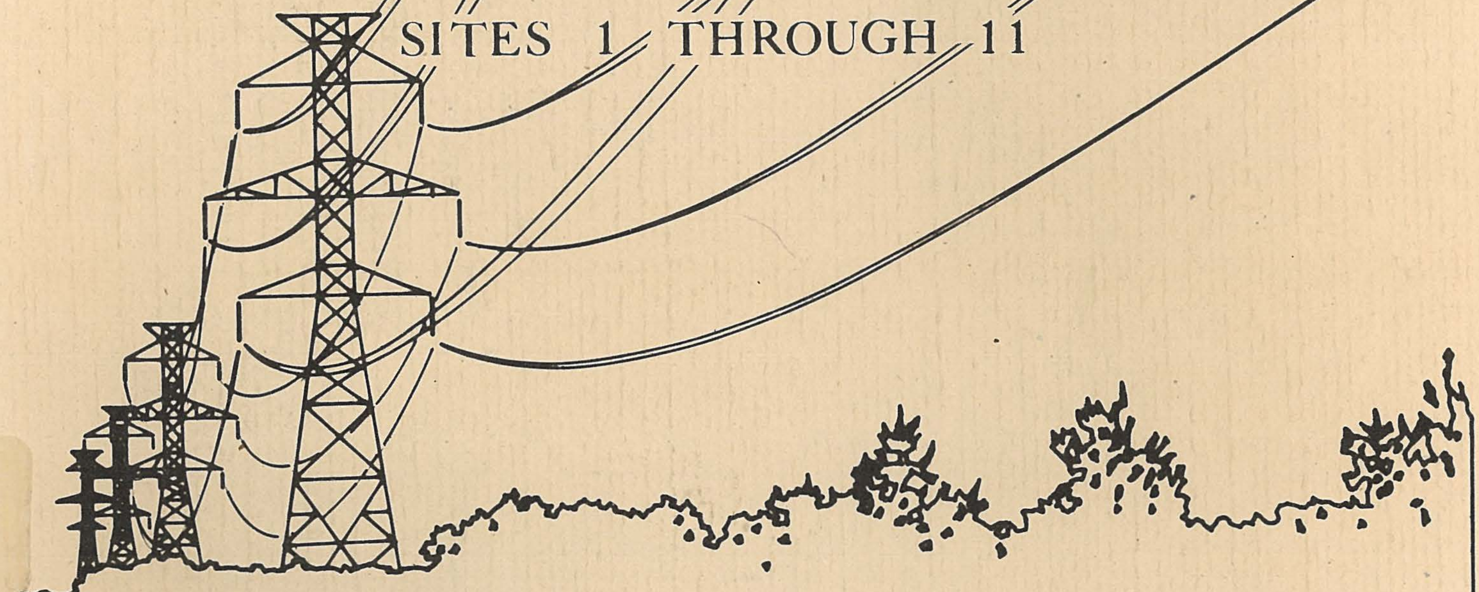
Individual Case Studies of Sites 1 through 11

2

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

Volume 2

INDIVIDUAL CASE STUDIES OF SITES 1 THROUGH 11



JUNE 1977

Empire State Electric Energy Research Corporation (ESEERCO)

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

VOLUME 2

INDIVIDUAL CASE STUDIES OF SITES 1 THROUGH 11

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

JUNE 1977

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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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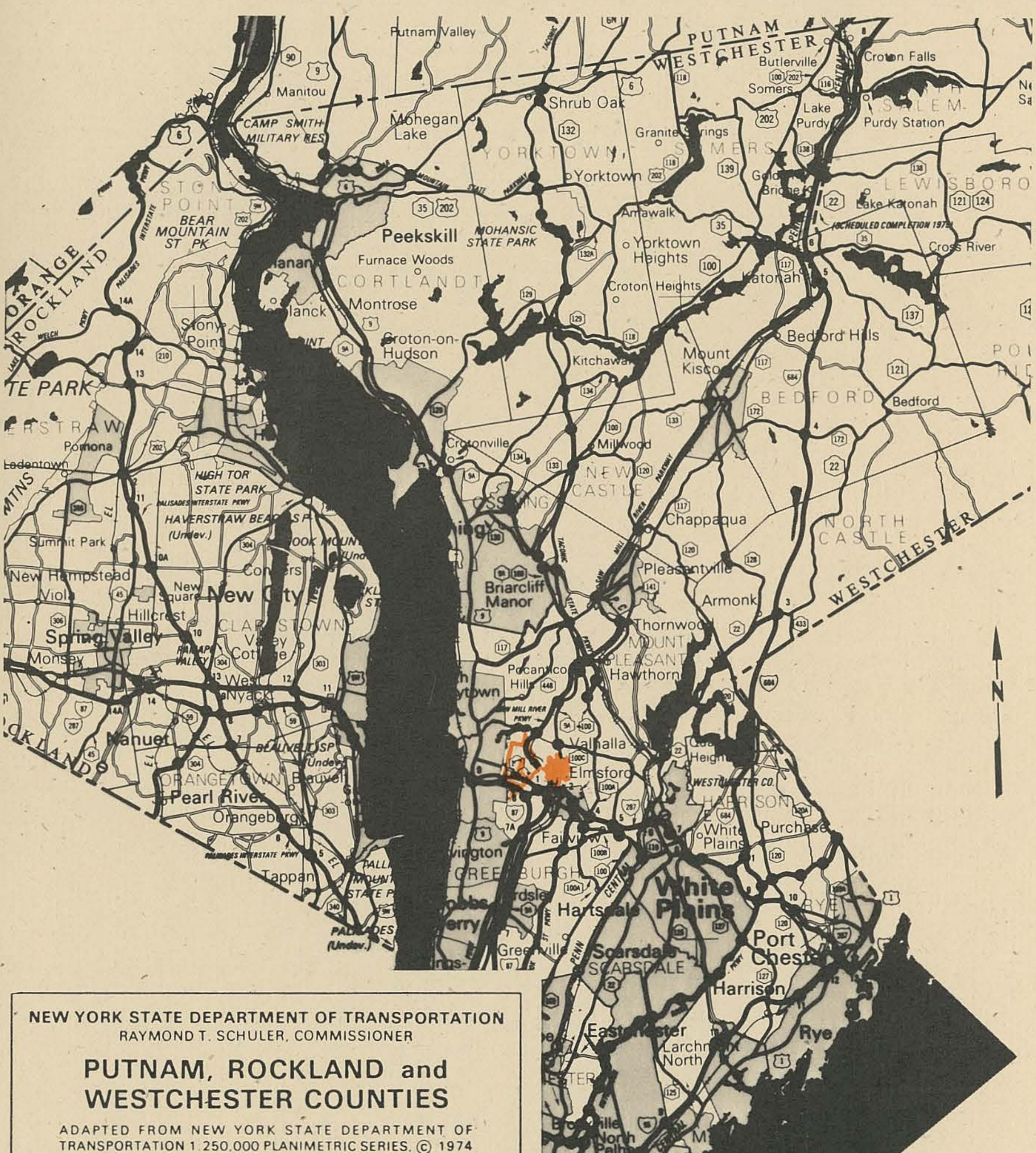
SITE 1

SPRAINBROOK to EASTVIEW



Site 1 Sprainbrook to Eastview

Study area extends from Saw Mill Parkway near exit 87 to structure E. 75 and is located north of Elmsford. To reach the area, proceed north on route 9A following it to the industrial park at the end of Fairview Park Drive (a left turn off of 9A north).

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Site 1 Sprainbrook to Eastview

1 Introduction

Site 1, Sprainbrook to Eastview, is located in that physiographic area of New York designated the Long Island Coastal Plain by Cline (1970) and the New England Upland region, Manhattan Hills subdivision, by Thompson (1966), in the Oaks forest type area (Stout, 1958). The general landscape of the ROW and adjacent areas is shown in Figs. 1.1.1 and 1.1.2.

The topography of the area is typically rolling to steep, with a great number of small lakes and reservoirs. Elevations range from 100 to 1,500 feet (Stout, 1958).

Typical forest types of the region are Oaks, and Oak-Northern Hardwoods (Stout, 1958). Occurring on the site are Oak-Northern Hardwoods and Black Locust forest types.

2 Location and Identification

Site 1 is located north of Elmsford in Westchester County, New York (73^{o} 49' 00" W. Longitude; 41^{o} 4' 00" N. Latitude).

The site is on the Sprainbrook to Eastview ROW, which is operated by the Consolidated Edison Company of New York, Inc. (CE). This 200-foot easement consists of 2 double circuit 345 kV lines, each with steel lattice structures. The project site is approximately 3,800 feet in length and extends from the Saw Mill Parkway at structure E/68 north to the railroad tracks, which are north of structure E/74.

3 Background

The following outlines documentable management techniques of clearing, construction, restoration, and maintenance for site 1, as received from CE (letters dated March 23, 1976, and October 21, 1976, from J. Frederick Caslick, Consolidated Edison Company of New York, Inc., New York, N.Y.; telephone conversations December 2 and 3, 1976, with Mr. Caslick. All available pertinent information and cost data are included under each operation of clearing, construction, restoration, and maintenance.

3.1 Clearing

The 1955 line (west line) was cleared between June and July, 1955, but was probably completed by September of that year. Work was completed by contractors. The 60-foot-wide areas approximately under the crossarms of towers were clear cut, while on each side trees were topped to a 20-foot height, and selected trees were side trimmed. Beyond that stated, danger trees were cut to stump heights. Presumably, crews with chain saws performed the clearing and some heavy equipment, such as chippers and bulldozers were used. Logs were piled and burned, and branches and twigs were chipped. Cutting and burning of slash continued beyond the initial clearing, until approximately 1962 to 1963.

The 1961 line (east line) was clear cut between October, 1960, and March 1, 1961, by contractors. Trees were topped to a 20-foot trim line; danger trees outside cutting lines were cut; and limbs extending over the cleared strip were side trimmed. A strip about 100 feet in width of shrubs and underbrush not exceeding 12 feet in height were retained on each side of secondary roads. Presumably, equipment, including chain saws, bulldozers, and trucks, were utilized. Brush disposal was also completed by contractors, which included burning, except where prohibited by local ordinance.

With regard to both lines, Esteron 245 was applied to stumps in the 60-foot area under tower crossarms (4 gallons of Esteron per 96 gallons of No. 2 fuel oil). No additional information or pertinent cost data is available.

3.2 Construction

Contractors constructed foundations, and strung the towers. During 1976-77 the 1961 line(east line) was reconductored. No other information is available.

3.3 Restoration

It is believed that restoration before 1969 and 1970 was completed under contract assignment, including construction of water bars, probably with bulldozers, and the planting of hemlocks. Tower sites and access roads were graded after 1970. No additional information or cost data is available.

3.4 Maintenance

Subsequent to line construction, periodic chemical maintenance was made. Trees less than 10 feet tall were treated basally, while those greater than 10 feet tall were stump cut and chemically treated. Recently, nonselective cutting and clearing are apparently utilized. Chemicals used after 1970 include 2,4-Dichlorophenoxyacetic acid (2,4-D), and 2,4,5-Trichlorophenoxyacetic acid (2,4,5-T). 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. 1.1 which shows site habitat conditions. In this reconnaissance it was noted that the major vegetational types showed some correlation with the soil types on the mesic habitat.

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 1.1 and described in Appendix 17. Specific reference is made to some of these photo stations throughout the reports which are shown on the photos in Fig. 1.1. With the exception of aerial photography used to identify land use, older photographs depicting the area are not available.

The ROW site and structures are visible from several adjacent locations and are not particularly pleasing to view, but simply reflect the context of the adjacent urban/industrial setting.

The potential number of people viewing the site is generally high since it is located on a hill and is visible from several highways, most notably Routes 9A and 100C, as well as commercial areas in Elmsford. The site is visible mostly from the east where the industrial park is located, and not as much from the Saw Mill Parkway due to screening provided by trees along the ROW edge. Because of the fairly urban and industrialized setting, the ROW blends with the surroundings.

5 Field Studies - Results and Discussion

5.1 Soils

5.1.1 Geology and Soils

Site 1, Sprainbrook to Eastview ROW, is located in Westchester County in the area of New York designated by Cline (1970) as the Long Island Coastal Plain, and by Thompson (1966) as the Manhattan Hills subdivision of the New England Uplands region. Bedrock geology is of Cambrian-Ordovician period, 435 million to 570 million years ago, of the Paleozoic age, and consists predominantly of intensely folded and faulted shales, slate, phyllite, schist, gneiss, limestone, dolostone, marble, quartzite, and graywacke (Broughton et al., 1973). Soils in this area have developed in glacial till (Goodman, 1970).

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 subsurface horizons (Soil Survey Staff, 1975; Buckman and Brady, 1969). The site lies in the Steep Rockland area bordered by the Rockaway-Chatfield association and a miscellaneous unit designated undifferentiated urban land (Cline, 1970). The sole soil series on this site is Hollis, with 2 soil-type phases (Goodman, 1970; Anon., 1972) described below and plotted on the habitat map (Map 1.1; Table 1.1).

Hollis fine sandy loam (HsC): These soils developed in low lime glacial till dominated by granitic materials on gently sloping to steep terrain. Well drained to somewhat excessively drained, Hollis soils are generally shallow, with bedrock occurring at 10 to 20 inches. Soil reaction is strongly acid, ranging from pH 4.5 to pH 5.5 throughout a typical profile, but pH 4.7 in the upper 3 inches on this site. Hollis fine sandy loam is assigned to Woodland Suitability Group 5d2, designating low productivity for timber (Class 5) and restricted rooting depth (Subclass d) due to shallowness to hard rock.

Hollis very rocky fine sandy loam (HoD and HoE): These soils also developed in low lime glacial till dominated by granitic materials, occupying gently sloping to steep bedrock-controlled landforms. Ranging from 10 to 20 inches in depth over granitic bedrock in most instances, Hollis very rocky fine sandy loam is well drained to excessively drained. Soil reaction is strongly acid, and ranges from pH 4.7 to pH 4.9 on this site in the surface mineral soil. Depending upon slope, this soil is in either Woodland Suitability Group 5d2 or 5d3; in either event, low productivity is designated, as well as restricted rooting depth, as with the Hollis fine sandy loam soils.

5.1.2 Humus Types

Organic layers present on the soil surface of the ROW and adjacent woodland were measured on 4 mesic upland locations. Average thickness of the organic layers and A1 horizon was based on 5 samples taken at the edges, midpoints, and center of both woods and ROW study plots at each location (Table 1.2). The presence and thickness of these layers were used for humus type classification. There is no evidence of plowing or grazing on this site. Past burning was evident in one location where charcoal was noted in the surface soil.

On mesic plots 1 and 3, where conditions approached xeric, all organic layers (litter, fermentation, and humus) were present at each site on both the ROW and woodland. On mesic 4 all organic layers were present in the woodland, but the humus layer and A1 horizon were absent from the ROW. It is probable that the surface soil in this area was disturbed by ROW activities; therefore, humus-type classification was not feasible. On mesic 2, the humus layer was absent both from the ROW and the woodland, and that, combined with sandy soil, resulted in the classification "very shallow sand mull" on the ROW and "shallow sand mull" in the forest.

Presence and thickness of organic layers and A1 horizon varied considerably among the 4 mesic plots sampled on both ROW and woodland. Comparison between ROW and woodland for all plots combined (Table 1.2) showed that the A1 horizon was twice as thick under the undisturbed woodland, while only minor differences were evident in average thickness of the surface organic layers. Organic layers, expecially litter and fermentation, in the woods were composed of tree parts (leaves, twigs, branches, and fruit) in contrast to leaves and stems of grasses, herbs, and shrubs on the ROW. Elimination of the forest cover in ROW construction 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 deposition and continuation of a protective litter mulch on the ROW. The predominant humus types present in 1976 were "thin duff mull with very shallow A1" and "thin duff mull with shallow A1" in the woodland and ROW, respectively.

5.1.3 Soil Erosion

Current Active Erosion. Observations of active soil erosion on the ROW and adjacent woodland were made on the Sprainbrook to Eastview study area in September, 1976. Eroding areas were identified as to location on the ROW and in the forest, soil type, average slope, and present plant cover (Table 1.3). Erosion was classified as to kind (sheet, rill, gully) and class (slight, moderate, severe); average depth of gullies were recorded and locations of the 2 major gullies were plotted on the site habitat conditions map (Map 1.1).

Except for some slight sheet and moderate gully erosion on a few steep slopes, no prominent erosion was evident in the general woodland. This is apparently due to the protective canopy of trees and shrubs and undisturbed organic layers present on the soil. On the general ROW, no active or recent erosion was observed in areas on which woody brush was controlled with little or no disturbance to the soil surface. Good vegetative cover, composed of grasses, herbs, and shrubs, had developed on the general ROW following maintenance for brush control, and a protective litter mulch from these plant parts was present (Table 1.2).

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 (Fig. 1.1.3), tower sites, and road bank cuts used in ROW construction and maintenance on this site (Table 1.3). Areas where moderate erosion occurred had average slopes of between 15-20%. Large areas where sheet and rill erosion are occurring also were mapped. Some sediment resulting from moderate gully erosion, at one tower site, was leaving the ROW and entering the forest. In general, however, sediment resulting from erosion on the ROW accumulated on lower slopes and did not leave the ROW via streams or collect in water-impoundments.

In general, there was no restoration in the form of seeding and planting following construction of this ROW; therefore, denuded areas were dependent on natural plant invasion. The main access road on this site has just been regraded because of new line construction procedures and some slight, moderate, and severe sheet, rill, and gully erosion was occurring throughout the study area at various locations along the access road. The tower structures were being dismantled on the eastern most ROW (line K) in September, 1976, and there was some slight to moderate sheet, rill, and gully erosion occurring at these locations. There also was some bare soil under several tower locations with slight active sheet erosion on both ROW's. Vegetation mortality on these areas appears to be caused either by a chemical reaction from the tower or by paint droppings. One large bank excavation with severe gully erosion was located in the forest off the ROW. No areas of mass land movement, such as landslides, were observed on this site.

5.2 Vegetation

5.2.1 Habitat and Forest Types on the Site

<u>Mesic Habitat</u> There are 4 mesic, or medium moist, habitats on this site. The mesic 1 habitat was located on the lower slopes of an upland hill. Slope was negligible on the ROW, and aspect was generally flat; slope was approximately 20% in the forest east of the ROW, on an east-facing slope. Drainage was free to somewhat excessive. The forest type was Black Locust, with black locust, gray birch, and quaking aspen as the prominent species.

The mesic 2 habitat was located between 2 hills in an upland setting. Slope was approximately 15% in the forest to the west, 9% on the ROW, and 22% in the forest to the east, on an east-facing slope. Drainage was free but not excessive. The forest type to the west was Oak-Northern Hardwoods, with white oak and red oak being dominant species, and red maple, sweet birch, yellow birch, beech, and black cherry among the associate species.

Mesic 3 habitat was located on the side of a north-facing hill. Slope was approximately 25% on a northeast-facing slope. Drainage was free but generally not excessive. The forest type was Oak-Northern Hardwoods.

Mesic 4 habitat was located on the lower slopes of a steep hill. Slope was approximately 12% on a northeast-facing slope. Drainage was free but not excessive. The forest type was Oak-Northern Hardwoods.

5.2.2 Analysis of Forest Types and Associated ROW Vegetation

<u>General Changes in Vegetation</u> 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. 1.2).

In order to more completely characterize the forest types, an analysis was made of the forest plots to derive importance values for tree species (Table 1.4). Obviously, quaking aspen, gray birch, sycamore, and black locust were important species on mesic 1, while red oak and sweet birch were important on the remaining plots, with the addition of yellow birch to mesic 2 and beech to mesic 3.

On mesic 1, a Black Locust forest type and an Oak-Northern Hardwoods forest type were changed to a Black Locust-Goldenrod plant community. The large amount of black locust occurring on the ROW stems from stump sprouts and root suckers. On mesic 2, a Black Locust forest type and an Oak-Northern Hardwoods forest type was changed to a Tartarian Honeysuckle-Goldenrod plant community. On mesic 3, an Oak-Northern Hardwoods forest type was changed to a Blackberry-Goldenrod plant community. On mesic 4, an Oak-Northern Hardwoods forest type was changed to a Blackberry-Goldenrod plant communtiy.

Quantitative Changes There was a slight change in the number of shrubs on mesic 1 habitat, with 8 shrubs occurring on the ROW and 5 in the forest. There was a large increase in the number of herbs on the ROW as compared to the forest, with 21 occurring on the ROW and 8 in the forest (Table 1.5; Fig. 1.3). On mesic 2, there were more shrubs and herbs on the ROW than in the forest (Table 1.5). On mesic 3, there was a marked increase in the number of shrubs and herbs on the ROW as compared to the adjacent forest, 8 shrubs and 20 herbs on the ROW and 2 shrubs and 6 herbs in the forest (Table 1.5; Figs. 1.3 and 1.4). On mesic 4, there was a marked increase in the number of shrubs on the ROW as compared to the forest, 13 shrubs on the ROW and 7 shrubs in the forest. In the herb layer, however, there were more species in the forest, 19, than on the ROW, 16, (Table 1.5; Figs. 1.3 and 1.4).

Qualitative Changes On mesic 1 habitat, 7 shrub and herb species occurred both in the forest and on the ROW (Fig. 1.5), while 2 shrubs and 4 herbs appeared in the forest but were absent from the ROW (Table 1.6). On the other hand, 5 shrubs and 17 herbs occurred on the ROW but not in the forest (Table 1.7).

On mesic 2 habitat, there were 9 shrub and herb species which occurred both in the forest and on the ROW (Fig. 1.5; Table 1.5). No shrubs and 4 herbs occurred in the forest to the west and were not present on the ROW (Table 1.6). There were no herbs present in the forest to the east of the ROW (Table 1.6). This was most likely because of the large density of Tartarian honeysuckle which occurred there, crowding out other species (Table 1.5). On the other hand, 3 shrubs and 10 herbs appeared on the ROW and not in the forest (Table 1.7), as were 18 herbs.

On mesic 3 habitat, 3 shrub and herb species occurred both in the forest and on the ROW (Fig. 1.5), while 1 shrub and 4 herbs appeared in the forest and not on the ROW (Table 1.6). On the other hand, 7 shrubs, among which blackberry and sumac, light-loving species, were prominent, were present only on the ROW (Table 1.7).

On mesic 4 habitat, 16 shrub and herb species occurred both in the forest and on the ROW (Fig. 1.5), while 1 shrub and 9 herbs appeared in the forest and not on the ROW (Table 1.6). On the other hand, 7 shrubs occurred on the ROW and not in the forest; among these sumac was very abundant. There were 6 herbs which occurred on the ROW only (Table 1.7).

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

Table 1.8 presents a breakdown of major vegetational communities (Map 1.2) for the mesic plots on the Sprainbrook to Eastview ROW. Much of the present composition of herbaceous and woody plant communities reflects the maintenance history. Two 345 kV ROW's now occupy the site. One was cleared in 1955 and the other in 1961. The ROW's were basically clear cut and the stumps were treated with a mixture of 4 gallons of Esteron 245 in 96 gallons of No. 2 fuel oil. Periodic chemical maintenance occurred in the years subsequent to line construction. Trees less than 10 feet tall were given a basal treatment, while those trees greater than 10 feet were cut and their stumps treated. Most recently, nonselective cutting and clearing appear to be the basic maintenance practices. The chemicals used after 1970 include 2,4-D and 2,4,5-T.

The major vegetational community on mesic plot 1, a somewhat dry mesic site, was Black Locust-Blackberry-Mixed Grass; on mesic 2 it was Tartarian Honeysuckle-Grape; on mesic 3, another somewhat dry mesic site, it was Mixed Grass-Herb; and on mesic 4 it was Mixed Grass-Herb-Sumac.

There are many root-suckering species on this ROW, as evidenced by the large amount of black locust and sumac which occurs on various plots (Map 1.2). The remainder of the woody vegetation consists of stump sprouts, and such species as dogwood, a desirable species, were cut.

If proper selective cutting and chemical maintenance is performed, it is likely that many of the undesirable woody species such as black locust and white ash will be eventually eliminated or become less abundant on the ROW.

5.2.4 Comparison of Forest Type with ROW Vegetation

The ROW's were clear cut in 1955 and 1961 with side-trims and toppings performed along the edges as required. The stumps were initially treated with Esteron 245, 4 gallons in 96 gallons of No. 2 fuel oil. The remaining maintenance history is outlined in sections 3.4 and 5.2.3.

The general impact of the maintenance treatments was to change the forest types (Black Locust, and Oak-Northern Hardwoods) to shrub-herb-grass communities with many root-suckering species (Fig. 1.1.4) and stump sprouts occurring throughout the ROW.

The general impact of the maintenance history is outlined in sections 3.4 and 5.2.3.

On mesic 1 habitat, which was formerly occupied by a Black Locust forest type on the east side of the ROW and an Oak-Northern Hardwoods forest type on the west, a Black Locust-Goldenrod community was produced. There was a slight change in the number of shrubs and a large increase in the number of herbs 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 (Table 1.5).

On mesic 2 habitat, which was formerly occupied by a Black Locust forest type on the east side of the ROW and an Oak-Northern Hardwoods forest type on the west, a Tartarian Honeysuckle-Goldenrod plant community developed. There was a slight increase in the number of shrub and herb species on the ROW as compared to the adjacent forest. There was a qualitative difference in the shrub and herb species on the ROW as compared to the forest. The dense thickets of Tartarian honeysuckle completely eliminated any herbs which may have existed on the habitat east of mesic 2 (Table 1.5).

On mesic 3 habitat, which was formerly occupied by an Oak-Northern Hardwoods forest type, a Blackberry-Goldenrod plant community was produced. There was a major increase in the 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 (Table 1.5).

On mesic 4 habitat, which was formerly occupied by an Oak-Northern Hardwoods forest type, a Blackberry-Goldenrod plant community was produced. There was a marked increase in the number of shrubs on the ROW as compared to the forest. However, there were more herbs in the forest than on the ROW. There was a qualitative difference in shrub and herb species on the ROW as compared to the forest (Table 1.5).

5.3 Wildlife

The major game species for site 1, Sprainbrook to Eastview, as determined by Asplundh Environmental Services, (AES) in conjunction with the New York State Department of Environmental Conservation (DEC), are ring-necked pheasant, gray squirrel, and raccon.

5.3.1 Actual Use

Ring-necked Pheasant Pheasants were seen on the study area during the period of the study, but none were actually observed on the ROW proper. Cock birds were heard crowing during the spring of 1975 along the ROW edge.

Gray Squirrel Squirrels were only observed on the study area during the fall of 1976. However, squirrels may well have utilized the study area previously even though not observed during site visitations. One squirrel was observed running down the access road, above mesic plot 4, from which it jumped into escape cover of Japanese honeysuckle. Another squirrel was seen running on the ROW, and it utilized a red oak as escape cover off the ROW in the forest at mesic plot 3. One squirrel leaf nest was observed off the ROW near mesic plot 4. Squirrel tracks were moderately abundant in a wet spot on mesic plot 2.

Raccoon Raccoon tracks were moderately abundant on the ROW on the access road during the fall of 1976. No other raccoon observations were made during the remainder of the study.

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 1.9.

During the spring of 1975, chipmunks were seen scampering both on and off the ROW and were heard. One ruffed grouse was flushed from the ROW edge from a cover of interrupted fern. One woodchuck was seen on the ROW running to its burrow.

During the fall of 1975, 2 woodchucks were seen on the ROW, feeding near the edge of the access road. They ran to their burrows upon approach. Rabbit activity was heavy at this time. Two rabbit dogs were observed on the ROW, hunting. One dead shrew (Fig. 1.1.5) was seen on the access road.

During the spring of 1976, earthworm activity was moderate on mesic plot 3. A cooper's hawk nest was seen in the woods on the northeast side of the ROW between structures K/70 and K/71. Both the male and female hawk were seen at this time protecting the nest. Cottontail rabbit gnawings were observed on rambler rose in the woods plot at mesic 1. Spring onion tops were nipped off by rabbits at the same location and rabbit pellets were found scattered throughout the area. Rabbit gnawings were observed on blackberry, beech, and yellow birch on mesic plot 3. Rabbit pellets were moderately abundant at this time on mesic plot 3 on the ROW. Rabbit pellets were also observed off the ROW in the woods on mesic plot 4. Spring peeper activity was high off the ROW throughout the study area.

5.3.2 Potential Use

Potential wildlife use of the plant species present on Site 1 for the 3 major game species, pheasant, squirrel, and raccoon, is contained in Table 1.10. In addition to asterisk ratings from New York, asterisk ratings for the Northeast were included for pheasants for those plant species present on the study area which were not noted in the New York ratings. Asterisk ratings for the Northeast for raccoons and the East for squirrels were also included. 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 1 is located in an urban section of the town of Greenburgh, Westchester County, New York. Between 1960 and 1970 there was a 10.6% increase in population of Westchester County with a 1970 distribution of 93.8% urban, 6.1% rural nonfarm, and .1% rural farm (U.S. Bureau of the Census, 1972).

The closest community is Elmsford (3,911) which is approximately one mile to the south.

5.4.2 Land Use Near the Time of Construction

The ROW was constructed during the years of 1955 to 1970. Data prior to this date was unavailable. The earliest available data obtained from 1963 aerial photography indicates that the land adjacent to the ROW was primarily urban (Table 1.11; Fig. 1.6). Land use distribution included the following subtypes:

Agriculture:
- Ah - Horticulture or floriculture

Commercial and Industrial:
- Cu = Central business sections
- Cs - Commercial strip development
- Il - Light manufacturing and industrial parks
- Ih - Heavy manufacturing

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

Outdoor Recreation:
- Or - Outdoor recreation

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

Residential:
- Rm - Medium density
- Rl - Low density

Transportation:
- Th - Highways

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

Water Resources:
- Wc - Artificial ponds

5.4.3 Land Use After Construction

The adjacent land use to site 1 has had a minimal change from the 1965 data, with an increase in public and semi-public uses and a decrease in urban inactive areas. The land adjacent to the ROW is still urban with the same land use distribution subtypes as described near the time of construction (Section 5.4.2; Table 1.11; Fig. 1.6).

In addition to use of the ROW for the transmission of electrical power, portions of the ROW are currently being used for recreational and hunting purposes (Fig. 1.1.6).

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 undistrubed forest areas on both sides of the ROW.

6.1.1 Soils

One soil series, with 2 soil-type phases, was present in the adjacent forest. The soil is strongly acid fine sandy loam with scattered exposed bedrock on steeply sloping segments. Effective soil depth is less than 20 inches to bedrock and internal drainage is good to excellent. Occasional slight to moderate erosion was evident on steep slopes, 26 to 35% gradients, in the general forest under natural conditions. This area was considered a medium-moist upland mesic habitat supporting a natural Oak-Northern Hardwoods forest; however, due to restricted rooting depth the soil is rated low for woodland productivity.

The forest floor was composed of fresh and partially decomposed organic materials consisting of tree leaves, twigs, and fruit; well decomposed organic matter was incorporated to a depth of 1.0 to 1.5 inches in the mineral soil. The resultant humus type in the forest was classified a "thin duff mull with shallow A1" due to the presence of distinct litter, fermentation, humus, and A1 layers.

6.1.2 Vegetation

Prior to corridor clearing in 1955 to 1960, the present study area was in forest. Stumps and stump sprouts present on this area indicate that the Black Locust type and Oak-Northern Hardwoods type formed the major forest cover. These stumps and sprouts suggest that the present corridor area originally had tree cover similar in composition to the stands presently bordering this corridor.

There is no evidence that any part of the study area was in agriculture or grazing immediately prior to corridor construction; however, the stone-wall suggests that portions of this area were cleared at some time in the past.

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, gray squirrel, and raccoon, occupied 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.

6.1.4 Land Use

Earliest data available near the time of construction of the ROW in 1955 is 1963 aerial photography. The ROW and adjacent land area was urban with a land use distribution of agriculture (.2%), commercial and industrial (11.0%), forest land (34.8%), outdoor recreation (6.5%), public and semi-public (1.3%), water resources (1.0%), urban inactive (17.1%), transportation (10.7%), and residential (17.4%).

6.2 Conditions Which Exist at Present

6.2.1 Soils

The same soil series identified in the adjacent forest was present on the ROW, with respective soil-type phases associated with physiographic conditions. Hollis fine sandy loam occurred on lower slopes with gently to moderate gradients, less than 25%, while Hollis very rocky fine sandy loam occurred on steeper upper slopes with gradients of 25 to 50%. Except for surface rock content, there is little difference in profile properties and productivity of these soils. However, dominant ROW vegetation showed some relation to soils; the Blackberry-Goldenrod community occurring primarily on the fine sandy loam phase.

Active soil erosion on the ROW was prominent at 6 tower sites partially or completely devoid of vegetation; 7 access road locations, 1 with gullies eroded to a depth of 1.5 to 2.0 feet; and 2 road bank excavations. In addition, active erosion occurred on segments of the access road constructed through the adjacent forest. Sediment resulting from erosion accumulated on lower slopes or moved into the adjacent forest, but did not enter waterways. No active erosion was observed on the general ROW, areas where woody brush was controlled but surface soil was not mechanically disturbed.

Surface organic layers varied in presence and thickness on the general ROW, but overall averaged 1.0 inch in depth. The consistently present litter layer was composed of parts from ROW plants, mainly shrubs, grasses, and herbs. The predominant humus type on the ROW was classified a "thin duff mull with very shallow A1".

6.2.2 Vegetation

Corridor clearing and subsequent maintenance practices have resulted in a complex mixture of plant communities which include small trees, shrubs, vines, grasses, and herbs. Some of the woody species presently on the line area are sprouts or root suckers from trees cut at the time of ROW establishment, and certain shrubs and herbs have persisted from the understory of the former forest stand. However, many of the present species have become established since the corridor opening was made. These include staghorn-sumac, elderberry, Japanese honeysuckle and blueberry, and many shade intolerant herbs.

Among the most common communities presently occupying the ROW are Black-Locust-Blackberry-Mixed Grass, Tartarian Honeysuckle-Grape, Mixed Grass-Herb, Mixed Grass-Herb-Sumac, Reed (Phragmites), and Broom-sedge. Where the shrub and vine cover is dense, such as in the Tartarian Honeysuckle-Grape and Japanese Honeysuckle communities, tree seedlings and other vegetation do not rapidly invade. Where herbaceous communities exist, however, large numbers of tree seedlings are becoming established, indicating a rapid succession to shrubs and trees.

6.2.3 Wildlife

Ring-necked pheasant, gray squirrel, and raccoon are the major game animals that currently occupy the study area. Indirect observations (crowing) and direct observations of ring-necked pheasant off the ROW indicated the species' presence in the vicinity. Raccoon tracks as well as gray squirrel tracks and several sightings on the ROW, evidenced their presence on the study area. 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 1 have had a minimal change from the 1963 data. The ROW and the adjacent land area is still considered to be urban with a distribution of agriculture (.2%), commercial and industrial (11.0%), forest land (34.8%), outdoor recreation (6.5%), public and semi-public (2.0%), water resources (1.0%), urban inactive (16.4%), transportation (10.7%), and residential (17.4%). With reference to the total area involved, shifts in land use are noted as follows:

Agriculture -	no change
Commercial and Industrial -	no change
Forest Land -	no change
Outdoor Recreation -	no change
Public and Semi-public -	+ .7%
Water Resources -	no change
Urban Inactive -	- .7%
Transportation -	no change
Residential -	no change

In addition to use of the ROW for the transmission of electrical power, portions of the ROW are currently being used for hunting and recreational purposes (Fig. 1.1.6).

6.3 Environmental Effect and Probable Causes

6.3.1 Soils

The major detrimental effect of ROW construction and management on soils of the Sprainbrook to Eastview area is continuing and progressive erosion resulting from construction and grading of tower sites and access roads. These activities removed the protective vegetation and surface organic mulch and disrupted the underlying mineral soil. There was no restoration of these disturbed areas, and periodic vehicular use and recent regrading of the access road have prevented natural plant invasion. Further, vegetation establishment on several tower sites has been retarded or prevented, possibly due to materials leached from the steel structures, thus subjecting the bare soil to erosive forces. Soil particles dislodged in erosion have accumulated on lower slopes of the ROW and adjacent forest and have not been transported out of the immediate ROW area.

Creation of the ROW and subsequent maintenance for brush control also has effected a change in composition of surface organic layers from tree parts to organic remains of shrubs, grasses, and herbs. Presence and thickness of organic layers are more variable on the ROW than in the forest, but the duff mull humus on the general ROW provides a good surface mulch that moderates raindrop impact and erosion potential.

6.3.2 Vegetation

The major environmental effect of corridor establishment has been to change the vegetative cover from forest to a mixture dominated by shade intolerant tree seedlings, shrubs, vines, and herbaceous plants. Periodic removal of taller woody plants has allowed many of the intolerant shrubs and herbaceous plants to continue to dominate the line area.

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

Slight changes in adjacent ROW land use composition since the ROW was constructed can not specifically be attributed to the ROW's presence. The area has remained urban in character since the ROW was constructed, and is similar in composition to the rest of Westchester County, New York.

Table 1.1. Soil series present on the Sprainbrook to Eastview study area.

Soil Series	Map Symbol[1]	Drainage Class[2]	Surface Soil pH	Surface Soil Texture	Woodland Suitability Group
Hollis	HsC	G-E	4.7	fine sandy loam	5d2
Hollis	HoD	G-E	4.9	very rocky fine sandy loam	5d2
Hollis	HoE	G-E	4.7	very rocky fine sandy loam	5d3

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

A = 0-8%, B = 8-15%, C = 15-25%, D = 25-30%, 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 1.2. Average thickness of organic layers and A1 horizon and humus types for mesic sites on ROW and adjacent woodland of site 1.

Moisture Regime	Location	Layer Thickness (in.) L	F	H	A1	Humus Type
1. Mesic (1)[1]	ROW	.7	.3	.3	.6	Thin duff mull with very shallow A1
	Woodland	.6	.2	.2	.2	Thin duff mull with very shallow A1
2. Mesic (2)	ROW	.5	.1	0	.2	Very shallow sand mull
	Woodland	.7	0	0	1.5	Shallow sand mull
3. Mesic (3)	ROW	.5	.3	.3	1.3	Thin duff mull with shallow A1
	Woodland	1.1	.3	.2	1.1	Thin duff mull with shallow A1
4. Mesic (4)	ROW	.8	.1	0	0	Disturbed area - no humus type
	Woodland	.8	.2	.1	1.4	Thin duff mull with shallow A1
All Plots Combined	ROW	.6	.2	.2	.5	Thin duff mull with very shallow A1
	Woodland	.8	.2	.1	1.1	Thin duff mull with shallow A1

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

Table 1.3. Areas exhibiting active erosion in September, 1976, on the Sprainbrook to Eastview ROW study area.

Location	Soil Type	Average Slope (%)	Plant Cover	Erosion on Site		
				Kind	Class	Gully Depth (in.)
		ROW				
Tower Site	Hollis fine sandy loam	16	Bare-grass	Sheet,Rill & Gully	Moderate	2
Tower Site	Hollis fine sandy loam	5	Bare	Sheet	Slight	-
Tower Site	Hollis fine sandy loam	5	Bare	Sheet	Slight	-
Tower Site	Hollis very rocky fine sandy loam	2	Bare-grass-herb	Sheet & Rill	Slight	-
Tower Site	Hollis very rocky fine sandy loam	18	Bare	Sheet, Rill & Gully	Moderate	2
Tower Site	Hollis very rocky fine sandy loam	20	Bare-seedlings	Sheet & Gully	Moderate	4
Access Road	Hollis fine sandy loam	16	Grass (rutted)	Sheet & Gully	Slight	½
Access Road	Hollis fine sandy loam	3	Bare	Sheet & Rill	Slight	-
Access Road/ Bank Cut	Hollis fine sandy loam	45	Bare-shrub-herb	Sheet & Rill	Slight	-

Table 1.3 Continued

Location	Soil Type	Average Slope (%)	Plant Cover	Erosion on Site: Kind	Erosion on Site: Class	Erosion on Site: Gully Depth (in.)
Access Road	Hollis fine sandy loam	12	Bare-grass-herb	Sheet & Rill	Moderate	-
Access Road	Hollis very rocky sandy loam	30	Bare	Sheet, Rill & Gully	Moderate	4
Access Road/ Bank Cut	Hollis very rocky sandy loam	45	Bare-shrub	Sheet	Slight	-
Access Road	Hollis very rocky fine sandy loam	3	Bare	Sheet	Slight	-
Access Road	Hollis very rocky fine sandy loam	17	Bare-grass	Gully	Severe	18-24
Access Road	Hollis very rocky fine sandy loam	18	Bare	Sheet & Gully	Moderate	6
		FOREST				
General Forest	Hollis fine sandy loam	26	Grass-herb	Gully	Moderate	3
General Forest	Hollis fine sandy loam	26	Grass-moss	Sheet	Slight	-
General Forest	Hollis very rocky fine sandy loam	35	Shrub-herb-litter	Sheet	Slight	-

Table 1.3 Continued

Location	Soil Type	Average Slope (%)	Plant Cover	Erosion on Site: Kind	Erosion on Site: Class	Erosion on Site: Gully Depth (in.)
Access Road	Hollis fine sandy loam	18	Bare	Sheet & Rill	Slight	-
Access Road	Hollis fine sandy loam	17	Bare	Sheet & Gully	Moderate	3
Bank/Excavation	Hollis very rocky fine sandy loam	60	Bare	Sheet, Rill & Gully	Severe	12-60

Table 1.4. 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	Quaking Aspen	57.06	38	95.06
	Gray Birch	29.77	30	59.77
	Sycamore	4.39	8	12.39
	Black Locust	4.39	8	12.39
	Large-toothed Aspen	2.81	8	10.81
	Sweet Birch	1.58	8	9.58
Mesic 2	Red Oak	69.88	25	94.88
	Yellow Birch	16.19	25	41.19
	Sweet Birch	7.79	25	32.79
	American Hop-Hornbeam	6.14	25	31.14
Mesic 3	Beech	69.07	38	107.07
	Red Oak	11.67	13	24.67
	Sweet Birch	8.84	13	21.84
	Tulip-Poplar	4.99	12	16.99
	Sugar-Maple	4.34	12	16.34
	Flowering Dogwood	1.09	12	13.09
Mesic 4	Sweet Birch	47.72	42	89.72
	Red Oak	45.12	33	78.12
	Shagbark-Hickory	4.62	13	17.62
	Black Cherry	1.80	4	5.80
	Gray Birch	.45	4	4.45
	Beech	.29	4	4.29

Table 1.5. 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 mesic habitats.

Species	Mesic (1) Forest A.S.	Mesic (1) ROW A.S.	Mesic (2) Forest A.S. (E)	Mesic (2) ROW A.S.	Mesic (2) Forest A.S. (W)	Mesic (3) Forest A.S.	Mesic (3) ROW A.S.	Mesic (4) Forest A.S.	Mesic (4) ROW A.S.
Tree Layer									
Sycamore	+.1	-	-	-	-	-	-	-	-
Large-toothed Aspen	++.1	-	-	-	-	-	-	-	-
Gray Birch	1.1	-	-	-	-	-	-	++.1	-
Sweet Birch	++.1	-	-	-	+.1	+.1	-	2.1	-
Black Locust	+.1	-	5.1	-	-	-	-	-	-
Quaking Aspen	1.1	-	-	-	-	-	-	-	-
American Hop-Hornbeam	-	-	-	-	+.1	-	-	-	-
Red Oak	-	-	-	-	+.1	+.1	-	2.1	-
Yellow Birch	-	-	-	-	+.1	-	-	-	-
Sugar-Maple	-	-	-	-	-	+.1	-	-	-
Beech	-	-	-	-	-	1.1	-	++.1	-
Flowering Dogwood	-	-	-	-	-	+.1	-	-	-
Tulip-Poplar	-	-	-	-	-	+.1	-	-	-
Black Cherry	-	-	-	-	-	-	-	+.1	-
Shagbark-Hickory	-	-	-	-	-	-	-	1.1	-
No. Species	6	0	1	0	4	6	0	6	0
Shrub Layer									
Labrador-tea	2.3	-	-	-	-	-	-	-	-
Rambler Rose	2.3	-	-	1.3	-	-	-	-	-
Willow	1.2	1.1	-	+.1	-	-	2.1	++.1	+.1
Tartarian Honeysuckle	+.2	1.3	5.5	4.4	2.3	-	-	+.2	-
Blackberry	1.1	4.1	-	1.1	1.2	-	3.1	1.1	+.1
Smooth Sumac	-	1.1	-	+.1	2.1	-	1.1	-	++.1
Staghorn-Sumac	-	1.1	-	-	-	-	2.1	-	4.1
Elderberry	-	+.2	-	+.2	-	-	-	-	-
Blueberry	-	-	-	-	-	-	++.1	-	-
Maple-leaved Viburnum	-	+.1	-	-	-	-	+.3	-	1.1

Table 1.5. Continued

Species	Mesic (1) Forest A.S.	Mesic (1) ROW A.S.	Mesic (2) Forest A.S. (E)	Mesic (2) ROW A.S.	Mesic (2) Forest A.S. (W)	Mesic (3) Forest A.S.	Mesic (3) ROW A.S.	Mesic (4) Forest A.S.	Mesic (4) ROW A.S.
Japanese Honeysuckle	-	+.4	-	-	-	-	-	-	1.4
Grape	-	-	-	3.3	2.2	-	-	2.2	1.3
Poison Ivy	-	-	-	1.2	1.1	2.3	-	-	+.2
Virginia Creeper	-	-	-	+.2	+.2	-	-	1.3	1.2
American Hazelnut	-	-	-	-	-	-	+.3	+.3	1.1
Pinxter-flower	-	-	-	-	-	-	-	-	++.1
Witch-Hazel	-	-	-	-	-	-	-	-	1.1
Climbing Bittersweet	-	-	-	-	-	+.1	1.3	+.1	2.2
No. Species	5	8	1	9	6	2	8	7	13
Trees in the Shrub Layer									
Gray Birch	3.1	1.1	-	-	-	-	2.1	-	1.1
Sycamore	++.1	-	-	-	-	-	-	-	-
Large-toothed Aspen	2.1	+.1	-	++.1	+.1	-	2.2	-	1.1
Black Locust	4.1	3.1	-	1.1	2.1	-	-	-	-
Black Cherry	-	+.1	-	-	-	-	+.1	2.1	+.1
Red Oak	-	+.1	-	+.1	2.1	2.1	3.2	-	1.1
White Ash	-	1.1	-	+.1	+.1	-	+.1	2.1	3.1
White Oak	-	+.1	-	-	-	-	+.1	-	-
Flowering Dogwood	-	+.1	-	-	+.1	3.1	1.2	1.1	1.2
Sweet Birch	-	+.1	-	++.1	1.1	2.1	1.2	2.1	1.1
Sugar-Maple	-	-	-	-	+.1	2.1	+.1	-	-
Tree-of-heaven	-	-	-	+.1	-	-	-	-	1.1
Tulip-Poplar	-	-	-	+.1	-	1.1	+.2	-	++.1
Beech	-	-	-	-	-	3.1	+.1	-	-
Shagbark-Hickory	-	-	-	-	-	1.1	-	3.1	++.1
Bitternut Hickory	-	-	-	-	-	-	+.2	1.1	+.1
White Sassafras	-	-	-	-	-	-	1.2	-	-
Quaking Aspen	-	-	-	-	-	-	2.2	-	1.1
Red Maple	-	-	-	-	-	-	-	-	++.1
No. Species	4	9	0	7	7	7	14	6	13

Table 1.5. Continued

Species	Mesic (1) Forest A.S.	Mesic (1) ROW A.S.	Mesic (2) Forest A.S. (E)	Mesic (2) ROW A.S.	Mesic (2) Forest A.S. (W)	Mesic (3) Forest A.S.	Mesic (3) ROW A.S.	Mesic (4) Forest A.S.	Mesic (4) ROW A.S.
Herb Layer[1]									
Strawberry	2.2	1.2	-	-	-	-	-	1.2	+.3
Cinquefoil spp.	1.2	2.3	-	+.3	-	-	1.3	1.2	+.2
Whorled Loosestrife	++.1	-	-	-	-	-	-	-	-
Hair-cap Moss	3.4	-	-	-	-	-	-	-	-
Yarrow	++.2	+.1	-	+.2	-	-	+.1	-	+.1
White Moss	1.3	-	-	-	-	-	-	-	-
Onion sp.	1.2	-	-	-	1.2	-	-	-	-
Deer-tongue Grass	-	+.3	-	-	-	-	-	-	-
Pokeweed	-	+.3	-	-	-	-	-	-	++.2
Wild Cranesbill	-	+.2	-	-	-	-	+.3	+.1	-
Joe-Pye-weed	-	+.1	-	-	-	-	-	-	-
Solomon's-seal	-	+.2	-	-	-	-	-	-	-
Queen Anne's-lace	-	+.2	-	-	-	-	-	-	-
Goldenrod spp.	-	1.2	-	1.2	-	-	1.4	+.1	3.2
Everlasting sp.	-	+.1	-	-	-	-	-	-	-
Upright Yellow Wood-sorrel	-	+.2	-	-	-	-	-	+.2	+.2
St. John's-wort	-	+.1	-	-	-	-	-	-	-
Aster spp.	-	+.1	-	-	-	-	+.1	1.1	3.3
Heal-all	-	++.3	-	-	-	-	++.2	-	-
Indian-tobacco	-	+.2	-	-	-	-	-	-	-
Mixed Grass	+.2	3.2	-	2.2	+.2	1.2	4.2	+.2	4.2
Panic-Grass	-	1.4	-	-	-	-	+.3	-	-
Sheep-Sorrel	-	+.2	-	+.3	-	-	-	-	-
Coltsfoot	-	+.2	-	-	(1.2)	-	-	-	-
Common Mullein	-	+.2	-	-	-	-	+.1	-	-
Black Snakeroot	-	-	-	-	+.1	-	-	-	-
Moss spp.	-	-	-	-	2.4	-	-	-	-
Spotted Touch-me-not	-	-	-	1.3	2.3	-	-	-	-
Christmas Fern	-	-	-	+.2	1.2	2.2	-	+.2	+.2

Table 1.5. Continued

Species	Mesic (1)		Mesic (2)			Mesic (3)		Mesic (4)	
	Forest A.S.	ROW A.S.	Forest A.S. (E)	ROW A.S.	Forest A.S. (W)	Forest A.S.	ROW A.S.	Forest A.S.	ROW A.S.
Interrupted Fern	-	-	-	1.2	-	+.2	1.2	2.2	-
False Spikenard	-	-	-	+.2	-	+.2	-	1.1	+.1
Sensitive Fern	-	-	-	+.2	-	-	-	-	-
Jack-in-the-pulpit	-	-	-	+.1	-	-	-	-	-
Wild Lettuce	-	-	-	1.3	-	-	-	-	-
Common Evening-Primrose	-	-	-	+.2	-	-	-	-	-
Broad Beech-Fern	-	-	-	-	-	+.2	-	-	-
New York Fern	-	-	-	-	-	++.2	-	-	-
Broom-sedge	-	-	-	-	-	-	1.4	-	-
Hay-scented Fern	-	-	-	-	-	-	+.3	-	1.2
Violet	-	-	-	-	-	-	+.1	-	-
Lady-Fern	-	-	-	-	-	-	+.2	-	-
Tick-trefoil	-	-	-	-	-	-	1.4	-	1.1
Deptford Pink	-	-	-	-	-	-	++.1	-	-
Partridge-Pea	-	-	-	-	-	-	++.2	-	-
Black-eyed Susan	-	-	-	-	-	-	++.2	-	-
Butter-and-eggs	-	-	-	-	-	-	++.1	-	-
Common Plantain	-	-	-	-	-	-	+.2	-	-
Wild Sarsaparilla	-	-	-	-	-	-	-	+.1	-
Early Meadow-Rue	-	-	-	-	-	-	-	1.2	+.1
Perfoliate Bellwort	-	-	-	-	-	-	-	+.1	-
Sweet-scented Bedstraw	-	-	-	-	-	-	-	+.1	-
White Baneberry	-	-	-	-	-	-	-	1.1	-
White Snakeroot	-	-	-	-	-	-	-	+.1	-
Virginia Knotweed	-	-	-	-	-	-	-	+.1	-
Devil's Paint-brush	-	-	-	-	-	-	-	(1.1)	1.3
Poverty-Grass	-	-	-	-	-	-	-	+.2	-
Reed	-	-	-	-	-	-	-	-	+.3
Wild Yam-root	-	-	-	-	-	-	-	-	(+.3)
No. Species	8	21	0	13	7	6	20	19	16

Table 1.5. Continued

Species	Mesic (1) Forest A.S.	Mesic (1) ROW A.S.	Mesic (2) Forest A.S. (E)	Mesic (2) ROW A.S.	Mesic (2) Forest A.S. (W)	Mesic (3) Forest A.S.	Mesic (3) ROW A.S.	Mesic (4) Forest A.S.	Mesic (4) ROW A.S.
Total No. Species									
Trees[2]	6	9	1	7	9	7	14	9	13
Shrubs	5	8	1	9	6	2	8	7	13
Herbs	8	21	0	13	7	6	20	19	16
Totals	19	38	2	29	22	15	42	35	42

[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 1.6. 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			
Labrador-tea		2.3	-
Rambler Rose		2.3	-
Herbs[1]			
Whorled Loosestrife		++.1	-
Hair-cap Moss		3.4	-
White Moss		1.3	-
Onion sp.		1.2	-
No. Species		6	
Mesic (2)			
	(East)	(West)	
Shrubs			
Herbs			
Coltsfoot	-	(1.2)	-
Black Snakeroot	-	+.1	-
Moss spp.	-	2.4	-
Onion sp.	-	1.2	-
No. Species	0	4	
Mesic (3)			
Shrubs			
Poison Ivy		2.3	-
Herbs			
Christmas Fern		2.2	-
False Spikenard		+.2	-
Broad Beech-Fern		+.2	-
New York Fern		++.2	-
No. Species		5	

Table 1.6. Continued

Species	Forest A.S.	ROW A.S.
Mesic (4)		
Shrubs		
Tartarian Honeysuckle	+.2	-
Herbs		
Wild Cranesbill	+.1	-
Interrupted Fern	2.2	-
Wild Sarsaparilla	+.1	-
Perfoliate Bellwort	+.1	-
Sweet-scented Bedstraw	+.1	-
White Baneberry	1.1	-
White Snakeroot	+.1	-
Virginia Knotweed	+.1	-
Poverty-Grass	+.2	-
No. Species	10	

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

Table 1.7. 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		
Smooth Sumac	1.1	-
Staghorn-Sumac	1.1	-
Elderberry	+.2	-
Maple-leaved Viburnum	+.1	-
Japanese Honeysuckle	+.4	-
Herbs[1]		
Deer-tongue Grass	+.3	-
Pokeweed	+.3	-
Wild Cranesbill	+.2	-
Joe-Pye-weed	+.1	-
Solomon's-seal	+.2	-
Queen Anne's-lace	+.2	-
Goldenrod spp.	1.2	-
Everlasting sp.	+.1	-
Upright Yellow Wood-sorrel	+.2	-
St. John's-wort	+.1	-
Aster spp.	+.1	-
Heal-all	++.3	-
Indian-tobacco	+.2	-
Panic-Grass	1.4	-
Sheep-Sorrel	+.2	-
Coltsfoot	+.2	-
Mullein	+.2	-
No. Species	22	
Mesic (2)		
Shrubs		
Rambler Rose	1.3	-
Willow	+.1	-
Elderberry	+.2	-
Herbs		
Cinquefoil	+.3	-
Yarrow	+.2	-
Goldenrod spp.	1.2	-
Sheep-Sorrel	+.3	-

Table 1.7. Continued

Species	ROW A.S.	Forest A.S.
Interrupted Fern	1.2	-
False Spikenard	+.2	-
Sensitive Fern	+.2	-
Jack-in-the-pulpit	+.1	-
Wild Lettuce	1.3	-
Common Evening-Primrose	+.2	-
No. Species	13	
Mesic (3)		
Shrubs		
Blackberry	3.1	-
Smooth Sumac	1.1	-
Staghorn-Sumac	2.1	-
Willow	2.1	-
Blueberry	++.1	-
Maple-leaved Viburnum	+.3	-
American Hazelnut	+.3	-
Herbs		
Cinquefoil spp.	1.3	-
Yarrow	+.1	-
Wild Cranesbill	+.3	-
Goldenrod spp.	1.4	-
Aster spp.	+.1	-
Heal-all	++.2	-
Panic-Grass	+.3	-
Common Mullein	+.1	-
Broom-sedge	1.4	-
Hay-scented Fern	+.3	-
Violet sp.	+.1	-
Lady-Fern	+.2	-
Tick-trefoil	1.4	-
Deptford Pink	++.1	-
Partridge-Pea	++.2	-
Black-eyed Susan	++.2	-
Butter-and-eggs	++.1	-
Common Plantain	+.2	-
No. Species	25	
Mesic (4)		
Shrubs		
Smooth Sumac	++.1	-
Staghorn-Sumac	4.1	-

Table 1.7. Continued

Species	ROW A.S.	Forest A.S.
Maple-leaved Viburnum	1.1	-
Japanese Honeysuckle	1.4	-
Poison Ivy	+.2	-
Pinxter-flower	++.1	-
Witch-Hazel	1.1	-
<u>Herbs</u>		
Yarrow	+.1	-
Pokeweed	++.2	-
Hay-scented Fern	1.2	-
Tick-trefoil	1.1	-
Reed	+.3	-
Wild Yam-root	(+.3)	-
No. Species	13	

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

Table 1.8. Major vegetational types for the Sprainbrook to Eastview study area based on percent of study plots occupied by each plant community and other components on the ROW.

Community	Site Classification			
	Mesic (1)	Mesic (2)	Mesic (3)	Mesic (4)
	Percent of Total Area			
Black Locust-Blackberry-Mixed Grass	28.0			
Mixed Grass-Blackberry-Mixed Herb	24.7			
Access Road	5.9	3.8		4.8
Cinquefoil-Mixed Herb	5.8			
Blackberry	4.5		.4	
Japanese Honeysuckle-Mixed Grass-Herb	3.9			
Blackberry-Mixed Grass-Herb	3.2			
Mixed Grass-Blackberry	3.2			
Black Locust-Staghorn-Sumac-Mixed Grass-Herb	2.9			
Black Locust-Mixed Herb	2.5			
Black Locust-Blackberry-Mixed Herb	2.2			
Panic-Grass-Blackberry-Black Locust	2.1			
Black Locust	1.9	.1		
Blackberry-Mixed Herb	1.4		.7	1.9
Mixed Grass	1.3	.2		
Tartarian Honeysuckle	1.3	2.2		
Deer-tongue Grass	1.3			
Japanese Honeysuckle-Blackberry	1.0			
Black Locust-Mixed Grass-Blackberry	.9			
Blackberry-Solomon's-seal	.8			
Elderberry	.5			
Black Cherry	.5			
Staghorn-Sumac	.2		1.2	
Tartarian Honeysuckle-Grape		42.6		
Open-Mixed Grass-Herb		15.2		
Tartarian Honeysuckle-Mixed Herb		13.5		
Mixed Herb-Grass		10.7		
Mixed Herb		4.5		
False Spikenard		1.7		

Table 1.8. Continued

Community	Site Classification			
	Mesic (1)	Mesic (2)	Mesic (3)	Mesic (4)
	Percent of Total Area			
Stone Wall		1.6		
Cinquefoil-Mixed Grass-Herb		.8		
Sheep-Sorrel-Mixed Herb		.7		
Interrupted Fern		.5		
Mixed Grass-Herb		.5	72.2	5.8
Standing Water		.5		
Rock		.4		.9
Rambler Rose (*Rosa Multiflora*)		.3		
Yarrow		.1		
Smooth Sumac		.1		
Broom-sedge			10.5	
Open (Gully Erosion)			8.4	
Access Road (Invading)			5.1	
Open			1.3	
Hay-scented Fern			.2	
Mixed Grass-Herb-Sumac				82.4
Reed (*Phragmites* sp.)				1.9
Japanese Honeysuckle-Sumac-Mixed Herb				1.7
Grape-Blackberry				.6
Total	100.0	100.0	100.0	100.0

Table 1.9. Birds observed and/or heard on the ROW and on the ROW edge during the study period.

Species	Species
Great blue heron	Robin
Cooper's hawk	Wood thrush
Red-tailed hawk	Red-eyed vireo
Ruffed grouse	American redstart
Ring-necked pheasant	Worm-eating warbler
Downy woodpecker	Yellow-breasted chat
Yellow-shafted flicker	Yellow warbler
Eastern wood pewee	Yellowthroat
Blue jay	Red-winged blackbird
Common crow	Indigo bunting
Tufted titmouse	Rose-breasted grosbeak
Brown thrasher	Song sparrow
Catbird	Rufous-sided towhee
Mockingbird	Slate-colored junco

Table 1.10. Potential wildlife use of plant species[1] present on the ROW and adjacent woods for the major game species on the Sprainbrook to Eastview study area.

Species	Wildlife Species		
	Pheasant	Squirrel	Raccoon
Trees			
Red Oak	*	****	****
White Oak	*	****	****
Beech		**	+
Shagbark-Hickory		***	+
Bitternut Hickory		***	+
Sugar-Maple		**	
Red Maple		**	
Flowering Dogwood	+	*	
Tulip-Poplar		+	
Black Cherry	*	+	
Shrubs			
Blackberry	***	+	
Grape	**		*
Smooth Sumac	*		
Staghorn-Sumac	*		
Hazelnut			+
Elderberry	*		
Herbs[2]			
Strawberry	*		
Pokeweed			*

1 Those plants not included in this table provide a certain amount of cover (Table 1.5) 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 1.11. 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	-.2 *.2
(C,I)	Commercial & Industrial	----------11 **********11
(F)	Forest Land	-------------------------34.8 *************************34.8
(E)	Extractive Industry	
(N)	Non-productive	
(OR)	Outdoor Recreation	------6.5 ******6.5
(P)	Public & Semi-public	---1.3 ****2.0
(W)	Water Resources	--1.0 **1.0
(U)	Urban Inactive	--------------17.1 *************16.4
(T)	Transportation	----------10.7 **********10.7
(R)	Residential	---------------17.4 ***************17.4

[1] Source: USDA-SCS, Hyattsville, Md., air photo No. S35 36119 174-163, Oct. 24, 1974
USDA-SCS, Westchester County, air photo, 1965

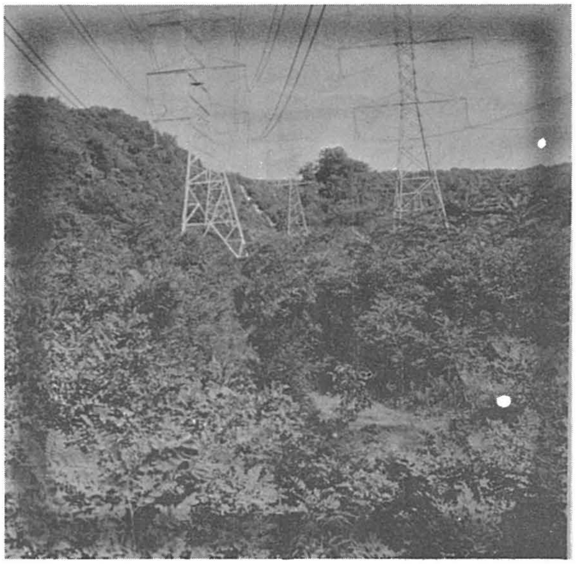


FIG. 1.1.1. General view of the ROW and adjacent forest, looking north-northwest, in summer, 1975 (Photo Station 2).

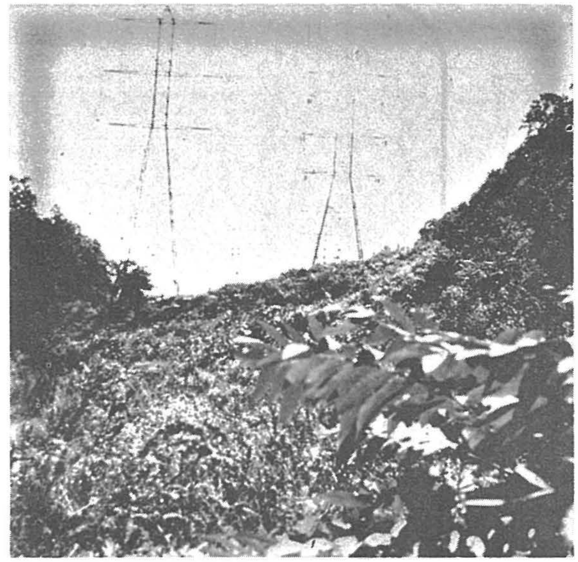


FIG. 1.1.2. General view of the ROW and adjacent forest, looking southeast, in summer, 1975 (Photo Station 14).

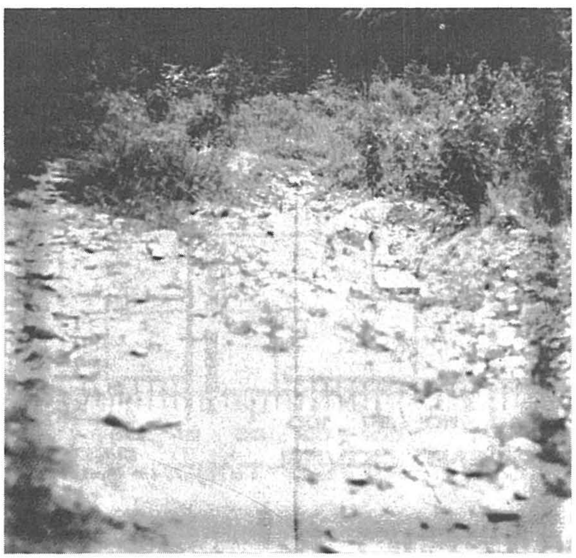


FIG. 1.1.3. Severe gully erosion along edge of access road, in spring, 1975 (Photo Station 9).

FIG. 1.1.4. Staghorn-sumac, a root-suckering species, on ROW, in spring, 1975 (Photo Station 12).

FIG. 1.1.5. Dead shrew on ROW, fall, 1975.

FIG. 1.1.6. Campfire on ROW, in winter, 1976.

FIG. 1.1. Visual characteristics.

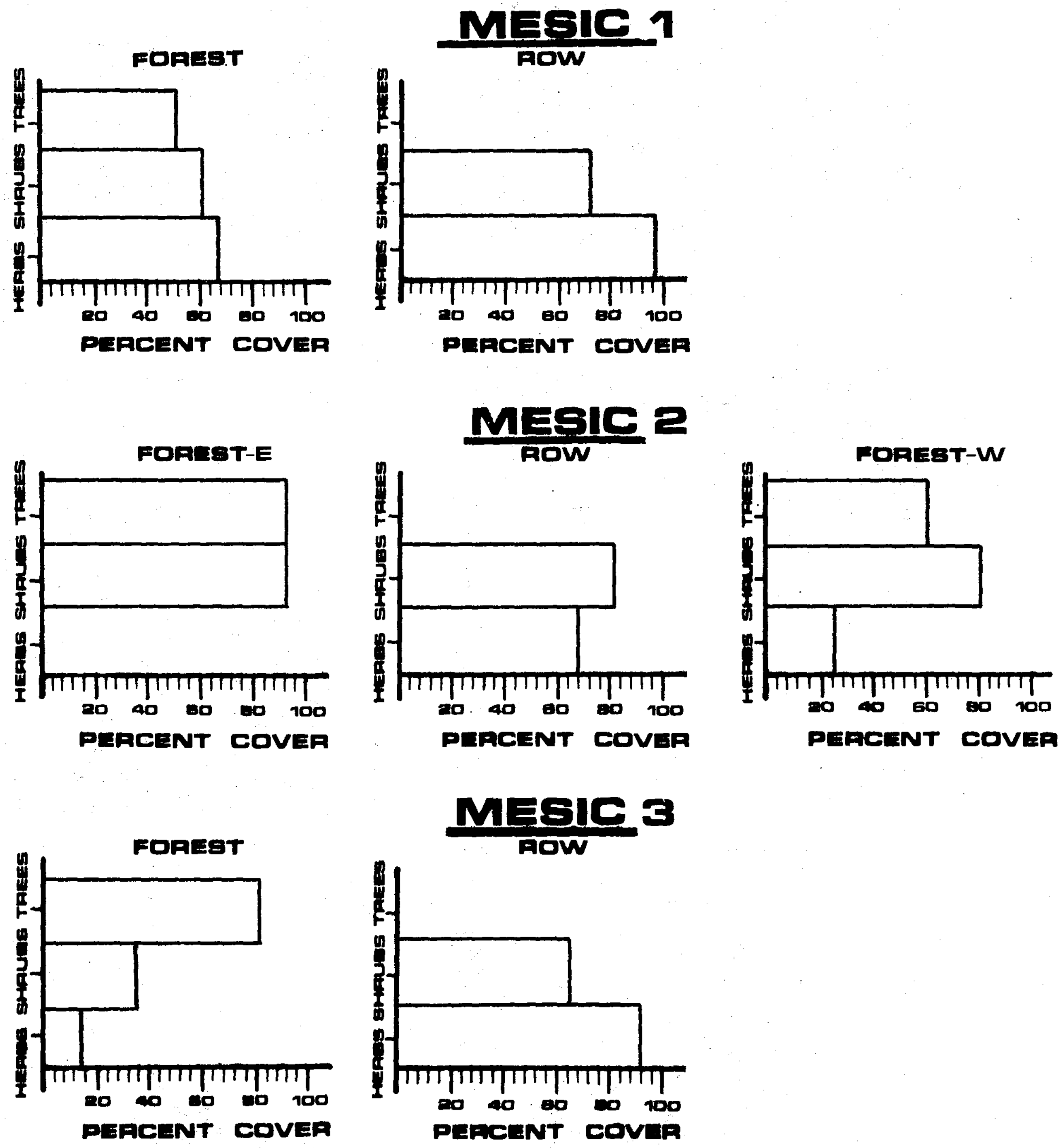


Fig. I.2. Changes in cover value of tree, shrub, and herb layers from forest to ROW.

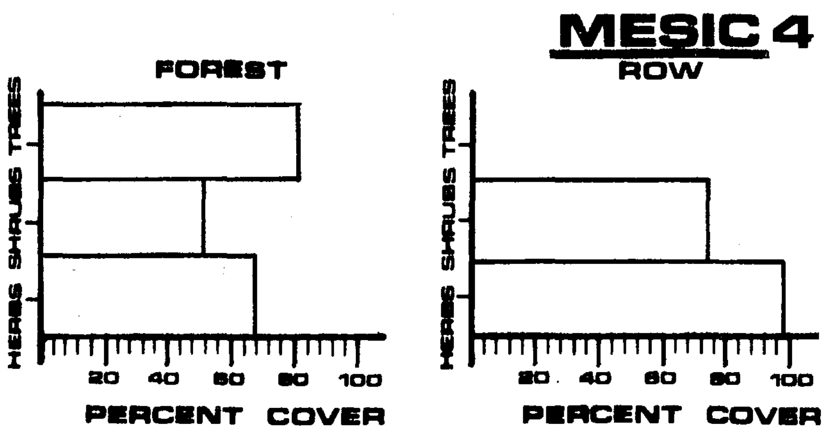


Fig. 1.2a. Changes in cover value of tree, shrub, and herb layers from forest to ROW.

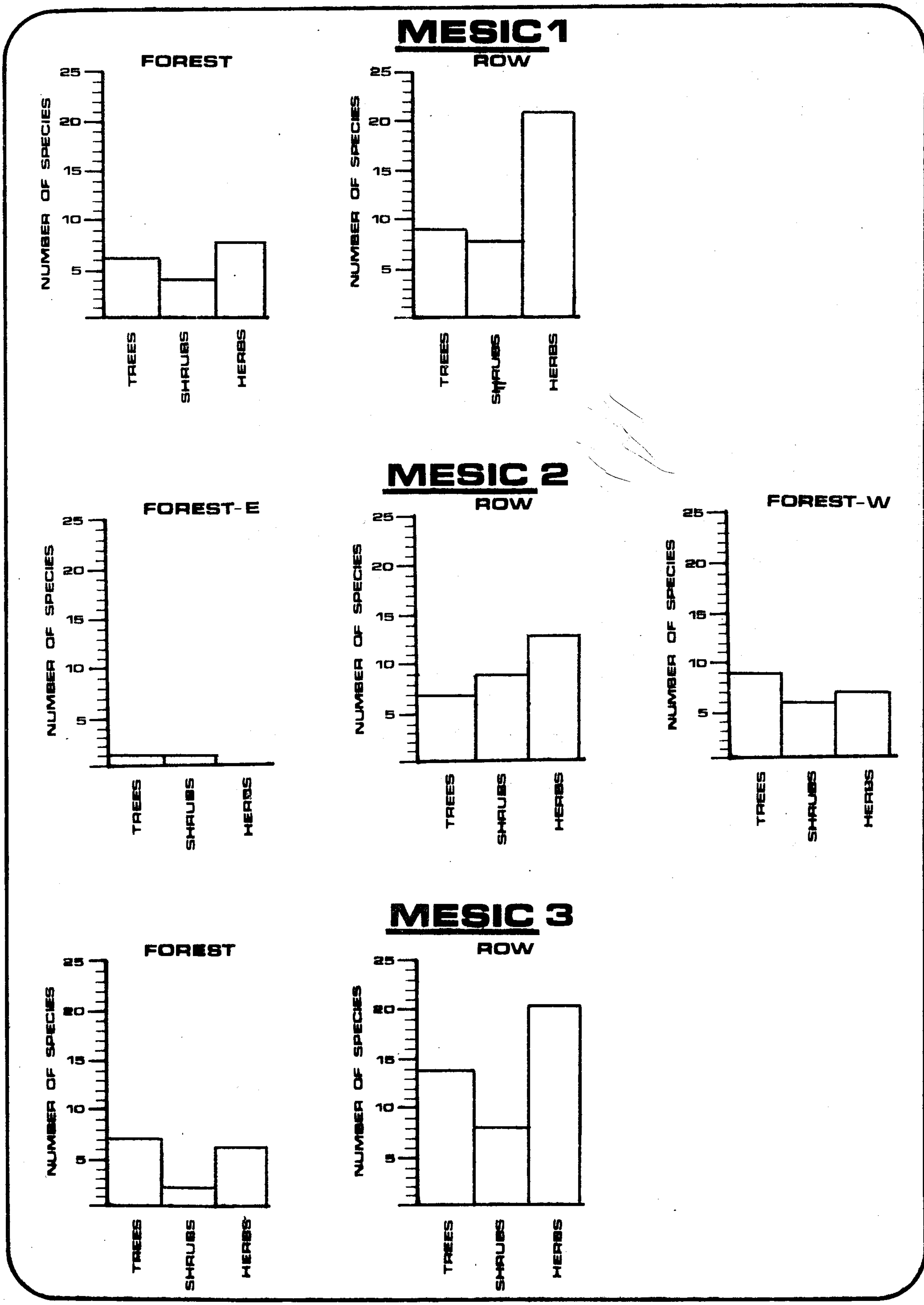


Fig. 1.3. Species diversity in the forest and on the ROW.

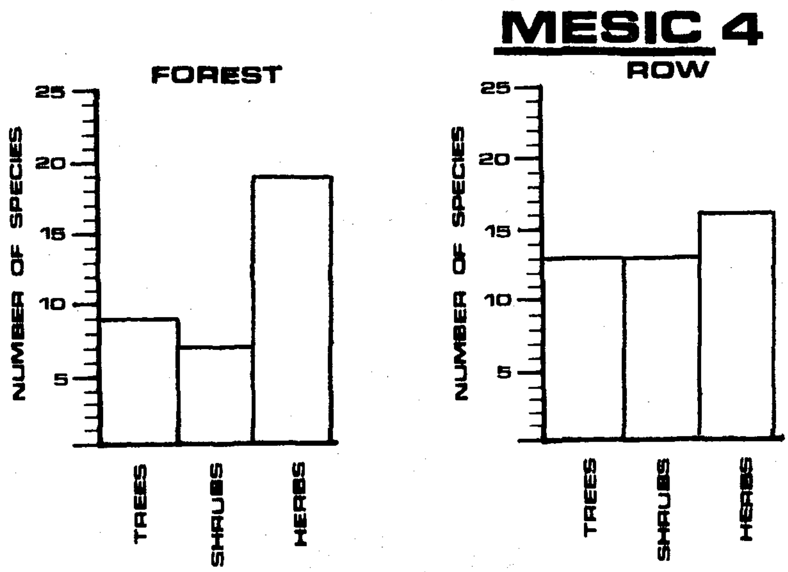


Fig. 1.3a. **Species diversity in the forest and on the ROW.**

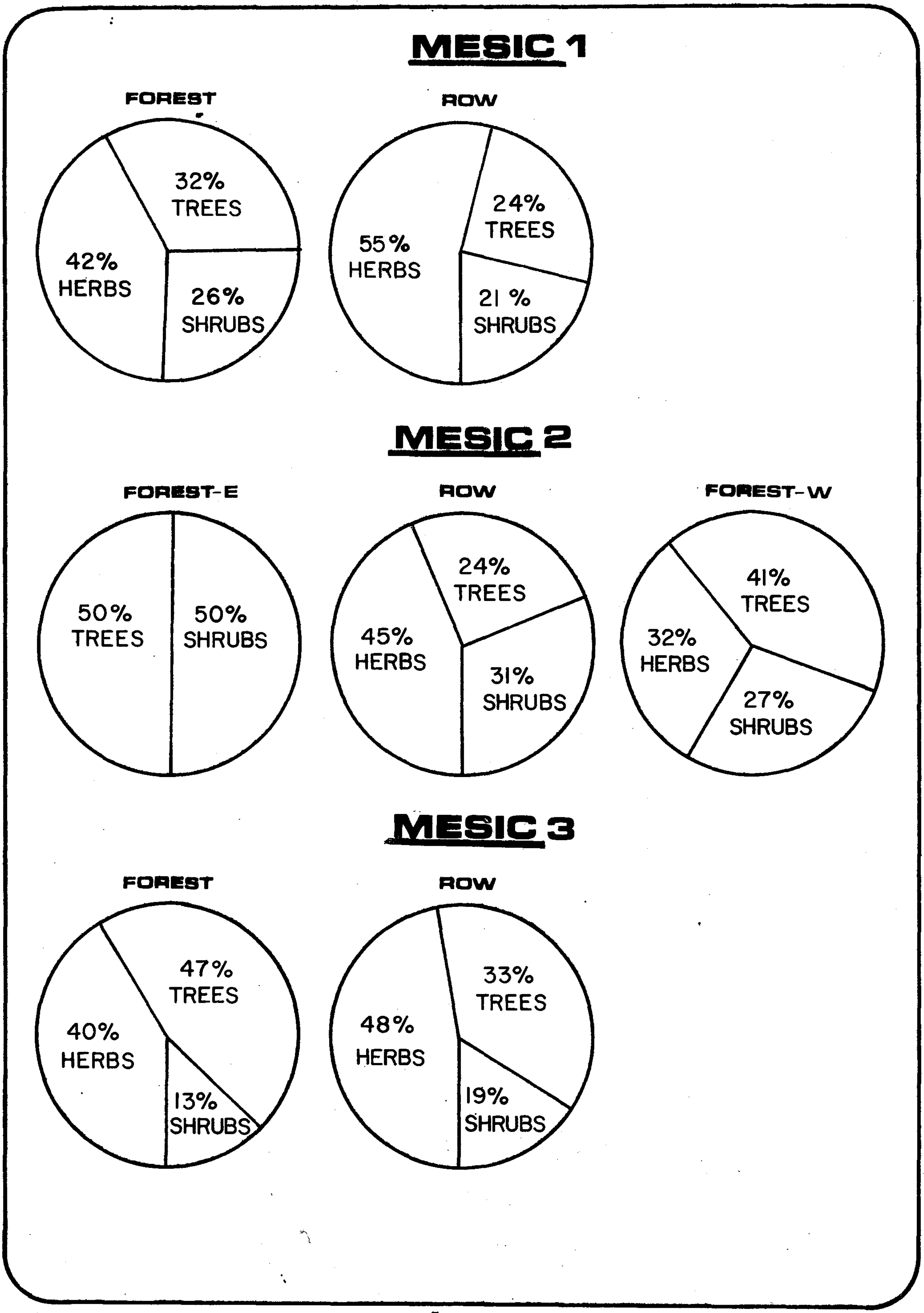


Fig. 1.4. **Life form spectrum of the ROW as compared to the adjacent forest to compare species make-up of each, based on the number of species in each life form expressed as a percent of total species.**

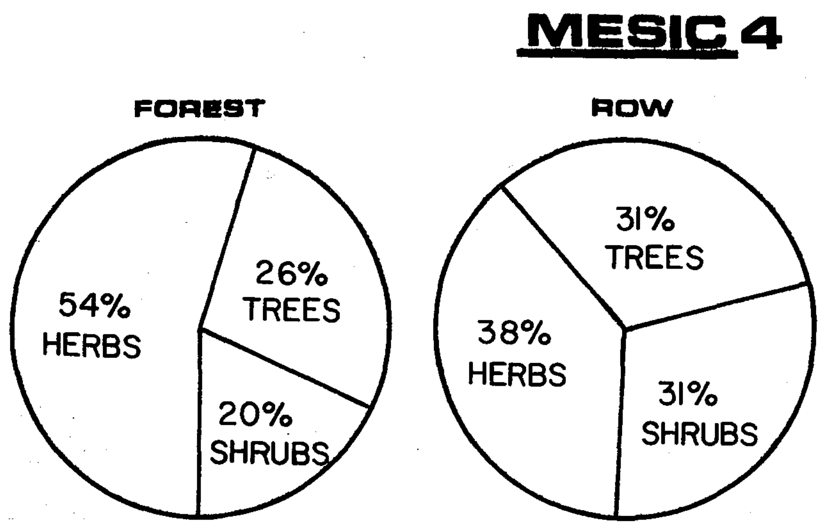


Fig. 1.4a. Life form spectrum of the ROW as compared to the adjacent forest to compare species make-up of each, based on the number of species in each life form expressed as a percent of total species

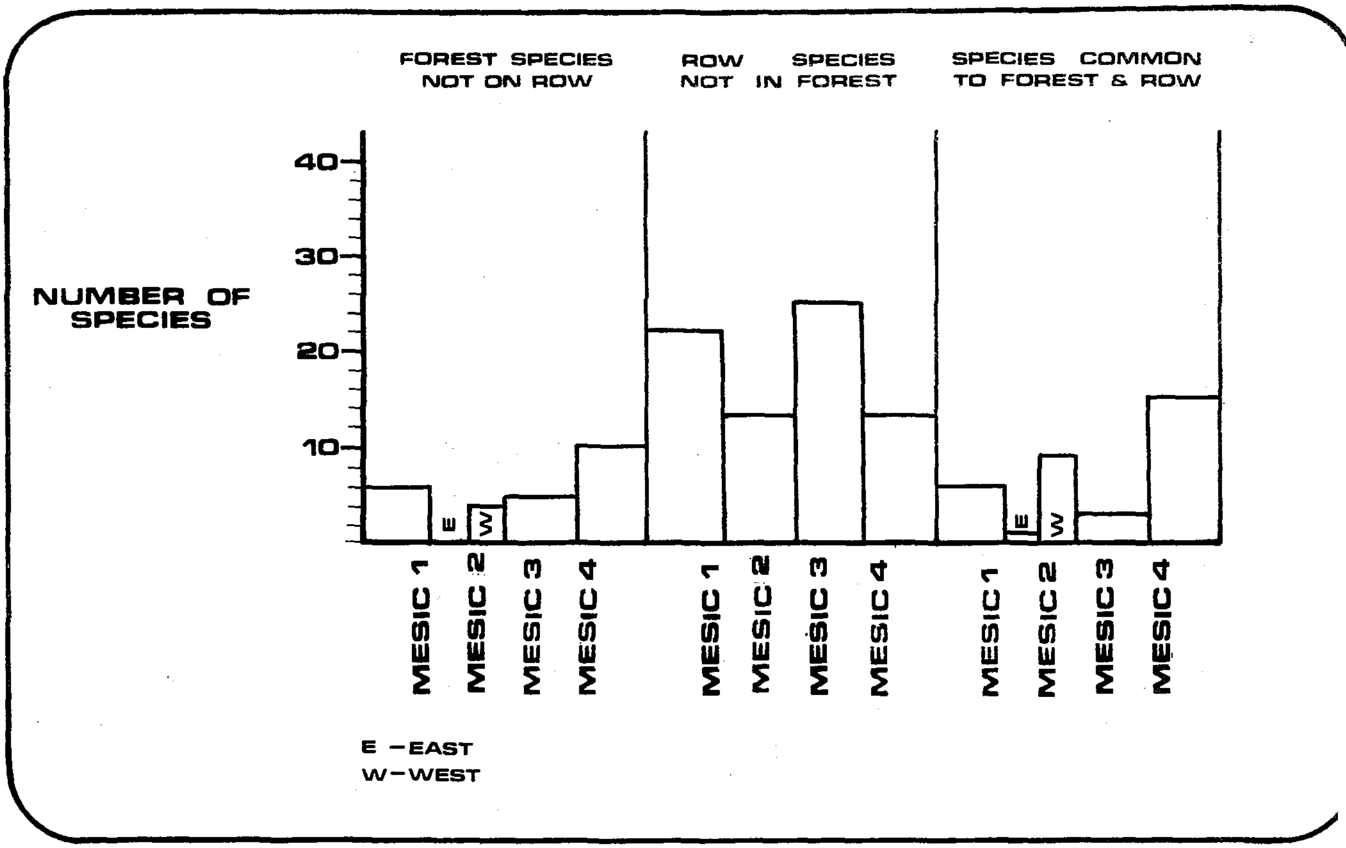
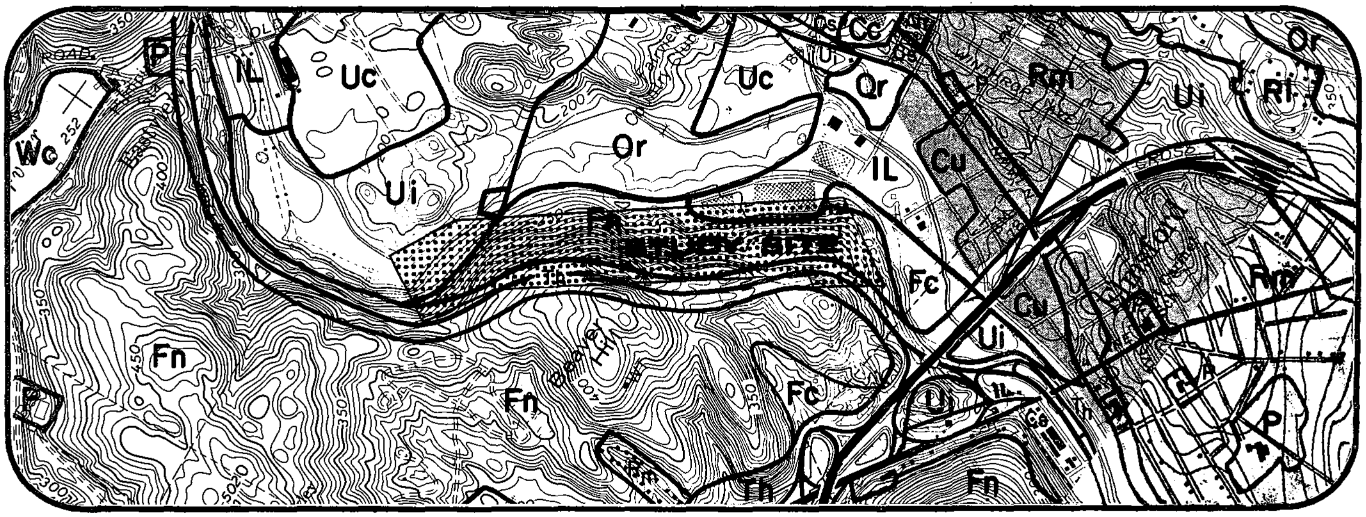
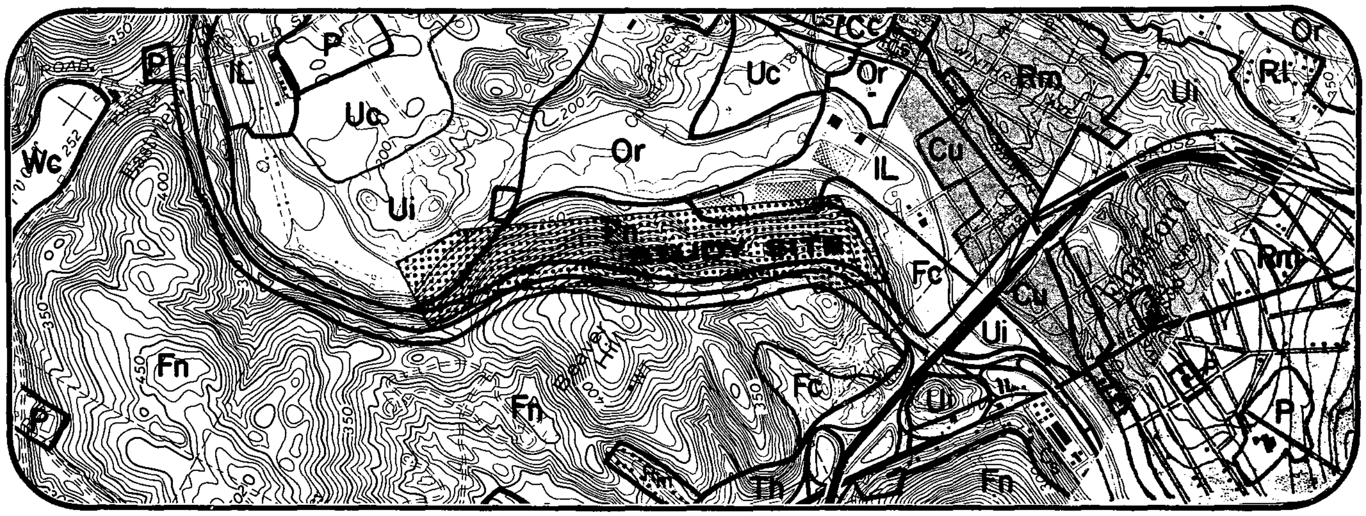


Fig. I.5. Comparison of shrub and herb species in the forest and on the ROW.



