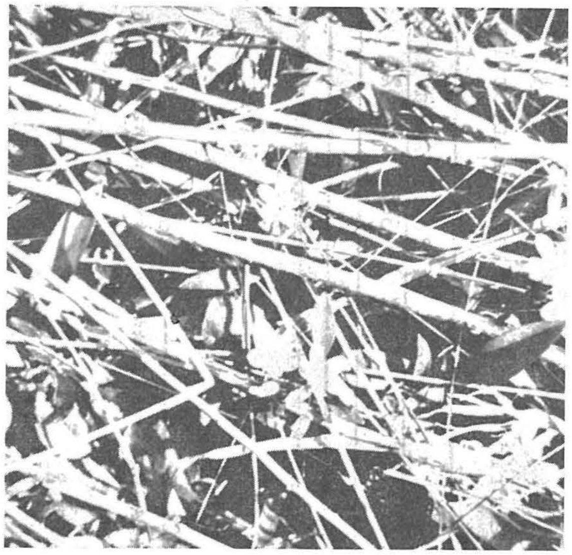


FIG. 22.1.4. Carolina spring beauties on the ROW, in the spring of 1976.

FIG. 22.1.5. Carolina spring beauties off the ROW, in adjacent woods during the spring of 1976.

FIG. 22.1.6. Deer skull on the ROW infested with carrion beetles.

FIG. 22.I. Visual characteristics.

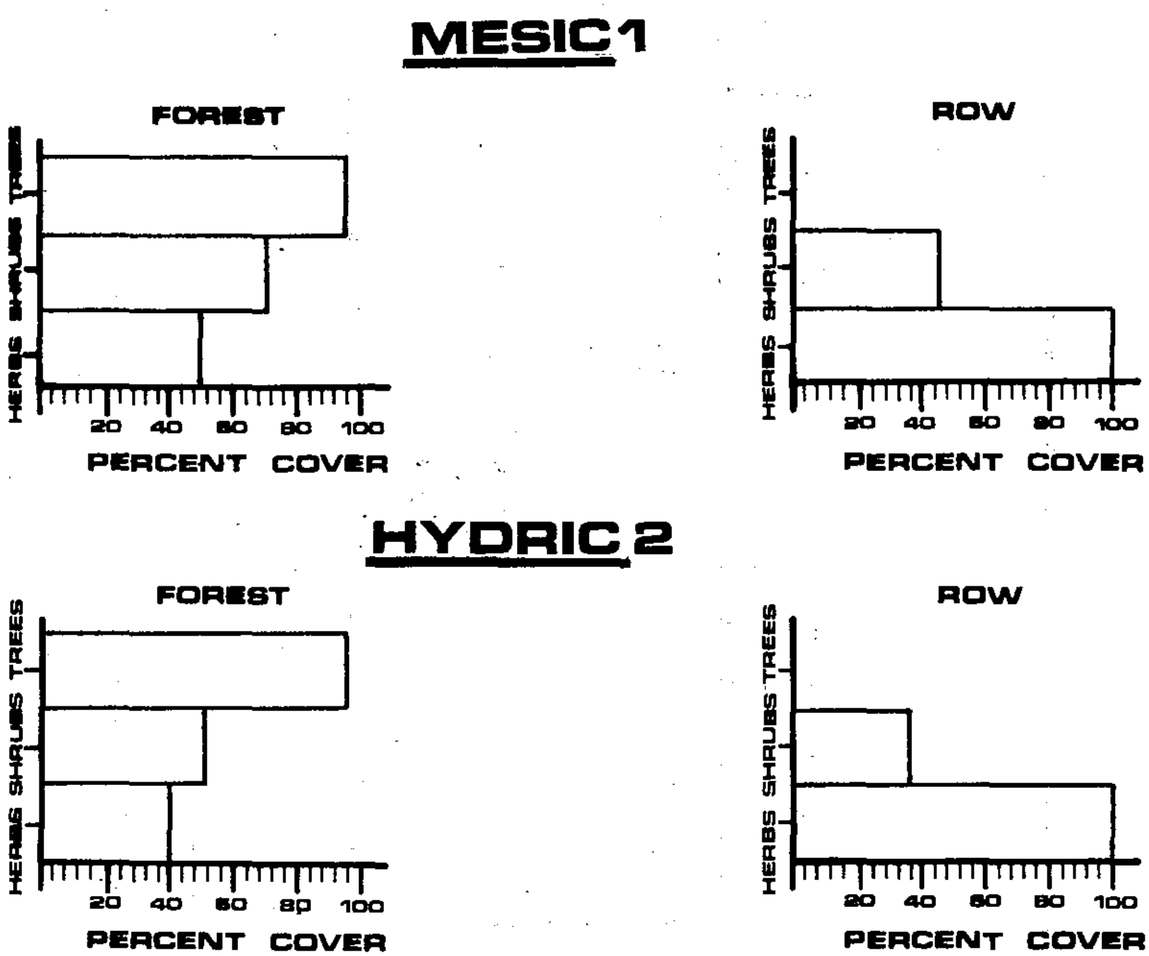


Fig. 22.2. Changes in cover value of tree, shrub, and herb layers from forest to ROW.