LAND USE PRIOR TO ROW CONSTRUCTION SCALE 1"-2000



LAND USE AFTER CONSTRUTION OF ROW SCALE 1"-2000

LEGEND FOR LAND USE SYMBOLS

AGRICULTURE
- Ah - Horticulture or floriculture

COMMERCIAL AND INDUSTRIAL LAND USES
- Cs - Commercial strip development
- Cu - Central business sections
- I1 - Light manufacturing
- ih - Heavy manufacturing

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

OUTDOOR RECREATION LAND USE
- Or - Outdoor recreation

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

RESIDENTIAL LAND USE
- Rm-- Medium density
- R1 - Low Density

TRANSPORTATION LAND USES
- Th - Highways

WATER RESOURCES
- Wc - Artificial ponds

URBAN
- Uc — Under Construction
- Ui — Urban Inactive

SOURCES:

USDA-SCS, Hyattsville, Md., air photo No. S35 36119 174-163, Oct. 24, 1974
USDA-SCS, Westchester County, air photo, 1965
Area Land Use Map, LUNR, Cornell University, N.Y., 1974
U. S. G. S. Topographic Map, White Plains, N.Y., 1967

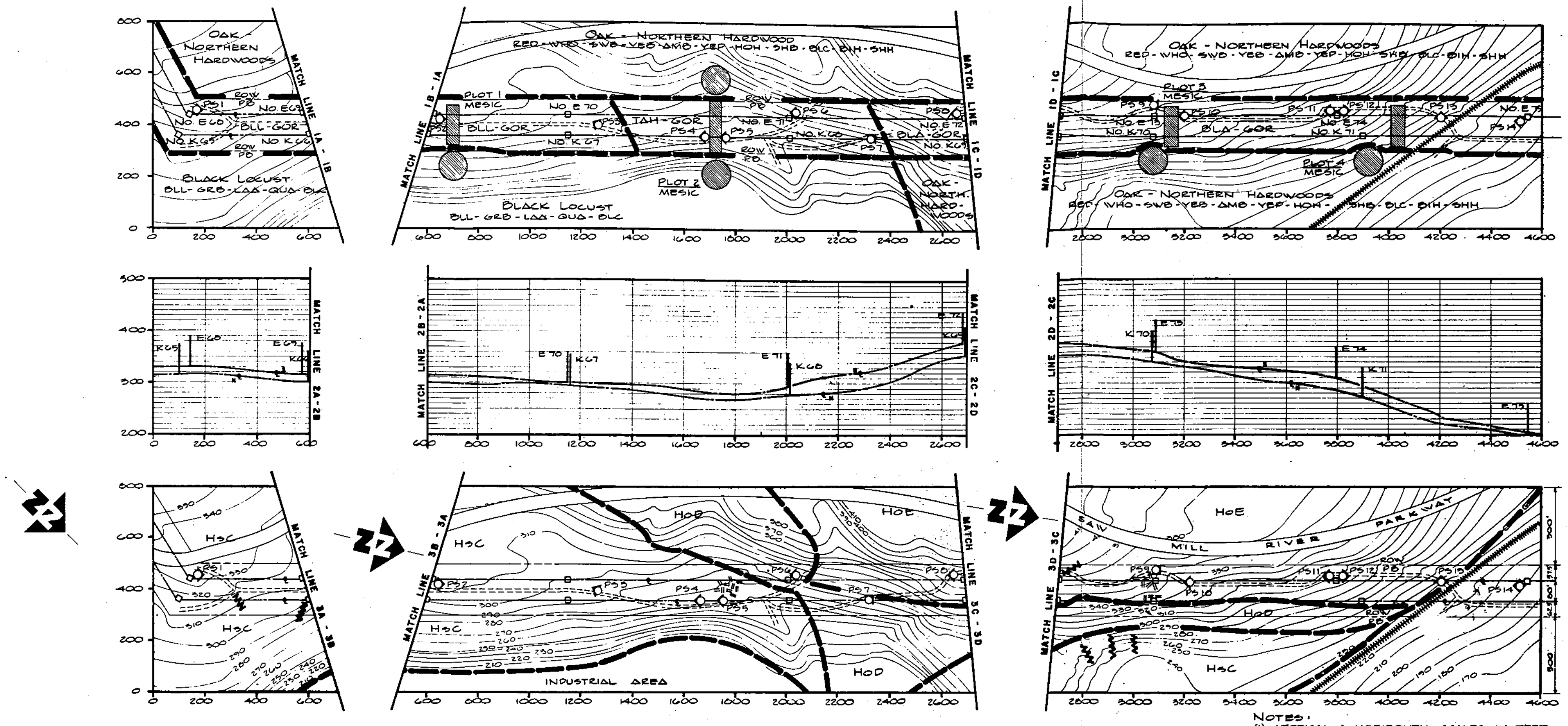
Fig. I.6. **Land use change.**

ASPLUNDH ENVIRONMENTAL SERVICES
BLAIR MILL ROAD
WILLOW GROVE, PA

VEGETATION

CENTERLINE PROFILE

SOILS



NOTES:
(1) VERTICAL & HORIZONTAL SCALES IN FEET.
(2) CONTOUR INTERVALS ARE 10 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 (23)
- DEPRESSION CONTOUR

SOIL SYMBOL AND NAME

HsC	HOLLIS	fine sandy loam (15 to 25% slope)
HoD	HOLLIS	very rocky fine sandy loam (25 to 35%)
HoE	HOLLIS	very rocky fine sandy loam (35 to 50%)

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. 19090

CONSOLIDATED EDISON - ENGINEERING PLAN & PROFILE

USGS 7.5 MIN TOPOGRAPHIC MAP WHITE PLAN, NY '67

USDA, SCS IN COOPERATION WITH CORNELL UNIVER AGR. EXP STA WESTCHESTER COUNTY SOIL AND WATER CONSERVATION DISTRICT

USDA-SCS, HYATTSVILLE, MD., WESTCHESTER CO. AIR PHOTO NO. 535 36119 174-163 (SCALE 1:35,000) 10/29/74

ASPLUNDH ENVIRONMENTAL SERVICES AES PROJECT NO. 81-0028 FIELD STUDIES 1975-76

SCALE: 1" = 200'-0"

200 100 0 100 200 400 800 1000

MAP 1.1

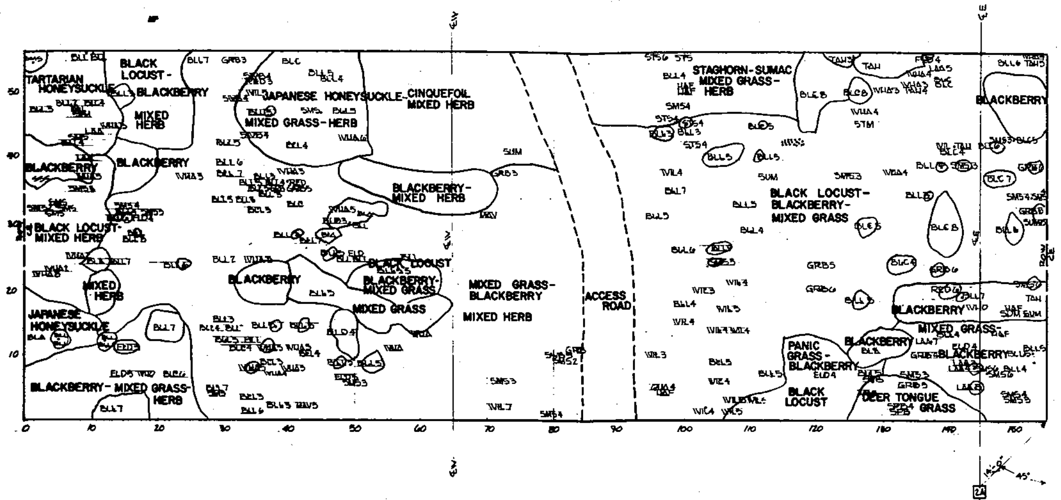
SITE 1

HABITAT CONDITIONS

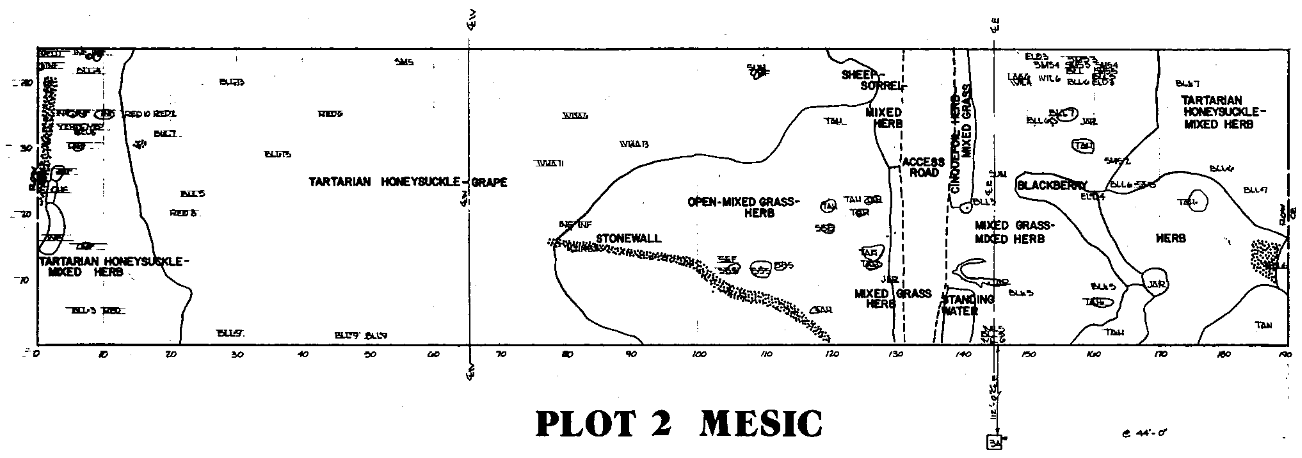
UTILITY: CONSOLIDATED EDISON

ROW DESCRIPTION: SPRAINBROOK TO EASTVIEW 345 KV

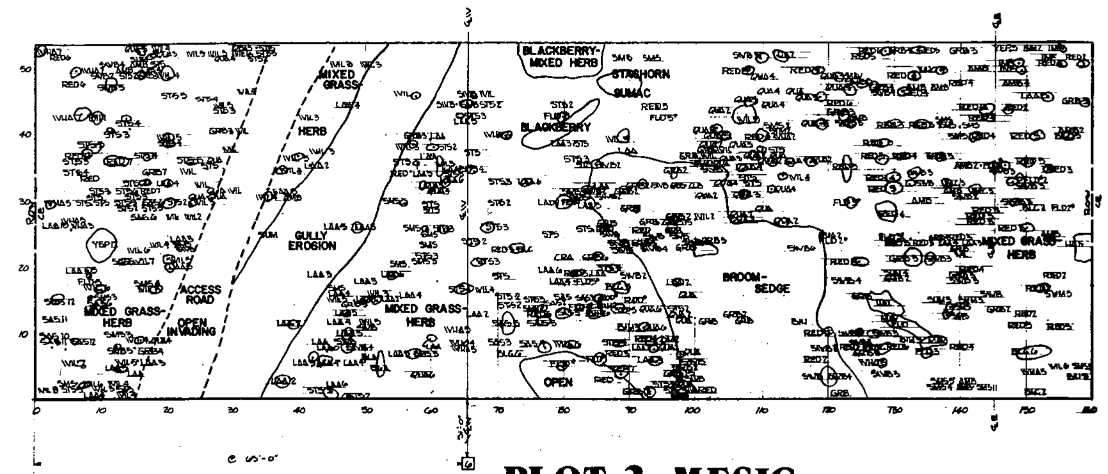
STEEL LATTICE 200 ROW



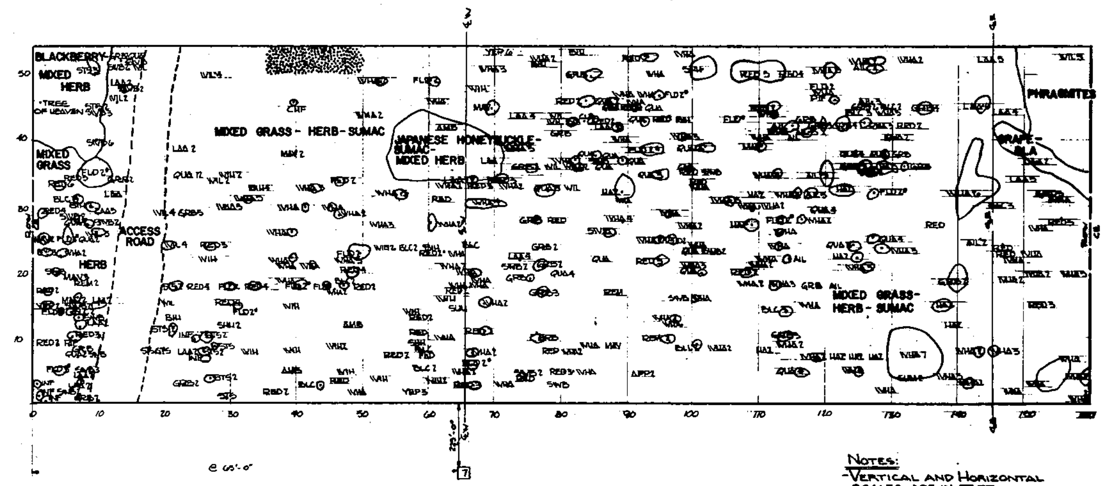
PLOT 1 MESIC



PLOT 2 MESIC



PLOT 3 MESIC



PLOT 4 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 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*
CIF	CINNAMON-FERN *Osmunda cinnamomea*
DEG	DEERTONGUE GRASS *Panicum clandestinum*
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HOT	HORSETAIL *Equisetum spp.*
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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 1.2

SITE 1

MAPPED PLOTS

UTILITY: CONSOLIDATED EDISON

ROW DESCRIPTION: SPRAINBROOK TO EASTVIEW 345 KV.

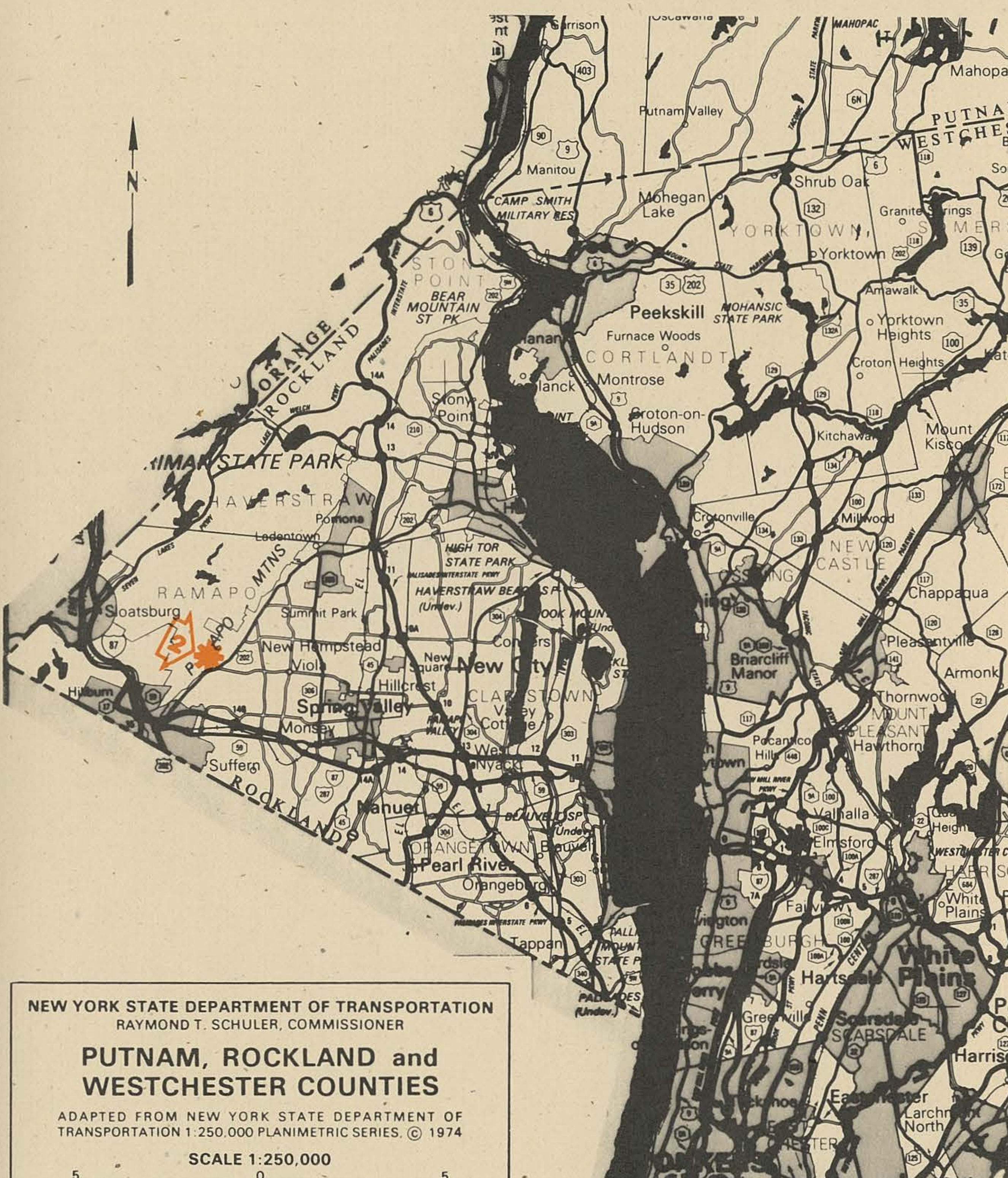
STEEL LATTICE 200' ROW.

SCALE: 1" = 10'-0"

10 5 0 5 10 20 40 50

SITE 2

RAMAPO to HUDSON RIVER



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

PUTNAM, ROCKLAND and WESTCHESTER COUNTIES

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

SCALE 1:250,000

5 0 5

STATUTE MILES

Site 2 Ramapo to Hudson River (PJM-West)

Study area extends from structure 2, near the substation, to structure 13 and is located in the proximity of a sanitary land fill near Suffern. To reach the area, proceed west on route 59 through Suffern and make a right turn onto Torne Valley Road (near beverage factory). Proceed on that road to the Ramapo Substation.

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Site 2 Ramapo to Hudson River (PJM-West)

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LIST OF FIGURES

LIST OF MAPS

Site 2 Ramapo to Hudson River (PJM-West)

1 Introduction

Site 2 is located in the New England Uplands physiographic area of New York (Cline, 1970), also termed the Hudson Hills subdivision (Thompson, 1966), in the Oak-Northern Hardwoods forest type area (Stout, 1958). The general landscape of the ROW and adjacent area is shown in Figs. 2.1.1 and 2.1.2.

The topography of the area is typically rolling to steep, rough and stony, with a great number of small lakes and reservoirs, and a relatively high proportion of forest cover. Elevations range between 100 and 1,500 feet (Stout, 1958).

Typical forest types of the region are Oaks, and Oak-Northern Hardwoods (Stout, 1958). Occurring on the site were Hemlock-Yellow Birch, Oak-Hickory, Chestnut-Oak and Oak-Northern Hardwoods forest types.

2 Location and Identification

Site 2 is approximately 1 mile northeast of the community of Ramapo, in the town of Ramapo, Rockland County, New York (74° 08' 00" W. Longitude; 41° 08' 30" N. Latitude).

The site is on the Ramapo to Hudson River (PJM-West) ROW which is operated by Orange and Rockland Utilities, Inc. (O&R). This easement varies in width from 150 feet from structures 2 through 8, to 100 feet from structures 6 through 13, and consists of 1 double curcuit, 345 kV line, on single steel pole structures. The project site is approximately 8,600 feet in length and extends from structure 2 at the Ramapo substation to include structure 13.

3 Background

The following discussion outlines documentable management techniques of clearing, construction, restoration, and maintenance for site 2, as received from O&R (letter dated October 20, 1975, from A. A. Benjamin, Orange and Rockland Utilities, Inc., Spring Valley, 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 selectively cleared during the winter of 1970 and 1971 and the stumps sprayed with 2,4,5-Trichlorophenoxyacetic acid (2,4,5-T) in oil.

Pole sites, areas 120 to 150 feet long by 80 feet wide, were completely cleared of all growth.

Additional clearing of the normally defined ROW was required at dead-end poles for wire stringing equipment positioning.

The hedgrow or tree blind (a minimum of 100 feet wide) was left on both sides of all traveled road crossings of the transmission line, and at the shore lines of lakes and ponds.

The strip of ROW 25 feet wide, 12.5 feet to the right and left of the center line of the transmission line, was cleared of all trees 4 inches and larger in diameter. The exceptions to this strip were hedgerows or tree blinds where trimming or topping (Fig. 2.1.3) was performed in order to secure the proper clearances.

In areas where clear-cutting was performed, all tree growth within the designated clearing limits was cut. Trees were limbed and tops removed. Exceptions for fruit trees, ornamental trees, vines, or shrubs were made.

Logs and limbs 4 inches in diameter and larger were classed as salvageable timber and were disposed of in accordance with each property owner's agreement.

On edges and banks of streams and other natural watercourses susceptible to erosion, clearing was done in such a manner as not to disturb the root structures of existing growth.

In low lying areas subjected to flooding from natural watercourses, the contractor moved all logs to ground above high water level and piled them off the ROW.

Equipment included a small tractor with a brush rake mounted on the front and winch on the rear. A log skidder was also used near the end of clearing of the study area. No other equipment other than saws, ropes, jeeps, and other light equipment was used.

Brush was burned in random piles the spring of 1971, along the ROW. The remaining brush was lopped and scattered. Some logs were piled at random locations along the ROW (Fig. 2.1.4). Others were lopped where felled.

Initial clearing costs ran about $3,600 per acre. This figure resulted from high contract bidding due to inaccurate knowledge of the number of danger trees. No additional cost data is available.

3.2 Construction

No information is available.

3.3 Restoration

Erosion control was done on an on-site basis and included placement of water bars, ditches, culverts, and gravel, as required during construction and after.

Hydroseeding was done with a Finn hydroseeder having a 3,00 gallon capacity. A Franklin log skidder was utilized for tagging the hydroseeder up steep slopes. Only half loads were used when tagging was necessary.

A Gradall was used for ditch lining.

Bulldozers were used to punch new roads through with a follow-up bulldozer for trimming and water bars. A laborer was in accompaniment of all equipment at all times to fine work ditches and water bars.

Ten-wheel dump trucks were used to haul gravel for road construction. During construction, graders were used intermittently to keep roads in good shape. Upon completion of construction, road banks were pulled back to at least 1 or 2 slope, it possible, and wearing surfaces of roads were narrowed to 12 or 15 feet.

Restoration costs for hydroseeding were $640 per acre (distrubed areas only). Costs of topsoiling on park property were not available on a per acre basis; however, it is believed to be about $22 per yard, in place. Normal restoration of construction debris, opening of ditches, placement of water bars, pulling back steep banks, and grading of access roads, generally ran $10,000 per mile. No additional information or cost data is available.

3.4 Maintenance

In 1973 and 1974, contractors performed removal and tree topping at road crossings during the fall and winter. Lop and scatter methods and spotty stump and basal chemical treatments were conducted over the remainder of the ROW.

The chemical used was Tordon 155 and oil at a rate of application of 1.5 to 98.5. It was applied during the fall and winter as a stump treatment of selectively removed trees and spotty basal treatment. Chain saws and backpack sprayers were used at an average cost of $150 an acre.

In 1975, maintenance was performed using the same treatments as 1973 and 1974. Cost of operations average $60 per acre. 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 2.1 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 2.1 and described in Appendix 17. Specific reference is made to some of these photo stations throughout the report and illustrated in Fig. 2.1. With the exception of aerial photography used to identify land use, older photographs depicting the area are not available.

The site is generally pleasing to view within the surrounding landscape. It is well vegetated and remains attractive throughout the seasons. Features within the area which may make the ROW somewhat sensitive to view include the adjacent state lands, which may attract people to the ROW for hunting or hiking. However, there is no evidence of great use on either the state land or ROW for recreational purposes. The ROW is somewhat visible, but only from 2 locations. From Route 17, which is well traveled, the site can only be seen by people proceeding south towards Suffern. The ROW site is also visible at a distance through a somewhat screened view, from a residential area on Babbling Brook Road at Route 202. Part of the site which extends up the adjacent hills is visible for some distance around, but much of the ROW is located out of view because of adjacent low areas or valleys. Most of the area is wooded. The potential number of people viewing the ROW is somewhat low, because the site is generally screened and not viewed by local residents or large numbers of motorists.

5 Field Studies - Results and Discussion

5.1 Soils

5.1.1 Geology and Soils

Site 2, Ramapo to Hudson River (PJM-West), is located in Rockland County in the southwestern corner of the New England Uplands (Cline, 1970), in the

Hudson Hills subdivision (Thompson, 1966), and in the Passaic River and Ramapo River drainage basins. Bedrock geology is of Precambrian age, pre 1,100 to 570 million years ago, consisting predominantly of metasedimentary and metavolcanic rocks such as gneisses, marble, and quartzite. Surficial geology is glacial drift, and soils in this area have developed in glacial till (Broughton et al., 1973; Goodman, 1970).

Soils on this site are classified in 2 orders. Those in the order Spodosols, suborder Orthods (Charlton and Hollis series), have leached surface horizons and accumulations of organic matter, iron, and aluminum in the subsurface horizons. Those in the order Inceptisols, suborder Aquepts (Leicester and Sun series), lack horizons of marked accumulation of clay and iron and aluminum oxides, and are wet (Soil Survey Staff, 1975; Buckman and Brady, 1969). The site is located in an area bordered by 2 broad associations, Wethersfield-Swartswood, comprised of deep, well-drained soils, and Hollis-Charlton, the soils of which are underlain by granite bedrock (Goodman, 1970). Brief descriptions (Goodman, 1970; Anon.,1972) of soil types occurring on the ROW study site (Map 2.1; Table 2.1) are:

Charlton very stony sandy loam (ChA, ChB, ChC, and ChD): These soils developed in glacial till dominated by granitic materials, and derived mainly from schist and gneiss; they occupy gently sloping to moderately steep areas of upland till plains. Extremely stony in nature, they may contain up to 240 cubic yards of stone per acre foot. The Charlton soils are deep and well drained. Soil reaction varies from very strongly to strongly acid; pH was 4.9 and 4.8 in the surface 3 inches on this site. Charlton very stony sandy loam is assigned to Woodland Suitability Group 4x3, designating moderate productivity for timber (Class 4) and stoniness (Subclass x) serving as a restriction or limitation for woodland use or management.

Hollis very rocky fine sandy loam (HrC, HrD, and HrE): Hollis soils developed in glacial till dominated by granitic materials, on gently sloping to steep bedrock-controlled landforms. They are shallow, and bedrock is usually within 20 inches of the surface. Small areas of deeper soil, seeps, and other wet patches occur. These soils are excessively drained to well drained, and bedrock outcrops are not unusual, ranging from less than 2 to as much as 50% of the surface. They are generally strongly acid, ranging in soil reaction from pH 4.5 to pH 5.5 throughout a typical profile; on this site soil reaction was pH 4.7 and pH 4.8 in the surface mineral soil. Hollis very rocky fine sandy loam is in Woodland Suitability Groups 5d2 and 5d3, designating low productivity and restricted rooting depth.

Sun-Leicester stony sandy loam (SlA): This is an undifferentiated soil group, and both Sun and Leicester soils occur. These soil areas are very stony, as stones comprise up to 50 cubic yards per acre foot. Both soils developed in glacial till, but that of the Sun soils is calcareous. Leicester soils normally occupy nearly level to very gently sloping, slightly concave uplands, while Sun soils are commonly found on nearly level areas or depressions within undulating to rolling till plains. Leicester soils are poorly drained to somewhat poorly drained; Sun soils are poorly to very poorly drained. For Leicester soils, the depth to the seasonal water table may be as much as 12 inches, while water is generally at the surface for Sun soils, and some areas of the latter may have from 6 to 18 inches of muck at the surface. Leicester soils are moderately acid, ranging from pH 4.5 to pH 5.5 throughout the first 30 inches, while Sun soils are slightly acid to neutral, ranging from pH 6.0 to pH 7.5; on this site, at 3 locations sampled, soil reaction was pH 5.2, pH 5.9, and pH 6.3 in the surface horizon. Both soils are in Woodland Suitability Group 4w1, indicating moderate productivity for woodland and excessive wetness.

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 upland locations. Average thickness of the organic layers and A1 horizon was based on 5 samples taken at each location (Table 2.2). 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 very shallow A1". Organic layers, other than litter, on the ROW were nearly equivalent to those in the woodland. Organic layers in the woods were composed primarily of tree parts (leaves, twigs, and fruits) in contrast to the leaves and stems of grasses, herbs, and shrubs on the ROW.

Based on 4 samples on mesic and xeric habitats, it appears that ROW construction and maintenance for brush control did not change the humus type on the general ROW, but did result in a thinner litter layer. 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 Ramapo to Hudson River (PJM-West) study area in September of 1976. Except for moderate sheet and rill erosion on 1 steep slope, no active erosion was evident in the woodland on all soil types and slopes. This is 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, except in 1 instance where some slight sheet erosion was observed. Good vegetation cover, composed of grasses, herbs, and low shrubs, had developed on the general ROW following clearing and maintenance treatments for brush control and a protective litter mulch from these plant parts was present (Table 2.2).

Eroding areas were identified as to location on the ROW, soil type, average slope, and present plant cover (Table 2.3). Erosion was classified as to kind (sheet, rill, gully) and class (slight, moderate, severe); average depth of gullies was recorded and locations of major gullies were plotted on the site habitat conditions map (Map 2.1). 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 tower sites (Fig. 2.1.5). Similarly, moderate sheet, rill, and gully erosion was observed on an access road in the forest. Erosion and sedimentation conditions on stream banks are discussed in the section on water quality.

There was restoration in the form of seeding following construction of this ROW. However, this was not successful on some areas, particularly steep slopes, and active erosion occurred. Evaluation of seeding and natural plant invasion on disturbed areas of the ROW are discussed further in the section on "Special Studies", (Volume 1, Section 5).

5.2 Vegetation

5.2.1 Habitat and Forest Types on the Site

Hydric Habitat The hydric, or wet, habitat was located in a stream bottom tom. Slope was negligible and aspect was flat. Drainage was impeded and marsh conditions have developed. The forest type was Hemlock-Yellow Birch.

Mesic Habitat The mesic, or medium moist, habitat was located on the lower slope of an upland area in the Ramapo Mountains. Slope was approximately 10%. Drainage was free but not excessive. The forest type was Oak-Hickory.

Xeric Habitat The xeric, or dry, habitat was located on the middle of a steep mountain. Slope was approximately 20%. Drainage was excessive. The forest type was Chestnut-Oak.

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, 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 treatments (Fig. 2.2).

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 2.4). Obviously hemlock and yellow birch were important species on the hydric plot, while red oak was an important species on the mesic plot, and chestnut-oak and red oak were important on the xeric plot.

On the hydric habitat, a Hemlock-Yellow Birch forest type was changed to a Willow-Sensitive Fern plant community. On the mesic habitat an Oak-Hickory forest type was changed to a Blackberry-Goldenrod plant community, and on the xeric habitat a Chestnut-Oak forest type was changed to a Blueberry-Sweet-fern plant community (Map 2.1; Table 2.5).

Quantitative Changes There was a major increase in the number of shrub and herb species on the hydric, mesic, and xeric habitats on the ROW as compared to the adjacent forest (Table 2.5; Figs. 2.3 and 2.4). On the hydric habitat, there were 8 shrubs and 27 herbs on the ROW as compared to 3 shrubs and 15 herbs in the forest. On the mesic habitat, there were 9 shrubs and 17 herbs on the ROW, as compared to 1 shrub and 4 herbs in the forest. On the xeric habitat, there were 8 shrubs and 12 herbs on the ROW as compared to 3 shrubs and 2 herbs in the forest (Table 2.5).

Qualitative Changes On the hydric habitat, 11 shrub and herb species occurred both in the forest and on the ROW (Fig. 2.5), while no shrubs and 7 herbs appeared in the forest but not on the ROW (Table 2.6). On the other hand, 5 shrubs, willow, spiraea, elderberry, blackberry, and Virginia creeper, occurred on the ROW but not in the forest, and 19 herbs also occurred on the ROW but not in the forest (Table 2.7).

On the mesic habitat, 4 shrub and herb species occurred both in the forest and on the ROW (Fig. 2.5), while no shrubs and 1 herb appeared in the forest but not on the ROW (Table 2.6). On the other hand, 5 shrubs, including a large amount of blackberry, occurred on the ROW but not in the forest. Similarly, 14 herbs occurred only on the ROW (Table 2.7).

On the xeric habitat, 3 shrubs and herb species occurred both in the forest and on the ROW (Fig. 2.5), while no shrubs and 2 herbs appeared in the forest but not on the ROW (Table 2.6). On the other hand, 5 shrubs, including a large amount of sweet-fern, occurred on the ROW but not in the forest. Twelve herbs also occurred on the ROW but not in the forest (Table 2.7).

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

Table 2.8 presents a breakdown of major vegetational communities (Map 2.2) for the hydric, mesic, and xeric plots on the Ramapo to Hudson River (PJM-West) ROW. Much of the present composition of herbaceous and woody plant communities reflects the treatment history. The ROW was selectively cleared during the winter of 1970 and 1971 and the stumps sprayed with 2,4,5-Trichlorophenoxyacetic acid (2,4,5-T) in oil. In 1973 to 1974 lop and scatter methods and spotty stump and basal chemical treatments were performed. The chemical was Tordon 155 and oil. The same treatment was repeated in 1975.

The major vegetational community on the hydric plot was Sedge-Mixed Grass-Herb with Reed (Phragmites sp.) prominant. On the mesic plot, the major plant community was Mixed Grass-Herb with blueberry, blackberry, and hay-scented fern prominant. On the xeric plot, the major plat community was Lowbush Blueberry-Mixed Grass with mountain-laurel and sweet-fern prominent.

The vegetation on the hydric plot appears to have been fairly extensively influenced by the presence of the ROW and its management techniques. It may well be that the piling of logs on both sides of the ROW in this area scarified the site, and thus contributed to more hydric conditions. The plant species which exist here are light-loving and many will continue to thrive under the present ROW maintenance.

Those plant communities on the mesic and xeric plots also are mainly light-loving species and many will probably survive and expand under the present management program.

5.2.4 Comparison of Forest Type with ROW Vegetation

The ROW was selectively cut in 1970 to 1971 and the stumps were treated with 2,4,5-T in oil. Maintenance was performed in 1973 to 1974 by lopping and scattering undesirable material, and spotty stump and basal chemical treatment were applied. The same treatment was repeated in 1975.

The general impact of the ROW was to change the forest types (Chestnut-Oak, Oak-Hickory, and Hemlock-Yellow Birch) to shrub-herb-grass communities. Some species of the forest were replaced by plants favored by open conditions.

On the hydric habitat, which was formerly occupied by a Hemlock-Yellow Birch forest type, a Willow-Sensitive Fern community was produced.

There was a 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; e.g., a large amount of willow and spiraea occurred on the ROW but was absent from the forest. It may be noted that many of the shrub and herb species in the forest are more mesic in character than those on the ROW. This may be due to the fact that the ROW became more hydric due to the initial tree removal.

On the mesic habitat, which was formerly occupied by an Oak-Hickory forest type, a Blackberry-Goldenrod plant community developed. There was a marked 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, as evidenced by the large amount of blackberry which occurred on the ROW but not in the forest (Table 2.5).

On the xeric habitat, which was formerly occupied by a Chestnut-Oak forest type, a Blueberry-Sweet-fern community was produced. There was a major increase in the number of 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 as evidenced by large amounts of sweet-fern which occurred on the ROW but not in the forest (Table 2.5).

A number of trees in the Hemlock-Yellow Birch forest, most notably hemlocks, were topped during line clearing. In general, most of the smaller trees left on the line area were of lower crown class positions, with low vigor. Many of these have died from exposure. Those trees with higher vigor prior to ROW establishment have responded favorably to the increased light (See Volume 1, Section 5, "Special Studies").

5.3 Wildlife

The major game species for site 2, Ramapo to Hudson River, 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

<u>White-tailed Deer</u> One deer skeleton was observed on the ROW southeast of structure 2 during the spring of 1975.

During the fall of 1975, 8 deer were observed crossing the ROW between structures 5 and 6. Two more deer were seen crossing the ROW between structures 7 and 8.

During the winter, deer tracks were found in moderate abundance on the access road near structure 3 and in the south woods near structure 5 (Fig. 2.1.6).

One deer bed as observed on mesic plot 2 and deer pellet groups were moderate to heavy both on and off the ROW at all 3 study locations during the spring of 1976. Three deer were crossing the ROW, in a heavy cover of recently burned mountain-laurel, between structures 7 and 8 at this time. Deer gnawings were heavy on dogwood on plot 2 on the ROW.

<u>Browse Survey</u> Six browse transects were established on O&R ROW study area 2 (Tables 2.9 and 2.10; Fig. 2.6). These transects were established at each permanent study plot location, with 1 transect on each side of the ROW, on March 20, 1976.

Overall browse utilization by percentage of actual use was fairly consistent between the ROW, ROW edge, and woods. However, there were more woody stems available at the ROW edge and on the ROW, than in the woods. There were also more woody stems taken by deer at the ROW edge and on the ROW, than in the interior adjacent woods (Table 2.9; Fig. 2.6).

Lowbush blueberry far surpassed all other species insofar as total abundance and amount used for browse is concerned (Table 2.9). Of the total of 356 stems, blueberry comprised 137, and of those, 103 stems were browsed.

Sweet and yellow birches were second in importance, with a total of 67 stems available. Of the 67 stems, 28 were taken by deer. Blackberry was the third most abundant browse plant available, having 48 stems available for browse; however, only 8 of those stems were utilized (Table 2.10).

Gray Squirrel One gray squirrel was observed near photo station 6 during the summer of 1975. Two squirrels were seen in the fall of the year; 1 was feeding in the woods near structure 8 and the other was flushed from the access road near structure 9.

Squirrel tracks were moderately abundant, during the winter, at the ROW edge on the access road near structure 6 and in the south woods between structures 6 and 7.

No other squirrel activity was noted for the remainder of the study.

Raccoon No raccoon activity was observed during the period of the study.

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 2.11.

One ruffed grouse was flushed from a cover of maple-leaved viburnum during the fall of 1975. The bird was located in the forest adjacent to structure 8.

During the spring of 1976, tadpoles were observed swimming in a wet area on hydric plot 1. A cooper's hawk nest was observed at this time in the trees to the north of structure 4. There was evidence of horseback riding on the access road at this time. A swallowtail butterfly was seen flying on the ROW at this time. Cottontail rabbit pellets were slightly abundant on xeric plot 3 and were moderately abundant on mesic plot 2 on the ROW.

5.3.2 Potential Use

Potential wildlife use of the plant species present on site 2 for the 2 major game species, deer, squirrel, and raccoon, is contained in Table 2.12 (Martin et. al., 1951). 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 that game species. Asterisk ratings for the Northeast for raccoons and for the East for squirrels are also listed (Martin et al., 1951).

5.4 Water

Torne Brook on the Ramapo to Hudson River site was sampled for water quality on September 23, 1975, and February 3, May 11, and August 5, 1976 (Table 2.13, Map 2.1).

5.4.1 Stream Description and Sampling Points

Torne Brook is located in the Passaic River Basin and originates in Harriman State Park. At the ROW the brook is a second order stream (Hynes, 1970) and the gradient is 1.3%. About 1.3 miles downstream from the ROW the brook enters the Ramapo River, 2.4 miles upriver of the New York-New Jersey border.

Sampling locations on Torne Brook were sited as follows:

1. 100 yards upstream, northeast, of the ROW;

2. mid ROW;
3. 50 yards downstream, southwest, of the ROW;
4. 200 yards downstream, southwest, of the ROW (Map 2.1).

Boulders, rubble, gravel, sand, and, in still water, a light covering of organic material, form the substrate (Environmental Protection Agency, 1973). Boulders, fallen logs, and roots are common sediment traps; a piece of sheet metal functions as a trap at location 4.

Vegetation at locations 1, 3, and 4 is similar. Overstory vegetation such as hemlock, yellow birch, tulip-poplar, red maple, and red oak shade the brook. Other common vegetation includes striped maple, sedge, twisted-stalk, and mosses and ferns. At location 2, partial shading of the stream is provided by yellow birch and topped hemlock. Red and striped maples, mountain-laurel, wild lily-of-the-valley, sedge, mixed grasses, and mosses are found along the brook.

Reeds (Phragmites sp.) dominate a wet area on the ROW southeast of the brook. This area may receive overflow from Torne Brook during high water, but most water apparently comes from seepage. A small stream enters Torne Brook from the east between locations 3 and 4. This stream receives most of the runoff from the ROW east of Torne Brook to the top of the ridge. Near the base of this slope the stream flows through a culvert under the access road and drains the reed (Phragmites sp.) area before entering the brook.

Between locations 2 and 3, Torne Brook divides and 2 channels are formed. The channels unite at location 4.

The study area is utilized by wildlife, hunters, hikers, and campers. The "official classification" assigned by the New York Department of State is Class B, Bathing and/or Recreation.

5.4.2 Analysis of Water Quality

Site 2 was sampled from 6:30 to 8:35 a.m. on September 23, 1975 (Table 2.13). Although rain preceded sampling for 12 hours, the stream was clear. Depth at locations 1, 2, 3, and 4 was 12, 12, 14, and 14 inches and width was 16.0, 18.5, 13.5, and 19.5 feet, respectively. Water temperature was nearly constant, 12.7 C at locations 2 and 3 and 12.8 C at locations 1 and 4. Dissolved oxygen concentration and percent saturation were high, and ranged from 10.7 to 10.9 ppm and 106 to 108%, respectively. The pH was nearly constant, and ranged from 6.6 to 6.7. Sediment stakes were placed at 4 locations.

On February 3, 1976, from 2:55 to 3:55 p.m., it was clear and sunny and air temperature was -8 C (Table 2.13). Snow up to 6 inches in depth covered the site and ice was present in the Brook and along the shore. Depth at locations 1, 2, 3, and 4 was 18, 24, 24, and 30 inches, and estimated width at locations 2, 3, and 4 was 18.5, 13.5, and 19.5 feet, respectively. Water temperature was near freezing. Dissolved oxygen concentration and percent saturation were high, and ranged from 13.8 to 15.4 ppm and 98 to 109%, respectively. The pH ranged from 5.1 to 5.9, and no sediment was found.

On May 11, 1976, from 9:30 to 11:00 a.m., it was clear and sunny and air temperature ranged from 18 to 22 C (Table 2.13). Depth at locations 1, 2, 3, and 4 was 12, 8, 11, and 12 inches, and width was 21.0, 19.0, 13.5, and 19.5 feet, respectively.

Water temperature increased from 10.2 C at location 1 to 10.5 C at location 2 and 11.0 C at locations 3 and 4. Dissolved oxygen concentration and percent saturation were high, and ranged from 10.6 to 11.3 ppm and from 100 to 106%, respectively. The pH ranged from 5.5 to 6.0. Sediment stakes were absent at locations 1 and 3, but sediment was not observed. No sediment was measured at location 2, and 1 inch of sand and gravel formed the sediment that accumulated at location 4.

On August 5, 1976, from 2:00 to 2:35 p.m., it was sunny and the air temperature was 29 C (Table 2.13). Depth at locations 1, 2, 3, and 4 was 10, 5, 9, and 11 inches, and width was 15.0, 16.0, 10.0, and 9.5 feet, respectively. Water temperature ranged from 17.0 C at locations 2 and 4 to 18.5 C at location 1. Dissolved oxygen concentration and percent saturation were high, and ranged from 8.4 to 9.4 ppm and 93 to 103%, respectively. The pH ranged from 5.7 to 6.5. No sediment was present.

Fish were observed in Torne Brook but no positive identification was made.

No sampling location was sited on the small stream that enters Torne Brook from the east between locations 3 and 4. However, the following observations were made:

1. Sedimentation was severe downstream of the access road;
2. the stream receives runoff from the ROW uphill of the access road, the access road, the the adjacent woods;
3. the culvert under the access road was undersized;
4. the location of the culvert would prevent upstream migration of fish.

5.5 Land Use

5.5.1 Location

Site 2 is located in a rural nonfarm section of the town of Ramapo, Rockland County, New York. Between 1960 and 1970 there was a 68.1% increase in population of Rockland County with a 1970 distribution of 96.2% urban, 3.7% rural nonfarm, and .1% rural farm (U.S. Bureau of the Census, 1972). The closest community is Ramapo which is approximately 1 mile to the southwest.

5.5.2 Land use Prior to Construction

The ROW was constructed during the years of 1970 to 1971. The earliest available date obtained from 1967 aerial photography indicates that the land adjacent to the ROW was primarily rural nonfarm (Table 2.14; Fig. 2.7). Land use distribution included the following subtypes:

Extractive Industry:
- Eg - Sand and gravel pits

Forest Land:
- Fn - Forest lands

Non-productive Land:
- Nr - Exposed rock cliff, rock slopes, and slide areas

Outdoor Recreation:
- Or - Outdoor recreation

Water Resources:
- Ww - Wooded wetlands

5.5.3 Land Use After Construction

The adjacent land use to site 2 has changed from the 1967 data, with an increase in transportation (utility) uses and a decrease in forested areas. With the increase in population of Rockland County, it has been defined as urban though the area adjacent to site 2 is defined as rural nonfarm (Table 2.14; Fig. 2.7), with a land use distribution that includes the following subtypes:

Extractive Industry:
Eg - Sand and gravel pits

Forest Land:
Fn - Forest lands

Non-productive Land:
Nr - Exposed rock cliff, rock slopes, and slide areas

Outdoor Recreation:
Or - Outdoor recreation

Transporation:
Tt - Communications and utilities

Water Resources:
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 hunting 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 area is characterized by hilly, strongly sloping terrain with granite rock outcrops and high stone content in the soil. There are 2 major upland soil series, Charlton and Hollis, each with several slope-phrase mapping units. Lowland and depressional areas bording Torne Brook and intermittent seeps consist of an undifferentiated soil complex, Sun-Leicester series, that are poorly drained and exhibit a high seasonal water table.

Active sheet and rill erosion was observed at only 1 upland location in the adjacent forest, a 40% slope with light litter cover. Otherwise the soil surface was protected by tree, shrub, and ground layersand a forest floor composed of fresh and decomposed organic matter, duff mull humus type, with no evidence of erosion.

Charlton and Hollis sandy loam and fine sandy loam, respectively, support Chestnut-Oak on the dry ridge tops and upper slopes and Oak-Hickory on lower slopes, benches, and saddles. The deep Charlton soils are rated moderate and the shallow Hollis soils low for woodland productivity. The poorly drained Sun-Leicester sandy loam soils have moderate woodland productivity and support a Hemlock-Yellow Birch forest type. It is probable that this reflects soil-forest type relationships existing prior to ROW construction in 1970.

6.1.2 Vegetation

The study area was completely forested prior to ROW clearing in 1970 to 1971. Stands on xeric sites were primarily Chestnut-Oak type. On mesic sites mixtures of Oak-Hickory were the predominant cover. Red maple, red oak, black cherry and shagbark-hickory were prominent species. On hydric sites Hemlock-Yellow Birch was the major forest type.

There is no indication that any part of the study area was in agriculture or old field for many years prior to selective clearing of 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 that currently occupy the site, i.e., white-tailed deer, gray squirrel, 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, 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

Earliest data available prior to construction of the ROW in 1970 and 1971 is 1967 aerial photography. The ROW and adjacent land area was rural nonfarm with a land use distribution of forest land (27.7%), extractive industry (1.2%), non-productive (4.0%), outdoor recreation (65.6%), and water resources (1.6%).

6.2 Conditions Which Exist at Present

6.2.1 Soils

Physiography and soil types on the ROW coincide with those in the adjacent forest, with soil-type boundaries being closely related to relief position, slope, steepness, and drainage patterns. Dominant ROW plant communities are closely associated with soil types on the 3 moisture regimes. Spiraea-Reed developed on the seasonally wet Sun-Leicester soil complex; Blueberry-Sweet-fern and Blackberry-Sweet-fern on dry, upper-slope segments of both Charlton and Hollis soils; and Blackberry-Goldenrod and some mountain-laurel on mesic relief positions of Hollis and Charlton soils, respectively.

Upland soils on the general ROW, areas relatively undisturbed by ROW management activities, are well stabilized by natural shrub-herb-grass vegetation and organic mulch classified as a duff mull humus type. Active erosion was minimal on the general ROW and limited to slight sheet erosion on a steep slope segment of Hollis fine sandy loam. However, active erosion was observed on several sloping segments (8 to 30% gradients) of the access road and 4 tower sites, especially sites where deep bank cuts were necessary to attain desired footing for structure support. Although these disturbed areas were hydroseeded following ROW construction, much of the soil surface on steeper slopes is bare or sparsely vegetated; thus, exposed mineral soil is subject to high erosion potential. Most soil particles moved in erosion were deposited on lower slopes of the ROW; however, some occurred as sediments in Torne Brook and adjacent wet areas.

6.2.2 Vegetation

Selective clearing and topping have resulted in a wide variety of conditions on this ROW. In some locations it was possible to leave many of the trees, while in other situations most trees were removed. Thus tree cover varies from moderately dense to nearly open. Most of the smaller trees left on the line area were trees of lower crown class positions and thus of low vigor. Many of these have died from exposure. Other trees, of higher vigor prior to corridor establishment, have responded to the increased light and are growing rapidly.

In most parts of the study area selective clearing and topping have allowed sufficient light to reach the forest floor so that many shade intolerant plants, shrubs, and tree seedlings have become established. These, along with species originally present prior to line clearing, form the present vegetational cover.

Major plant communities on hydric sites are various mixtures of sedges, herbs, and grasses with small centers of cinnamon-fern and reed. Mesic sites support a variety of communities with Blackberry-Hay-scented Fern, Mixed Grass-Sedge, and Mixed Grass-Herb communities particularly prominent. Tree seedlings and saplings are abundant in communities on mesic sites.

Mountain-laurel is a conspicuous shrub on xeric sites. In most cases this shrub has persisted from the understory of the previous stand and has increased in size and vigor due to the greater light afforded by selective clearing. Other prominent xeric site communities are sweet-fern and blueberry.

6.2.3 Wildlife

White-tailed deer, gray squirrel, and raccoon are the major game animals that currently occupy the study area. Indirect observations, i.e., a skeleton, tracks, browse, a deer bed, and pellets, and direct observations of white-tailed deer indicated their use of the ROW area. Browse surveys indicated that more stems were available at the ROW edge and on the ROW than in the interior woods. Blueberry far surpassed all other species in total abundance, and was heavily browsed. Among those species that were highly utilized by deer were birches (sweet and yellow), maple-leaved viburnum, red oak, striped maple, and sweet-fern.

Gray squirrels and their tracks were seen on the ROW and in the adjacent forest. No raccoon activity was noted. A variety of other animals were observed, 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

Off the ROW, Torne Brook is shaded by overstory vegetation in a Hemlock-Yellow Birch forest. The stream cuts the forest floor and boulders, rubble, gravel, and sand comprise the substrate.

On the ROW, the Brook receives partial shade from trees, shrubs, and herbs. The substrate is similar to that off the ROW, and herbs stablize the banks.

6.2.5 Land Use

Presently, the adjacent land uses to site 2 have had a minimal change from the 1967 data. The ROW and the adjacent land area is still considered to be rural nonfarm with a distribution of forest land (26.5%), extractive industry (1.2%), non-productive (3.8%), outdoor recreation (65.5%), water resources (1.6%), and transportation (1.4%). With reference to the total area involved, shifts in land use are noted as follows:

Forest Land -	-1.2%
Extractive Industry -	no change
Non-productive -	- .2%
Outdoor Recreation -	- .1%
Water Resources -	no change
Transportation -	+1.4%

Land use of transportation (utility)(1.4%) is a new type which was not present in 1967. In addition to use of the ROW for the transmission of electrical power, portions of the ROW are currently being used for hunting and hiking.

6.3 Environmental Effect and Probable Causes

6.3.1 Soils

The most serious effect of ROW construction and maintenance is the disturbance and exposure of mineral soil on access roads and tower sites leading to subsequent soil erosion. Due to strongly sloping topography on this ROW, grading for several tower sites and segments of the access road required deep bank cuts that exposed subsoil horizons and parent geologic material. These areas have not been stabilized by natural plant invasion or through restoration by direct seeding. It is likely that progressive active erosion further interfered with plant establishment on these areas.

A secondary impact related to mineral soil exposure and erosion is the accumulation of eroded soil particles on lower slopes of the ROW and deposition directly into the stream crossing the ROW.

Also, the litter layer resulting from organic matter deposits was only one-half as thick on the ROW as in the adjacent forest, while other organic layers and A1 horizon were equivalent. Origin of organic materials varied from tree parts in the forest to leaves and stems of shrubs, herbs, and grasses on the ROW. The thin duff mull humus type present on the general ROW and in the forest provided an effective organic mulch on the soil surface.

6.3.2 Vegetation

The general impact of ROW management was to produce a Willow-Sensitive Fern plant community on the hydric habitat from a Hemlock-Yellow Birch forest type; a Blackberry-Goldenrod community from an Oak-Hickory type on the mesic habitat; and a Blueberry-Sweet-fern community from a Chestnut-Oak forest type on the xeric habitat.

The number of shrub and herb species (species diversity) increased on the ROW as compared with the adjacent forest on all habitats.

Important differences occurred in kinds of plants on the ROW and in the forest, although a number of species occurred on both. Such important shrubs as blackberry, spiraea, elderberry, sweet-fern, and hazelnut were found only 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

From observation and analysis of the available data, the ROW had no detrimental effect on the water quality in Torne Brook. Protection of the stream bank during ROW construction, selective cutting, and the swift flowing brook minimize impact of the ROW.

Increase of water temperature during this study was insignificant and downstream effect was limited; maximum increase in temperature was 1.0 C and it returned to ambient upstream of location 4.

Dissolved oxygen concentration and percent saturation were high, indicting good water quality, and ranged from 8.4 to 15.4 ppm and 93 to 109%, respectively.

The pH ranged from 5.1 to 6.7 and indicated the water was acidic.

Line Management Factors Special construction and clearing methods applied near Torne Brook resulted in minimal effect on water quality.

Other Influences Special construction methods near Torne Brook minimized the effect of the ROW on water quality.

Excessive sedimentation was observable downstream of the access road in the small stream that enters Torne Brook between sampling locations 3 and 4.

Use of the access road by "off-the-road" recreation vehicles may accelerate erosion.

6.3.5 Land Use

Changes within the area may be attributed to other changing land use characteristics in Rockland County. The inventoried area has remained rural nonfarm, though the county has changed to urban in character. Portions of the ROW and the adjacent land to the ROW are being utilized for hunting and hiking.

Table 2.1. Soil series present on the Ramapo to Hudson River study area.

Soil Series	Map Symbol[1]	Drainage Class[2]	Surface Soil pH	Surface Soil Texture	Woodland Suitability Group
Charlton	ChA	G	4.9	very stony sandy loam	4x3
Charlton	ChB	G	4.9	very stony sandy loam	4x3
Charlton	ChC	G	4.8	very stony sandy loam	4x3
Charlton	ChD	G	4.8	very stony sandy loam	4x3
Hollis	HrC	G-E	4.7	very rocky fine sandy loam	5d2
Hollis	HrE	G-E	4.8	very rocky fine sandy loam	5d3
Sun-Leicester	SlA	SPD-VPD	5.2, 5.9, 6.3	stony sandy loam	4wl

[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 darined, ID = imperfectly drained, MG = moderately good, G = good, E = excellent (excessive).

Table 2.2. Average thickness of organic layers and A1 horizon and humus types for mesic and xeric sites on ROW and adjacent woodland at site 2.

Moisture Regime	Location	Layer Thickness (in.) L	F	H	A1	Humus Type
1. Mesic (2)[1]	ROW	.5	.2	.4	.5	Thin duff mull with very shallow A1
	Woodland	1.1	.3	.4	.6	Thin duff mull with very shallow A1
2. Mesic	ROW	.5	.1	.4	.6	Thin duff mull with very shallow A1
	Woodland	1.0	.3	.4	.5	Thin duff mull with very shallow A1
All Mesic Plots Combined	ROW	.5	.2	.4	.6	Thin duff mull with very shallow A1
	Woodland	1.1	.3	.4	.6	Thin duff mull with very shallow A1
3. Xeric (3)	ROW	.6	.3	.3	.3	Thin duff mull with very shallow A1
	Woodland	.9	.2	.4	.4	Thin duff mull with very shallow A1
4. Xeric	ROW	.4	.3	.4	.5	Thin duff mull with very shallow A1
	Woodland	.9	.2	.2	.7	Thin duff mull with very shallow A1
All Xeric Plots Combined	ROW	.5	.3	.4	.4	Thin duff mull with very shallow A1
	Woodland	.9	.2	.3	.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 2.3. Areas exhibiting actual erosion in September, 1976, on the Ramapo to Hudson River 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	Hollis very rocky fine sandy loam	32	Shrub-herb	Sheet	Slight	-
Tower Site/Bank Cut	Charlton very stony silt loam	53	Bare	Sheet & Rill	Severe	-
Tower Site	Charlton very stony silt loam	12	Bare with grass-herb	Sheet & Rill	Slight	-
Tower Site/Bank Cut	Hollis very rocky fine sandy loam	29	Bare with sweet-herb	Sheet	Moderate	-
Tower Site	Hollis very rocky fine sandy loam	12	Bare with grass-herb	Sheet	Slight	-
Tower Site	Hollis very rocky fine sandy loam	50	Bare with grass-herb	Sheet & Rill	Moderate	-
Tower Site	Hollis very rocky fine sandy loam	2	Bare	Sheet & Rill	Slight	-
Access Road/Ditch	Charlton very stony silt loam	10	Bare with seeded grass	Gully	Slight-Moderate	8
Access Road/Ditch	Charlton very stony silt loam	8	Seeded grass	Gully	Slight-Moderate	8

Table 2.3. Continued

Location	Soil Type	Average Slope (%)	Plant Cover	Erosion on Site: Kind	Erosion on Site: Class	Erosion on Site: Gully Depth (in.)
Access Road	Charlton very stony silt loam	8	Grass-herb	Sheet, Rill, & Gully	Slight	3
Access Road	Hollis very rocky fine sandy loam	25	Bare	Sheet & Gully	Severe	12
Access Road	Hollis very rocky fine sandy loam	20	Bare	Gully	Severe	0-18
Bank from Road to Stream	Charlton very stony silt loam	25	Grass-herb	Sheet	Slight	-
		FOREST				
General Forest	Hollis very rocky fine sandy loam	40	Bare with shrub-litter	Sheet & Rill	Moderate	-
Access Road	Hollis very rocky fine sandy loam	30	Bare	Sheet, Rill, & Gully	Moderate	6-12

Table 2.4. 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)	Hemlock	43.87	24	67.87
	Yellow Birch	25.43	24	49.43
	Red Maple	23.01	19	42.01
	Tulip-Poplar	1.83	13	14.83
	Red Oak	3.41	5	8.41
	Black Gum	1.83	5	6.83
	Beech	.38	5	5.38
	Sweet Birch	.24	5	5.24
Mesic (2)	Red Oak	63.03	42	105.03
	Sweet Birch	23.37	21	44.37
	Chestnut-Oak	11.59	25	36.59
	Red Maple	1.85	8	9.85
	Sugar-Maple	.16	4	4.16
Xeric (3)	Red Oak	48.21	53	101.21
	Chestnut-Oak	51.50	40	91.50
	Red Maple	.29	7	7.29

Table 2.5. 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) 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.
Tree Layer						
Hemlock	2.1	-	-	-	-	-
Red Maple	1.1	-	+.1	-	++.1	-
Yellow Birch	1.1	-	-	-	-	-
Tulip-Poplar	1.1	-	-	-	-	-
Beech	++.1	-	-	-	-	-
Sweet Birch	++.1	-	1.1	-	-	-
Black Gum	++.1	-	-	-	-	-
Red Oak	++.1	-	2.1	-	2.1	-
Chestnut-Oak	-	-	1.1	-	2.1	-
Sugar-Maple	-	-	++.1	-	-	-
No. Species	8	0	5	0	3	0
Shrub Layer						
Striped Maple	(+.1)	++.1	-	-	-	-
Blueberry	+.1	+.2	3.3	1.2	2.3	3.4
Witch-Hazel	+.1	(+.1)	-	+.1	-	1.1
Spiraea	-	1.2	-	+.2	-	++.1
Willow	-	2.1	-	+.1	-	-
Elderberry	-	+.1	-	-	-	-
Blackberry	-	1.1	-	3.1	-	++.1
Virginia Creeper	-	+.2	-	-	-	-
Red Osier Dogwood	-	-	-	++.1	-	-
Maple-leaved Viburnum	-	-	-	1.2	1.3	1.1
Grape	-	-	-	+.2	-	-
Dewberry	-	-	-	(1.1)	-	-
Mountain-Laurel	-	-	-	-	<u>5.5</u>	2.2
Sweet-fern	-	-	-	-	-	2.3
American Hazelnut	-	-	-	-	-	1.2
No. Species	3	8	1	9	3	8
Trees in the Shrub Layer						
Sweet Birch	3.1	-	2.1	2.1	+.1	3.1
Beech	2.1	+.1	-	-	-	-
Yellow Birch	2.1	2.1	-	-	-	-
Tulip-Poplar	1.1	+.1	-	-	-	+.1
Hemlock	2.1	(1.1)	-	-	-	++.1
Red Maple	2.1	1.1	3.1	1.1	2.1	2.1
Flowering Dogwood	1.1	-	(+.1)	+.1	-	+.1
White Ash	-	++.1	-	-	-	-
Shagbark-Hickory	-	++.1	-	-	-	-
Sugar-Maple	-	++.1	-	++.1	-	-

Table 2.5. 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.
Red Oak	-	+.1	2.1	-	1.1	+.1
Chestnut-Oak	-	-	2.1	+.1	-	+.1
White Sassafras	-	-	+.1	+.1	-	-
Pignut Hickory	-	-	1.1	+.1	-	-
White Oak	-	-	-	1.1	-	++.1
Black Cherry	-	-	-	+.1	-	-
No. Species	7	9	7	9	3	8
Herb Layer[1]						
Wild Sarsaparilla	1.1	-	-	-	-	-
New York Fern	1.2	-	-	1.2	-	-
Christmas Fern	++.2	-	-	-	-	-
Hay-scented Fern	2.2	+.3	-	2.4	-	+.2
Cinnamon-Fern	1.2	2.3	-	-	-	-
Maidenhair-Fern	1.3	-	-	-	-	-
Violet spp.	1.2	1.2	-	-	-	++.2
Jack-in-the-pulpit	+.1	1.2	-	-	-	-
Sensitive Fern	+.1	+.1	-	-	-	-
Wild Lily-of-the-valley	2.1	+.2	-	-	-	-
Twisted-stalk	1.1	++.1	-	-	-	+.2
Deer-tongue Grass	(1.2)	1.2	-	-	-	-
Rue-Anemone	(++.1)	-	-	-	-	-
Star-flower	(++.1)	-	-	-	-	-
Marginal Shield-Fern	-	+.2	-	-	-	-
Sedge	-	2.3	-	++.2	-	-
Reed (*Phragmites* sp.)	-	2.4	-	+.2	-	-
Boneset	-	+.2	-	-	-	-
Cinquefoil spp.	-	2.3	-	1.2	-	1.2
Rush	-	2.2	-	++.2	-	-
Sphagnum	-	1.3	-	-	-	-
Upright Yellow Wood-sorrel	-	+.2	-	-	-	-
Jewelweed	-	1.3	-	-	-	-
Tearthumb	-	1.4	-	-	-	-
Goldenrod spp.	-	+.2	-	+.1	-	++.2
Smartweed	-	+.2	-	-	-	-
Water-purslane	-	2.3	-	-	-	-
Horsetail	-	2.3	-	+.3	-	-
Pennsylvania Bitter-cress	-	+.1	-	-	-	-
Interrupted Fern	-	+.2	-	-	-	-
Cat-tail	-	(+.3)	-	-	-	-
Dwarf Ginseng	-	++.1	-	-	-	-
Whorled Loosestrife	-	-	+.1	2.1	-	1.1
Poverty-Grass	-	-	1.2	2.2	-	2.2
Hair-cap Moss	-	-	1.2	1.3	2.4	-
White Moss	-	-	1.2	-	1.2	-
Mixed Grass	-	1.2	-	3.2	-	1.2
Partridge-berry	+.2	-	-	-	-	-

Table 2.5. 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.
Broom-sedge	-	-	-	2.2	-	1.2
Aster spp.	-	-	-	+.1	-	-
Indian-tobacco	-	-	-	+.2	-	-
Dandelion	-	-	-	++.2	-	-
Thistle	-	-	-	(1.1)	-	-
Panic-Grass	-	-	-	-	-	1.3
Everlasting sp.	-	-	-	-	-	+.2
Wild Lettuce	-	-	-	-	-	+.2
No. Species	15	27	4	17	2	12
Total No. Species						
Trees[2]	9	9	8	9	4	8
Shrubs	3	8	1	9	3	8
Herbs	15	27	4	17	2	12
Totals	27	44	13	35	9	28

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

Species	Forest A.S.	ROW A.S.
Hydric (1)		
Shurbs		
Herbs[1]		
Partridge-berry	+.2	-
Wild Sarsaparilla	1.1	-
New York Fern	1.2	-
Christmas Fern	++.2	-
Maidenhair-Fern	1.3	-
Rue-Anemone	(++.1)	-
Star-flower	(++.1)	-
No. Species	7	
Mesic (2)		
Shrubs		
Herbs		
White Moss	1.2	-
No. Species	1	
Xeric (3)		
Shrubs		
Herbs		
Hair-cap Moss	2.4	-
White Moss	1.2	-
No. Species	2	

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

Table 2.7. 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	1.2	-
Willow	2.1	-
Elderberry	+.1	-
Blackberry	1.1	-
Virginia Creeper	+.2	-
Herbs[1]		
Marginal Shield-Fern	+.2	-
Sedge	2.3	-
Reed (*Phragmites* sp.)	2.4	-
Boneset	+.2	-
Cinquefoil spp.	2.3	-
Rush	2.2	-
Sphagnum	1.3	-
Upright Yellow Wood-sorrel	+.2	-
Jewelweed	1.3	-
Tearthumb	1.4	-
Goldenrod spp.	+.2	-
Smartweed	+.2	-
Water-purslane	2.3	-
Horsetail	2.3	-
Pennsylvania Bitter-cress	+.1	-
Interrupted Fern	+.2	-
Cat-tail	(+.3)	-
Dwarf Ginseng	++.1	-
Mixed Grass	1.2	-
No. Species	24	
Mesic (2)		
Shrubs		
Witch-Hazel	+.1	-
Spiraea	+.2	-
Willow	+.1	-
Blackberry	3.1	-
Red Osier Dogwood	++.1	-
Maple-leaved Viburnum	1.2	-
Grape	+.2	-
Dewberry	(1.1)	-

Table 2. 7. Continued

Species	ROW A.S.	Forest A.S.
Herbs		
New York Fern	1.2	-
Hay-scented Fern	2.4	-
Sedge	++.2	-
Reed (Phragmites sp.)	+.2	-
Cinquefoil spp.	1.2	-
Rush	++.2	-
Goldenrod spp.	+.1	-
Horsetail	+.3	-
Mixed Grass	3.2	-
Broom-sedge	2.2	-
Aster spp.	+.1	-
Indian-tobacco	+.2	-
Dandelion	++.2	-
Thistle	(1.1)	-
No. Species	22	
Xeric (3)		
Shrubs		
Witch-Hazel	1.1	-
Spiraea	++.1	-
Blackberry	++.1	-
Sweet-fern	2.3	-
American Hazelnut	1.2	-
Herbs		
Hay-scented Fern	+.2	-
Violet spp.	++.2	-
Twisted-stalk	+.2	-
Cinquefoil spp.	1.2	-
Goldenrod spp.	++.2	-
Whorled Loosestrife	1.1	-
Poverty-Grass	2.2	-
Mixed Grass	1.2	-
Broom-sedge	1.2	-
Panic-Grass	1.3	-
Everlasting sp.	+.2	-
Wild Lettuce	+.2	-
No. Species	17	

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

Table 2.8. Major vegetational types for the Ramapo to Hudson River 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-Mixed Grass-Herb	58.9		
Reed (Phragmites sp.)-Sedge	10.8		
Sedge-Mixed Herb-Rock	10.6		
Logs	7.3		
Sedge-Reed (Phragmites sp.)	4.4		
Mixed Herb	3.3		
Rock	1.9		
Cinnamon-Fern-Sedge-Mixed Herb	1.7		
Stream	1.1		
Mixed Grass-Herb		22.6	
Mixed Herb-Blueberry		20.6	
Blackberry-Hay-scented Fern-New York Fern		15.9	
Hay-scented Fern-Blackberry		14.7	
Access Road		6.6	
Mixed Grass-Broom-sedge-Mixed Herb		6.5	
Maple-leaved Viburnum-Blackberry		4.2	
Mixed Grass (seeded)-Herb		3.4	
Mixed Grass		2.8	
Mixed Grass-Sedge		2.1	
Blackberry		.6	
Lowbush Blueberry-Mixed Grass			29.6
Mountain-Laurel-Blueberry			18.8
Open (invading)			15.2
Blueberry-Mountain-Laurel			14.3
Sweet-fern			9.6
Blueberry			8.7
Mountain-Laurel			2.2
Maple-leaved Viburnum			1.6
Total	100.0	100.0	100.0

Table 2.9. 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	%
Beech			1/1	100	0/1	0	1/2	50
Birch (Yellow, Sweet)	9/15	60	18/50	37	1/2	50	28/67	42
Blackberry	7/45	16	1/3	33			8/48	17
Black Locust			0/1	0			0/1	0
Hemlock	0/1	0					0/1	0
Lowbush Blueberry	44/46	96	23/37	62	36/54	67	103/137	75
Maple-leaved Viburnum	8/8	100	2/7	29	3/3	100	13/18	72
Mountain-Laurel	2/6	33	1/10	10	4/10	40	7/26	27
Red Maple			2/9	22	2/4	50	4/13	31
Red Oak			2/2	100			2/2	100
Spiraea	0/5	0	0/5	0			0/10	0
Striped Maple			1/1	100	1/1	100	2/2	100
Sweet-fern	4/4	100	21/21	100			25/25	100
Willow spp.	1/1	100					1/1	100
Witch-Hazel	1/2	50	0/1	0	1/1	100	2/4	50
Tulip-Poplar			0/1	0			0/1	0
Total	76/133	57	72/149	48	48/76	63	196/358	55

Table 2.10. 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					
	Blueberry		Sweet & Yellow Birches		Blackberry	
	Ratio	%	Ratio	%	Ratio	%
ROW	44/46	96	9/15	67	7/45	16
ROW Edge	23/37	62	18/50	37	1/3	33
Woods	36/54	67	1/2	50	0/0	0
Total	103/137	75	28/67	51	8/48	17

Table 2.11. Birds observed and/or heard on the ROW and on the ROW edge during the study period.

Species	Species
Turkey vulture	Wood thrush
Cooper's hawk	Starling
Red-tailed hawk	Red-eyed vireo
Belted kingfisher	Baltimore oriole
Downy woodpecker	Brown-headed cowbird
Yellow-shafted flicker	Common grackle
Eastern wood pewee	Red-winged blackbird
Blue jay	Indigo bunting
Common crow	Rose-breasted grosbeak
Black-capped chickadee	Rufous-sided towhee
White-breasted nuthatch	

Table 2.12. Potential wildlife use of plant species[1] present on the ROW and adjacent woods for the major game species on the Ramapo to Hudson River study area.

Species	Wildlife Species		
	Deer	Squirrel	Raccoon
Trees			
Red Maple	****	**	
Sugar-Maple	****		
Yellow Birch	*		
Sweet Birch	*		
Beech	+	**	+
Red Oak	*	****	****
Chestnut-Oak	*	****	****
White Oak	*	****	****
White Ash	*		
Black Cherry	*		
Hemlock	+		
Sassafras	+		
Shagbark-Hickory		***	+
Pignut Hickory		***	+
Tulip-Poplar		+	
Flowering Dogwood	*	*	
Shrubs			
Striped Maple	****		
Blueberry	+		
Witch-Hazel	**		
Spiraea	+		
Willow	*		
Blackberry	+	+	
Red Osier Dogwood	*		
Maple-leaved Viburnum	*		
Grape			*
Dewberry	+	+	
Mountain-Laurel	*		
Sweet-fern	+		
Hazelnut	+		+
Herbs[2]			
Mixed Grass	*		
New York Fern	*		
Christmas Fern	*		
Hay-scented Fern	*		
Cinnamon-Fern	*		

Table 2.12. Continued

Species	Wildlife Species		
	Deer	Squirrel	Raccoon
Maidenhair-Fern	*		
Sensitive Fern	*		
Sedge		+	
Goldenrod	+		
Interrupted Fern	*		

1 Those plants not included in this table provide a certain amount of cover (Table 2.5) 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 2.13. Water quality data collected from September 23, 1975, to August 5, 1976, at site 2, Ramapo to Hudson River ROW, Rockland County, New York.

Date	September 23, 1975				February 3, 1976				May 11, 1976				August 5, 1976			
Sampling Location	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Hour	0630	0715	0810	0835	1500	1455	1520	1555	0930	1000	1035	1100	1400	1415	1425	1435
Water Temp. (C)	12.8	12.7	12.7	12.8	-1.0	-0.5	-1.0	-1.0	10.2	10.5	11.0	11.0	18.5	17.0	18.0	17.0
Dissolved Oxygen (ppm)	10.7	10.8	10.9	10.8	15.4	13.8	14.7	14.6	11.2	11.3	10.7	10.6	9.2	9.4	8.4	9.0
% Saturation D.O.	106	107	108	107	109	98	105	104	105	106	102	100	103	103	93	96
pH	6.6	6.6	6.6	6.7	5.1	5.9	5.2	5.7	5.7	6.0	5.6	5.5	6.5	6.0	5.7	6.4
Water Temp. (C) range	12.7-12.8				-1.0-(-0.5)				10.2-11.0				17.0-18.5			
mean	12.8				-0.9				10.7				17.6			
% Saturation D.O. range	106-108				98-109				100-106				93-103			
mean	107				104				103				99			
pH range	6.6-6.7				5.1-5.9				5.5-6.0				5.7-6.5			
mean	6.7				5.5				5.7				6.2			
Comments	rain for 12 hr. preceding sampling, stream clear				clear, sunny, air temp. -8 C, ice in stream and and along banks, 6 in. of snow covering ground				clear, sunny, air temp. 18 to 22 C				sunny, air temp. 29 C			

Table 2.14. 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	
(C,I)	Commercial & Industrial	
(F)	Forest Land	-------------------27.7 ******************26.5
(E)	Extractive Industry	--1.2 **1.2
(N)	Non-productive	----4.0 ***3.8
(OR)	Outdoor Recreation	--65.6 **65.5
(P)	Public & Semi-public	
(W)	Water Resources	---1.6 ***1.6
(U)	Urban Inactive	
(T)	Transportation	**1.4
(R)	Residential	

[1] Source: USDA-SCS, Hyattsville, Md., air photo No. 535 36087-174-314, Oct. 24, 1974
Orange & Rockland Utilities, Inc., Rockland County air photo, Jan. 10, 1967

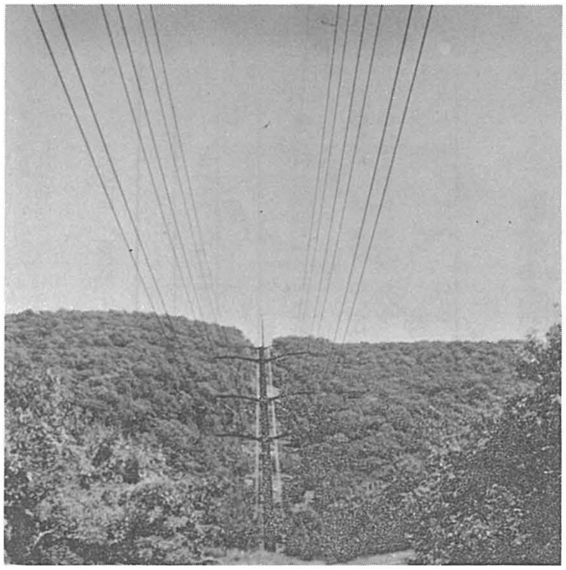


FIG. 2.1.1. General view of the ROW and adjacent forest, looking south-southeast, in summer, 1975 (Photo Station 2).

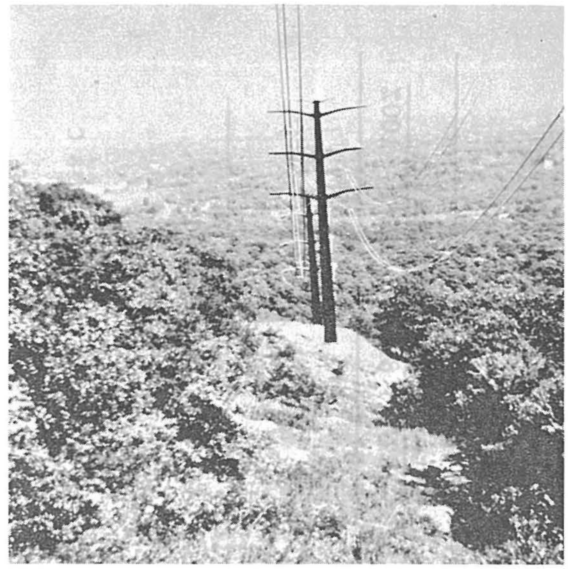


FIG. 2.1.2. General view of the ROW and adjacent forest, looking east, in summer, 1975 (Photo Station 14).

FIG. 2.1.3. Topped hemlock on ROW along stream bank, in winter, 1976 (Photo Station 4).

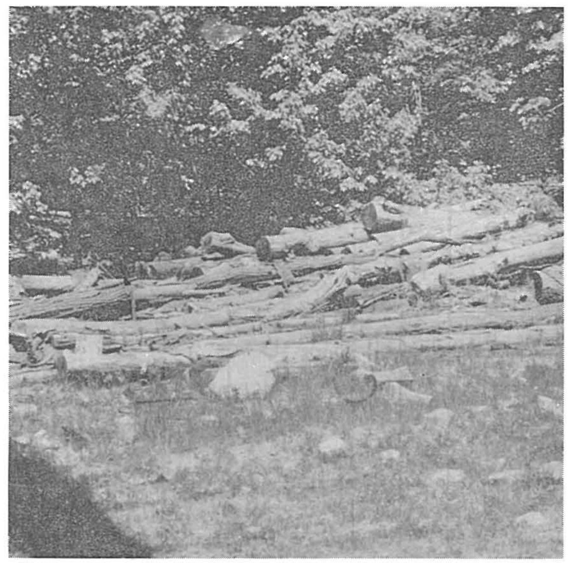


FIG. 2.1.4. Logs piled at edge of ROW, in spring, 1975 (Photo Station 3).

FIG. 2.1.5. Severe sheet and rill erosion on bank cut at tower 4, in spring, 1975 (Photo Station 6).

FIG. 2.1.6. Deer tracks crossing ROW, in winter of 1976.

FIG. 2.1. Visual characteristics.

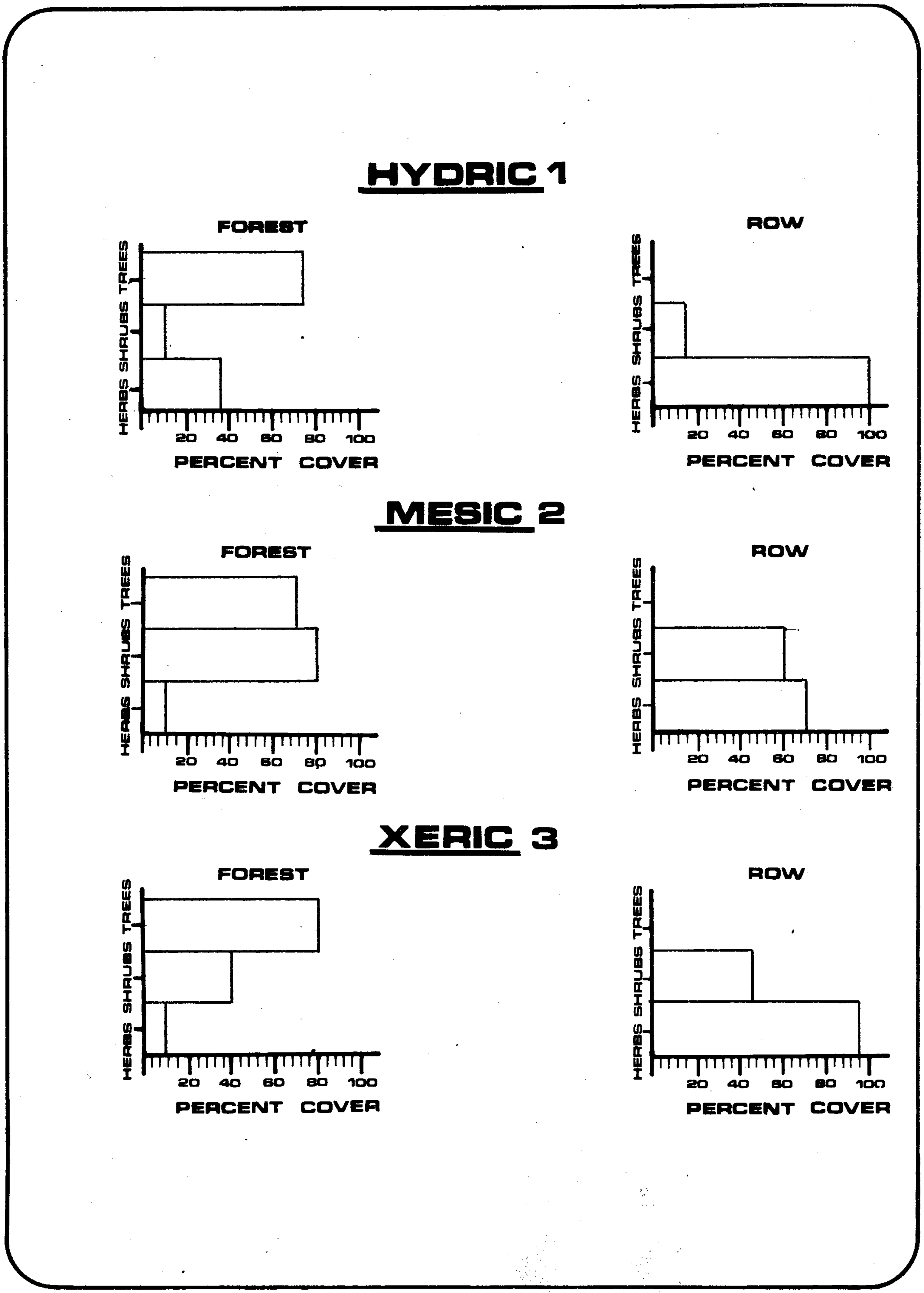


Fig. 2.2. Changes in cover value of tree, shrub, and herb layers from forest to ROW.

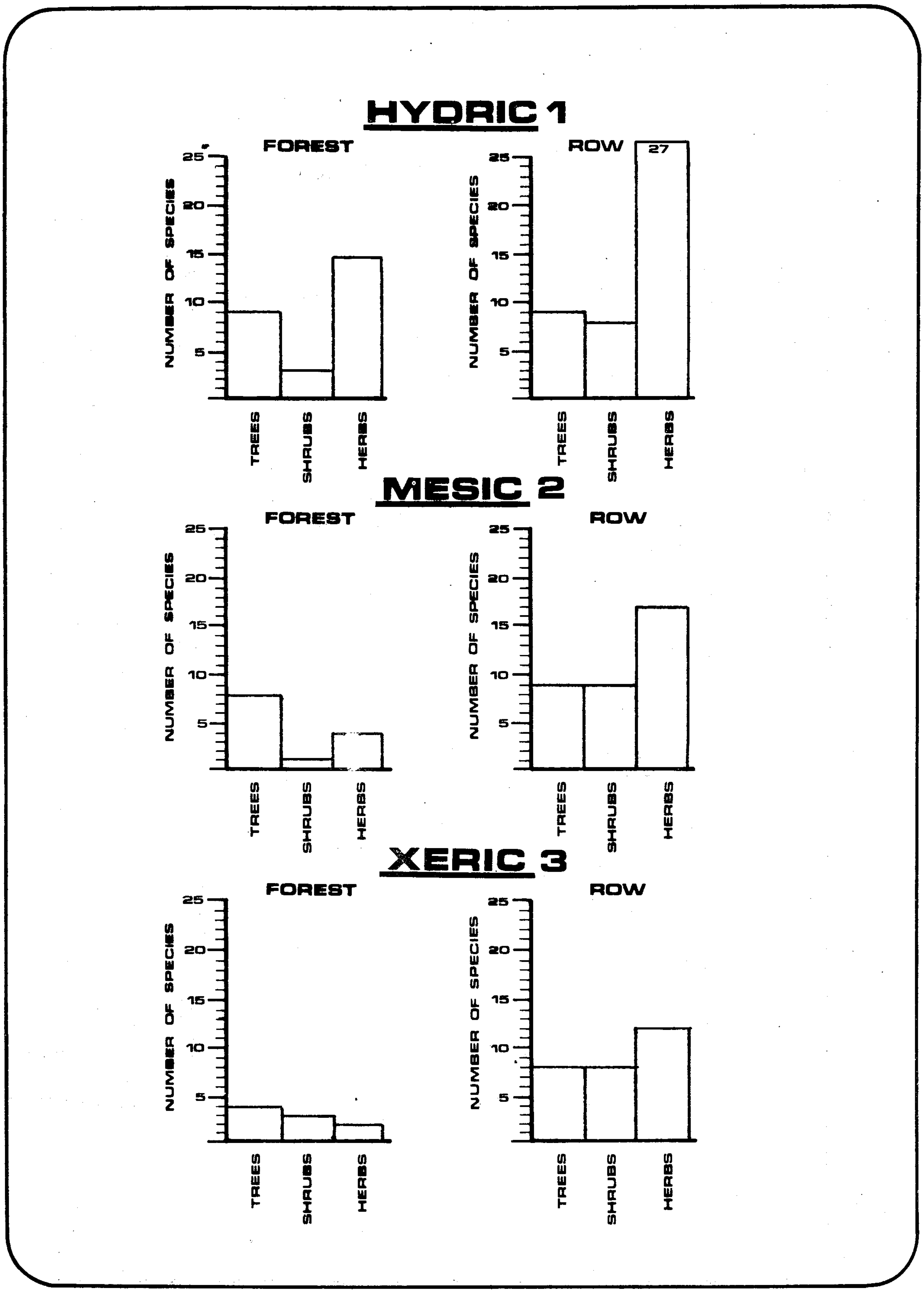


Fig. 2.3. Species diversity in the forest and on the ROW.

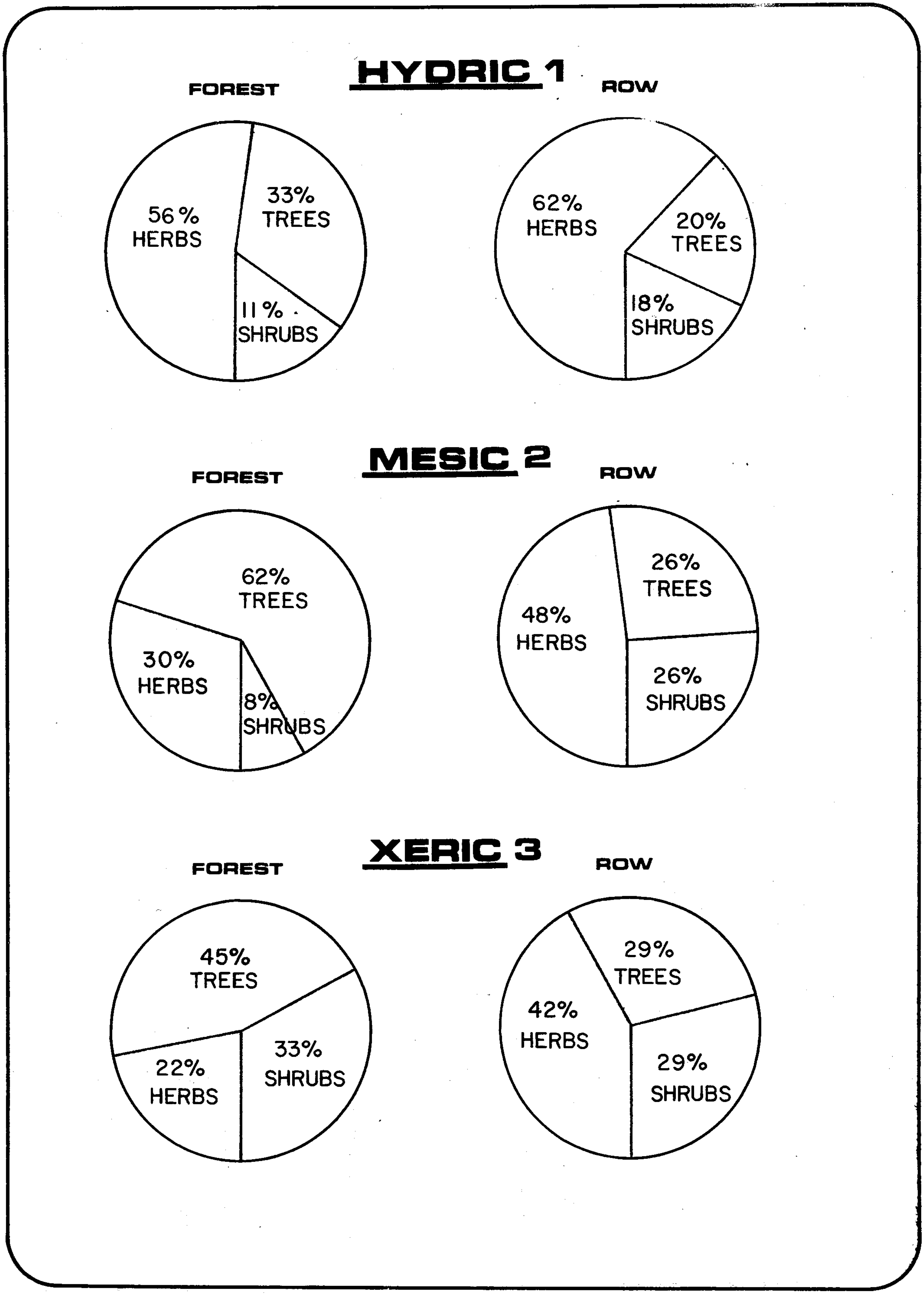


Fig. 2.4. Life form spectrum of the ROW as compared to the adjacent forest to compare species make-up of each, based on the number of species in each life form expressed as a percent of total species.

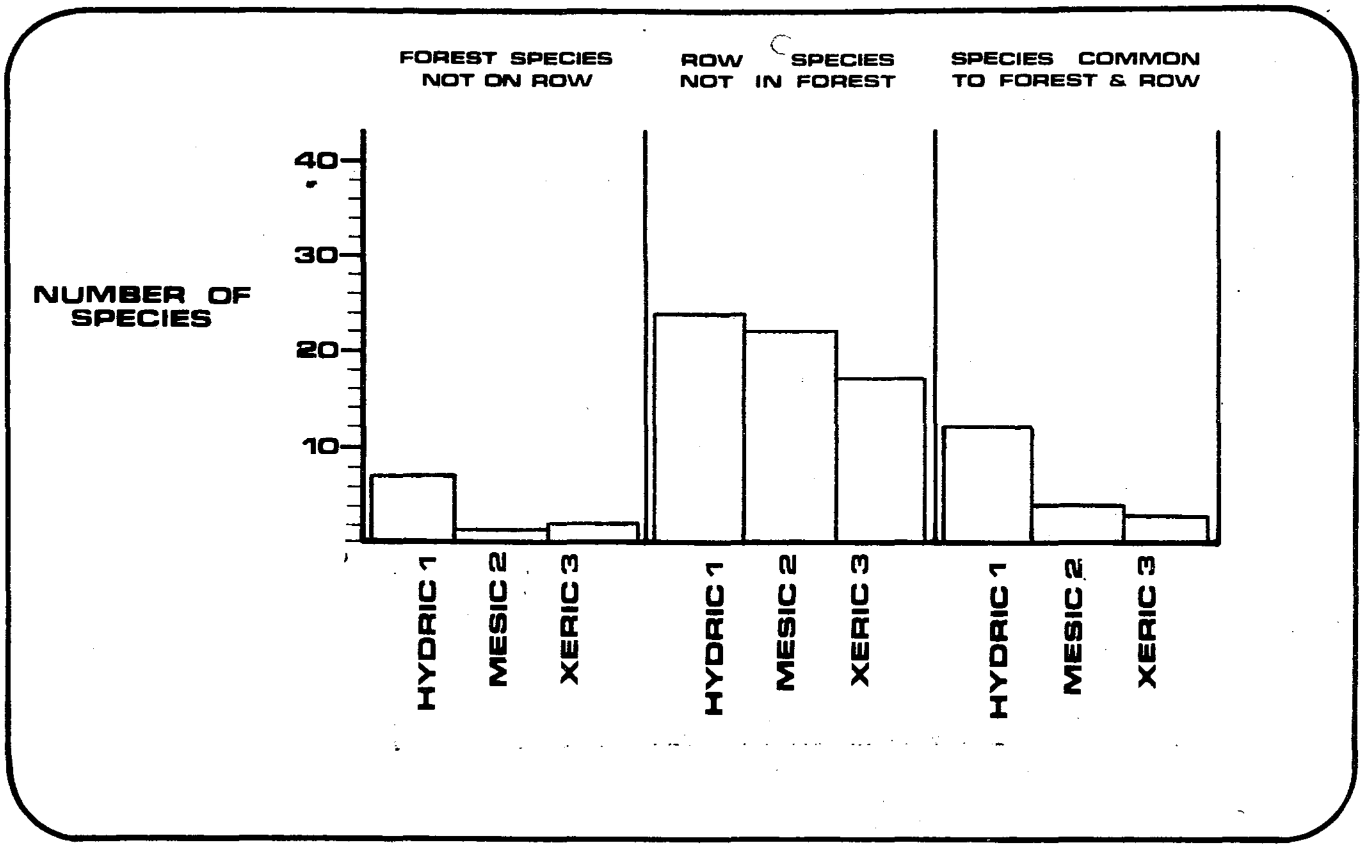


Fig. 2.5 Comparison of shrub and herb species in the forest and on the ROW.

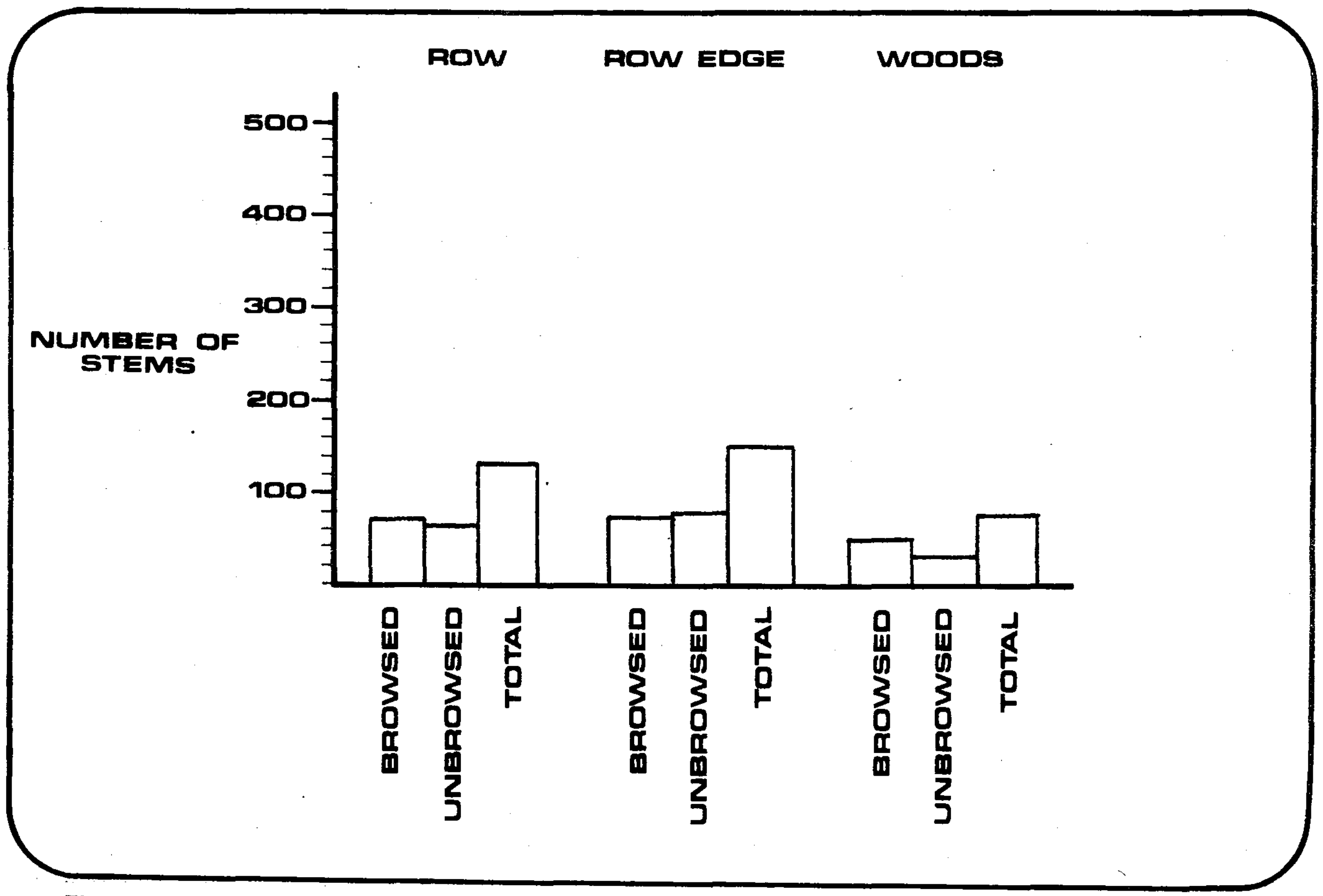
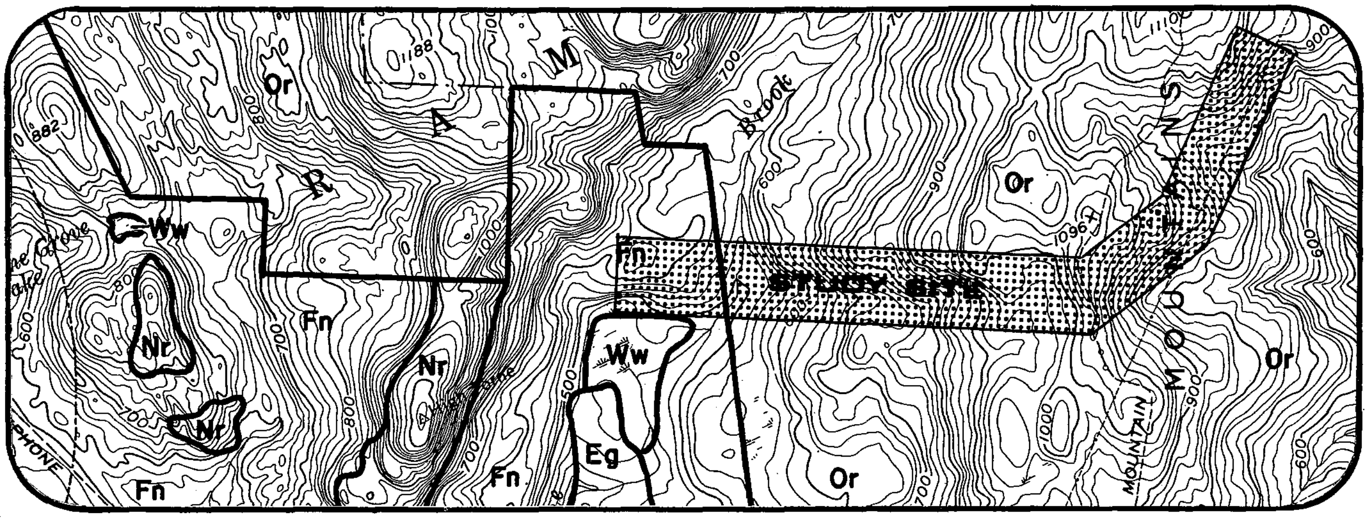
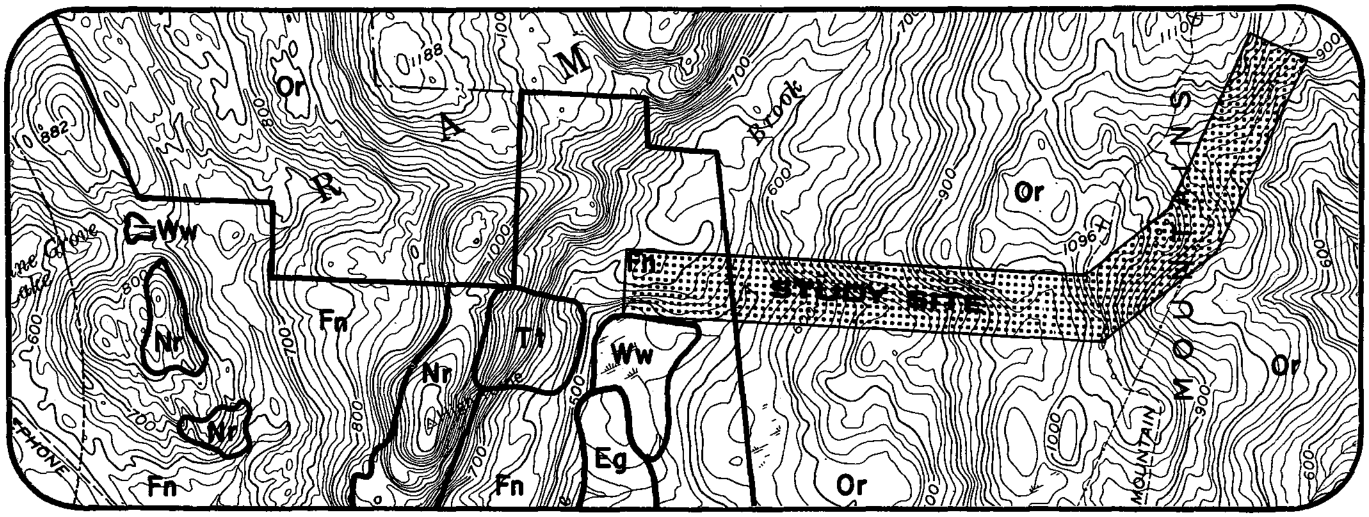


Fig. 2.6. Browse survey showing number of browsed, unbrowsed, and total stems for the ROW, ROW edge, and forest for 6 browse transects.



LAND USE PRIOR TO ROW CONSTRUCTION (1967) SCALE 1"-2000



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

LEGEND FOR LAND USE SYMBOLS

EXTRACTIVE INDUSTRY LAND USE
- Eg - Sand and gravel pits

FOREST LAND
- Fn - Forest lands

NON-PRODUCTIVE LAND
- Nr - Exposed rock cliff, rock slopes and slide areas

OUTDOOR RECREATION LAND USE
- Or - Outdoor recreation

TRANSPORTATION LAND USES
- Tt - Utility

WATER RESOURCES
- Ww- Wooded wetlands

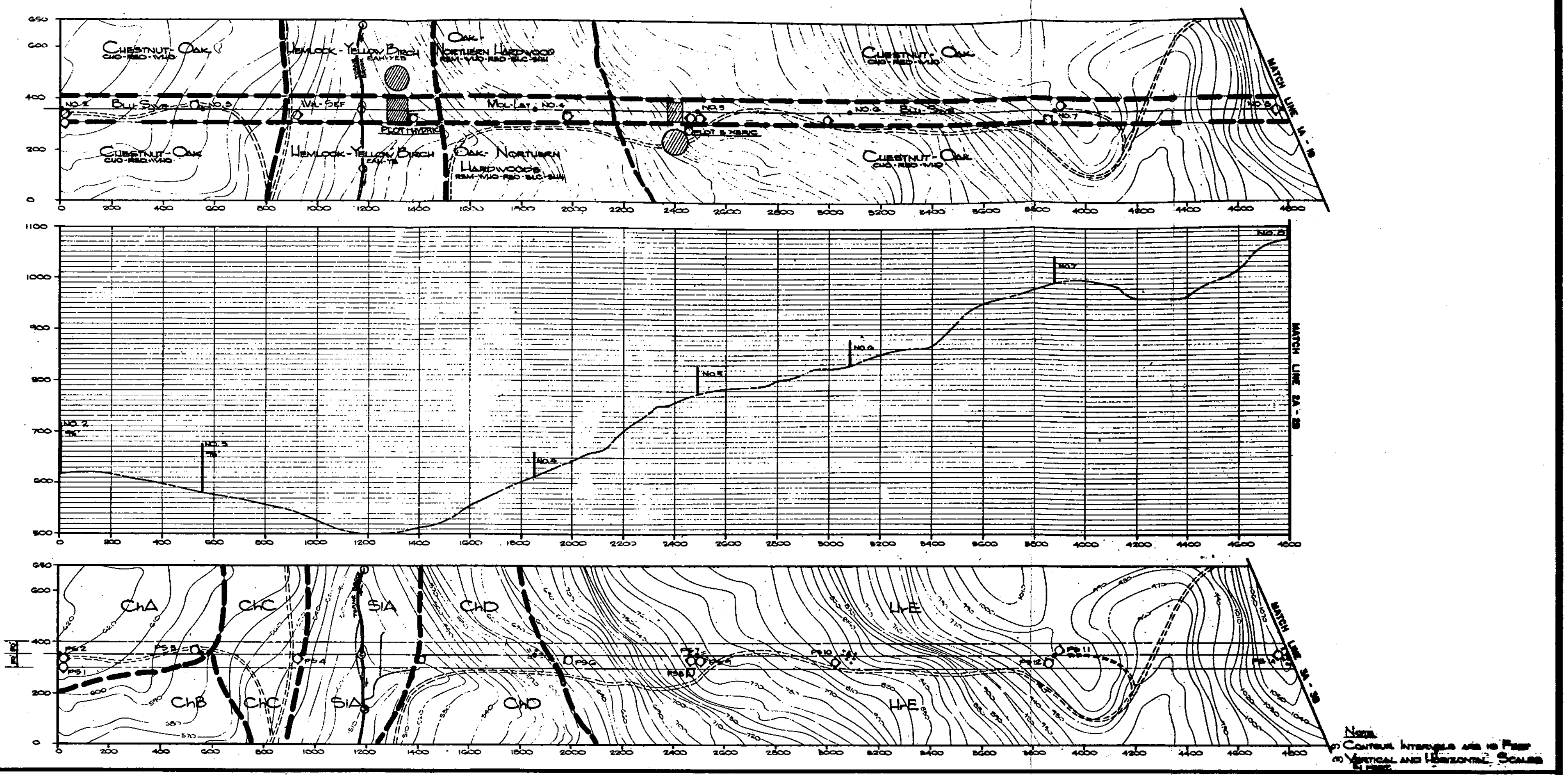
SOURCES:
- USDA-SCS, Hyattsville, Md., air photo No. 536 36087 174-314, Oct. 24, 1974
- Orange & Rockland Utilities, Inc., Rockland County air photo, Jan. 10, 1967
- Area Land Use Map, LUNR, Cornell University, N.Y., 1974
- U. S. G. S. Topographic Map, Sloatsburg, N.Y.- N.J., 1955

Fig. 2.7. 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. (cem.)
- 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

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

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 SYMBOL AND NAME

ChC	CHARLTON very stony sandy loam (15 to 25% slope)
ChA	CHARLTON " " " " (0 to 8% slope)
ChD	CHARLTON " " " " (25 to 35%)
HrE	HOLLIS very rocky fine sandy loam(35 to 50%)
SIA	SUN-LEICESTER stony sandy loam(0 to 8%)
ChB	CHARLTON very stony sandy loam(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	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
aes
BLAIR MILL ROAD
WILLOW GROVE, PA. 19090

ORANGE & ROCKLAND UTILITIES-ENGINEERING PLAN & PROFILE 7/8/69

USGS 7.5 MIN TOPOGRAPHIC MAP, SLOATSBURG NY. 55

CORNELL UNIV. AGR. EXP. STA., DEPT OF SOILS TECH. IN COOPERATION WITH BUREAU OF SOILS, U.S.D.A. SOIL SURVEY OF ROCKLAND COUNTY N.Y. '70

ASPLUNDH ENVIRONMENTAL SERVICES A.E.S. PROJECT NO. 81-0028 FIELD STUDIES 1975-76

SCALE: 1" = 200'-0"

200 100 0 100 200 400 800 1000

MAP 2.1 1 OF 2

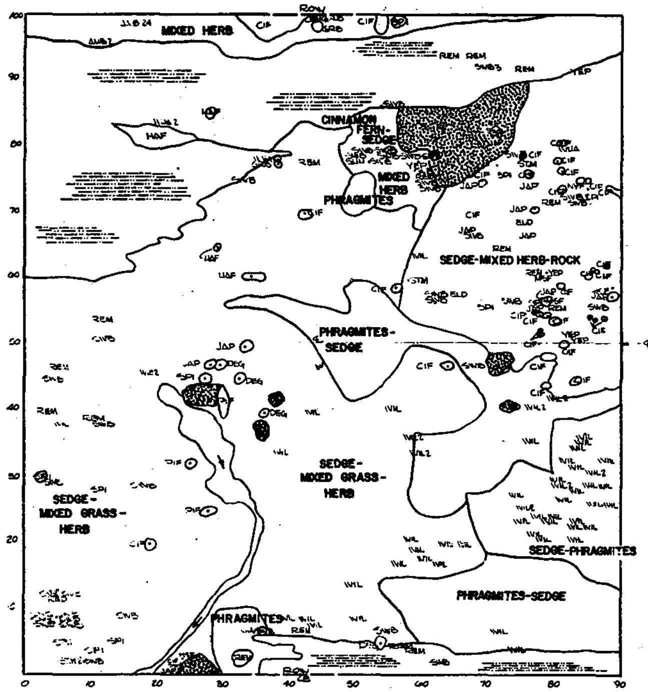
SITE 2

HABITAT CONDITIONS

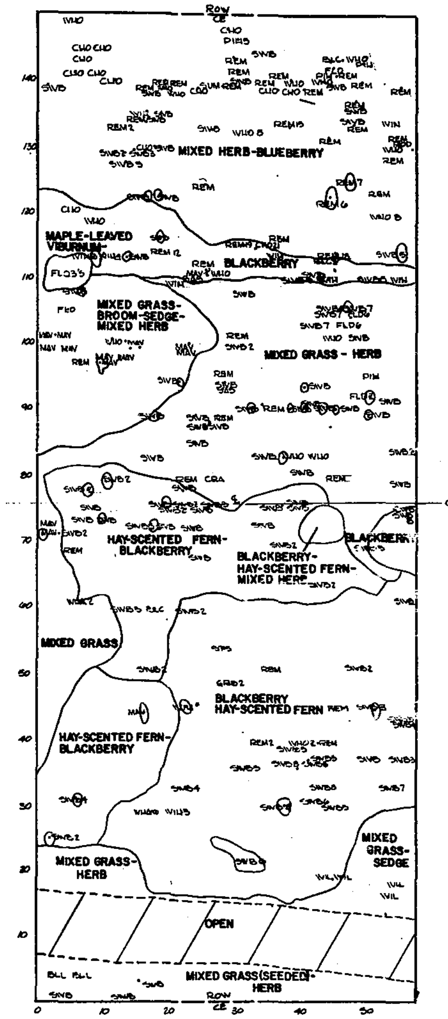
UTILITY: ORANGE & ROCKLAND UTILITIES, INC.

ROW DESCRIPTION: RAMAPO-HUDSON RIVER (PJM-WEST) 345KV

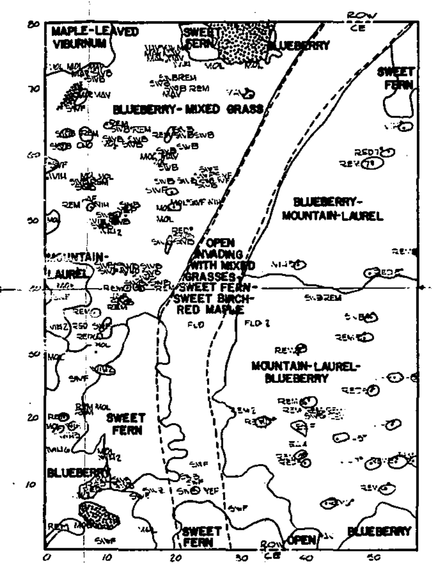
STEEL POLE 100' & 150 ROW



PLOT 1 HYDRIC



PLOT 2 MESIC



PLOT 3 XERIC

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 *Calamagrostis canadensis*
BON BONESET *Eupatorium perfoliatum*
BRN BRACKEN *Pteridum aquilinum*
BRO BROOM-SEDGE *Arthalophia 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*
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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*

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*
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HAA COMMON ALDER *Alnus serrulata*
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HUC HUCKLEBERRY *Gaylussacia spp.*
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MOH MOUNTAIN-HOLLY *Nemopanthus mucronata*
MOL MOUNTAIN-LAUREL *Kalmia latifolia*
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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.*
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

FIELD SURVEY - A.E.S. 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 2.2

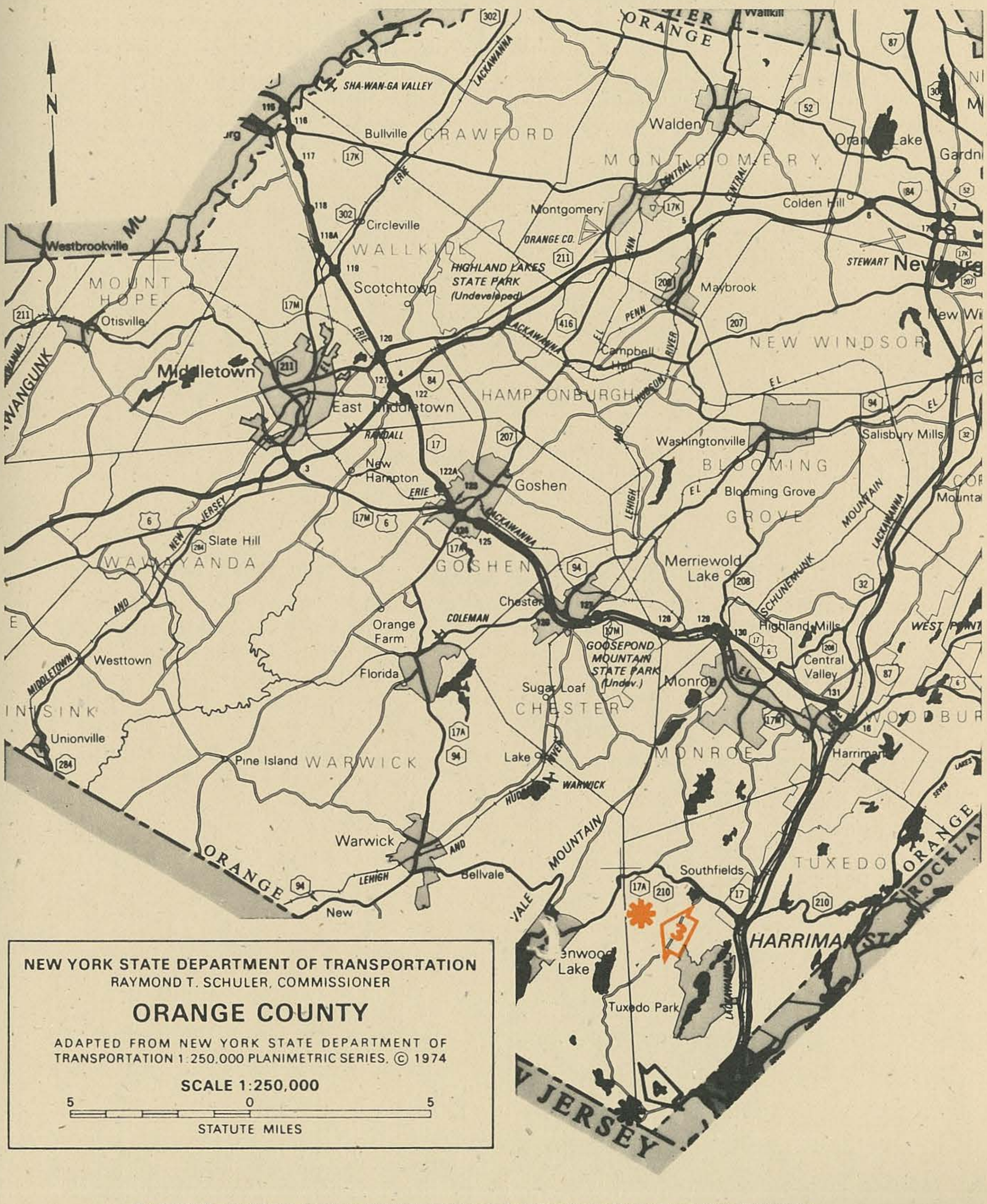
SITE 2

MAPPED PLOTS

UTILITY: ORANGE & ROCKLAND UTILITIES, INC.
ROW DESCRIPTION: RAMAPO™ HUDSON RIVER (PJM-WEST) 345 KV
STEEL POLE 100' & 150' ROW

SITE 3

SOUTHERN TIER LINE 77



Site 3 Southern Tier Line 77

Study area extends from structure 61, near a group of apartments, to Sterling Lake Road (structure 53), and is located in Sterling Forest. It can be reached by route 17 north through Sloatsburg and Tuxedo, and then taking a left turn on route 17A and 210 (west), a left at Sterling Lake Road (second left), and a right on the first right turn (blacktop road), past International Paper Company and following that road to the end.

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Site 3 Southern Tier Line 77

1 Introduction

Site 3 is located in the New England Uplands physiogrpahic area of New York (Cline, 1970) in the Oaks forest type area (Stout, 1958). The general landscape of the ROW and adjacent area is shown in Fig. 3.1.1.

The area is characterized by rolling to steep topography, and a number of small lakes and reservoirs. The surface is rolling to steep, and is rough and stony (Stout, 1958).

Typical forest types of the region are Oaks, and Oaks-Northern Hardwoods (Stout, 1958). Located on the site are Chestnut-Oak, and Oak-Hickory forest types.

2 Location and Identification

Site 3 is on the Southern Tier Line 77 ROW which is operated by Orange and Rockland Utilities, Inc. (O&R). This 200-foot lease agreement consists of 1 single circuit 345 kV line on a double circuit steel lattice structure. The project site is approximately 7,900 feet in length and extends from tower 53 to Sterling Lake Road to include tower 61 south of Bare Mountain.

The site is located in the town of Tuxedo, Orange County, New York (74^{o} 14' 0" W. Longitude; 41^{o} 13' 0" N. Latitude).

3 Background

The following discussion outlines documentable management techniques of clearing, construction, restoration, and maintenance for site 3, as received from O&R (letters dated January 26, 1976, and March 21, 1976, from A. A. Benjamin, Orange and Rockland Utilities, Inc., Spring Valley, 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 selectively cleared (Fig. 3.1.2) by height. Work was completed by contractors in September, 1973. All major trees were cut, trimmed, or topped. Structure sites were completely cleared; each structure site was not to exceed 120 feet by 80 feet in area. 100-foot hedges were left on either side of road crossings. Bulldozers were used during the clearing operation.

Certain large and desirable trees were considered valuable to adjacent property owners, and guyed to prevent them from falling into the ROW.

Danger trees were topped, trimmed, or removed.

Clearing for the remaining area of the ROW was completed in accordance with 1 of the following 4 methods:

1. Where vegetation was low and open grown, slash was lopped and scattered and the logs bucked to remain reasonably flat with the ground;
2. Where vegetation was tall but open grown, slash was lopped and scattered, and the trees were bucked into firewood lengths and stacked;

3. Where the vegetation was tall and the forest well developed, most of the material was cut to provide the necessary line clearance; the slash and logs under 4 inches were distributed along the ROW and in the buffer zones; and there they were bucked to remain reasonably flat with the ground.
4. Open grown individual trees were felled; slash to a diameter limit of 4 inches was chipped and the larger material was bucked into firewood lengths and stacked.

Burning was not permitted. Logs less than 4 inches in diameter and slashings were chipped, lopped and scattered (Fig. 3.1.3), stacked or piled in an acceptable location and manner, as determined by the forester.

Mechanical chippers were used to spread the chips uniformly on the ground surface within the cleared area and especially on areas of potential soil erosion. Piles of chips were not permitted to remain, unless requested by the property owner.

Aerial spraying, foliage spraying, and the use of soil sterilants was prohibited. No area was chemically treated unless approved by the company representative.

The contractor used a mid-summer basal treatment of sprouts, in those cases where stump treatment was ineffective or only partially effective for the inhibition of sprouting.

Spray treatment consisted of applying a solution of 2,4-Dichlorophenoxyacetic acid (2,4-D) or silvex and diesel oil. Where chemical injection was used, the contractor used an amine form of 2,4-D and 4 pounds of acid equivalent per gallon used. Red aniline dye was used for the purpose of identifying stumps which had been sprayed.

The chemical solution was applied to stumps after cutting by use of pressure tank spray equipment.

In certain designated areas, such as road and water crossings, stumps remained untreated so as to promote sprout growth.

3.2 Construction

Contractors completed construction of the line by September, 1974. Bulldozers were used for various aspects of construction including wire pulling.

3.3 Restoration

Contract work was completed for seeding in October, 1974, and planting between June and September, 1975. Hand labor was used for planting and a cyclone seeder was used for seeding work. No fertilizer or mulch was applied.

3.4 Maintenance

In 1975, selective removals using lop and scatter method of those trees deemed undesirable species and chemical stump treatment of their stumps was performed during the early winter.

The following pieces of equipment were used: pick-up trucks, chain saws, and backpack pump type sprayers.

Chemicals used were 2,4,5-Trichlorophenoxyacetic acid (2,4,5-T) and oil at a rate of 7 ounces of chemical per 5 gallons of oil applied during the same day as cut.

4 General Reconnaissance

A general reconnaissance was made in accordance with the methodology and is set forth in Map 3.1 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 4.1 and described in Appendix 17. Specific reference is made to some of these photo stations throughout the report and illustrated on photos in Fig. 4.1. With the execption of aerial photography used to identify land use, older photographs depicting the area are not available.

With the surrounding landscape the ROW site is generally pleasing to view since it opens up a vista through an otherwise uniform forest cover, and contains many desirable looking plant species such as flowering dogwood. Although it is pleasing to look at, site 3, which is adjacent to site 4, is a newer ROW, and as yet has not completely healed from clearing operations. In the winter, brush which has been drop lopped and scattered is more visible than in summer. Features within the area which may make the ROW site somewhat more sensitive to viewers include office and residential developments which are naturally landscaped to blend with the surrounding forest, and many nearby recreation activities, such as hiking and horseback riding. The south portion of the ROW located on a hill overlooking Sterling Lake Road, is clearly visible to motorists. Although somewhat screened, the opposite end of the ROW site is visible to residents of a small apartment development. The potential number of people viewing the ROW is somewhat high because of Sterling Lake Road which is well traveled, although the area is not highly developed.

5 Field Studies - Results and Discussion

5.1 Soils

5.1.1 Geology and Soils

Site 3, Southern Tier Line 77 ROW, is located in Orange County in the New England Uplands (Cline, 1970), also termed the Hudson Hills subdivision (Thompson, 1966), in the Hudson River and Ramapo River drainage basins. Bedrock geology is of Precambrain age, pre 1,100 to 570 million years ago, consisting predominantly of metasedimentary and metavolcanic rocks such as gneiss, marble, and quartzite (Broughton et al., 1973). Surficial geology is glacial drift, largely glacial till deposited directly by the ice sheet (Broughton et al., 1973; Wright and Olsson, 1972).

Soils on this site are largely classified in the order Inceptisols, suborder Ochrepts (Hollis, Lackawana, and Swartswood series), reflecting the absence of horizons of marked accumulation of clay and iron and aluminum oxides, and in the suborder Aquepts (Alden, Scriba, and Sun series), indicating that they are wet Inceptisols. The Hollis soils are in the order Spodosols, suborder Orthods, indicating leached surface horizons and accumulations of organic matter, iron, and aluminum in the subsurface horizons. Wayland soils are Entisols, suborder Aquents, reflecting recent sediments that are continuously saturated with water; and, the Palms bog soils that consist almost completely of decomposed plant remains are Histosols, suborder Saprists (Soil Survery Staff, 1975). The site is located within the confines of the Rockland-Chatfield association, in which gneiss rock outcrop with shallow, stony soil developed from glacial till are prominent (Knox et al., 1954). Brief descriptions (Wright and Olsson, 1972; Anon., 1972) of soil types occurring on the ROW study site (Map 3.1; Table 3.1) are:

Alden-Sun very stony silt loam (AsA): These soils are mapped together here, and evidence very stony conditions; otherwise, they are very similar to the Sun soils. Alden soils formed in calcareous silty material in level to slightly depressed areas, mainly on lakes but including local depressions of till plains. Sun soils developed on glacial till and occupy nearly level areas or depressions within undulating to rolling till plains. These soils are deep, and poorly drained to very poorly drained. Alden soils are usually ponded, and the Sun soils evidence a seasonal water table at the surface. Both are slightly acid to neutral; Alden soils range from pH 5.5 to pH 7.5, while Sun soils may vary from pH 6.0 to 7.5 throughout a typical profile. On this site, soil reaction was pH 6.0 in the surface mineral soil. Alden very stony silt loam is assigned to Woodland Suitability Group 4wl, designating moderately low productivity for timber (Class 4) and a high water table (Subclass w) adversely affecting stand development or management. Sun very stony silt loam is in Woodland Suitability Group 4x2, indicating the presence of stones as a limitation.

Hollis rocky sandy loam (HoE): As with the Hollis-Rock Outcrop association, this is described as an association and not as a specific soil series. It is shallow, and formed in low lying glacial till dominated by granitic materials, where slope ranges from gently sloping to steep, and runoff is moderate to rapid. This association is excessively drained. Bedrock outcroppings generally occupy from 2 to 10% of the surface. The Hollis soils are generally strongly acid, and soil reaction was pH 5.0 in the surface horizon on this site. Hollis soils with slopes of 35% or greater are in Woodland Suitability Group 5d3, reflecting low productivity and restricted rooting depth.

Hollis-Rock Outcrop rocky sandy loam (HrA, HrB, HrB-C, HrC, HrE): This is an association, composed of the shallow Hollis rocky sandy loam, and rock outcrop, the latter of which occupies about 90% of the surface. Hollis soils developed in low lime glacial till dominated by granitic materials, and occupy gently sloping to steep bedrock-controlled landforms. Depth to bedrock ranges from 10 to 20 inches. The association is excessively drained, and runoff is rapid. Hollis soils are generally strongly acid, ranging from pH 4.5 to pH 5.5 throughout a typical profile; on this site soil reaction in the surface 3 inches at the locations sampled varied from pH 4.8 to pH 5.0. Hollis soils, depending upon steepness of slope, are assigned to Woodland Suitability Groups 5d1, 5d2, and 5d3, designating low productivity and restricted rooting depth. Tree growth in the areas occupied by rock outcrops is normally poor, due to droughty conditions and shallow rooting depth.

Palms muck (PaA): Palms muck formed from highly decomposed herbaceous materials deposited over loamy mineral soil material; they occur on level to nearly level lake and till plains. They consist of from 18 to 48 inches of black organic material underlain by grayish clay loam to fine sandy loam. Palms soils are very poorly drained, and the water table is often evident at the surface. These soils are medium to slightly acid, ranging from pH 5.6 to pH 7.8 in the surface 35 inches; on this site, soil reaction was pH 6.1 in the upper mineral horizon. Assigned to Woodland Suitability Group 4w1, Palms muck is moderate for woodland production with management limitations related to poor drainage and a high water table.

Scriba-Sun very stony loam (SsA-B): In this area, Scriba and Sun soils occur in such an intricate pattern that they are mapped as a unit. This association formed in glacial till derived from gray and brown quartzite and sandstone; they occupy uplands on slopes ranging from level to gently sloping. This association ranges from somewhat poorly drained through poorly drained; runoff is slow, and permeability is very slow due to a dense hardpan at 12 inches. Scriba soils are slightly to strongly acid, while Sun soils are slightly acid to neutral; the soil reaction on this site was pH 5.4 in the upper mineral horizon. Scriba very stony loam is in Woodland Suitability Group 3w2, and Sun very stony loam is in Woodland Suitability Group 4w1, designating moderately high and moderate productivity, respectively, and excessive wetness.

Swartswood-Lackawana very stony fine sandy loam (SlB and SlC): On this site, these soils were mapped together. They are upland soils that formed in glacial till derived from gray and brown quartzite, gray sandstone, and red shale, and occur on level to very steep terrain. They are well drained, even though permeability is slow to very slow, due largely to the presence of a very firm hardpan within 28 inches of the surface; runoff is slow to rapid. Approximately 3 to 15% of the surface is covered with large stones. These soils are strongly acid, varying between them from pH 4.5 to pH 5.3 in the surface 16 inches ; on 2 locations sampled, soil reaction was pH 5.0 and pH 5.2 in the surface 3 inches. Both soils are assigned to Woodland Suitability Group 3o1, indicating moderately high productivity for timber and no significant limitations or restrictions for woodland use or management. Where slopes exceed 15%, and may cause management limitations and restrictions, they are assigned to Woodland Suitability Group 3r3.

Wayland silt loam (WaA): Wayland soils developed in neutral or calcareous recent alluvium; they occupy nearly level areas or depressions on floodplains or streams receiving erosion from uplands that contain some calcareous materials. The surface is high in organic matter. These soils are poorly drained, with the depth to the seasonal water table varying from the surface to 6 inches. Soil reaction is normally neutral to slightly alkaline; however, on this site it was pH 5.4 in the upper mineral horizon. Wayland silt loam is assigned to Woodland Suitability Group 4wl, 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 2 mesic and 2 xeric upland locations. Average thickness of the organic layers and A1 horizon was based on 5 samples taken at each location (Table 3.2). 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; similar measurements were thus not made on the hydric site. No evidence of plowing, grazing, or recent fires was observed.

All organic layers (litter, fermentation, and humus) plus an A1 horizon (mixed mineral and organic) were present at each mesic and xeric 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 mesic sites, and a "thick duff mull with very shallow A1" on the xeric sites for both ROW and woodland. The litter layer in the forest was consistently thicker than that on the ROW, while other organic layers were nearly equivalent at both locations. Organic layers in the woods were composed primarily of tree parts (leaves, twigs, and fruit) in contrast to the leaves, stems, and fruit of grasses, herbs, and shrubs on the ROW. Of the latter, much organic matter was supplied by the rather predominent shrub community, consisting largely of huckleberry, but also composed of herbs and scattered slash left from the initial clearing.

Based on these limited observations, it appears that ROW construction and periodic maintenance for brush control did result in reduced litter accumulation, but did not materially alter the thickness of other organic layers. Elimination of the forest cover also caused a change in kind of organic material; however, regrowth and persistance of a shrub-herb and mixed grass-herb-shrub cover has resulted in sufficient litter depositions to provide 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 Southern Tier Line 77 study area in September, 1976. Active erosion was evident in the woodland at 1 location, where slope was approximately 37% and the ground was generally bare with sparse litter. Otherwise, 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, active soil erosion was noted on the general ROW on 1 area where slope was about 20% and huckleberry formed the major plant cover. In general, however, areas on which woody brush was controlled but with little or no disturbance to the soil surface, evidenced no active or recent erosion. Good vegetation cover, composed of grasses, herbs, and low shrubs, had developed on the general ROW following clearing and chemical treatments for brush control and a protective litter mulch from these plant parts was present (Table 3.3).

Eroding areas were identified as to location on the ROW, soil type, average slope, and present plant cover (Table 3.3). Erosion was classified as to kind (sheet, rill, gully) and class (slight, moderate, severe); average depth of gullies was recorded and locations of major gullies were plotted on the site habitat conditions map (Map 3.1). Active erosion on the ROW was largely limited to areas that had been subjected to past and/or recent mechanical disturbance of the soil, i.e., access roads, a logging and skidding area, and tower sites (Table 3.3). Sediment resulting from erosion on the ROW accumulated on lower slopes, and for the most part did not leave the ROW via streams or collect in water impoundments.

Seeding was done as a part of restoration, and natural plant invasion has also occurred. One area evidencing severe gully erosion (Fig. 3.1.4) was noted at tower 57; the gully at its widest was 15 feet, with a depth of about 48 inches, even though the area had been seeded with grass. Recreational use, as well as usage for logging operations and line maintenance, has deterred successful plant invasion of many areas of the access roads. Several tower sites were bare with some grass cover developing. No areas of mass land movement such as landslides were observed on this site.

5.2 Vegetation

5.2.1 Habitat and Forest Types on the Site

Hydric Habitat The hydric, or wet site, was located in a stream bottom adjacent to Sterling Lake Road. Slope was negligible and aspect was flat. Drainage was impeded and an alder swamp had developed. The forest type was absent from the south of the ROW, where the control plot was established, because the alder swamp occupied a large area to the south. The forest type to the north of the ROW was Northern Hardwoods as the elevation increased rapidly and thus a mesic to xeric habitat exists there.

Mesic Habitat The mesic, or medium moist, habitat was located on the lower to mid-slope of a low rounded hill. The slope was approximately 12%. Drainage was free but not excessive. The forest type was Oak-Hickory.

Xeric Habitat The xeric, or dry, habitat was located on the upper slope of a large hill. Slope was approximately 12%. The drainage was excessive throughout the area. The forest type was Chestnut-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, 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. 3.2).

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 3.4). Obviously chestnut-oak was an important species on the xeric and mesic plots. No importance values were present for the hydric plot because it was located in an alder swamp and no trees reached a sufficiently large diameter of breast height (d.b.h.).

On the hydric habitat, an Alder-Spiraea plant community existed and was not affected by the ROW. On the mesic habitat, an Oak-Hickory forest type was changed to a Blackberry-Goldenrod plant community. On the xeric habitat, a Chestnut-Oak forest type was changed to a Blueberry-Bracken plant community (Map 3.1; Table 3.5). For purposes of this analysis the term Blueberry includes both blueberry and huckleberry species.

Quantitative Changes No major increase in the number of shrub and herb species on the hydric habitat was apparent on the ROW as compared with the adjacent forest (Table 3.5; Figs. 3.3 and 3.4). On the mesic habitat there was a slight increase in the number of shrubs on the ROW as compared to the forest; however, there was a large increase in the number of herbs in the forest as compared to the ROW (Table 3.5). On the xeric habitat there was no major increase in the number of shrub and herb species on the ROW as compared to the forest (Table 3.5; Figs. 3.3 and 3.5).

Qualitative Changes On the hydric habitat, 18 shrubs and herbs occurred both on the control and on the ROW (Fig. 3.5). There was no difference in the number of shrubs and herbs on the control plot and on the ROW plot (Tables 3.6 and 3.7).

On the mesic habitat, 7 shrub and herb species occurred both in the forest and on the ROW (Fig. 3.5), while 2 shrubs and 13 herbs appeared in the forest but were absent from the ROW (Table 3.6). On the other hand, 5 shrubs and 6 herbs appeared on the ROW but not in the forest (Table 3.7).

On the xeric habitat, 6 shrub and herb species occurred both in the forest and on the ROW (Fig. 3.5), while 2 shrubs and 5 herbs appeared in the forest but not on the ROW (Table 3.6). On the other hand, 2 shrubs and 7 herbs appeared on the ROW but not in the forest (Table 3.7).

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

Table 3.8 presents a breakdown of major vegetational communities for the hydric, mesic, and xeric plots on the Southern Tier Line 77 ROW (Map 3.2). Much of the present composition of herbaceous and woody plant communities reflects the treatment history. The ROW was selectively cleared during 1973 and the stumps chemically treated with 2,4-D or silvex in diesel oil, where designated by the forester. In 1975, undesirable species were selectively removed by "lopping and scattering" and their stumps were treated with 2,4,5-T in oil at a rate of 7 ounces of chemical per 5 gallons of oil.

The major vegetational community on the hydric plot was Alder-Sedge-Royal Fern, and a large portion of the plot area was occupied by the stream. On the mesic plot, the major plant community was Mixed Grass-Herb, while on the xeric plot it was Huckleberry-Mixed Grass (Map 3.2; Table 3.5).

The vegetation on the hydric plot appears not to have been influenced to any great extent by the initial ROW clearing or follow-up maintenance treatments (Map 3.1; Table 3.5).

The vegetation currently occupying the mesic and xeric plots, namely Mixed Grass-Herb and Huckleberry-Mixed Grass, is composed of light-loving species and evidently came in following ROW clearing. It may well be that most of the plant species will remain on the ROW in relatively large amounts and continue to play an important role in the vegetational complex.

5.2.4 Comparison of Forest Type with ROW Vegetation

The ROW was selectively cut in 1973 and the stumps were treated with 2,4-D or silvex in diesel oil. In 1975 the ROW was selectively cut and a herbicidal application of 2,4,5-T in oil was applied to the stumps.

The general impact of the above treatments of the ROW was to change the forest types (Chestnut-Oak and Oak-Hickory) to a shrub-herb-grass community. Some shrubs and herbs of the forest were replaced by plants favored by open conditions.

The hydric habitat was apparently unchanged by the presence of the ROW as an Alder-Spiraea plant community exists on the control area as well as on the ROW.

On the mesic habitat, formerly occupied by an Oak-Hickory forest type, a Blackberry-Goldenrod community has evolved. There was a slight increase in the number of shrubs on the ROW as compared to the forest. However, there was a large increase in the number of herbs in the forest as compared to the ROW; this was not true in most cases on other sites. A qualitative difference in species existed between the ROW and the forest largely with open growing species on the ROW and shade tolerant species in the forest (Table 3.5).

On the xeric habitat, formerly occupied by a Chestnut-Oak forest type, a Blueberry-Bracken plant community developed. There was no major increase in the number of shrub and herb species on the ROW as compared to the forest. There was a qualitative difference in shrub and herb species noted with some shrubs of the forest not on the ROW and some shrubs of the ROW absent from 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 (Table 3.5).

5.3 Wildlife

The major game species for site 3, Southern Tier Line 77, 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 observations consisted of direct and indirect observations. Deer tracks were found in moderate abundance on the access road on ROW between structures 54 and 55, and structures 59 and 60, during the spring of 1975. Deer pellets were moderately abundant on the ROW between structures 60 and 61 and deer grazing was heavy on pokeweed between structures 58 and 59 at this time.

During the summer of 1975, 3 deer were observed on the study area. One deer was feeding off the ROW in the forest east of structure 59. Two more deer were seen feeding off the ROW near structure 58 during this time.

In the fall of 1975, 2 deer were observed running in the forest north of structure 59. Two deer were observed feeding from the edge of the access road near tower 60 (Fig. 3.1.5).

Three deer were seen running down the ROW near structure 53 and into "escape cover" in the forest adjacent to the alder swamp near Sterling Lake Road, during the winter of 1976. Deer browse was extremely heavy on flowering dogwood on plot 2 at this time. The ROW was covered with a heavy smowfall and animal activity was minimal.

During the spring of 1976, numerous deer pellets were found on xeric plot 3. Deer browse was heavy on huckleberry and red maple and oak stump sprouts. On mesic plot 2, deer pellets were moderately abundant; deer browse was heavy on dogwood and huckleberry.

Browse Survey Three browse transects were established on study area 3 (Table 3.9; Fig. 3.6). These transects were established at each permanent study plot location, on March 21, 1976, with 1 transect on each side of the ROW.

Overall browse utilization by percentage of actual use was higher on the ROW than at the edge or in the interior adjacent woods. Browse utilization was fairly consistent between the edge and the woods. There were more stems available on the ROW than at the edge or in the woods (Table 3.9; Fig. 3.6).

Huckleberry, mountain-laurel, and flowering dogwood were the most abundant plant species on the transect. Flowering dogwood was heavily utilized (Fig. 3.1.6) along with huckleberry, while mountain-laurel was not taken frequently by the deer (Table 3.10).

Gray Squirrel Two gray squirrels were observed on the study area during the period of observation. One squirrel was seen nut-gathering in the forest near structure 58 during the fall of 1975. Another squirrel was seen running to "escape cover" near structure 58 in the summer of 1976. This area does provide good habitat for squirrels even though few were observed during the course of the study. This is evidenced by the fact that the forest adjacent to the ROW is well endowed with tree species which can provide a large amount of food, i.e., oaks, hickories, and other hardwoods.

Raccoon Raccoon tracks were moderately abundant beside a water hole along the west side of the access road between structures 53 and 54 during the spring of 1975.

No other raccoon observations were recorded during the remainder of the study.

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 3.11.

During the spring of 1975, 1 small mammal (mouse sp.) was seen running on the ROW between structures 53 and 54 on mesic plot 2. Chipmunk activity was variable both on and off the ROW. One red-tailed hawk was observed soaring over the ROW and adjacent woods. Woodchuck activity was variable both on and off the ROW during the summer of 1975.

Spring peeper activity was heavy during the spring of 1976 as evidenced by vocalization.

5.3.2 Potential Use

Potential wildlife use of the plant species present on site 3 for the 3 major game species, deer, squirrel, and raccoon, is contained in Table 3.12 (Martin et al. 1951). 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.

5.4 Land Use

5.4.1 Location

Site 3 is located in a rural nonfarm section of the town of Tuxedo, Orange County, New York. Between 1960 and 1970 there was a 20.6% increase in the population of Orange County with a 1970 distribution of 51.1% urban, 47.3% rural nonfarm, and 1.6% rural farm (U.S. Bureau of the Census, 1972).

5.4.2 Land Use Prior to Construction

The ROW was constructed during the year of 1973. The earliest available data obtained from 1965 aerial photography indicates that the location of the ROW and adjacent land to the ROW was primarily rural nonfarm (Table 3.13; Fig. 3.7). Land use distribution included the following subtypes:

Forest Land:
- Fn - Forest lands

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

5.4.3 Land Use After Construction

The adjacent land use to site 3 has not changed from the 1965 data. The land adjacent to the ROW is still rural nonfarm with the same land use distribution subtypes as described prior to construction (Sec. 5.4.2)(Table 3.13; Fig. 3.7).

In addition to use of the ROW for the transmission of electrical power, portions of the ROW are currently being used for hunting and hiking. Some logging operations have been noted adjacent to the ROW.

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 course of this study on adjacent undisturbed forest areas on both sides of the ROW.

6.1.1 Soils

This site is typified by rolling terrain of variable slope gradients and exposures consisting of well-drained upland and poorly drained lowland soils. Upland areas include 1) acid, very shallow, sandy loam soils (Hollis) interspersed with exposed granitic bedrock and 2) a complex of 2 soil series (Swartswood-Lackawana) that are acid, stony fine sandy loams with a fragipan. The low-productivity Hollis soils are associated with Oak-Hickory on mesic sites and Chestnut-Oak on the xeric upper slopes with southern exposures. The Swartswood-Lackawana soils have moderately high productivity and support Northern Hardwoods and Oak-Hickory forest types on mid- and lower slope positions.

Lowland soils generally are rated moderate in woodland productivity due to high water table restrictions and are closely associated with Alder-Spiraea on the Palms muck, Northern Hardwoods on the Alden-Sun and Wayland silt loams, and Hemlock-Yellow Birch on the Scriba-Sun stony loam.

Organic layers in the forest were composed of tree leaves, twigs, branches, and fruit and averaged 1.4 and 2.1 inches thick on mesic and xeric habitats, respectively. Decomposed organic matter was incorporated only to a depth of ½ inch in the mineral soil. Humus types were classified as duff mulls. There was no active soil erosion evident in the forest, except on one steep slope with thin litter cover where slight sheet erosion occurred.

6.1.2 Vegetation

Prior to corridor clearing in 1973 this study area was in forest. Chestnut-oak was the primary species on xeric sites and oak-hickory mixtures occurred on mesic sites. On hydric areas alder thickets were the dominant vegetation with spiraeas and other shrubs as associates.

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 sepcies 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 even before ROW construction. The degree of use is impossible to determine at this time.

6.1.4 Land Use

Earliest data available prior to construction of the ROW in 1973 is 1965 aerial photography. The ROW and the adjacent land area was rural non-farm with a land use distribution of forest land (88.4%) and water resources (11.6%).

6.2 Conditions Which Exist at Present

6.2.1 Soils

Variable slope, exposure, drainage, and soil conditions present in the forest also were present on the ROW. Soil type boundaries coincided with topographic positions and general relief extending across the ROW and forest on both sides of the ROW. Smaller soil mapping units such as Hollis-Rock Outcrops and depressional poorly drained soils occurred sporadically and occupied only parts of the ROW and/or woodland area. Present ROW vegetation correlated well with soil types on hydric, mesic, and xeric habitats. The Alder type persisted on the muck soils; Willow-Sensitive Fern developed on the poorly drained silt loams; Blackberry-Goldenrod on the stony find sandy loams; Blackberry-Hay-scented Fern on the moderately sloping rocky sandy loams; and Blueberry-Bracken on the dry and rocky sandy loams.

Active erosion was negligible on the general ROW where soils were not disturbed; however, advanced erosion, was evident at 3 tower sites, 6 access road locations, and 1 area used for logging operations. Gully erosion had occurred on some segments of the access road and gullies at tower 57, located on a steep area of Hollis rocky sandy loam, had eroded to a depth of 4 feet.

Organic layers on the ROW were thinner than those in the forest; average thickness being 0.6 and 1.9 inches on the mesic and xeric ROW sites, respectively. Duff mull humus types with shallow incorportion of organic matter in the mineral soil persisted on the ROW. ROW litter was composed mostly of leaves from woody shrubs combined with deposits from grasses and herbs.

6.2.2 Vegetation

On mesic and xeric sites selective clearing and topping have reduced the total area occupied by large trees. This has resulted in an increase in the shrub and herbaceous component. On hydric sites the major community is Alder-Sedge-Royal Fern, similar in many respects to the community on these sites prior to corridor establishment. On mesic sites Mixed Grass-Herb communities form the major cover type, and on xeric sites Blueberry-Mixed Grass communities are dominant.

6.2.3 Wildlife

White-tailed deer, gray squirrel, and raccoon are the major game animals that currently occupy the study area. Indirect observations for 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 more stems were available on the ROW than either on the ROW edge or in the interior woods. Huckleberry, mountain-laurel, and flowering dogwood were most abundant, but of the 3, only flowering dogwood and huckleberry were heavily browsed.

Gray squirrels were observed on the study area, as were raccoon tracks. A number 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 3 have not changed from the 1965 data. The inventoried area has remained as rural nonfarm, though the county has changed to urban in character.

In addition to use of the ROW for the transmission of electrical power, portions of the ROW are currently being used for hunting and hiking. Some logging operations have been noted adjacent to the ROW.

6.3 Environmental Effect and Probable Causes

6.3.1 Soils

Effects of ROW construction and management on soils were reflected in 1) changes in composition of the organic deposits from predominantly tree leaves to shrub, grass, and herb litter; 2) a slightly thinner liter mulch; and 3) occurrence of erosion and sedimentation on areas where vegetation, organic layers, and mineral soil was disturbed or removed, i.e., access roads and tower sites. Although organic layer were somewhat altered, they still provided a mulch cover that was effective in protecting the soil against erosion on the general ROW.

Some plant cover has developed on access roads and tower sites as a result of grass seeding for restoration in fall, 1974, and through natural plant invasion. However, this sparse cover was not adequate to prevent serious erosion, espcially on steeper segments of these disturbed areas. Further, recent vehicular traffic on the ROW corridor for maintenance and/or recreational use and logging operations has interfered with plant development and subsequent stabilization of access roads. Soil particles transported in erosion have accumulated on lower slopes of the ROW and small amounts entered perennial streams that flow across the ROW.

6.3.2 Vegetation

The general impact of ROW management was to produce an Alder-Spiraea community on the hydric habitat from an existing alder lowland shrub type; a Blackberry-Goldenrod community from an Oak-Hickory forest type on the mesic habitat; and a Blueberry-Bracken community on the xeric habitat from a Chestnut-Oak forest type.

The number of species (species diversity) changed very little on the ROW as compared with the adjacent forest on all habitats.

The kinds of species remained the same on the ROW and in the forest on the hydric habitat as the alder vegetation type was not disturbed. On the mesic habitat, in contrast to most cases, there were more herb species in the forest. A number were plants typical of open areas such as hazelnut an and witch-hazel were abundant on the ROW but not in the forest on the mesic habitat. On the xeric habitat, goldenrod and aster appeared only on the ROW, while such plants as twisted-stalk, wild sarsaparilla, bluebead-lily, and wild lily-of-the-valley appeared only in the forest.

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 identifiable effect on the adjacent land use, although the ROW has opened the area to some recreational uses.

Table 3.1. Soil series present on the Southern Tier Line 77 study area.

Soil Series	Map Symbol[1]	Drainage Class[2]	Surface Soil pH	Surface Soil Texture	Woodland Suitability Group
Alden-Sun	AsA	PD-VPD	6.0	very stony silt loam	4w1/4x2
Hollis	HoE	E	5.0	rocky sandy loam	3d3
Hollis-Rock Outcrop	HrA	E	4.8	rocky sandy loam	5d1
Hollis-Rock Outcrop	HrB	E	5.0	rocky sandy loam	5d1
Hollis-Rock Outcrop	HrB-C	E	4.9	rocky sandy loam	5d2
Hollis-Rock Outcrop	HrC	E	4.8	rocky sandy loam	5e2
Hollis-Rock Outcrop	HrE	E	4.8	rocky sandy loam	5d3
Palms	PaA	VPD	6.1	muck	4w1
Scriba-Sun	SsA-B	SPD-VPD	5.4	very stony loam	3w2/4w1
Swartswood-Lackawana	S1B	G	5.0	very stony fine sandy loam	3o1
Swartswood-Lackawana	S1C	G	5.2	very stony fine sandy loam	3r3
Wayland	WaA	PD	5.4	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 3.2. Average thickness of organic layers and A1 horizon and humus types for mesic and xeric sites on ROW and adjacent woodland of site 3.

Moisture Regime	Location	Layer Thickness (in.) L	F	H	A1	Humus Type
1. Mesic (2)[1]	ROW	.3	.1	.2	.3	Thin duff mull with very shallow A1
	Woodland	.8	.2	.2	.5	Thin duff mull with very shallow A1
2. Mesic (2)	ROW	.3	.1	.2	.3	Thin duff mull with very shallow A1
	Woodland	1.1	.1	.2	.4	Thin duff mull with very shallow A1
All Mesic Plots Combined	ROW	.3	.1	.2	.3	Thin duff mull with very shallow A1
	Woodland	1.0	.2	.2	.5	Thin duff mull with very shallow A1
3. Xeric (3)	ROW	.7	.5	.5	.6	Thick duff mull with very shallow A1
	Woodland	1.0	.4	.7	.3	Thick duff mull with very shallow A1
4. Xeric (3)	ROW	.8	.4	.6	.6	Thick duff mull with very shallow A1
	Woodland	1.0	.3	.7	.4	Thick duff mull with very shallow A1
All Xeric Plots Combined	ROW	.8	.5	.6	.6	Thick duff mull with very shallow A1
	Woodland	1.0	.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 3.3. Areas exhibiting active erosion in September, 1976, on the Southern Tier Line 77 ROW study area.

				Erosion on Site		
Location	Soil Type	Average Slope (%)	Plant Cover	Kind	Class	Gully Depth (in.)
		ROW				
General ROW	Hollis-Rock Outcrop rocky sandy loam	20	Huckleberry-herb	Sheet	Slight	-
Tower Site	Hollis-Rock Outcrop rocky sandy loam	15	Bare-grass	Gully	Severe	48
Tower Site	Hollis-Rock Outcrop rocky sandy loam	10	Bare-grass	Sheet & Rill	Moderate	-
Tower Site	Hollis-Rock Outcrop rocky sandy loam	8	Bare-grass	Sheet & Rill	Moderate	-
Access Road	Swartswood-Lackawana very stony fine sandy loam	10	Grass	Gully	Moderate	4
Access Road/Water	Swartswood-Lackawana very stony fine sandy loam	8	Grass	Sheet	Slight	-
Access Road	Swartswood-Lackawana very stony fine sandy loam	5	Bare-grass	Sheet & Rill	Slight	-

Table 3.3. Continued

Location	Soil Type	Average Slope (%)	Plant Cover	Erosion on Site: Kind	Erosion on Site: Class	Erosion on Site: Gully Depth (in.)
Access Road/ Bank Cut	Swartswood-Lackawana very stony fine sandy loam	12	Bare-grass-herb	Sheet & Rill	Moderate	-
Access Road	Hollis-Rock Outcrop rocky sandy loam	20	Bare	Gully	Severe	12
Access Road	Hollis-Rock Outcrop rocky sandy loam	15	Bare-grass	Gully	Moderate	6
Logging/Skidding Area	Hollis-Rock Outcrop rocky sandy loam	5	Bare	Sheet	Slight	-
		FOREST				
General Forest	Hollis-Rock Outcrop rocky sandy loam	37	Bare-litter(leaves)	Sheet	Slight	-

Table 3.4. 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)[1]				
Mesic (2)	Chestnut-Oak	37.73	18.75	56.48
	Red Maple	10.65	18.75	29.40
	Sugar-Maple	17.83	18.75	36.58
	Red Oak	9.43	12.50	21.93
	Hemlock	9.43	6.75	15.68
	White Oak	8.29	6.25	14.54
	Black Oak	5.31	6.25	11.56
	Flowering Dogwood	1.33	12.50	13.83
Xeric (3)	Chestnut-Oak	60.00	56.52	116.52
	Red Oak	31.52	17.39	48.91
	Sweet Birch	5.72	13.04	18.76
	White Oak	2.66	8.69	11.35
	Red Maple	.10	4.36	4.46

[1] There were no trees of greater than 3 inches d.b.h. on the hydric plot.

Table 3.5. 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						
White Oak	-	-	+.1	-	1.1	-
Sugar-Maple	-	-	1.1	-	-	-
Hemlock	-	-	+.1	-	-	-
Red Oak	-	-	1.1	-	1.1	-
Red Maple	-	-	1.1	-	++.1	-
Flowering Dogwood	-	-	+.1	-	-	-
Chestnut-Oak	-	-	1.1	-	2.1	-
Black Oak	-	-	+.1	-	-	-
Sweet Birch	-	-	-	-	1.1	-
No. Species	0	0	8	0	5	0
Shrub Layer						
Willow spp.	1.2	+.2	-	-	-	++.1
Red Osier Dogwood	2.1	1.1	-	-	-	-
Highbush-Blueberry	1.2	1.2	-	-	-	-
Alder sp.	4.1	4.1	-	-	-	-
Elderberry	+.1	+.1	-	-	-	-
Spiraea	2.3	2.3	-	-	-	-
Huckleberry	-	-	2.3	2.2	4.4	4.4
Rose	-	-	1.3	-	-	-
Blackberry	-	-		+.1	-	+.1
Virginia Creeper	-	-	+.1	+.2	+.1	-
Barberry	-	-	-	1.2	-	-
Hazelnut	-	-	-	1.1	-	-
Witch-Hazel	-	-	-	1.2	2.1	+.1
Maple-leaved Viburnum	-	-	-	+.2	+.2	-
Grape	-	-	-	+.2	-	-
No. Species	6	6	3	8	4	4
Trees in the Shrub Layer						
Red Maple	2.1	1.1	2.1	2.1	+.1	1.1
American Elm	1.1	+.1	-	++.1	-	-
White Ash	+.1	+.1	-	1.1	-	-
Flowering Dogwood	-	+.1	2.2	3.3	+.1	+.1
Sugar-Maple	-	-	2.1	-	-	-
Red Oak	-	-	-	+.2	+.1	1.1
White Oak	-	-	-	1.1	1.1	+.1
Black Cherry	-	-	-	+.1	++.1	+.1

Table 3.5. 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.
Pignut Hickory	-	-	-	+.1	-	-
Sweet Birch	-	-	-	1.2	-	1.1
White Sassafras	-	-	-	+.2	-	-
American Hop-Hornbeam	-	-	-	+.1	-	-
Quaking Aspen	-	-	-	+.1	-	++.1
Chestnut	-	-	-	-	2.1	-
Chestnut-Oak	-	-	-	-	1.1	1.1
Gray Birch	-	-	-	-	-	+.1
No. Species	3	4	3	12	7	9
Herb Layer[1]						
Bullhead-lily	+.2	1.2	-	-	-	-
Duckweek	+.2	+.2	-	-	-	-
Water-celery	+.3	1.3	-	-	-	-
Pondweed	1.2	1.2	-	-	-	-
Sedge	2.3	2.2	1.3	2.2	-	1.2
Royal Fern	3.3	3.3	-	-	-	-
Mixed Grass	+.2	1.2	+.2	2.4	+.2	2.3
Water-purslane	1.4	1.4	-	-	-	-
Marsh-St. John's-wort	+.3	+.3	-	-	-	-
Polygonum sp.	+.3	1.3	-	-	-	-
Iris	+.2	+.2	-	-	-	-
Water Moss	+.2	+.2	-	-	-	-
Cinnamon-Fern	-	-	++.1	-	-	-
Cinquefoil spp.	-	-	1.2	2.3	-	+.2
Dicranum scoparium	-	-	+.2	-	-	-
Poverty-Grass	-	-	1.2	-	-	-
Hair-cap Moss	-	-	1.2	-	1.2	2.3
White Moss	-	-	+.2	-	1.2	+.2
Rough Bedstraw	-	-	1.1	-	-	-
Wild Sarsaparilla	-	-	+.1	-	+.1	-
Christmas Fern	-	-	+.2	-	-	-
Jack-in-the-pulpit	-	-	(+.1)	-	-	-
Perfoliate Bellwort	-	-	+.1	-	-	-
Deer-tongue Grass	-	-	+.2	-	-	-
White Snakeroot	-	-	+.3	3.3	-	-
Violet spp.	-	-	+.2	+.2	-	-
Hay-scented Fern	-	-	+.3	-	-	-
Common Mullein	-	-	-	+.2	-	-
Wild Lettuce	-	-	-	3.3	-	1.3
Goldenrod spp.	-	-	-	+.2	-	1.2
Aster spp.	-	-	-	+.1	-	+.2
Rush	-	-	-	(+.2)	-	-
Lion's-foot	-	-	-	(+.2)	-	-
Partridge-berry	-	-	+.2	-	-	-

Table 3. 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.
Hypnum imponens	-	-	-	-	+.3	-
Wild Lily-of-the-valley	-	-	-	-	1.1	-
Twisted-stalk	-	-	-	-	+.1	-
Bluebead-Lily	-	-	-	-	+.2	-
Pale Corydalis	-	-	-	-	-	(++.2)
Bird's-foot-Trefoil	-	-	-	-	-	(+.2)
No. Species	12	12	18	11	8	10
Total No. Species						
Trees[2]	3	4	8	12	8	8
Shrubs	6	6	3	8	4	4
Herbs	12	12	18	11	8	10
Totals	21	22	29	31	20	22

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 3. 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		
Herbs[1]		
No. Species	0	-
Mesic (2)		
Shrubs		
Rose	1.3	-
Herbs		
Partridge-berry	+.2	-
Cinnamon-Fern	++.1	-
Dicranum scoparium	+.2	
Poverty-Grass	1.2	-
Hair-cap Moos	1.2	-
White Moss	+.2	-
Rough Bedstraw	1.1	-
Wild Sarsaparilla	+.1	-
Christmas Fern	+.2	-
Jack-in-the-pulpit	(+.1)	-
Perfoliate Bellwort	+.1	-
Deer-tongue Grass	+.1	-
Hay-scented Fern	+.3	-
No. Species	14	-
Xeric (3)		
Shrubs		
Virginia Creeper	+.1	-
Maple-leaved Viburnum	+.2	-
Herbs		
Wild Sarsaparilla	+.1	-
Hypnum imponens	+.3	-
Wild Lily-of-the-valley	1.1	-

Table 3.6. Continued

Species	Forest A.S.	ROW A.S.
Twisted-stalk	+.1	-
Bluebead-Lily	+.2	-
No. Species	7	-

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

Table 3.7. 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		
Herbs[1]		
No. Species	0	-
	Mesic (2)	
Shrubs		
Witch-Hazel	1.2	-
Grape	+.2	-
Barberry	1.2	-
Hazelnut	1.1	-
Maple-leaved Viburnum	+.2	-
Blackberry	+.1	-
Herbs		
Common Mullein	+.2	-
Wild Lettuce	3.3	-
Goldenrod spp.	+.2	-
Aster spp.	+.1	-
Rush	(+.2)	-
Lion's-foot	(+.2)	-
No. Species	12	-
	Xeric (3)	
Shrubs		
Willow spp.	++.1	-
Blackberry	+.1	-
Herbs		
Sedge	1.2	-
Cinquefoil spp.	+.2	-
Wild Lettuce	1.3	-
Goldenrod spp.	1.2	-
Aster spp.	+.2	-
Pale Corydalis	(++.2)	-
Bird's-foot-Trefoil	(+.2)	-
No. Species	9	-

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

Table 3. 8. Major vegetational types for the Southern Tier Line 77 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		
Alder-Sedge-Royal Fern	61.78		
Mixed Grass	4.63		
Sedge	.03		
Stream	33.56		
Mixed Grass-Herb		95.7	
Flowering Dogwood		4.3	
Blueberry-Mixed Grass			82.2
Rock			17.8
Total	100.0	100.0	100.0

Table 3.9. 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	%
Alder	0/1	0					0/1	0
Barberry	0/1	0	0/2	0	0/3	0	0/6	0
Black Cherry					0/1	0	0/1	0
Black Gum	0/1	0					0/1	0
Chestnut-Oak	7/7	100	3/3	100	3/3	100	13/13	100
Elderberry	1/1	100					1/1	100
Flowering Dogwood	17/17	100	6/6	100	12/12	100	35/35	100
Highbush-Blueberry	3/3	100					3/3	100
Serviceberry			1/1	100			1/1	100
Huckleberry	28/38	74	15/20	75	9/14	64	52/72	72
Maple-leaved Viburnum	2/4	50			1/1	100	3/5	60
Mountain-Laurel	1/3	33	0/23	0	0/12	0	1/38	3
Red Maple					1/1	100	1/1	100
Red Oak	2/2	100	1/1	100			3/3	100
Rose spp.	3/4	75					3/4	75
Spiraea	0/1	0					0/1	0
Sweet Birch	0/1	0					0/1	0
Quaking Aspen	1/1	100					1/1	100
Witch-Hazel	1/1	100	3/5	60			4/6	67
White Ash					0/2	0	0/2	0
Total	66/86	77	29/61	48	26/49	53	121/196	62

Table 3.10. 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					
	Huckleberry		Mountain-Laurel		Flowering Dogwood	
Location	Ratio	%	Ratio	%	Ratio	%
ROW	28/38	74	1/3	33	17/17	100
ROW Edge	15/20	75	0/23	0	6/6	100
Woods	9/14	64	0/12	0	12/12	100
Total	52/72	72	1/38	3	35/35	100

Table 3.11. Birds observed and/or heard on the ROW and on the ROW edge during the study period.

Species	Species
Turkey vulture	Red-eyed vireo
Cooper's hawk	Black-and white warbler
Red-tailed hawk	Baltimore oriole
Downy woodpecker	Indigo bunting
Pileated woodpecker	Rose-breasted grosbeak
Yellow-shafted flicker	American goldfinch
Eastern phoebe	Chipping sparrow
Eastern wood pewee	Field sparrow
Black-capped chickadee	Song sparrow
Robin	Rufous-sided towhee
Wood thrush	Slate-colored junco
Starling	

Table 3.12. Potential wildlife use of plant species[1] present on the ROW and adjacent forest for the major game species on the Southern Tier Line 77 study area.

Species	Wildlife Species		
	Deer	Squirrel	Raccoon
<u>Trees</u>			
Red Maple	****		
Sugar-Maple	****		
American Elm	+	+	
White Ash	*		
Flowering Dogwood	*	*	
Red Oak	*	****	****
White Oak	*	****	****
Chestnut-Oak	*	****	****
Black Cherry	*	+	
Sweet Birch	*		
White Sassafras	+		
American Hop-Hornbeam	+		
Quaking Aspen	**		
Gray Birch	*		
Black Oak	*	****	****
Hemlock	+		
Pignut Hickory		***	+
<u>Shrubs</u>			
Willow spp.	*		
Red Osier Dogwood	*		
Highbush-Blueberry	+		
Spiraea	+		
Huckleberry	+		
Blackberry	+	+	
Hazelnut	+		+
Witch-Hazel	**		
Maple-leaved Viburnum	*		
Grape			*
<u>Herbs</u>[2]			
Mixed Grass	*		
Royal Fern	*		
Cinnamon-Fern	*		
Christmas Fern	*		

Table 3.12. Continued

Species	Wildlife Species		
	Deer	Squirrel	Raccoon
Hay-scented Fern	*		
Goldenrod	+		
Sedge		+	

[1] Those plants not included in this table provide a certain amount of cover (Table 3.5) 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 3.13. 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%–100%): Prior (-)	After (*)
(A)	Agriculture		
(C,I)	Commercial & Industrial		
(F)	Forest Land	88.4	88.4
(E)	Extractive Industry		
(N)	Non-productive		
(OR)	Outdoor Recreation		
(P)	Public & Semi-public		
(W)	Water Resources	11.6	11.6
(U)	Urban Inactive		
(T)	Transportation		
(R)	Residential		

1 Source: SCS Spartanburg, S. C., air photo No. S40 36071 175 69, July 29, 1975
Orange County, air photo No. ELQ-266-70, Oct. 30, 1965

FIG. 3.1.1. General view of the ROW and adjacent forest, looking north, in spring, 1975 (Photo Station 11).

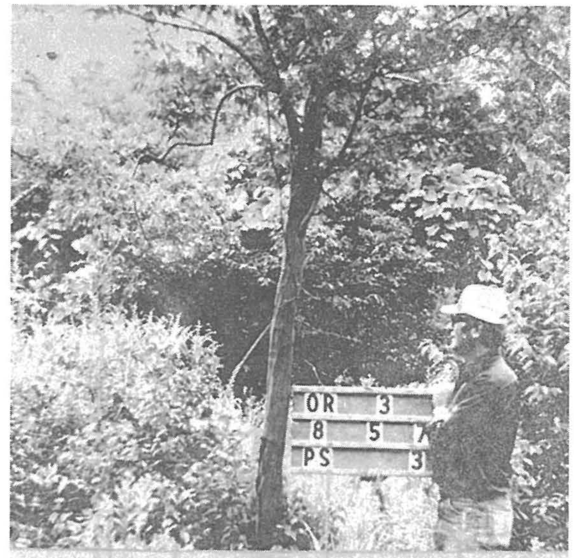


FIG. 3.1.2. American hornbeam on ROW, left from selective clearing, in summer of 1976 (Photo Station 3).

FIG. 3.1.3. General view of the ROW and adjacent forest showing drop and lop method of slash disposal, in winter, 1976 (Photo Station 4).

FIG. 3.1.4. Severe gully erosion on ROW near tower site, in spring, 1975 (Photo Station 12).

FIG. 3.1.5. Deer on access road on ROW, fall, 1975.

FIG. 3.1.6. Heavily browsed dogwood on ROW.

FIG. 3.1. Visual characteristics.

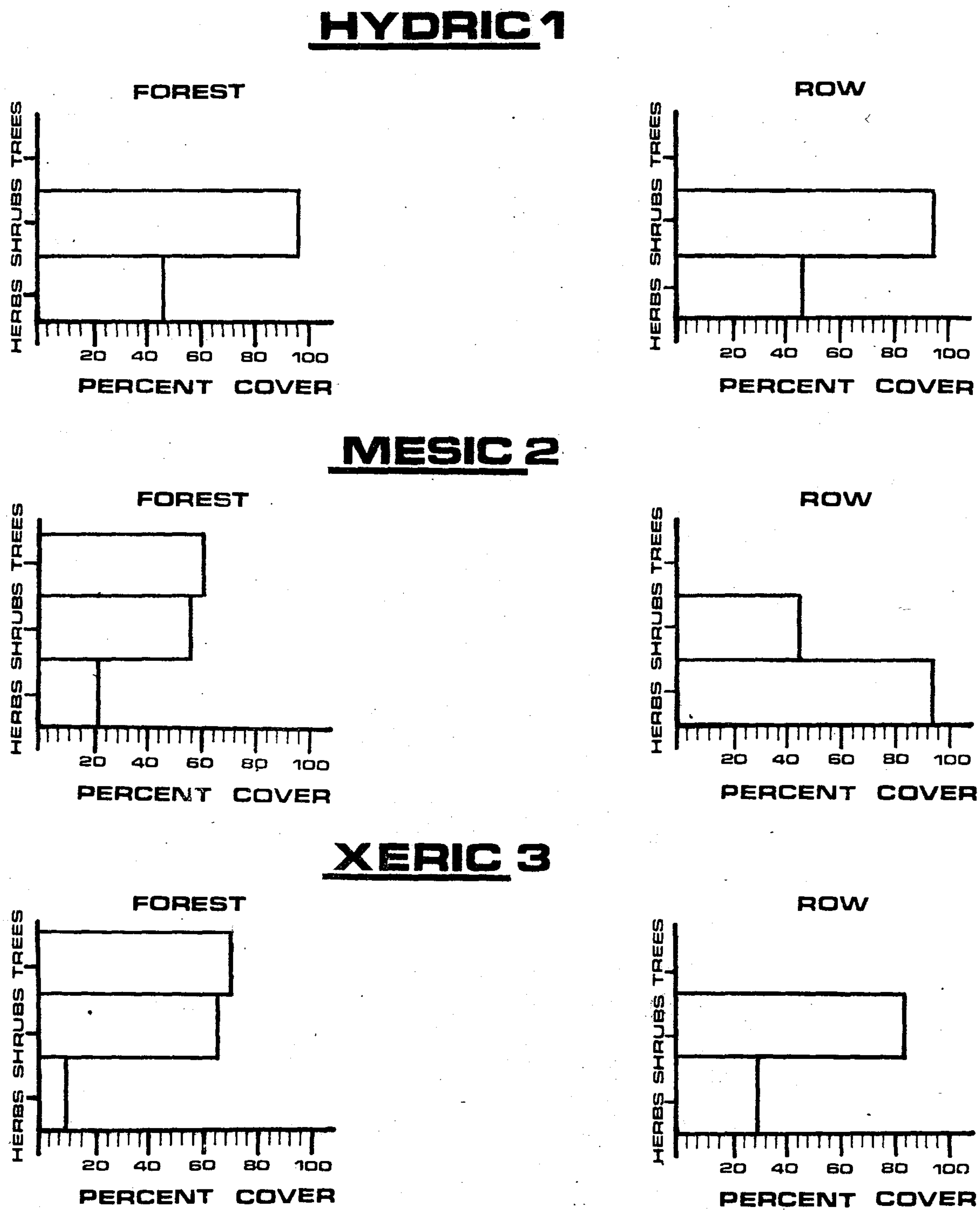


Fig. 3.2. Changes in cover value of tree, shrub, and herb layers from forest to ROW.

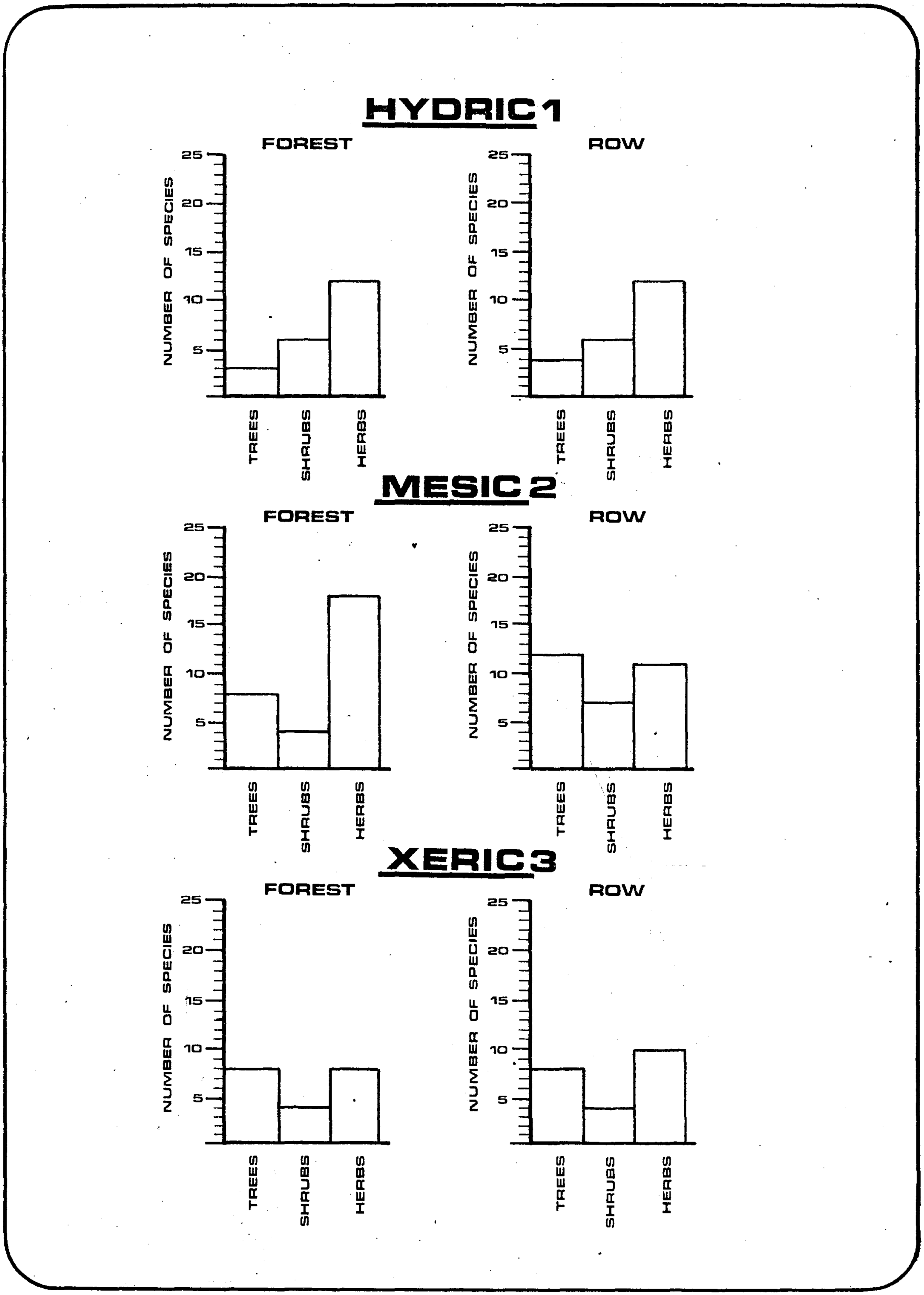


Fig. 3.3. Species diversity in the forest and on the ROW.