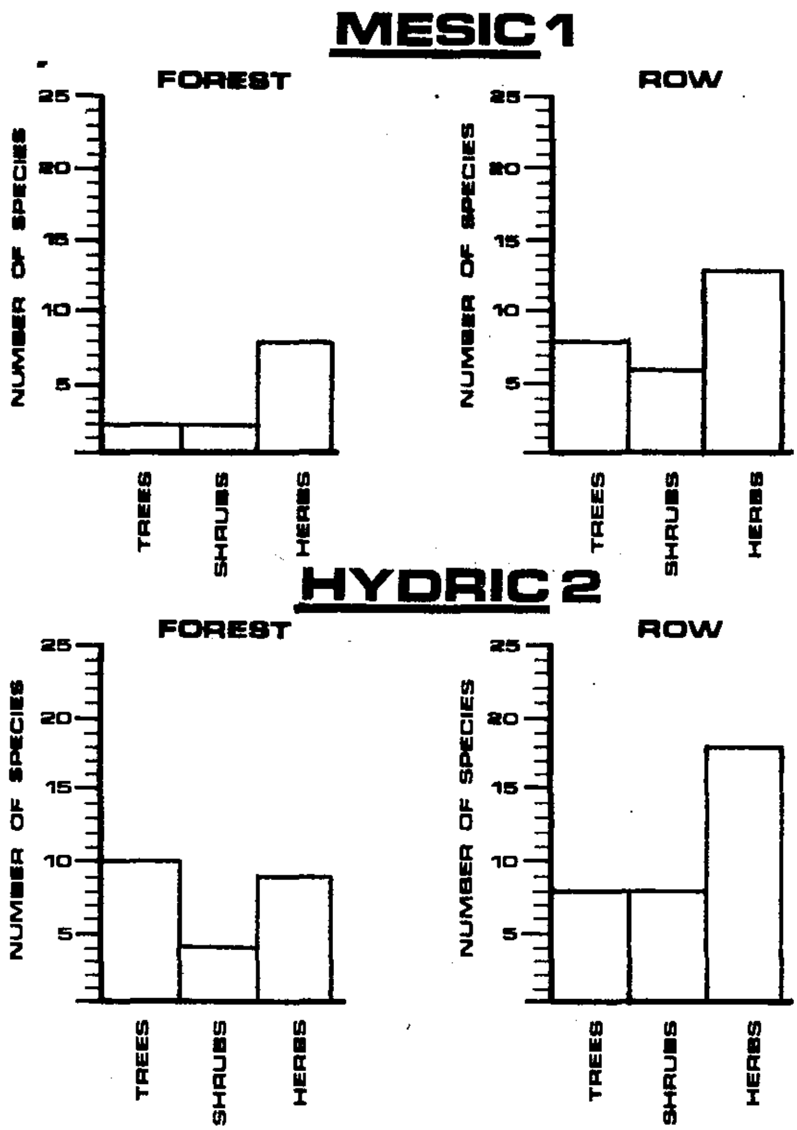


Fig. 22.3. Species diversity in the forest and on the ROW.

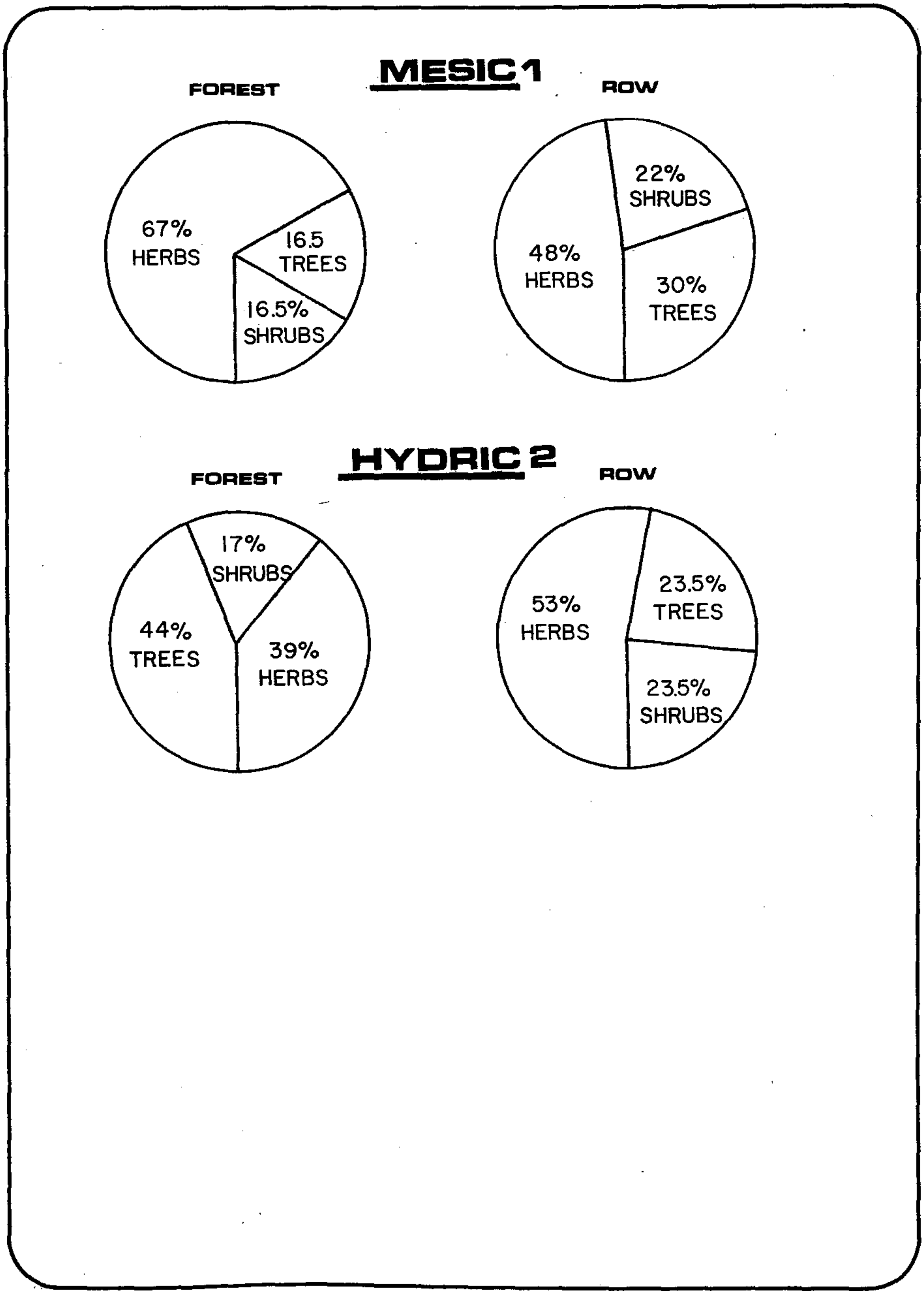


Fig. 22.4. Life form spectrum of the ROW as compared to the adjacent forest to compare species make-up of each, based on the number of species in each life form expressed as a percent. of total species.