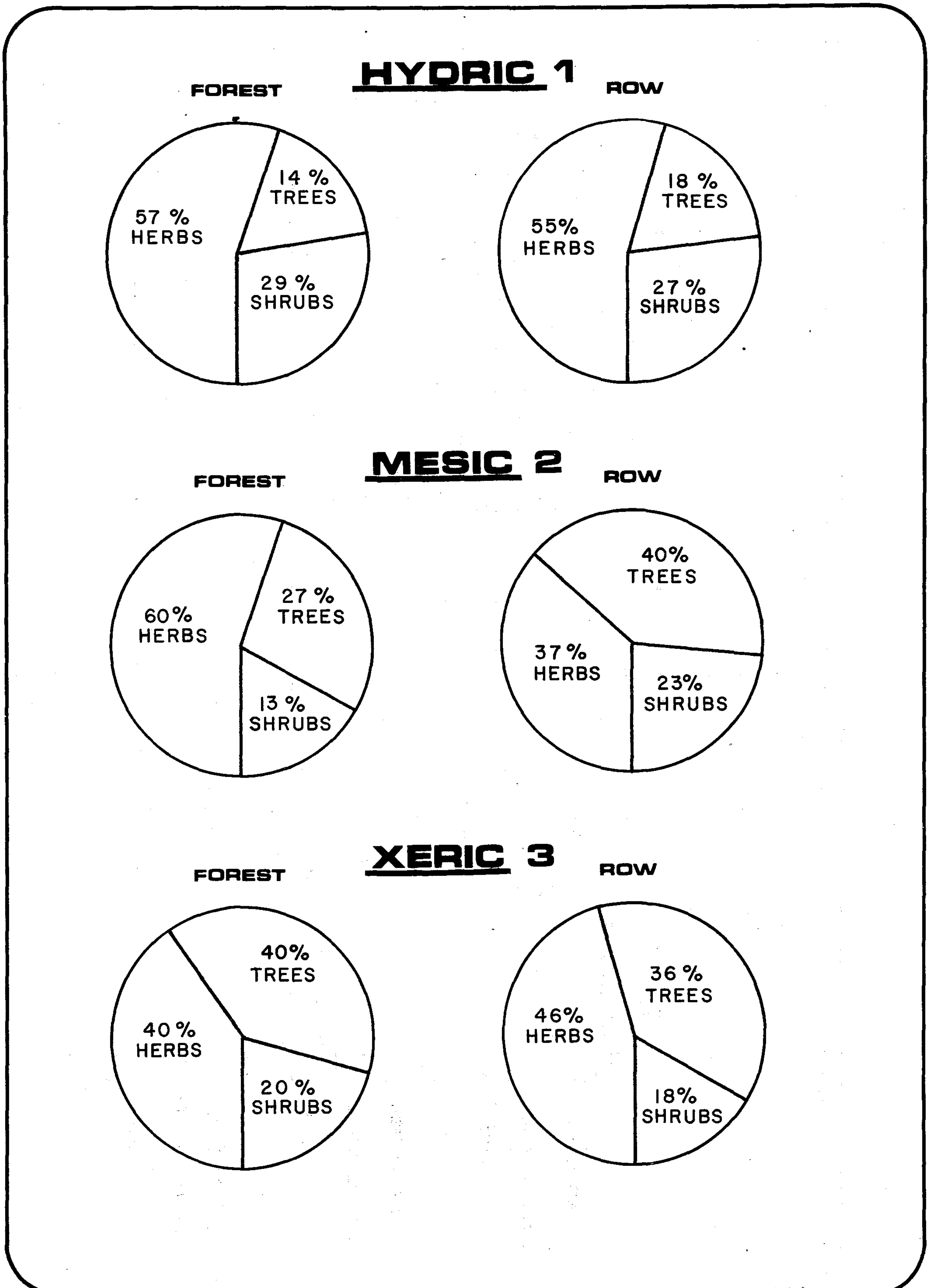


Fig. 3.4. **Life form spectrum of the ROW as compared to the adjacent forest to compare species make-up of each, based on the number of species in each life form expressed as a percent** of total species.

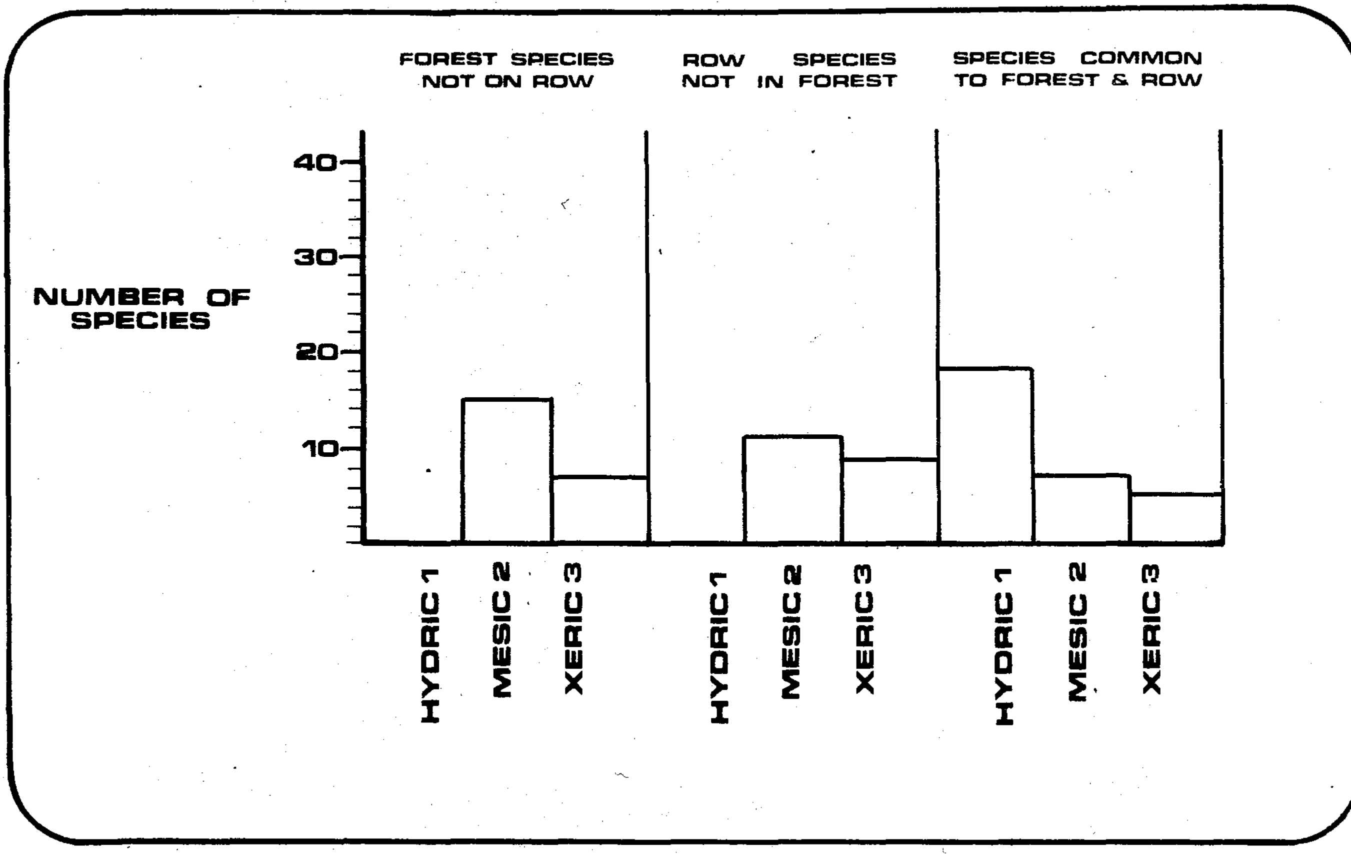


Fig. 3.5. Comparison of shrub and herb species in the forest and on the ROW.

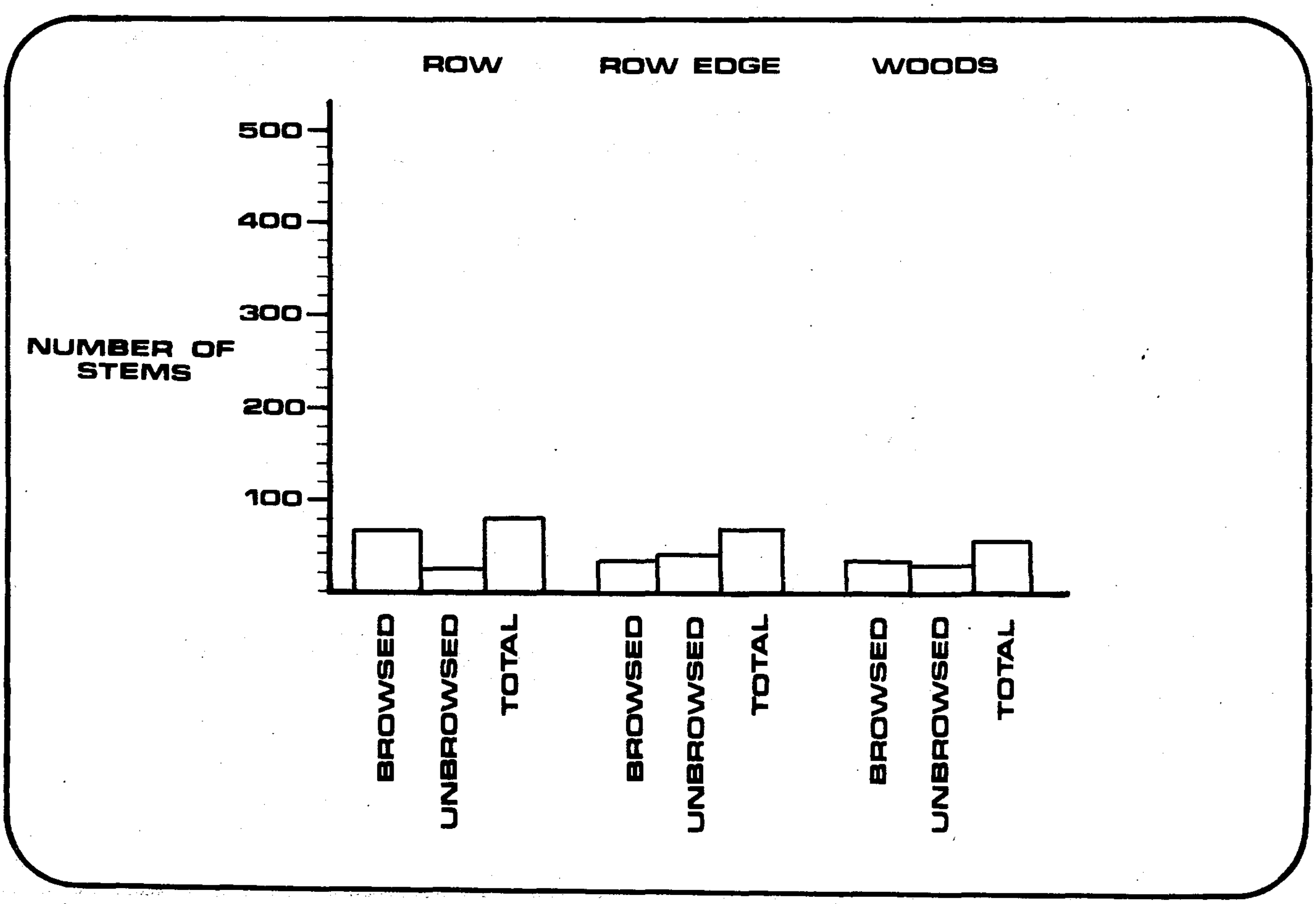
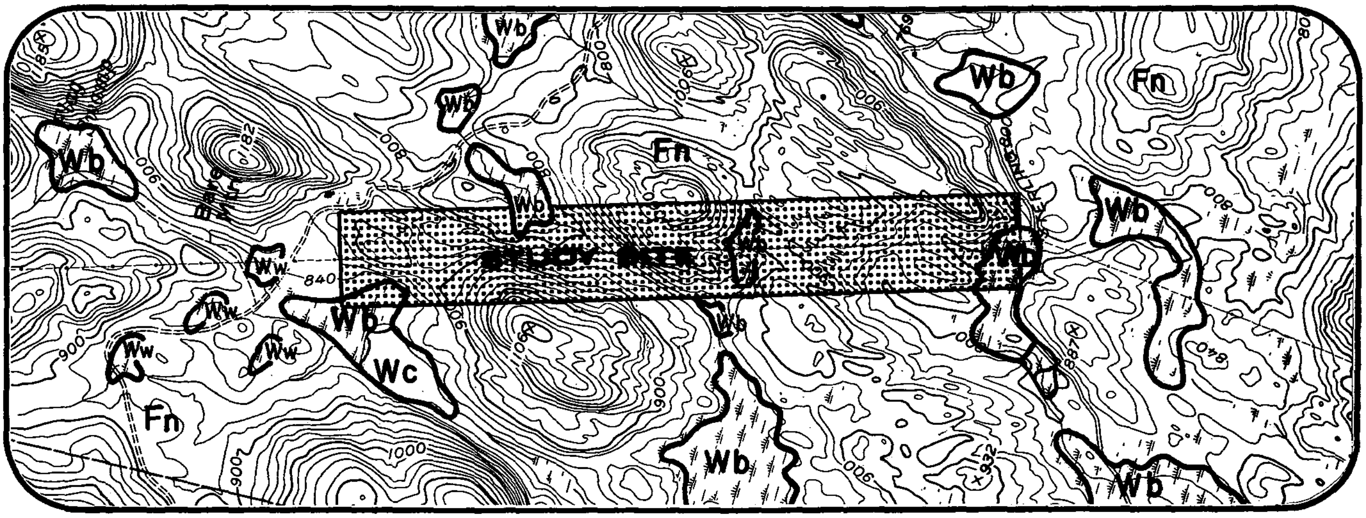
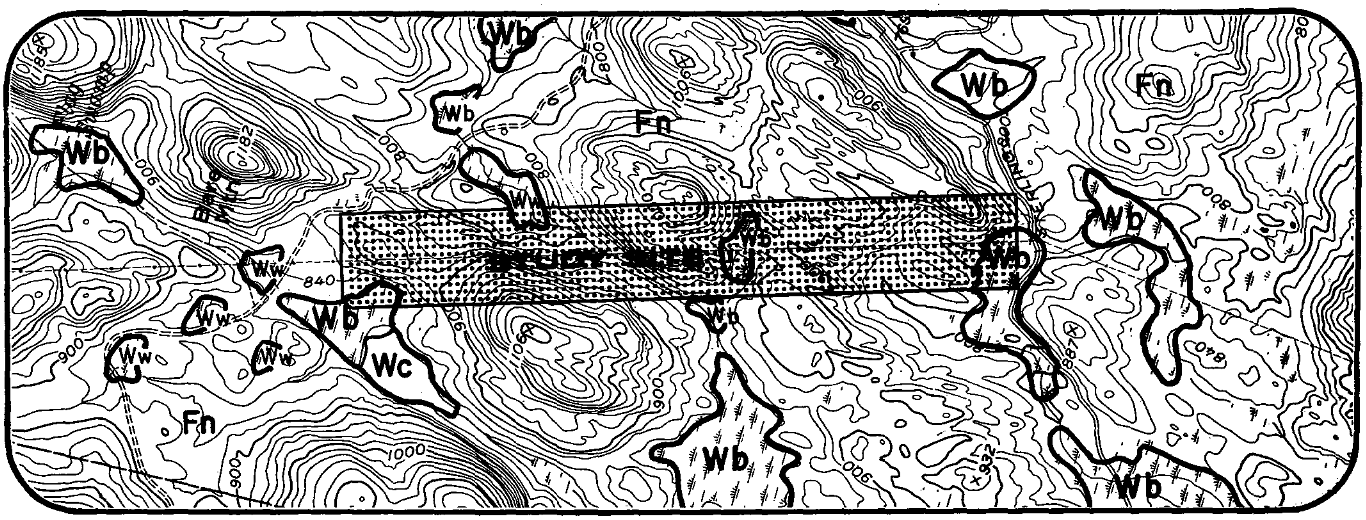


Fig. 3.6. Browse survey showing number of browsed, unbrowsed, and total stems for the ROW, ROW edge, and forest for 3 browse transects.



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

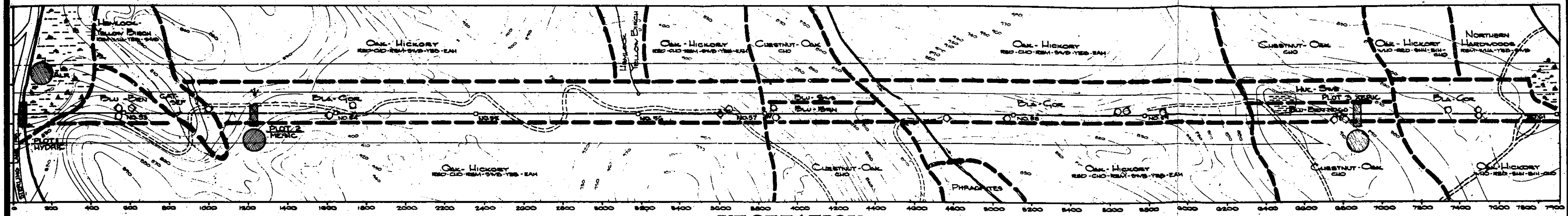
FOREST LAND
Fn - Forest lands

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

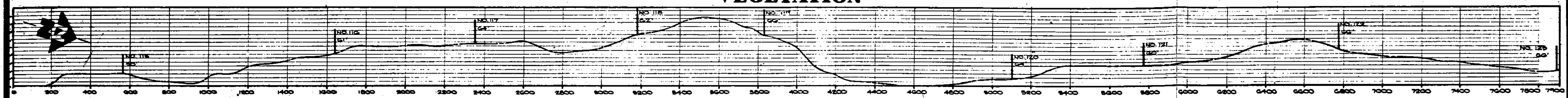
SOURCES:
SCS Spartanburg, S.C., air photo No. S40 36071 175 69, July 29, 1975
Orange County, air photo No. ELQ-266-70, Oct. 30, 1965
Area Land Use Map, LUNR, Cornell University, N.Y., 1974
U.S.G.S. Topographic Map, Sloatsburg, N.Y. - N.J., 1955

Fig. 3.7. Land use change.

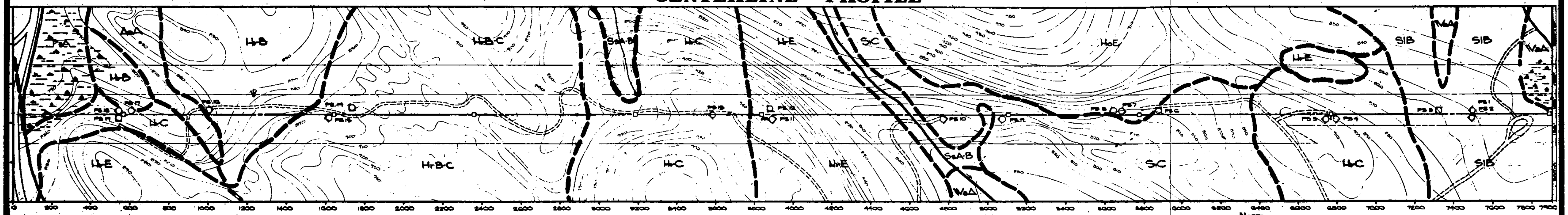
ASPLUNDH ENVIRONMENTAL SERVICES
BLAIR MILL ROAD WILLOW GROVE PA



VEGETATION



CENTERLINE PROFILE



SOILS

NOTES:
- VERTICAL AND HORIZONTAL SCALES ARE 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.
- 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

AsA	ALDEN-SUN very stony silt loam (0 to 8% slope)
HrA	HOLLIS-ROCK OUTCROP rocky sandy loam (0 to 8%)
HrB	HOLLIS-ROCK OUTCROP " " " (8 to 15%)
HrB-C	HOLLIS-ROCK OUTCROP " " " (8 to 25%)
HrC	HOLLIS-ROCK OUTCROP " " " (15 to 25%)
HrE	HOLLIS-ROCK OUTCROP " " " (35 to 50%)
HoE	HOLLIS rocky sandy loam (35 to 50%)
PaA	PALMS muck (0 to 8% slope)
SIB	SWARTSWOOD - LACKAWANA very stony fine sandy loam (8 to 15%)
SIC	SWARTSWOOD-LACKAWANA very stony fine sandy loam (15 to 25%)
SsA-B	SCRIBA-SUN very stony loam (0 to 15%)
WaA	WAYLAND silty 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*
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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*
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PIF	PINXTER - FLOWER *Rhododendron nudiflorum*
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POS	POISON SUMAC *Rhus vernix*
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PRU	BUCKTHORN *Rhamnus spp.*
RIB	RIBES *Ribes spp.*
ROD	RED OSIER DOGWOOD *Cornus stolonifera*
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SPI	SPIRAEA *Spiraea spp.*
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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*
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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

- CONSOLIDATED EDISON CO.-ENGIN. PLAN & PROFILE 1-5-73
- U.S.G.S. 7.5 MIN. TOPOGRAPHIC MAP, SLOATSBURG, N.Y. '55
- U.S.D.A., CORNELL UNIV. AGR. EXP. STA., DEPT. OF SOIL TECH. IN COOPERATION WITH THE BUREAU OF SOILS SOIL SURVEY FOR ORANGE COUNTY, N.Y.
- S.C.S., SPARTANBURG, S.C. ORANGE COUNTY AIR PHOTO NO 540 36071 175 69 (SCALE 1:40,000) JULY 29, 1975
- 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"

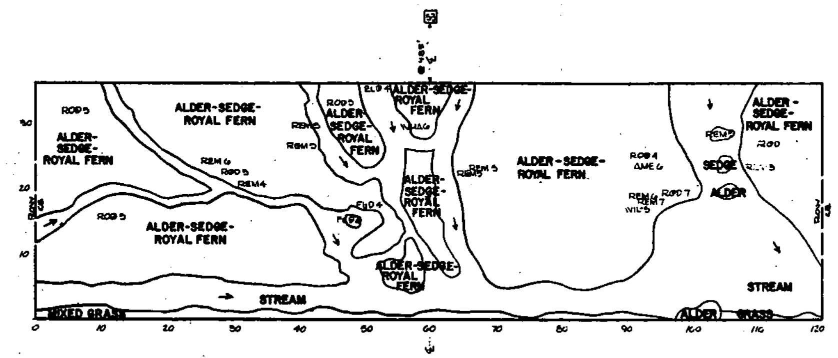
MAP 3.1

SITE 3 HABITAT CONDITIONS

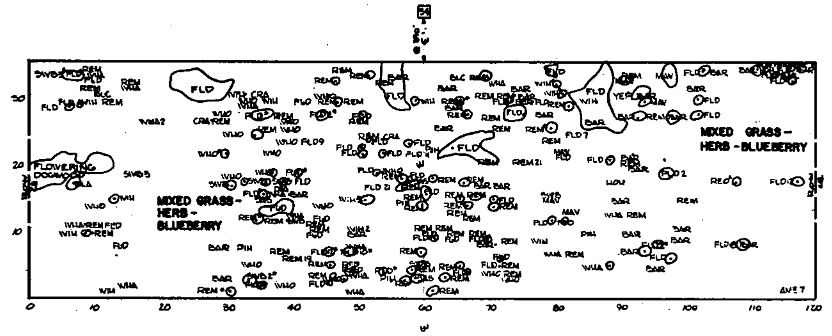
UTILITY: ORANGE & ROCKLAND UTILITIES, INC.
ROW DESCRIPTION: SOUTHERN TIER LINE 77 345 KV.
STEEL LATTICE 300 ROW

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

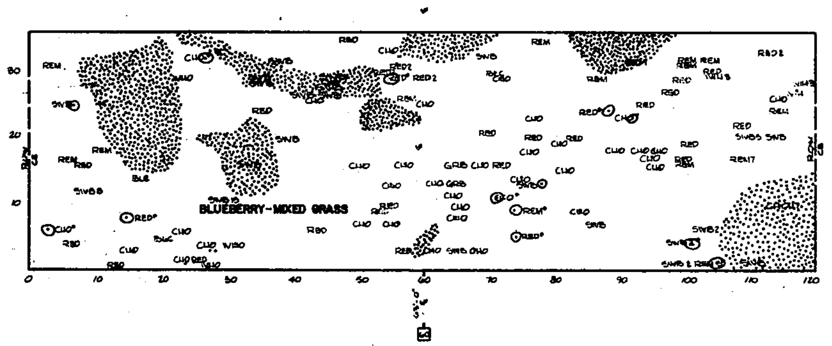
PLOT 1 HYDRIC



PLOT 2 MESIC



PLOT 3 XERIC



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

SITE MARKERS

- SAMPLE LOCATION
- PHOTO STATION

WATER SYMBOLS

- PERENNIAL STREAMS
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WIL	WILLOW *Salix spp.*
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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.

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 3.2

SITE 3

MAPPED PLOTS

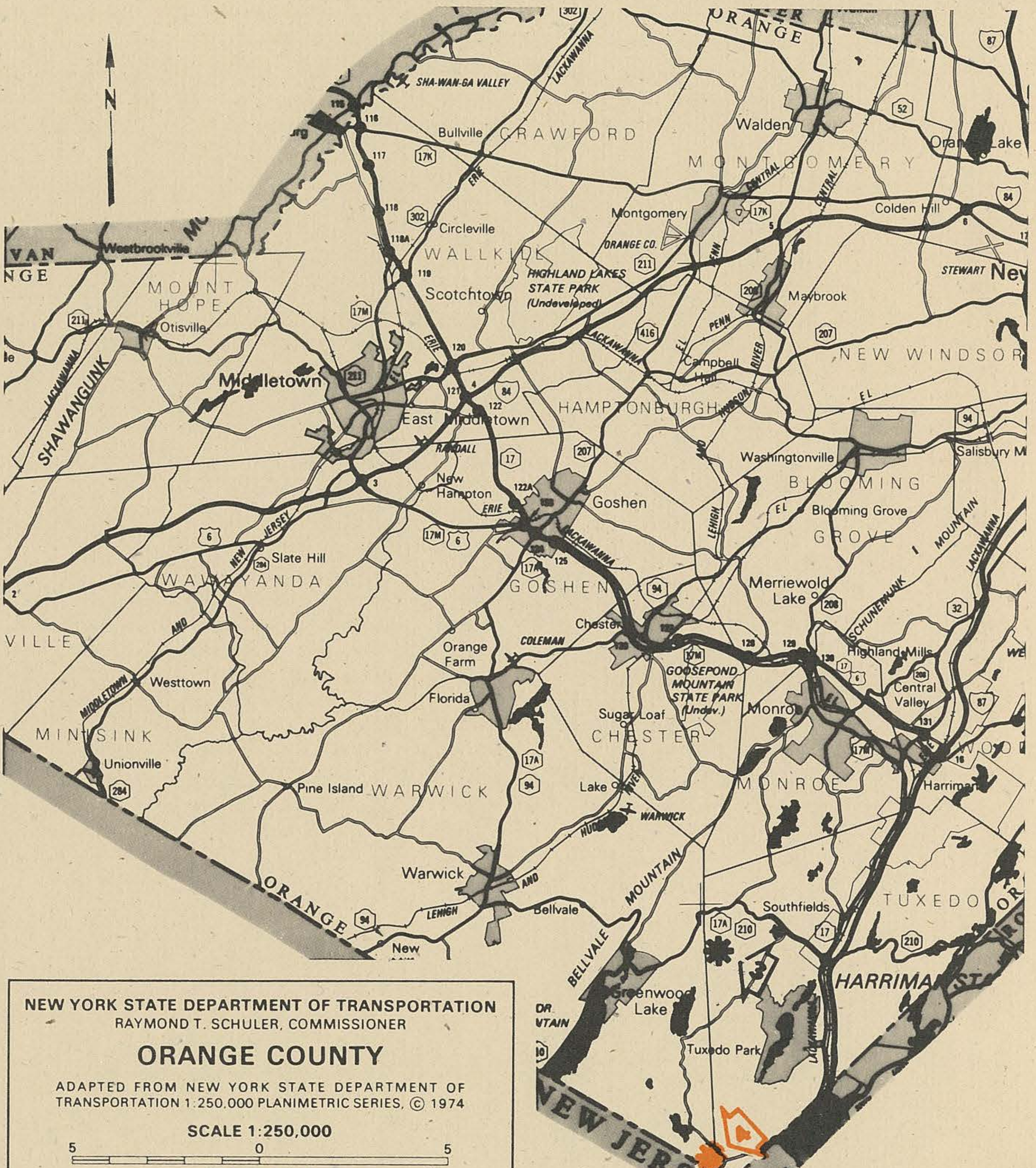
UTILITY: ORANGE & ROCKLAND UTILITIES, INC.
ROW DESCRIPTION: SOUTHERN TIER LINE 77 345 KV.
STEEL LATTICE 300' ROW

SCALE: 1" = 10'-0"

10 5 0 5 10 20 40 50

SITE 4

HILLBURN to SHOEMAKER



BASE MAP COPYRIGHT 1974 BY NEW YORK STATE DEPARTMENT OF TRANSPORTATION

Site 4 Hillburn to Shoemaker

Study area parallels Site 3 and extends from structure 107 to include structure 114. It can be reached by route 17 north through Sloatsburg and Tuxedo, and then taking a left turn on route 17A and 210 (west), a left at Sterling Lake Road (second left), and a right on the first right turn (blacktop road), past International Paper Company, and following that road to the end.

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Site 4 Hillburn to Shoemaker

1 Introduction

Site 4 is located in the New England Uplands physiographic area of New York (Cline, 1970) in the Oaks forest type area (Stout, 1958). The general landscape of the ROW and adjacent area is shown in Figs. 4.1.1 and 4.1.2.

The area is characterized by rolling to steep topography, and a number of small lakes and reservoirs. The surface is rolling to steep, and is rough and stony (Stout, 1958).

Typical forest types of the region are Oaks, and Oak-Northern Hardwoods (Stout, 1958). Located on the site are Chestnut-Oak, Northern Hardwoods, Hemlock-Yellow Birch, Oak-Hemlock, and Oak Hickory forest types.

2 Location and Identification

Site 4 is on the Hillburn to Shoemaker ROW which is operated by Orange and Rockland Utilities, Inc. (O&R). This 200-foot easement consists of 1 double circuit 138 kV line on steel lattice structures. The project site is approximately 7,600 feet in length and extends from structure 115 at Sterling Lake Road to include structure 107 south of Bare Mountain.

Site 4 is located approximately 2 miles northwest of Tuxedo Park in the town of Tuxedo, Orange County, New York (74° 14' 0" W. Longitude; 41° 13' 0" N. Latitude).

3 Background

The following discussion outlines documentable management techniques of clearing, construction, restoration, and maintenance for site 4, as received from O&R (letters dated January 26, 1976, and March 21, 1976, from A. A. Benjamin, Orange and Rockland Utilities, Inc., Spring Valley, N.Y.). All available pertinent information and cost data are included under each operation of clearing, construction, restoration, and maintenance.

3.1 Clearing

This ROW was clear cut in the 1920's. Logs were stacked and brush burned. No further information is available.

3.2 Construction

No information is available.

3.3 Restoration

No restoration of the ROW was performed.

3.4 Maintenance

During the early history of the line, broadcast spraying was conducted.

Between 1958 and 1962 there was selective basal treatment, with only undesirable tree species as target vegetation. Apparently there was very little, if any, mechanical maintenance.

Between 1970 and 1975, there was no maintenance performed on the ROW. No cost information is available.

4 General Reconnaissance

A general reconnaissance was made in accordance with the methodology and is set forth in Map 4.1 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 4.1 and described in Appendix 17. Specific reference is made to some of these photo stations throughout the report and illustrated on photos in Fig. 4.1. 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 since it opens up a vista through an otherwise uniform forest cover, and contains many desirable looking plant species such as flowering dogwood. Features within the area which may make the ROW site somewhat more sensitive to viewers include office and residential development which are naturally landscaped to blend with the surrounding forest, and many nearby recreation activities such as hiking, and horseback riding. The south portion of the ROW located on a hill overlooking Sterling Lake Road, is clearly visible to motorists. Although somewhat screened, the opposite end of the ROW site is visible to residents of a small apartment development. The potential number of people viewing the ROW is somewhat high because of Sterling Lake Road which is well traveled, although the area is not highly developed.

5 Field Studies - Results and Discussion

5.1 Soils

5.1.1 Geology and Soils

Site 4, Hillburn to Shoemaker ROW, is located in Orange County in the Hudson Valley (Cline, 1970), also termed the Hudson Hills subdivision (Thompson, 1966), in the Hudson River and Ramapo River drainage basins. Bedrock geology is of Precambrain age, pre 1,100 to 570 million years ago, consisting predominantly of metasedimentary and metavolcanic rocks such as gneise, marble, and quartzite (Broughton et al., 1973). Surficial geology is glacial drift, largely glacial till deposited directly by the ice sheet (Broughton et al., 1973; Wright and Olsson, 1972).

Soils on this site are largely classified in the order Inceptisols, suborder Ochrepts (Hollis, Lackawana, and Swartswood series), reflecting the absence of horizons of marked accumulation of clay and iron and aluminum oxides, and in the suborder Aquepts (Alden, Scriba, and Sun series), indicating that they are wet Inceptisols. The Hollis soils are in the order Spodosols, suborder Orthods, indicating leached surface horizons and accumulations of organic matter, iron, and aluminum in the subsurface horizons. Wayland soils are Entisols, suborder Aquents, reflecting recent sediments that are continuously saturated with water; and the Palms bog soils that consist almost completely of decomposed plant remains are Histosols, suborder Saprists (Soil Survery Staff, 1975). The site is located within the confines of the Rockland-Chatfield association, in which gneiss rock outcrop with shallow, stony soil, developed from glacial till, are prominent (Knox et al., 1954). Brief descriptions (Wright and Olsson, 1972; <u>Anon</u>., 1973) of soil types occurring on the ROW study site (Map 4.1; Table 4.1) are:

Alden-Sun very stony silt loam (AsA): These soils are mapped together here, and evidence very stony conditions; otherwise, they are very similar to the Sun soils. Alden soils formed in calcareous silty material in level to slightly depressed areas, mainly on lakes but including local depressions of till plains. Sun soils developed on glacial till, and occupy nearly level areas or depressions within undulating to rolling till plains. These soils are deep, and poorly drained. Alden soils are usually ponded, and the Sun soils evidence a seasonal water table at the surface. Both are slightly acid to neutral; Alden soils range from pH 5.5 to pH 7.5, while Sun soils may vary from pH 6.0 to pH 7.5 throughout a typical profile. On this site, soil reaction was pH 6.0 in the surface mineral soil. Alden very stony silt loam is assigned to Woodland Suitability Group 4wl, designating moderately low productivity for timber (Class 4) and a high water table (Subclass w) adversely affecting stand development or management. Sun very stony silt loam is in Woodland Suitability Group 4x2, indicating the presence of stones as a limitation.

Hollis rocky sandy loam (HoE): This is more in the nature of an association on this site, and not a specific soil series. It is shallow and formed in low lying glacial till dominated by granitic materials, where slopes range from gently sloping to steep, and runoff is moderate to rapid. This association is excessivley drained. Bedrock outcroppings generally occupy from 2 to 10% of the surface. The Hollis soils are generally strongly acid, and soil reaction was pH 5.2 in the surface horizon on this site. Hollis soils with slopes of 35% or greater are in Woodland Suitability Group 5d3, reflecting low productivity and restricted rooting depth.

Hollis-Rock Outcrop rocky sandy loam (HrA, HrB, HrB-C, HrE): As with the Hollis rocky sandy loam, this is described as an association, composed of the shallow Hollis rocky sandy loam, and rock outcrops, the latter of which occupy about 90% of the surface. Hollis soils developed in the low lime glacial till dominated by granitic materials, and occupy gently sloping to steep bedrock-controlled landforms. Depth to bedrock ranges from 10 to 20 inches. The association is excessively drained, and runoff is rapid. Hollis soils are generally strongly acid, ranging from pH 4.5 to pH 5.5 throughout a typical profile; on this site soil reaction in the surface 3 inches at the locations sampled varied from pH 4.8 to pH 5.1. Hollis soils, depending upon steepness of slope, are assigned to Woodland Suitability Groups 5dl, 5d2, and 5d3, designating low productivity and restricted rooting depth. Tree growth in the areas occupied by rock outcrop is normally poor, due to droughty conditions and shallow rooting depth.

Palms muck (PaA): Palms muck formed from highly decomposed herbaceous materials deposited over loamy mineral soil material; they occur on level to nearly level lake and till plains. They consist of from 18 to 48 inches of black organic material underlain by grayish clay loam to fine sandy loam. Palms soils are very poorly drained, and the water table is often evident at the surface. These soils are medium to slightly acid, ranging from pH 5.6 to pH 7.8 in the surface 35 inches; on this site, soil reaction was pH 6.1 in the upper mineral horizon. Assigned to Woodland Suitability Group 4wl, Palms muck is moderate for woodland production with management limitations related to poor drainage and a high water table.

Scriba-Sun very stony loam (SsA-B): In this area, Scriba and Sun soils occur in such an intricate pattern that they are mapped as a unit. This association formed in glacial till derived from gray and brown quartzite and sandstone; they occupy uplands on slopes ranging from level to gently sloping. This association ranges from somewhat poorly drained through very poorly drained; runoff is slow, and permeability is very slow due to a dense hardpan at 12 inches. Scriba soils are slightly to strongly acid, while Sun soils are slightly acid to neutral; the soil reaction on this site was pH 5.4 in the upper mineral horizon. Scriba very stony loam is in Woodland Suitability Group 3w2, and Sun very stony loam is in Woodland Suitability Group 4wl, designating moderately high and moderate productivity, respectively, and excessive wetness.

Swartswood-Lackawana very stony fine sandy laom (SlB and SlC): On this site, these soils were mapped together. They are upland soils that formed in glacial till derived from gray and brown quartzite, gray sandstone, and red shale, and occur on level to very steep terrain. They are well drained, even though permeability is slow to very slow, due largely to the presence of a very firm hardpan within 28 inches of the surface; runoff is slow to rapid. Approximately 3 to 15% of the surface is covered with large stones. These soils are strongly acid, varying between them from pH 4.5 to pH 5.5 in the surface 16 inches; on 3 locations sampled, soil reaction was pH 5.7, pH 4.9, and pH 5.1 in the surface 3 inches. Both soils are assigned to Woodland Suitability Group 3ol, indicating moderately high productivity for timber and no significant limitations or restrictions for woodland use or management. Where slopes exceed 15%, and may cause management limitations and restrictions, they are assigned to Woodland Suitability Group 3r3. The stony nature of this association may also cause limitations not noted in the woodland suitability group designations for the individual soils.

Wayland silt loam (WaA): Wayland soils developed in neutral or calcareous recent alluvium; they occupy nearly level areas or depressions on floodplains or streams receiving erosion from uplands that contain some calcareous materials. The surface is high in organic matter. These soils are poorly drained, with the depth to the seasonal water table varying from the surface to 6 inches. Soil reaction is normally neutral to slightly alkaline; however, on this site it was pH 5.4 in the upper mineral horizon. Wayland silt loam is assigned to Woodland Suitability Group 4wl, 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 2 xeric and 2 mesic upland locations. Average thickness of the organic layers and A1 horizon was based on 5 samples taken at each location (Table 4.2). 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; thus similar measurements were not made on the hydric site. No evidence of plowing, grazing, or recent fires was observed.

On the 2 xeric sites, 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 on both the ROW and woodland was designated a "thin duff mull with very shallow A1"; only minor differences occurred in thickness of the respective layers. On the 2 mesic sites, the predominant humus type both on the ROW and woodland again was a "thin duff mull with very shallow A1". Organic layers on the ROW were nearly equivalent to those in the woodland. Organic layers in the woods were composed primarily of tree parts (leaves, twig, and fruit) in contrast to leaves, stems; and fruit of the shrub layer, consisting largely of huckleberry, with some herbs present on the ROW.

Based on these limited observations, it appears that ROW construction and periodic maintenance since 1920 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, composed predominantly of shrubs in this instance, has resulted in annual litter deposition and continuation of a protective organic layer.

5.1.3 Soil Erosion

<u>Current Active Erosion</u> Observations of active soil erosion on the ROW and adjacent woodland were made on the Hillburn to Shoemaker study area in September, 1976. Active erosion was evident in the woodland on 3 locations, where soil cover consisted only of sparse litter, generally on steep slopes. Further evidence of erosion was not noted, apparently due to the protective canopy of trees and shrubs and undisturbed organic layers present on the soil. Likewise, only slight sheet erosion was noted in 1 location on the general ROW, areas on which woody brush was controlled but with little or no distrubance to the soil surface. Good vegetative 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 4.2).

Eroding areas were identified as to location on the ROW, soil type, average slope, and present plant cover (Table 4.3). Erosion was classified as to kind (sheet, rill, gully) and class (slight, moderate, severe); the average depth of the 1 gully noted on the ROW was recorded and its location plotted on the site habitat conditions map (Map 4.1). Active erosion on the ROW was largely confined to areas that had been subjected to past and/or recent mechanical disturbance of the soil, i.e., access roads, tower sites, and areas of excavation and logging usage (Table 4.3). In general, sediment resulting from erosion on the ROW accumulated on lower slopes and did not leave the ROW via streams or collect in water impoundments.

There was no restoration in the form of seeding and planting following construction of this ROW in 1920; therefore, denuded areas were dependent upon natural plant invasion. Some grass cover has developed on access roads; however, roads are apparently maintained periodically and used frequently, for recreational purposes, by the utility for repair and maintenance, and by private persons who are logging in part of the adjacent forest, and this has apparently prevented substantial plant invasion. Progressive sheet erosion apparently has hindered plant invasion of the excavated area, as this area is mainly bare. Current logging and skidding activities on the ROW appear to be responsible for bare and eroding soils on a segment of the ROW (Map 4.1). The soils under several towers remain bare, with slight to moderate sheet and rill erosion occurring (Fig. 4.1.3), and this may be due to the presence of paint drippings or corrosion from the towers. No areas of mass land movement such as landslides were observed on this site.

5.2 Vegetation

5.2.1 Habitat and Forest Types on the Site

Xeric Habitat The xeric, or dry, habitat was located on the upper slope of a large hill. Slope was approximately 12% on the north section of the plot on a west-facing slope, and extremely steep on the south part of the plot, 30%, where it dropped off rapidly on a south-facing slope. Drainage was excessive throughout the area. The forest type was Chestnut-Oak.

Mesic Habitat The mesic, or medium moist, habitat was located on the middle slope of a relatively steep hill. Slope was approximately 18% on a north-facing slope. Drainage was free but not excessive. The forest type was Oak- Hickory with red oak, chestnut-oak, red maple, sweet birch, and yellow birch predominant.

Hydric Habitat The hydric, or wet, habitat was located in a small depression. Slope was negligible and aspect was flat. Drainage was impeded and water frequently remained near or on the surface. The forest type was Hemlock-Yellow Birch with red maple, white ash, 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, 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. 4.2).

In order to more completely characterize the forest types, an analysis was made on the forest plots to derive importance values for the tree species there (Table 4.4). Obviously, chestnut-oak was an important species on the xeric plot, while yellow birch and chestnut-oak were important on the mesic plot, and red maple, yellow birch, and hemlock were important on the hydric plot.

On the xeric habitat, a Chestnut-Oak forest type was changed to a Huckleberry-Sweet-fern plant community. On the mesic habitat, an Oak-Hickory forest type was changed to a Blackberry-Goldenrod plant community. On the hydric habitat a Hemlock-Yellow Birch forest type was changed to a Willow Sensitive Fern plant community (Map 4.1; Table 4.5).

Quantitative Changes There was a slight increase in the number of shrub and herb species on the ROW as compared to the forest on the xeric habitat (Table 4.5; Figs. 4.3 and 4.4). On the mesic habitat there was a slight increase in the number of shrubs and a major increase in the number of herbs on the ROW as compared with the adjacent forest (Table 4.5; Fig. 4.5). On the hydric habitat, a major increase in the number of shrubs and herbs was apparent on the ROW as compared with the adjacent forest (Table 4.5; Fig. 4.5).

Qualitative Changes On the xeric habitat, 8 shrub and herb species occurred both in the forest and on the ROW (Fig. 4.5), while 2 shrubs and 4 herbs occurred in the forest but were absent from the ROW (Table 4.6). However, 5 shrubs and 7 herbs appeared on the ROW but were absent from the adjacent forest (Table 4.7).

On the mesic habitat, 7 shrub and herb species occurred both on the ROW and in the forest (Fig. 4.5), while 1 shrub and 3 herbs appeared in the forest but not on the ROW (Table 4.6). However, 3 shrubs and 14 herbs appeared on the ROW and were absent from the forest (Table 4.7).

On the hydric habitat, 12 shrub and herb species occurred both in the forest and on the ROW (Fig. 4.5), while no shrubs and 6 herbs occurred in the forest but not on the ROW (Table 4.6). However, 6 shrubs and 19 herbs appeared on the ROW and not in the forest (Table 4.7).

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

Table 4.8 presents a breakdown of major vegetational communities (Map 4.2) for xeric, mesic, and hydric plots on the Hillburn to Shoemaker ROW. Much of the present composition of herbaceous and woody plant communities reflects the maintenance history. The maintenance records are sketchy for this site thus making reasonable imputations difficult. The ROW has had a past history of broadcast herbicide applications. There were selective basal applications between 1958 and 1962 on this ROW. No further information is available.

The major vegetational community on the xeric plot was Huckleberry. On the mesic plot the major plant community was Hay-scented Fern, but a large community of yellow birch exists near the edge of the ROW. The hydric plot consisted mainly of Sedge-Spiraea-Mixed Grass-Herb (Map 4.2; Table 4.8).

Most of these species appear to be relatively resistant to herbicides and will most likely play an important role in the future development of vegetational matrix of this ROW.

5.2.4 Comparison of Forest Type with ROW Vegetation

The line was cleared in the 1920's and since that time has been maintained by broadcast herbicide applications except for some selective basal application during the late 1950's and early 1960's.

The general impact of the above treatments of the ROW was to change the forest types (Chestnut-Oak, Oak-Hickory, and Hemlock-Yellow Birch) to shrub-herb-grass communities. Some plants of the forest were replaced by light-loving species. Plants such as pinxter-flower and Canada lily (Figs. 4.1.4 and 4.1.5) were found only on the ROW.

On the xeric habitat, which was formerly occupied by a Chestnut-Oak forest type, a Huckleberry-Sweet-fern community was produced. There was a slight increase in the 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 forest species not on the ROW and some light-loving species of the ROW not in the forest (Table 4.5).

On the mesic habitat, which was formerly occupied by an Oak-Hickory forest type, a Blackberry-Goldenrod community was produced. There was a major increase in the number of shrub and herb species on the ROW as compared to the forest. There was a qualitative difference in the species of shrubs and herbs on the ROW as compared to the adjacent forest (Table 4.5).

5.3 Wildlife

The major game species for site 4, Hillburn to Shoemaker, as determined by Asplundh Environmental Services (AES) in conjunction with the New York State Department of Environmental Convservation (DEC), are white-tailed deer, gray squirrel, and raccoon.

5.3.1 Actual Use

White-tailed Deer White-tailed deer observations consisted of direct and indirect observations, i.e., sighting, browse, tracks, and pellets. One deer was seen walking on the ROW near tower structure 114 during the summer of 1975. Two deer beds were found on the ROW and deer browse was heavy on sweet birch and other species at this time. One deer was observed on the access road on ROW in the fall of 1975 (Fig. 4.1.6). During the winter of 1976, 3 deer were seen running down the ROW where they entered the alder swamp and continued into the forest to the east. Deer pellets were heavy and browse was moderate during the spring of 1976. Two deer were seen crossing the ROW by tower 109 at this time.

Browse Survey Three browse transects were established on study area 4 (Table 4.9; Fig. 4.6). These transects were established at each permanent study plot location, on March 21, 1976.

Overall browse utilization was highest in the woods, at 60%; however, many more stems were available and were taken by deer on the ROW and at the power line edge. Browse utilization was fairly consistent between the ROW, 37%, and the edge, 40% (Table 4.9; Fig. 4.6).

Huckleberry, sweet birch and yellow birch, and blackberry far surpassed all other species in total abundance. However, sweet birch and yellow birch were utilized much more than either huckleberry or blackberry (Table 4.10).

Gray Squirrel One gray squirrel was seen feeding in the forest adjacent to the ROW. No other squirrels were observed duirng the period of observation. This area does provide good habitat for squirrels, as evidenced by the fact that the forest adjacent to the ROW is well endowed with tree species which can provide a large amount of food, i.e., oaks, hickories, and other hardwoods.

Raccoon Small amounts of raccoon tracks were found in the forest near the hydric plot beside a small stream. No other activity was noted during the period of study even though this area does provide good habitat for raccoons.

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 4.11.

During the summer of 1975, 3 cottontail rabbits were flushed on the ROW between structures 107 and 108. One rabbit was flushed from a heavy cover of sweet-fern-huckleberry. Chipmunk activity was variable over the entire ROW and in the adjacent forest at this time.

During the fall of 1975, 2 rabbits were flushed on the ROW between structures 107 and 108, from a heavy cover of sweet-fern-huckleberry.

During the spring of 1976, 1 spotted turtle was seen crossing Sterling Lake Road near the alder swamp. One red eft was observed walking in the woods off the ROW.

5.3.2 Potential Use

Potential wildlife use of the plant species present on site 4 for the 3 major game species, deer, squirrel, and raccoon, is contained in Table 4.12 (Martin et al., 1951). 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.

5.4 Land Use

5.4.1 Location

Site 4 is located in a rural nonfarm section of the town of Tuxedo, Orange County, New York. Between 1960 and 1970 there was a 20.6% increase in the population of Orange County with a 1970 distribution of 51.1% urban, 47.3% rural nonfarm, and 1.6% rural farm (U.S. Bureau of the Census, 1972).

5.4.2 Land Use Near the Time of Construction

The ROW was constructed during the 1920's. Data prior to this date was unavailable. The earliest available data obtained from 1965 aerial photography indicates that the land adjacent to the ROW was primarily rural nonfarm (Table 4.13; Fig. 4.7). Land use distribution included the following subtypes:

Forest Land:
- Fn - Forest lands

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

5.4.3 Land Use After Construction

The adjacent land use to site 4 has not changed from the 1965 data. The land adjacent to the ROW is still rural nonfarm with the same land use distribution subtypes as described above (Section 5.4.2; Table 4.13; Fig. 4.7).

In addition to use of the ROW for the transmission of electrical power, portions of the ROW are currently being used for hunting and hiking. Some logging operations have been noted adjacent to the ROW.

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 undistrubed forest areas on both sides of the ROW. Since this ROW parallels the Southern Tier Line 77 constructed in 1973, biological and physical resources of the adjacent forest are similar.

6.1.1 Soils

This site is typified by rolling terrain of variable slope gradients and exposures consisting of well-drained upland and poorly drained lowland soils. Upland areas include 1) acid, very shallow, sandy loam soils (Hollis) interspersed with exposed granitic bedrock and 2) a complex of 2 soil series (Swartswood-Lackawana) that are acid, stony fine sandy loams with a fragipan. The low-productivity Hollis soils are associated with Oak-Hickory on mesic sites and Chestnut-Oak on the xeric upper slopes with southern exposures. The Swartswood-Lackawana soils have moderately high productivity and support Northern Hardwoods, Oaks, and Oak-Hickory forest types on mid- and lower slope positions.

Lowland soils generally are rated moderate in woodland productivity due to high water table restrictions and are closely associated with Alder on the Palms muck, Hemlock-Yellow Birch on the Alden-Sun silt loam and Scriba-Sun stony loam, and Northern Hardwoods on the Wayland silt loam.

Organic layers in the forest were composed of tree leaves, twigs, and fruit remains and averaged 1.5 and 1.9 inches thick on mesic and xeric sites, respectively. Decomposed organic matter was incorporated to a depth of .4 inch in the mineral soil. Humus types were classified as thin duff mulls. Slight sheet erosion was evident on 3 areas in the forest, mostly on very steep slopes where litter was sparse.

6.1.2 Vegetation

Prior to corridor establishment in the 1920's, forest stands of Chestnut-Oak occurred on xeric sites, and Oak-Hickory and Northern Hardwoods stands on mesic sites. On hydric sites some areas were occupied by hardwood stands of red maple and yellow birch with sweet birch, white ash, and hemlock as associates. Small areas of hydric sites may have been open with communities of Willow and Sensitive Fern as the plant cover.

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, 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 even before ROW construction. The degree of use is impossible to determine at this time.

6.1.4 Land Use

Earliest data available near the time of construction of the ROW in 1920 is

1965 aerial photography. The ROW and the adjacent land area was primarily rural nonfarm with a land use distribution of forest land (88.4%) and water resources (11.6%).

6.2. Conditions Which Exist at Present

6.2.1 Soils

Variable slope, exposure, drainage, and soil conditions present in the forest also were present on the ROW. Soil type boundaries coincided with topographic positions and general relief extending across the ROW and forest on both sides of the ROW. Smaller soil mapping units such as Hollis-Rock Outcrops and depressional poorly drained soils occurred sporatically and occupied only parts of the ROW and/or woodland area. Present ROW vegetation correlated well with soil types on hydric, mesic, and xeric habitats. The Alder type persisted on the muck soils; Willow Sensitive Fern developed on the poorly drained silt loams; Blackberry-Goldenrod on the stony fine sandy loams; Blackberry-Goldenrod on the moderately sloping rocky sandy loams; and Bracken and Huckleberry-Sweet-fern on the dry and rocky sandy loams.

Active erosion was negligible on the general ROW where soils were not disturbed; only slight sheet erosion was occurring at one location on rocky sandy loam with 20% slope. Active sheet and rill erosion, however, was evident on several segments of the access road, 2 tower sites where the soil was bare, an area where current logging operations are being conducted, and in a large excavation on the ROW near the north end of the study area. Severe gully erosion, with gullies 1 foot deep, occurred on a steep portion of the access road completely devoid of plant cover.

Surface organic layers on the general ROW are equivalent to those in the adjacent woodland with both areas exhibiting thin duff mull humus types. Since this ROW has been in existence since 1920, it is apparent that litter accumulation from ROW vegetation has been sufficient to provide a good organic mulch. The nature of organic materials vary some, with shrub-herb litter prevalent on the ROW.

6.2.2 Vegetation

Line clearing and a long period of broadcast spraying have resulted in a low vegetative cover of shrubs, grasses, and other herbaceous plants. Rock outcrops are present on mesic and xeric sites.

On xeric sites Huckleberry communities are the most common plant cover. In these communities serviceberrry and red maple seedlings are present. Mesic sites support extensive areas of hay-scented fern with scattered thickest of yellow birch. On hydric sites Hay-scented Fern-Spreading Dogbane, Hay-scented Fern-Spiraea-Mixed Grass-Herb, and Sedge-Spiraea-Mixed Grass-Herb communities are all present with little invasion of tree seedlings.

6.2.3 Wildlife

White-tailed deer, gray squirrel, and raccoon are the major game animals that currently occupy the study area. Deer were seen on the ROW, and indirect observations, i.e., browse, tracks, pellets, and beds, indicated their use of the ROW area. Browse surveys indicated that more stems were available on the ROW than either on the ROW edge or in the interior woods. Huckleberry, sweet and yellow birches, and blackberry were most abundant, but of these, sweet birch and yellow birch were more heavily browsed.

One gray squirrel was observed on the study area, in the adjacent forest, as were raccoon tracks. A number 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 4 have not changed from the 1965 data. The inventoried area has remained as rural nonfarm, though the county has changed to urban in character.

In addition to use of the ROW for the transmission of electrical power, portions of the ROW are currently being used for hunting and hiking. Some logging operations have been noted adjacent to the ROW.

6.3 Environmental Effect and Probable Causes

6.3.1 Soils

Detrimental effects of ROW construction and periodic management activities on soils were limited to soil disturbance on construction sites (access roads, tower areas, and excavations) and subsequent soil erosion. The pattern of continuing use of the access road for maintenance and other activities, such as current use for logging in the adjacent forest, interferes with plant establishment and soil stabilization and ultimately leads to active erosion. Lack of plant cover under several towers, possibly due to toxic leachates from the structures, also subjects the soil to erosive forces. Soil particles dislodged in erosion have accumulated on lower slopes of the ROW and/or moved into the adjacent forest, but generally did not occur as stream sediments.

Surface organic deposits on the general ROW were equivalent to those in the forest in humus type, thin duff mull, and thickness of respective layers. The only apparent difference was a change in composition of litter from tree parts in the forest to shrub-herb on the ROW, with both providing a highly effective mulch.

6.3.2 Vegetation

The general impact of ROW management was to produce a Huckleberry-Sweet-fern community on the xeric ROW habitat area, formerly a Chestnut-Oak forest type; a Blackberry-Goldenrod community on the mesic ROW habitat area form an Oak-Hickory forest type; and a Willow-Sensitive Fern community on the hydric ROW habitat area in the midst of a Hemlock-Yellow Birch type.

The number of species (species diversity) increased on the ROW as compared with the adjacent forest on all habitat areas.

Important differences in kinds of plants were exhibited by the ROW and forest, and such shrubs as blackberry, sweet-fern, and spiraea occurred only on the ROW on all habitat areas. Other species such as twisted-stalk, marginal shield-fern, New York fern, and cinnamon-fern occurred only in the forest.

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 identifiable effect on the adjacent land use, although the ROW has opened the area to some recreational uses.

Table 4.1. Soil series present on the Hillburn to Shoemaker study area.

Soil Series	Map Symbol[1]	Drainage Class[2]	Surface Soil pH	Surface Soil Texture	Woodland Suitability Group
Alden-Sun	AsA	PD-VPD	6.0	very stony silt loam	4w1/4x2
Hollis	HoE	E	5.2	rocky sandy loam	5d3
Hollis-Rock Outcrop	HrA	E	4.9	rocky sandy loam	5d1
Hollis-Rock Outcrop	HrB	E	5.1	rocky sandy loam	5d1
Hollis-Rock Outcrop	HrB-C	E	5.1	rocky sandy loam	5d2
Hollis-Rock Outcrop	HrC	E	4.8	rocky sandy loam	5d2
Hollis-Rock Outcrop	HrE	E	4.8	rocky sandy loam	5d3
Palms	PaA	VPD	6.1	muck	4w1
Scriba-Sun	SsA-B	SPD-VPD	5.4	very stony loam	3w2/4w1
Swartswood-Lackawana	SlB	G	5.7 & 4.9	very stony fine sandy loam	3o1
Smartswood-Lackawana	SlC	G	5.1	very stony fine sandy loam	3r3
Wayland	WaA	PD	5.4	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 4.2 Average thickness of organic layers and A1 horizon and humus types for xeric and mesic sites on ROW and adjacent woodland of site 4.

Moisture Regime	Location	Layer Thickness (in.) L	F	H	A1	Humus Type
L. Xeric (1)[1]	ROW	1.0	.3	.6	.2	Thin duff mull with very shallow A1
	Woodland	1.0	.4	.6	.3	Thin duff mull with very shallow A1
2. Xeric (1)	ROW	1.0	.3	.7	.3	Thin duff mull with very shallow A1
	Woodland	1.1	.2	.6	.3	Thin duff mull with very shallow A1
All Xeric Plots Combined	ROW	1.0	.3	.7	.3	Thin duff mull with very shallwo A1
	Woodland	1.	.3	.6	.3	Thin duff mull with very shallow A1
3. Mesic (2)	ROW	.5	.2	.2	.3	Thin duff mull with very shallow A1
	Woodland	.6	.3	.5	.4	Thin duff mull with very sahllow A1
4. Mesic (2)	ROW	.5	.2	.3	.3	Thin duff mull with very shallow A1
	Woodland	.8	.2	.5	.4	Thin duff mull with very shallow A1
All Mesic Plots Combined	ROW	.5	.2	.3	.3	Thin duff mull with very shallow A1
	Woodland	.7	.3	.5	.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 4.3. Areas exhibiting active erosion in September, 1976, on the Hillburn to Shoemaker ROW study area.

Location	Soil Type	Average Slope (%)	Plant	Erosion on Site: Kind	Erosion on Site: Class	Erosion on Site: Gully Depth (in.)
		ROW				
General ROW	Hollis-Rock Out crop rocky sandy loam	20	Huckleberry-herb	Sheet	Slight	-
Tower Site	Hollis-Rock Out crop rocky sandy loam	1	Bare	Sheet & Rill	Moderate	-
Tower Site	Hollis-Rock Out crop rocky sandy loam	2	Bare	Sheet & Rill	Slight	-
Access Road	Hollis-Rock Out crop rocky sandy loam	18	Grass	Sheet & Rill	Slight	-
Access Road	Hollis-Rock Out crop rocky sandy loam	20	Bare	Gully	Severe	12
Logging/Skidding Area	Hollis-Rock Out crop rocky sandy loam	5	Huckleberry	Sheet	Slight	-
Excavation	Hollis-Rock Out crop rocky sandy loam	15	Bare-grass-herb	Sheet	Moderate	-
		FOREST				
General Forest	Smartswood-Lackawana very stony fine sandy loam	3	Bare-litter (twigs & leaves)	Sheet	Slight	-
General Forest	Hollis-Rock Out-crop rocky sandy loam	25	Bare-litter (twigs & leaves)	Sheet	Slight	-

Table 4.3. Continued

Location	Soil Type	Average Slope (%)	Plant Cover	Erosion on Site Kind	Class	Gully Depth (in.)
General Forest	Hollis rocky sandy loam	40	Bare-litter (twigs & leaves)	Sheet	Slight	-

Table 4.4. 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
Xeric 1	Chestnut-Oak	84.23	67	151.23
	Yellow Birch	9.21	21	30.21
	Red Oak	6.40	8	14.40
	Red Maple	.16	4	4.16
Mesic 2	Yellow Birch	35.70	35	70.70
	Chestnut-Oak	35.58	24	59.58
	Red Oak	23.90	18	41.90
	Red Maple	2.41	18	20.41
	Sweet Birch	2.41	5	7.41
Hydric 3	Red Maple	45.00	44	89.00
	Yellow Birch	42.76	27	69.76
	Hemlock	2.85	11	13.85
	Red Oak	5.46	6	11.46
	White Ash	3.78	6	9.78
	Shagbark-Hickory	.15	6	6.15

Table 4.5. 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						
Yellow Birch	1.1	–	1.1	–	1.1	–
Chestnut-Oak	2.1	–	1.1	–	–	–
Red Maple	++.1	–	1.1	–	2.1	–
Red Oak	+.1	–	+.1	–	++.1	–
Sweet Birch	–	–	++.1	–	–	–
Shagbark-Hickory	–	–	–	–	++.1	–
Hemlock	–	–	–	–	+.1	–
White Ash	–	–	–	–	++.1	–
No. Species	4	0	5	0	6	0
Shrub Layer						
Huckleberry	3.3	4.5	3.3	+.2	++.2	2.3
Witch-Hazel	2.1	–	–	–	–	+.1
Maple-leaved Viburnum	+.1	–	2.3	+.2	–	–
Arrow-wood	++.1	++.1	–	–	–	–
Mountain-Laurel	+.1	1.3	–	–	–	–
Virginia Creeper	++.1	++.1	–	–	(+.2)	+.2
Blackberry	–	2.1	–	2.1	–	+.1
Scrub-Oak	–	+.1	–	–	–	–
Sweet-fern	–	2.3	–	–	–	–
Spiraea	–	+.2	–	+.2	–	2.3
Dewberry	–	+.1	–	–	–	–
Gooseberry		–	+.1	++.1	–	–
Mountain-Maple	–	–	+.1	–	–	–
Rambler Rose	–	–	–	++.1	–	–
Barberry	–	–	–	–	–	1.3
Willow	–	–	–	–	–	+.2
Grape	–	–	–	–	–	2.3
Poison Ivy	–	–	–	–	+.1	1.1
No. Species	6	9	4	6	3	9
Trees in the Shrub Layer						
Chestnut-Oak	1.1	–	3.1	+.1	–	–
Red Maple	2.1	2.1	–	1.1	–	+.1
Yellow Birch	2.1	–	–	3.1	–	–
Red Oak	1.1	1.1	–	1.1	–	–
Shagbark-Hickory	+.1	+.1	–	–	–	–
Chestnut	++.1	–	–	–	–	–
Serviceberry	–	1.1	–	–	–	–

Table 4.5. 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.
American Hornbeam	-	+.1	++.1	-	3.1	-
Black Cherry	-	++.1	-	-	-	-
Gray Birch	-	+.1	-	-	-	-
Bitternut Hickory	+.1	++.1	-	-	-	-
White Ash	-	+.1	++.1	-	++.1	-
Flowering Dogwood	-	-	3.1	+.1	-	2.1
Basswood	-	-	-	++.1	-	-
Sweet Birch	-	-	-	+.1	-	-
White Sassafras	-	-	-	-	++.1	-
No. Species	7	9	4	7	3	2
Herb Layer[1]						
White Moss	2.2	++.2	-	+.2	-	++.2
Wild Sarsaparilla	1.1	-	1.1	+.1	-	-
Hair-cap Moss	1.2	3.3	-	3.4	-	+.3
Mixed Grass	+.2	1.2	+.2	++.2	3.3	3.3
Whorled Loosestrife	+.1	++.1	-	1.1	-	-
Wild Lily-of-the-valley	+.1	-	-	(+.1)	-	-
Violet spp.	+.2	-	-	+.1	2.2	1.2
Hay-scented Fern	-	1.3	++.2	4.5	-	1.4
Bracken	-	1.2	-	-	-	-
Deer-tongue Grass	-	++.2	-	+.2	-	+.2
Goldenrod spp.	-	1.2	-	++.1	-	1.2
Broom-sedge	-	1.2	-	-	-	-
Pale Corydalis	-	(+.2)	-	-	-	-
Lion's-foot	+.1	-	-	-	-	-
Old-field-Cinquefoil	-	-	-	++.1	-	+.1
Marginal Shield-Fern	-	-	++.2	-	-	-
Aster spp.	-	-	-	+.1	-	2.2
White Snakeroot	-	-	-	+.2	-	+.1
Wild Lettuce	-	-	-	++.1	-	-
Poverty-Grass	-	-	-	1.2	-	-
Hawkweed (yellow)	-	-	-	+.1	-	-
Jack-in-the-pulpit	-	-	-	(1.2)	+.1	+.1
Twisted-stalk	-	-	+.1	-	1.1	-
Moss spp.	-	-	1.2	-	2.3	+.2
Sphagnum	-	-	-	-	-	+.3
Spreading Dogbane	-	-	-	-	-	4.4
Maidenhair-Fern	-	-	-	-	+.2	1.2
Sensitive Fern	-	-	-	-	2.2	+.1
Blue-eyed Grass	-	-	-	-	-	+.2
Boneset	-	-	-	-	-	+.1
New York Fern	-	-	-	-	2.3	-
Royal Fern	-	-	-	-	+.2	-
Cinnamon-Fern	-	-	-	-	+.2	-

Table 4.5. 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.
Spotted Touch-me-not	-	-	-	-	+.2	+.2
Sedge	-	-	-	-	4.2	3.2
Tearthumb	-	-	-	-	-	1.3
Cardinal-flower	-	-	-	-	-	++.2
Thoroughwort	-	-	-	-	-	1.1
Cat-tail	-	-	-	-	-	1.2
Stonecrop sp.	-	-	-	-	-	++.2
Common Mouse-ear Chick-weed	-	-	-	-	-	+.1
Rush	-	-	-	-	-	1.2
Sweet-scented Bedstraw	-	-	-	-	+.2	1.1
Christmas Fern	-	-	-	-	+.2	-
False Hellebore	-	-	-	-	+.2	-
Stemless Lady's-slipper	-	++.1	-	-	-	-
No. Species	8	11	6	17	15	28
Total No. Species						
Trees[2]	7	9	8	7	8	2
Shrubs	6	9	4	6	3	9
Herbs	8	11	6	17	15	28
Totals	21	29	18	30	26	39

[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 4. 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		
Witch-Hazel	2.1	-
Maple-leaved Viburnum	+.1	-
Herbs[1]		
Wild Sarsaparilla	1.1	-
Wild Lily-of-the-valley	+.1	-
Violet spp.	+.2	-
Lion's-foot	+.1	-
No. Species	6	
Mesic (2)		
Shrubs		
Mountain-Maple	+.1	-
Herbs		
Marginal Shield-Fern	++.2	-
Twisted-stalk	+.1	-
Moss spp.	1.2	-
No. Species	4	
Hydric (3)		
Shrubs		
Herbs		
Twisted-stalk	1.1	-
New York Fern	2.3	-
Royal Fern	+.2	-
Cinnamon-Fern	+.2	-
Christmas Fern	+.2	-
False Hellebore	+.2	-
No. Species	6	

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

Table 4.7. Characteristic species with abundance and sociability ratings (A.S.) in the shrub and herb layers on the ROW which did not occur in the adjacent forest.

Species	ROW A.S.	Forest A.S.
Xeric (1)		
Shrubs		
Blackberry	2.1	-
Scrub-Oak	2.3	-
Spiraea	+.2	-
Dewberry	+.1	-
Sweet-fern	2.3	-
Herbs[1]		
Hay-scented Fern	1.3	-
Bracken	1.2	-
Deer-tongue Grass	++.2	-
Goldenrod spp.	1.2	-
Broom-sedge	1.2	-
Pale Corydalis	(+.2)	-
Stemless Lady's-slipper	++.1	-
No. Species	12	
Mesic (2)		
Shrubs		
Blackberry	2.1	-
Spiraea	+.2	-
Rambler Rose	++.1	-
Herbs		
White Moss	+.2	-
Hair-cap Moss	3.4	-
Whorled Loosestrife	1.1	-
Wild Lily-of-the-valley	(+.1)	-
Violet spp.	+.1	-
Deer-tongue Grass	+.2	-
Goldenrod spp.	++.1	-
Old-field Cinquefoil	++.1	-
Aster spp.	+.1	-
White Snakeroot	+.2	-
Wild Lettuce	++.1	-
Poverty-Grass	1.2	-
Hawkweed (yellow)	+.1	-
Jack-in-the-pulpit	(1.2)	-
No. Species	17	

Table 4.7. Continued

Species	ROW A.S.	Forest A.S.
Hydric (3)		
Shrubs		
Witch-Hazel	+.1	-
Blackberry	+.1	-
Spiraea	2.3	-
Barberry	1.3	-
Willow	+.2	-
Grape	2.3	-
Herbs		
White Moss	++.2	-
Hair-cap Moss	+.3	-
Hay-scented Fern	1.4	-
Deer-tongue Grass	+.2	-
Goldenrod spp.	1.2	-
Old-field-Cinquefoil	+.1	-
Aster spp.	2.2	-
White Snakeroot	+.1	-
Sphagnum	+.3	-
Spreading Dogbane	4.4	-
Blue-eyed Grass	+.2	-
Boneset	+.1	-
Tearthumb	1.3	-
Cardinal-flower	++.2	-
Thoroughwort	1.1	-
Cat-tail	1.2	-
Stonecrop sp.	++.2	-
Common Mouse-ear Chickweed	+.1	-
Rush	1.2	-
No. Species	25	

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

Table 4.8. Major vegetational types for the Hillburn to Shoemaker 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		
Huckleberry	75.7		1.0
Rock	24.0	2.6	
Mountain-Laurel	.3		
Hay-scented Fern		70.6	14.4
Yellow Birch		26.2	
Flowering Dogwood		.4	
Rambler Rose (Rosa Multiflora)		.1	
Maple-leaved Viburnum		.1	
Sedge-Spiraea-Mixed Grass-Herb			38.1
Hay-scented Fern-Spreading Dogbane			31.4
Hay-scented Fern-Spiraea-Mixed Grass-Herb			10.3
Cat-tail-Sedge-Mixed Grass-Herb			2.9
Barberry			1.6
Maidenhair-Fern			.1
Willow			.1
Deer-tongue Grass			.1
Total	100.0	100.0	100.0

Table 4.9. 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	%
Barberry					0/2	0	0/2	0
Blackberry	6/19	32	0/8	0			6/27	22
Black Cherry			1/1	100	0/1	0	1/2	50
Birch (Yellow, Sweet)	8/8	100	18/21	86	0/1	0	26/30	87
Dewberry	0/2	0					0/2	0
Red Cedar			0/1	0			0/1	0
Highbush-Blueberry			0/1	0			0/1	0
Huckleberry	5/22	23	0/15	0	2/2	100	7/39	18
Mockernut Hickory			0/1	0			0/1	0
Mountain Laurel	2/6	33			4/4	100	6/10	60
Red Maple			1/1	100			1/1	100
Red Oak			1/1	100			1/1	100
Spiraea	0/2	0	0/1	0			0/3	0
Sweet-fern	1/1	100					1/1	100
Witch-Hazel			0/1	0			0/1	0
Total	22/60	37	21/52	40	6/10	60	49/122	40

Table 4.10. 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					
	Huckleberry		Sweet & Yellow Birches		Blackberry	
	Ratio	%	Ratio	%	Ratio	%
ROW	5/22	23	8/8	100	6/19	32
ROW Edge	0/15	0	18/21	86	0/8	0
Woods	2/2	100	0/1	0		
Total	7/39	18	26/30	87	6/27	22

Table 4.11. Birds observed and/or heard on the ROW and on the ROW edge during the study period.

Species	Species
Turkey vulture	Wood thrush
Cooper's hawk	Starling
Red-tailed hawk	Red-eyed vireo
Ruffed grouse	Black-and-white warbler
American woodcock	Baltimore oriole
Mourning dove	Red-winged blackbird
Downy woodpecker	Cardinal
Pileated woodpecker	Indigo bunting
Yellow-shafted flicker	Rose-breasted grosbeak
Eastern kingbird	American goldfinch
Eastern wood pewee	Chipping sparrow
Blue jay	Field sparrow
Common crow	Song sparrow
Black-capped chickadee	Rufous-sided towhee
Catbird	Slate-colored junco

Table 4.12. Potential wildlife use of plant species[1] present on the ROW and adjacent woods for the major game species on the Hillburn to Shoemaker study area.

Species	Wildlife Species		
	Deer	Squirrel	Raccoon
Trees			
Red Maple	****	**	
Chestnut-Oak	*	****	****
Red Oak	*	****	****
Yellow Birch	*		
Sweet Birch	*		
Flowering Dogwood	*	*	
White Oak	*		
Basswood	*		
Black Cherry	*	*	
American Hornbeam	*	*	
Gray Birch	*		
Serviceberry	+		
Sassafras	+		
Hemlock	+		
Shagbark-Hickory		***	+
Bitternut Hickory		***	+
Shrubs			
Witch-Hazel	**		
Maple-leaved Viburnum	*		
Arrow-wood	*		
Mountain-Maple	****		
Willow	*		
Blackberry	+	+	
Dewberry	+	+	
Huckleberry	+		
Blueberry	+		
Sweet-fern	+		
Spiraea	+		
Grape			*
Herbs[2]			
Goldenrod	+		
Mixed Grasses	*		
Hay-scented Fern	*		
Bracken	*		
Marginal Shield-Fern	*		
Mardenhair-Fern	*		
Sensitive Fern	*		

Table 4.12. Continued

Species	Wildlife Species		
	Deer	Squirrel	Raccoon
New York Fern	*		
Royal Fern	*		
Cinnamon-Fern	*		
Christmas Fern	*		
Sedge		+	

1 Those plants not included in this table provide a certain amount of cover (Table 4.5) 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 4.13 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	
(C,I)	Commercial & Industrial	
(F)	Forest Land	---88.4 ***88.4
(E)	Extractive Industry	
(N)	Non-productive	
(OR)	Outdoor Recreation	
(P)	Public & Semi-public	
(W)	Water Resources	----------11.6 **********11.6
(U)	Urban Inactive	
(T)	Transportation	
(R)	Residential	

1 Source: SCS Spartanburg, S. C., air photo No. S40 36071 175 69, July 29, 1975
Orange County, air photo No. ELQ-266-70, Oct. 30, 1965

FIG. 4.1.1. General view of the ROW and adjacent forest, looking north, in spring of 1976 (Photo Station 9).

FIG. 4.1.2. General view of the ROW and adjacent forest, looking south, in fall, 1975 (Photo Station 11).

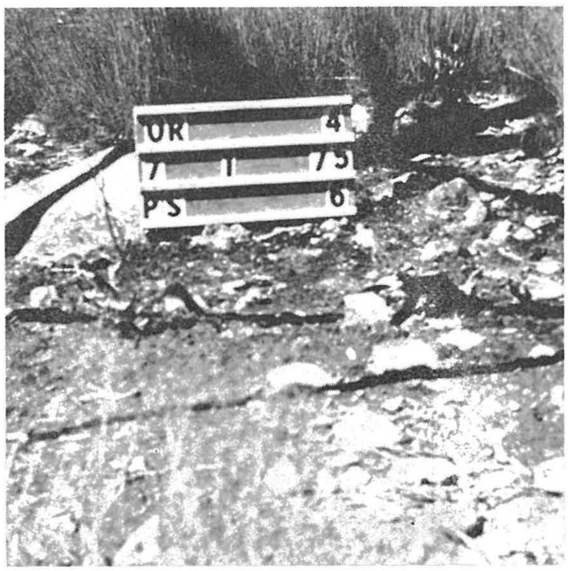


FIG. 4.1.3. Open soil under tower 108 exhibiting moderate sheet and rill erosion, in summer, 1975 (Photo Station 6).

FIG. 4.1.4. Pinxter-flower in bloom on ROW, in the spring of 1976.

FIG. 4.1.5. Canada lily in bloom on the ROW, in the summer of 1975.

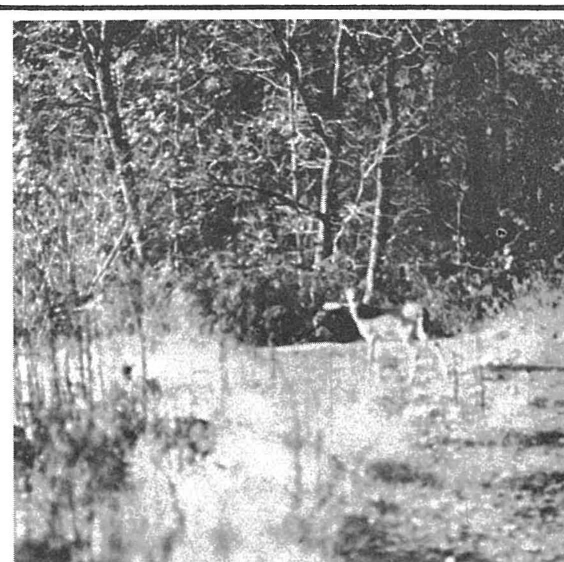


FIG. 4.1.6. Deer on access road on ROW during the fall of 1975.

FIG. 4.1 Visual Characteristics

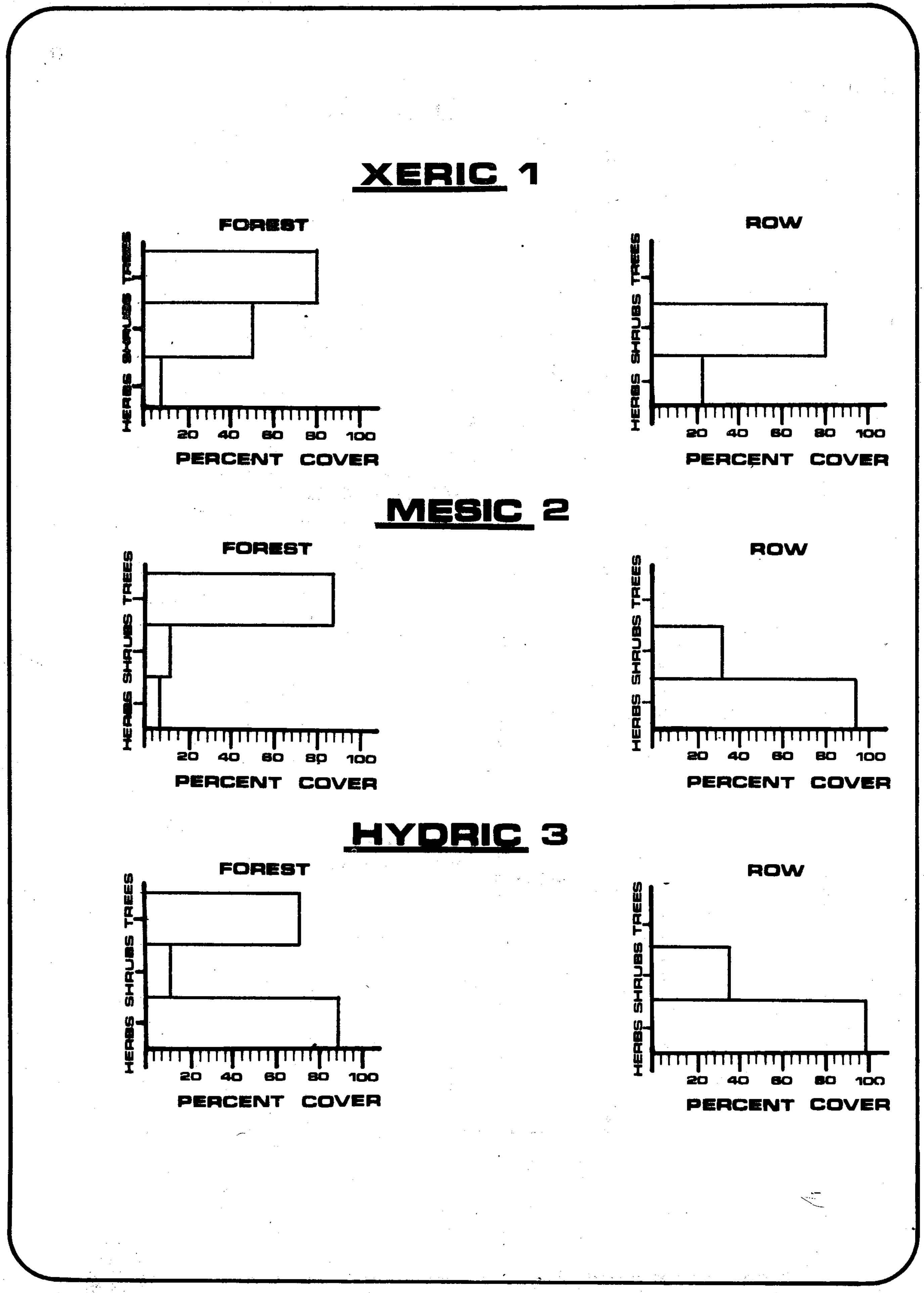


Fig. 4.2. Changes in cover value of tree, shrub, and herb layers from forest to ROW.

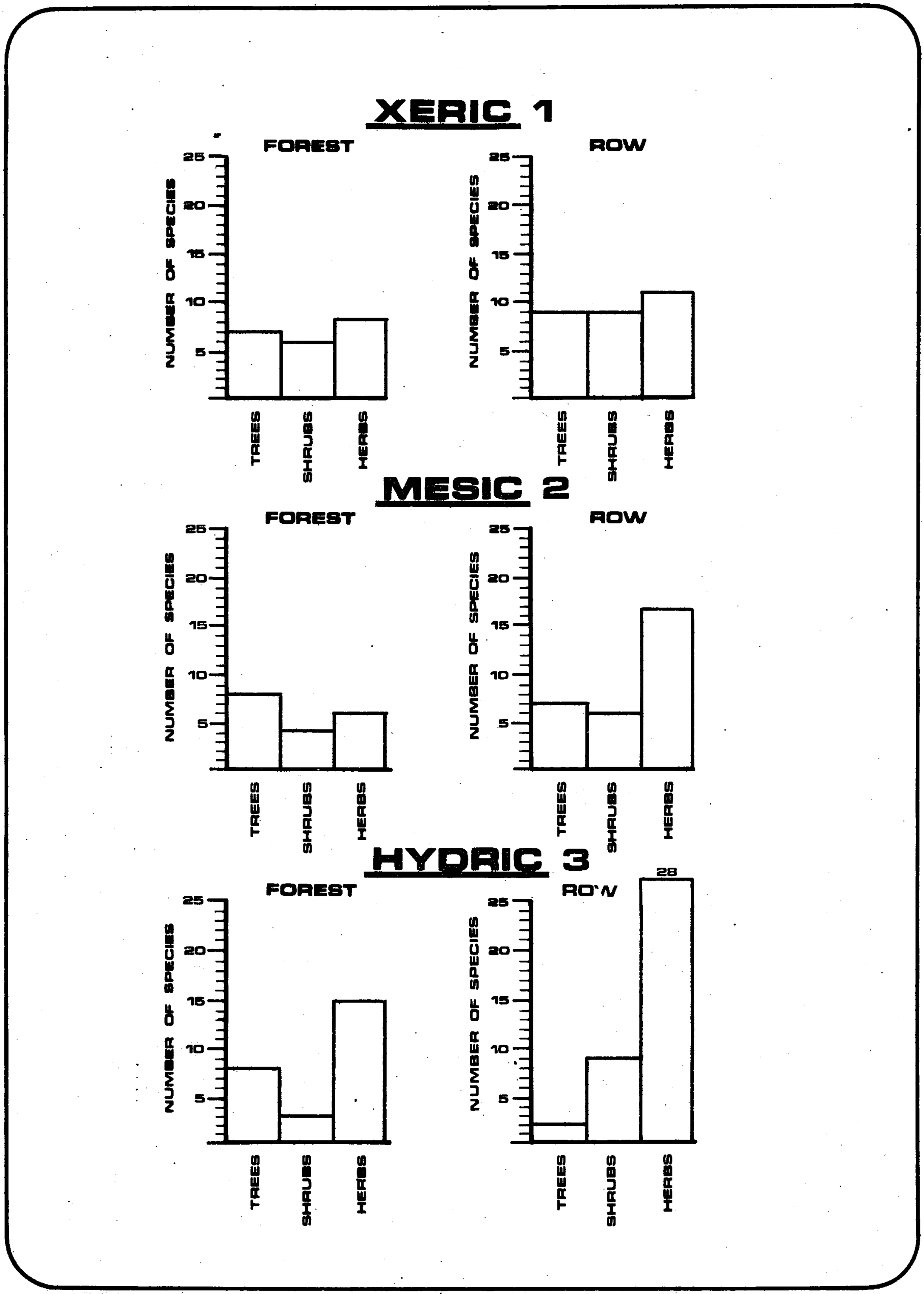


Fig. 4.3. Species diversity in the forest and on the ROW.

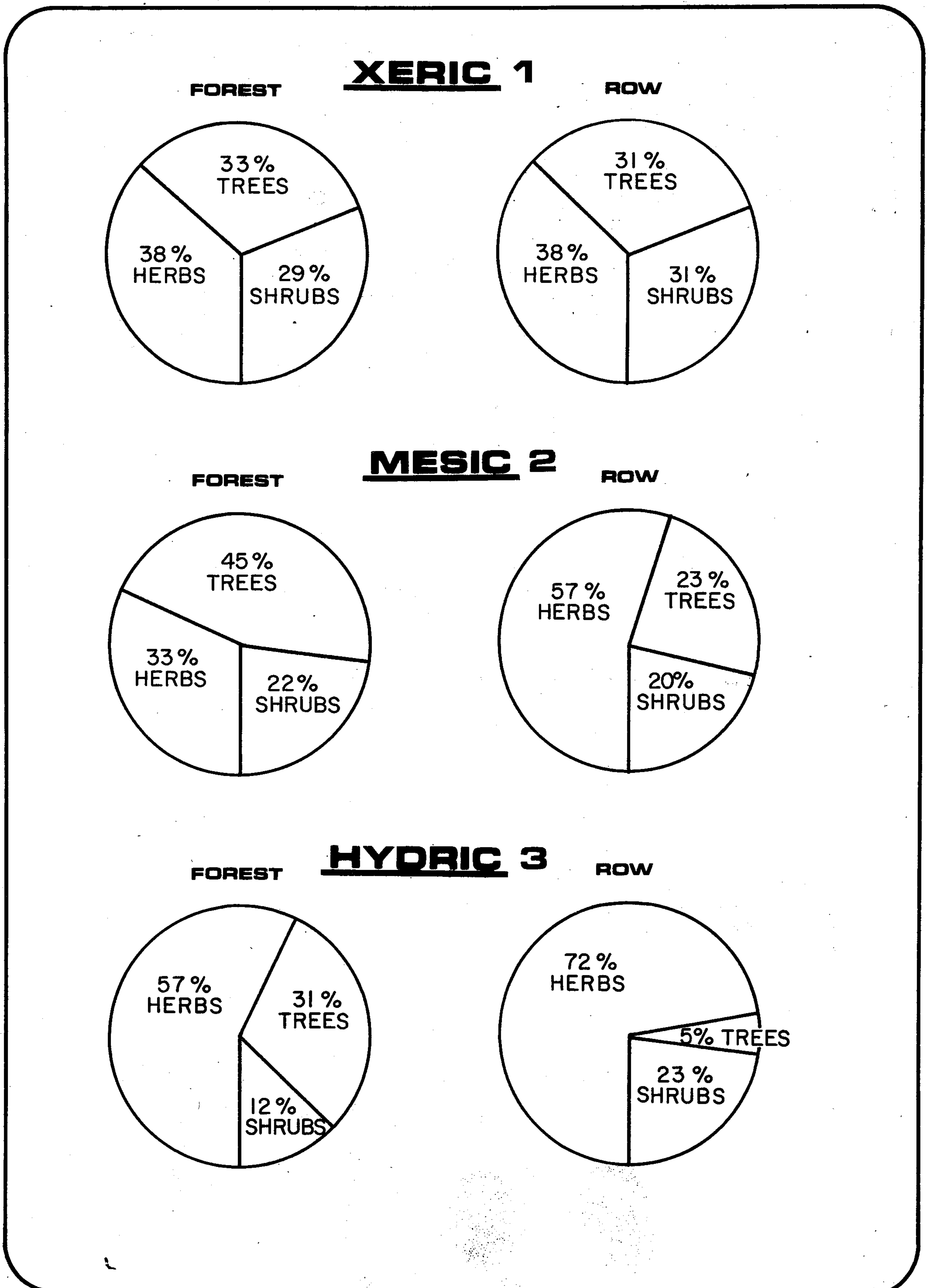


Fig. 4.4. Life form spectrum of the ROW as compared to the adjacent forest to compare species make-up of each, based on the number of species in each life form expressed as a percent of total species.

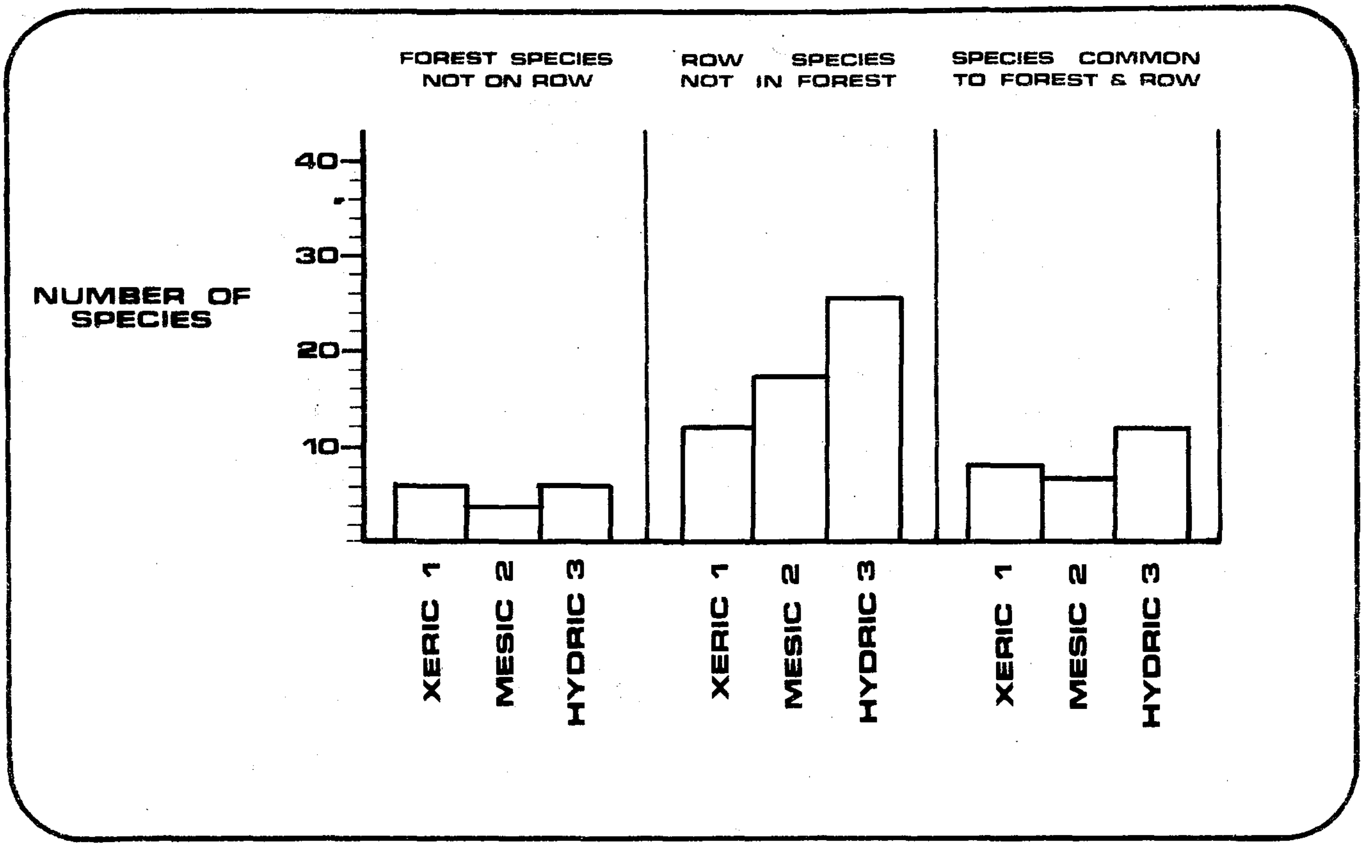


Fig. 4.5. Comparison of shrub and herb species in the forest and on the ROW.

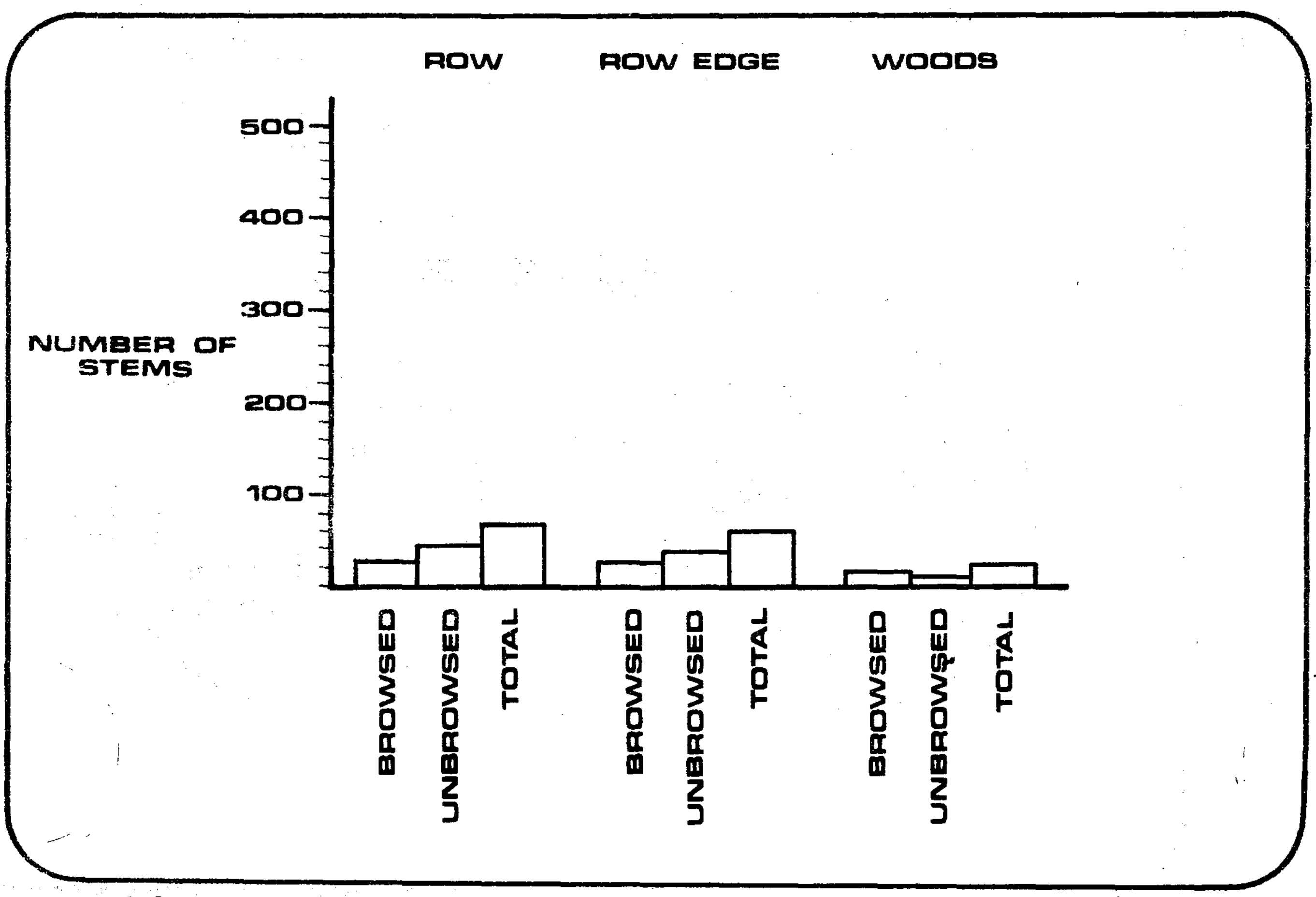
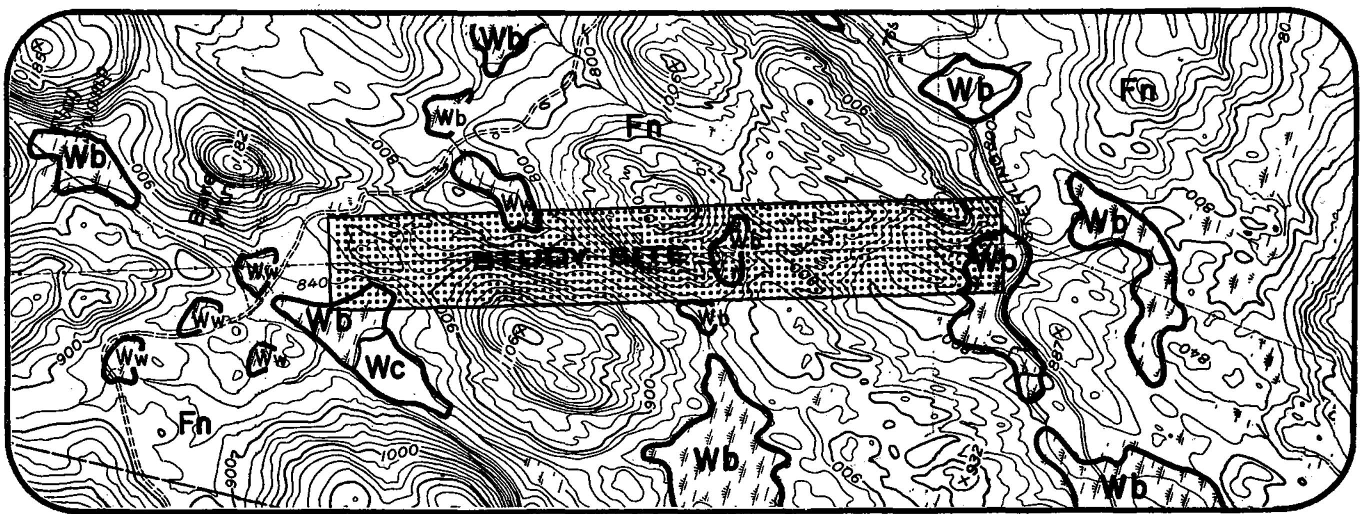
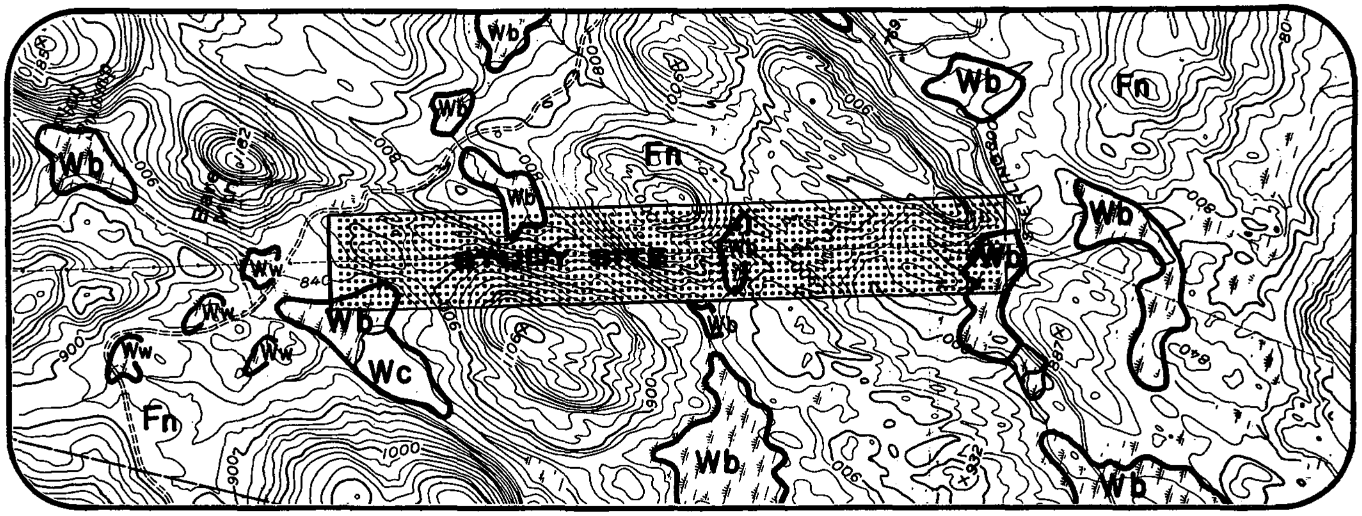


Fig. 4.6. Browse survey showing number of browsed, unbrowsed, and total stems for the ROW, ROW edge, and forest for 3 browse transects.



1965 DATA DEPICTING LAND USES NEAR THE TIME OF CONSTRUCTION **SCALE 1"- 2000** N



LAND USE AFTER CONSTRUTION OF ROW **SCALE 1"- 2000** N

LEGEND FOR LAND USE SYMBOLS

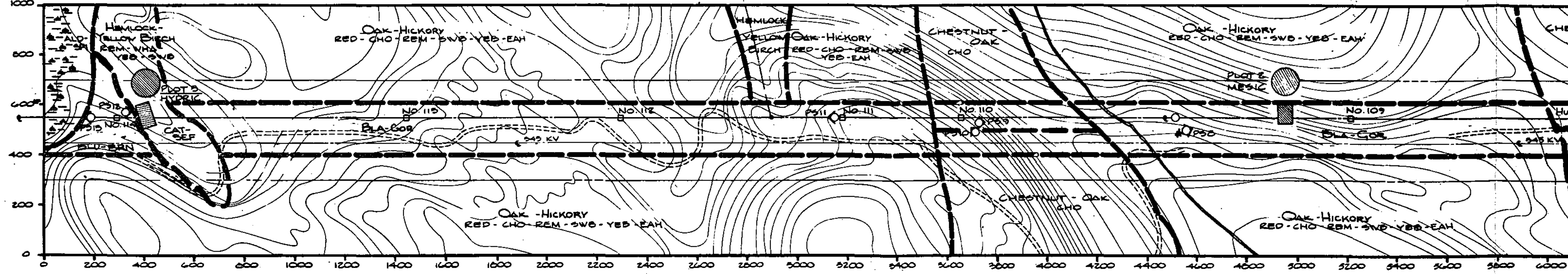
FOREST LAND
- Fn - Forest lands

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

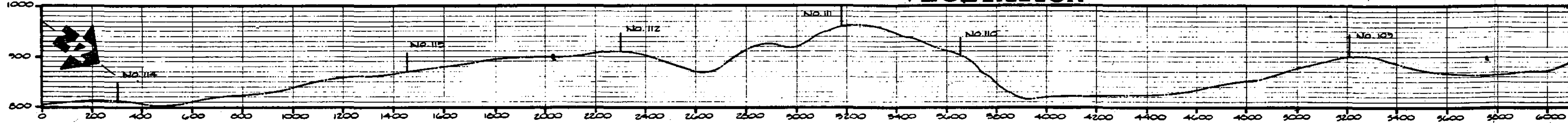
SOURCES:
- SCS Spartanburg, S.C., air photo No. S40 36071 175 69, July 29, 1975
- Orange County, air photo No. ELQ-266-70, Oct. 30, 1965
- Area Land Use Map, LUNR, Cornell University, N.Y. 1974
- U.S.G.S. Topographic Map, Sloatsburg, N.Y. - N.J., 1955

Fig. 4.7. Land use change.

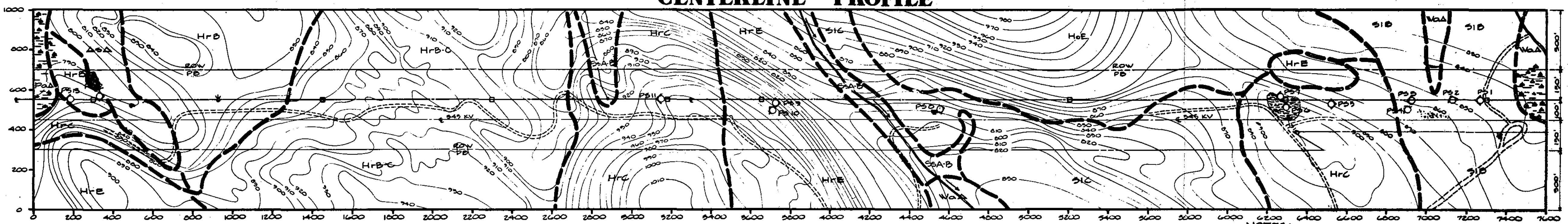
ASPLUNDH ENVIRONMENTAL SERVICES



VEGETATION



CENTERLINE PROFILE



SOILS

NOTES:
1) CONTOUR INTERVALS ARE 10 FEET.
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
- 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
- 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

AsA	ALDEN - SUN very stony silt loam (0 to 8%)
HrA	HOLLIS-ROCK OUTCROP rocky sandy loam (0 to 8%)
HrB	HOLLIS-ROCK OUTCROP " " " (8 to 15%)
HrB-C	HOLLIS-ROCK OUTCROP " " " (8 to 25%)
HrC	HOLLIS-ROCK OUTCROP " " " (15 to 25%)
HrE	HOLLIS-ROCK OUTCROP " " " (35 to 50%)
HoE	HOLLIS rocky sandy loam (35 to 50% slope)
PaA	PALMS muck (0 to 8% slope)
SlB	SWARTSWOOD - LACKAWANA very stony fine sandy loam (8 to 15%)
SlC	SWARTSWOOD - LACKAWANA very stony fine sandy loam (15 to 25%)
SsA-B	SCRIBA - SUN very stony loam (0 to 15%)
WaA	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

- CONSOLIDATED EDISON CO.-ENGIN. PLAN & PROFILE 1-5-73
- USGS 7.5 MIN. TOPOGRAPHIC MAP, SLOATSBURG, N.Y. -55
- USDA, CORNELL UNIV. AGR. EXP. STA., DEPT OF SOIL TECH IN COOPERATION WITH THE BUREAU OF SOILS SOIL SURVEY FOR ORANGE COUNTY, N.Y.
- SCS, SPARTANBURG, SC. ORANGE COUNTY AIR PHOTO NO 940 36071 175 69 (SCALE 1:40,000) JULY 29, 1975
- 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"

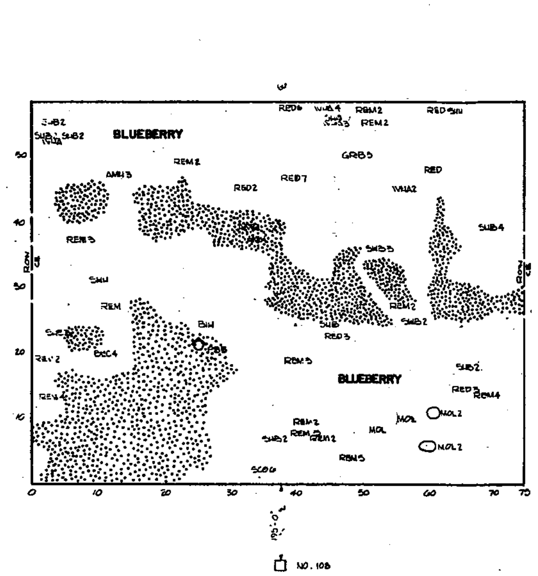
MAP 4.1

SITE 4 HABITAT CONDITIONS

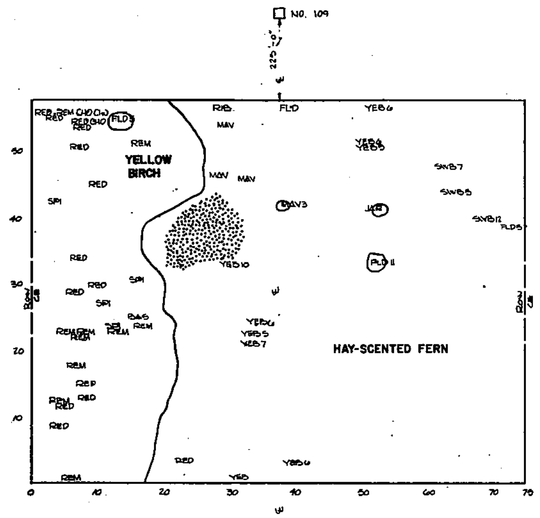
UTILITY: ORANGE AND ROCKLAND UTIL., INC.
ROW DESCRIPTION: HILLBURN TO SHOEMAKER 138 KV
STEEL LATTICE 300'-400' ROW

SCALE: 1" = 200'-0"

200 100 0 100 200 400 800 1000



PLOT 1 XERIC



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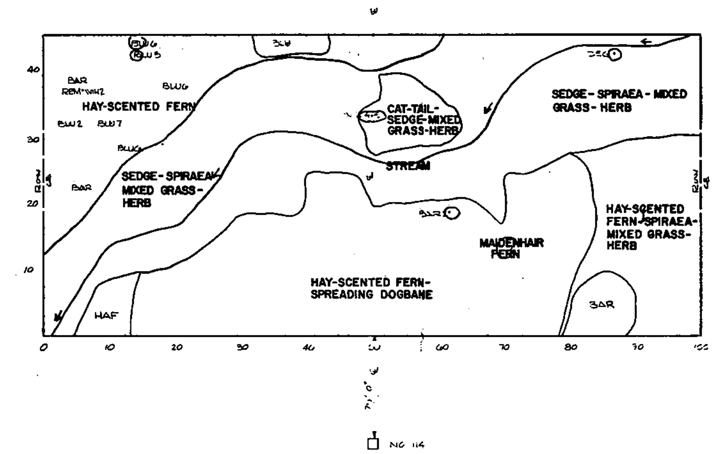

PLOT 3 HYDRIC

N

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 EASEMENT BOUNDARY
- EXISTING ROW CLEARING EDGE

SITE MARKERS

- SAMPLE LOCATION
- PHOTO STATION

WATER SYMBOLS

- PERENNIAL STREAMS
- INTERMITTENT STREAMS
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- LARGE RAPIDS
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- MARSH, SWAMP OR WET MEADOW
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- ALLUVIAL FAN

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- SCATTERED ROCK

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POS	POISON SUMAC	Rhus vernix
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WIR	WILD-RAISIN	Viburnum cassinoides
ZBC	BLACK CHOKEBERRY	Pyrus melanocarpa

trees

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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

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 4.2

SITE 4

MAPPED PLOTS

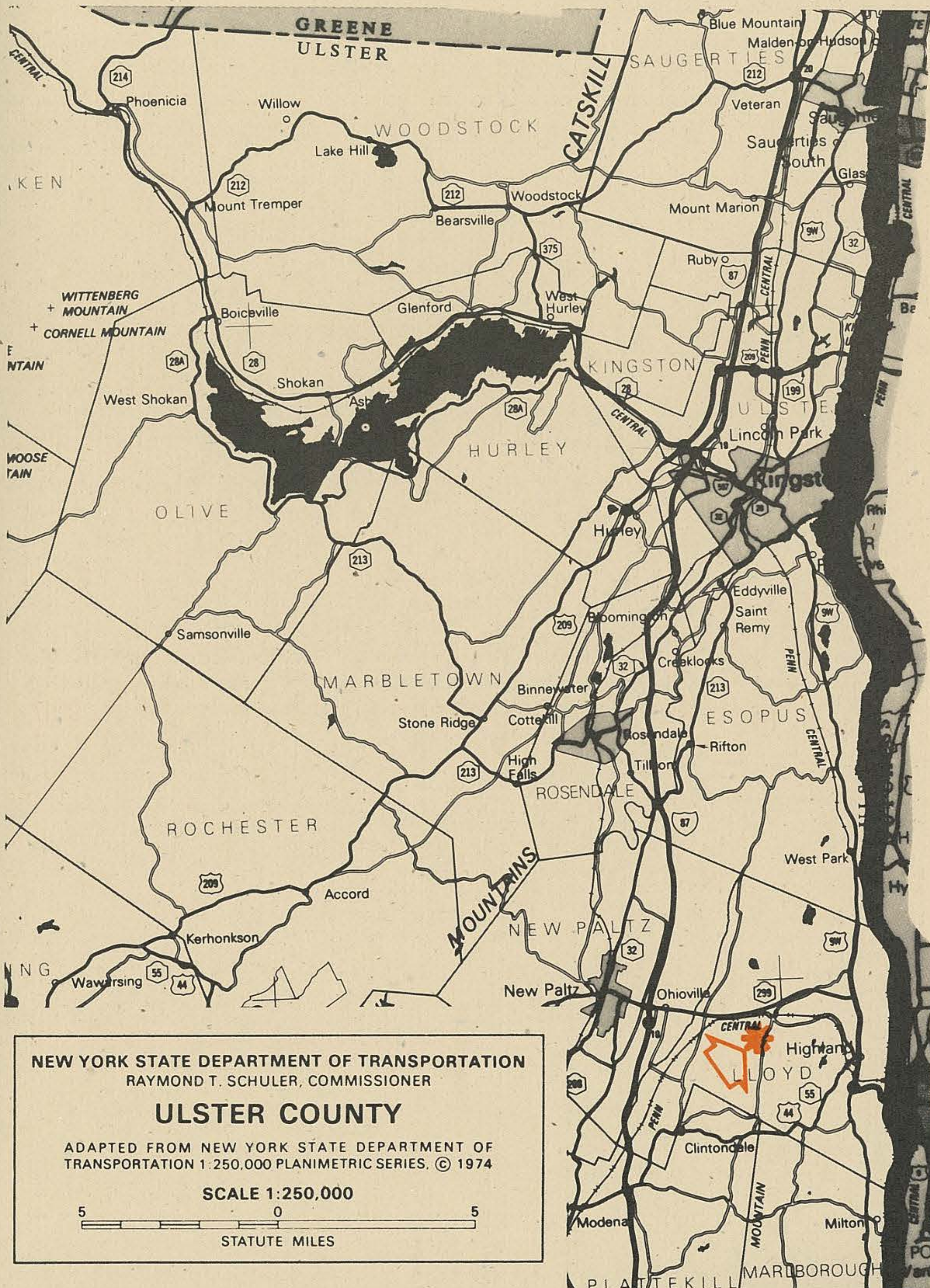
UTILITY: ORANGE & ROCKLAND UTILITIES, INC.

ROW DESCRIPTION: HILLBURN TO SHOEMAKER 138 KV.

STEEL LATTICE 400 ROW

SITE 5

POUGHKEEPSIE to OHIOVILLE



BASE MAP COPYRIGHT 1974 BY NEW YORK STATE DEPARTMENT OF TRANSPORTATION

Site 5 Poughkeepsie to Ohioville

Study area extends from South Street (Structure 62) to Structure 51 in Highland. To visit the area, take the Thruway to Exit 18 and proceed East on route 299 for approximately one mile. Take a right onto South Street and proceed a short distance to the study area, which begins on the East side (left) of South Street.

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Site 5 Poughkeepsie to Ohioville

1 Introduction

Site 5 is located in the Hudson Valley physiographic area of New York (Cline, 1970) in the Oak-Northern Hardwoods forest type area (Stout, 1958). The general landscape of the ROW and adjacent area is shown in Figs. 5.1.1 and 5.1.2.

The topography of the area is typically uniformly low relief, featured by rolling hills. The area has been modified by stream erosion which has formed long, narrow, bottom lands (Stout, 1958).

Typical forest types of the regions are Oaks, and Oak-Northern Hardwoods (Stout, 1958), but Oak-Hickory, Chestnut-Oak, and Elm-Red Maple forest types occupy the site.

2 Location and Identification

Site 5 is approximately 1½ miles southeast of New Paltz, in the town of Lloyd, Ulster County, New York (74° 01' 30" W. Longitude; 42° 00' 00" N. Latitude).

The site is on the Poughkeepsie to Ohioville ROW which is operated by the Central Hudson Gas & Electric Corporation (CHG&E). This 100-foot easement consists of 1 single circuit, 115 kV line, having wood pole structures and steel lattice towers. The project site is approximately 6,000 feet in length, and extends from structure 51 to structure 62, just east of South Road.

3 Background

The following discussion outlines documentable management techniques of clearing, construction, restoration, and maintenance for site 5, as received from CHG&E (letter dated October 14, 1975, from S. P. Laidlaw, Central Hudson Gas & Electric Corporation, Poughkeepsie, N.Y.; letter dated March 29, 1976, from D. Hinkley, Central Hudson Gas & Electric Corporation, Poughkeepsie, N.Y.). All available pertinent information and cost data are included under each operation of clearing, construction, restoration, and maintenance.

3.1 Clearing

It is assumed that initial clearing was done by company personnel in 1916 with no selective cutting. The ROW was clear cut to a width of 100 feet including all danger trees. Brush was burned and logs removed when economical to do so. No other information is available.

3.2 Construction

Construction started March 23, 1917, and was completed March 5, 1920. No other information is available.

3.3 Restoration

No information is available.

3.4 Maintenance

Through the years, periodic cutting was done when necessary.

The first available records indicate that the ROW was recleared by a local contractor in October, 1949. There is no contract available to examine the extent or nature of the clearing, but all wood was to be cut in 8-foot lengths, and piled along the ROW. All brush was to be burned or disposed of. Cost of operation was $375.00 per acre.

In 1955, approximately 1/3 of the ROW was cleared by a brush hog. Basal spray was applied. However, there is no way of determining whether site 5 was included in this clearing operation since it was apparently conducted by company personnel during periods of low work load.

In 1958, contractors cleared the entire ROW. The work was completed in February, 1959. A note in an employee's log book states: "Basswood heavy east slope of mtn.; brush heavy in spots 1958; brush hog did only 1/3 of line in 1955".

Between September and December, 1967, a local contractor recleared the Poughkeepsie-Ohioville ROW. Brush was burned or otherwise disposed of. A basal spray was applied to stumps of high growing species only, and spray material and provided by CHG&E. Records indicate that 45 gallons of 2,4,5-Trichlorophenoxyacetic acid (2,4,5-T) and 1,062 gallons of carrier were applied by Indian backpack pumps in early November, 1967, and work was completed before Christmas, 1967.

In January, 1970, contractors applied a selective basal spray.

In 1974, contractors cut and removed selective high growing species and applied a basal spray.

4 General Reconnaissance

A general reconnaissance was made in accordance with the methodology and is set forth in Map 5.1 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 5.1 and described in Appendix 17. Specific reference is made to some of these photo stations throughout the report and illustrated in Fig. 5.1. 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 5 ROW is not necessarily pleasing or objectionable to view, nor does it appear to visually stand apart from the surrounding area. The site is located in a rural setting, part agricultural and part forested. The ROW site has many interesting flowers which could be visible to hikers or horsemen who may use the ROW. Features within the area which may make the ROW somewhat sensitive to view include the location of one end of the site on top of a hill which exposes 1 structure and the ROW in clear view from South Street below. Although the ROW is very visible from the road, most residents in the area are located on lower ground and thus cannot see the ROW. Located in basically a rural area, the potential number of people viewing the ROW is somewhat low. South Street which the ROW crosses is moderate to heavily used.

5 Field Studies - Results and Discussion

5.1 Soils

5.1.1 Geology and Soils

Site 5, Poughkeepsie to Ohioville ROW, is located in Ulster County in that physiographic region termed Hudson Valley by Cline (1970) and the Hudson Valley subdivision of the Hudson-Mohawk Lowland by Thompson (1966), in the Hudson River drainage basin. Bedrock geology is of Ordovician age, 500 to 435 million years ago, consisting predominantly of shale and sandstone in the upper part, and limestone and dolostone in the lower. Surficial geology is glacial drift, and soils in this area have largely developed in glacial till and glaciofluvial outwash, although 1 soil formed in glacial lake deposits and another in organic deposits over loamy mineral soil material (Broughton et.al., 1973; Anon., 1972).

Most of the soils on this site are classified in the order Inceptisols, suborder Ochrepts (Bath, Chenango, and Nassau series), reflecting the absence of horizons of marked accumulation of clay and iron and aluminum oxides; Canadaigua is in the suborder Aquepts, indicating the presence of wetness and its attendant characteristics. Erie soil is in the order Alfisols, suborder Aqualfs, indicating the presence of gray to brown surface horizons, medium to high base status, and an illuvial horizon in which silicate clays have accumulated. The bog soil (Palms) on this site is in the order Histosol, suborder Saprists, that developed in areas of fluctuating ground water and consist almost completely of decomposed plant remains (Soil Survey Staff, 1975; Buckman and Brady, 1966). The study area falls within the location occupied by the broad Troy-Cossayuna association, the dominant association on the undulating to rolling glacial till plain of the Hudson Valley, in which drumlins are prominent local features and Nassau soils are important inclusions (Cline, 1970). Brief descriptions (Tornes et al., 1973, Anon., 1972) of soil types occurring on the ROW study site (Map 5.1; Table 5.1) follow:

Bath-Nassau gravelly loam (BnA, BnB, and BnC): These soils developed in glacial till, and occupy level and gently sloping to moderately steep terrain. The 2 soils are intermingled to such an extent that they could not be mapped separately. They are well drained to somewhat excessively drained; Bath soils are moderately permeable in the upper part but slow in the fragipan which occurs at about 18 to 36 inches; Nassau soils have moderate permeability. Bedrock is present at a depth of about 48 inches in the Bath soils, and 20 inches in the Nassau soils. These soils are generally strongly acid, and at 3 locations tested on this site, soil reaction in the surface 3 inches was pH 5.0, pH 4.5, and pH 4.6. Bath soils are in Woodland Suitability Group 3o1, indicating moderately high productivity for timber (Class 3) and the absence of significant limitations or restrictions for woodland use or management. (Subclass o). Where slope exceeds 15%, and may cause management limitations and restrictions, they are assigned to Woodland Suitability Group 3r3. Nassau soils are assigned to Woodland Suitability Group 4d1, designating moderate productivity and restricted rooting depth. Where there is a high stone content on the surface of some Nassau soils, they are assigned to Woodland Suitability Group 4x6.

Bath-Nassau-Rock Outcrop very rocky gravelly loam (BrC, BrD, and BrE): Bath and Nassau soils developed in glacial till, and occupy level and gently sloping to moderately steep terrain. In this area of the county the 2 soils are intermingled to such an extent that they could not be mapped separately. Bedrock outcrops occupy 10 to 25% of the association. Bath soils are deep and well drained to somewhat excessively drained; Nassau soils are shallow, but have similar drainage characteristics. The association is strongly acid; on this site, soil reaction on 3 locations sampled was pH 4.7 and pH 4.9 in the surface mineral soil. Bath soils are assigned to Woodland Suitability Group 3r3, designating moderately high productivity and steep slope. Nassau soils are assigned to Woodland Suitability Group 4x6, and 4x9, designating moderate productivity and stoniness or rockiness.

Canandaigua silt loam (CaA): These soils formed in calcareous glacial lake deposits, on nearly level to depressional areas. They are poorly drained, and permeability is slow. Due to the flat terrain, water runoff is also slow. Depth to the seasonal water table is from the surface to 6 inches. Soil reaction varies from slightly acid to neutral; on this site it was pH 6.0 in the surface horizon. Canandaigua soils are in Woodland Suitability Group 4w1, indicating moderate productivity for timber and management limitations relating to excessive wetness.

Chenango gravelly silt loam (ChA): These soils developed in glacial outwash sand and gravel; they occupy level outwash terraces in the valleys, alluvial fans where postglacial side streams left gravelly or channery deposits on the valley floors, and hilly gravel deposits where streams that issued from the glacier dropped their loads. Chenango soils are well drained to somewhat excessively drained; internal drainage is rapid. These soils are underlain by sand and gravel below 24 to 37 inches. They are subject to leaching and may be slightly droughty. They are generally strongly acid, but soil reaction may range from pH 5.0 to pH 6.0 through the first 12 inches; soil reaction was pH 5.2 in the upper mineral horizon on this site.

Erie very stony loam (ErA): Erie soils developed in glacial till; they are level through sloping soils that receive some runoff from higher land. Being somewhat poorly drained, these soils contain a fragipan below 15 to 25 inches. Permeability is moderate above the fragipan and very slow below. Depth to the seasonal water table is 12 to 18 inches. Stones form a prominent part of the surface soil. Soil reaction is generally slightly acid, although it may range from pH 5.0 to pH 7.8 throughout a typical profile; it was pH 5.7 in the surface mineral soil on this site. Erie very stony loam is assigned to Woodland Suitability Group 3w1, which is moderately high for woodland production with management limitations related largely to poor drainage.

Palms muck (PaA): These soils formed in organic deposits over loamy ✓

mineral soil material, and occupy lake plains, till plains, or moraines in basins that were formerly lakes or ponds. Palms soils are very poorly drained; surface runoff and internal drainage are very slow. The seasonal water table is at the surface, and most areas are in marsh vegetation. They are medium acid to mildly alkaline, and may range from pH 5.6 to pH 8.4 throughout a typical profile; on this site, soil reaction was pH 6.4 in the upper mineral horizon. Palms muck is assigned to Woodland Suitability Group 4wl, indicating moderate productivity and excessive wetness.

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 upland locations. Average thickness of the organic layers and A1 horizon was based on 5 samples taken at each location (Table 5.2). 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. There is no evidence of plowing, grazing, or recent fires on this site; however, an orchard where grass is mowed occupies a portion of the 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, except for the woodland of xeric 2 , where fermentation and humus layers were absent. Based on thickness of the fermentation, humus, and A1 layers, the predominant humus type was designated a "thin duff mull with very shallow A1". In general, organic layers on the ROW were nearly equivalent to those in the woodland. On 1 xeric site a thicker A1 horizon on the ROW resulted in a "thin duff mull with shallow A1", and in the adjacent woodland the absence of the fermentation and humus layers resulted in a "very shallow medium mull". 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 occurrence or thickness of surface organic layers of the soil. Xeric 2 is the only exception, and where the fermentation and humus layers were absent in the forest, they were present on the ROW. 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.

5.1.3 Soil Erosion

Current Active Erosion Observations of active soil erosion on the ROW and adjacent woodland were made on the Poughkeepsie to Ohioville study area in September, 1976. Eroding areas were identified as to location on the ROW and woodland, soil type, average slope, and present plant cover (Table 5.3). Erosion was classified as to kind and class; 1 small gully was recorded, but was not shown on the site habitat conditions map since it was not extensive.

Slight sheet erosion was evident at 2 general woodland locations on Bath-Nassau gravelly loam where litter and ground layer vegetation was sparse; and, on horse and wild animal trails where the mineral soil was exposed by trampling. Likewise, minor active erosion was observed on the general ROW, restricted to 1 area with light moss cover where animal digging had disturbed the mineral soil (Map 5.1) and along a bare trail used for horseback riding. Otherwise, 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 5.2).

In general, active erosion on the ROW was most evident on areas that had been subjected to past and/or present mechanical disturbance of the soil, i.e., access roads, tower sites, and an excavation area at 1 tower site. Much of the sediment resulting from erosion on the ROW and adjacent forest appears to collect in 2 swamps, but does not appear to leave the general ROW area.

There apparently was no restoration in the form of seeding and planting following construction of this ROW; thus, denuded areas were dependent on natural plant invasion. A grass-herb-shrub community has developed on access roads, and only those portions utilized heavily by animals, hikers, or horses remain denuded or with only sparse grass cover. Progressive sheet, rill, and gully erosion on these areas apparently prevents or discourages natural plant invasion, since these areas were generally devoid of plant cover or were slowly being invaded. Areas under several towers were bare, with slight sheet and rill erosion occurring (Fig. 5.1.3); this may be due to paint drippings or leachates from the towers which affect vegetation development. 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 There were 2 hydric, or wet, habitats on the study area. Hydric 1 habitat was located on a generally level, slightly depressed area at the base of a gently rolling hill. Slope was negligible and aspect was flat. Drainage was somewhat impeded, and wet meadow conditions have developed. The forest type was Elm-Red Maple, with elm and red maple the dominant species, and yellow birch, white ash, and hemlock as associated species.

Hydric 4 habitat was located in a depressed area at the base of a drumlin. Slope was negligible and aspect was flat. Drainage was impeded, and swamp conditions have developed. The forest type was also Elm-Red Maple.

Mesic Habitat The mesic, or medium moist, habitat (5) was located on the lower slopes of a long, gently rolling hill. Slope was negligible and aspect was flat. Drainage was free but not excessive. The forest type was Oak-Hickory, composed predominantly of red oak, chestnut-oak, and white ash, and bitternut hickory and shagbark-hickory.

Xeric Habitat There were 2 xeric, or dry, habitats on the site. Xeric 2 habitat was located on a drumlin. Slope was approximately 8% on a west-facing slope, about 12% on a south-facing slope, and 18% on an east-facing slope. Drainage was excessive. The forest type was a Chestnut-Oak, in which chestnut-oak comprised the dominant species, and red oak, shagbark-hickory, red maple, white oak, and sweet birch were prominent.

Xeric 3 habitat is also located on a drumlin. Slope was about 15% on a west-facing slope, 15% on a south-facing slope, and 18% on an east-facing slope. Drainage in general was excessive. The forest type was also Chestnut-Oak.

5.2.2 Analysis of Forest Types and Associated ROW Vegetation

General Changes in Vegetation The primary impact of the ROW was to 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 spray application (Fig. 5.2).

In order to more completely characterize the forest types, an analysis was made on the forest plots to derive importance values for the tree species there (Table 5.4).

On the hydric habitats; an Elm-Red Maple forest type was changed to a Willow-Sensitive Fern community. On the mesic habitats, an Oak-Hickory forest type was changed to a Blackberry-Goldenrod plant community. On the xeric habitats, a Chestnut-Oak forest type was changed to a Blueberry-Sweet-fern plant community (Map 5.1; Table 5.5).

Quantitative Changes On hydric 1 habitat, there was a marked increase in the number of shrubs and herbs on the ROW as compared to the adjacent forest (Table 5.5 ; Figs. 5.3 and 5.4). On hydric 4 habitat, there were more shrubs in the forest than on the ROW, while there were more herbs on the ROW as compared to the forest. On mesic 5 habitat, there was a large increase in the number of shrubs and herbs on the ROW as compared to the forest. There was a major increase in the number of shrubs and herbs on ROW as compared to the adjacent forest on xeric 2 and 3 habitats (Table 5.5).

Qualitative Changes There were 2 hydric habitats on this ROW (Map 5.1). On hydric 1 habitat, 9 shrub and herb species occurred both in the forest and on the ROW (Fig. 5.5), while 3 shrubs appeared in the forest but were absent from the ROW (Table 5.6). On the other hand, 13 shrubs occurred on the ROW but not in the forest (Table 5.7). Five herbs were found in the forest only and 11 herbs occurred only on the ROW (Tables 5.6 and 5.7). On hydric 4 habitat, 10 shrub and herb species occurred both in the forest and on the ROW (Fig. 5.5), while 5 shrubs and 4 herbs appeared in the forest but were absent from the ROW (Table 5.6); conversely, 5 shrubs and 9 herbs appeared on the ROW but were absent from the forest (Table 5.7).

There was 1 mesic habitat where data was taken on the ROW. On mesic 5 habitat (Map 5.1), 12 shrub and herb species occurred both in the forest and on the ROW (Fig. 5.5), while no shrubs and 4 herbs appeared in the forest but were absent on the ROW (Table 5.6); conversely, 8 shrubs and 23 herbs appeared on the ROW but were absent from the forest (Table 5.7).

There were 2 xeric habitats where data were taken on this ROW (Map 5.1). On xeric 2 habitat, 10 shrub and herb species occurred both on the ROW and in the forest (Fig. 5.5), while no shrubs and 8 herbs appeared in the forest but were absent from the ROW (Table 5.6); conversely, 17 shrubs and 12 herbs appeared on the ROW but were absent from the forest (Table 5.7).

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

Table 5.8 presents a breakdown of major megetational communities (Map 5.2) for hydric, mesic, and xeric plots on the Poughkeepsie to Ohioville ROW. Some of the present composition of herbaceous and woody plant communities reflects the maintenance history. The ROW was recleared last in 1967 and the stumps were treated with 45 gallons of 2,4,5-T and 1,062 gallons of carrier applied by Indian backpack pumps. The ROW received a selective basal application in 1970. In 1974, tall growing species were selectively removed and a basal spray applied.

The major vegetational communities on the hydric plots (Map 5.2) were Willow-Spiked Loosestrife-Mixed Fern and Mixed Herb-Sedge-Spiraea. The dominant plant communities on the xeric plots (Map 5.2) consisted of Broom-sedge-Sweet-fern-Staghorn-Sumac-Mixed Herb and Blackberry-Mixed Herb. The mesic plot (Map 5.2) consisted mainly of Mixed Grass-Herb. There was a high density of shrub species on this ROW, i.e., sumac (Fig. 5.1.4), spiraea, gray dogwood, among others, and also, there was a high density of tree species on the ROW (Map 5.2).

If selective maintenance is used in the continued development of the ROW vegetation, the major plant communities which were previously mentioned should remain an integral part of the vegetation.

5.2.4 Comparison of Forest Types with ROW Vegetation

The ROW was originally clear cut in 1916. Through the years, periodic cutting was done when necessary. The ROW was recleared in 1949 and partially cleared in 1955 but it is not known if any of the study area was cleared at this time. The ROW was again recleared in 1953 with a final reclearing in 1967. Since that time, the ROW has been under a cut and spray program. The records are incomplete in some instances, thus making reasonable interpretation of management difficult.

The general impact of the above treatments of the ROW was to change the forest types (Elm-Red Maple, Oak-Hickory, and Chestnut Oak) to shrub-herb-grass communities. Some plants of the forest were replaced by plants favored by open conditions.

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 significant change 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 with some shrubs and herbs of the forest not on the ROW and some shrubs and herbs of the ROW not in the forest (Table 5.5).

On the xeric habitats, which were formerly occupied by a Chestnut-Oak forest type, a Blueberry-Sweet-fern plant community was produced. There was a major increase in the 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 with some shrubs and herbs of the forest not on the ROW and some shrubs and herbs of the ROW not in the forest (Table 5.5).

On the mesic habitat, an Oak-Hickory forest type was changed to a Blackberry-Goldenrod plant community. There was a large increase in the number of shrub and herb species on the ROW as compared to the forest. There was a qualitative difference in the species of shrubs and herbs on the ROW as compared to the forest.

5.3 Wildlife

The major game species for site 5, Poughkeepsie to Ohioville, as determined by Asplundh Environmental Services (AES) in conjunction with the New York State Department of Environmental Conservation (DEC), are cottontail rabbit, ruffed grouse, and raccoon.

5.3.1 Actual Use

Cottontail Rabbit During the winter of 1976, cottontail rabbit tracks were moderate on the ROW. One rabbit was flushed in the woods to the north of the ROW during the spring of 1976. No other rabbit or rabbit signs were seen during the remainder of the study.

Ruffed Grouse During the summer of 1975, 1 ruffed grouse was flushed from a cover of witch-hazel on the southwest edge of the ROW near structure 54. Grouse were also observed feeding off the ROW during this period of time.

During the spring of 1976, 2 grouse were flushed off the ROW in the north woods between structures 58 and 59.

A ruffed grouse drumming census was made on April 20, 1976, from 5:15 a.m. to 7:00 a.m. The temperature was 65 F, and the weather was calm, with occasional cloudiness.

Two birds were noted drumming in the area, 1 in the woods to the north, and 1 in the woods to the south of the ROW. One of the birds was drumming in the woods to the northeast of structure 55, near the access road, in a heavy cover of hemlock. The other bird was located in the woods to the south of the orchard (Map 5.1).

Another census was made on May 12, 1976, and 2 birds were noted drumming in the same locations as previously noted on April 20.

Raccoon No raccoon activity was noted on the study area during the period of observations.

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 5.9.

During the summer of 1975, 1 eastern box turtle was seen walking on the ROW (Fig. 5.1.5). Two black rat snakes were observed hunting off the ROW to the south, between structures 51 and 52. Chipmunk activity was variable both on and off ROW at this time. Woodchuck activity was slight off the ROW to the south at this time. Bullfrog vocalization was heavy both on and off the ROW in the large swamp between structures 55 and 56.

During the winter of 1976, gray squirrel tracks were moderate off the ROW. Deer tracks were moderate on the ROW in the apple orchard. Deer were debarking and browsing young apple shoots at this time.

During the spring of 1976, 1 gray squirrel was seen climbing a tree in the forest north of structure 55. Four squirrel leaf nests were observed in the forest at this time. White-tailed deer browse was moderate on staghorn-sumac. Leopard frogs were seen swimming in the water off the ROW in the stream in the north woods. One spring peeper was seen hopping in the woods on control plot 2; spring peeper vocalization was moderate both on and off the ROW. One woodchuck burrow was observed in the south woods near structure 55. One red eft was seen walking on ROW in the swamp. Fox scats were found in moderate abundance at this time.

During the summer of 1976, 1 black rat snake was observed lying on the rocks at the ROW edge near plot 3. One gray squirrel was flushed from the ROW near the orchard. Three squirrels were heard in the woods adjacent to the ROW where acorns were being eaten and dropped from the trees.

5.3.2 Potential Use

Potential wildlife use of the plant species present on site 5 for the 3 major game species, rabbit, grouse, and raccoon, is contained in Table 5.10 (Martin et al. 1951).

5.4 Water

A swamp on the Poughkeepsie to Ohioville site was sampled for water quality on October 2, 1975, and February 5, May 12, and August 5, 1976 (Table 5.11, Map 5.1).

5.4.1 Description and Sampling Points

The study area is located in a swamp that drains north via a small stream to Black Creek, a tributary of the Hudson River. Aspect in the study area is flat and water velocity negligible.

Sampling locations were sited as follows:

1. 100 yards south of ROW;
2. mid ROW;
3. 100 yards north of ROW (Map 5.1).

The bottom is predominately organic components (Environmental Protection Agency, 1973) and aquatic plants are common. At locations 1 and 3 elm and red maple, with yellow birch, white ash, and hemlock, provide a multistory canopy that shades the swamp. Mosses and herbs are abundant in the study area. At location 2 the swamp is well shaded by dense shrubs and herbs, but the overstory canopy, found off the ROW, is absent.

The swamp and surrounding area is utilized by wildlife and hunters. The New York Department of State has no "official classification" for the water in the swamp.

5.4.2 Analysis of Water Quality

Site 5 was sampled from 12:00 noon to 12:50 p.m. on October 2, 1975 (Table 5.11). It was cloudy and the air temperature was 16 C. Depth at locations 1, 2, and 3 was 12, 36, and 12 inches, respectively. Water temperature was the lowest at location 2, 10.5 C, and was 11.0 C at location 3 and 11.2 C at location 1. Dissolved oxygen concentration and percent saturation were low, and ranged from 1.7 to 3.2 ppm and 15 to 30%, respectively. The swamp was acidic, and pH averaged 4.9. Sediment stakes were placed at all locations.

On February 5, 1976, from 12:55 to 1:55 p.m., air temperature was -4 C and it was partly cloudy (Table 5.11). Snow covered the site and ice was broken to permit sampling at locations 1 and 3. Water temperature was 0.5 C at location 1, 2.0 C at location 2, and 0.0 C at location 3. The dissolved oxygen concentration and percent saturation averaged 8.3 ppm and 58%, respectively. The pH ranged from 7.2 to 8.2.

On May 12, 1976, from 8:40 to 9:10 p.m., it was partly cloudy and the air temperature was 18 C (Table 5.11). Water depth at locations 1, 2, and 3 was 12, 36, and 12 inches, respectively. Water temperature was 13.0 C at all locations. Dissolved oxygen concentration ranged from 2.0 to 4.7 ppm, and the percent saturation ranged from 19 to 47%. Mean pH was 6.0 and 3 inches of sediment, predominately organic material, was measured at location 3.

Air temperature was 23 C and it was sunny from 9:35 to 9:55 a.m. on August 5, 1976 (Table 5.11). On this date location 1 was relocated due to the absence of water. The new location was designated 1A. Depth of water at locations 1A, 2, and 3 was 4, 4, and 5 inches, respectively. The lowest water temperature was at location 2, 15.0 C, and water temperature at locations 1A and 3 was 16.0 C. Dissolved oxygen concentration and percent saturation were low, and ranged from 1.2 to 2.4 ppm and from 12 to 24%, respectively. The pH ranged from 5.7 to 6.4.

5.5 Land Use

5.5.1 Location

Site 5 is located in a rural nonfarm section of the town of Lloyd, Ulster County, New York. Between 1960 and 1970 there was a 18.9% increase in population of Ulster County with a 1970 distribution of 37.5% urban, 60.8% rural nonfarm, and 1.7% rural farm (U.S. Bureau of the Census, 1972). The closest community is New Paltz which is approximately 1½ miles to the northwest.

5.5.2 Land Use Near the Time of Construction

The ROW was constructed during 1918. Data prior to this date was unavailable. The earliest available data obtained from 1957 USGS Quadrangle map indicates that the location of the ROW and adjacent land area was primarily rural nonfarm in character (Table 5.12; Fig. 5.7). Land use distribution included the following subtypes:

Agriculture:
- Ao - Orchards
- Ac - Cropland and cropland pasture

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

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

Residential:
- Ri - Low density
- Rs - Strip development

Transporation:
- Tt - Communications and utilities

Water Resources:
- Wb - Marshes, shrub wetlands, and bogs
- Wn - Natural ponds and lakes
- Ww - Wooded wetland

5.5.3 Land Use After Construction

The adjacent land use to site 5 has changed slightly from the 1957 data. The land adjacent to the ROW is still rural nonfarm (Table 5.12; Fig. 5.7), with a land use distribution that includes the following subtypes:

Agriculture:
- Ao - Orchards
- Av - Vineyards
- Ac - Cropland and cropland pasture
- Ai - Inactive agricultural land

Commercial and Industrial:
- Cs - Commercial strip development
- Il - Light manufacturing and industrial parks

Extractive Industry:
- Eg - Sand and gravel pits

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

Outdoor Recreation:
- Or - outdoor recreation

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

Residential:
- Rh - High density
- Rl - Low density
- Rs - Strip development
- Rc - Farm labor camp

Transportation:
- Tt - Communications and utilities

Water Resources:
- Wn - Natural ponds and lakes
- Wb - Marshes, shrub wetlands, and bogs
- Ww - Wooded wetlands

In addition to use of the ROW for the transmission of electrical power, protions of the ROW are currently being used for agriculture (Fig. 5.1.6), hunting, horse trails, and other recreational uses.

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 area occurs on a glacial till plain that consists of undulating and rolling topography and locally prominent drumlin formations that vary from about 40 to 100 feet in elevation. Variable relief, slope, and drainage patterns are associated with distinct moisture regimes and natural forest vegetation. Xeric sites occur on the crests and steeply sloping segments of drumlins and low hills; soils (Bath and Nassau gravelly loam) are shallow to moderately deep, well drained above a weak fragipan, with some bedrock outcrops and support a Chestnut-Oak forest type of moderate productivity. Mesic areas also exhibit shallow to moderately deep, well-drained Bath-Nassau soils, but occupy more moist lower slopes and flats and support an Oak-Hickory forest type of moderately high productivity. Depressional areas, primarily basins and lake plains, are hydric sites with poorly drained Canandaigua, Erie, and Palms soils that support a moderately productive Elm-Red Maple forest.

The forest floor under natural conditions is made up of tree litter deposits about 1 inch thick, decomposed organic matter, and mixed mineral and organic A1 horizon. The predominant humus type is a "thin duff mull with very shallow A1". Occasional slight sheet erosion is evident under undisturbed forest conditions on areas where the soil surface has been disrupted by wild animal activity such as deer trails.

It is likely that present relief and soil conditions in the forest are similar to those that existed prior to ROW construction in 1916. However, organic matter deposits and soil erosion may be somewhat different due to the age, structure, and density of the natural forest 60 years ago.

6.1.2 Vegetation

Due to the age of this corridor it is difficult to surmise the precise conditions that existed prior to ROW extablishment. The present age and structure of the adjacent forests, particularly on xeric and hydric sites, suggest that the corridor penetrating these areas was originally covered with pole-stage trees. Oak-hickory and chestnut-oak types were present on xeric sites. On hydric sites elm and red maple were the prominent species.

Certain portions of mesic areas traversed by this corridor were possibly open land; others where the slope is steep and rocky were probably in forest. Oak-Hickory stands of northern red oak, basswood, white ash, and shagbark-hicory were the cover on these 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 currently occupy the site, i.e., cottontail rabbit, ruffed grouse, 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, 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

Earliest data available near the time of construction of the ROW in 1918 is a 1957 USGS Quadrangle map. The ROW and adjacent land area was rural non-farm with a land use distribution of forest land (61.7%), water resources (16.9%), agriculture (18.0%), public and semi-public (.8%), commercial and industrial (1.7%), residential (.8%), and transportation (.1%).

6.2 Conditions Which Exist at Present

6.2.1 Soils

General landforms and associated soil types and moisture regimes described in the adjacent forest are also present on the ROW. Soil type boundaries coincide closely with slope configuration, relief position, and surface drainage patterns. Dominant plant communities on the ROW reflect existing soil and moisture conditions: Blueberry-Sweet-fern and Blueberry-Broom-sedge on the xeric positions of Bath-Nassau soils with rock outcrops; Blackberry-Goldenrod on mesic lower slope and level phases of Bath-Nassau gravelly loam; and Willow-Sevsitive Fern on the seasonally wet Canandaigua, Erie, and Palms soils.

Occurrence and thickness of organic matter deposits on the ROW are comparable to those in the forest, resulting in a similar "thin duff mull with very shallow A1" humus type. There is some slight sheet erosion on the general ROW, but the most obvious active erosion occurs on tower sites, portions of the access road, and excavations that are bare or have sparse vegetation cover. Use of the ROW and adjacent forest for horseback riding has interfered with plant development and exposed such areas to erosion.

6.2.2 Vegetation

The variety of vegetation management practices used on this line area since 1916, including a long period of hand cutting and more recently hand cutting and basal spraying of high-growing species, has resulted in a complex mixture of plant communities. These include large numbers of shrubs, tree seedlings, and sprouts, as well as many herbs, grasses, and ferns.

Hydric sites are occupied by low communities of herbaceous vegetation interspersed with thickets of sumac, willow, aspen, and gray dogwood. Tree seedlings and saplings are abundant in all herbaceous communities with red maple, gray birch, aspen, elm, and sassafras particularly prevalent.

On mesic sites hay-scented fern communities are common, interspersed with various combinations of blackberry, herbs, and mixed grasses. Shrubs and tree seedlings include smooth sumac, willows, gray birch, sassafras, and ground-juniper. Poison ivy occurs locally as a dominant plant, or as single stems interspersed throughout the herbaceous communities.

On xeric sites various grass-herb mixtures form the major plant cover. Sweet-fern and a large number of tree seedlings and sprouts are present.

6.2.3 Wildlife

Cottontail rabbit, ruffed grouse, and raccoon are the major game animals that currently occupy the study area. Indirect (tracks) and direct observations of rabbits indicated their presence on the ROW. No raccoon activity was noted during the period of the study, although habitat conditions are favorable. Ruffed grouse were seen on the ROW and on the ROW edge, and utilized the adjacent forest for drumming during the spring, 1976.

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

The bottom of the swamp is predominantly organic material and aquatic plants are abundant. Off the ROW a multistory canopy shades the swamp. On the ROW the swamp is well shaded by dense herbs, shrubs, and saplings. The recent ROW maintenance technique "cut and remove selective high-growing species" has resulted in minimal effect on water quality in the swamp.

Low pH and dissolved oxygen concentration and percent saturation were attributed to the abundant decaying organic material (Hynes, 1970).

During this sampling program average water temperature and pH were the same at all locations.

Dissolved oxygen concentration and percent saturation on the average were greater at location 2 than at locations 1 and 3. The increase of dissolved oxygen on the ROW is probably due to increased photosynthesis by aquatic vegetation.

Siltation and erosion were not observed.

6.2.5 Land Use

Presently, the adjacent land uses to site 5 have had a minimal change from the 1957 data. The ROW and the adjacent land area is still rural nonfarm with a land use distribution of agriculture (13.6%), commercial and industrial (2.7%), forest land (53.6%), extractive industry (1.4%), outdoor recreation (.3%), public and semi-public (3.0%), water resources (22.8%), transportation (.5%), and residential (2.1%). With reference to the total area involved, shifts in land use are noted as follows:

Agriculture -	-4.4%
Commercial and Industrial -	+1.0%
Forest Land -	-8.1%
Extractive Industry -	+1.4%
Outdoor Recreation -	+0.3%
Public and Semi-public -	+2.2%
Water Resources -	+5.9%
Transportation -	+0.4%
Residential -	+1.3%

Land use of extractive industry (1.4%) and outdoor recreation (.3%) are new types not present in 1957. In addition to use of the ROW for the transmission of electrical power, portions of the ROW are currently being used for agriculture, hunting, horse trails, and other recreational uses.

6.3 Environmental Effect and Probable Causes

6.3.1 Soils

The impact of ROW management on soils of this area has been minimal, mostly related to disturbance of the surface soil on access roads, excavations, and tower sites. Sporadic and slow plant invasion on access road due to periodic use, primarily recreational, has exposed the mineral soil to slight sheet and rill erosion. Also, bare soils under some towers, possibly related to toxic leachates from steel structures, exhibit slight sheet erosion at the present time.

A portion of the sediments resulting from soil erosion are transported and deposited in the 2 swamps that occur on the ROW and adjacent forest. Other soil particles dislodged in erosion accumulate on lower slopes of the ROW.

Organic litter on the soil surface of the general ROW is composed mostly of herbaceous leaves and stems in contrast to hardwood tree litter in the forest; otherwise, the ROW had no deleterious effect on organic layers.

6.3.2 Vegetation

The general impact of ROW management was to produce a Blackberry-Goldenrod community on the mesic ROW habitat from an Oak-Hickory forest type; a Blueberry-Sweet-fern community on the xeric ROW habitat from a Chestnut-Oak forest type; and a Willow-Sensitive Fern community on the hydric habitat area on the ROW from an Elm-Red Maple forest type.

The number of species (species diversity) increased on the ROW as compared with the adjacent forest on the mesic and xeric habitat areas. The same number of species occurred on the ROW and in the forest on one hydric habitat; many more species occurred on the ROW on the other hydric habitat area.

Considerable differences in kinds of plants were recorded on the ROW and in the forest. On the mesic habitat area, such shrubs as gray dogwood, sumac, hazelnut, and New Jersey tea occurred only on the ROW; on the xeric habitat, blackberry, blueberry, sweet-fern, and dewberry occurred only on the ROW; on the hydric habitat, spiraea, virgin's-bower, and arrow-wood occurred only on the ROW. On the other hand, such shrubs as spicebush and Virginia creeper occurred only in the forest on the hydric habitat; no shrubs occurred only in the forest on the mesic habitat; teaberry and American bladdernut occurred only in the forest on the xeric habitat area.

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

From the existing data and observation the environmental effects of the ROW on water quality were negligible.

Line Management Factors Recent right-of-way maintenance "cut and remove selective high growing species" has resulted in minimal effect on the water quality in the swamp.

6.3.5 Land Use

It is not possible to attribute changes in land use (classification) 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 Ulster County. The inventoried area remains rural nonfarm in character.

Table 5.1. Soil series present on the Poughkeepsie to Ohioville study area.

Soil Series	Map Symbol[1]	Drainage Class[2]	Surface Soil pH	Surface Soil Texture	Woodland Suitability Group
Bath-Nassau	BnA	G-E	5.0	gravelly loam	3o1/4d1
Bath-Nassau	BnB	G-E	4.5	gravelly loam	3o1/4d1
Bath-Nassau	BnC	G-E	4.6	gravelly loam	3r3/4x6
Bath-Nassau-Rock Outcrip	BrC	G-E	4.7	very rocky gravelly loam	3r3/4x6
Bath-Nassau-Rock Outcrop	BrD	G-E	4.9	very rocky gravelly loam	3r3/4x6
Bath-Nassau-Rock Outcrop	BrE	G-E	4.8	very rocky gravelly loam	347/4x9
Canandaigua	CaA	PD	6.0	silt loam	4w1
Chenango	ChA	G-E	5.2	gravelly silt loam	3o1
Erie	ErA	SPD	5.7	very stony loam	3w2
Palms	PaA	VPD	6.4	muck	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 5.2. Average thickness of organic layers and A1 horizon and humus types for mesic and xeric sites on ROW and adjacent woodland of site 5.

Moisture Regime	Location	Layer Thickness (in.) L	F	H	A1	Humus Type
1. Mesic (5)[1]	ROW	.8	.2	.4	.6	Thin duff mull with very shallow A1
	Woodland	1.2	.2	.4	.4	Thin duff mull with very shallow A1
2. Mesic	ROW	.9	.2	.4	.7	Thin duff mull with very shallow A1
	Woodland	1.1	.2	.4	.5	Thin duff mull with very shallow A1
All Mesic Plots Combined	ROW	.9	.2	.4	.7	Thin duff mull with very shallow A1
	Woodland	1.2	.2	.4	.5	Thin duff mull with very shallow A1
3. Xeric (2)	ROW	.7	.1	.4	1.0	Thin duff mull with shallow A1
	Woodland	.5	0	0	.8	Very shallow medium mull
4. Xeric (3)	ROW	.4	.2	.3	.7	Thin duff mull with very shallow A1
	Woodland	.9	.1	.4	.7	Thin duff mull with very shallow A1
All Xeric Plots Combined	ROW	.6	.2	.4	.9	Thin duff mull with very sahllow A1
	Woodland	.7	.1	.2	.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 5.3 Areas exhibiting active erosion in September, 1976, on the Poughkeepsie to Ohioville 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	Bath-Nassau gravelly loam	15	Bare-mosses	Sheet, Rill Gully	Slight-Moderate	3
Tower Site	Bath-Nassau gravelly loam	3-12	Bare	Sheet & Rill	Slight	-
Tower Site	Bath-Nassau gravelly loam	3-15	Bare	Sheet	Slight	-
Tower Site/ Excavation	Bath-Nassau Rock Outcrop	20	Bare-herb	Sheet & Rill	Slight	-
Access Road/Path	Bath-Nassau gravelly loam	2	Bare-grass-herb	Sheet	Slight	-
Horse Trail	Erie very stony loam	5	Bare	Sheet	Slight	-
		FOREST				
General Forest	Bath-Nassau gravelly loam	3-5	Bare-litter-herb	Sheet	Slight	
General Forest	Bath-Nassau gravelly loam	12	Bare-litter-herb	Sheet	Slight	-
Access Road/Path	Bath-Nassau gravelly loam	5	Grass-herb	Sheet	Slight	-

Table 5.3. Continued

Location	Soil Type	Average Slope (%)	Plant Cover	Erosion on ROW Kind	Erosion on ROW Class	Erosion on ROW Gully Depth (in.)
Horse Trail	Canandaigua silt loam	5	Bare	Sheet	Slight	-
Deer Trail	Palms muck	2	Bare	Sheet	Slight	-

Table 5.4. 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	53.91	46	99.91
	White Ash	31.30	27	58.30
	American Elm	14.79	27	41.79
Xeric 2	White Ash	49.09	24	73.09
	Red Maple	20.74	15	35.74
	Bitternut Hickory	9.94	15	24.94
	Shagbark-Hickory	7.85	15	22.85
	Chestnut-Oak	6.01	15	21.01
	Red Oak	4.41	8	12.41
	White Oak	1.96	8	9.96
Xeric 3	Red Oak	84.48	50	134.48
	Chestnut-Oak	7.44	15	22.44
	Red Maple	6.10	20	26.10
	White Oak	1.08	5	6.08
	Yellow Birch	.83	5	5.83
	Serviceberry	.07	5	5.07
Hydric 4	Red Maple	89.23	62	151.23
	American Elm	7.92	19	26.92
	Yellow Birch	2.85	19	21.85
Mesic 5	Red Maple	34.90	35	69.90
	Red Oak	44.18	23	67.18
	Chestnut-Oak	7.67	12	19.67
	Sweet Birch	1.23	12	13.23
	Bitternut Hickory	8.72	6	14.72
	White Oak	2.76	6	8.76
	White Ash	.54	6	6.54

Table 5.5. 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)		Xeric (2)		Xeric (3)		Hydric (4)		Mesic (5)	
	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	2.1	-	+.1	-	1.1	-	2.1	-	1.1	-
White Ash	1.1	-	+.1	-	-	-	-	-	+.1	-
American Elm	1.1	-	-	-	-	-	1.1	-	-	-
Chestnut-Oak	-	-	+.1	-	1.1	-	-	-	+.1	-
Bitternut Hickory	-	-	+.1	-	-	-	-	-	+.1	-
White Oak	-	-	+.1	-	+.1	-	-	-	+.1	-
Red Oak	-	-	+.1	-	1.1	-	-	-	1.1	-
Shagbark-Hickory	-	-	+.1	-	-	-	-	-	-	-
Yellow Birch	-	-	-	-	+.1	-	1.1	-	-	-
Serviceberry	-	-	-	-	+.1	-	-	-	-	-
Sweet Birch	-	-	-	-	-	-	-	-	+.1	-
No. Species	3	0	7	0	6	0	3	0	7	0
Shrub Layer										
Spicebush	2.3	-	-	-	-	-	-	-	-	-
Virginia Creeper	2.3	-	-	+.2	+.1	1.3	2.2	-	-	-
Poison Ivy	1.1	-	-	1.3	-	1.3	-	-	-	-
Willow spp.	-	++.1	-	-	-	-	-	4.5	-	+.1
Gray Dogwood	-	2.4	-	++.1	-	-	-	1.1	-	+.3
Arrow-wood	-	1.2	-	1.1	+.1	-	-	-	-	-
Pagoda-Dogwood	-	+.1	-	-	-	-	-	-	-	-
Ground-Juniper	-	+.4	+.1	+.3	-	-	-	-	-	-
Smooth Sumac	-	+.1	-	2.1	-	-	-	-	-	1.1
Nannyberry	-	+.4	-	++.1	-	+.1	-	-	-	++.1
Staghorn-Sumac	-	2.1	-	2.1	-	3.4	-	-	-	1.1
Spiraea spp.	-	2.3	-	1.2	-	1.3	-	1.2	-	-
Blueberry spp.	-	+.2	-	1.4	2.2	2.2	-	-	2.3	+.3
Blackberry	-	2.4	-	2.1	-	2.4	-	-	1.2	2.1

Table 5.5. Continued

Species	Hydric (1) Forest A.S.	Hydric (1) ROW A.S.	Xeric (2) Forest A.S.	Xeric (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.
Virgin's-bower	-	3.4	-	-	-	-	-	-	-	-
Rose	-	++.1	-	-	-	++.1	-	-	-	-
Witch-Hazel	-	-	+.1	+.1	2.1	-	-	-	3.1	+.1
Grape	-	-	1.3	+.2	-	1.3	-	-	1.2	2.2
Hazelnut	-	-	-	+.1	-	-	-	-	-	+.1
Sweet-fern	-	-	-	2.1	-	3.2	-	-	-	-
Winterberry	-	-	-	+.1	-	-	-	+.3	-	-
Maple-leaved Viburnum	-	-	-	++.1	+.2	-	+.1	-	1.2	+.1
Teaberry	-	-	-	+.3	2.3	-	-	-	+.2	++.1
Pinxter-flower	-	-	-	1.3	+.3	-	-	-	(1.1)	+.3
Dewberry	-	-	-	1.4	-	-	-	-	-	-
American Bladder-nut	-	-	-	-	2.5	-	-	-	-	-
Hawthorn	-	-	-	-	-	+.1	-	-	-	-
Scrub-Oak	-	-	-	-	-	++.1	-	-	-	-
Buttonbush	-	-	-	-	-	-	+.1	+.2	-	-
Poison Sumac	-	-	-	-	-	-	-	1.2	-	-
Red Osier Dogwood	-	-	-	-	-	-	1.1	-	-	-
Elderberry	-	-	-	-	-	-	+.1	-	-	-
Common Alder	-	-	-	-	-	-	1.1	-	-	-
New Jersey Tea	-	-	-	-	-	-	-	-	-	2.2
Raspberry	-	-	-	-	-	-	-	-	-	+.1
No. Species	3	13	3	20	8	12	6	6	7	15

Trees in the Shrub Layer

Species	Hydric (1) Forest A.S.	Hydric (1) ROW A.S.	Xeric (2) Forest A.S.	Xeric (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.
Red Cedar	+.1	++.1	++.1	-	-	-	-	-	-	-
White Ash	3.1	2.1	4.1	1.1	2.1	2.1	1.1	+.1	1.1	+.1
American Elm	3.1	2.1	-	1.1	-	+.1	2.1	1.1	-	-
Red Maple	-	2.1	3.1	1.1	-	2.1	3.1	2.1	2.1	+.1
White Sassafras	-	1.1	-	2.1	-	1.1	-	+.1	-	3.1
Quaking Aspen	-	1.1	-	+.1	-	-	-	-	-	-
Apple	-	+.1	-	-	-	-	-	-	-	-
Gray Birch	-	++.1	-	-	-	1.1	-	-	-	1.1

Table 5.5. Continued

Species	Hydric (1) Forest A.S.	Hydric (1) ROW A.S.	Xeric (2) Forest A.S.	Xeric (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.
Red Oak	-	++.1	3.1	1.1	1.1	3.1	+.1	-	2.1	+.1
Black Cherry	-	+.1	+.1	1.1	-	+.1	-	-	-	++.1
Shagbark-Hickory	-	++.1	-	-	-	-	-	-	-	-
Large-toothed Aspen	-	++.1	-	+.1	-	+.1	-	-	-	1.1
American Hornbeam	-	-	3.1	++.1	-	+.1	-	-	-	-
Chestnut-Oak	-	-	2.1	-	3.1	+.1	-	-	+.1	+.1
Bitternut Hickory	-	-	-	+.1	-	+.1	-	-	-	1.1
Yellow Birch	-	-	-	+.1	-	+.1	1.1	-	1.1	2.1
Basswood	-	-	-	-	++.1	-	++.1	-	-	-
Chestnut	-	-	-	-	++.1	-	-	-	2.1	-
Hemlock	-	-	-	-	++.1	-	-	-	-	-
American Hop-Hornbeam	-	-	-	-	+.1	-	-	-	-	-
Serviceberry	-	-	-	-	3.1	-	-	-	2.1	-
Flowering Dogwood	-	-	-	-	1.1	-	+.1	-	3.4	++.1
Tulip-Poplar	-	-	-	-	-	++.1	-	-	++.1	-
Sweet Birch	-	-	-	-	-	-	-	-	2.1	-
White Oak	-	-	-	-	-	-	-	-	-	+.1
No. Species	3	12	7	11	9	13	7	4	10	12

Herb Layer[1]

Species	Hydric (1) Forest A.S.	Hydric (1) ROW A.S.	Xeric (2) Forest A.S.	Xeric (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.
Sedge	3.2	2.2	-	-	-	-	3.2	2.2	-	-
Skunk-cabbage	2.2	+.2	-	-	-	-	3.2	3.2	-	-
Mosses	4.2	-	-	-	-	-	3.3	3.3	-	-
Horsetail	2.1	+.1	-	+.1	-	-	-	-	-	-
Marginal Shield-Fern	1.2	+.2	+.2	-	+.2	-	-	1.2	-	-
Cinnamon-Fern	+.2	-	-	-	-	-	-	-	-	-
Sensitive Fern	1.2	-	-	-	-	-	1.2	4.4	-	-
Wild Sarsaparilla	+.1	-	-	-	-	+.2	1.3	-	++.1	-
Spotted Touch-me-not	1.1	+.3	-	-	-	-	-	+.3	-	-
Jack-in-the-pulpit	+.1	+.1	-	-	-	-	-	-	-	-
Pennsylvania Bitter-cress	1.1	++.1	-	-	-	-	-	-	-	-

Table 5.5. Continued

Species	Hydric (1) Forest A.S.	Hydric (1) ROW A.S.	Xeric (2) Forest A.S.	Xeric (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.
Wild Cranesbill	(+.1)	+.1	+.2	+.2	-	-	-	-	-	-
Violet spp.	2.2	+.2	(2.2)	-	-	-	+.2	+.2	-	+.2
Golden Ragwort	(++.1)	-	(++.1)	-	-	-	-	-	-	-
Spiked Loosestrife	-	3.4	-	-	-	-	-	4.4	-	++.1
Old-field Cinquefoil	-	1.3	-	-	-	1.1	-	-	+.3	2.3
Strawberry	-	+.2	1.2	+.2	-	+.4	-	-	-	++.1
Ox-eye-Daisy	-	++.2	-	-	-	-	-	-	-	+.2
Boneset	-	++.1	-	-	-	-	-	-	-	-
Goldenrod spp.	-	+.2	-	+.2	-	1.2	-	-	+.1	1.3
Spotted Knapweed	-	++.1	-	-	-	1.2	-	-	-	3.2
Tearthumb	-	++.2	-	-	-	-	-	-	-	-
Nodding Ladies'-tresses	-	++.1	-	-	-	-	-	-	-	-
Aster spp.	-	++.1	-	+.2	-	-	-	-	1.1	-
Cutgrass	-	1.4	-	-	-	-	-	-	-	-
False Spikenard	-	-	1.1	+.1	-	+.3	-	-	-	+.1
Common Cinquefoil	-	-	2.2	1.2	-	-	-	-	-	-
Wild Lily-of-the-valley	-	-	(+.3)	-	1.1	2.3	-	-	-	-
Perfoliate Bellwort	-	-	1.1	-	-	-	-	-	1.1	+.1
Mixed Grass	-	-	1.2	2.2	+.2	2.2	-	-	1.2	2.3
Large-flowered Bell-wort	-	-	2.1	+.3	+.1	1.3	-	-	-	1.1
Bedstraw	-	-	++.1	-	-	-	-	-	-	-
Bracken	-	-	1.1	-	-	-	-	-	-	2.1
Plantain sp.	-	-	1.2	1.2	1.2	++.2	-	-	-	-
Kidneyleaf-Buttercup	-	-	++.1	-	-	-	-	-	-	-
Hair-cap Moss	-	-	-	2.4	1.3	3.4	+.2	-	-	-
Canada Lily	-	-	-	+.1	-	-	-	-	-	-
Wood-Lily	-	-	-	+.1	-	-	-	-	-	-
Whorled Loosestrife	-	-	-	+.2	-	-	-	-	1.1	+.1

Table 5.5. Continued

Species	Hydric (1) Forest A.S.	Hydric (1) ROW A.S.	Xeric (2) Forest A.S.	Xeric (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.
Large-leaved Aster	-	-	-	+.2	-	-	-	-	-	-
Maryland Golden Aster	-	-	-	+.2	-	-	-	-	-	-
Broom-sedge	-	-	-	2.2	-	1.2	-	-	-	-
Hay-scented Fern	-	-	-	2.4	-	2.4	-	-	-	1.4
Reindeer Lichen	-	-	-	+.2	1.2	1.2	-	-	-	-
White Moss	-	-	-	-	1.2	-	-	-	-	-
Solomon's-seal	-	-	-	-	1.2	-	-	-	-	-
Pearly Everlasting	-	-	-	-	-	+.2	-	-	-	-
Aster spp.	-	-	-	-	-	+.2	-	-	-	1.3
Christmas Fern	-	-	-	-	-	+.2	-	-	-	-
Sheep-Sorrel	-	-	-	-	-	3.2	-	-	-	+.2
Poverty-Grass	-	-	-	-	-	2.2	-	-	-	-
New York Fern	-	-	-	-	-	+.2	-	-	-	-
Field Cat's-foot	-	-	-	-	-	+.2	-	-	-	-
Yarrow	-	-	-	-	-	+.2	-	-	-	-
Sphagnum	-	-	-	-	-	-	4.4	3.2	-	-
Royal Fern	-	-	-	-	-	-	3.4	3.2	-	-
Marsh-Fern	-	-	-	-	-	-	2.2	1.2	-	-
Partridge-berry	-	-	-	-	-	-	+.2	-	-	-
Purple Trillium	-	-	-	-	-	-	(1.1)	-	-	-
Cattail	-	-	-	-	-	-	-	2.4	-	-
Angelica	-	-	-	-	-	-	-	1.1	-	-
Northern Water Plantain	-	-	-	-	-	-	-	+.2	-	-
Water-purslane	-	-	-	-	-	-	-	1.3	-	-
Various-leaved Water-Milfoil	-	-	-	-	-	-	-	1.1	-	-
Interrupted Fern	-	-	-	-	-	-	-	2.2	-	-
Cowslip	-	-	-	-	-	-	(1.2)	(1.2)	-	-
Indian-tobacco	-	-	-	-	-	-	-	-	1.1	-
Spotted Wintergreen	-	-	-	-	-	-	-	-	+.1	-
Hawkweed spp.	-	-	-	-	-	-	-	-	-	2.2

Table 5.5. Continued

Species	Hydric (1) Forest A.S.	Hydric (1) ROW A.S.	Xeric (2) Forest A.S.	Xeric (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.
Prostate Tick-trefoil	-	-	-	-	-	-	-	-	-	1.4
Mint spp.	-	-	-	-	-	-	-	-	-	+.2
Deptford Pink	-	-	-	-	-	-	-	-	-	+.1
Common Mullein	-	-	-	-	-	-	-	-	-	++.1
Joe-Pye-weed	-	-	-	-	-	-	-	-	-	++.1
Bush-Clover	-	-	-	-	-	-	-	-	-	+.2
Common Ragweed	-	-	-	-	-	-	-	-	-	+.2
Boneset	-	-	-	-	-	-	-	-	-	+.1
Tick-trefoil sp.	-	-	-	-	-	-	-	-	-	1.3
White Snakeroot	-	-	-	-	-	-	-	-	-	++.1
Dandelion	-	-	-	-	-	-	-	-	-	1.2
No. Species	14	20	15	19	9	22	13	18	9	28
Total No. Species										
Trees[2]	4	12	9	11	12	13	7	4	12	12
Shrubs	3	13	3	20	8	12	6	6	7	15
Herbs	14	20	15	19	9	22	13	18	9	28
Totals	21	45	27	50	29	47	26	28	28	55

[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 5.6. 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		
Spicebush	2.3	-
Virginia Creeper	2.3	-
Poison Ivy	1.1	-
Herbs[1]		
Mosses	4.2	-
Cinnamon-Fern	+.2	-
Sensitive Fern	1.2	-
Wild Sarsaparilla	+.1	-
Golden Ragwort	(++.1)	
No. Species	8	
Xeric (2)		
Shrubs	-	-
Herbs		
Marginal Shield-Fern	+.2	-
Golden Ragwort	(++.1)	-
Violet spp.	(2.2)	-
Wild Lily-of-the-valley	(+.3)	-
Perfoliate Bellwort	1.1	-
Bedstraw	++.1	-
Bracken	1.1	-
Kidneyleaf-Buttercup	++.1	-
No. Species	8	
Xeric (3)		
Shrubs		
Arrow-wood	+.1	-
Witch-Hazel	2.1	-
Maple-leaved Viburnum	+.2	-
Teaberry	2.3	-
Pinxter-flower	+.3	-
American Bladder-nut	2.5	-

Table 5.6. Continued

Species	Forest A.S.	ROW A.S.
Herbs		
Marginal Shield-Fern	+.2	-
White Moss	1.2	-
Solomon's-seal	1.2	-
No. Species	9	
Hydric (4)		
Shrubs		
Virginia Creeper	2.2	-
Maple-leaved Viburnum	+.1	-
Red Osier Dogwood	1.1	-
Elderberry	+.1	-
Common Alder	1.1	-
Herbs		
Wild Sarsaparilla	1.3	-
Hair-cap Moss	+.2	-
Partridge-berry	+.2	-
Purple Trillium	(1.1)	-
No. Species	9	
Mesic (5)		
Shrubs	-	-
Herbs		
Wild Sarsaparilla	++.1	-
Aster spp.	1.1	-
Indian-tobacco	1.1	-
Spotted Wintergreen	+.1	-
No. Species	4	

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

Table 5.7. 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	-
Gray Dogwood	2.4	-
Arrow-wood	1.2	-
Pagoda-Dogwood	+.1	-
Ground Juniper	+.4	-
Smooth Sumac	+.1	-
Nannyberry	+.4	-
Staghorn-Sumac	2.1	-
Spiraea spp.	2.3	-
Blueberry spp.	+.2	-
Blackberry	2.4	-
Virgin's-bower	3.4	-
Rose	++.1	-
Herbs[1]		
Spiked Loosestrife	3.4	-
Old-field-Cinquefoil	1.3	-
Strawberry	+.2	-
Ox-eye-Daisy	++.2	-
Boneset	++.1	-
Goldenrod spp.	+.2	-
Spotted Knapweed	++.1	-
Tearthumb	++.2	-
Nodding Ladies'-tresses	++.1	-
Aster spp.	++.1	-
	1.4	-
No. Species	24	
Xeric (2)		
Shrubs		
Virginia Creeper	+.2	-
Poison Ivy	1.3	-
Gray Dogwood	++.1	-
Arrow-wood	1.1	-
Smooth Sumac	2.1	-
Nannyberry	++.1	-
Staghorn-Sumac	2.1	-
Spiraea spp.	1.2	-
Blueberry spp.	1.4	-

Table 5.7. Continued

Species	ROW A.S.	Forest A.S.
Blackberry	2.1	-
Hazelnut	+.1	-
Sweet-fern	2.1	-
Winterberry	+.1	-
Maple-leaved Viburnum	++.1	-
Teaberry	+.3	-
Pinxter-flower	1.3	-
Dewberry	1.4	-
Herbs		
Horsetail	+.1	-
Goldenrod spp.	+.2	-
Aster spp.	+.2	-
Hair-cap Moss	2.4	-
Canada Lily	+.1	-
Wood-Lily	+.1	-
Whorled Loosestrife	+.2	-
Large-leaved Aster	+.2	-
Maryland Golden Aster	+.2	-
Broom-sedge	2.2	-
Hay-scented Fern	2.4	-
Reindeer Lichen	+.2	-
No. Species	29	
Xeric (3)		
Shrubs		
Poison Ivy	1.3	-
Nannyberry	+.1	-
Staghorn-Sumac	3.4	-
Spiraea spp.	1.3	-
Blackberry	2.4	-
Rose	++.1	-
Grape	1.3	-
Sweet-fern	3.2	-
Hawthorn	+.1	-
Scrub-Oak	++.1	-
Herbs		
Wild Sarsaparilla	+.2	-
Old-field-Cinquefoil	1.1	-
Strawberry	+.4	-
Goldenrod spp.	1.2	-
Spotted Knapweed	1.2	-
False Spikenard	+.3	-

Table 5.7. Continued

Species	ROW A.S.	Forest A.S.
Broom-sedge	1.2	-
Hay-scented Fern	2.4	-
Pearly Everlasting	++.2	-
Aster spp.	+.2	-
Christmas Fern	+.2	-
Sheep-Sorrel	3.2	-
Poverty-Grass	2.2	-
New York Fern	+.2	-
Field Cat's-foot	+.2	-
Yarrow	+.2	-
No. Species	26	
Hydric (4)		
Shrubs		
Willow spp.	4.5	-
Gray Dogwood	1.1	-
Spiraea	1.2	-
Winterberry	+.3	-
Poison Sumac	1.2	-
Herbs		
Marginal Shield-Fern	1.2	
Spotted Touch-me-not	+.3	-
Spiked Loosestrife	4.4	-
Cattail	2.4	-
Angelica	1.1	-
Northern Water Plantain	+.2	-
Water-purslane	1.3	-
Various-leaved Water-Milfoil	1.1	-
Interrupted Fern	2.2	-
No. Species	14	
Mesic (5)		
Shrubs		
Willow spp.	+.1	-
Gray Dogwood	+.3	-
Smooth Sumac	1.1	-
Nannyberry	++.1	-
Staghorn-Sumac	1.1	-
Hazelnut	+.1	-
New Jersey Tea	2.2	-
Raspberry	+.1	-

Table 5.7. Continued

Species	ROW A.S.	Forest A.S.
Herbs		
Violet spp.	+.2	-
Spiked Loosestrife	++.1	-
Strawberry	++.1	-
Ox-eye-Daisy	+.2	-
Spotted Knapweed	3.2	-
False Spikenard	+.1	-
Large-flowered Bellwort	1.1	-
Bracken	2.1	-
Hay-scented Fern	1.4	-
Aster spp.	1.3	-
Sheep-Sorrel	+.2	-
Hawkweed	2.2	-
Prostate Tick-trefoil	1.4	-
Mint sp.	+.2	-
Deptford Pink	+.1	-
Common Mullein	++.1	-
Joe-Pye-weed	++.1	-
Bush-Clover	+.2	-
Common Ragweed	+.2	-
Boneset	+.1	-
Tick-trefoil sp.	1.3	-
White Snakeroot	++.1	-
Dandelion	1.2	-
No. Species	31	

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

Table 5.8. Major vegetational types for the Poughkeepsie to Ohioville study area based on percent of study plots occupied by each plant community and other components on the ROW.