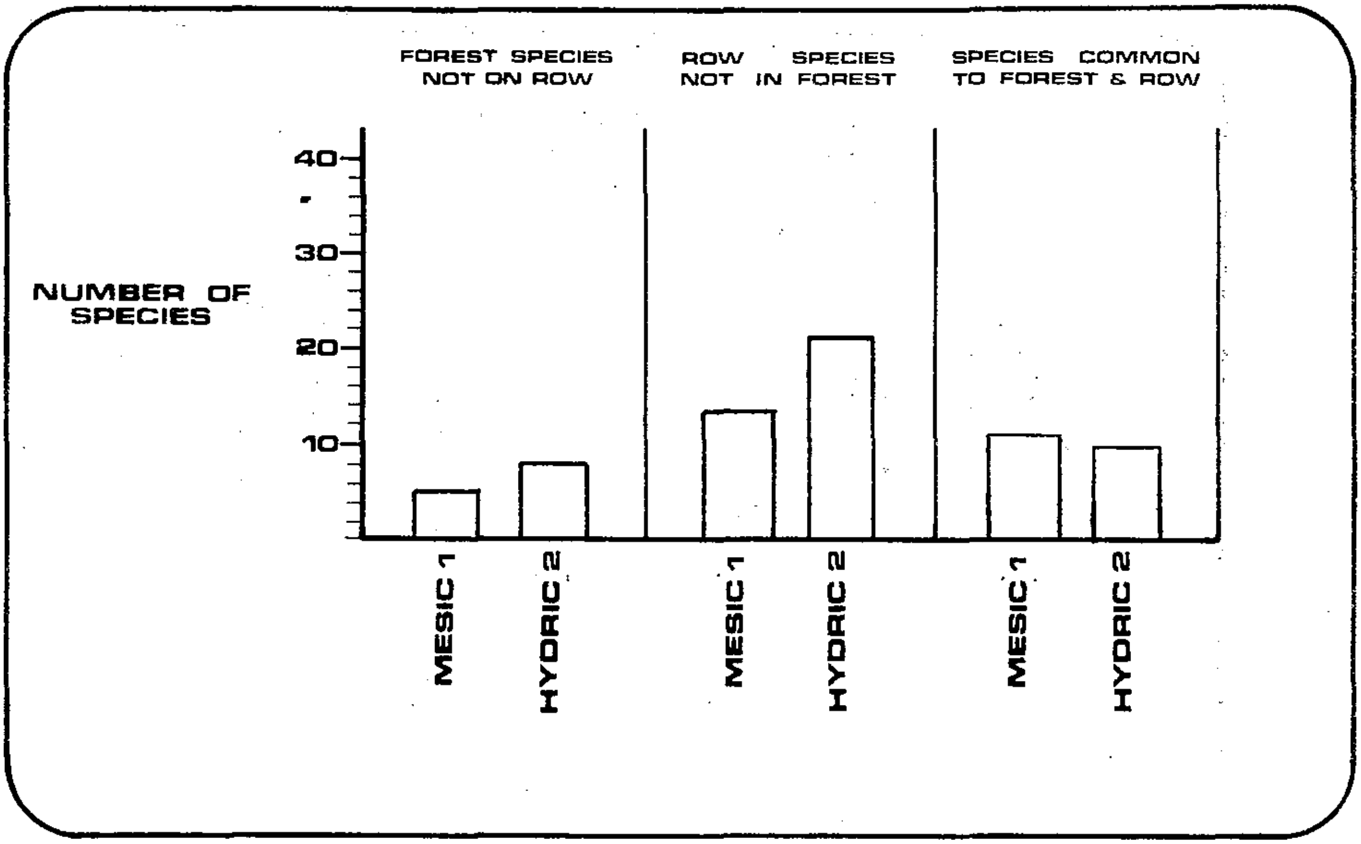


Fig. 22.5. Comparison of shrub and herb species in the forest and on the ROW.

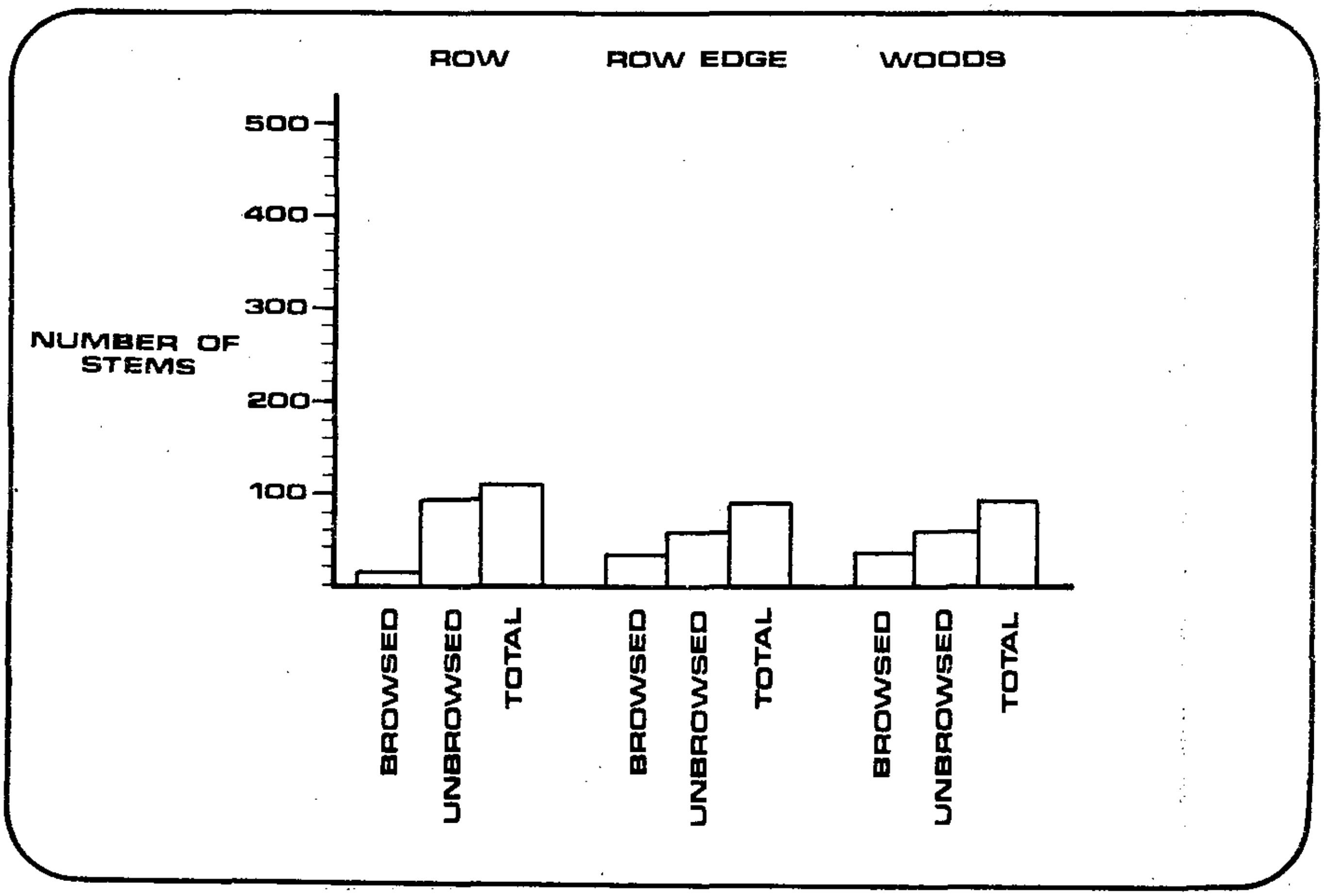
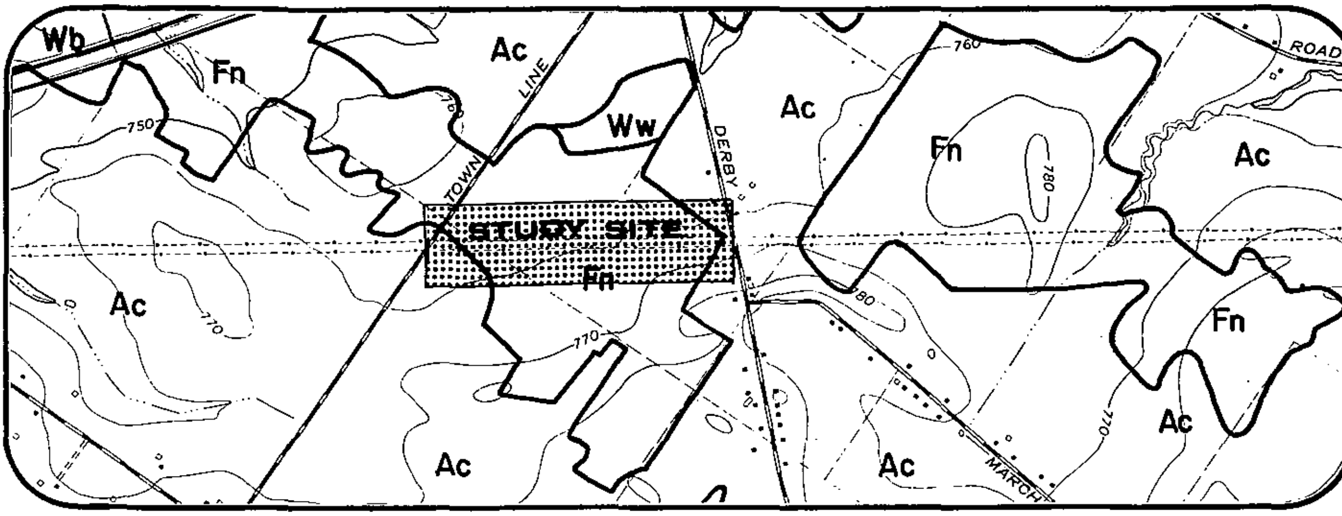
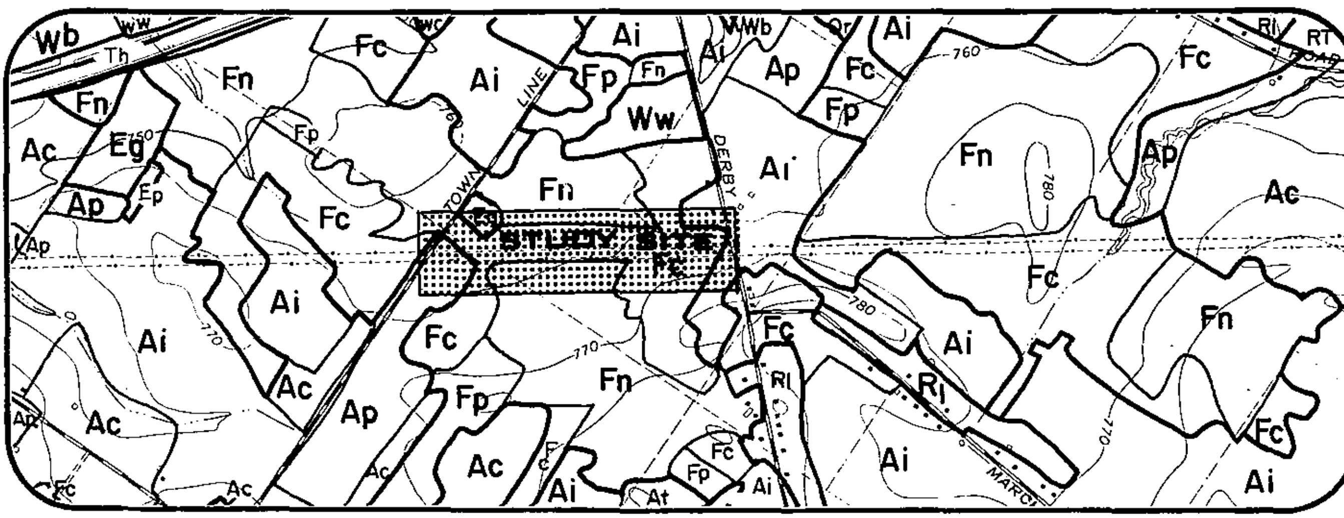