Community	Site Classification				
	Hydric (1)	Xeric (2)	Xeric (3)	Hydric (4)	Mesic (5)
	Percent of Total Area				
Mixed Herb-Sedge-Spiraea	32.3				
Spiraea-Sedge-Mixed Herb	15.5				
Red Maple-Mixed Herb	11.5				
Sumac-Aspen	11.4				
Gray Dogwood	10.2				
Gray Dogwood-Staghorn-Sumac	8.9				
Arrow-wood	2.5	1.4			
Open	2.4	8.2			
Cutgrass	2.3				
Nannyberry	1.3		.3		
Ground-Juniper	1.0	.9			
Red Osier Dogwood	.7				
Blackberry-Herb		33.2			
Hay-scented Fern		16.9			
Rubus-Mixed Grass-Herb		16.6			
Rock		8.7	.2		
Mixed Grass-Herb		3.4			59.4
Blueberry-Mixed Grass-Herb		3.2			
Poison Ivy		2.6	1.8		
Hair-cap Moss		1.9			
Blueberry		1.7			
Hazelnut		.6			.1
Broom-sedge		.4			
Red Oak		.1			
Sassafras		.1	.6		
Wooden Beam		.1			
Broom-sedge-Sweet-fern-Staghorn-Sumac-Mixed Herb			31.8		
Mixed Grass-Herb-Sweet-fern			19.2		
Mixed Grass-Herb-Staghorn-Sumac			15.2		
Open-Hair-cap Moss-Broom-Sedge			11.7		
Rubus-Staghorn-Sumac-Sweet-fern			10.5		

Table 5.8. Continued

Community	Site Classification				
	Hydric (1)	Xeric (2)	Xeric (3)	Hydric (4)	Mesic (5)
	Percent of Total Area				
Hay-scented Fern-Staghorn-Sumac			4.6		
Sweet-fern-Broom-sedge-*Rubus*			3.3		
New York Fern			.5		
Grape			.3		
Willow-Spiked Loosestrife-Mixed Fern				96.6	
Poison Sumac-Willow				2.9	
Winterberry				.3	
Red Maple				.1	
White Ash				.1	
Yellow Birch-Sassafras-Mixed Grass-Herb					26.4
Staghorn Sumac - *Rubus*					5.8
Grape-*Rubus*					4.8
Staghorn-Sumac-*Rubus*-Maple-leaved Viburnum					1.9
Smooth Sumac-Mixed Grass-Herb					1.3
Witch-Hazel					.3
Total	100.0	100.0	100.0	100.0	100.0

Table 5.9. Birds observed and/or heard on the ROW and on the ROW edge during the study period.

Species	Species
Black duck	Tufted titmouse
Cooper's hawk	Brown thrasher
Red-tailed hawk	Catbird
Osprey	Robin
Ruffed grouse	Wood thrush
Mourning dove	Starling
Downy woodpecker	Myrtle warbler
Hairy woodpecker	Yellowthroat
Pileated woodpecker	Baltimore oriole
Yellow-shafted flicker	Red-winged blackbird
Eastern wood pewee	Cardinal
Great crested flycatcher	Rose-breasted grosbeak
Blue jay	White-throated sparrow
Common crow	Rufous-sided towhee
Black-capped chickadee	

Table 5.10. Potential wildlife use of plant species[1] present on the ROW and adjacent forest for the major game species on the Poughkeepsie to Ohioville ROW.

Species	Wildlife Species		
	Rabbit	Grouse	Raccoon
Trees			
Red Maple	*		
Red Oak	+	+	****
Chestnut-Oak	+	+	****
White Oak	+	+	****
Bitternut Hickory			+
Shagbark-Hickory			+
Yellow Birch		**	
Quaking Aspen		***	
Apple	+	*	
Gray Birch	*	**	
Large-toothed Aspen		***	
American Hornbeam		+	
Serviceberry		+	
Sweet Birch		**	
Flowering Dogwood	+	+	
Shrubs			
Grape		*	*
Teaberry	+	+	
Blueberry		+	
Hazelnut		**	+
Gray Dogwood	+	+	
Pagoda-Dogwood	+	+	
Blackberry	**	*	
Dewberry	**	*	
Smooth Sumac	+	*	
Staghorn-Sumac	+	*	
Raspberry	**	*	
Willow	**	+	
Winterberry	+		
Herbs[2]			
Plantain sp.	**		
Sheep-Sorrel	**	+	
Goldenrod	*		
Mixed Grass	**		

Table 5.10. Continued

Species	Wildlife Species		
	Rabbit	Grouse	Raccoon
Strawberry	+	*	
Sedge		+	

[1] Those plants not included in this table provide a certain amount of cover (Table 5.5) 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 5.11. Water data collected from October 2, 1975, to August 5, 1976, at site 5, Poughkeepsie to Ohioville ROW, Lloyd County, New York.

Date		October 2, 1975			February 5, 1976			May 12, 1976			August 5, 1976		
Sampling Location		1	2	3	1	2	3	1	2	3	1A[1]	2	3
Hour		1225	1200	1250	1315	1255	1355	0840	0950	0910	0935	0945	0955
Water Temp. (C)		11.2	10.5	11.0	0.5	2.0	0.0	13.0	13.0	13.0	16.0	15.0	16.0
Dissolved Oxygen (ppm)		2.7	1.7	3.2	6.0	9.2	9.6	4.7	3.6	2.0	1.8	2.4	1.2
% Saturation D.O.		25	15	30	44	62	68	47	35	19	19	24	12
pH		4.9	5.0	4.9	7.4	8.2	7.2	6.1	5.8	6.1	6.1	5.7	6.4
Water Temp. (C)	range	10.5-11.2			0.0-2.0			13.0			15.0-16.0		
	mean	10.9			0.8			13.0			15.7		
% of Saturation D.O.	range	15-30			44-68			19-47			12-24		
	mean	23			58			34			18		
pH	range	4.9-5.0			7.2-8.2			5.8-6.1			5.7-6.4		
	mean	4.9			7.6			6.0			6.1		
Comments		cloudy, air temp. 16 C			partly cloudy, air temp. -4 C, snow covers ground, ice covering at sampling locations 1 & 3			partly cloudy, air temp. 18 C			sunny, air temp. 23 C		

[1] On August 5, 1976, sampling location 1 was relocated due to the absence of water.

Table 5.12. 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	-------------18.0 **********13.6
(C,I)	Commercial & Industrial	--1.7 ***2.7
(F)	Forest Land	--61.7 **53.6
(E)	Extractive Industry	--1.4
(N)	Non-productive	
(OR)	Outdoor Recreation	-.3
(P)	Public & Semi-public	*.8 ----3.0
(W)	Water Resources	************16.9 ------------------22.8
(U)	Urban Inactive	
(T)	Transportation	-.1 *.5
(R)	Residential	*.8 ---2.1

[1] Source: National Cargographic Info. Center, Reston, Va., air photo No. 2-09 GS-VDMA, Apr. 22, 1975

FIG. 5.1.1. General view of the ROW and adjacent forest, looking southeast, in summer, 1975 (Photo Station 4).

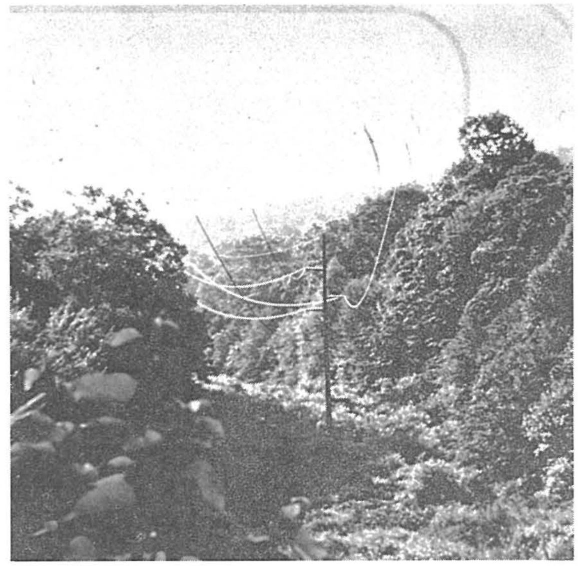


FIG. 5.1.2. General view of the ROW and adjacent forest, looking southeast, in summer, 1975 (Photo Station 6).

FIG. 5.1.3. Open soil under tower 57 exhibiting slight sheet and rill erosion, in summer, 1975 (Photo Station 3).

FIG. 5.1.4. Staghorn- and smooth sumacs, typical species on ROW, not found in adjacent woods, in summer, 1975 (Photo Station 8).

FIG. 5.1.5. Box turtle on ROW during the summer of 1975.

FIG. 5.1.6. Apple orchard on ROW, in fall, 1975 (Photo Station 2).

FIG. 5.1. Visual characteristics.

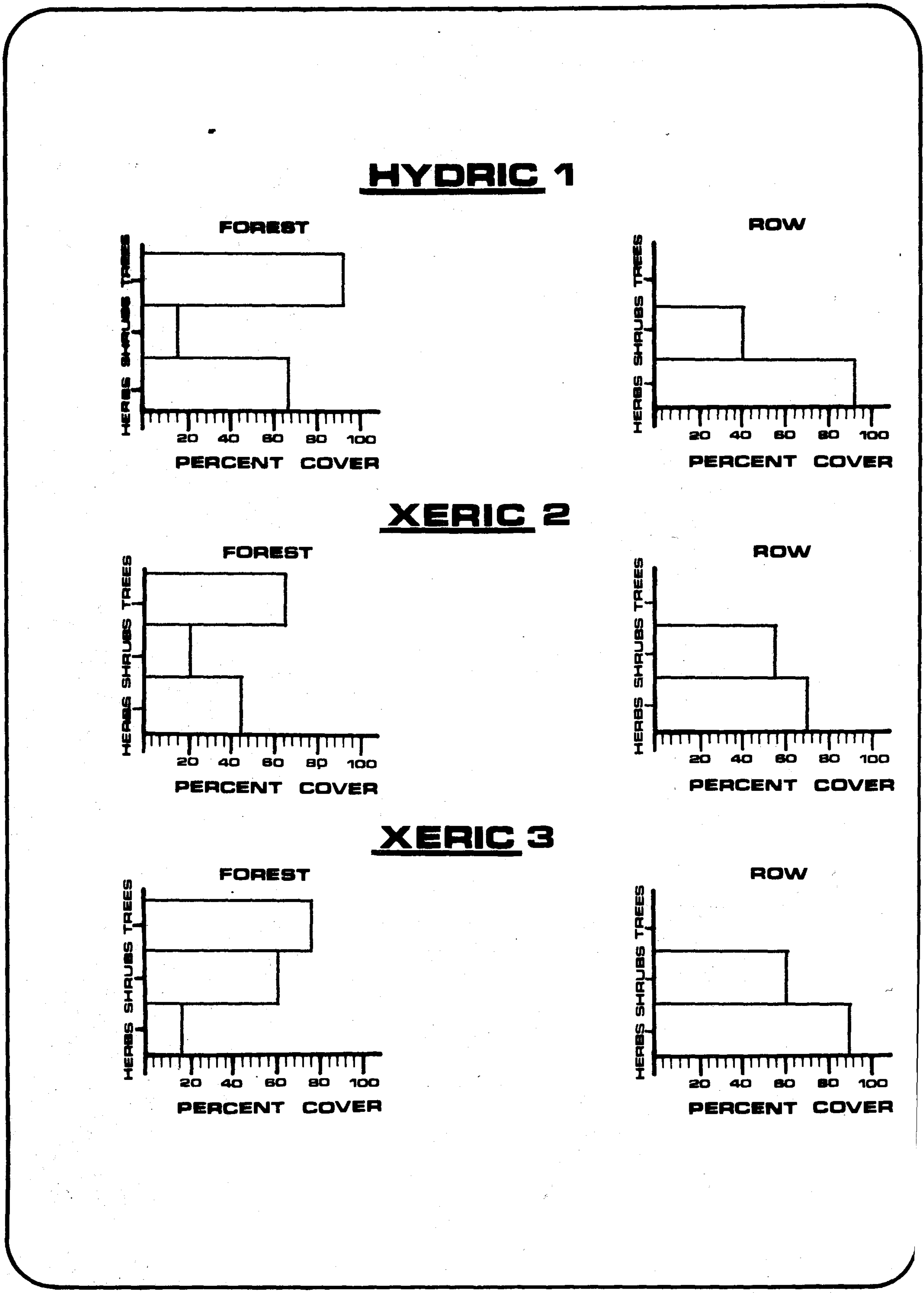


Fig. 5.2. Changes in cover value of tree, shrub, and herb layers from forest to ROW.

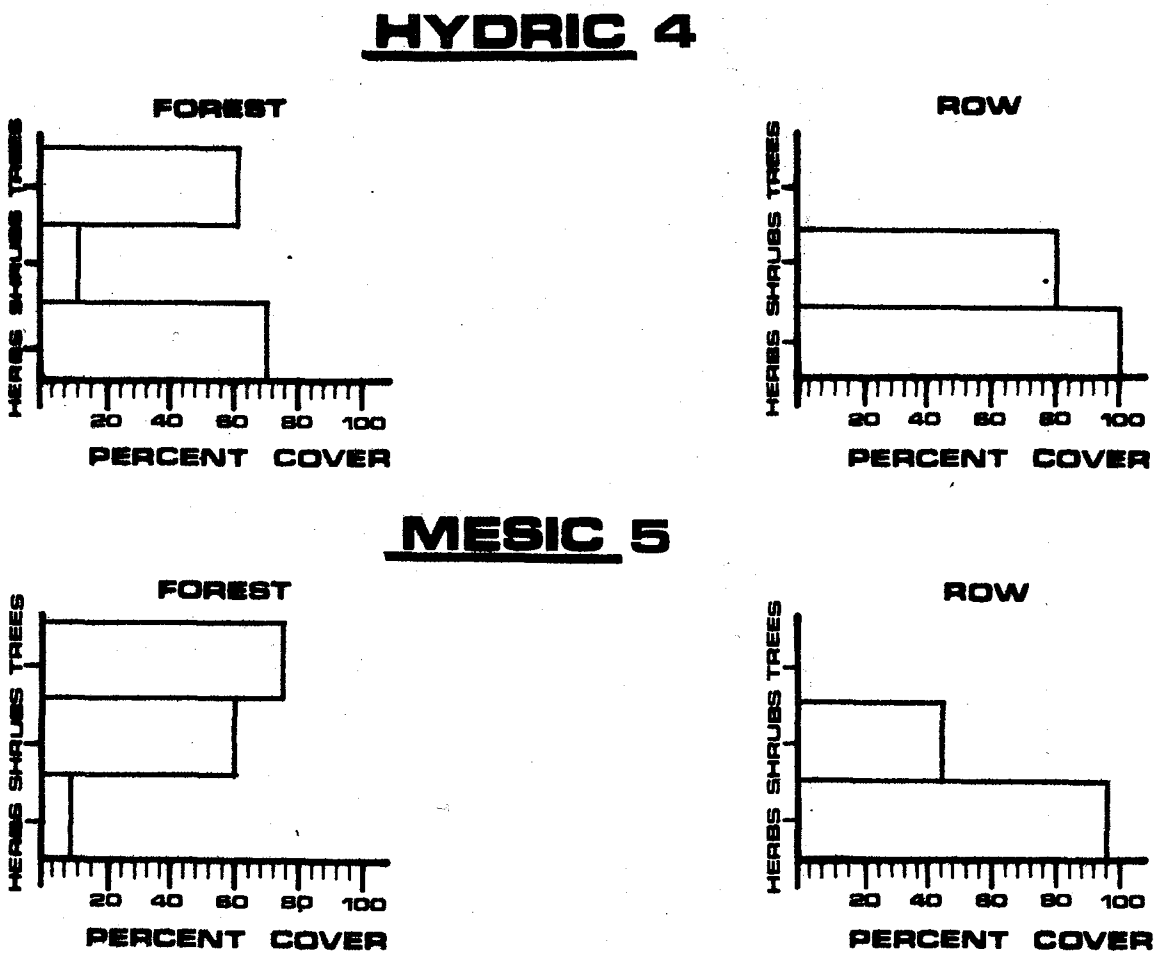


Fig. 5.2a. Changes in cover value of tree, shrub, and herb layers from forest to ROW.

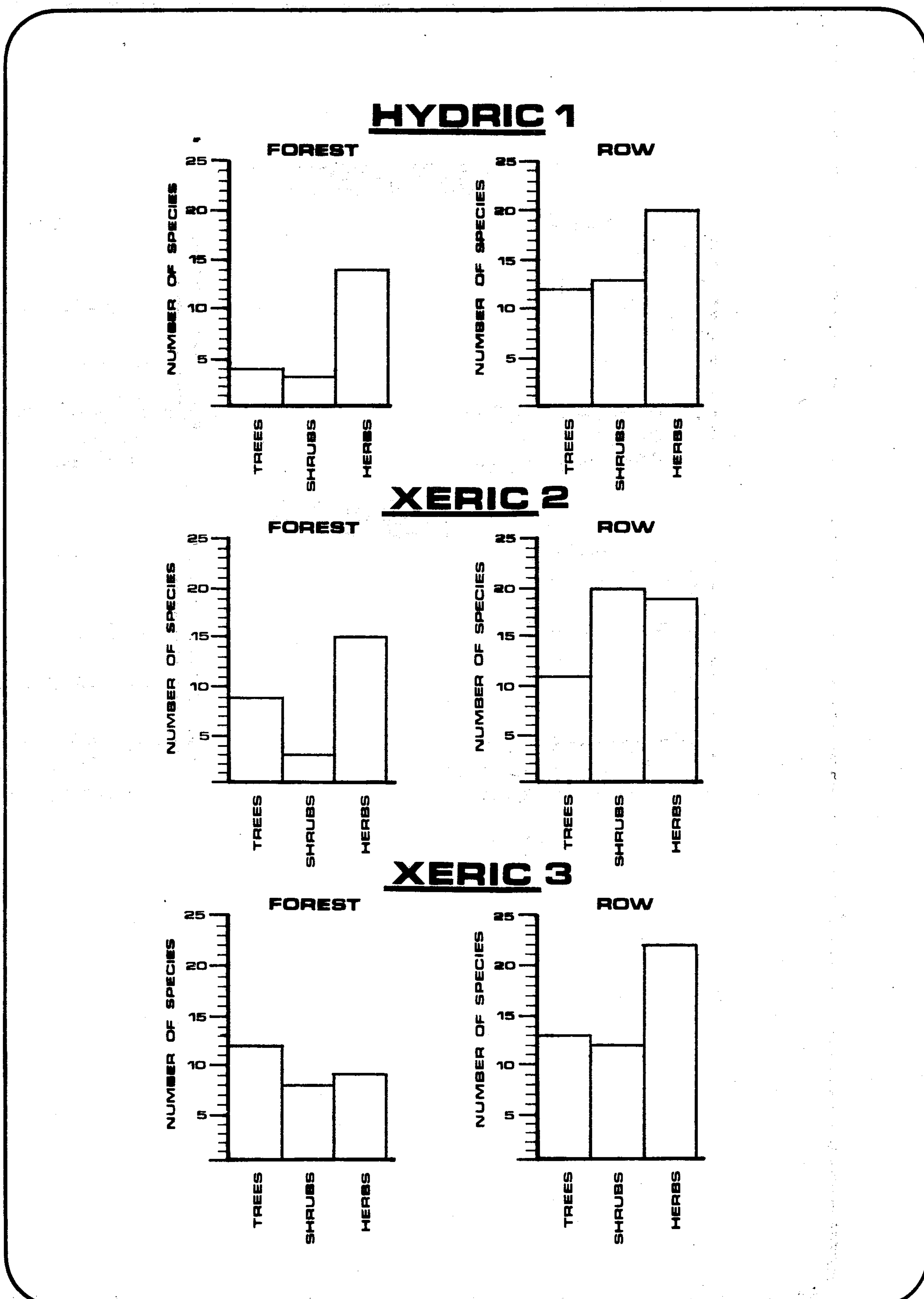


Fig. 5.3. Species diversity in the forest and on the ROW.

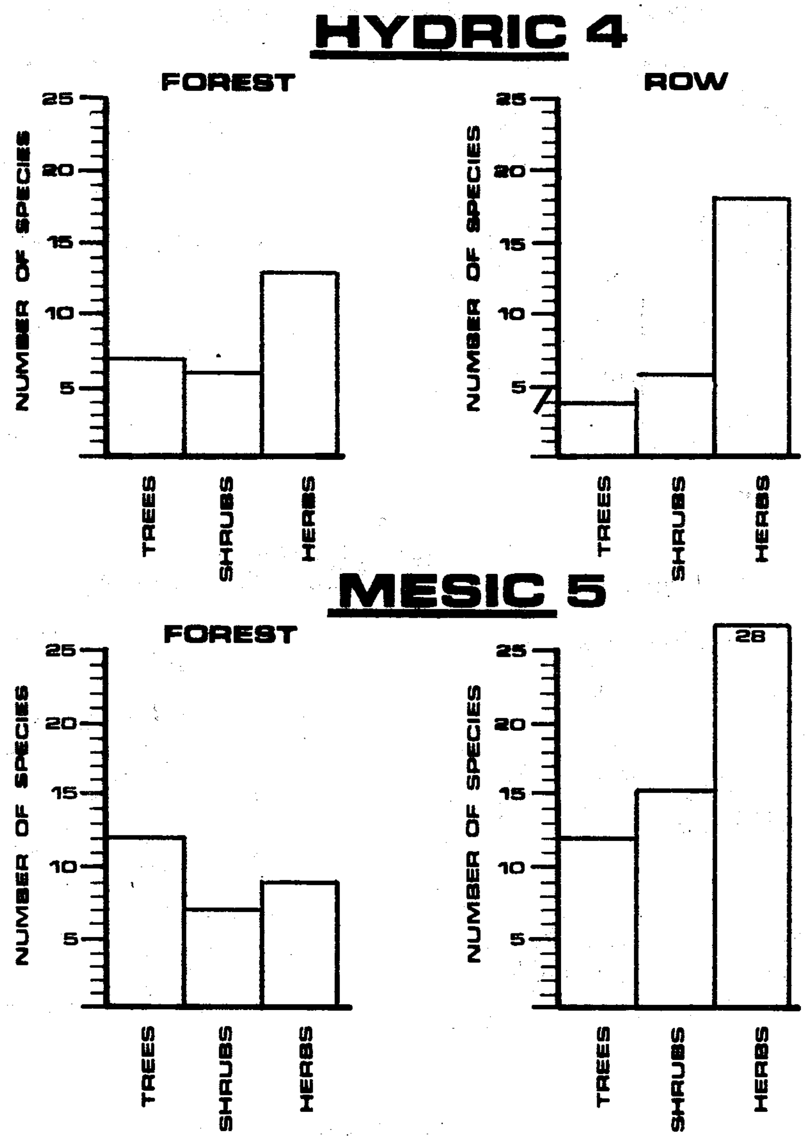


Fig. 5.3a. Species diversity in the forest and on the ROW.

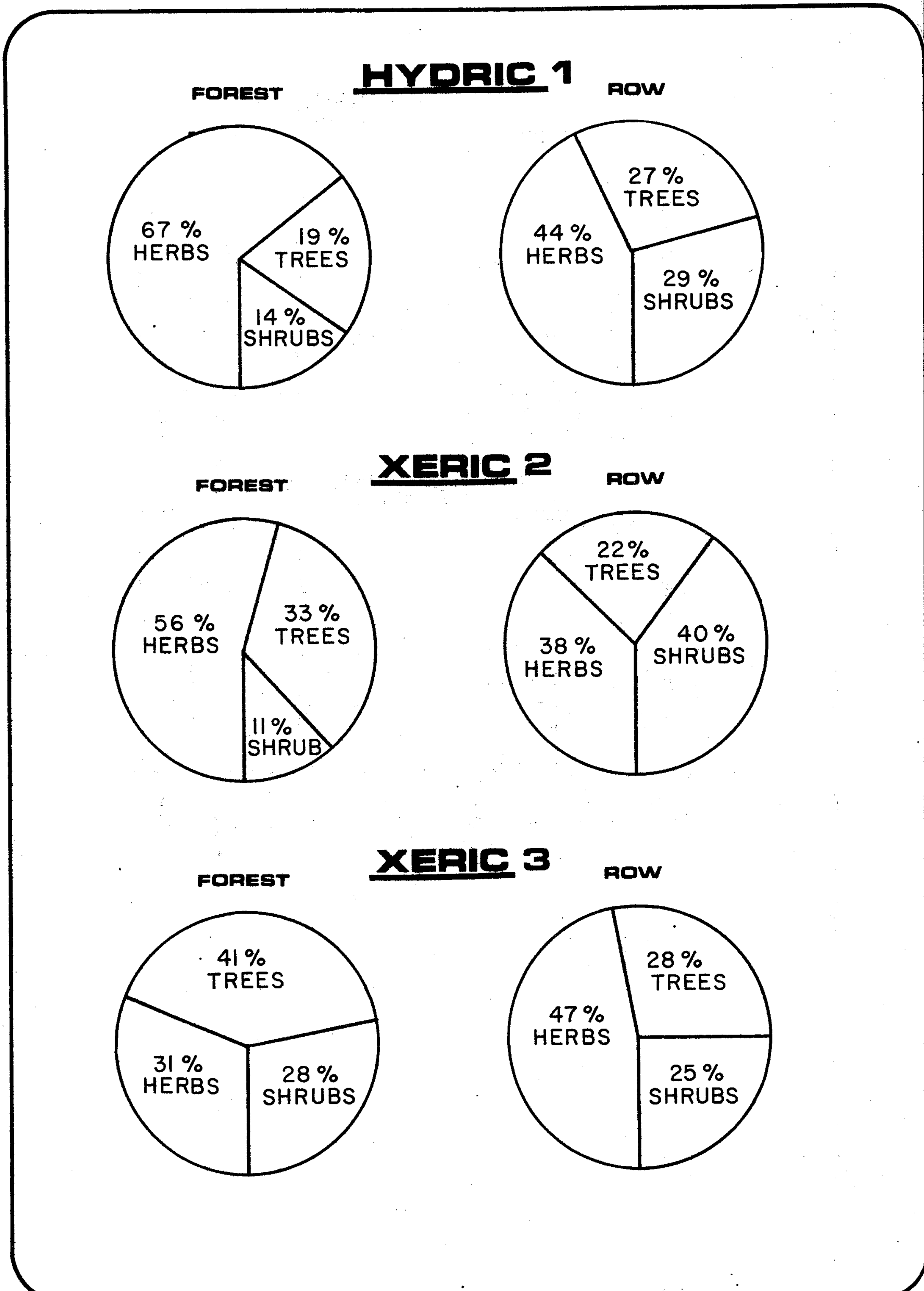


Fig. 5.4. Life form spectrum of the ROW as compared to the adjacent forest to compare species make-up of each, based on the number of species in each life form expressed as a percent of total species.

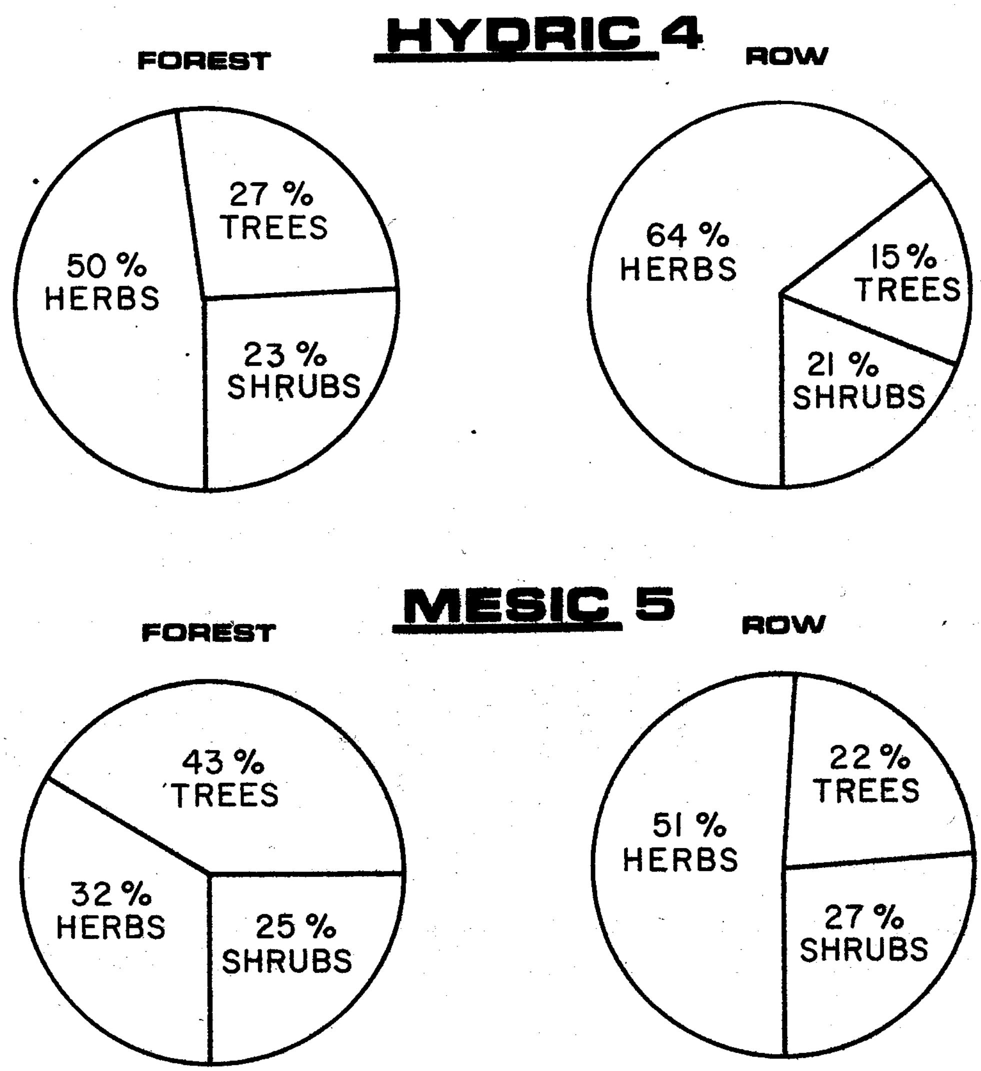


Fig. 5.4a. **Life form spectrum of the ROW as compared to the adjacent forest to compare species make-up of each, based on the number of species in each life form expressed as a percent** of total species.

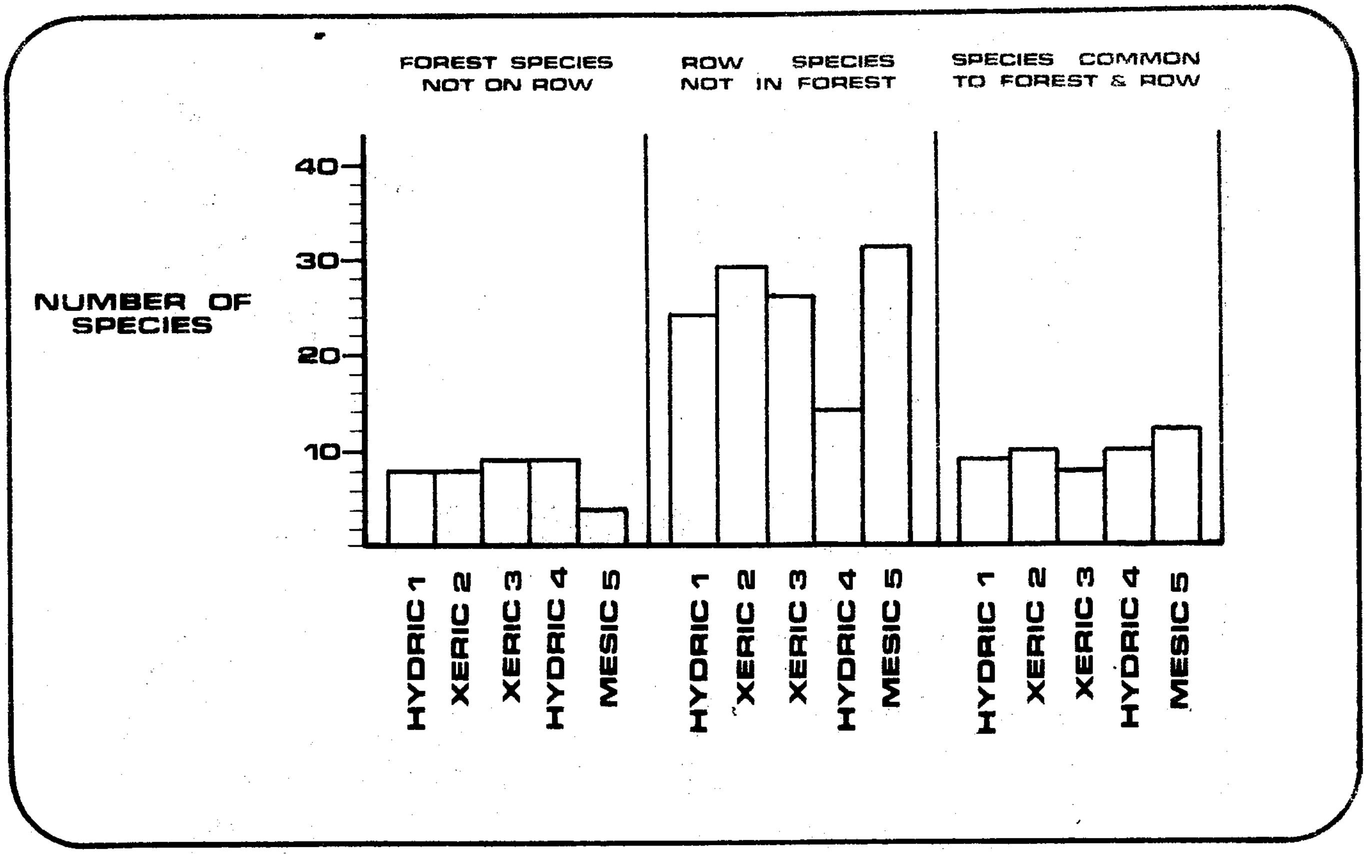
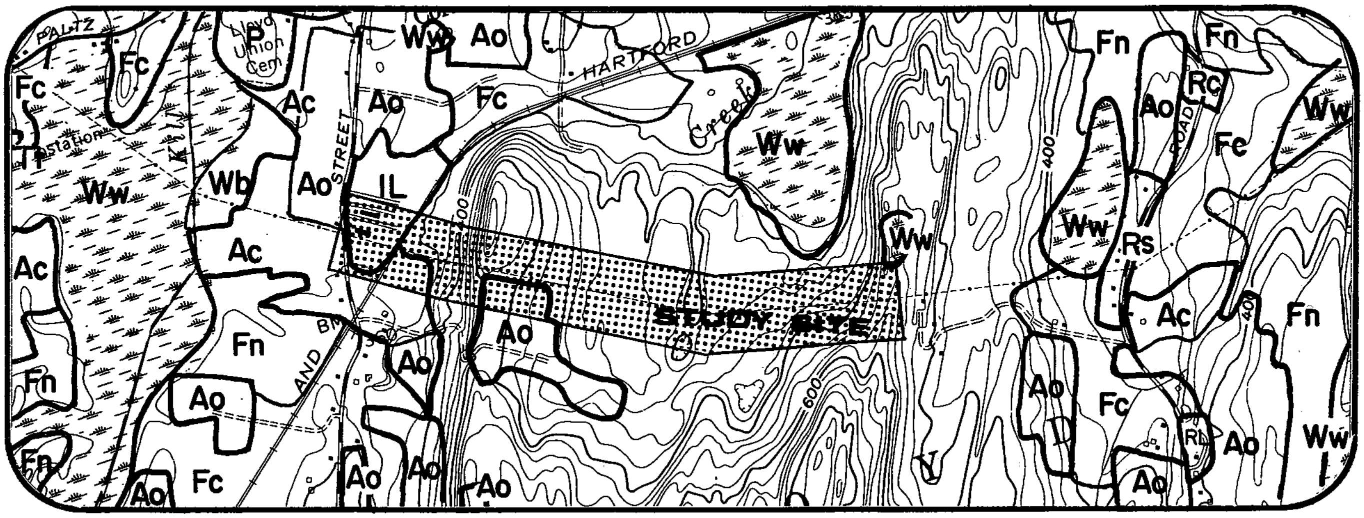
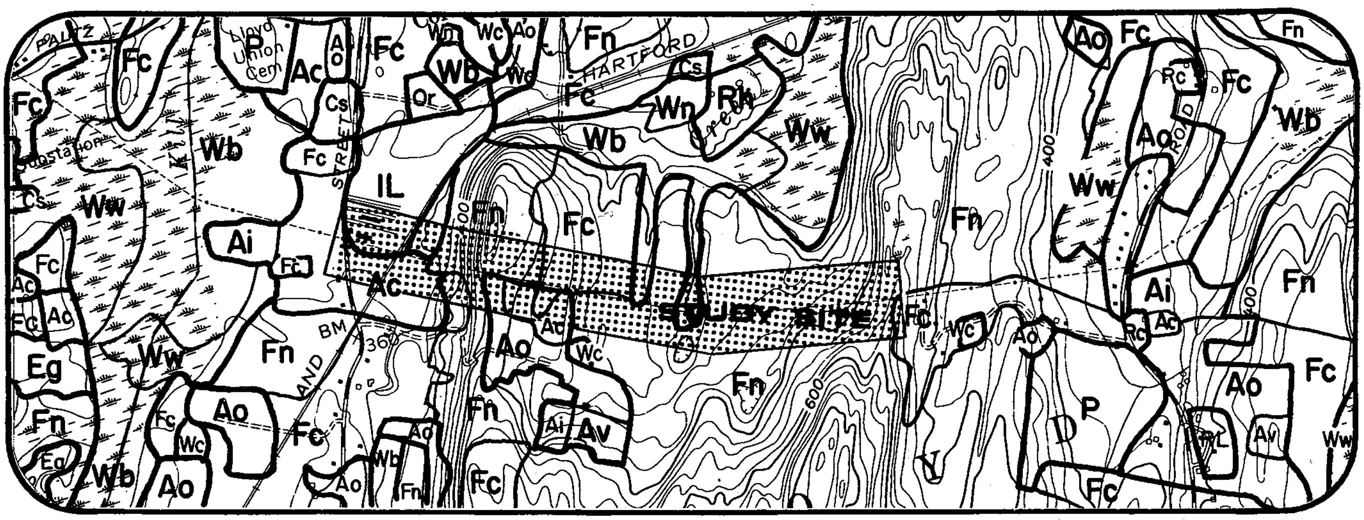


Fig. 5.5. Comparison of shrub and herb species in the forest and on the ROW.



1957 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

AGRICULTURE
- Ao - Orchards
- Ac - Croplands and cropland pasture
- Ai - Inactive agricultural land
- Av - Vineyards

COMMERCIAL AND INDUSTRIAL LAND USES
- Cs - Commercial strip development
- I1 - Light manufacturing

EXTRACTIVE INDUSTRY LAND USE
- Eg - Sand and gravel pits

FOREST LAND
- Fc - Forest brushland
- Fn - Fprest lands

OUTDOOR RECREATION LAND USE
- Or - Outdoor recreation

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

RESIDENTIAL LAND USE
- Rc - Farm labor camp
- Rh - High density
- Ri - Low density
- Rs - Strip development

TRANSPORTATION LAND USES
- Tt - Utility

WATER RESOURCES
- Wb- Marshes, shrub wetlands and bogs
- Wn- Natural ponds and lakes
- Ww- Wooded wetlands

SOURCES:
National Cartographic Info. Center, Reston, Va., air photo No.2-09 GS-VDMA, Apr. 22, 1975
Area Land Use Map, LUNR, Cornell University, N.Y., 1974
U. S. G. S. Topographic Map, Clintondale, N.Y., 1957

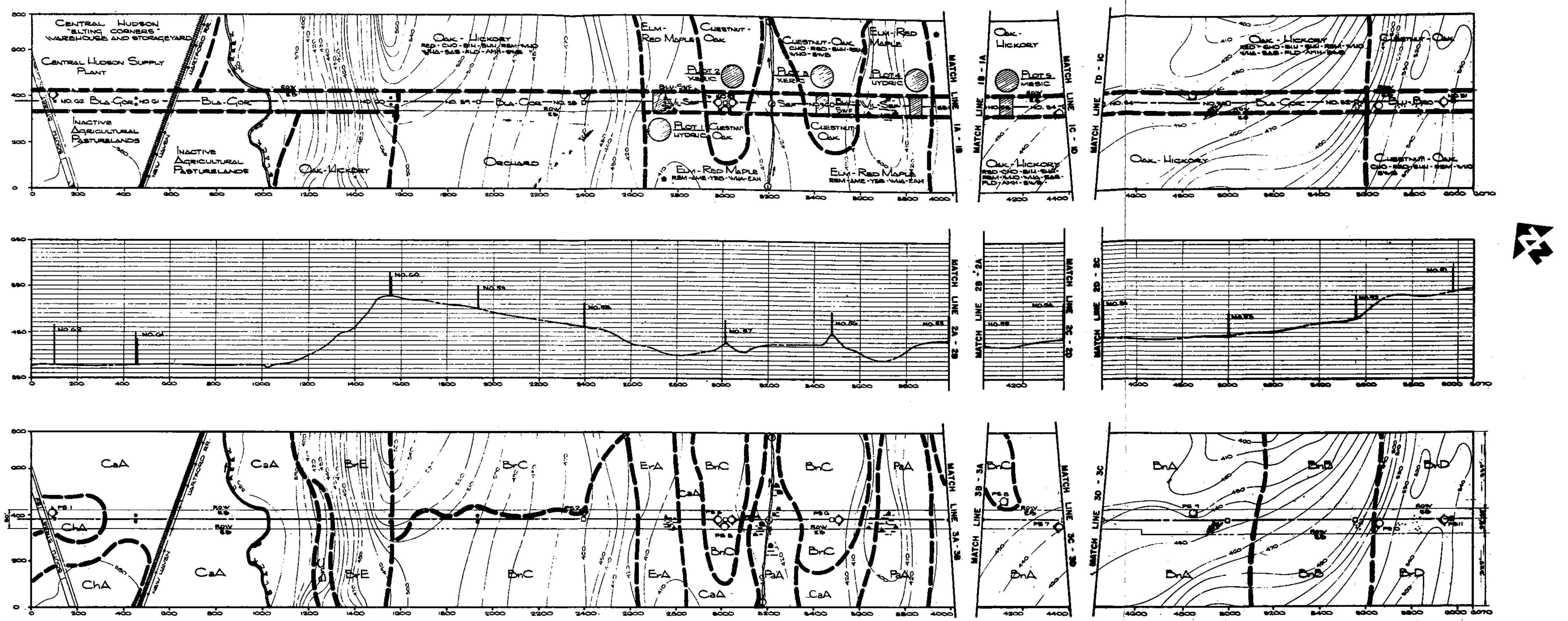
Fig. 5.6. Land use change.

ASPLUNDH ENVIRONMENTAL SERVICES

VEGETATION

CENTERLINE PROFILE

SOILS



Notes: 10' Contour Intervals
Vertical and Horizontal Scale 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.
- 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

- 23 CONTOUR
- DEPRESSION CONTOUR

SOIL SYMBOL AND NAME

ChA	CHENANGO gravelly silt loam (0 to 8% slope)
CaA	CANANDAIGUA silt loam (0 to 8% slope)
BnC	BATH-NASSAU gravelly loam (15 to 25%)
ErA	ERIE very stony loam (0 to 8%)
BrE	BATH-NASSAU ROCK OUTCROP very rocky gravelly loam (35 to 50%)
BnB	BATH-NASSAU gravelly loam (8 to 15%)
PaA	PALMS muck (0 to 8%)
BnA	BATH-NASSAU gravelly loam (0 to 8%)
BrD	BATH-NASSAU ROCK OUTCROP very rocky gravelly loam (25 to 35%)
BrC	BATH-NASSAU ROCK OUTCROP very rocky gravelly loam (15 to 25%)

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

Central Hudson Gas & Electric Corp.-Engineering Plan & Profile 10/29/71

U.S.G.S. 7.5 min Topographic Map, Clintondale N.Y. '57

U.S.D.A. S.C.S. in cooperation with Cornell Univ. Agr. Exp. Sta. Interim Soil Report 3-71

National Cartographic Info. Center, Reston, Va. Air Photo no. 2-09 GS-VDMA (Scale 1:19,000) 4/22/75

Asplundh Environmental Services A.E.S. 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 5.1

SITE 5 HABITAT CONDITIONS

UTILITY: Central Hudson Gas & Electric Corp

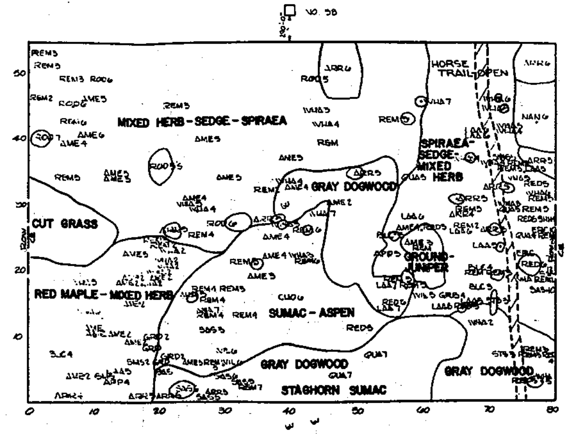
ROW DESCRIPTION: Poughkeepsie to Ohioville 115 KV

Steel Tower & Wood Pole 80'-100' ROW

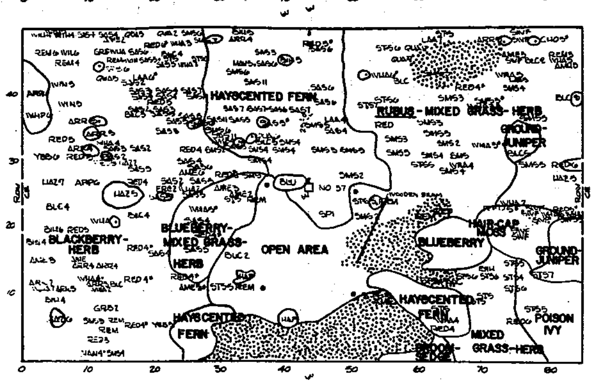
SCALE: 1"=200'-0"

200 100 0 100 200 400 800 1000

PLOT 1 HYDRIC



PLOT 2 XERIC



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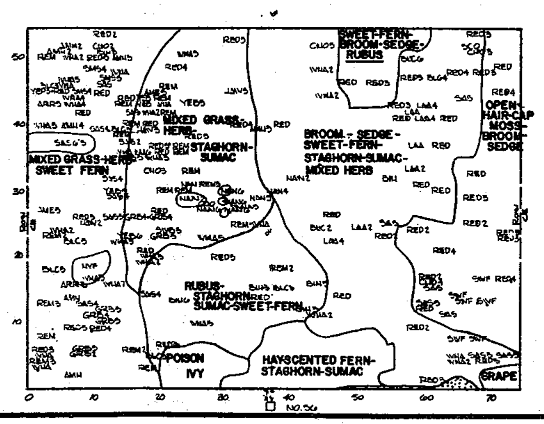

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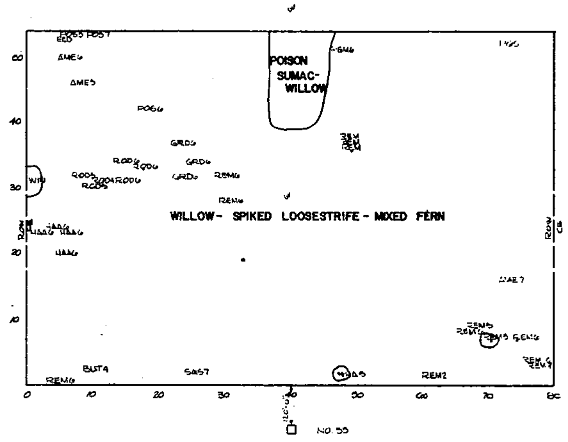

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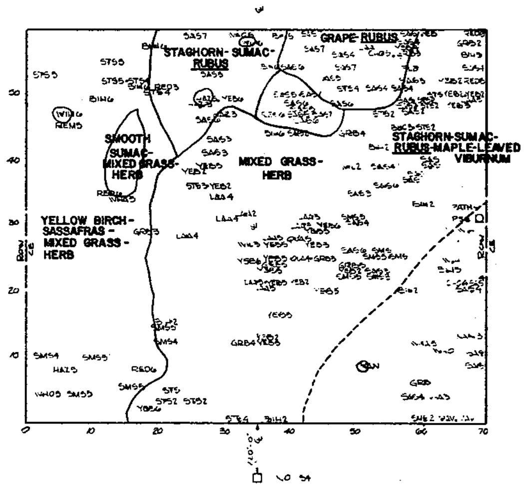

NOTES:
VERTICAL AND HORIZONTAL SCALES ARE IN FEET

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

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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 5.2

SITE 5 MAPPED PLOTS

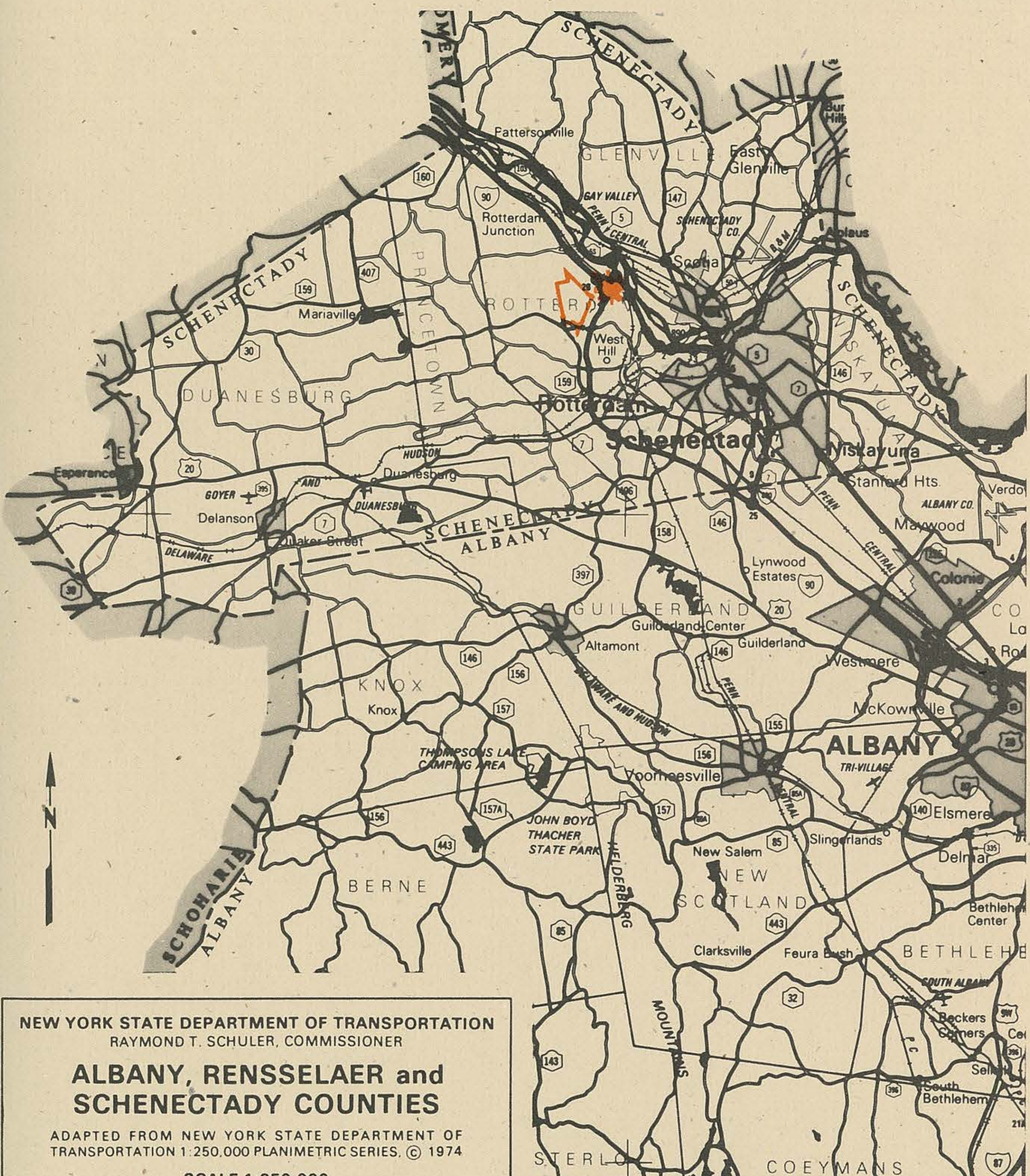
UTILITY: CENTRAL HUDSON GAS & ELEC. CORP.
ROW DESCRIPTION: POUGHKEEPSIE TO OHIOVILLE 115 KV.
WOODEN POLE 'H' FRAME 200' ROW

SCALE: 1" = 10' - 0"

10 5 0 5 10 20 40 50

SITE 6

PORTER to ROTTERDAM



BASE MAP COPYRIGHT 1974 BY NEW YORK STATE DEPARTMENT OF TRANSPORTATION

Site 6 Porter to Rotterdam

Study area extends from the Rotterdam substation to the New York Thruway (structures 687, 712 and 14), at green marker 161/7 before Exit 26. To reach the study area, proceed north on the Thruway (route 90) to Exit 26 and take route 890 South to Rice Road. Take a left on Schermerhorn Road, then the first right off of Schermerhorn Road and follow it to the Rotterdam Substation.

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Site 6 Porter to Rotterdam

1 Introduction

Site 6 is located in the Mohawk Valley physiographic area of New York (Cline, 1970) in the Pine-Oak-Northern Hardwoods forest type area (Stout, 1958). The general landscape of the ROW and adjacent area is shown in Figs. 6.1.1 and 6.1.2.

The land relief is uniformly low and is featured by rolling hills. The area has been modified by stream erosion which has formed long, narrow, bottom lands (Stout, 1958).

The typical forest type of the area is Pine-Oak-Northern Hardwoods (Stout, 1958), but located on the study area are Elm-Red Maple and Oak-Hickory forest types (Society of American Foresters, 1975).

2 Location and Identification

Site 6 is approximately 3 miles east of Rynex Corners in the town of Rotterdam, Schenectady County, New York (74^{o} 00' 00" W. Longitude; 42^{o} 49' 25" N. Latitude).

The site is on the Porter to Rotterdam ROW which is owned and operated by the Niagara Mohawk Power Corporation (NMPC). This 300-foot ROW consists of 2 single circuit, 230 kV lines, each having wood pole H-frame structures, and 1 single circuit, 345 kV line, having steel lattice structures. The project site is approximately 3,200 feet in length, and extends from structures 687A, 712, and 14, west of the New York Thruway (Interstate 90), to the Rotterdam substation.

3 Background

The following discussion outlines documentable management techniques of clearing, construction, restoration, and maintenance for site 6, as received from NMPC (letter dated May 6, 1976, from Kenneth Finch and James Brogan, Niagara Mohawk Power Corporation, Syracuse, N.Y.; and telephone conversation, 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 cleared between 1932 and 1934.

The ROW was then clear cut under contract between May and December, 1959. Brush was mechanically collected with a bulldozer and "rake" piled, and burned. Cost of clearing and brush removal averaged $393.50 per acre.

3.2 Construction

The original 100-foot ROW for the Deerfield to Rotterdam 115 kV line was cleared and constructed in about 1932 to 1934. In about 1947 the ROW was widened to accomodate additional circuits.

Under a clearing contract, the #30 line was constructed on the new ROW, between July, 1959, and November, 1960. While specific information is unavailable, it is assumed that a bulldozer was used to skid the poles from the road crossing to the structure sites. The structures were then framed on the ground, the pole holes dug and/or dynamited, and the structures set. Wherever possible, the pole holes were dug with a backhoe equipped with a special "clam" or hole attachment.

In June, 1960, a separate contractor began rebuilding the parallel Deerfield to Rotterdam 115 kV circuit to carry 230 kV. The existing wood pole H-frame line was adapted to 230 kV by adding pole top extensions, heavier crossarms, 230 kV insulators, and new conductors. While the specific types of equipment used on this project are unknown, it is known that the 115 kV H-frames were dismantled and reassembled for 230 kV "in the air". As a result, a gin pole and/or heavy crane was not needed to raise the structures. This reconstruction phase was completed in October, 1961. No additional cost information is available.

3.3 Restoration

No information is available.

3.4 Maintenance

In 1946, the ROW was hand cut and in 1950 the ROW was hand cut and disked.

In 1956, the ROW was broadcast sprayed with 2,4-Dichlorophenoxyacetic acid (2,4-D) and 2,4,5-Trichlorophenoxyacetic acid (2,4,5-T).

In 1959, the ROW was broadcast sprayed with 2,4,5-T.

The ROW was treated with a broadcast ground foliar spray of Tordon 101 in 1965.

In 1966, tall ash were cut and in 1974 the ROW was sprayed by helicopter with Tordon 101.

No cost information is available.

4 General Reconnaissance

A general reconnaissance was made in accordance with the methodology and is set forth in Map 6.1 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 6.1 and described in Appendix 17. Specific reference is made to some of these photo stations throughout the report and illustrated on photos in Fig. 6.1. With the execption 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. The site is, in general, adjacent to forest land on either side. Generally, the site does not support flowering shrubs, and along the length of the access road and at a stream near the substation, erosion has occurred. This access road erosion, however, is not generally visible from off the ROW. Features within the area which may make the ROW somewhat sensitive to view, include its proximity to the New York Thruway (Interstate 90) immediately to the west, which the ROW also crosses. The ROW site is located near Schenectady and is highly visible from the Thruway. Providing space for 3 lines, the ROW is quite wide and is located on a broad hill or series of hills overlooking Interstate 90. The potential number of people viewing the ROW site is high, due to its proximity and clear view from Interstate 90.

5 Field Studies - Results and Discussion

5.1 Soils

5.1.1 Geology and Soils

Site 6, Porter to Rotterdam ROW, is located in Schenectady County in the Mohawk Valley (Cline, 1970), termed the Mohawk Valley subdivision of the Hudson-Mohawk Lowland region by Thompson (1966), in the Mohawk River drainage basin. Bedrock geology is of the Ordovician age, 500 to 435 million years ago, consisting predominatly of shale and sandstone in the upper part, and limestone and dolostone in the lower. Surficial geology is glacial drift, largely glacial till deposited directly by the ice sheet (Broughton et al., 1973).

Most soils on this site are classified in the order Inceptisols, suborder Ochrepts (Arnot, Lordstown, and Nassau series), reflecting the absence of horizons of marked accumulation of clay, and iron and aluminum oxides. One soil, Hornell, is in the suborder Aquepts, as it has characteristics associated with wetness. Brockport soils are in the order Alfisols, suborder Aqualfs, indicating the presence of gray to brown surface horizons, medium to high base status, and an illuvial horizon in which silicate clays have accumulated (Soil Survey Staff, 1975; Buckman and Brady, 1969). The site is located in the area occupied by the Camroden-Marcy association, on the borad, smoothly sloping hills of the Mohawk River Valley (Cline, 1970). Brief discriptions (personal communication, January 26, 1976, with Mac Wilson, Soil Conservation Service, Schenectady, New York; Anon., 1972) of soil types occurring on the ROW study site (Map 6.1; Table 6.1) are:

Arnot channery silt loam (ArB and ArC): These soils developed in thin, medium textured glacial till; they occupy gently sloping to steep bedrock-controlled landforms. Drainage is good to moderately good, and depth to the seasonal water table is over 24 inches. Bedrock lies at a depth of from 10 to 20 inches, and at an average depth of 17 inches in this county. Soil reaction is strongly acid, ranging from pH 4.5 to pH 5.5 throughout a typical profile; in the surface mineral soil on this site it was pH 4.8. Arnot channery silt loam is assigned to Woodland Suitability Group 4d1, where slopes range from 8 to 15%, designating moderate productivity for timber (Class 4) and restricted rooting depth causing a limitation to woodland use or management (Subclass d). Where slopes range between 15 and 25%, the high stone content on the surface may cause additional management limitations and restrictions; they are assigned to Woodland Suitability Group 4x1.

Brockport silty clay loam (BrA and BrB): Brockport soils formed in fine textured glacial till, on nearly level to gently sloping upland areas.

These soils are somewhat poorly drained; a mottled slowly permeable subsoil layer of clay occurs from 9 to 27 inches. Bedrock is generally present at 27 inches. The depth to the seasonal water table varies from approximately 6 to 18 inches. These soils are generally medium to slightly acid, and may range in reaction from pH 6.0 to pH 7.5 throughout a complete profile; in the surface 3 inches on this site, soil reaction was pH 6.3. Brockport soils are in Woodland Suitability Group 3w1, designating moderately high productivity for timber, with excessive wetness caused by restricted drainage and a seasonally high water table limiting woodland use or management.

Disturbed (DiA): This is a miscellaneous land type, not a soil series, and designates soil that has been so disturbed by man, that it cannot be classified according to any particular soil series or type. On this site apparent grading activities in the vicinity of Interstate 90 have rendered such a designation applicable.

Hornell silt loam (HoA): These soils formed in a thin mantle of glacial till, on gently sloping to steep glaciated landforms of the uplands. They are somewhat poorly drained to moderately well drained, with mottling occurring in the silty clay loam subsoil from about 7 to 10 inches. The seasonal water table is at a depth of from 12 to 18 inches, and bedrock is present at about 38 inches. Soil reaction is normally strongly acid, and ranges from pH 4.5 to pH 5.5 throughout a typical profile; it was pH 5.4 in the surface horizon on this site. Hornell soils are in Woodland Suitability Group 3w1, indicating moderately high productivity and excessive wetness.

Lordstown channery silt loam (LnA): This soil developed in medium textured glacial till derived from sandstone, siltstone, and shale, and occupies gently sloping to very steep uplands. It is well drained, and depth to bedrock generally extends below 30 inches. It is a strongly acid soil, and throughout a typical profile varies from pH 4.5 to pH 5.5; it was pH 5.2 in the upper mineral horizon on this site. Lordstown is assigned to Woodland Suitability Group 3o1, which is moderately high for woodland production with no significant management limitations.

Nassau shaly silt loam (NaA): Nassau soils developed in a thin mantle of glacial till, and occupy undulating to steep bedrock-controlled glacially modified upland landforms. These soils are well drained to somewhat excessively drained, and hard shale and bedrock occur at a depth of about 16 inches. They are generally strongly acid, ranging from pH 4.5 to pH 5.5 throughout a typical profile; soil reaction was pH 4.8 in the surface 3 inches on this site. Nassau is in Woodland Suitability Group 4d1, designating moderate productivity and restricted rooting depth.

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 upland locations. Average thickness of the organic layers and A1 horizon was based on 5 samples taken at each location (Table 6.2). 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; thus, similar measurements were not made on the hydric site. No evidence of plowing, grazing, or recent fires was observed.

On the 2 mesic sites, the litter layer and A1 horizon were present, but there was only a trace of fermentation and/or humus. In general, the A1 horizon, though present at all locations, was thicker in the forest than on the ROW. Based on the presence of the litter layers and incorporation of decomposed organic matter in the mineral soil (A1 horizon), the predominant humus type in the woodland and ROW of mesic sites was designated a "shallow medium mull". Earthworm activity in these soils was likely responsible for more rapid breakdown and incorporation of organic matter, thus resulting in the mull humus type.

On the 2 xeric sites, organic layers on the ROW were generally similar to those in the woodland. Only on the ROW of xeric 3 was the humus layer absent, and it was thickest in the woodland of xeric 4. In all instances, the A1 horizon was thicker in the woodland than on the ROW. Again, based on the 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 "thin duff mull with shallow A1" on the adjacent woodland.

Based on these limited observations, it appears that ROW construction and periodic maintenance for brush control did alter the thickness of surface organic layers of the soil. In general, the humus, where present, and litter layers were thicker in the forest than on the ROW. Also, in all cases, the A1 horizon was thicker in the woodland than on the ROW.

With regard to both mesic and xeric sites, organic layers in the forest were composed primarily of tree parts (leaves, needles, twigs, and fruit) in contrast to the leaves and stems of grasses, herbs, and shrubs on the ROW. Also, regrowth and persistence of a mixed grass-herb-shrub cover on the ROW has resulted in annual litter depositions and continuation of a protective organic mulch.

5.1.3 Soil Erosion

Current Active Erosion Observations of active soil erosion on the ROW and adjacent woodland were made on the Porter to Rotterdam study area in July, 1976. Little 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 of the forest floor. In one area of the forest, however, moderate sheet and rill erosion had occurred on a 25% slope and sediment appeared to be moving down slope into a stream below.

Although not extensive, some 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 surface soil. Severe sheet, rill, and gully erosion was observed on the general ROW on a 12% slope in Arnot channery silt loam, the same soil type in which erosion was noted in the forest. In addition, severe gully erosion was occurring on a 14% slope of the general ROW, below tower 10, in Brockport silty clay loam. Overall, however, good vegetation cover, composed of grasses, herbs, and low shrubs, had developed on the general ROW following maintenance activities and a protective mulch was present on the soil surface (Table 6.2).

On the ROW, eroding areas were identified as to location, soil type, average slope, and present plant cover (Table 6.3). Erosion was classified as to kind (sheet, rill, gully) and class (slight, moderate, severe); average depth of gullies was recorded and locations of the major gullies were plotted on the site habitat conditions map (Map 6.1). Most 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 tower sites (Table 6.3; Figs. 6.1.3 and 6.1.4). Some eroded areas appeared to be related to construction or maintenance of access roads, i.e., graded areas, a culvert at an access road where a stream crosses, and an equipment cut (Table 6.3).

A portion of the 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. However, a great deal of sediment does appear to leave the ROW via a stream flowing near the substation. Sediment from the stream banks, from the general ROW, and from severe gully erosion along the access road (Fig. 6.1.3) enters the stream. In 1 location, where a large culvert was installed at the access road to accommodate stream flow, the road had collapsed away from the culvert to a depth of over 36 inches, to the level of the stream bottom.

It should be noted that vehicles other than those related to utility personnel were observed on the ROW during visits to the site. These included trail bikes and a 4-wheel-drive pickup. The latter was observed driving across the stream near the culvert and down the length of the ROW.

From the information available, it is probable that no restoration in the form of seeding and planting was performed following construction of this ROW, and indeed natural plant invasion has apparently covered most denuded areas. Some grass and herb cover has developed on access roads; however, severe progressive gully erosion and recent use by vehicles resulting in rutting and thus providing runoff channels and subsequent erosion are evident on some segments of the road. This progressive erosion along the access road apparently prevents natural plant invasion, since these areas generally were devoid of plant cover. The areas immediately beneath several tower structures were also generally bare, although erosion was slight. There were no areas of mass land movement such as landslides observed on this site.

5.2 Vegetation

5.2.1 Habitat and Forest Types on the Site

<u>Hydric Habitat</u> The hydric, or wet, site was located in a stream bottom. Slope was negligible and aspect was flat. Drainage was impeded and a Willow-Sensitive Fern plant community developed on the ROW. The forest type was Elm-Red Maple.

<u>Mesic Habitat</u> There were 2 mesic, or medium moist, locations on the ROW. Mesic 2 habitat was located on the side of a gently rolling hill. Slope was approximately 6% on a west-facing slope. Drainage was good to excellent. The forest type was Oak-Hickory. Mesic 5 habitat was located on the crest of a

gently rolling hill. Slope was approximately 3% on an east-facing slope. Drainage was good to excellent. The forest type was Oak-Hickory.

Xeric Habitat There were 2 xeric, or dry, locations on the ROW. Xeric 3 habitat was located on the top of a long flat hill. Slope was negligible and aspect was flat. Drainage was excellent except where small inclusions of poorly drained soil occurred, and a Blueberry-Sweet-fern plant community developed on the ROW. The forest type was Oak-Hickory. Xeric 4 habitat was located on the top of a long flat hill. Slope was negligible and aspect was flat. Drainage was excellent, except where small inclusions of poorly drained soil occurred, and a Blueberry-Sweet-fern plant community developed on the ROW. The forest type was Oak-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 which were not removed by maintenance spraying, or which have arisen since the last spray application (Fig. 6.2), and a herb layer.

In order to more completely characterize the forest types, an analysis was made on the forest plots to derive importance values for the tree species there (Table 6.4).

On the hydric habitat, an Elm-Red Maple forest type was changed to a Willow-Sensitive Fern plant community with teasel prominent. On the mesic habitats, an Oak-Hickory forest type was changed to a Blackberry-Goldenrod plant community. On the xeric habitats, an Oak-Hickory forest type was changed to a Blueberry-Sweet-fern plant community.

Quantitative Changes There was a slight increase in the number of shrubs and a large increase in the number of herbs on the ROW as compared to the adjacent forest on the hydric habitat (Table 6.5; Figs. 6.3 and 6.4).

There was a slight increase in the number of shrubs and a relatively large increase in the number of herbs on the ROW as compared to the forest on mesic 2 habitat. Mesic 5 habitat had a marked increase in the number of shrubs and a large increase in the number of herbs on the ROW as compared to the forest (Table 6.5; Figs. 6.3 and 6.4).

There was a major increase in the number of shrub and herb species on the ROW as compared to the forest on xeric 3 and 4 habitats (Table 6.5; Figs. 6.3 and 6.4).

Qualitative Changes On hydric 1 habitat, 2 shrub and herb species occurred both in the forest and on the ROW (Fig. 6.5), while 5 shrub and 7 herbs appeared in the forest but were absent from the ROW (Table 6.6). On the other hand, 6 shrubs and 15 herbs occurred on the ROW but not in the forest (Table 6.7).

On mesic 2 habitat, 5 shrub and herb species occurred both in the forest and on the ROW (Fig. 6.5), while 4 shrubs and 11 herbs appeared in the forest but were absent from the ROW (Table 6.6). On the other hand, 4 shrubs and 13 herbs occurred on the ROW but not in the forest (Table 6.7).

On mesic 5 habitat, 7 shrub and herb species occurred both in the forest and on the ROW (Fig. 6.5), while 5 shrubs and 7 herbs appeared in the forest but were absent from the ROW (Table 6.6). On the other hand, 8 shrubs and 17 herbs occurred on the ROW but not in the forest (Table 6.7).

On xeric 3 habitat, 5 shrub and herb species occurred both in the forest and on the ROW (Fig. 6.5), while 3 shrubs and 7 herbs appeared in the forest but were absent from the ROW (Table 6.6). On the other hand, 12 shrubs and 18 herbs occurred on the ROW but not in the forest (Table 6.7).

On xeric 4 habitat, 6 shrub and herb species occurred both in the forest and on the ROW (Fig. 6.5), while 3 shrubs and 8 herbs appeared in the forest but were absent from the ROW (Table 6.6). On the other hand, 9 shrubs and 20 herbs occurred on the ROW but not in the forest (Table 6.7).

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

Table 6.8 presents a breakdown of major vegetational communities (Map 6.2) for hydric, mesic, and xeric plots on the Porter to Rotterdam ROW. Much of the present composition of herbaceous and woody plant communities reflects the maintenance history. The ROW was hand cut in 1946 and again in 1950. In 1956 it received a herbicide treatment with 2,4,-D and 3,4,5-T. It was treated again in 1959 with 2,4,5-T. In 1965, it received a ground foliar application of Tordon 101, and a helicopter spray in 1974 with Tordon 101.

The dominant plant community on the mesic and xeric plots on this ROW is Mixed Grass-Herb, while the major plant community occupying the hydric plot is Sensitive Fern-Mixed Herb. Cat-tail and teasel were prominent on the hydric area while gray dogwood and hair-cap moss were important components of the mesic and xeric areas. There is also a large amount of white pine and white ash regeneration on the ROW (Table 6.8).

Most of the previously mentioned species are selectively resistant to herbicides and may be expected to play a major role in the continued vegetational makeup of this ROW.

5.2.4 Comparison of Forest Type with ROW Vegetation

The original ROW was cleared in about 1932 to 1934 for the Deerfield-Rotterdam 115 kV line. The original clearing was 100 feet in width. The ROW was later widened to accommodate additional circuits. This was done in approximately 1947. The Porter to Rotterdam 230 kV line was cleared in 1959 and an additional 100 feet was clear cut at that time. Since 1956, the ROW has been under chemical maintenance as stated in section 3 (Background).

The general impact of the clearing and maintenance techniques on this ROW was to change the forest types (Oak-Hickory and Elm-Red Maple) to shrub-herb-grass communities. Some shrub 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 no significant change in the numbers of shrubs on the ROW as compared to the forest. However, a notable increase did occur in the herb layer on the ROW as compared to the forest. A qualitative difference in the shrub and herb species also occurred. This is evidenced by the presence of cat-tail and sensitive fern on the ROW and their absence from the interior adjacent forest (Table 6.5).

On the mesic habitats, which were formerly occupied by an Oak-Hickory forest type, a Blackberry-Goldenrod community was produced. There was a marked increase in the 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 with some shrubs of the ROW lacking or sparse in the forest. The same was true for herbs (Table 6.5).

On the xeric habitat, which was formerly occupied by an Oak-Hickory forest type, a Blueberry-Sweet-fern community was produced. There was a significant increase in the number of shrub and herb species 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 (Table 6.5).

5.3 Wildlife

The major game species for site 6, Porter to Rotterdam, as determined by Asplundh Environmental Services (AES) in conjunction with the New York State Department of Environmental Conservation (DEC), are cottontail rabbit, gray squirrel, and woodcock.

5.3.1 Actual Use

Cottontail Rabbit Cottontail rabbit tracks, pellets, and browse were heavy throughout the ROW during the winter of 1976 as indicated by their presence in heavy snow.

One rabbit was seen running near the substation during the spring of 1976. Rabbit grawings were heavy on xeric plot 3 on the ROW during this period of time. American hornbeam and apple were the main species that were gnawed by rabbits. A small amount of rabbit fur was observed on the ROW near structure 690.

Gray Squirrel Gray Squirrel activity was slight on and around the study area during the length of the observations. One squirrel leaf nest was observed in the woods to the north of the ROW during the spring of 1976.

Woodcock On March 21, 1976, from 6:00 p.m. to 7:00 p.m., woodcock singing ground surveys were conducted on study area 6. The weather was cloudy with a wind speed of approximately 15-20 mph. The temperature was approximately 50 F.

Observations were made from 6:00 p.m. to 7:15 p.m. No peenting was heard on the site toward the New York Thruway. One bird was located at the end of the survey, near the substation, peenting on the ROW. The location of the singing ground was recorded.

On April 19, 1976, from 6:30 p.m. to 7:10 p.m., woodcock singing ground surveys were again conducted on study area 6. The weather was clear, at 75 F with winds of from 15 to 20 mph.

Two woodcock were observed flying across the south side of the ROW, near plot 5, into the south woods. One bird was located near the substation, peenting on the ROW, utilizing the same singing ground as noted on March 31, 1976.

Miscellaneous Wildlife Observations Various birds were seen and/or heard on the study area throughout the period of this study. Birds observed or heard on the ROW or the ROW edge are included in Table 6.9.

White-tailed deer tracks were moderately abundant in the wet area along the stream on the ROW during the summer of 1975. Deer browse was heavy throughout the study area during this time. Deer beds were found to be sparse on the ROW in a grass community west of structure 692. During the fall of 1975, deer tracks and pellets were found in moderate abundance on the ROW. During the winter of 1976, deer browse appeared to be moderate throughout the ROW. During the spring of 1976, deer tracks were moderate along the access road.

During the spring of 1976, raccoon tracks (Fig. 6.1.5) were moderate on the ROW near the stream on plot 1. Raccoon tracks were slight off the ROW in the north woods near the stream. One green snake and 1 meadow mouse were seen at this time. One active woodchuck burrow (Fig. 6.1.6) was also observed on the ROW at this time. Spring peeper activity was moderate off the ROW.

5.3.2 Potential Use

Potential wildlife use of the plant species present on site 6 for the 3 major game species, rabbit, squirrel, and raccoon, is contained in Table 6.10 (Martin et al., 1951).

5.4 Water

An intermittent stream on the Porter to Rotterdam site was sampled for water quality on October 2, 1975, and January 26, May 12, and August 4, 1976 (Table 6.11, Map 6.1).

5.4.1 Stream Description and Sampling Locations

The stream originates southeast of the study area and flows north. On the ROW, the stream is first order and the gradient is 2%. Downstream of the ROW, the stream descends into the Mohawk River Valley and enters the Mohawk River via the abandoned Erie Canal.

Sampling locations were sited as follows:

1. Upstream, southeast, of the ROW;
2. on the ROW immediately downstream of the access road;
3. mid ROW;
4. at the downstream, north, edge of the ROW;
5. 100 yards downstream, north, of the ROW (Map 6.1).

Upstream of the ROW several channels are present. The stream is shaded by apple, buckthorn, nannyberry, and American elm; herbs are abundant in the understory. On the ROW, willow, aspen, and dogwood occur in groups and cat-tail, horsetail, sedge, rush, goldenrod, and ferns and grasses are prevalent. Location 2 is not shaded. Locations 3 and 4 are shaded by herbs and shrubs and saplings shade location 4. Downstream of the ROW, the stream is shaded by overstory vegetation in the White Pine-Red Oak-White Ash forest. Red maple, basswood, black cherry, and white ash are typical.

Sediment traps, roots, small logs, and branches, at locations 1 and 5 are similar. In the small pool at location 2, no sediment trap is evident, and at locations 3 and 4, vegetation traps sediment.

Substrate at all locations is gravel and rubble (Environmental Protection Agency, 1973).

South of location 2, vegetation is sparse and the soil is exposed near the stream. On the ROW the stream is utilized by wildlife. A segment of the New York State Thruway is contained in this watershed and the stream receives runoff from the Thruway for most of its length. The New York Department of State "official classification" is Class D, Agricultural and/or Industrial Water Supply.

5.4.2 Analysis of Water Quality

Site 6 was sampled from 8:15 to 9:40 a.m., on October 2, 1975, during rain, and at an air temperature of 16 C (Table 6.11). Stream depth at locations 1 through 5 was 2, 3, 2, 6, and 3 inches, respectively, and stream width was 3.5, 6.0, 1.3, 5.0, and 4.0 feet, respectively. Water temperature was 11.0 C at all locations. Dissolved oxygen concentration and percent saturation ranged from 9.0 to 11.7 ppm and 85 to 109%, respectively. The pH averaged 5.7. Algae was present at locations 1 through 4 and stream vegetation was absent at location 5. Sediment stakes were placed at all locations.

On January 26, 1976, from 3:00 to 4:15 p.m., sampling was conducted during rain (Table 6.11). Air temperature was 4 C and the ground was covered by about 18 inches of snow. Measurements were not taken at location 2 because the stream was frozen solid. Depth at locations 1, 3, 4, and 5 was 4, 4, 7½, and 5 inches, respectively. Water temperature was at or near freezing. The dissolved oxygen concentration and percent saturation ranged from 13.1 to 13.9 ppm and 94 to 97%, respectively. The pH averaged 7.2.

On May 12, 1976, from 2:20 to 3:10 p.m., air temperature was 13 C and it was cloudy (Table 6.11). Stream depth at location 1 through 5 was 4, 3, 4, 5, and 3 inches and width was 3.5, 6.0, 2.2, 5.0, and 4.0 feet, respectively. Water temperature at locations 1 and 2 was 11.2 C, increased to 12.5 C at location 3, and decreased to 12.0 C at locations 4 and 5. Dissolved oxygen concentration and percent saturation ranged from 9.6 to 10.6 ppm and from 91 to 103%, respectively. The pH averaged 7.0. No sediment was found.

On August 4, 1976, from 5:10 to 5:45 p.m., the air temperature was 27 C and it was sunny (Table 6.11). Isolated pools were present and stream depth at locations 1 through 5 was 1, 2¼, 1½, 2½, and 4 inches and width was 1.0, 3.3, 1.0, 2.2, and 4.5 feet, respectively. The highest water temperature, 31.0 C, was measured at location 2. Water temperature ranged from 20.0 C to 22.0 C at locations 1, 3, and 4, and 18.2 C at location 5. Dissolved oxygen concentration and percent saturation at locations 1, 2, 4, and 5 ranged from 8.0 to 9.8 ppm and 95 to 127%, respectively. At location 3 dissolved oxygen concentration was 5.2 ppm and percent saturation was 61%. The pH averaged 6.9. At locations 2 and 3, 1 and 1¼ inches of sediment was measured, respectively. The stream bed at locations 1 and 4 was scoured, and 1½ and 3 inches of substrate were removed, respectively. The sediment stake at location 5 was missing.

5.5 Land Use

5.5.1 Location

Site 6 is located in a rural farm section of the town of Rotterdam, Schenectady County, New York. Between 1960 and 1970 there was a 5.4% increase in population of Schenectady County with a 1970 distribution of 88.9% urban, 10.7% rural nonfarm, and .4% rural farm (U.S. Bureau of the Census, 1972). The closest community is Rynex Corners which is 3 miles to the west.

5.5.2 Land Use Near the Time of Construction

The ROW was constructed during 1940. Data prior to this date was unavailable. The earliest available data obtained from 1941 aerial photography indicates that the location of the ROW and adjacent land to the ROW was primarily rural nonfarm in character (Table 6.12; Fig. 6.6). Land use distribution included the following subtypes:

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

Commercial and Industrial:
- Cs - Commercial strip
- Il - Light manufacturing and industrial parks

Extractive Industry:
- Eg - Sand and gravel pits

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

Residential:
- Rm - Medium density

Transportation:
- Th - Highways
- Tb - Barge canal
- Tt - Utility

5.5.3 Land Use After Construction

Land use of the adjacent area has changed slightly from 1941 data. The land adjacent to the ROW is still rural nonfarm in character (Table 6.12; Fig. 6.6), with a land use distribution that includes the following subtypes:

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

Commercial and Industrial:
- Cs - Commercial strip development
- Il - Light manufacturing and industrial parks

Extractive Industry:
- Eg - Sand and gravel pits

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

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

Residential:
 Rm - Medium density

Transportation:
 Th - Highways
 Tb - Barge canal
 Tt - Communications and utilities

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

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

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

Soils on this area developed in thin glacial till high in dark-shale fragments from local bedrock sources. The general landform is characterized by broad, smooth hills with long, gentle slopes. Xeric sites occupy the smooth hilltops and slopes of distinctly convex form; they are comprised of shallow, excessively drained Nassau shaly silt loam soil, and support an Oak-Hickory forest type of moderate productivity. Arnot, Hornell, and Lordstown silt loams occur on mesic mid-slope positions; they are good to somewhat poorly drained and support the Oak-Hickory forest type of moderately high productivity. Hydric sites occupy lowland flats and gentle concave slopes on somewhat poorly drained Brockport silty clay loam that is rated moderately high for timber production, and on this site supported an Elm-Red Maple forest type.

Predominant humus types in the forest varied with site conditions; a "thin duff mull" was present on xeric sites and "medium mull" on mesic. Mull development on mesic sites likely was due to better moisture availability and more rapid organic matter decomposition and mixing from high earthworn activity; whereas, the drier sites were conducive to slower decomposition and greater accumulation of partially decayed organic material.

Active erosion in the forest was negligible, limited to moderate sheet, rill, and gully erosion on one 25% slope segment of Arnot channery silt loam soil.

It is probable that present soil conditions in the adjacent forest are representative of this site at the time of ROW clearing in the mid-1930's.

6.1.2 Vegetation

Most of this study area was forested prior to corridor establishment in 1932 to 1934. On xeric and some mesic sites stands of the Oak-Hickory type were the forest cover. Some hydric sites supported stands of the Elm-Red Maple type. Most of the hydric area along Interstate 90, however, was active or recently abandoned agricultural land at the time of ROW clearing.

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., cottontail rabbit, gray squirrel, and woodcock, occupied 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 depicting land use near the time of construction of the ROW in 1940 is 1941 aerial photography. The ROW and adjacent land area was rural nonfarm with a land use distribution of agriculture (19.3%), commercial and industrial (.5%), forest land (69.0%), extractive industry (1.4%), public and semi-public (.3%), water resources (1.3%), transportation (6.8%), and residential (1.4%).

6.2 Conditions Which Exist at Present

6.2.1 Soils

Physiographic and soil conditions on the ROW in 1976 were comparable to those previously described in the adjacent forest. Soil-type boundaries generally crossed the ROW and forest on both sides in close relation to slope gradients and form, topographic position, and drainage characteristics. Plant communities occurring on the ROW were associated with soil type: Blueberry-Sweet-fern developed on droughty Nassau soils; Blackberry-Goldenrod on mesic Arnot, Hornell, and Lordstown silt loams; and Willow-Sensitive Fern on the wet Brockport silty clay loam.

Humus types on the ROW, as in the forest, were related to moisture conditions; "medium mulls" occurred on mesic sites and "thin duff mulls" on xeric sites. However, the litter layer and A1 horizon on the ROW were thinner than comparable layers in the forest.

Active erosion was evident on the ROW, some occurring on relatively undisturbed segments with little protective cover, but most extensively on access roads, tower sites, and stream banks. Gullies up to 24 inches deep had occurred at 7 locations on the erosive silt loam and silty clay loam soils. Some sediment resulting from erosion accumulated on lower slopes of the ROW, but significant amounts have entered nearby streams.

6.2.2 Vegetation

Repeated broadcast sprayings with 2,4,-D and 2,4,5-T and more recently with picloram and 2,4-D have reduced the number of plant species, and resulted in a comparatively simple pattern of communities on this study area.

On mesic sites Mixed Grass-Herb communities are the predominant herbaceous cover. Gray dogwood, a common shrub in this locality, is a conspicuous component of these communities. White pine and white ash are also aggressive invaders. Other common woody plants scattered throughout Mixed Grass-Herb communities are red maple, hawthorn, red oak, and quaking aspen.

On xeric sites Mixed Grass-Herb communities are also the predominant cover. Mats of hair-cap moss often form conspicuous parts of these communities. Patches of sweet-fern, blackberry, blueberry, fly-honeysuckle, ground-juniper, and New Jersey tea have also become established on these sites.

Sensitive Fern-Mixed Herb communities dominate the hydric sites. Cattail-Teasel-Mixed Herb communities occur immediately adjacent to the small stream. Elderberry, willow, and wild-rasin, shrubs typical of poorly drained areas, are invading these areas.