Fig. 22.6. Browse survey showing number of browsed, unbrowsed, and total stems for the ROW, ROW edge, and forest for .4 browse transects.



LAND USE PRIOR TO ROW CONSTRUCTION (1938) SCALE 1"-2000



LAND USE AFTER CONSTRUTION OF ROW (1974) SCALE 1"-2000

LEGEND FOR LAND USE SYMBOLS

AGRICULTURE
- Ac - Cropland and cropland pasture
- Ai - Inactive agricultural land
- Ap - Pasture
- At - High density cropland
- Av - Vineyards

EXTRACTIVE INDUSTRY LAND USE
- Eg - Sand and gravel pits

FOREST LAND
- Fc - Forest brushland
- Fn - Forest lands
- Fp - Plantations

OUTDOOR RECREATION LAND USE
- Or - Outdoor recreation

RESIDENTIAL
- Rl - low density

TRANSPORTATION LAND USES
- Th - Highway

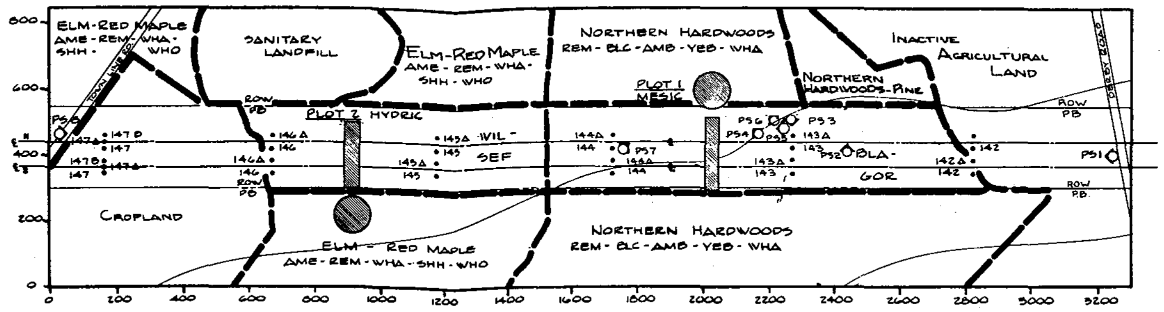
WATER RESOURCES
- Wb - Marshes, shrub wetlands and bogs
- Wc - Artificial ponds
- Ww - Wooded wetlands

SOURCES:
- National Cattographic Info. Center, Reston, Va., air photo No. 1-238 GS-VDLA, Apr. 17, 1974
- USDA-SCS, Erie County, air photo No. ARF 8-46, Aug. 29, 1938
- Area Land Use Map LUNR, Cornell University, N.Y., 1974
- U. S. G. S. Topographic Map, Eden, N. Y., 1965

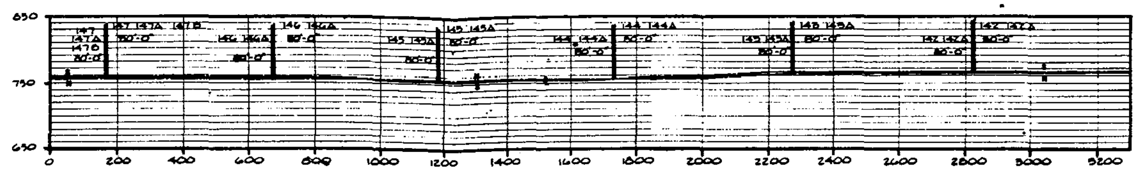
Fig. 22.7. Land use change.

ASPLUNDH ENVIRONMENTAL SERVICES

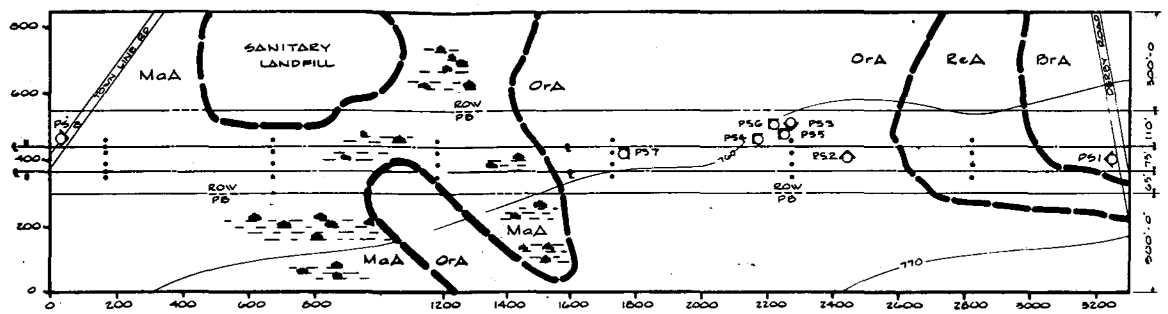
VEGETATION



CENTERLINE PROFILE



SOILS



NOTES:
(1) CONTOUR INTERVALS ARE 10'-0"
(2) VERTICAL & HORIZONTAL SCALES ARE IN FEET.

LEGEND

WORKS AND STRUCTURES

HIGHWAYS AND ROADS
HEAVY DUTY
MEDIUM DUTY
LIGHT DUTY
ACCESS ROAD
UNIMPROVED DIRT ROAD
NATIONAL INTERSTATE
US ROUTE
STATE OR COUNTY
SINGLE TRACK RAILROAD
MULTIPLE TRACK RAILROAD
ABANDONED RAILROAD TRACK
RAILROAD OVER
RAILROAD UNDER
FORD
ROAD CROSSING
BUILDING
EXCAVATION
MINE DUMP
PIPELINE
TRANSMISSION STRUCTURES
DAMS
CULVERT
TANKS
WELLS
BRUSH AND LOG DISPOSAL SITES
SMALL PARKS, CEMETERY, ETC.
FENCE

BOUNDARIES

NATIONAL OR STATE
COUNTY
MINOR CIVIL DIVISION
RESERVATION, NATIONAL OR STATE
LAND GRANT
ROW PROPERTY BOUNDARY
ROW EASEMENT BOUNDARY
ROW CLEARING EDGING
SITE BOUNDARY
THE CENTERLINE OF STRUCTURE
VEGETATION OR SOIL BOUNDARY

SITE MARKERS

SAMPLE LOCATION
PHOTO STATIONS
MAPPED PLOT ON ROW
MAPPED PLOT OFF ROW

WATER SYMBOLS

PERENNIAL STREAMS
INTERMITTENT STREAMS
SMALL RAPIDS
LARGE RAPIDS
DISAPPEARING STREAM
CANALS AND DITCHES
PERENNIAL LAKES AND PONDS
INTERMITTENT LAKES AND PONDS
SPRING
MARSH, SWAMP OR WET MEADOW
WET SPOT
ALLUVIAL FAN

TOPOGRAPHIC RELIEF

CONTOUR
DEPRESSION CONTOUR

SOIL SYMBOL AND NAME

BrA	BROCKPORT	silty clay loam (0 to 8% slope)
MaA	MADALIN	silt loam (0 to 8% slope)
OrA	ORPARK	silt loam (0 to 8% slope)
ReA	REMSEN	silt loam (0 to 8% slope)

SOIL SYMBOLS

ROCK
SAND
SCATTERED ROCK
BARE AND ERODING (GULLY)
BARE AND ERODING (SHEET)
BARE AND INCREASING IN SIZE
BARE AND HEALING
ERODED BUT HEALED
CLAY AREA
WIND EROSION

PLANT COMMUNITY SYMBOLS

shrubs

ALR	ALDER	Alnus spp.
ARR	ARROW - WOOD	Viburnum recognitum
BAR	BARBERRY	Berberis spp.
BLA	BLACKBERRY	Rubus spp.
BLH	BLACK - VIBURNUM	Viburnum prunifolium
BLU	BLUEBERRY	Vaccinium spp.
BUT	BUTTONBUSH	Cephalanthus occidentalis
CAY	AMERICAN YEW	Taxus canadensis
CFH	FLY - HONEYSUCKLE	Lonicera canadensis
CHC	CHOKE - CHERRY	Prunus virginiana
CLB	CLIMBING BITTERSWEET	Celastrus scandens
CRA	GRAPE	Vitis spp.
DEY	DEWBERRY	Rubus spp.
ELD	ELDERBERRY	Sambucus canadensis
GRD	GRAY DOGWOOD	Cornus racemosa
GRJ	GROUND - JUNIPER	Juniperus communis
HAA	COMMON ALDER	Alnus serrulata
HAW	HAWTHORN	Crataegus spp.
HAZ	HAZELNUT	Corylus spp.
HUC	HUCKLEBERRY	Gaylussacia spp.
JAR	MULTIFLORA ROSE	Rosa multiflora
MAV	MAPLE - LEAVED VIBURNUM	Viburnum acerifolium
MOH	MOUNTAIN - HOLLY	Nemopanthus mucronata
MOL	MOUNTAIN - LAUREL	Kalmia latifolia
MOM	MOUNTAIN - MAPLE	Acer spicatum
NAN	NANNYBERRY	Viburnum Lentago
NJT	NEW JERSEY TEA	Ceanothus americanus
PIF	PINXTER - FLOWER	Rhododendron nudiflorum
POI	POISON IVY	Rhus radicans
POS	POISON SUMAC	Rhus vernix
PRA	NORTHERN PRICKLY ASH	Xanthoxylum americanum
PRU	BUCKTHORN	Rhamnus spp.
RIB	RIBES	Ribes spp.
ROD	RED OSIER DOGWOOD	Cornus stolonifera
SMC	SUMAC	Rhus spp.
SPA	SPECKLED ALDER	Alnus rugosa
SPB	SPICEBUSH	Lindera Benzoin
SPI	SPIRAEA	Spiraea spp.
SMS	SMOOTH SUMAC	Rhus glabra
STM	STRIPED MAPLE	Acer pensylvanicum
STS	STAGHORN - SUMAC	Rhus typhina
SWF	SWEET - FERN	Comptonia peregrina
TAH	TARTARIAN HONEYSUCKLE	Lonicera tatarica
WIH	WITCH - HAZEL	Hamamelis virginiana
WIL	WILLOW	Salix spp.
WIN	WINTERBERRY	Ilex verticillata
WIR	WILD - RAISIN	Viburnum cassinoides
ZBC	BLACK CHOKEBERRY	Pyrus melanocarpa