6.2.3 Wildlife

Cottontail rabbit, gray squirrel, and woodcock are the major game animals that currently occupy the study area. Indirect observations (tracks, pellets, browse, gnawings, and fur) and direct observations indicated that species' presence on the ROW. A squirrel leaf nest was observed in the adjacent woods; no other squirrel activity was noted. Woodcock were observed utilizing the ROW during the course of spring mating activity. One bird was peenting on the ROW area, and several crossed the ROW to enter the adjacent woods.

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

Approximately a 600-foot segment of an intermittent stream is located on the Porter to Rotterdam ROW. Off the ROW the stream is shaded by overstory vegetation. Upstream several channels are present and downstream of the ROW 1 channel exists. On the ROW 1 channel flows through the wet meadow, and a small tributary enters the stream at mid-ROW. Shading from overstory vegetation is sparse and scattered shrubs and saplings and dense herbs shade the stream, except at location 2. The stream receives runoff from the New York State Thruway for most of its length.

On August 4, 1976, there was a significant increase in water temperature from 20.0 C at location 1 to 31.0 C at location 2. However, isolated pool were present and there was limited downstream effect. Water temperature at locations 3, 4, and 5, was 21.0, 22.0, and 18.2 C. respectively.

Dissolved oxygen concentration and percent saturation were greater than 7.9 ppm and 84%, except at location 3 on August 4, 1976, when they were 5.2 ppm and 61%, respectively.

The pH ranged from 5.7 to 7.7.

Between May 12 and August 4, 1976, movement of substrate and sedimentation occurred.

6.2.5 Land Use

Presently, the adjacent land uses to site 6 have had a minimal change from the 1941 data. The ROW and the adjacent land area is still considered to be rural nonfarm with a distribution of agriculture (16.7%), commercial and industrial (.5%), forest land (67.2%), extractive industry (.1%), public and semi-public (.4%), water resources (1.4%), transportation (12.0%), and residential (1.7%). With reference to the total area involved, shifts in land use are noted as follows:

Agriculture -	-2.6%
Commercial and Industrial -	no change
Forest Land -	-1.8%
Extractive Industry -	-1.3%
Public and Semi-public -	+.1%
Water Resources -	+.1%
Transportation -	+5.2%
Residential -	+.3%

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

6.3 Environmental Effect and Probable Causes

6.3.1 Soils

The major effect of ROW management on soils is expressed in severe and progressive erosion on areas where soils have been disturbed, especially access roads, tower sites, and stream crossings, as well as on some segments of the general ROW. Soils on these areas were bare or had only light plant cover in 1976. Periodic maintenance and vehicular use, including trail bikes and 4-wheel-drive vehicles, of access roads have prevented plant invasion, compacted surface mineral soil, and produced wheel ruts that channel runoff water and subsequently cause accelerated erosion. A related effect is deposition of sediments in the intermittent stream crossing the west end of the study area and a stream flowing near the substation.

Average thickness of organic deposits, especially the litter layer, and A1 horizon also seemed to be altered, being thinner on the ROW than in the forest. Origin of organic materials also varied from predominantly hardwood leaves and pine needles in the forest to leaves and stems of grasses and herbs on the ROW.

6.3.2 Vegetation

The general impact of ROW management was to produce a Blackberry-Goldenrod community on the mesic ROW habitat areas from an Oak-Hickory forest type. On the xeric ROW habitat, a Blueberry-Sweet-fern community was produced from an Oak-Hickory forest type. On the hydric ROW habitat area, a Willow-Sensitive-fern community was developed in the midst of Elm-Red Maple forest types.

The number of species (species diversity) increased on the ROW as compared with the adjacent forest on all habitat areas.

Important differences in kinds of plants were exhibited by the ROW and forest. Such shrubs as blackberry, spiraea, and sumac occurred only on the ROW on the mesic habitat; witch-hazel, gray dogwood, and choke-cherry only on the ROW on the xeric habitat; elderberry, wild-raisin, and willow only on the ROW on the hydric habitat. On the other hand, striped maple, maple-leaved viburnum, teaberry, and arrow-wood occurred only in the forest. Such plants as twisted-stalk, false spikenar, and partridge-berry also occurred only in the forest, while goldenrod, aster, and hawkweed occurred only 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

On August 2, 1976, water temperature was 31.0 C at location 2; the downstream effect was limited, probably the combination of solar radiation, negligible flow, lack of shade, and time of sampling increased water temperature.

Movement of substrate and sediment measured on August 4, 1976, probably resulted from flooding that occurred between May 12 and August 4, 1976. This flooding may have resulted from spring runoff or excessive rains later in the season, or both.

Line Management Factors Shading by overstory vegetation was limited on the ROW.

Lack of vegetation south of location 2 may increase erosion and sedimentation.

Other Influences Use of site 6 by "off-the-road" recreational vehicles increases the possibility of erosion.

Runoff from the New York State Thruway enters the watershed upstream, on, and downstream of the study area.

6.3.5 Land Use

It is not possible to attribute changes in land use within the area inventoried to the presence of the ROW. Changes within the area reflect an increase in residential and transportation uses. This may more likely be a reflection of changing land use characteristics in Schenectady County. The inventory area remains rural nonfarm in character.

Table 6.1. Soil series present on the Porter to Rotterdam study area.

Soil Series	Map Symbol[1]	Drainage Class[2]	Surface Soil pH	Surface Soil Texture	Woodland Suitability Group
Arnot	ArB	G-MG	4.8	channery silt loam	4d1
Arnot	ArC	G-MG	4.8	channery silt loam	4x1
Brockport	BrA	SPD	6.1	silty clay loam	3w1
Brockport	BrB	SPD	6.3	silty clay loam	3w1
Disturbed	DiA	-	-	-	-
Hornell	HoA	SPD-MG	5.4	silt loam	3w1
Lordstown	LnA	G	5.2	channery silt loam	3o1
Nassau	NaA	E	4.8	shaly silt loam	4d1

[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 6.2. Average thickness of oragnic layers and A1 horizon and humus types for mesic and xeric sites on ROW and adjacent woodland of site 6.

Moisture Regime	Location	Layer Thickness (in.) L	F	H	A1	Humus Type
1. Mesic (2)[1]	ROW	.3	.1	0	.1	Very shallow medium mull
	Woodland	.7	0	0	.5	Very shallow medium mull
2. Mesic (5)	ROW	.5	.1	.1	.3	Very shallow medium mull
	Woodland	.6	.1	0	1.5	Very shallow medium mull
All Mesic Plots Combined	ROW	.4	.0	.0	.2	Very shallow medium mull
	Woodland	.7	.1	0	1.0	Very shallow medium mull
3. Xeric (3)	ROW	.3	.1	0	.4	Very shallow medium mull
	Woodland	.9	.1	.2	1.3	Thin duff mull with shallow A1
4. Xeric (4)	ROW	.3	.1	.1	.6	Thin duff mull with very shallow A1
	Woodland	1.1	.2	.6	1.1	Thin duff mull with shallow A1
All Xeric Plots Combined	ROW	.3	.1	.1	.5	Thin duff mull with very shallow A1
	Woodland	1.0	.2	.4	1.2	Thin duff mull with shallow A1

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

Table 6.3. Areas exhibiting active erosion in July, 1976, on the Porter to Rotterdam study area.

				Erosion on Site		
Location	Soil Type	Average Slope (%)	Plant Cover	Kind	Class	Gully Depth (in.)
		ROW				
General ROW	Arnot channery silt loam	12	Bare	Sheet, Rill & Gully	Severe	12-24
General ROW	Brockport silty clay loam	14	Bare-herb	Gully	Severe	5-18
Tower Site	Brockport silty clay loam	4	Bare-horsetail	Sheet	Slight	-
Tower Site	Brockport silty clay loam	0	Bare	Sheet	Slight	-
Access Road	Lordstown channery silt loam	11	Bare	Sheet & Rill	Moderate	-
Access Road	Brockport silty clay loam	14	Bare	Sheet & Gully	Severe	12
Access Road	Arnot channery silt loam	15	Bare	Sheet & Gully	Severe	24
Access Road	Arnot channery silt loam	5	Bare-grass	Sheet & Rill	Moderate	-
Access Road	Arnot channery silt loam	37	Bare-grass	Sheet	Severe	-
Culvert	Lordstown channery silt loam	2	Bare	Sheet	Severe	-

Table 6.3. Continued

Location	Soil Type	Average Slope (%)	Plant Cover	Erosion on Site Kind	Class	Gully Depth (in.)
Bank (graded) near stream	Lordstown channery silt loam	19	Bare	Sheet, Rill & Gully	Severe	4-5
Bank of Stream	Brockport silty clay loam	5	Grass-herb	Sheet	Severe	-
Equipment Cut	Arnot channery silt loam	31	Bare-grass	Sheet	Severe	-

Table 6.4. 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 Oak	24.11	25	49.11
	White Pine	34.73	13	47.73
	Black Cherry	15.44	18	33.44
	American Elm	14.17	13	27.17
	White Oak	9.67	13	22.67
	Basswood	.96	6	6.96
	Apple	.68	6	6.68
	Red Maple	.24	6	6.24
Mesic 2				
North	White Pine	97.63	79	176.63
	Red Maple	.63	11	11.63
	Gray Birch	1.28	5	6.28
	American Elm	.46	5	5.46
South	Red Oak	64.06	43	107.06
	White Oak	11.98	29	40.98
	White Ash	23.48	21	44.48
	Red Maple	.48	7	7.48
Xeric 3	The upper tree layer here is the same as for Xeric 4.			
Xeric 4				
North	Red Oak	54.25	40	94.25
	White Pine	34.30	40	74.30
	White Oak	9.97	9	18.97
	Red Maple	.82	5	5.82
	American Elm	.46	3	3.46
	Pignut Hickory	.20	3	3.20
South	Red Oak	48.57	50	98.57
	White Oak	49.11	43	92.11
	White Pine	2.32	7	9.32
Mesic 5				
North	Red Oak	79.84	58	137.84
	White Oak	9.66	13	22.66
	Pignut Hickory	7.01	10	17.01
	Shagbark-Hickory	2.60	10	12.60
	White Ash	.65	5	5.65
	Red Maple	.12	2	2.12
	White Pine	.12	2	2.12

Table 6.4. Continued

Site	Species	Relative Dominance Basal Area (% of total) 1	Relative Density (% of total) 2	Importance Value 1+2
Mesic 5 South	Hemlock	49.47	32	81.47
	Red Oak	30.09	37	67.09
	White Pine	15.35	10	25.35
	Gray Birch	4.94	16	20.94
	Pignut Hickory	.15	5	5.15

Table 6.5. 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.

	Hydric 1		Mesic 2			Xeric 3[1]	Xeric 4			Mesic 5		
	Forest A.S.	ROW A.S.	Forest(N) A.S. (N)	ROW A.S.	Forest(S) A.S. (S)	ROW A.S.	Forest(N) A.S. (N)	ROW A.S.	Forest(S) A.S. (S)	Forest(N) A.S. (N)	ROW A.S.	Forest(S) A.S. (S)
Tree Layer												
Basswood	++.1	-	-	-	-	-	-	-	-	-	-	-
Red Oak	1.1	-	-	-	1.1	-	3.1	-	2.1	3.1	-	1.1
Apple	++.1	-	-	-	-	-	-	-	-	-	-	-
White Pine	+.1	-	2.1	-	-	-	3.1	-	++.1	++.1	-	+.1
Black Cherry	1.1	-	-	-	-	-	-	-	-	-	-	-
Red Maple	+.1	-	+.1	-	++.1	-	+.1	-	-	++.1	-	-
American Elm	+.1	-	++.1	-	-	-	++.1	-	-	-	-	-
White Oak	+.1	-	-	-	+.1	-	+.1	-	1.1	1.1	-	-
Gray Birch	-	-	++.1	-	-	-	-	-	-	-	-	+.1
White Ash	-	-	-	-	1.1	-	-	-	-	+.1	-	-
Pignut Hickory	-	-	-	-	-	-	++.1	-	-	+.1	-	++.1
Shagbark-Hickory	-	-	-	-	-	-	-	-	-	+.1	-	-
Hemlock	-	-	-	-	-	-	-	-	-	-	-	1.1
No. Species	8	0	4	0	4	0	6	0	3	7	0	5
Shrub Layer												
Striped Maple	++.1	-	-	-	-	-	-	-	-	-	-	-
Buckthorn	2.1	-	-	-	1.1	+.1	-	-	-	-	-	-
Maple-leaved Viburnum	1.1	-	-	-	-	-	+.1	-	-	-	-	++.1
Arrow-wood	2.1	-	-	-	-	-	-	-	-	-	-	-
Virginia Creeper	2.3	-	+.1	-	-	-	-	-	-	-	-	-
Gray Dogwood	-	3.3	2.1	3.3	-	2.3	-	1.2	-	-	2.3	-
Elderberry	-	3.1	-	-	-	-	-	-	-	-	-	-
Wild-raisin	-	2.2	-	-	-	+.3	-	-	-	-	-	-
Willow	-	2.1	-	+.2	-	++.1	-	-	-	-	-	-
Poison Ivy	-	+.3	-	-	-	-	-	-	-	(+.3)	-	-
Raspberry	-	++.1	++.1	1.3	-	+.3	-	1.1	-	-	2.3	-
Witch-Hazel	-	-	2.1	-	+.1	+.1	-	-	-	3.1	-	-

Table 6. 5. Continued

	Hydric 1		Mesic 2			Xeric 3	Xeric 4			Mesic 5		
	Forest A.S.	ROW A.S.	Forest(N) A.S. (N)	ROW A.S.	Forest(S) A.S. (S)	ROW A.S.	Forest(N) A.S. (N)	ROW A.S.	Forest(S) A.S. (S)	Forest(N) A.S. (N)	ROW A.S.	Forest(S) A.S. (S)
Nannyberry	-	-	-	-	1.1	-	-	-	-	-	-	-
Rambler Rose	-	-	-	2.3	-	-	-	-	-	-	1.4	-
New Jersey Tea	-	-	-	+.2	-	+.2	-	1.2	-	-	+.2	-
Blackberry	-	-	-	+.1	-	++.1	-	-	-	-	-	-
Spiraea	-	-	-	-	-	+.3	-	-	-	-	+.2	-
Staghorn-Sumac	-	-	-	-	-	1.1	-	1.1	-	-	2.1	-
Smooth Sumac	-	-	-	-	-	+.2	-	1.1	-	-	-	-
Hawthorn	-	-	-	-	-	+.1	-	-	-	-	-	-
Low Blueberry	-	-	-	-	-	1.4	4.4	2.2	3.4	2.2	+.2	3.4
Choke-Cherry	-	-	-	-	-	-	++.1	-	-	-	-	1.3
Teaberry	-	-	-	-	-	-	-	-	2.2	-	-	-
Sweet-fern	-	-	-	-	-	-	-	1.3	-	-	-	-
Dewberry	-	-	-	-	-	-	-	1.1	-	-	+.1	-
Ground-Juniper	-	-	-	-	-	-	-	1.3	-	-	-	-
Fly-Honeysuckle	-	-	-	-	-	-	-	+.3	-	-	-	-
Purple-flowering Raspberry	-	-	-	-	-	-	-	-	-	-	-	1.1
Climbing Bittersweet	-	-	-	-	-	-	-	-	-	-	2.1	-
No. Species	5	6	4	6	3	13	3	10	2	3	9	4
Trees in the Shrub Layer												
American Hornbeam	2.1	-	-	-	3.1	-	-	-	-	-	-	-
White Ash	3.1	1.1	+.1	-	2.1	2.1	-	1.1	1.1	-	1.1	-
Basswood	+.1	-	-	+.1	-	-	-	-	-	-	-	-
White Pine	-	1.1	-	3.1	1.1	3.1	4.1	3.1	4.1	2.1	3.1	+.1
American Elm	-	+.1	-	-	-	++.1	+.1	-	-	-	-	-
Apple	-	+.1	-	-	-	-	-	++.1	-	-	-	-
Pignut Hickory	-	-	+.1	-	+.1	+.1	+.1	-	-	2.1	+.1	1.1
White Oak	-	-	-	-	2.1	-	2.1	+.1	+.1	2.1	+.1	1.1
Red Maple	-	-	4.1	+.1	3.1	1.1	1.1	1.1	2.1	+.1	1.1	3.1
Red Oak	-	-	-	+.1	2.1	1.1	3.1	1.1	2.1	-	1.1	2.1
Quaking Aspen	-	-	-	+.1	-	+.1	-	-	-	-	-	-
Pin-Cherry	-	-	-	-	-	2.1	-	1.1	-	-	1.1	-

Table 6.5. Continued

	Hydric 1		Mesic 2			Xeric 3	Xeric 4			Mesic 5		
	Forest A.S.	ROW A.S.	Forest(N) A.S.	ROW A.S.	Forest(S) A.S.	ROW A.S.	Forest(N) A.S.	ROW A.S.	Forest(S) A.S.	Forest(N) A.S.	ROW A.S.	Forest(S) A.S.
Serviceberry	-	-	-	-	-	-	++.1	-	+.1	1.1	-	+.1
Pitch-Pine	-	-	-	-	-	-	-	+.1	-	-	-	-
Red Cedar	-	-	-	-	-	-	-	+.1	-	-	-	-
Shagbark-Hickory	-	-	-	-	-	-	-	-	-	2.1	+.1	1.1
Scrub-Oak	-	-	-	-	-	-	-	-	-	++.1	-	-
Hemlock	-	-	-	-	-	-	-	-	-	1.1	-	2.1
Flowering Dogwood	-	-	-	-	-	-	-	-	-	-	-	(+.1)
Gray Birch	-	-	-	-	-	-	-	-	-	-	1.1	-
No. Species	3	4	3	5	7	8	7	9	6	8	9	9
Herb Layer[2]												
Wild Sarsaparilla	2.1	-	4.1	-	+.1	-	2.1	-	1.1	+.1	1.4	4.4
Sensitive Fern	+.2	3.4	-	-	-	-	-	-	-	-	-	-
Dog's-tooth-Violet	4.1	2.3	1.1	-	-	-	-	-	-	-	-	-
Twisted-stalk	+.2	-	-	-	+.1	-	-	-	-	-	-	-
Early Meadow-Rue	++.2	-	-	-	-	-	-	-	-	-	-	-
Marginal Shield-Fern	+.2	-	-	-	-	-	-	-	-	+.2	-	-
Goldenrod	-	3.3	-	3.4	-	2.2	-	1.2	-	-	1.3	-
Sedge	-	2.4	-	1.3	3.2	2.2	-	2.2	1.4	-	+.3	-
Cat-tail	-	2.4	-	-	-	-	-	-	-	-	-	-
Teasel	-	2.3	-	-	-	-	-	-	-	-	-	-
Milkweed	-	2.2	-	-	-	-	-	-	-	-	-	-
Aster	-	2.2	-	3.3	-	1.1	-	1.1	-	-	1.2	-
Boneset	-	2.1	-	-	-	-	-	-	-	-	-	-
Horsetail	-	1.4	-	-	-	-	-	-	-	-	-	-
Mixed Grass	-	1.4	-	4.5	-	4.5	-	4.5	-	1.2	-	-
Spotted Knapweed	-	1.2	-	+.2	-	+.2	-	-	-	-	-	-
Thistle	-	1.1	-	-	-	++.1	-	-	-	-	+.1	-
Interrupted Fern	-	+.2	-	-	-	-	-	-	-	-	-	-
Nightshade	-	+.2	-	-	-	-	-	-	-	-	-	-
False Hellebore	-	1.2	-	-	-	-	-	-	-	-	-	-
Canada Lily	-	++.1	-	+.1	-	-	-	-	-	-	-	-

Table 6.5. Continued

	Hydric 1		Mesic 2			Xeric 3	Xeric 4			Mesic 5		
	Forest A.S.	ROW A.S.	Forest(N) A.S.	ROW A.S.	Forest(S) A.S.	ROW A.S.	Forest(N) A.S.	ROW A.S.	Forest(S) A.S.	Forest(N) A.S.	ROW A.S.	Forest(S) A.S.
Hypnum imponens	-	-	+.2	-	-	-	-	-	-	-	-	-
Common Periwinkle	-	-	+.2	-	-	-	-	-	-	-	-	-
Wild Cranesbill	+.2	-	2.2	1.2	+.2	-	-	(+.2)	-	-	-	-
Strawberry	++.1	-	(++.1)	3.2	-	2.2	-	+.2	-	-	+.2	-
Wild Lily-of-the-valley	-	-	+.2	-	-	2.3	1.1	-	4.1	1.1	-	2.2
Old-field-Cinquefoil	-	-	+.1	-	-	-	-	-	-	+.1	1.1	-
Ox-eye-Daisy	-	-	-	1.1	-	-	-	++.1	-	-	-	-
Bugle-weed	-	-	-	+.2	-	-	-	-	-	-	-	-
Common Ragweed	-	-	-	+.1	-	-	-	-	-	-	3.1	-
St. John's-wort	-	-	-	+.1	-	+.1	-	-	-	-	+.2	-
Heal-all	-	-	-	+.1	-	-	-	-	-	-	-	-
Moth-Mullein	-	-	-	++.1	-	-	-	-	-	-	-	-
Yarrow	-	-	-	++.1	-	1.2	-	+.2	-	-	-	-
Dandelion	-	-	-	+.2	-	++.2	-	-	-	-	-	-
May-apple	-	-	-	-	1.1	-	-	(+.4)	-	1.1	++.1	-
Common Cinquefoil	-	-	-	-	1.2	3.4	-	-	-	-	2.3	-
Spreading Dogbane	-	-	-	-	-	2.4	-	1.2	-	-	1.2	-
Asparagas	-	-	-	-	-	+.1	-	-	-	-	-	-
Common Mullein	-	-	-	-	-	++.2	-	1.2	-	-	-	-
Butter-and-eggs	-	-	-	-	-	2.2	-	1.2	-	-	-	-
Queen Anne's-lace	-	-	-	-	-	+.1	-	-	-	-	+.1	-
Rue-Anemone	-	-	-	-	-	+.2	-	-	++.1	+.1	+.1	-
Solomon's-seal	-	-	-	-	-	++.3	-	-	-	-	-	-
Sheep-Sorrel	-	-	-	-	-	+.2	-	1.2	-	-	-	-
Partridge-berry	-	-	1.2	-	+.3	-	1.2	-	-	-	-	-
Hair-cap Moss	-	-	-	-	-	3.4	2.2	2.4	-	-	3.3	-
Hawkweed	-	-	-	-	-	1.2	-	1.2	-	-	2.1	-
White Moss	-	-	-	-	-	-	1.2	-	+.2	-	-	-
Schreber's Moss	-	-	-	-	-	-	+.2	-	-	-	-	-
Barren Strawberry	++.1	-	-	-	-	-	+.3	-	1.2	1.3	+.3	1.2
Bracken	-	-	-	-	-	-	-	1.3	++.1	-	-	-

Table 6.5. Continued

	Hydric 1		Mesic 2			Xeric 3	Xeric 4			Mesic 5		
	Forest A.S.	ROW A.S.	Forest(N) A.S.	ROW A.S.	Forest(S) A.S.	ROW A.S.	Forest(N) A.S.	ROW A.S.	Forest(S) A.S.	Forest(N) A.S.	ROW A.S.	Forest(S) A.S.
Pearly Everlasting	-	-	-	-	-	-	-	+.2	-	-	-	-
Tearthumb	-	-	-	-	-	-	-	+.3	-	-	-	-
Field Cat's-foot	-	-	-	-	-	-	-	+.2	-	-	-	-
Bastard Toad-flax	-	-	-	-	-	-	-	2.1	-	-	-	-
Violet spp.	-	-	-	-	-	-	-	2.2	-	-	1.2	-
Poverty-Grass	-	-	-	-	-	-	-	3.2	-	-	-	-
Wild Lettuce	-	-	-	-	-	-	-	1.1	-	-	1.3	-
False Spikenard	-	-	++.1	-	-	-	-	-	+.1	-	-	-
Wild-oats	-	-	-	-	-	-	-	-	-	+.1	1.3	-
Roundlobe Hepatica		-	-	-	-	-	-	-	-	+.2	-	-
Carolina Crane's-bill	-	-	-	-	-	-	-	-	-	1.2	-	-
Whorled Loosestrife	-	-	-	-	-	-	-	-	-	-	2.3	-
Pokeweed	-	-	-	-	-	-	-	-	-	-	+.3	-
Everlasting sp.	-	-	-	-	-	-	-	-	-	-	+.3	-
White Baneberry	-	-	-	-	-	-	-	-	-	-	-	+.1
Fringed Polygala	-	-	-	-	-	++.2	+.2	++.2	+.2	-	-	+.3
No. Species	9	17	10	16	7	23	8	24	9	11	23	5
Total No. Species												
Trees	10	4	6	5	7	8	7	9	6	10	9	10
Shrubs	5	6	4	6	3	13	3	10	2	3	9	4
Herbs	9	17	10	16	7	23	8	24	9	11	23	5
Totals	24	27	20	27	17	44	18	43	17	24	41	19

1 No forest plot was established for xeric 3 as the adjacent forest was typical of that for xeric 4.

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

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

Table 6.6. 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	2.3		-
Arrow-wood	2.1		-
Maple-leaved Viburnum	1.1		-
Striped Maple	++.1		-
Buckthorn	2.1		-
Herbs[1]			
Wild Sarsaparilla	2.1		-
Twisted-stalk	+.2		-
Early Meadow-Rue	++.2		-
Marginal Shield-Fern	+.2		-
Wild Cranesbill	+.2		-
Strawberry	++.1		-
Barren Strawberry	++.1		-
No. Species	12		
	Mesic (2)		
	North	South	
Shrubs			
Virginia Creeper	+.1	-	-
Witch-Hazel	2.1	+.1	-
Buckthorn	-	1.1	-
Nannyberry	-	1.1	-
Herbs			
Wild Sarsaparilla	4.1	+.1	-
Dog's-tooth-Violet	1.1	-	-
Twisted-stalk	-	+.1	-
Hypnum imponens	+.2	-	-
Common Periwinkle	+.2	-	-
Wild Lily-of-the-valley	+.2	-	-
Old-field-Cinquefoil	+.1	-	-
May-apple	-	1.1	-
Common Cinquefoil	-	1.2	-
Partridge-berry	1.2	+.3	-
False Spikenard	++.1	-	-
No. Species	10	8	

Table 6.6. Continued

Species	Forest A.S.		ROW A.S.
	Xeric (3)[2]		
	North	South	
Shrubs			
Maple-leaved Viburnum	+.1	-	-
Choke-Cherry	++.1	-	-
Teaberry	-	2.2	-
Herbs			
Wild Sarsaparilla	2.1	1.1	-
Rue-Anemone	-	++.1	-
Partridge-berry	1.2	-	-
White Moss	1.2	+.2	-
Schreber's Moss	+.2	-	-
Barren Strawberry	+.3	1.2	-
False Solomon's-seal	-	+.1	-
No. Species	7	6	
	Xeric (4)		
	North	South	
Shrubs			
Maple-leaved Viburnum	+.1	-	-
Choke-Cherry	++.1	-	-
Teaberry	-	2.2	-
Herbs			
Wild Sarsaparilla	2.1	1.1	-
Wild Lily-of-the-valley	1.1	4.1	-
Rue-Anemone	-	++.1	-
Partridge-berry	1.2	-	-
White Moss	1.2	+.2	-
Schreber's Moss	+.2	-	-
Barren Strawberry	+.3	1.2	-
False Spikenard	-	+.1	-
No. Species	8	7	
	Mesic (5)		
	North	South	
Shrubs			
Maple-leaved Viburnum	-	++.1	-
Poison Ivy	(+.3)	-	-

Table 6.6. Continued

Species	Forest A.S.		ROW A.S.
	North	South	
Witch-Hazel	3.1	-	-
Choke-Cherry	-	1.3	-
Purple-flowering Raspberry	-	1.1	-
Herbs			
Marginal Shield-Fern	+.2	-	-
Mixed Grass	1.2	-	-
Wild Lily-of-the-valley	1.1	2.2	-
Roundlobe Gepatica	+.2	-	-
Carolina Crane's-bill	1.2	-	-
White Baneberry	-	+.1	-
Fringed Polygala	-	+.3	-
No. Species	7	6	

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

2 No woods plot was established as the forest types here and at xeric 4 were the same. For purposes of this table, the xeric 4 woods plot was compared to the xeric 3 ROW plot.

Table 6.7. 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	3.3	-
Elderberry	3.1	-
Wild-raisin	2.2	-
Willow	2.1	-
Poison Ivy	+.3	-
Raspberry	++.1	-
Herbs[1]		
Goldenrod spp.	3.3	-
Sedge	2.4	-
Cat-tail	2.4	-
Teasel	2.3	-
Milkweed	2.2	-
Aster spp.	2.2	-
Boneset	2.1	-
Horsetail	1.4	-
Mixed Grass	1.4	-
Spotted Knapweed	1.2	-
Thistle	1.1	-
Interrupted Fern	+.2	-
Nightshade	+.2	-
False Hellebore	1.2	-
Canada Lily	++.1	-
No. Species	21	
Mesic (2)		
Shrubs		
Willow	+.2	-
Rambler Rose	2.3	-
New Jersey Tea	+.2	-
Blackberry	+.1	-
Herbs		
Mixed Grass	4.5	-
Goldenrod spp.	3.4	-

Table 6.7. Continued

Species	ROW A.S.	Forest A.S.
Aster spp.	3.3	-
Spotted Knapweed	+.2	-
Canada Lily	+.1	-
Ox-eye-Daisy	1.1	-
Bugle-weed	+.2	-
Common Ragweed	+.1	-
St. John's-wort	+.1	-
Heal-all	+.1	-
Moth-Mullein	++.1	-
Yarrow	++.1	-
Dandelion	+.2	-
No. Species	17	
Xeric (3)[2]		
Shrubs		
Buckthorn	+.1	-
Wild-raisin	+.3	-
Willow	++.1	-
Gray Dogwood	2.3	-
Raspberry	+.3	-
Witch-Hazel	+.1	-
New Jersey Tea	+.2	-
Blackberry	++.1	-
Spiraea	+.3	-
Staghorn-Sumac	1.1	-
Smooth Sumac	+.2	-
Hawthorn	+.1	-
Herbs		
Goldenrod spp.	2.2	-
Aster spp.	1.1	-
Mixed Grass	4.5	-
Strawberry	2.2	-
St. John's-wort	+.1	-
Yarrow	1.2	-
Dandelion	++.2	-
Common Cinquefoil	3.4	-
Spreading Dogbane	2.4	-
Asparagas	+.1	-
Common Mullein	++.2	-
Butter-and-eggs	2.2	-
Queen Anne's-lace	+.1	-
Spotted Knapweed	+.2	-
Thistle	++.1	-

Table 6.7. Continued

Species	ROW A.S.	Forest A.S.
Solomon's-seal	++.3	-
Sheep-Sorrel	+.2	-
Hawkweed	1.2	-
No. Species	30	
Xeric (4)		
Shrubs		
Gray Dogwood	1.2	-
Raspberry	1.1	-
New Jersey Tea	1.2	-
Staghorn-Sumac	1.1	-
Smooth Sumac	1.1	-
Sweet-fern	1.3	-
Dewberry	1.1	-
Ground-Juniper	1.3	-
Fly-Honeysuckle	+.3	-
Herbs		
Goldenrod	1.2	-
Aster	1.1	-
Mixed Grass	4.5	-
Wild Cranesbill	(+.2)	-
Strawberry	+.2	-
Ox-eye-Daisy	++.1	-
Yarrow	+.2	-
May-apple	(+.4)	-
Spreading Dogbane	1.2	-
Common Mullein	1.2	-
Butter-and-eggs	1.2	-
Sheep-Sorrel	1.2	-
Hawkweed	1.2	-
Pearly Everlasting	+.2	-
Tearthumb	+.3	-
Field Cat's-foot	+.2	-
Bastard Toad-flax	2.1	-
Violet spp.	2.2	-
Poverty-Grass	3.2	-
Wild Lettuce	1.1	
No. Species	29	
Mesic (5)		
Shrubs		
Gray Dogwood	2.3	-

Table 6.7. Continued

Species	ROW A.S.	Forest A.S.
Raspberry	2.3	-
Rambler Rose	1.4	-
New Jersey Tea	+.2	-
Spiraea	+.2	-
Staghorn-Sumac	2.1	-
Dewberry	+.1	-
Bittersweet	2.1	-
Herbs		
Goldenrod spp.	1.3	-
Sedge	+.3	-
Aster spp.	1.2	-
Thistle	+.1	
Strawberry	+.2	-
Common Ragweed	3.1	-
St. John's-wort	+.2	-
Common Cinquefoil	2.3	-
Spreading Dogbane	1.2	-
Queen Anne's-lace	+.1	-
Hair-cap Moss	3.3	-
Hawkweed	2.1	-
Violet spp.	1.2	-
Wild Lettuce	1.3	-
Whorled Loosestrife	2.3	-
Pokeweed	+.3	-
Everlasting sp.	+.3	-
No. Species	25	

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

[2] No woods plot was established as the forest types here and at xeric 4 were the same. For purposes of this table, the xeric 3 ROW plot was compared to the xeric 4 woods plot.

Table 6.8. Major vegetational types for the Porter to Rotterdam 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)	Xeric (4)	Mesic (5)
	Percent of Total Area				
Sensitive Fern-Mixed Herb	63.7				
Cat-tail-Teasel-Mixed Herb	12.8				
Cat-tail-Mixed Herb	7.8				
Stream	5.0				
Mixed Grass-Herb	3.6	50.5	76.2	1.2	89.1
Horsetail-Teasel	2.9				
Gray Dogwood	2.5	2.1	1.9		1.8
Wild-raisin	1.2		.1		
Willow	.3	.1			
Rock	.1		.7		
Interrupted Fern	.1				
Mixed Grass-Herb-Gray Dogwood		27.4	9.9		
Sedge-Mixed Grass-Herb		6.2			
Mixed Grass-Herb-White Pine		3.2			
Gray Dogwood-Mixed Grass-Herb		4.1			
Rubus		3.5			
Access road (ruts)		1.7	1.9		
White Pine		.8	.8		
New Jersey Tea		.1		1.5	.1
Rubus-Quaking Aspen-Mixed Grass-Herb			3.5		
Cinquefoil-Mixed Grass-Herb			1.7		
White Pine-Rubus-Quaking Aspen-Mixed Grass-Herb			1.2		
Spiraea			.9		.1
Blueberry			.6		
Pin-Cherry			.5		.1
White Ash			.1		
Mixed Grass-Herb-Hair-cap Moss				51.5	
Hair-cap Moss-White Pine-Mixed Grass-Herb				19.6	
Hair-cap Moss-Mixed Grass-Herb				8.6	
Access Road (open)				5.6	3.8
Blackberry-Mixed Grass-Herb				3.0	

Table 6.8. Continued

Community	Site Classification				
	Hydric (1)	Mesic (2)	Xeric (3)	Xerix (4)	Mesic (5)
	Percent of Total Area				
Hair-cap Moss (with dead White Pine seedlings)				2.1	
Fly-Honeysuckle				2.0	
Sweet-fern				1.6	
Bracken-Hair-cap Moss				1.4	
Ground-Juniper				1.0	
Red Oak				.7	
Blackberry		.3		.2	
Mixed Grass-Moss (access road)					2.0
Rose					1.0
Wild Sarsaparilla					.9
Sedge					.8
Log					.2
Everlasting					.1
Total	100.0	100.0	100.0	100.0	100.0

Table 6.9. Birds observed and/or heard on the ROW and on the ROW edge during the study period.

Species	Species
Red-tailed hawk	Cat-bird
Killdeer	Robin
American woodcock	Wood thrush
Mourning dove	Starling
Whip-poor-will	Worm-eating warbler
Downy woodpecker	Yellow throat
Yellow-shafter flicker	Red-winged black bird
Blue jay	American goldfinch
Common crow	Song sparrow
Black-capped chickadee	Rufous-sided towhee
Tufted-titmouse	

Table 6.10. Potential wildlife use of plant species[1] present on the ROW and adjacent forest for the major game species on the Porter to Rotterdam study area.

Species	Wildlife Species		
	Rabbit	Squirrel	Woodcock
<u>Trees</u>			
Red Maple	*	**	
Gray Birch	*		
Black Cherry	*		
Apple	+		
Pin-Cherry	*		
Flowering Dogwood	+	*	
Red Oak	+	****	
White Oak	+	****	
Scrub-Oak	+	****	
Shagbark-Hickory		***	
Pignut Hickory		***	
American Hornbeam		*	
White Pine		*	
Pitch-Pine		*	
American Elm		+	
<u>Shrubs</u>			
Blackberry	**	+	+
Raspberry	**	+	+
Dewberry	**	+	+
Blueberry	*		
Willow	+		
Staghorn-Sumac	+		
Smooth Sumac	+		
<u>Herbs</u>[2]			
Sedge		+	+
Violet spp.			+
Common Ragweed			+
Mixed Grass	**		
Sheep-Sorrel	**		
Goldenrod	*		
Strawberry	+		

[1] Those plants not included in this table provide a certain amount of cover (Table 6.5) 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 6.11. Water quality data collected from October 2, 1975, to August 4, 1976, at site 6, Porter to Rotterdam ROW, Schenectady County, New York.

Date		October 2, 1975					January 26, 1976					May 12, 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		0940	0920	0905	0845	0815	1615	1610	1545	1520	1500	1420	1430	1445	1500	1510	1745	1735	1725	1715	1710
Water Temp. (C)		11.0	11.0	11.0	11.0	11.0	0.0	ice[1]	-1.0	-1.0	0.0	11.2	11.2	12.5	12.0	12.0	20.0	31.0	21.0	22.0	18.2
Dissolved Oxygen (ppm)		10.2	9.0	10.5	11.7	10.0	13.1	ice	13.7	13.9	13.2	9.6	9.6	10.0	10.2	10.6	9.6	9.4	5.2	8.0	9.8
% Saturation D.O.		97	85	99	109	95	94	-	96	97	94	91	91	98	99	103	110	127	61	95	108
pH		5.5	5.7	5.7	5.9	5.7	7.3	ice	7.0	7.2	7.4	6.8	6.7	7.2	7.0	7.2	6.3	6.7	6.7	7.2	7.7
Water Temp. (C)	range			11.0					-1.0-0.0					11.2-12.5					18.2-31.0		
	mean			11.0					-0.5					11.8					22.4		
% Saturation D.O.	range			85-109					94-97					91-103					61-127		
	mean			97					95					96					100		
pH	range			5.5-5.9					7.0-7.4					6.7-7.2					6.3-7.7		
	mean			5.7					7.2					7.0					6.9		
Comments		light rain, air temp. 16 C					hard rain, air temp. 4 C, ground covered with 18" snow					cloudy, windy, air temp. 13 C					sunny, sir temp. 27 C, stream level extremely low with isolated pools present				

[1] ice = frozen, measurements not taken.

Table 6.12. 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	-------------19.3 ***********16.7
(C,I)	Commercial & Industrial	-.5 *.5
(F)	Forest Land	---69.0 **67.2
(E)	Extractive Industry	--1.4 *.1
(N)	Non-productive	
(OR)	Outdoor Recreation	
(P)	Public & Semi-public	-.3 *.4
(W)	Water Resources	--1.3 **1.4
(U)	Urban Inactive	
(T)	Transportation	------6.8 ************12.0
(R)	Residential	--1.4 **1.7

[1] Source: USDA-SCS, Hyattsville, Md., air photo No. S38 36093 173, Oct. 28, 1974
USDA-SCS, Schenectady County, air photo No. 203.8, 1941

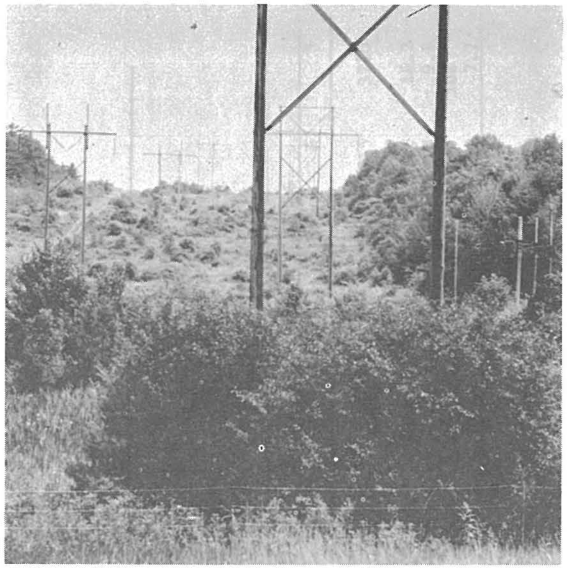


FIG. 6.1.1. General view of the ROW and adjacent forest, looking southeast, in summer, 1975 (Photo Station 15).

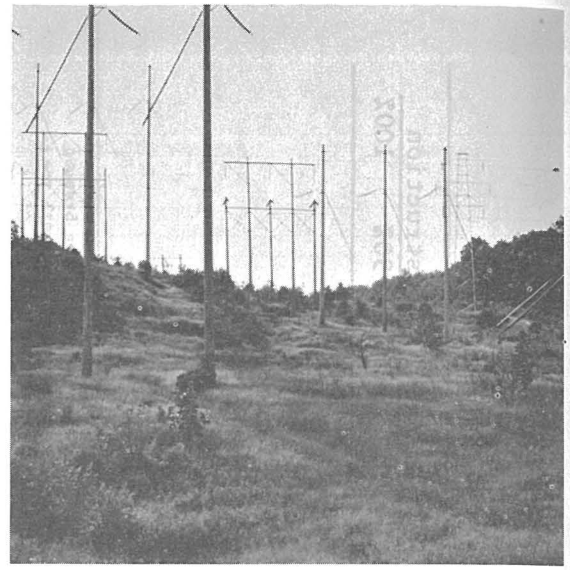


FIG. 6.1.2. General view of the ROW and adjacent forest, looking northwest, in summer, 1975 (Photo Station 1).

FIG. 6.1.3. Severe gully erosion on access road, in summer, 1976.

FIG. 6.1.4. Open soil under tower 14, exhibiting slight sheet erosion, in fall, 1975 (Photo Station 12).

FIG. 6.1.5. Raccoon tracks by stream on ROW, in the spring of 1976.

FIG. 6.1.6. Woodchuck burrow on ROW during the spring of 1976.

FIG. 6.1. Visual characteristics.

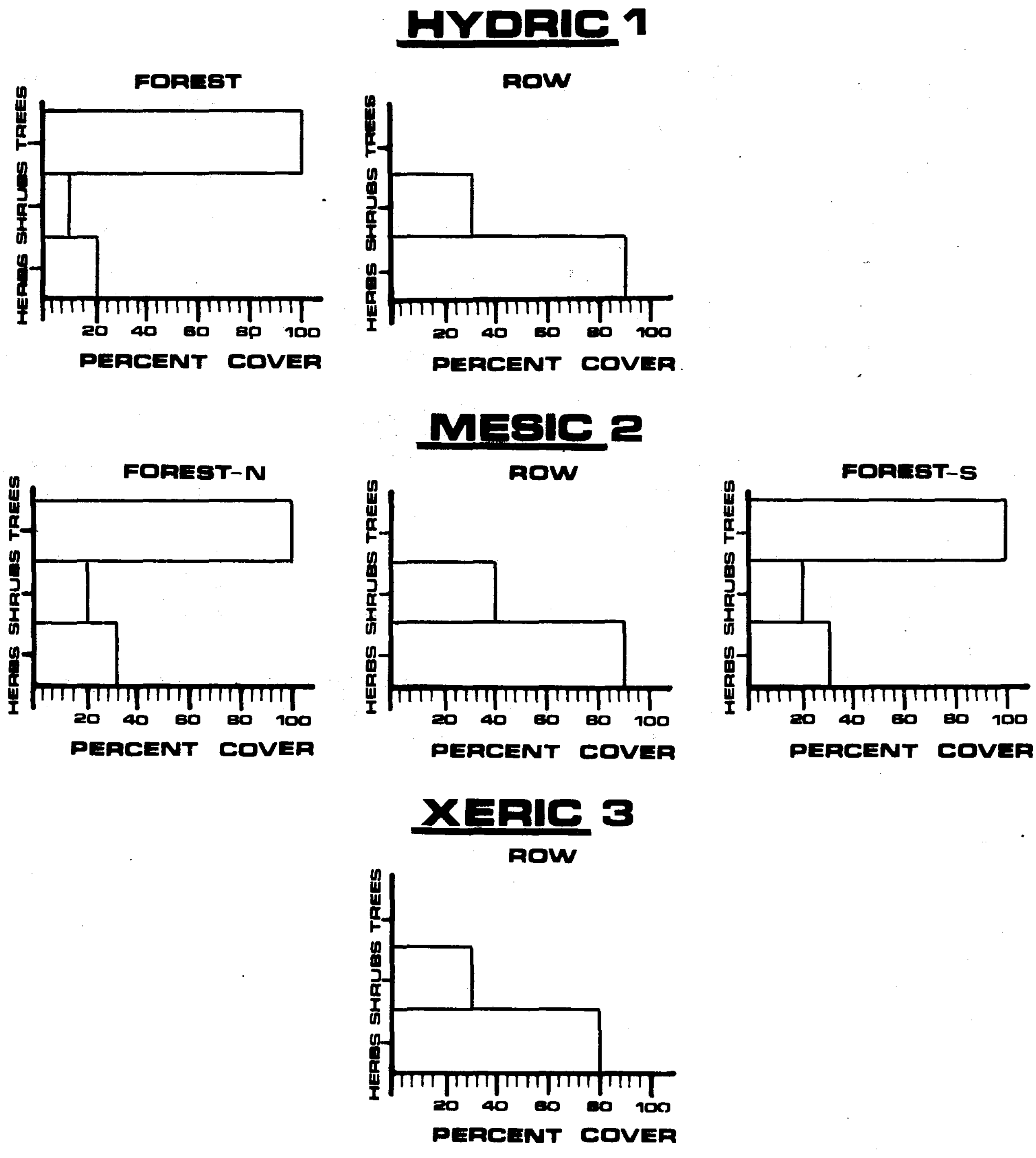


Fig. 6.2. Changes in cover value of tree, shrub, and herb layers from forest to ROW.

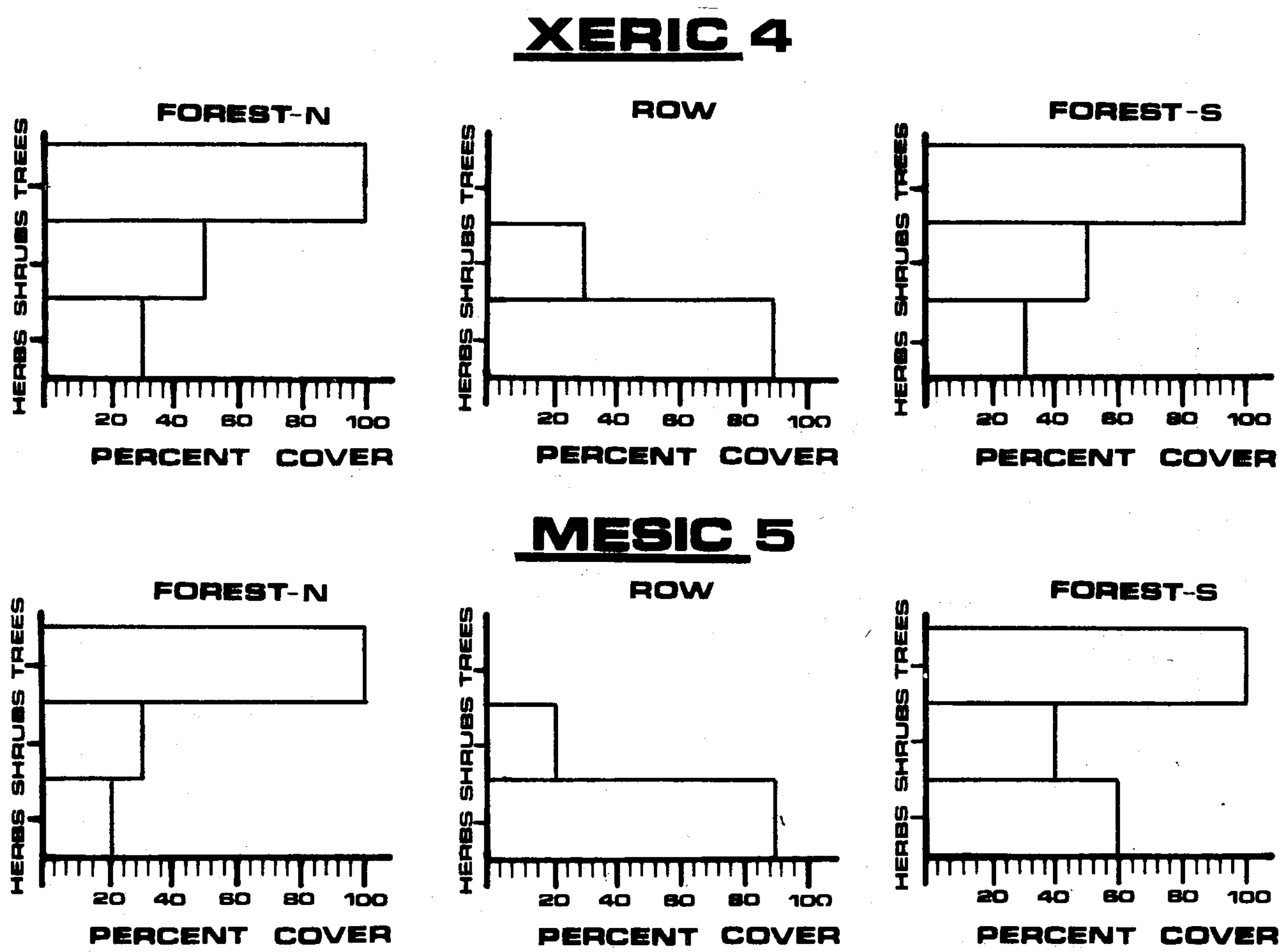


Fig. 6.2 a. Changes in cover value of tree, shrub, and herb layers from forest to ROW.

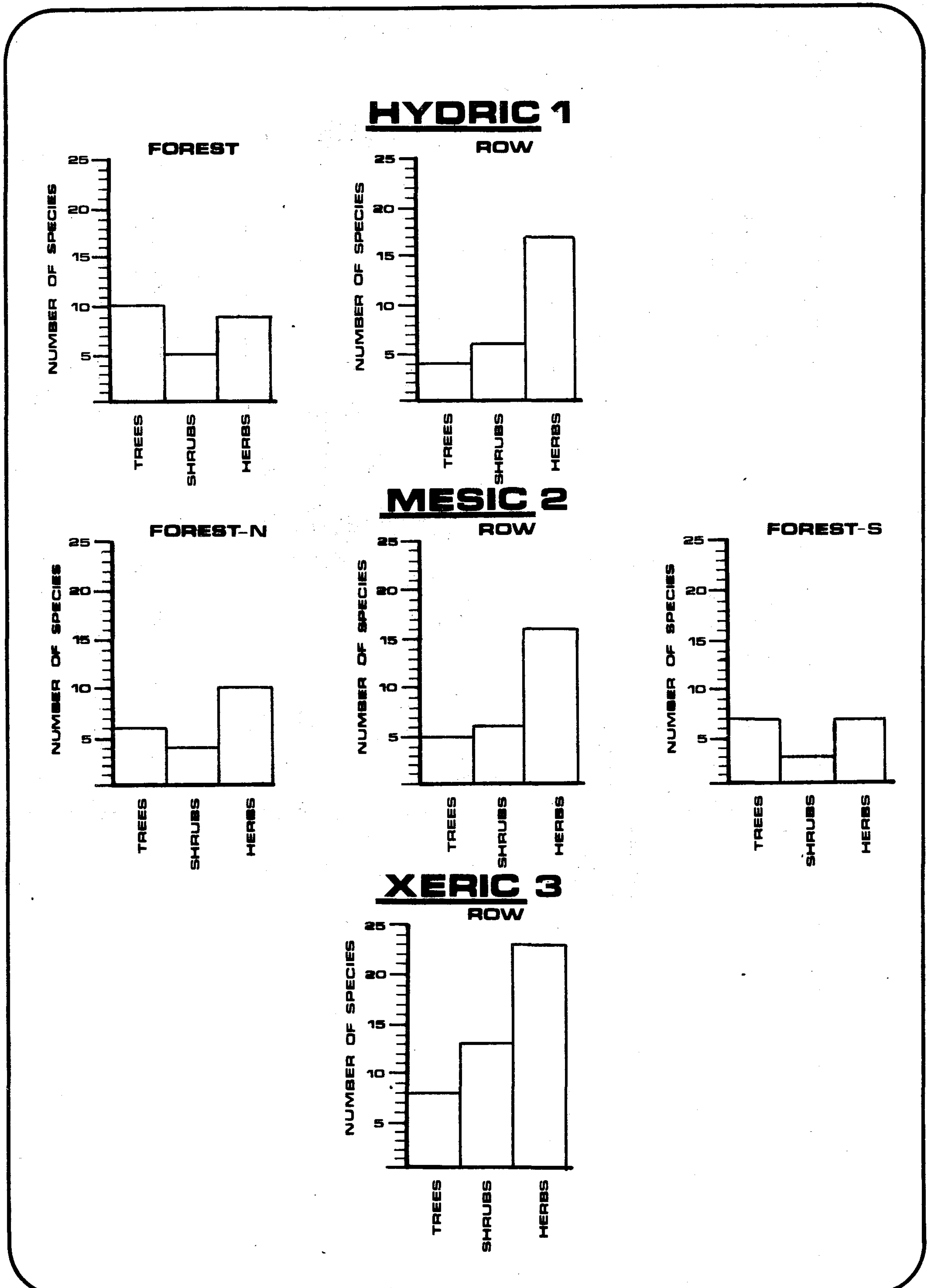


Fig. 6.3. Species diversity in the forest and on the ROW.

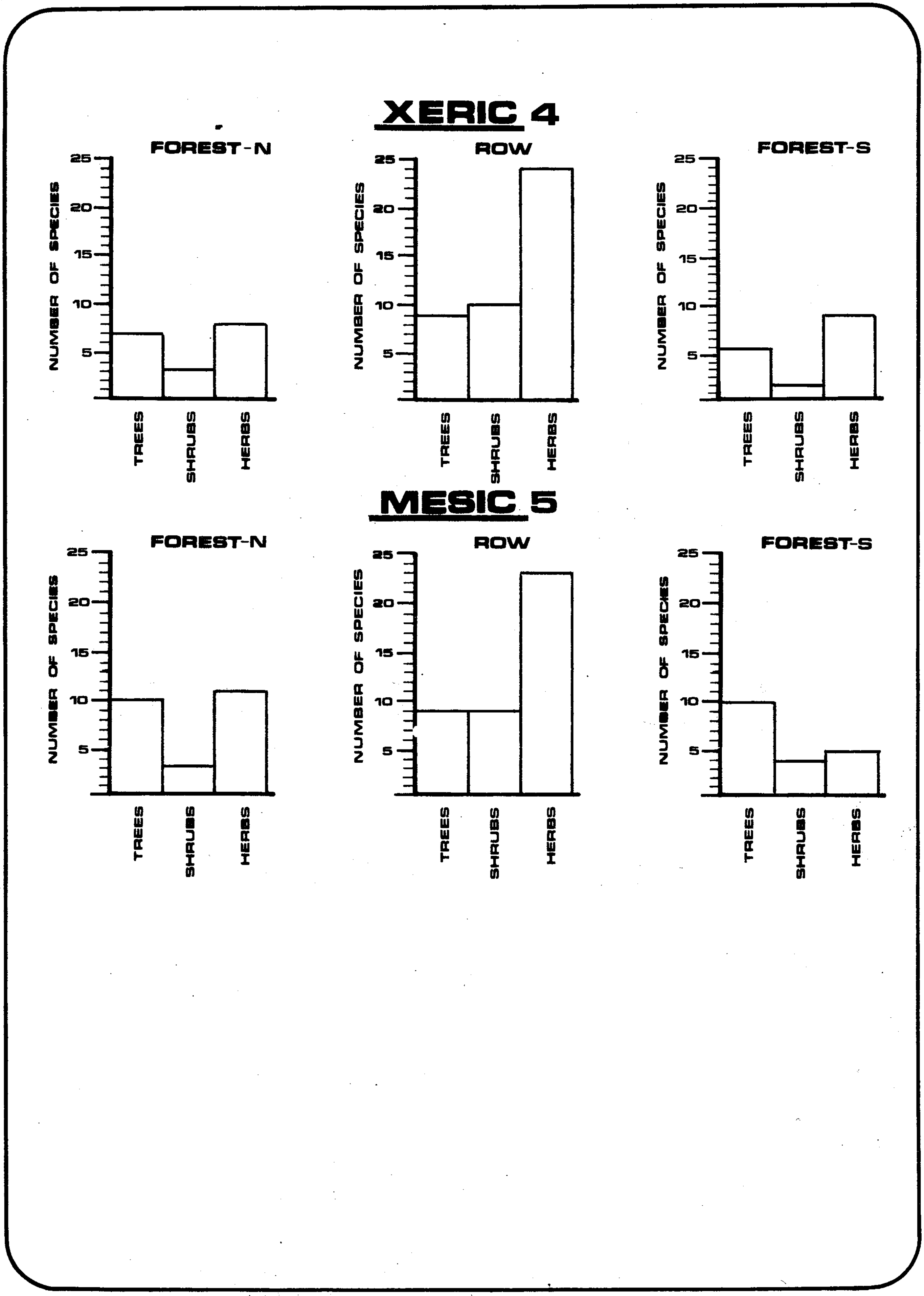


Fig. 6.3a. Species diversity in the forest and on the ROW.

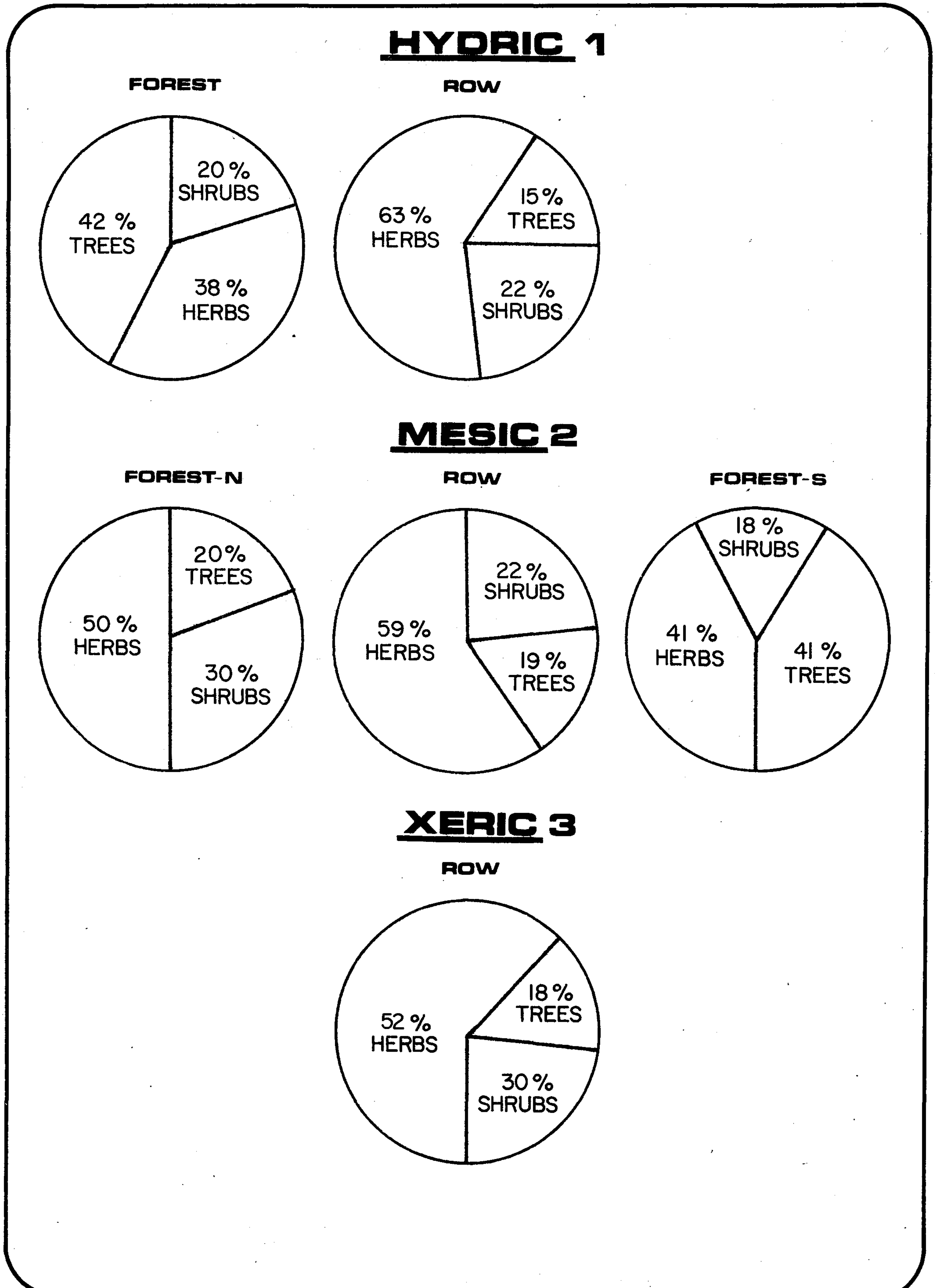


Fig. 6.4. Life form spectrum of the ROW as compared to the adjacent forest to compare species make-up of each, based on the number of species in each life form expressed as a percent of total species.

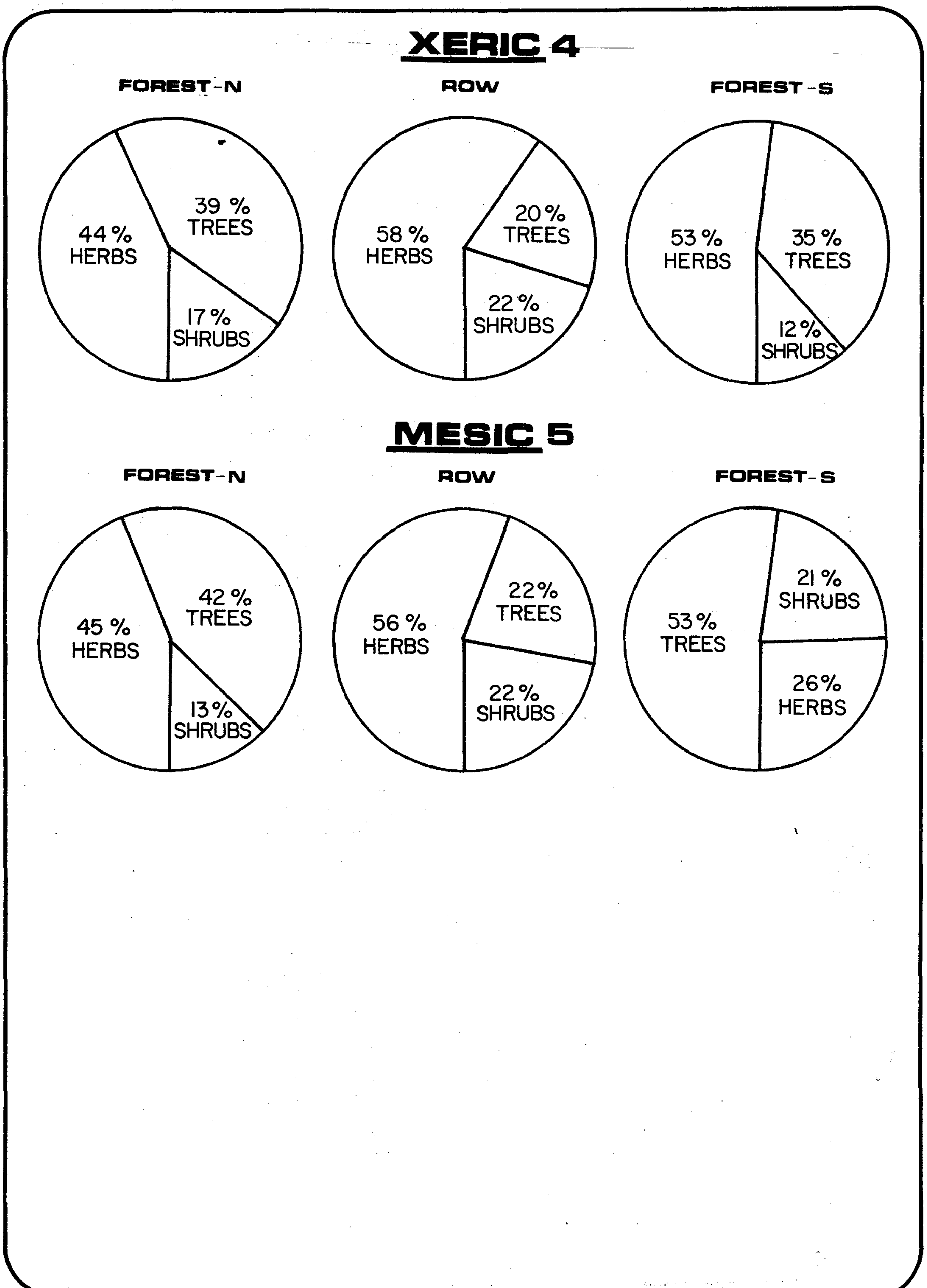


Fig. 6.4a. Life form spectrum of the ROW as compared to the adjacent forest to compare species make-up of each, based on the number of species in each life form expressed as a percent of total species.

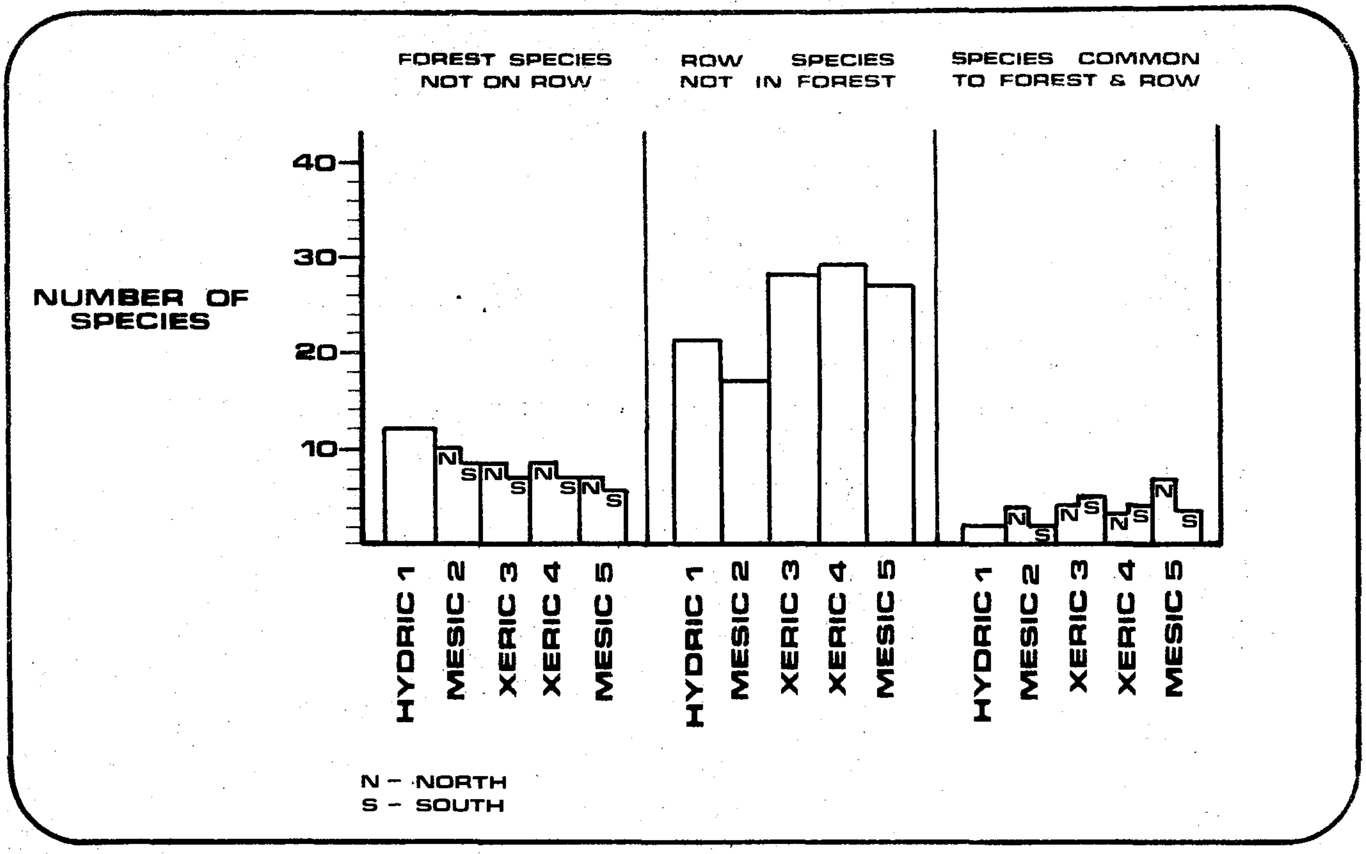
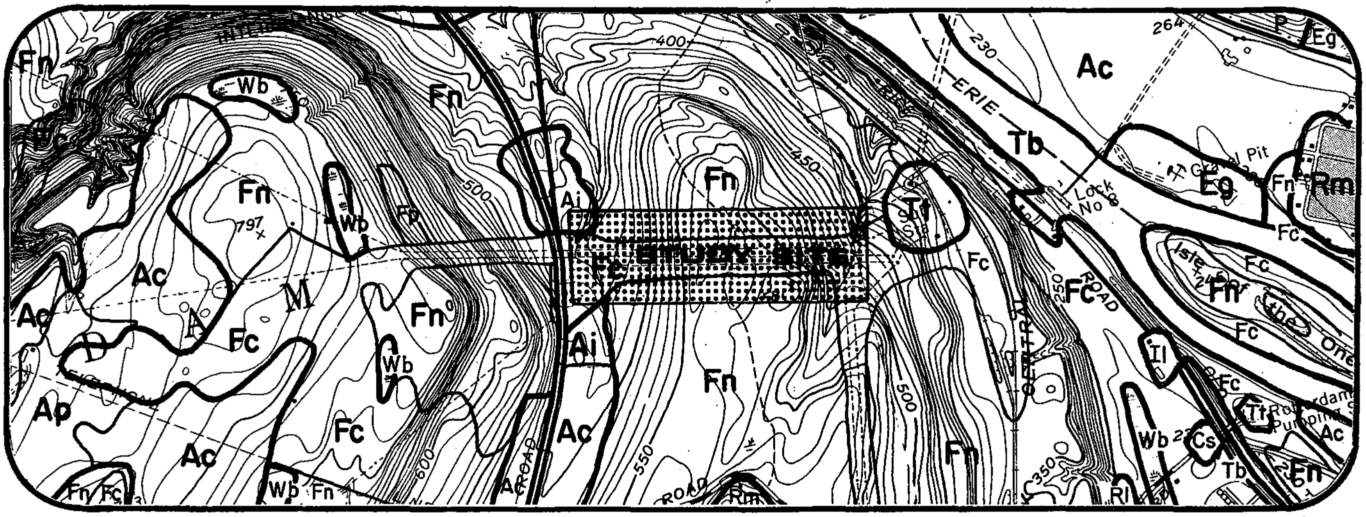
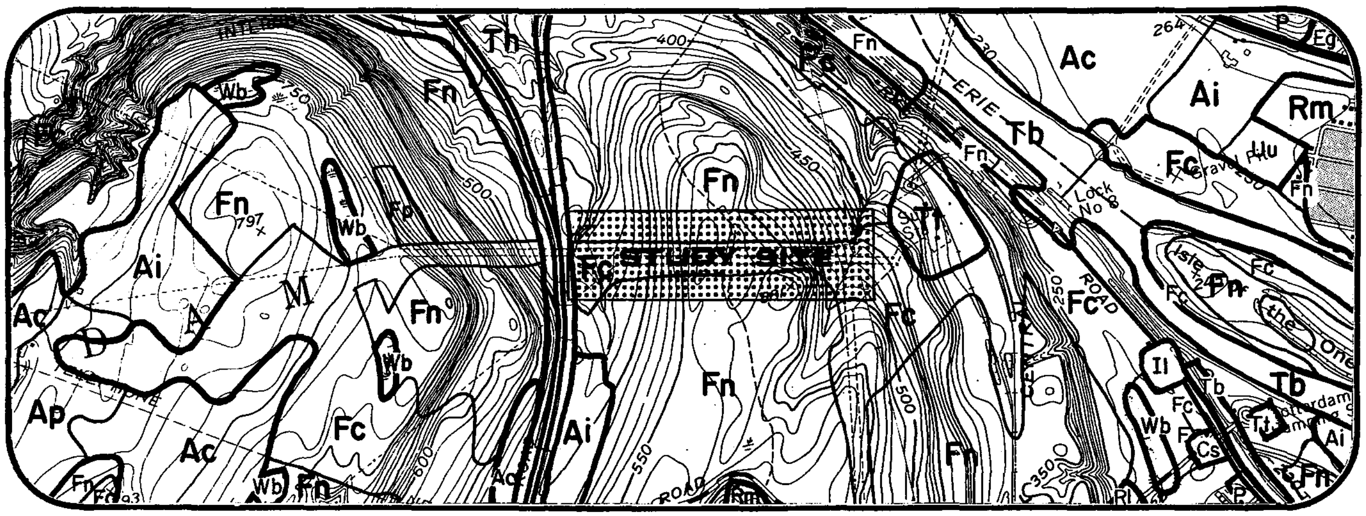


Fig. 6.5. Comparison of shrub and herb species in the forest and on the ROW.



1941 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

AGRICULTURE
- Ac - Cropland and Cropland Pasture
- Ai - Inactive Agricultural Land
- Ap - Pasture

COMMERCIAL
- Il - Light Manufacturing and Industrial
- Cs - Strip Development

EXTRACTIVE INDUSTRY LAND USE
- Eg - Sand and Gravel Pits

FOREST LAND
- Fc - Forest Brushland
- Fn - Forest Lands
- Fp - Plantations

PUBLIC AND SEMI-PUBLIC LAND USES
- P - Public and Semi-Public Land Uses

RESIDENTIAL LAND USE
- Rl - Low Density
- Rm - Medium Density

TRANSPORTATION
- Tb - Barge Canal
- Th - Highways
- Tt - Utilities

URBAN INACTIVE
- Uc - Under Construction

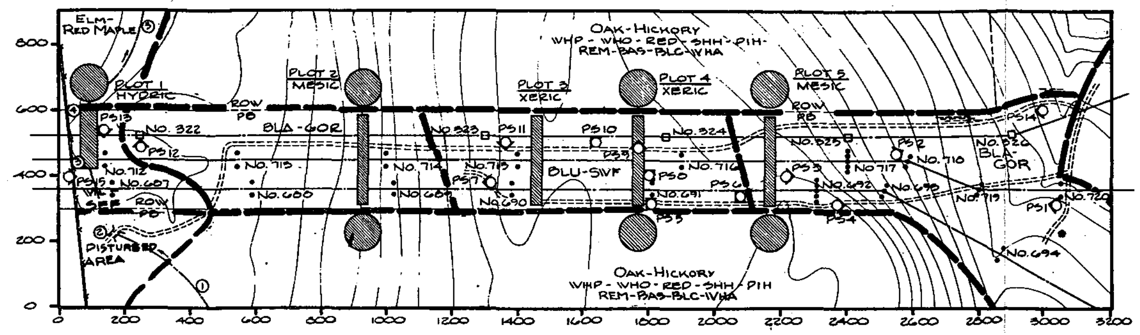
WATER RESOURCES
- Wb - Marshes, Shrub Wetlands and Bogs

SOURCES:
USDA-SCS, Hyattsville, Md., air photo, 10-28-74
USDA-SCS and USGS Quadrangle Map Rotterdam and Schenectady, 1954
Area Land Use Map, LUNR, Cornell University, N.Y., 1974
U. S. G. S. Topographic Maps, Rotterdam Junction, N.Y., 1954, and Schenectady, N.Y., 1954

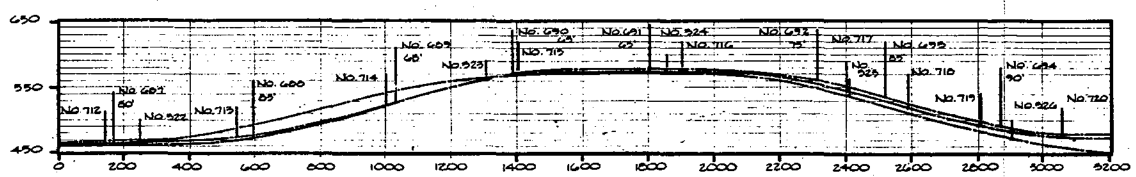
Fig. 6.6. Land use change.

ASPLUNDH ENVIRONMENTAL SERVICES

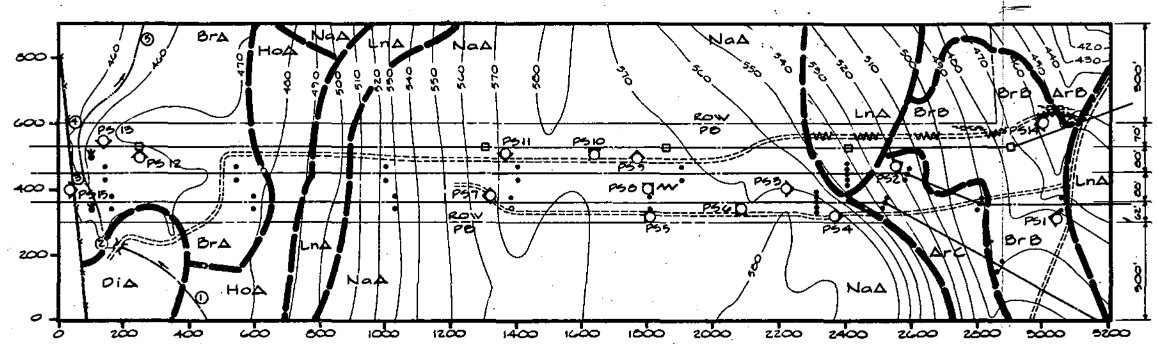
VEGETATION



CENTERLINE PROFILE



SOILS



NOTES:
(1) CONTOUR INTERVALS ARE 10 FEET.
(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
- 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
- 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

ArB	ARNOT	channery silt loam (8 to 15% slope)
ArC	ARNOT	" " (15 to 25% ")
BrA	BROCKPORT	silty clay loam (0 to 8%)
BrB	BROCKPORT	" " (8 to 15%)
DIA	DISTURBED AREA	
HoA	HORNELL	silt loam (0 to 8%)
LnA	LORDSTOWN	channery silt loam (0 to 8%)
NaA	NASSAU	shaly silt 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

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

NMPC. - ENGINEERING PLAN & PROFILE 9/17/63
USGS 7.5 MIN TOPOGRAPHIC MAP, ROTTERDAM JUNCTION, N.Y. 1954
SCHENECTADY COUNTY CONSERVATION DISTRICT, USDA, SCS
USDA - SCS, HYATTSVILLE, MD. SCHENECTADY CO
AIR PHOTO NO. 538 36093 173-21
(SCALE 1:38,000) OCT. 28, 1974
ASPLUNDH ENVIRONMENTAL SERVICES
AES PROJECT NO. 61-0028 FIELD STUDIES 1975-76

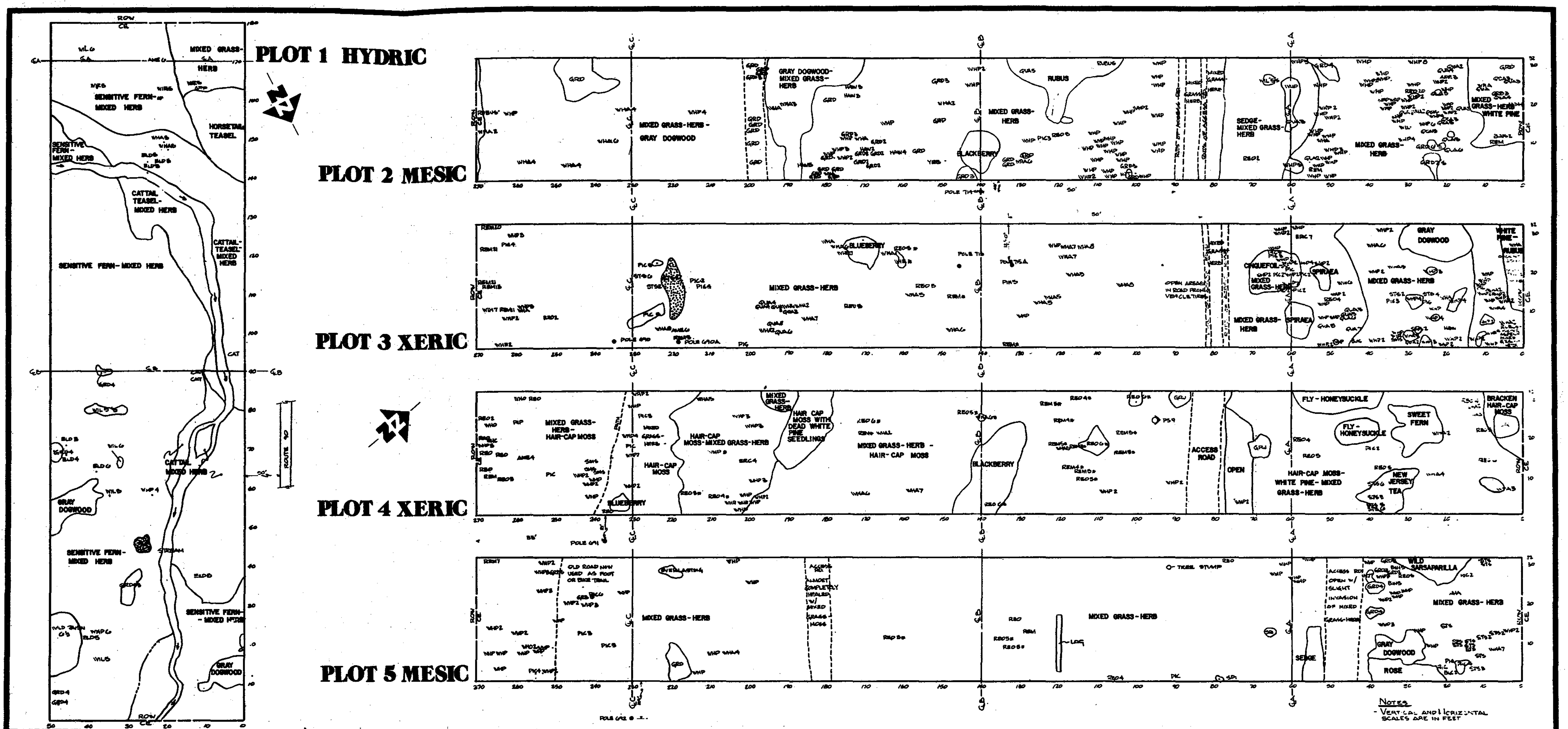
This information is a part of the ESEERCO "STUDY OF ENVIRONMENTAL AND ECONOMIC ASPECTS OF CONTEMPORANEOUS ELECTRIC TRANSMISSION LINE RIGHT-OF-WAY MANAGEMENT TECHNIQUES"

MAP 6.1

SITE 6 HABITAT CONDITIONS

UTILITY: NIAGARA MOHAWK POWER CORP.
ROW DESCRIPTION: PORTER TO ROTTERDAM 345 KV
STEEL LATTICE 300' ROW

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



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
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BRO	BROOM-SEDGE	Arthologhis virginicus
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YPL	BULLHEAD-LILY	Nuphar variegatum

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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.

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"

SCALE: 1" = 10' - 0"

10 5 0 5 10 20 40 50

MAP 6.2

SITE 6

MAPPED PLOTS

UTILITY: NIAGARA MOHAWK POWER CORP.

ROW DESCRIPTION: PORTER - ROTTERDAM 345 KV.

STEEL LATTICE 300' ROW

SITE 7

GILBOA to NEW SCOTLAND

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

OTSEGO and SCHOHARIE COUNTIES

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

SCALE 1:250,000

5 0 5

STATUTE MILES

Site 7 Gilboa to New Scotland

Study area extends from structure GNS 1-1-4 east of the Switchyard and is located near Gilboa. Take route 30 north toward Gilboa. Take a left on the road to Schoharie Creek/public fishing; proceed approximately 1 mile to the gate at the Power Authority State of New York (PASNY) complex and follow this road to the substation.

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Site 7 Gilboa to New Scotland

1 Introduction

Site 7 is located in the Allegheny Plateau 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 area is shown in Figs. 7.1.1 and 7.1.2.

The topography of the area is typically heavily rolling uplands slashed by deep ravines, with steep hills and mountains and narrow valleys in bordering areas (Stout, 1958).

Typical forest types of the region are: White Pine and Northern Hardwoods, Oak-Northern Hardwoods, and Northern Hardwoods (Stout, 1958). Also found on the study area is the Hemlock-Northern Hardwoods forest type.

2 Location and Identification

Site 7 is approximately 2½ miles southeast of North Blenheim, in the town of Gilboa, Schoharie County, New York (74° 26' 00" W. Longitude; 42° 26' 00" N. Latitude).

The site is on the Gilboa to New Scotland ROW which is operated by the Power Authority of the State of New York (PASNY). This 300-foot easement consists of 2 single circuit 345 kV lines, each having steel lattice structures. The project site is approximately 5,600 feet in length and extends from structure GNS-1/1/4 east of Valenti Road to include structure GNS-1/2/3 west of said road.

3 Background

The following discussion outlines documentable management techniques of clearing, construction, restoration, and maintenance for site 7, as received from PASNY (letter dated December 19, 1975, from Kevin T. McLoughlin, the Power Authority of the State of New York, Oriskany, N.Y.). No unit cost information is available.

3.1 Clearing

The ROW was selectively cleared under contract in 1970. Growth was selectively cleared in the mid-span areas, around tower locations, and along the access road. Other existing growth was thinned and the tops of outer trees removed.

All materials from clearing, selective clearing, removing danger trees, and selective trimming became the property of the contractor and were removed from the site or burned.

Initial chemical treatment consisted of a basal spray of low volatile esters of Tordon 155 and 2,4,5-Trichlorophenoxyacetic acid (2,4,5-T) in an oil carrier.

3.2 Construction

The towers were erected by a crane and the conductors strung by helicopter during the summer of 1971. There was no restriction on the size of tower work sites.

3.3 Restoration

Bulldozers were used to level areas near tower sites. Tower site openings were seeded during late spring, 1971, with 5 pounds of perennial rye-grass seed per 1,000 square feet, covering all open soil.

3.4 Maintenance

No maintenance was performed until late spring and early summer of 1976. Maintenance consisted of land erosion control work, ditching, and installing waterbars, and some topping of trees in the mid-span areas.

4 General Reconnaissance

A general reconnaissance was made in accordance with the methodology and is set forth in Map 7.1 which shows site habitat conditions. In this reconnaissance it was noted that the major vegetational types correlated with the soil types.

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 7.1 and described in Appendix 17. Specific reference is made to some of these photo stations throughout the report and illustrated in Fig. 7.1. With the execption 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. The site does not visibly vary from season to season since the ROW and adjacent area is green with vegetation winter and summer, consisting of predominately White Pine and Hemlock-Northern Hardwoods forest types. The only areas where clearing has occurred is at tower sites, in which regrowth of vegetation is occurring at these locations. Therefore, the appearance of the existing ROW site is in general harmony or reflects the character of the surrounding area. Features within the area which may make the site somewhat sensitive to view include adjacent water and park recreation areas. The ROW site decends the western side of Brown Mountain and overlooks the Schoharie Creek and reservoir which is used for some recreational purposes in addition to pump hydro storage for generation of electrical power. The site is located in a rural area and is visible from Route 30 along the ridge adjacent to the reservoir and from a park located across the reservoir. However, the ROW and structures are difficult to see since only the areas adjacent to the structures have been cleared, with remaining portions of the ROW generally retaining mostly evergreen species.

5 Field Studies - Results and Discussion

5.1 Soils

5.1.1 Geology and Soils

Site 7, Gilboa to New Scotland ROW, is located in Schoharie County in that physiographic region termed Allegheny Plateau by Cline (1970) and the Applalcian Upland region by Thompson (1966), in the border of the Catskill Mountains and Delaware Hills subdivisions. The north-central escarpment of the Catskill Mountains extends into this area in the form of steep hills that are approximately 600 feet above the general level of the high plateau located there (Flora et al., 1969); the site extends up the side of Brown Mountain (PASNY, 1969). Bedrock geology is of Devonian age, 395 to 345 million years ago, consisting predominantly of shale, siltstone, and sandstone. Surficial geology is largely glacial drift, and soils in the area have developed both in glacial till and glaciofluvial outwash (Flora et al., 1969; Broughton et al., 1973).