trees

ABU	BUTTERNUT	Juglans cinerea
AIL	TREE - OF - HEAVEN	Ailanthus altissima
ALD	ALTERNATE - LEAVED DOGWOOD	Cornus alternifolia
AMB	BEECH	Fagus grandifolia
AMC	CHESTNUT	Castanea dentata
AME	AMERICAN ELM	Ulmus americana
AMH	AMERICAN HORNBEAM	Carpinus caroliniana
APP	APPLE	Pyrus malus
BAF	BALSAM - FIR	Abies balsamea
BAS	BASSWOOD	Tilia americana
BIH	BITTERNUT HICKORY	Carya cordiformis
BLC	BLACK CHERRY	Prunus serotina
BLL	BLACK LOCUST	Robinia Pseudo-Acacia
BLW	BLACK WALNUT	Juglans nigra
CHO	CHESTNUT - OAK	Quercus prinus
COT	COTTONWOOD	Populus deltoides
EAH	HEMLOCK	Tsuga canadensis
ERC	RED CEDAR	Juniperus virginiana
FLD	FLOWERING DOGWOOD	Cornus florida
GRB	GRAY BIRCH	Betula populifolia
HOH	AMERICAN HOP-HORNBEAM	Ostrya virginiana
LAA	LARGE - TOOTHED ASPEN	Populus grandidentata
LAR	AMERICAN LARCH	Larix laricina
NWC	WHITE CEDAR	Thuja occidentalis
PAB	WHITE BIRCH	Betula papyrifera
PIC	PIN - CHERRY	Prunus pensylvanica
PIH	PIGNUT HICKORY	Carya glabra
PIP	PITCH - PINE	Pinus rigida
QUA	QUAKING ASPEN	Populus tremuloides
RED	RED OAK	Quercus rubra
REM	RED MAPLE	Acer rubrum
RES	RED SPRUCE	Picea rubens
SAS	WHITE SASSAFRAS	Sassafras albidum
SCO	SCRUB - OAK	Quercus ilicifolia
SCP	SCOTCH PINE	Pinus sylvestris
SHB	SERVICEBERRY	Amelanchier spp.
SHH	SHAGBARK - HICKORY	Carya ovata
SUM	SUGAR - MAPLE	Acer saccharum
SWB	SWEET BIRCH	Betula lenta
VIP	SCRUB - PINE	Pinus virginiana
WHA	WHITE ASH	Fraxinus americana
WHO	WHITE OAK	Quercus alba
WHP	WHITE PINE	Pinus strobus
YEB	YELLOW BIRCH	Betula lutea
YEP	TULIP - POPLAR	Liriodendron tulipifera

herbs

BLG	BLUE - JOINT GRASS	Calamagrostis canadensis
BON	BONESET	Eupatorium perfoliatum
BRN	BRACKEN	Pteridum aquilinum
BRO	BROOM - SEDGE	Artholophis virginicus
CAT	CAT TAIL	Typha spp.
CHF	CHRISTMAS - FERN	Polystichum acrostichoides
CIF	CINNAMON - FERN	Osmunda cinnamomea
DEG	DEERTONGUE GRASS	Panicum clandestinum
GOR	GOLDENROD	Solidago spp.
HAF	HAY - SCENTED FERN	Dennstaedtia punctilobula
HOT	HORSETAIL	Equisetum spp.
INF	INTERRUPTED FERN	Osmunda Claytoniana
IRS	IRIS	Iris spp.
JAP	SMALL JACK-IN-THE-PULPIT	Arisaema triphyllum
LET	WILD LETTUCE	Lactuca canadensis
MSF	MARGINAL SHIELD-FERN	Dryopteris marginalis
NYF	NEW YORK FERN	Dryopteris noveboracensis
PEV	PEARLY EVERLASTING	Anaphalis margaritacea
PHR	PHRAGMITES	Pragmites spp.
POG	POVERTY - GRASS	Danthonia spicata
RDM	REINDEER LICHEN	Cladonia rangiferina
ROF	ROYAL FERN	Osmunda regalis
SEF	SENSITIVE FERN	Onoclea sensibilis
SPL	SPIKED LOOSESTRIFE	Lythrum Salicaria
SPM	SPHAGNUM MOSS	Sphagnum spp.
SSS	SOLOMON'S - SEAL	Polygonatum biflorum
SWA	SWAMP - BUTTERCUP	Ranunculus septentrionalis
WHS	WHITE SNAKEROOT	Eupatorium rugosum
YPL	BULLHEAD - LILY	Nuphar variegatum

REVISIONS:

DATA SOURCES:

ASPLUNDH ENVIRONMENTAL SERVICES
BLAIR MILL ROAD
WILLOW GROVE PA

USGS 7.5 MIN TOPOGRAPHIC MAP [illegible] N.Y. 1965
USDA - SCS & CORNELL UNIVERSITY EXPERIMENT STATION IN COOPERATION WITH ERIE CO SOIL & WATER CONSERVATION
AGR EXP STA. SOILS SURVEY FOR ERIE COUNTY, N.Y. 1928
NATIONAL CARTOGRAPHIC INFO CENTER, RESTON, VA
ERIE COUNTY AIR PHOTO NO 1-238 55-VOLA (SCALE 1:24,000) APR 7 1974
ASPLUNDH ENVIRONMENTAL SERVICES
AES PROJECT NO 61-0028 FIELD STUDIES 1975-76

This information is a part of the ESEERCO "STUDY OF ENVIRONMENTAL AND ECONOMIC ASPECTS OF CONTEMPORANEOUS ELECTRIC TRANSMISSION LINE RIGHT-OF-WAY MANAGEMENT TECHNIQUES"

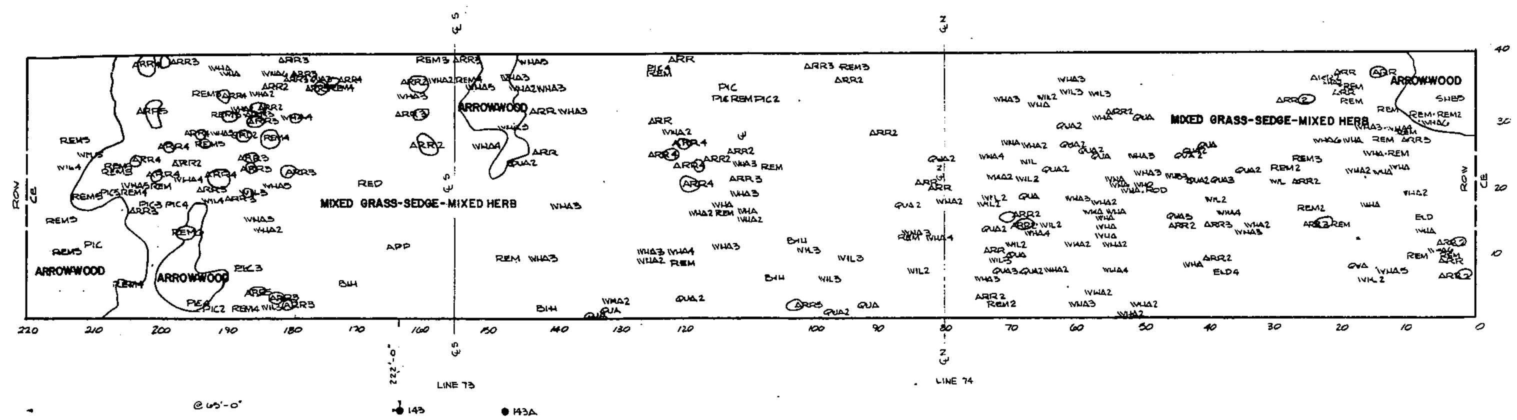
MAP 22.1

SITE 22 HABITAT CONDITIONS

UTILITY: NIAGARA MOHAWK POWER CORP.
ROW DESCRIPTION: GARDENVILLE TO DUNKIRK 230 KV
WOODEN POLE 'H' FRAME 250' COW

SCALE: 1" = 200'-0"
200 100 0 100 200 400 800 1000

PLOT 1 MESIC



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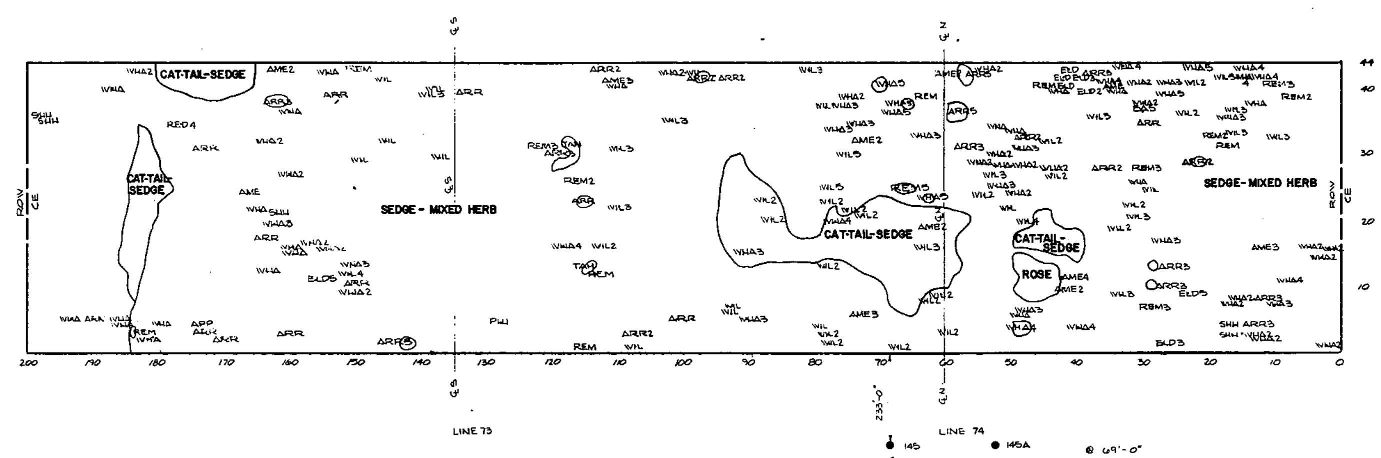

NOTES:
VERTICAL AND HORIZONTAL SCALE IN FEET

LEGEND

WORKS AND STRUCTURES

- ACCESS ROAD
- BRUSH AND LOG DISPOSAL SITES

BOUNDARIES

- THE CENTERLINE OF STRUCTURE
- ROW PROPERTY BOUNDARY
- ROW EASEMENT BOUNDARY
- EXISTING ROW CLEARING EDGE

SITE MARKERS

- SAMPLE LOCATION
- PHOTO STATION

WATER SYMBOLS

- PERENNIAL STREAMS
- INTERMITTENT STREAMS
- SMALL RAPIDS
- LARGE RAPIDS
- DISAPPEARING STREAM
- CANALS AND DITCHES
- PERENNIAL LAKES AND PONDS
- INTERMITTENT LAKES AND PONDS
- SPRING
- MARSH, SWAMP OR WET MEADOW
- WET SPOT
- ALLUVIAL FAN

SOIL SYMBOLS

- ROCK
- SCATTERED ROCK

PLANT COMMUNITY SYMBOLS

herbs

BLG	BLUE-JOINT GRASS	*Calamagrostis canadensis*
BON	BONESET	*Eupatorium perfoliatum*
BRN	BRACKEN	*Pteridum aquilinum*
BRO	BROOM-SEDGE	*Artholophis virginicus*
CAT	CAT-TAIL	*Typha spp.*
CHF	CHRISTMAS-FERN	*Polystichum acrostichoides*
CIF	CINNAMON-FERN	*Osmunda cinnamomea*
DEG	DEERTONGUE GRASS	*Panicum clandestinum*
GOR	GOLDENROD	*Solidago spp.*
HAF	HAY-SCENTED FERN	*Dennstaedtia punctilobula*
HOT	HORSETAIL	*Equisetum spp.*
INF	INTERRUPTED FERN	*Osmunda Claytoniana*
IRS	IRIS	*Iris spp.*
JAP	SMALL JACK-IN-THE-PULPIT	*Arisaema triphyllum*
LET	WILD LETTUCE	*Lactuca canadensis*
MSF	MARGINAL SHIELD-FERN	*Dryopteris marginalis*
NYF	NEW YORK FERN	*Dryopteris noveboracensis*
PEV	PEARLY EVERLASTING	*Anaphalis margaritacea*
PHR	PHRAGMITES	*Pragmites spp.*
POG	POVERTY-GRASS	*Danthonia spicata*
RDM	REINDEER LICHEN	*Cladonia rangiferina*
ROF	ROYAL FERN	*Osmunda regalis*
SEF	SENSITIVE FERN	*Onoclea sensibilis*
SPL	SPIKED LOOSESTRIFE	*Lythrum Salicaria*
SPM	SPHAGNUM MOSS	*Sphagnum spp.*
SSS	SOLOMON'S-SEAL	*Polygonatum biflorum*
SWA	SWAMP-BUTTERCUP	*Ranunculus septentrionalis*
WHS	WHITE SNAKEROOT	*Eupatorium rugosum*
YPL	BULLHEAD-LILY	*Nuphar variegatum*

shrubs

ALR	ALDER	*Alnus spp.*
ARR	ARROW-WOOD	*Viburnum recognitum*
BAR	BARBERRY	*Berberis spp.*
BLA	BLACKBERRY	*Rubus spp.*
BLH	BLACK-VIBURNUM	*Viburnum prunifolium*
BLU	BLUEBERRY	*Vaccinium spp.*
BUT	BUTTONBUSH	*Cephalanthus occidentalis*
CAY	AMERICAN YEW	*Taxus canadensis*
CFH	FLY-HONEYSUCKLE	*Lonicera canadensis*
CHC	CHOKE-CHERRY	*Prunus virginiana*
CLB	CLIMBING BITTERSWEET	*Celastrus scandens*
CRA	GRAPE	*Vitis spp.*
DEY	DEWBERRY	*Rubus spp.*
ELD	ELDERBERRY	*Sambucus canadensis*
GRD	GRAY DOGWOOD	*Cornus racemosa*
GRJ	GROUND-JUNIPER	*Juniperus communis*
HAA	COMMON ALDER	*Alnus serrulata*
HAW	HAWTHORN	*Crataegus spp.*
HAZ	HAZELNUT	*Corylus spp.*
HUC	HUCKLEBERRY	*Gaylussacia spp.*
JAR	MULTIFLORA ROSE	*Rosa multiflora*
MAV	MAPLE-LEAVED VIBURNUM	*Viburnum acerifolium*
MOH	MOUNTAIN-HOLLY	*Nemopanthus mucronata*
MOL	MOUNTAIN-LAUREL	*Kalmia latifolia*
MOM	MOUNTAIN-MAPLE	*Acer spicatum*
NAN	NANNYBERRY	*Viburnum Lentago*
NJT	NEW JERSEY TEA	*Ceanothus americanus*
PIF	PINXTER-FLOWER	*Rhododendron nudiflorum*
POI	POISON IVY	*Rhus radicans*
POS	POISON SUMAC	*Rhus vernix*
PRA	NORTHERN PRICKLY ASH	*Xanthoxylum americanum*
PRU	BUCKTHORN	*Rhamnus spp.*
RIB	RIBES	*Ribes spp.*
ROD	RED OSIER DOGWOOD	*Cornus stolonifera*
SMC	SUMAC	*Rhus spp.*
SPA	SPECKLED ALDER	*Alnus rugosa*
SPB	SPICEBUSH	*Lindera Benzoin*
SPI	SPIRAEA	*Spiraea spp.*
SMS	SMOOTH SUMAC	*Rhus glabra*
STM	STRIPED MAPLE	*Acer pensylvanicum*
STS	STAGHORN-SUMAC	*Rhus typhina*
SWF	SWEET-FERN	*Comptonia peregrina*
TAH	TARTARIAN HONEYSUCKLE	*Lonicera tatarica*
WIH	WITCH-HAZEL	*Hamamelis virginiana*
WIL	WILLOW	*Salix spp.*
WIN	WINTERBERRY	*Ilex verticillata*
WIR	WILD-RAISIN	*Viburnum cassinoides*
ZBC	BLACK CHOKEBERRY	*Pyrus melanocarpa*

trees

ABU	BUTTERNUT	*Juglans cinerea*
AIL	TREE-OF-HEAVEN	*Ailanthus altissima*
ALD	ALTERNATE-LEAVED DOGWOOD	*Cornus alternifolia*
AMB	BEECH	*Fagus grandifolia*
AMC	CHESTNUT	*Castanea dentata*
AME	AMERICAN ELM	*Ulmus americana*
AMH	AMERICAN HORNBEAM	*Carpinus caroliniana*
APP	APPLE	*Pyrus malus*
BAF	BALSAM-FIR	*Abies balsamea*
BAS	BASSWOOD	*Tilia americana*
BIH	BITTERNUT HICKORY	*Carya cordiformis*
BLC	BLACK CHERRY	*Prunus serotina*
BLL	BLACK LOCUST	*Robinia Pseudo-Acacia*
BLW	BLACK WALNUT	*Juglans nigra*
CHO	CHESTNUT-OAK	*Quercus prinus*
COT	COTTONWOOD	*Populus deltoides*
EAH	HEMLOCK	*Tsuga canadensis*
ERC	RED CEDAR	*Juniperus virginiana*
FLD	FLOWERING DOGWOOD	*Cornus florida*
GRB	GRAY BIRCH	*Betula populifolia*
HOH	AMERICAN HOP-HORNBEAM	*Ostrya virginiana*
LAA	LARGE-TOOTHED ASPEN	*Populus grandidentata*
LAR	AMERICAN LARCH	*Larix laricina*
NWC	WHITE CEDAR	*Thuja occidentalis*
PAB	WHITE BIRCH	*Betula papyrifera*
PIC	PIN-CHERRY	*Prunus pensylvanica*
PIH	PIGNUT HICKORY	*Carya glabra*
PIP	PITCH-PINE	*Pinus rigida*
QUA	QUAKING ASPEN	*Populus tremuloides*
RED	RED OAK	*Quercus rubra*
REM	RED MAPLE	*Acer rubrum*
RES	RED SPRUCE	*Picea rubens*
SAS	WHITE SASSAFRAS	*Sassafras albidum*
SCO	SCRUB-OAK	*Quercus ilicifolia*
SCP	SCOTCH PINE	*Pinus sylvestris*
SHB	SERVICEBERRY	*Amelanchier spp.*
SHH	SHAGBARK-HICKORY	*Carya ovata*
SUM	SUGAR-MAPLE	*Acer saccharum*
SWB	SWEET BIRCH	*Betula lenta*
VIP	SCRUB-PINE	*Pinus virginiana*
WHA	WHITE ASH	*Fraxinus americana*
WHO	WHITE OAK	*Quercus alba*
WHP	WHITE PINE	*Pinus strobus*
YEB	YELLOW BIRCH	*Betula lutea*
YEP	TULIP-POPLAR	*Liriodendron tulipifera*

REVISIONS :

DATA SOURCE :

ASPLUNDH ENVIRONMENTAL SERVICES
BLAIR MILL ROAD
WILLOW GROVE, PA. 19090

FIELD SURVEY - AES, 1975, 76

SCALE: 1" = 10' - 0"

10 5 0 5 10 20 40 50

This information is a part of the ESEERCO "STUDY OF ENVIRONMENTAL AND ECONOMIC ASPECTS OF CONTEMPORANEOUS ELECTRIC TRANSMISSION LINE RIGHT-OF-WAY MANAGEMENT TECHNIQUES"

MAP 22.2

SITE 22

MAPPED PLOTS

UTILITY: NIAGARA MOHAWK POWER CORP.
ROW DESCRIPTION: GARDENVILLE TO DUNKIRK 230 K.V.
WOODEN POLE 'H' FRAME 250 ROW

FOR REFERENCE ONLY

Because symbol systems noted below are used throughout the text; the keys for vegetation abundance, Cover and Grouping, (Braun-Blanquet, 1932 and 1964), and Wildlife value of plants as noted by Martin et. al. (1951) are repeated here for convenient reference by the reader.

For a complete referance of methods used in this study, refer to the General Methods section of this report, (Volume 1, Section 3).

Vegetation Abundance, Cover and Grouping

The scale used in the tables is as follows:

For abundance and cover:

++	-	occasional
+	-	sparsely present, covering less than 1/20 of the plot area
1	-	plentiful but of small cover value, covering less than 1/20 of the plot area
2	-	very numerous, covering at least 1/20 of the plot area
3	-	covering 1/4 to 1/2 of the plot area
4	-	covering 1/2 to 3/4 of the plot area
5	-	covering more than 3/4 of the plot area;

For grouping:

1	-	growing one in a place, singly
2	-	grouped or tufted
3	-	in troops, small patches, or cushions, less than 1 milacre[1]
4	-	in small colonies, extensive patches, or forming carpets, more than 1 milacre[1]
5	-	in pure populations (after Braun and Blanquet, 1932).

Wildlife Ratings of Plants (Potential Use)

Approximate percentage equivalents:

+	=	1/2 to 2% of diet
*	=	2 to 5% of diet
**	=	5 to 10% of diet
***	=	10 to 25% of diet
****	=	25 to 50% of diet
*****	=	50% or more of diet

---

[1] 1 milacre = 1/1000 of an acre.