Soils on this site are classified in the order Inceptisols, suborder Ochrepts (Lordstown, Mardin, Nassau, and Oquaga series), reflecting the absence of horizons of marked accumulation of clay, and iron and aluminum oxides; Chippewa is classified in the suborder Aquepts, indicating the addition of characteristics associated with wetness (Soil Survey Staff, 1975; Buckman and Brady, 1969). This site is located in the area occupied by the Lordstown-Mardin association (Flora et al., 1969). Brief descriptions (Flora et al., 1969) of soil types occurring on the ROW study site (Map 7.1; Table 7.1) are:

Chippewa stony silt loam (ChB): These soils formed from late Wisconsin till consisting of sandstone, siltstone, and shale, and generally occupy nearly level or depressional areas, but are also found in seep spots on steeper slopes. Drainage is poor, due to the presence of a fragipan at a depth of 10 to 15 inches, which varies from 10 to 20 inches in thickness. The water table is at or near the surface for long periods each year; bedrock occurs at 20 to 40 inches in some areas, but is generally more than 40 inches deep. Soil reaction is generally medium acid, and ranges from pH 5.0 to pH 6.4 throughout a typical profile; on this site, in the surface 3 inches, soil reaction was pH 5.1. Chippewa stony silt loam is assigned to Woodland Suitability Group 5w2, designating low productivity for timber (Class 5) and the presence of excessive water (Subclass w) due to restricted drainage and a seasonally high water table, which causes a significant limitation for woodland use or management.

Lordstown channery silt loam (LoE): Lordstown soils formed in thin glacial till dominated by sandstone, siltstone, or silty shale, and occur on high ridges and steep valley walls. These soils are generally well drained. Sandstone or shale bedrock is at a depth of 20 to 40 inches, and water-holding capacity increases with depth. Drainage may also be impeded by a high water table early in spring, especially where the bedrock is below a depth of 30 inches. These soils are medium to strongly acid, ranging from pH 5.0 to pH 5.6; however, on this site in the surface mineral soil, soil reaction was pH 4.5. Lordstown channery silt loam is in Woodland Suitability Group 3r3, designating moderately high productivity for timber, and restrictions or limitations for woodland use or management related to slope.

Lordstown-Oquaga-Nassau channery silt loam (LrB and LrE): These soils are mapped together in some areas of Schoharie County, and mapped areas may include 1, 2, or all 3 soils; on this site inclusions of all 3 were noted. These soils are steep to very steep, and are well drained. They range in depth from shallow to moderately deep, and in many places contain stones and rock fragments. Soil reaction on this site varied from pH 5.5 to pH 5.8 in the surface horizon. The Woodland Suitability Group designation for Lordstown and Oquaga soils, which are similar in description to this group, is 3r8 for slopes between 35% and 50%, indicating moderately high productivity, and slope as a limitation; where slope varies from 8% to 15%, the designation is 3o1, indicating no significant limitations for woodland use or management.

Mardin channery silt loam (MdB): Mardin soils developed in glacial till that was dominated by fine-grained sandstone and shale; they occupy uplands in the southern part of the county, on gentle to steep slopes. A dense, slowly permeable fragipan is present at depths of from 13 to 30 inches, and the water table during the early spring perches above the fragipan at a depth of between 15 and 24 inches. Nevertheless, Mardin soils are generally moderately well drained or well drained. Soil reaction is generally strongly acid, and ranges from pH 5.0 to pH 5.5 to a depth of 15 inches (Anon., 1972); on this site it was pH 5.5 in the upper mineral horizon. Mardin is assigned to Woodland Suitability Group 3o1, designating moderately high productivity for timber and the absence of significant limitations or restrictions for woodland use or management.

Nassau shaly silt loam (NaB): These soils developed on a thin layer of glacial till that contained a large amount of acid shale fragments, on gently sloping to steep terrain of the uplands. They are well drained, and depth to bedrock is 10 to 20 inches; in addition, the shale content is high. Thus, Nassau soils have low available moisture capacity. Soil reaction is generally strongly acid to medium acid; on this site it was pH 4.7 in the upper 3 inches. Nassau shaly silt loam is in Woodland Suitability Group 4d1, indicating moderate productivity for timber, and restricted rooting depth due to shallowness to bedrock.

5.1.2 Humus Types

Organic layers present on the soil surface of the structure openings and adjacent woodland were measured on 3 mesic upland locations, at towers 6 through 8. Average thickness of the organic layers and A1 horizon was based on 5 samples taken at each location (Table 7.2). The presence and thickness of these layers were used for humus type classification. No evidence of plowing, grazing, or recent fires was noted on this site; however, organic layers and surface mineral soil were disturbed by grading in the preparation of tower sites.

All organic layers (litter, fermentation, and humus) plus an A1 horizon (mixed mineral and organic) were present in the woodland at tower openings 7 and 8; the predominant humus type at tower 7 was a "thick duff mull with very shallow A1" and at tower 8 a "thin duff mull with very shallow A1". In the woodland at tower opening 6, only recent litter deposits were present; this area had been disturbed; thus humus type classification was not possible.

Similarly, humus types could not be determined for all tower openings sampled on the ROW due to soil disturbance during tower construction. At all locations, litter layers in the woods were composed of tree parts in contrast to the leaves and stems of grasses, herbs, and shrubs on the ROW.

Based on measurements at 3 structure openings on the ROW and the immediately adjacent forest, it apprears that construction of ROW structure openings materially altered the organic layers and surface mineral horizons of the soil. At towers 7 and 8, the fermentation and humus layers and A1 horizon present in the adjacent forest were absent from the structure openings; however, a thin litter layer, averaging 0.3 inch thick, had accumulated on these disturbed areas following construction in 1971. In addition, elimination of the forest cover resulted in a change in kind of organic material. However, in most instances, regrowth and persistence of a mixed grass-herb-shrub cover has resulted in annual litter depositions that serve as a protective layer on the under-lying mineral soil.

5.1.3 Soil Erosion

Current Active Erosion Observations of active soil erosion on the structure openings and adjacent woodland were made on the Gilboa to New Scotland study area in August, 1976. Active erosion was evident in the woodland and on the openings on a variety of soil types and slopes.

Eroding areas were identified as to location on the ROW and forest, soil type, average slope, and present plant cover (Table 7.3). 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 7.1). Active erosion on the structure openings was largely limited to areas that had been subjected to past and/or recent mechanical disturbance of the soil, i.e., tower sites and a bank cut at tower 7 (Fig. 7.1.3; Table 7.3). Active sheet erosion was also evident on the general ROW, specifically on the ROW corridor at the crest of Brown Mountain, where slope was approximately 32%, in the Lordstown channery silt loam soil type (Table 7.3). Sediment resulting from erosion on the general ROW and structure openings appeared largely to accumulate on lower slopes, and did not leave the ROW via streams or collect in water impoundments. However, it appears that sediment from tower 6 and from the adjacent woodland, due to the general steepness of the slope and the apparently large volume of runoff water from upland areas, may well leave the ROW vicinity via a large gully located approximately 200 feet below tower 6. The gully, which at its greatest size averages about 50 feet in width and 12 feet in depth, is located in the forest and is actively eroding. However, there is no evidence that the ROW or its construction either caused the gully or influenced it to any great extent.

Active sheet and rill erosion was noted in the forest on slopes ranging from 10 to 40%, where the forest floor was fairly well covered by litter from herbs and trees (Table 7.3). In all areas of the woodland where active erosion was observed, a canopy of trees and shrubs, as well as undisturbed organic layers on the soil, were present. In addition to the gully described herein above, a gully ranging in depth from 1 to 10 inches was located in a seep area of the forest, where drainage from a spring was apparently following the gully. Slope here was approximately 5% and the gully was devoid of plant cover (Table 7.3).

There was restoration in the form of seeding following construction of this ROW, at the 3 structure openings studied. In addition to the seeded perennial rye-grass, natural plant invasion has occurred. Progressive sheet and rill erosion on the bank cut at tower 7 (Fig. 7.1.3) and on portions of the 3 tower sites apparently contributed to prevention of natural plant invasion, since these areas were generally devoid of plant cover. Additionally, these areas appear to have been formed during clearing or construction by bulldozing to bedrock, and the absence of soil apparently also contributed to the lack of significant plant invasion. No areas of mass land movement such as landslides were observed on this site.

5.2 Vegetation

5.2.1 Habitat and Forest Types on the Site

Mesic Habitat The 3 structure openings on this site are located on mesic, or medium moist, habitats. Structure 6 (Fig. 7.1.4) is located on the lower slopes of Brown Mountain. Slope was approximately 40%, on a west-facing slope, although it was about 15% at the structure opening itself. Drainage was free but not excessive, except for several inclusions where hydric conditions were approached. The forest type was Hemlock-Northern Hardwoods with yellow birch, beech, red and sugar- maples, and hemlock prominent.

Tower 7 (Fig. 7.1.5) is located on the mid to upper slopes of Brown Mountain. Slope was again approximately 40%, on a west-facing slope; at the structure opening it was about 15%. Drainage was free but not excessive. The forest type was also Hemlock-Northern Hardwoods.

Tower 8 is located on the upper slopes near the crest of Brown Mountain. Slope was generally 15%, on a west-facing slope, but approximately 5% at the structure opening. Here, too, drainage was free but not excessive, except for 1 area where wet, or hydric, conditions prevailed. The forest type was Hemlock-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. Obviously, removal of the trees caused this; and what was essentially a 2-layered ROW community developed with a shrub layer consisting of shrubs and small trees not removed by maintenance or which have arisen since construction clearing and an herb layer.

On the mesic habitats, on all structure openings, a Hemlock-Northern Hardwoods forest type was changed to a Blackberry-Goldenrod plant community (Map 7.1).

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

Only special vegetational studies were made at site 7; thus on-ROW mapped vegetation plots were not established. A discussion of the studies made and data obtained therefrom is set forth in Section 5, Special Studies.

5.2.4 Comparison of Forest Type with ROW Vegetation

The general impact of the clearing and maintenance practices set forth in section 3 of this report was to change the forest types to a shrub-herb-grass community.

On the mesic habitat, which was formerly occupied by a Hemlock-Northern Hardwoods forest type, a Blackberry-Goldenrod plant community was produced.

5.3 Wildlife

The major game species for site 7, Gilboa to New Scotland, as determined by Asplundh Environmental Services (AES) in conjunction with the New York State Department of Environmental Conservation (DEC), are white-tailed deer, cottontail rabbit, and gray squirrel.

5.3.1 Actual Use

White-tailed Deer White-tailed deer data were recorded by direct and indirect observations. Three deer were seen grazing in the evening near the substation in a heavy cover of crown vetch in September, 1975. Deer pellets were moderate both on and off the ROW during this time.

During the fall of 1975, deer pellets were heavy both on and off the ROW throughout the sutdy area.

During the winter of 1976, deer tracks and pellets (Fig. 7.1.6) were heavy both on and off the ROW throughout the study area.

During the spring of 1976, deer pellets were few in number near the substation. Deer pellets were moderately abundant in the opening at structure 6, few in number in the opening at structure 7, and numerous in the opening at structure 8. Deer tracks were numerous in the opening at structure 8.

Cottontail Rabbit During the winter of 1976, rabbit tracks were moderately abundant on the ROW at the structure openings. Rabbit pellets were few in number at the edge of the woods at structure site 7. Two rabbits were observed on the ROW feeding at the edge of the access road.

Gray Squirrel No gray squirrel activity was observed during the period of observation.

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 7.4.

During the spring of 1976, 1 woodchuck was observed running, at the opening at structure 7. One red eft was seen running on the opening at structure 8, and another was seen in the woods at the same structure opening. One raptor casting was observed on the opening at structure 6. Small mammal bones were found in the casting. Two bald eagles were seen on the study area at this time (personal communication, April 22, 1976, with Steve Coonradt, PASNY, Gilboa, N.Y.).

During the summer of 1976, 1 rattlesnake was observed sunning itself at the upper edge of the opening at structure 6. Three garter snakes were seen feeding at the structures opening at this time.

5.3.2 Potential Use

Potential wildlife use of the plant species present on site 7 for the 3 major game species, deer, rabbit, and squirrel, is contained in Table 7.5. 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 (Martin et al., 1951).

5.4 Land Use

5.4.1 Location

Site 7 is located in a rural nonfarm section of the town of Gilboa, Schoharie County, New York. Between 1960 and 1970 there was a 9.4% increase in the population of Schoharie County with the 1970 distribution of 17.6% urban, 71.3% rural nonfarm, and 11.1% rural farm (U.S. Bureau of the Census, 1972). The closest community is North Blenheim which is approximately 2½ miles to the northwest.

5.4.2 Land Use Prior to Construction

The ROW was constructed during 1971. The earliest available data obtained from 1960 aerial photography indicated that the land adjacent to the ROW was primarily rural nonfarm (Table 7.6; Fig. 7.2). Land use distribution included the following subtypes:

Agriculture:
- Ac - Cropland and cropland pasture

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

Water Resources:
- Ws - Streams and rivers
- Wb - Marshes, shrub wetlands, and bogs

5.4.3 Land Use After Construction

The adjacent land use to site 7 has had a minimal change from the 1960 data, with an increase in water resources and a decrease in forest land. The land adjacent to the ROW is still rural nonfarm (Table 7.6; Fig. 7.2). Land use distribution includes the following subtypes:

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

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

Extractive Industry:
- Eg - Sand and gravel pits

Water Resources:
- Ws - Streams and rivers
- Wb - Marshes, shrub wetlands, and bogs

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

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 Gilboa to New Scotland study area is located on a steep mountain side and high ridge; existing soils developed in thin glacial till dominated by fine-grained rock fragments which on weathering produced silt loam soil textures. Upland soils (Lordstown, Mardin, Nassau, and Oquagua) are shallow to moderately deep, generally well drained, and have good water-holding capacity conducive to mesic habitats. The poorly drained Chippewa soils usually occupy flats and depressions, but on this site occur in small seepage areas emerging from steep slopes. Soils on this site supported a Northern Hardwoods forest type, with white pine as a major component on lower slopes and upland flats and hemlock on the steeper mid- and upper-slope soil phases. Upland soils are assigned to Woodland Suitability Groups 3 or 4, designating moderate to moderately high productivity for timber, with some management limitations on steep slope and shallow soil phases.

In undisturbed forest conditions on the mountain side, organic matter from tree litter has accumulated to a depth of nearly 2 inches with some incorporation of decayed organic material in surface mineral soil. The humus type on these mesic sites, classified a "thin duff mull with very shallow A1", provides a protective surface mulch that likely reduces erosion potential of the underlying mineral soil.

There is some active erosion as a natural occurrence on the silt loam soils in the undisturbed forest. Sheet and rill erosion occurs sporadically on moderate and steep slope segments, 10 to 40% gradients, where litter cover is light. Also, periodic runoff water from spring seeps on the mountain side and from upland areas has produced moderate to severe and progressive gully erosion at several locations in the forest. Sediments resulting from slight sheet and rill erosion generally are deposited on lower slopes, but soil particles dislodged in the gullies may be transported out the study area.

Based on present conditions in the adjacent forest, it is probable that land morphology, geologic features, and associated soil properties were similar at the time of ROW clearance and construction in 1970 to 1971.

6.1.2 Vegetation

Much of the slope occupied by the present study site was in stands of the Hemlock-Northern Hardwoods type prior to ROW establishment in 1970. The most abundant hardwoods in this type were red and sugar- maples and beech.

On the level terrain at the southeastern end of this study site, stands of the White Pine-Northern Hardwoods type formed the forest cover at the time the ROW was established. The younger age and even-aged condition of these stands suggest that this area was at one time in pasture or crops, but had been abandoned many years prior to corridor 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 surrounding the structure openings and adjacent to the ROW corridor. It can be assumed that those species currently utilizing the site, i.e., white-tailed deer, 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

Earliest data available prior to construction of the ROW in 1971 is 1960 aerial photography. The ROW and adjacent land area was rural nonfarm with a land use distribution of agriculture (13.7%), forest land (83.9%), and water resources (2.4%).

6.2 Conditions Which Exist at Present

6.2.1 Soils

Physical features of relief, geology, and soils described in the bordering forest were similar on the ROW. Soil type boundaries crossed both forest and ROW in relation to topographic configurations and slope gradients. Wet spots resulting from spring seeps were present on the ROW and generally occurred as small inclusions in the well-drained upland soils on steep slopes. Under ROW conditions, the mesic silt loam soils typical of this area supported a Blackberry-Goldenrod plant community in openings where the forest cover had been removed.

Organic layers of the forest floor and surface mineral soil were drastically disturbed at tower openings due to grading on the steep slopes for tower structures. Apparently, all organic materials and A1 horizon were removed during ROW construction; however, a thin litter layer from grass, herb, and shrub remains covered the mineral soil on these areas in 1976. Soils in the mid-span ROW areas had minimal disturbance.

Active erosion on the general ROW, essentially undisturbed segments, was limited to occasional slight sheet erosion which corresponds to similar conditions in the undisturbed forest. However, more conspicuous sheet and rill erosion was evident at 3 tower sites where exposed mineral soil was only partially stabilized by grass and herbs from restoration seeding and natural plant invasion. Most sediments from erosion on the ROW were deposited on lower slopes, but some, particularly from tower 6, leaves the ROW through a large gully in the adjacent forest.

6.2.2 Vegetation

Between tower sites the selective clearing, trimming, and topping have disturbed only a minor portion of the crown canopy, leaving most of the original hemlocks, white pines, and northern hardwoods as the forest cover. The shrubs and herbs in these stands are essentially the same as those in the adjacent stands.

In tower spenings, bulldozing, grading, seeding, and basl spraying have resulted in a cover of grasses, sedges, and forbs with only small patches of open soil. Plants in these openings include sensitive and hay-scented ferns, sheep-sorrel, white clover, goldenrod, and strawberry. Tree seedlings and shrubs invading these sites are northern red oak, red and sugar- maples, sweet and yellow birches, striped maple, and blackberry.

6.2.3 Wildlife

White-tailed deer, cottontail rabbit, and gray squirrel are the major game animals that currently utilize the study area. Indirect observations for deer, i.e., pellets and tracks, indicated their use of the ROW area and structure openings. Deer were also seen on the site. Cottontail rabbits were observed on the ROW, and indirect observations, i.e., tracks and pellets, evidenced presence on the structure openings and at the edge of the adjacent forest. No gray squirrel activity was observed.

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

6.2.4 Land Use

Presently, the adjacent land uses to site 7 have had a minimal change from the 1960 data. The ROW and the land adjacent to the ROW is still rural nonfarm with a distribution of agriculture (13.0%), forest land (82.4%), water resources (4.2%), and extractive industry (.4%). With reference to the total area involved, shifts in land use are noted as follows:

Forest Land -	-1.5%
Agriculture -	- .7%
Water Resources -	+1.8%
Extractive Industry -	+0.4%

Land use of extractive industry (.4%) is a new type which was not present in 1960. A reservoir has resulted from the damming of Scholorie Creek which has increased water resources 1.8%.

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

6.3 Environmental Effect and Probable Causes

6.3.1 Soils

The major impact of ROW construction and maintenance is the removal of organic layers and exposure of mineral soil at tower site openings on steeply sloping segments. Restoration seeding was performed following ROW construction, but exposed mineral soil was only partially stabilized by 1976 and active erosion was evident. Some natural invasion of herbs and shrubs has occurred and a thin litter layer from these plant parts was present, but continuing erosion appears to interfere with more rapid plant establishment on these sites.

6.3.2 Vegetation

The general impact of ROW management was to produce a Blackberry-Goldenrod plant community on the mesic ROW habitat area. The surrounding forest was a Northern Hardwoods-Hemlock forest type in which beech, yellow birch, and sugar- and red maples were the dominant species along with hemlock.

6.3.3 Wildlife

The presence of the ROW and the structure openings has encouraged the development of many different plant species, mainly light-loving, on these areas, 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

Minimal change has occurred in land use within the area inventoried. Although there was in increase in water resources, and the addition of extractive industry, this cannot be attributed to the existence of the ROW. Land use adjacent to the ROW study area has not changed. In addition, data available from comparison of land use before the ROW was constructed occurred a full 11 years before the ROW was constructed. Changes which were noted could have occurred in this 11 year period, which would then mean no change in land use of the ROW had occurred since it was constructed.

Table 7.1. Soil series present on the Gilboa to New Scotland study area.

Soil Series	Map Symbol[1]	Drainage Class[2]	Surface Soil pH	Surface Soil Texture	Woodland Suitability Group
Chippewa	ChB	PD	5.1	stony silt loam	5w2
Lordstown	LoE	G	4.5	channery silt loam	3r3
Lordstown-Oquaga-Nassau	LrB	G	5.5	channery silt loam	3o1[3]
Lordstown-Oquaga-Nassau	LrE	G	5.8	channery silt loam	3r8[3]
Mardin	MdB	MG-G	4.4	channery silt loam	3o1
Nassau	NaB	G	4.7	shaly silt loam	4d1

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).

3 The Woodland Suitability Group designation for Lordstown and Oquaga soils is given here.

Table 7.2. Average thickness of organic layers and A1 horizon and humus types for mesic sites on ROW and adjacent woodland of site 7.

Moisture Regime	Location	Layer Thickness (in.) L	F	H	A1	Humus Type
1. Mesic (6)[1]	ROW	.2	0	0	0	Disturbed area - no humus type
	Woodland	1.0	.1	0	0	Disturbed area - no humus type
2. Mesic (7)	ROW	.3	0	0	0	Disturbed area - no humus type
	Woodland	1.4	.2	.9	.9	Thick duff mull with very shallow A1
3. Mesic (8)	ROW	.5	0	0	0	Disturbed area - no humus type
	Woodland	1.2	.2	.6	.5	Thin duff mull with very shallow A1
All Plots Combined	ROW	.3	0	0	0	Disturbed area - no humus type
	Woodland	1.2	.2	.5	.5	Thin duff mull with very shallow A1

[1] Samples taken at tower sites, the numbers of which are indicated by figures in parentheses.

Table 7.3. Areas exhibiting active erosion in August, 1976, on the Gilboa to New Scotland 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	Lordstown channery silt loam	32	Grass-herb	Sheet	Slight	-
Tower Site	Nassau shaly silt loam	5	Bare-*Rubus*-grass-herb	Sheet	Slight	-
Tower Site/Bank Cut	Lordstown channery silt loam	36	Bare-grass-herb	Sheet & Rill	Slight-Moderate	-
Tower Site	Nassau channery silt loam	8	Bare-grass-herb	Sheet	Slight	-
		FOREST				
General Forest	Lordstown channery silt loam	40	Litter (herb & tree)	Sheet & Rill	Moderate	-
General Forest	Lordstown-Oquaga-Nassau channery silt loam	10	Litter (herb & tree)	Sheet	Moderate	-
Spring Seep	Chippewa stony silt loam	5	Bare	Gully	Slight-Moderate	1-10
Gully	Lordstown-Oquaga-Nassau channery silt loam	60	Bare-trees-herb	Gully	Severe	144

Table 7.4. Birds observed and/or heard on the ROW and on the ROW edge during the study period.

Species	Species
Turkey vulture	Black-capped chickadee
Bald eagle[1]	Robin
Hairy woodpecker	Chipping sparrow
Eastern wood pewee	Song sparrow
Blue jay	Slate-colored junco
Common crow	

1 Bird sighting reported by Steve Coonrod, PASNY, Gilboa, N.Y., 1976.

Table 7.5. Potential wildlife use of plant species[1] present on the ROW and adjacent woods for the major game species on the Gilboa to New Scotland study area.

Species	Wildlife Species		
	Deer	Rabbit	Squirrel
Trees			
Hemlock	+		
Beech	+		**
American Hop-Hornbeam	+		
Sugar Maple	****		**
Red Maple	****	*	**
Red Oak	*	+	****
White Pine	+		*
White Birch	*		
Yellow Birch	*		
Sweet Birch	*		
Aspen	**		
Serviceberry	+		
White Ash	*		
Basswood	*		
Gray Birch	*	*	
Shrubs			
Striped Maple	****		
Blackberry	+	**	+
Willow	*	+	
Spiraea	+		
Bush-Honeysuckle	+		
Herbs[2]			
Grasses	*	**	
Sensitive Fern	*		
Hay-scented Fern	*		
Goldenrod	+	*	
Sheep-Sorrel		**	
White Clover		**	
Plantin		**	
Strawberry		+	
Sedge			+

1 Those plants not included in this table provide a certain amount of cover (Tables 29, 30, and 31, Section 5, Special Vegetational Studies) 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 7.6. 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	-----------13.7 ***********13
(C,I)	Commercial & Industrial	
(F)	Forest Land	--83.9 ***82.4
(E)	Extractive Industry	*.4
(N)	Non-productive	
(OR)	Outdoor Recreation	
(P)	Public & Semi-public	
(W)	Water Resources	-2.4 *****4.2
(U)	Urban Inactive	
(T)	Transportation	
(R)	Residential	

[1] Source: Aero Service, Phila., Pa., air photo No. 2032 21 660, Apr. 16, 1975
SCS, Schoharie County, air photo, 1960

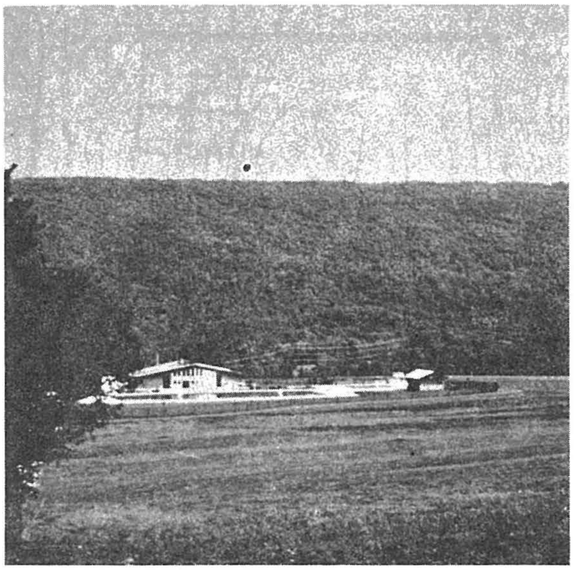


FIG. 7.1.1. General view of the ROW and adjacent forest, looking southeast, in summer, 1975 (Photo Station 1).

FIG. 7.1.2. General view of structure opening at tower 8 (GNS 1-1-8), in summer, 1975 (Photo Station 9).

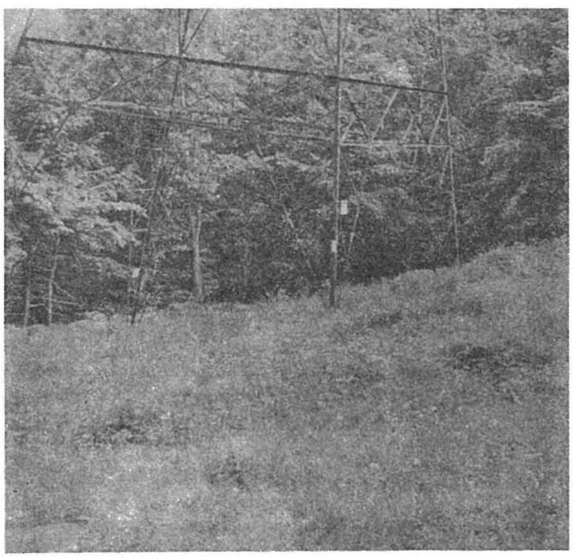


FIG. 7.1.3. Bank cut at tower 7 (GNS 1-1-7) showing slight and moderate sheet and rill erosion, in the summer of 1976.

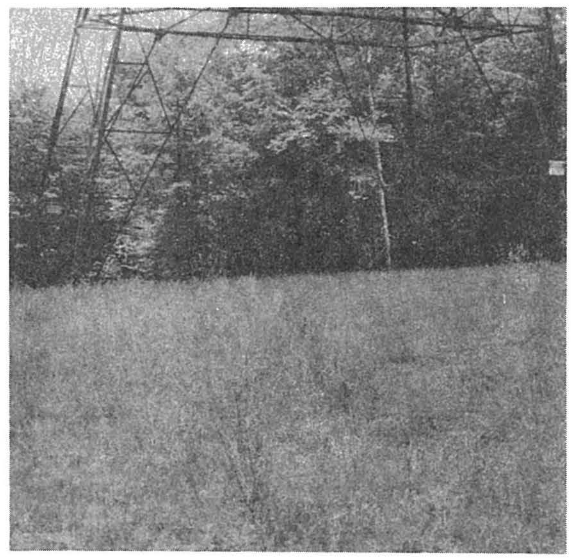
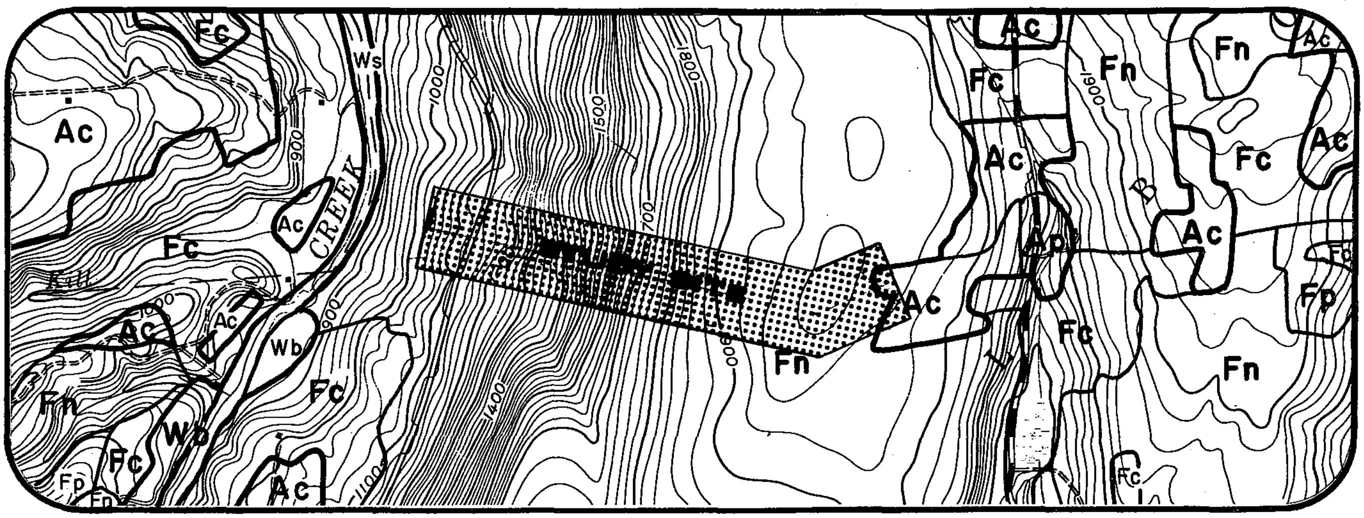


FIG. 7.1.4. General view of structure opening at tower 6 (GNS 1-1-6), in summer of 1976.

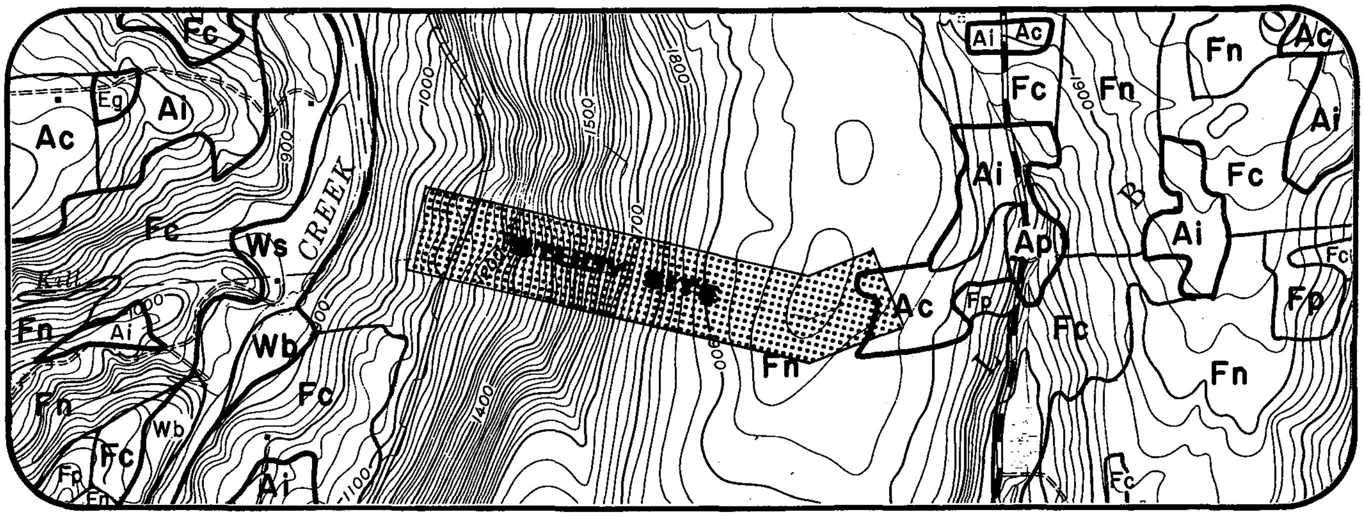
FIG. 7.1.5. General view of structure opening at tower 7 (GNS 1-1-7), in summer of 1976.

FIG. 7.1.6. Deer pellets in snow on ROW at tower 8 (GNS 1-1- 8).

FIG. 7.1. Visual characteristics.



LAND USE PRIOR TO ROW CONSTRUCTION (1960) 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

EXTRACTIVE INDUSTRY LAND USE
- Eg - Sand and gravel pits

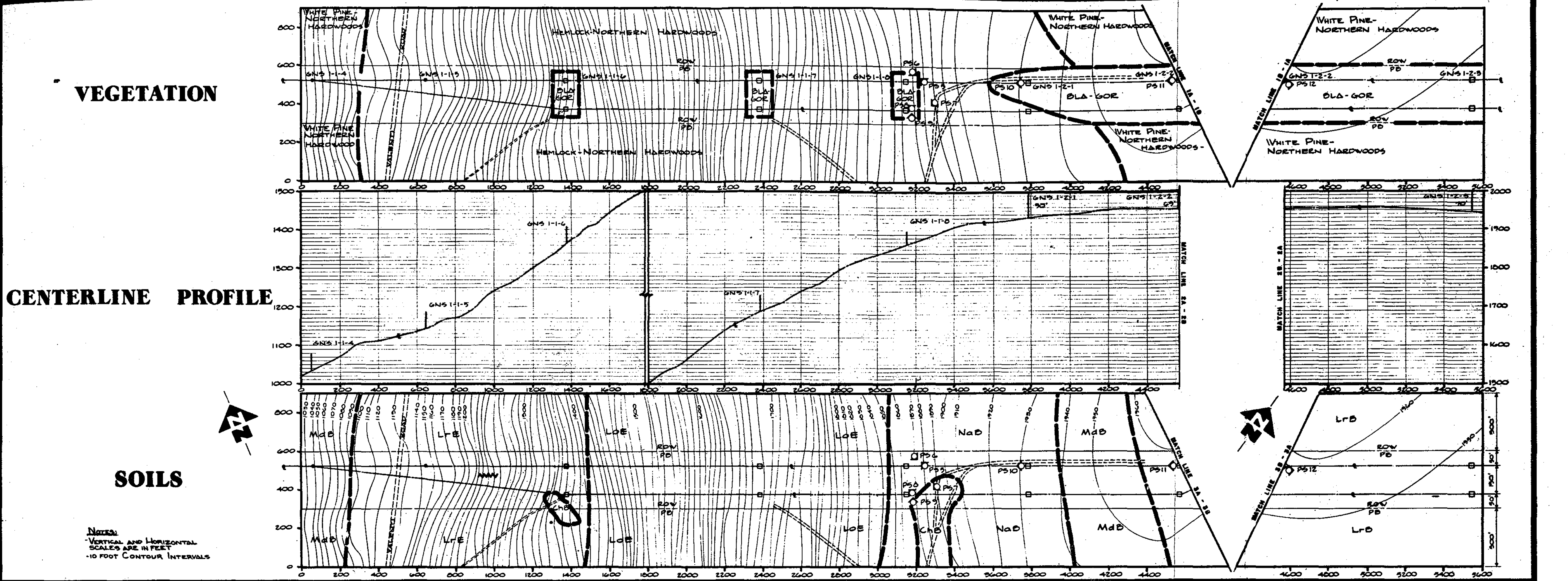
FOREST LAND
- Fc - Forest brushland
- Fn - Forest lands
- Fp - Plantations

WATER RESOURCES
- Wb - Marshes, shrub wetlands and bogs
- Ws - Streams and rivers

SOURCES:
- Aero Service, Phila., Pa., air photo No. 2032 21 660, Apr. 16, 1975
- SCS, Schoharie County, air photo, 1960
- Area Land Use Map, LUNR, Cornell University, N.Y., 1974
- U. S. G. S. Topographic Map, Gilboa, N.Y., 1945

Fig. 7.2. Land use change.

ASPLUNDH ENVIRONMENTAL SERVICES
BLAIR MILL ROAD WILLOW GROVE, PA



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
- 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

LoE	LORDSTOWN channery silt loam (35 to 50%)
LrB	LORDSTOWN-OQUAGA-NASSAU channery silt loam (8 to 15)
LrE	LORDSTOWN-OQUAGA-NASSAU " " " (35 to 50)
MdB	MARDIN channery silt loam (8 to 15% slope)
NaB	NASSAU shaly silt loam (8 to 15% slope)
ChB	CHIPPEWA stony silt loam (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*
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

Power Authority-State of N.Y.-Engineering Plan & Profile 9/25/70

USGS 7.5 min Topographic Map Gilboa N.Y. 1945

USDA SCS in cooperation with Cornell Univer. Agr Exp Sta Soil Survey for Schoharie Co N.Y. 4/69

Aero Service, Phila. Pa. Schoharie Co N.Y. Air Photo No 2032-21-660 (Scale 1:18000) Apr. 16, 1933

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 7.1

SITE 7 HABITAT CONDITIONS

UTILITY: Power Authority State of New York

ROW DESCRIPTION: Gilboa to New Scotland 345 KV

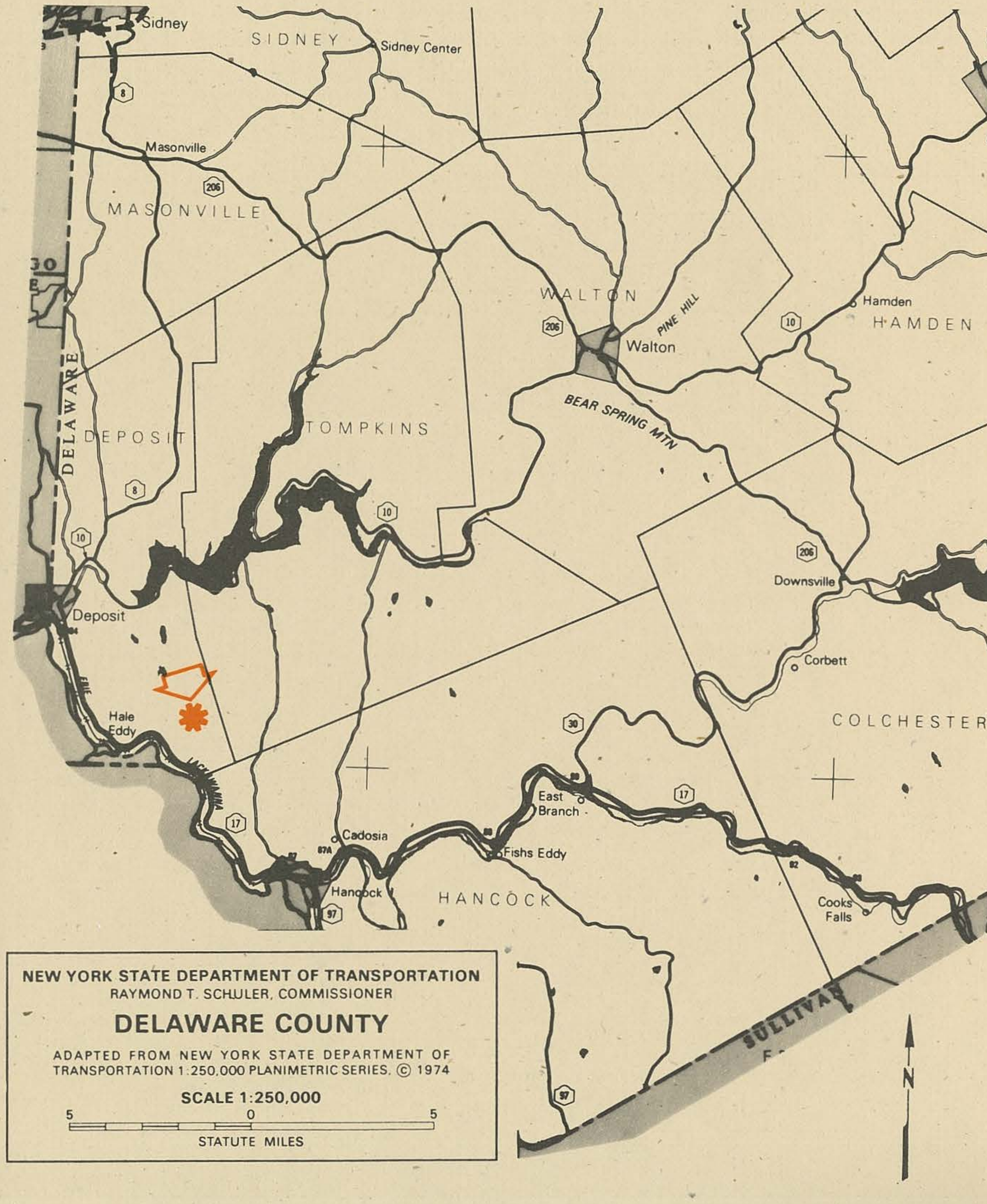
Steel Lattice 500' ROW

SCALE: 1"=200'-0"

200 100 0 100 200 400 800 1000

SITE 8

HANCOCK to STILESVILLE



Site 8 Hancock to Stilesville

Study area extends from Rush Road (structure 36) southeast to structure 29, in the vicinity of Hancock. To reach the area, take route 17 east toward Hancock. Take a left turn at "Joe's Jip Joint" onto Rush Road and proceed about one mile to the study area, which is east of Rush Road.

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Site 8 Hancock to Stilesville

1 Introduction

Site 8 is located in the Catskill Mountain 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. 8.1.1 and 8.1.2.

The topography of the area varies from steep slopes to more gently rolling terrain. The lands are rocky, with mountainous slopes (Stout, 1958).

The typical forest type of the region is Northern Hardwoods (Stout, 1958). Also found on the site are Oak-Northern Hardwoods, Hemlock-Northern Hardwoods, and Hemlock-Yellow Birch forest types.

2 Location and Identification

Site 8 is approximately 4 miles southwest of Kelsey in the town of Hancock, Delaware County, New York (75° 20' 00" W. Longitude; 42° 01' 30" N. Latitude).

The site is on the Hancock to Stilesville ROW which is operated by the New York State Electric & Gas Corporation (NYSEG). This 150-foot easement consists of 1 single circuit, 115 kV line, having wood pole H-frame structures. The project site is approximately 5,000 feet in length and extends from structure 29 (north of Rush Road) to Rush Road (south of structure 35).

3 Background

The following discussion outlines documentable management techniques of clearing, construction, restoration, and maintenance for site 8, as received from NYSEC (letters dated January 12 and October 26, 1976, from Robert L. Malecki, New York State Electric & Gas Corporation, Ithaca, N.Y.). All available pertinent information and cost data are included under each operation of clearing, construction, restoration, and maintenance.

3.1 Clearing

Under contract agreement, the ROW was clear cut to the "cutting line" between June and November, 1962. Trees and brush less than 6 inches in diameter were piled and burned on the ROW. Logs 6 inches or greater in diameter and suitable for saw timber were cut into standard log lengths and saved. Clearing and disposal was completed at an average cost of $400 per acre.

Following clearing, stump treatment was completed using 2,4,5-Trichlorophenoxyacetic acid (2,4,5-T) in diesel oil at a concentration of 16 pounds of acid equivalent to 100 gallons of solution. An average of 45 gallons per acre was applied using power equipment at a cost of $50 per acre.

After the first growing season following clearing, the ROW had a follow-up basal spray using 2,4,5-T in diesel oil (16 pounds and equivalent to 100 gallons of solution) at a cost of $65 per acre.

3.2 Construction

Construction work started in November, 1962, and was completed in June, 1963. The section of this line which includes the study site had the structure material, with the exception of the poles, delivered to the site by helicopter. The helicopter was utilized for economic reasons associated with difficulty of access in this area. Records also show at the time of construction of this line the study site area was covered by over 2 feet of snow.

3.3 Restoration

No special restoration practices were employed.

3.4 Maintenance

In the summer of 1970, the ROW received a broadcast application of Tordon pellets. Work was performed by company personnel. No additional information is available.

4 General Reconnaissance

A general reconnaissance was made in accordance with the methodology and is set forth in Map 8.1 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 8.1 and described in Appendix 17. Specific reference is made to some of these photo stations throughout the report and illustrated in Fig. 8.1. 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 ROW opens up a vista through a uniform forest cover, and the entire area is attractively rugged within visible rock outcroppings. Located in a rural setting and near areas bordering the Delaware River which are utilized for recreational purposes, the ROW site is in an area sensitive to view. The ROW is visible from Rush Road as it crosses the road and an open field ascending a steep hill beyond. The ROW subsequently descends into a valley, and up another hill where it disappears from view. The potential number of people viewing the site is low, since it is in a rural area, and is located above and out of sight of Route 17.

5 Field Studies - Results and Discussion

5.1 Soils

5.1.1 Geology and Soils

Site 8, Hancock to Stilesville ROW, is located in Delaware County, in the Catskill Mountains (Cline, 1970) or, more specifically, in the Delaware

Hills subdivision of the Appalachian Upland as it borders the Catskill Mountains subdivision (Thompson, 1966). Bedrock geology is of Early Upper Devonina age, 395 to 345 million years ago, consisting predominantly of shale, siltstone, and sandstone (Broughton et al., 1973). All soil materials in this area have been transported to a greater or lesser extent by movements of glacial ice in past ages, and have developed in glacial till (Lounsbury et al., 1930).

Soils on this site are classified in the order Inceptisols, suborders Ochrepts (Culvers and Lackawana series), reflecting the absence of horizons of marked accumulation of clay and oxides of aluminum and iron, and Aquepts (Morris, Norwich, and Wellsboro series) which developed under wet conditions (Buckman and Brady, 1969; Soil Survery Staff, 1975). Soil series comprising the association of site 8 are Lackawanna-Oquaga-Wellsboro.[1] Brief descriptions (Anon., 1972; U.S. Dept. Agric., 1973; Lounsbury et al., 1930) of soil types occurring on the ROW study site (Map 8.1; Table 8.1) are:

Culvers stony silt loam (CuB)[2]: These soils developed in glacial till, on uplands of gently sloping to moderately steep terrain. Drainage is usually adequate, even though a compact dense subsoil is evident. In areas where this subsoil becomes a hardpan-like silt loam, drainage may be poor. Soil reaction in the surface mineral soil on this site was strongly acidic, pH 4.9. No Woodland Suitability Group designation was determined for Culvers stony silt loam; however, it is likely that tree rooting capacity is affected by the occurrence of a fragipan in the subsoil.

Lackawanna channery silt loam (LkB and LkD): Lackawanna soils developed in glacial till derived from a texture of red and gray, or from brown, sandstone, siltstone and shale, on gently undulating to steep glaciated landforms. Though drainage is good, these soils are underlain by a dense brittle fragipan which is slowly permeable. Soil reaction is strongly acid, ranging from pH 5.0 to 6.0 throughout a typical profile; it was pH 5.1 and 5.0 in the upper 3 inches on this site. On the steeper slopes, many rock outcrops occurred, and the surface was very rocky. Lackawanna soils with slopes of 15% or less are assigned to Woodland Suitability Group 3o1, indicating moderately high productivity for timber (Class 3) and no significant restrictions or limitations for woodland use or management (Subclass o). Lackawanna soils with a slope of 25 to 35%, however, are assigned to Woodland Suitability Group 3r3, and while productivity is moderately high, slope acts as a restriction or limitation.

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[1] Soils were sampled on this site on September 1, 1976, with the assistance of John Rathborn, Soil Conservationist for Delaware County, N.Y.

[2] Culvers silt loams and stony silt loams have been recently reclassified in conjunction with the new Delaware County meso map and accompanying Soil Interpretation Report, but as the old Culvers designation of the 1930 Soil Survey was deemed most accurate, it is used here, as opposed to the broad association outlined in the more recent report.

Morris stony silt loam (MoA): These soils developed in acid glacial till, on uniform to slightly convex uplands. Somewhat poorly drained, they evidence a thick fragipan at 12 to 18 inches. Soil reaction is medium to very strongly acid, and is pH 5.3 in the mineral soil on this site. Morris stony silt loam is in Woodland Suitability Group 3w2, designating, once again, moderately high productivity for timber, but significant limitations for woodland use or management because of excessive wetness due to restricted drainage.

Norwich silt loam (NoA): Norwich soils developed in firm glacial till that was derived from reddish colored shale and sandstone, at times with a thin mantle of water-laid sediments on the surface. They occupy nearly level areas, depressions, and sloping seepy spots. Poorly to very poorly drained, these soils are composed of about 6 inches of silt loam over a very slowly permeable silt loam in a very brittle fragipan. The seasonal water table ranges from the surface to 6 inches below. Generally strongly acid, soil reaction was pH 5.4 in the upper 3 inches on this site. In Woodland Suitability Group 5w2, Norwich silt loam has a low potential for timber productivity as a result of excessive water from restricted drainage and a high water table.

Wellsboro silt loam (WeB and WeD): Wellsboro soils formed in glacial till, on gently undulating to moderately steep areas. These soils are well drained, with a medium surface runoff and slow internal drainage, the latter due largely to the presence of a firm fragipan from 14 to 24 inches below the surface. These soils are generally strongly acid and range from less than pH 4.5 to pH 6.0; in the upper 3 inches of surface soil, reaction on this site was pH 4.8 and pH 4.5. Wellsboro soils generally exhibit greater stoniness in the surface soil, but are silt loams on this site where stones were cleared and the area with slopes of 15% or less was plowed or grazed. In areas of steeper slopes rock outcrops occurred, and the soil was very rocky. As with the Lackawana soils, Wellsboro soils are in Woodland Suitability Groups 3o1 and 3r3, designating moderately high productivity in both instances, but little or no restrictions were slopes do not exceed 15%, and limitations due to relief where slopes range from 25 to 35%.

5.12. Humus Types

Organic layers present on the soil surface of the ROW and adjacent woodland were measured on 2 mesic and 2 xeric upland locations. Average thickness of the organic layers and A1 horizon was based on 5 samples taken at each location (Table 8.2). 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 plot. Also, there is evidence of recent grading in the area of the hydric plot. In addition, evidence of brush piling and burning occurred at scattered locations throughout the ROW study area.

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, except for 1 location on the ROW where the humus layer was absent. Based on average thickness of the fermentation, humus, and A1 layers, the predominant humus type was classified a "thin duff mull with very shallow A1". On xeric 5, a "thin duff mull" was present in the forest, but the absence of a humus layer on the ROW resulted in a "very shallow medium mull". Otherwise, duff mull humus types were prevalent. Overall, for both mesic and xeric sites combined, organic layers were thicker in the forest, 1.8 inches, than on the ROW, 0.9 inches, due mostly to deeper litter and humus layers. They also differed in kind of material present, i.e., primarily tree parts in the forest, and 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 reduce thickness of organic layers on the surface soil. Elimination of the forest cover also resulted in a change in kind of organic material; however, in most instances, regrowth and persistence of a mixed grass-herb-shrub cover has maintained annaul 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 Hancock to Stilesville study area in September of 1976. Except for slight and moderate sheet and rill erosion occurring at 2 locations in 1 soil type off the ROW and along an access road bank cut, 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, active erosion was observed at only 1 steep slope location 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 mainly of grasses, with herbs and low shrubs, had developed on the general ROW following chemical treatments for brush control, and a protective litter mulch from these plants was present (Table 8.2).

Specific eroding areas on the ROW were identified as to location, soil type, average slope, and present plant cover (Table 8.3). Erosion was classified as to kind (sheet, rill, gully) and class (slight, moderate, severe); average depth of gullies was recorded and the location of 1 major gully was plotted on the base map, as were major eroding areas (Map 8.1). Active erosion on the ROW as limited to areas that had been subjected to past and/or recent mechanical disturbance of the soil, i.e., access roads and equipment cuts probably made during ROW construction on this site (Table 8.3; Figs. 8.1.3 and 8.1.4). Small amounts of sediment resulting from erosion left the ROW and adjacent woodland via small streams, particularly that sediment following access roads ruts. Erosion and sedimentation on stream banks and flood plains is discussed in the section on water quality.

There was no restoration in the form of seeding and planting following construction of the ROW; therefore, denuded areas were dependent on natural plant invasion. Some grass cover has developed on access roads; however, recent use by recreational vehicles has resulted in rutting which provides runoff channels and subsequent gully erosion in sloping segments of the road

Areas exhibiting progressive sheet erosion on these excavations apparently were devoid of vegetation and berock was exposed, but natural succession has partially healed them with moss-mixed grass-herb cover. There were no areas of mass land movement such as landslides observed on this site.

5.2 Vegetation

5.2.1 Habitat and Forest Types on the Site

Hydric Habitat The hydric, or wet, habitat was located in an area between 2 large hills. Slope was approximately 8% on a northwest-facing slope. Drainage was moderately good but past equipment grading may have caused a somewhat poorly drained condition over most of the area. There is a fragipan in the soil type which also aided in the formation of the hydric habitat. The forest type was Hemlock-Yellow Birch.

Mesic Habitat There were 2 mesic, or medium moist, habitats on this ROW. Mesic 2 habitat was located at the base of a large hill. Slope was approximately 5% on a southeast-facing slope. Drainage was somewhat poor. The forest type was Hemlock-Northern Hardwoods. Mesic 3 habitat was located at the base of a large hill. Slope was approximately 15% on a northwest-facing slope. Drainage was good and the forest type was Hemlock-Northern Hardwoods.

Xeric Habitat There were 2 xeric, or dry, habitats on the ROW. Xeric 4 habitat was located on the top of a large hill. The slope was negligible and the aspect was flat. Drainage was moderately good to excessive as it occupied the top of a hill and water drained quickly on 3 sides. The forest type was Oak-Northern Hardwoods. Xeric 5 habitat was located on a ridgetop and drainage was excessive due to runoff. Slope was approximately 8% on an east-facing slope. 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. 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. 8.2), and an herb layer.

In order to more completely characterize the forest types, an analysis was made of the forest plots to derive importance values for tree species (Table 8.4).

On the hydyric habitat, a Hemlock-Yellow Birch forest type was changed to a Spiraea-Sensitive Fern plant community. On the mesic habitats, Hemlock-Northern Hardwoods forest type was changed to a Blackberry-Goldenrod plant community. On the xeric habitats, an Oak-Northern Hardwoods forest type was changed to a Blueberry-Sweet-fern community (Map 8.1; Table 8.5).

Quantitative Changes There was no major increase in the number of shrub species on the hydric habitat on the ROW as compared with the adjacent forest (Table 8.5; Figs. 8.3 and 8.4). There was a marked increase in the number of herb species on the ROW, namely, 10 species in the forest as compared to 20 on the ROW. There was marked increase in the number of shrubs on mesic 2 habitat while there was no major increase in the shrub species on mesic 3 habitat. There was no major increase in the number of herbs on mesic 2 and 3 habitats on the ROW. On xeric 4 and 5 habitats, there was no major increase in the shrub species on the ROW as compared to the forest. However, there was a major increase in the number of herbs on the ROW as compared to the forest (Table 8.5; Figs. 8.3 and 8.4).

Qualitative Changes On the hydric habitat (1), 5 shrub and herb species occurred both in the forest and on the ROW (Fig. 8.5), while 2 shrubs appeared in the forest but were absent from the ROW (Table 8.6). On the other hand, 3 shrubs occurred on the ROW but not in the forest (Table 8.7). In the herb layer of the hydric habitat, 5 species occurred in the forest but not on the ROW; 15 species appeared on the ROW but not in the forest (Tables 8.6 and 8.7).

On mesic 2 habitat, 8 shrub and herb species occurred both in the forest and on the ROW (Fig. 8.5), while 1 shrub, teaberry, appeared in the forest but was absent from the ROW (Table 8.6). On the other hand, 6 shrubs occurred on the ROW but not in the forest (Table 8.7). In the herb layer, 6 herbs occurred in the forest alone, while 9 occurred on ROW only (Table 8.6 and 8.7).

On mesic 3 habitat, 7 shrub and herb species occurred both in the forest and on the ROW (Fig. 8.5), while no shrubs appeared solely in the forest (Table 8.6). Only 1 shrub, raspberry, occurred on the ROW but not in the forest (Table 8.7). In the herb layer, 7 species occurred in the forest but not on the ROW; 13 species appeared on the ROW but not in the forest (Table 8.5).

On xeric 4 habitat, 5 shrub and herb species occurred both in the forest and on the ROW (Fig. 8.5), while 2 shrubs, blueberry and teaberry, appeared in the forest but were absent from the ROW (Table 8.6). On the other hand, 5 shrubs occurred on the ROW but not in the forest (Table 8.7). In the herb layer, 4 species occurred in the forest but not on the ROW; 11 species appeared on the ROW but not in the forest (Table 8.5).

On xeric 5 habitat, no shrub and herb species occurred both in the forest and on the ROW (Fig. 8.5), while 3 shrubs appeared in the forest but were absent from the ROW (Table 8.6). On the other hand, 3 shrubs occurred on the ROW but not in the forest (Table 8.7). In the herb layer, 4 species occurred in the forest but not on the ROW; 14 species appeared on the ROW but not in the forest (Table 8.5).

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

Table 8.8 presents a breakdown of major vegetational communities (Map 8.2) for hydric, mesic, and xeric plots on the Hancock to Stilesville ROW. Much of the present composition of herbaceous and woody plant communities reflects the treatment history. The ROW was cleared in 1962 and 1963. The area cleared was stump treated immediately following the original clearing and following the first growing season; thereafter, the brush was chemically treated to produce a 95% brush-free ROW. The chemical used was 2,4,5-T in diesel oil, 16 pounds per 100 gallons solution. Since that time, the ROW received 1 application of Tordon pellets in the summer of 1970. The pellets were broadcast.

The major plant community occupying the hydric plot was Sedge-Mixed Grass-Herb. On the 2 mesic plots, Mixed Grass-Herb and Hay-scented Fern were large components of the vegetation on these areas. The major plant communities occupying the 2 xeric locations were Whorled Loosestrife and Everlasting-Mixed Grass-Herb. These plants are apparently relatively resistant to herbicides and will most likely be an integral part of the vegetation on this ROW in the future if chemical maintenance is maintained.

5.2.4 Comparison of Forest Type with ROW Vegetation

The ROW was clear cut in 1962 to 1963 and received a stump treatment of 2,4,5-T in diesel oil at that time. The brush was also chemically treated with the same solution during the first year after clearing. One broadcast appliation of Tordon pellets was applied in 1970, during the summer.

The general impact of the above treatments of the ROW was to change the forest types to shrub-herb-grass communities. Some plants of the forest were replaced by plants favored by open conditions.

On the hydric habitat, which was formerly occupied by a Hemlock-Yellow Birch forest type, a Spiraea-Sensitive Fern community was produced. There was no significant change in the total number of shrub species on the ROW as compared with the forest. However, there was a marked increase in the number of herbs 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 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 8.5).

On the mesic habitats, which were formerly occupied by Hemlock-Northern Hardwoods forest type, a Blackberry-Goldenrod community was produced. There was a significant change in the number of shrub species on the mesic 2 habitat, and no marked change on the mesic 3 habitat. There was a slight change on mesic 2 habitat, and a larger change on mesic 3 habitat in the total number of herbs on the ROW as compared to the forest. There was also a qualitative difference in the shrub and herb species on the ROW as compared to the forest (Table 8.5).

On the xeric habitats, which were formerly occupied by an Oak-Northern Hardwoods forest type, a Blueberry-Sweet-fern plant community was produced. There was no significant change in the total number of shrub species on the ROW as compared with the forest. There was 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 shrubs of the ROW lacking from or sparse in the forest (Table 8.5).

5.3 Wildlife

The major game species for site 8, Hancock to Stilesville, as determined by Asplundh Environmental Services (AES) in conjunction with the Department of Environmental Conservation (DEC), are white-tailed deer, gray squirrel, and raccoon.

5.3.1 Actual Use

White-tailed Deer White-tailed deer data consisted of direct and indirect observations. Deer activity was heavy during the spring of 1975. Numerous deer were seen running across the ROW and in the forest. Most woody plant material was browsed by the deer when within reach. During the summer of 1975, numerous deer were observed (Fig. 8.1.5) on the study area browsing and running to escape cover. Deer browse and pellet groups were heavy throughout the study area at this time both on the ROW and in the forest.

Deer activity was heavy during the fall of 1975 on the study area. On September 25, 1975, 7 deer were observed browsing on and off the ROW. On October 3, 1975, 17 deer were seen feeding on and crossing the ROW. On November 10, 1975, 17 deer were seen on the study area. On November 11, 1975, 4 deer were observed on the ROW, feeding.

Deer activity was moderate on the study area during the winter months. Tracks, in the snow near photo station 11, indicated that dogs were chasing deer. Bobcat tracks were also found in the same area at this time. Deer pellets were found in moderate abundance at this time. Some tracks and pellets may have been covered with snow.

Deer activity was high during the spring of 1976. Deer were seen during each site visitation, feeding and running across the ROW. Deer pellets were heavy throughout the study area at this time. One deer carcass was found on the ROW between structures 32 and 33. A second carcass was found on the interior adjacent woods not far from the carcass on the ROW. Based upon the development of their tooth structure, indicating they were young deer, and upon the state of decay, they were probably born in the spring of 1975 and died in the fall of 1975. As they were found in an area leased by a hunting club in the general vacinity of a deer blind, it is likely their demise stemmed from that source.

Pellet Counts On November 11, 1975, a total of 30 deer pellet plots were established at site 8, Hancock to Stilesville.

An equal number of plots were established in the upper woods (10) (5 in the interior woods and 5 at the ROW edge), on the ROW (10), and in the lower woods, (10) (5 in the interior woods and 5 at the ROW edge). Plots were established longitudinally, horizonally, and obliquely, at random. These pellet plot locations were established 200 feet apart, starting 8 feet east of tower 34 and ending 21 feet west of tower 32. Each plot was 12 x 72.6 feet (Giles, 1969; Smith, 1974). The corners of each plot were marked with red ribbon attached to wire and inserted flush with the ground. All 30 pellet plots were raked and all old pellet groups removed.

Plots were reexamined on April 7 and 8, 1976. All new pellet groups were recorded for each plot location. Plots were examined before the growing season, at the most favorable time, when plant growth, leaf fall, and so on were least likely to interfere; this reduced the chance of human error in pellet group counting. Each plot was divided in half longitudinally, for greater ease in counting pellets, as each half was then examined.

After the deer pellet groups were counted, this information was applied in the following manner. A formula was utilized in which:

$$t = \frac{1\ y}{na'}$$

where:

y = sum of pellet groups counted over the plots
a'= area of one plot
n = number of plots
t = pellet groups per unit area.

In order to determine the value for t, t is translated to total deer days of use by:

a. assuming a defecation rate of 14 pellet groups/deer/day;
b. determining the period, the number of days, over which the pellet groups were deposited (149 days); and
c. dividing t by the defecation rate to obtain days of utilization by deer per area (Smith, 1974; Giles, 1969).

Pellet group information indicated a high actual use of all 3 areas, ROW, ROW edge, and woods, at site 8.

A total of 66 pellet groups were found on the plots located on the ROW; 86 pellet groups were found at the ROW edge; and 75 pellet groups were found in the interior woods (Table 8.9).

There was more deer activity at the ROW edge and in the interior woods to the north of the ROW than on the ROW (Table 8.10). Deer activity on the southside of the ROW was similar on the ROW, at the ROW edge and in the interior adjacent woods (Table 8.10).

Total deer day use was lowest on the ROW, 23, highest at the edge, 31, and 27 in the interior adjacent woods (Table 8.11).

The group t-test showed no significant difference among all 3 areas, namely, the ROW, ROW edge, and interior woods.

Browse Survey Ten browse transects were established on study area 8 (Tables 8.12 and 8.13; Fig. 8.6), on April 12, 1976. Two transects were established at each permanent study plot location, 1 on each side of the ROW.

Overall browse utilization was fairly uniform between the ROW, ROW edge, and woods (Tables 8.12 and 8.13). There were more woody stems available and more taken at the ROW edge than in the woods or on the ROW. There were more stems available and more taken by the deer on the ROW than in the woods. Total browse utilization was high, 75 percent (Table 8.12; Fig. 8.6).

Raspberry, sweet and yellow birches, sweet-fern (Fig. 8.1.6), beech, and blackberry were the most abundant species present (Table 8.13). Hazelnut, sweet-fern, sweet and yellow birches, serviceberry, blueberry, and mountain-laurel were heavily used by the deer and were quite abundant. White oak and red oak, American hornbeam, red maple, striped mapel, witch-hazel, and American hop-hornbeam were heavily used, but were not as abundant as those species previously mentioned (Table 8.12).

Gray Squirrel One gray squirrel was seen running off the ROW to the north woods near structure 33 during the spring of 1976. No other squirrels were observed on the study area during the period of the study.

Raccoon No raccoon activity was observed during the period of the study.

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 8.14. During the spring of 1975, 3 timber rattlesnakes were seen sunning on rocks on the

ROW. Evidence of horseback riding was noted near structure 29.

During the fall of 1975, one red-spotted newt (eft stage) was observed walking near Travis Brook in the interior woods to the north of the ROW. Turkey vultures were observed flying over the study area during this time.

During the winter of 1976, cottontail rabbit tracks were moderate to heavy both on and off the ROW. The only birds observed at this time were black-capped chickadees.

During the spring of 1976, cottontail rabbit pellets were found in moderate abundance both on and off the ROW. One woodchuck was sighted on the ROW as he ran to escape cover in his burrow. Two red-tailed hawks were observed perched on tower structure 35. Sharp-shinned hawks and sparrow hawks were also seen during this period. One owl casting was found in the woods near a deer stand to the north of the ROW. Turkey droppings were found in the woods near a deer stand to the north of the ROW. Turkey droppings were found in the interior woods in slight abundance to the south of the ROW. Chipmunk activity was slight off the ROW during this period of time. One fox scat was found on the access road on the ROW between structures 32 and 33

5.3.2 Potential Use

Potential wildlife use of the plant species present on site 8 for the 3 major game species, deer, squirrel, and raccoon, is contained in Table 8.15. 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. Asterisk ratings from the east and northeast were used for squirrel and raccoon. 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

Travis Brook on the Hancock to Stilesville site was sampled for water quality on September 25, 1975, and January 28, May 19, and August 3, 1976 (Table 8.16, Map 8.1).

5.4.1 Stream Description and Sampling Points

Travis Brook is a first order stream on the ROW, and is a tributary of the West Branch Delaware River. Stream gradient is 9.1%.

Sampling locations were sited on Travis Brook as follows:

1. 100 yards upstream, northeast, of the ROW;
2. upstream, northeast, edge of the ROW;
3. mid ROW;
4. downstream, southwest, edge of the ROW;
5. 100 yards downstream, southwest, of the ROW (Map 8.1).

At sampling locations 2 and 3, water temperature, dissolved oxygen concentration, and pH were the only parameters monitored.

Locations 1 and 5, located in a Hemlock-Northern Hardwoods forest, are heavily shaded. Common vegetation includes hemlock, yellow birch, red maple, American hornbeam, wild lily-of-the-valley, twisted-stalk, and mosses and ferns. Locations 2 and 4 receive partial shading from the overstory canopy present in the adjacent woods and from saplings at the edge of the ROW. Sampling location 3 is not well shaded, but most of the brook on the ROW is shaded by herbs. Common vegetation on the ROW includes blackberry, goldenrod, sedge, grasses, ferns, and mosses.

The substrate is predominantly rubble and gravel, and organic material is common (Environmental Protection Agency, 1973). Rocks, fallen logs and branches, and vegetation trap sediment. Upstream of the ROW numerous small tributaries are present and in the remaining area the Brook is confined to 1 stream. A "natural ford" is located immediately upstream of location 3.

The brook is presently utilized by wildlife. The New York Department of State "official classification" of Travis Brook is Class D, Agricultural and/or Industrial Water Supply.

5.4.2 Analysis of Water Quality

Site 8 was sampled on September 25, 1975, from 8:30 to 9:50 a.m. (Table 8.16). Rain for 60 hours preceded sampling; the stream was swollen and water was flowing over the banks. Water temperature was 9.5 C at location 1 and 10.0 C at locations 2 through 5. Dissolved oxygen concentration and percent saturation were high, and averaged 12.6 ppm and 121%, respectively. The pH measured at locations 1, 2, and 3 averaged 6.3. Stream depth at location 1, 3, and 5 was 12, 6, and 9 inches, and width was 11.5, 7.0, and 14.5 feet, respectively. Little turbidity was noted in the brook and limited erosion occurred in ruts on the access road. Sediment stakes were placed at location 1, 3, and 5.

On January 28, 1976, sampling was conducted during snow from 9:30 to 10:40 a.m. (Table 8.16). Water temperature was at or near freezing. Dissolved oxygen and percent saturation were high, and averaged 13.8 ppm and 103% respectively. The pH was low, and ranged from 4.6 to 4.7 at locations 1, 2, 4, and 5. The pH at location 3 was 5.3. Eight to 24 inches of snow covered the ground. Rain on January 27 caused the stream to swell. No sediment was found.

Sampling on May 19, 1976, was conducted from 12:10 to 1:10 p.m. (Table 8.16). Air temperature was 2 C and it was snowing. Stream depth at locations 1, 3, and 5, was 3, 5, and 10 inches and width was 3.0, 3.3, and 7.5 feet, respectively. Water temperature increased from 6.0 C at location 1 to 8.0 C at location 5. Dissolved oxygen concentration and percent saturation were high and ranged from 10.4 to 11.8 ppm and from 91 to 109%, respectively. The pH at locations 1 through 4 ranged from 4.8 to 4.9 and at location 5 the pH was 5.3. No sediment was present at location 1, but leaves were trapped against the stake. At locations 3 and 5, 1 1/8 and 1/2 inches of sediment were measured, respectively.

Air temperature on August 3, 1976, was 26 C; it was sunny and sampling was conducted from 2:25 to 3:05 p.m. (Table 8.16). The stream volume was the lowest observed. Depth at location 1, 3, and 5, was 3, 4, and 8 inches, and width was 2,3, 2.5, and 6.0 feet, respectively. Water temperature at location 1 was 13.0 C, 13.5 C at location 2, and 14.0 C at location 3, 4, and 5. Dissolved oxygen concentration and percent saturation ranged from 6.4 to 9.9 ppm and 66 to 104%, respectively. The pH ranged from 4.3 to 5.6. No additional sedimentation was present.

5.5 Land Use

5.5.1 Location

Site 8 is located in a rural nonfarm section of the town of Hancock, Delaware County, New York. Between 1960 and 1970 there was a 4.6% increase in population of Delaware County with a 1970 distribution of 25.8% urban, 63.4% rural nonfarm, and 10.8% rural farm (U.S. Bureau of the Census, 1972). The closest community is Kelsey, which is approximately 4 miles to the north.

5.5.2 Land Use Prior to Construction

The ROW was constructed during 1962 to 1963. The earliest available data obtained from 1955 aerial photography indicates that the land adjacent to the ROW was primarily rural nonfarm (Table 8.17; Fig. 8.7). Land use distribution included the following subtypes:

Agriculture:
- Ac - Cropland and cropland pasture

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

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

5.5.3 Land Use After Construction

The adjacent land use to site 8 has had a minimal change from the 1945 data. The land adjacent to the ROW is still rural nonfarm (Table 8.17; Fig. 8.7), with a land use distribution which includes the following subtypes:

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

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

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

In addition to use of the ROW for the transmission of electrical power, portions of the ROW are currently being used for hunting, inactive agricultural land, horseback riding and other recreational uses.

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

The adjacent forest, which represents conditions on this area before ROW clearance in 1962, occupies rolling and hilly terrain with northeast- and southwest- facing slopes bordering the Catskill Mountains. The acid, predominantly silt loam soils developed in a thin mantle of galcial till dominated by sandstone and shale. Rock outcrops are common on steep upper slopes. Natural forests present on the area related closely to soil types and moisture regimes. Oak-Northern Hardwoods occupy xeric hilltops in association with moderate to steep-slope phases of Lackawana and Wellsboro soils; predominantly Hemlock-Northern Hardwoods occur on mesic mid-slope phases of these soils as well as on the imperfectly drained Morris soils in low lying areas. The Hemlock-Yellow Birch forest type is associated with the imperfectly drained Culver soils on hydric lower slopes and seepage areas. All soils, except Norwich which was used for pasture in 1976, are rated by the Soil Conservation Service as moderately high for timber production with some management limitations on steep and/or wet phases.

Under undisturbed conditions, the forest floor consisted of tree litter and other organic layers that were 2.1 and 1.5 inches thick on mesic and xeric sites, respectively, with a very thin A1 horizon. The predominant humus type was a "thin duff mull with very shallow A1". Active erosion under the natural forest was limited to occasional small areas of sheet and rill erosion on 15 to 30% slope segments of Wellsboro silt loam soil where litter cover was light or missing. Otherwise, no erosion was evident on all soil types and slopes in the forest.

6.1.2 Vegetation

Where the terrain is relatively level, this ROW passes through active agricultural land. The steeper slopes, where the study areas are located, were in forest for many years prior to corridor clearing.

On hydric sites, prior to ROW clearing, pole-stage stands of Hemlock-Yellow Birch were the major forest type. Northern Hardwoods stands with lesser amounts of Hemlock occurred on mesic sites. On xeric sites Oak-Northern Hardwoods mixtures were dominant. The major species in these stands were red, black, white, and chestnut- oaks; beech; and red maple.

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 compostion of the forested areas adjacent to the ROW. It can be assumed that those species that currently utilize the site, i.e., white-tailed deer, gray squirrel, and raccoon, occupied the habitat before ROW construction. Even though the presence of the ROW may influence current wildlife activity, it is likely that those, designated by the DEC in conjunction with AES as major in this area, inhabitated 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 prior to the construction of the ROW in 1962 to 1963 is 1955 aerial photography. The ROW and adjacent land area was rural nonfarm with a land use distribution of agriculture (7.7%), public and semi-public (.2%), and forest land (92.1%).

6.2 Conditions Which Exist at Present

6.2.1 Soils

Physical land features, soil types, and associated drainage patterns described under natural forest conditions also are characteristic of the ROW at the present time. Distinct plant communities developed in association with soil types on the ROW; Blueberry-Sweet-fern occurred on upland xeric phases of Lackawana and Wellsboro soils; Blackberry-Goldenrod on sloping mesic phases of these soils and on the imperfectly drained Morris series; and Spiraea-Sensitive Fern in wet depressions and seepage spots of Culvers silt loam.

Soils on the general ROW, essentially undisturbed portions, are covered with an organic mulch, about 1 inch thick, from grass, herb, and shrub litter. Although surface organic layers and soil-incorporated organic matter are thinner on the ROW, the humus type, "thin duff mull with very shallow A1", is consistent with that in the forest. Soil erosion on the general ROW, as with the natural forest, was negligible; only 1 area of moderate erosion was observed. On disturbed segments of the ROW, however, erosion was occurring at numerous locations on most soil types and slopes. The most frequent occurrence is along access roads and equipment cuts where mineral soil was exposed and plant cover is sparse. Rutting of access roads by recent vehicular use further aggravates the erosion problem. Small amounts of erosion sediment enter intermittent streams crossing the ROW.

6.2.2 Vegetation

Early stump treatments with 2,4,5-T in oil (1962, 1963), and the application of picloram pellets (1970), have resulted in a corridor dominated by low herbaceous vegetation. On hydric sites Sedge-Mixed Grass-Herb communities are the major cover. Within these communities patches of whorled loosestrife, sensitive fern, and interrupted fern are common, and in the wettest areas cat-tail froms a dense cover.

On mesic sites there are extensive areas of Mixed Grass-Herb communities, broken by colonies of hay-scented fern. Along the corridor margin woody plants are invading the hay-scented fern communities. These tree seedlings and shrubs include sweet birch, red oak, hazelnut, red maple, hawthorn, and yellow birch. Areas of open soil are being invaded by hair-cap moss or by various grasses and herbs.

Whorled loosestrife covers vast areas on xeric sites. Within these communities are scattered centers of hay-scented fern and sweet-fern. Mixed Grass-Herb and Everlasting-Mixed Grass-Herb communities are also abundant on these sites. Sweet birch, paper birch, and hair-cap moss are invading centers of open soil.

6.2.3 Wildlife

White-tailed deer, gray squirrel, and raccoon are the major game species that currently use the study area. Indirect observations for deer, i.e., browse, pellets, tracks, and carcasses, indicated that deer use the ROW area. Additionally, many deer were seen on the site. Browse survey indicated that more stems were available and more were taken at the ROW edge than either in the interior woods, or on the ROW. Stems of raspberry, sweet birch, yellow birch, sweet-fern, beech, and blackberry were most abundant, and all but raspberry and blackberry were heavily browsed. Also heavily browsed were American hornbeam, hazelnut, serviceberry, blueberry, and red oak. Deer pellet counts indicated that no significant difference occurred in the number of pellet groups among the ROW, the ROW edge, and the interior woods.

One gray squirrel was observed in the forest. No other squirrel activity, and no raccoon activity, were noted. A variety of other animals were observed, directly or indirectly, to be utilizing either the ROW, the adjacent forest, or both. Potential wildlife use was evident from plant species present on the site.

6.2.4 Water

Near the headwaters a 150-foot segment of Travis Brook is located on the Hancock to Stilesville ROW. Off the ROW the brook was shaded by a Hemlock-Northern Hardwoods forest. Most of the brook on the ROW is well shaded by herbs. Shade is sparse at the "natural ford" at mid ROW. Upstream of the ROW many tributaries were observed. Downstream of the ROW one channel dominates.

Generally, water temperature was warmer at the downstream sampling locations; the reason(s) for this was not evident. Increased water temperature was attributed to solar radiation only on August 3, 1976.

Dissolved oxygen concentration and percent saturation indicated good water quality. Generally, dissolved oxygen was greater at the downstream sampling locations. Only on August 3, 1976, at location 1, was dissolved oxygen concentration and percent saturation less than 8.5 ppm and 90%, respectively.

The pH ranged from 4.3 to 6.4, indicating the stream was acidic.

6.2.5 Land Use

Presently, the adjacent land uses to site 8 have had a minimal change from the 1955 data. The ROW and the adjacent land area is still considered to be rural nonfarm with a distribution of agriculture (3.4%), public and semi-public (.2%), and forest land (96.4%). With reference to the total area involved, shifts in land use are noted as follows:

Forest Land -	+4.3%
Agriculture -	-4.3%
Public and Semi-public -	no change

In addition to use of the ROW for the transmission of electrical power, portions of the ROW are currently being used for hunting and inactive agricultural land, horseback riding and other recreational uses.

6.3 Environmental Effect and Probable Causes

6.3.1 Soils

The most serious impact of ROW management is the continuing and progressive erosion occurring on access roads and equipment excavations with some sedimentation of intermittent streams on the ROW. Mineral soil on these areas was exposed during ROW construction and, since no restoration seeding was performed, vegetative stabilization is dependent on natural plant invasion. Recent use of access roads by "off-the-road" vehicles has caused ruts which in turn accelerate water runoff and erosion.

There was some reduction in thickness of organic layers and change in composition of litter on the ROW, but the duff mull humus type typical of the bordering forest persisted on the ROW.

6.3.2 Vegetation

The general impact of ROW management was to produce a Spiraea-Sensitive

Fern community on the hydric ROW habitat area in a Hemlock-Yellow Birch forest type. A Blackberry-Goldenrod community was produced on the mesic ROW habitat area from a Hemlock-Northern Hardwoods forest type; and a Blueberry-Sweet-fern community on the xeric ROW habitat areas from an Oak-Northern Hardwoods forest type.

The number of species (species diversity) increased on the ROW as compared with the adjacent forest on all habitat areas.

Important differences in kinds of species were recorded on the ROW and in the forest. Found only on the ROW were spiraea, blackberry, sweet-fern, goldenrod, sorrel, gooseberry, and pearly everlasting. Found only in the forest were such species as New York fern, Christmas fern, starflower, bog clubmoss, and teaberry. Striped maple was common in the forest but sparse or lacking 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

Increase in dissolved oxygen concentration and percent saturation at downstream sampling locations probably resulted from the combination of photosynthesis by aquatic plants on the ROW and turbulence created by downstream flow.

Erosion of the access road near the brook is probably accelerated by "off-the-road" vehicles.

Line Management Factors Shading by overstory vegetation was limited on the ROW.

Erosion of the access road was present near the "natural ford".

Other Influences Use of the access road by "off-the-road" recreational vehicles increases the possibility of erosion.

6.3.5 Land Use

Slight changes have occurred in land use (classification) within the area inventoried between 1945 data and 1976 field reconnaissance. Shifts in classification types indicate agricultural use is diminishing and forest land is becoming more predominant. More importantly, agricultural cropland and cropland pasture land immediately adjacent to and inhabiting the ROW in 1945 data, is completely forest brushland in 1976. This change is significant.

However, because data prior to construction of the ROW was obtained almost 17 years before construction, there is no data to indicate this change did not occur before the ROW was built. In addition, if this change occurred after the ROW was constructed in 1962, it cannot be determined that it occurred because of the ROW with this data.

The inventory area is still rural nonfarm in character and reflects the predominantly rural nonfarm character of Delaware County of 63.4%.

8.1. Soil series present on the Hancock to Stilesville study area.

Soil Series	Map Symbol[1]	Drainage Class[2]	Surface Soil pH	Surface Soil Texture	Woodland Suitability Group
Culvers	CuB	MG	4.9	stony silt loam	-
Lackawanna	LkB	G	5.1	channery silt loam	3o1
Lackawanna	LkD	G	5.0	channery silt loam	3r3
Morris	MoA	SPD	5.3	stony silt loam	3w2
Norwich	NoA	PD-VPD	5.4	silt loam	5w2
Wellsboro	WeB	MG	4.8	silt loam	3o1
Wellsboro	WeD	MG	4.5	channery silt loam	3r3

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 8.2. Average thickness of organic layers and A1 horizon and humus types for mesic and xeric sites on ROW and adjacent woodland of site 8.

Moisture Regime	Location	Layer Thickness (in.) L	F	H	A1	Humus Type
1. Mesic (2)[1]	ROW	.5	.1	.2	.2	Thin duff mull with very shallow A1
	Woodland	1.1	.2	.5	.6	Thin duff mull with very shallow A1
2. Mesic (3)	ROW	.7	.2	.2	.3	Thin duff mull with very shallow A1
	Woodland	1.1	.3	.8	.8	Thick duff mull with very shallow A1
All Mesic Plots Combined	ROW	.6	.2	.2	.3	Thin duff mull with very shallow A1
	Woodland	1.1	.3	.7	.7	Thin duff mull with very shallow A1
1. Xeric (4)	ROW	.5	.2	.1	.2	Thin duff mull with very shallow A1
	Woodland	.9	.3	.4	.6	Thin duff mull with very shallow A1
2. Xeric (5)	ROW	.4	.2	.0	.2	Very shallow medium mull
	Woodland	.4	.2	.5	.6	Thin duff mull with very shallow A1
All Xeric Plots Combined	ROW	.5	.2	.1	.2	Thin duff mull with very shallow A1
	Woodland	.7	.3	.5	.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 8.3. Areas exhibiting active erosion in September, 1976, on the Hancock to Stilesville 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	Wellsboro channery silt loam	29	Bare-grass-herb	Sheet	Moderate	-
Tower Site/Equipment Cut	Wellsboro channery silt loam	3	Bare	Sheet	Moderate	-
Access Road/ Equipment Cut	Wellsboro channery silt loam	5	Bare and healing	Gully	Moderate	8
Access Road (ruts)	Morris stony silt loam	8	Bare and healing	Sheet	Moderate	-
Access Road (intermittent stream)	Morris stony silt loam	7	Bare	Sheet	Moderate	-
Access Road (ruts)	Morris stony silt loam	5	Bare	Sheet	Moderate	-
Access Road (ruts)	Wellsboro channery silt loam	8	Bare-grass	Sheet	Moderate	-
Access Road	Culvers stony silt loam	7	Bare-grass-herb	Sheet & Gully	Moderate	4-6
Access Road	Culvers stony silt loam	23	Bare-grass-herb-moss	Sheet, Rill & Gully	Moderate	3

Table 8.3. Continued

Location	Soil Type	Average Slope (%)	Plant Cover	Erosion on Site: Kind	Erosion on Site: Class	Erosion on Site: Gully Depth (in.)
Access Road	Lackawana channery silt loam	32	Bare-grass-herb-moss	Sheet, Rill & Gully	Moderate	4
Access Road	Wellsboro channery slit loam	20	Bare-grass-herb-moss	Sheet & Rill	Moderate	-
Equipment Cut	Lackawana channery silt loam	3	Bare-grass-herb-moss	Sheet & Rill	Moderate	-
Equipment Cut	Lackawana channery silt loam	6	Bare-grass-herb-moss	Sheet	Moderate	-
		FOREST				
General Forest	Wellsboro channery silt loam	30	Bare	Sheet	Moderate	-
General Forest	Wellsboro channery silt loam	15	Bare-litter	Sheet & Rill	Slight	-
Bank Cut/ Access Road	Wellsboro channery silt loam	20	Bare	Sheet & Rill	Moderate	-

Table 8.4. 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	Hemlock	44.75	30	74.75
	Sweet Birch	34.50	25	59.50
	Red Maple	5.98	10	15.98
	Beech	5.98	10	15.98
	White Ash	5.24	10	15.24
	Quaking Aspen	2.15	5	7.15
	American Hop-Hornbeam	.98	5	5.98
	Red Oak	.42	5	5.42
Mesic 2	Red Oak	46.00	39	85.00
	Red Maple	31.00	39	70.00
	Large-toothed Aspen	23.00	22	45.00
Mesic 3	Beech	70.00	61	131.00
	Sweet Birch	27.00	29	56.00
	Hemlock	3.00	10	13.00
Xeric 4	Red Maple	34.62	41	75.62
	Red Oak	44.06	27	71.06
	Beech	13.11	23	36.11
	Black Oak	8.21	9	17.21
Xeric 5	Red Oak	82.59	44	126.59
	Red Maple	10.69	25	35.69
	White Oak	4.26	13	17.26
	Chestnut-Oak	1.45	6	7.45
	Large-toothed Aspen	.74	6	6.74
	Beech	.27	6	6.27

Table 8. 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) 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.A.	Xeric (4) Forest A.S.	Xeric (4) ROW A.S.	Xeric (5) Forest A.S.	Xeric (5) ROW A.S.
Tree Layer										
Red Maple	+.1	-	1.1	-	-	-	2.1	-	1.1	-
Hemlock	1.1	-	-	-	+.1	-	-	-	-	-
Beech	+.1	-	-	-	2.1	-	1.1	-	++.1	-
Sweet Birch	1.1	-	-	-	1.1	-	-	-	-	-
Yellow Birch	++.1	-	-	-	-	-	-	-	-	-
White Ash	+.1	-	-	-	-	-	-	-	-	-
American Hop-Hornbeam	++.1	-	-	-	-	-	-	-	-	-
Red Oak	++.1	-	1.1	-	-	-	1.1	-	1.1	-
Quaking Aspen	++.1	-	-	-	-	-	-	-	-	-
Larged-toothed Aspen	-	-	1.1	-	-	-	-	-	++.1	-
Black Oak	-	-	-	-	-	-	+.1	-	-	-
White Oak	-	-	-	-	-	-	-	-	1.1	-
Chestnut-Oak	-	-	-	-	-	-	-	-	++.1	-
No. Species	9	0	3	0	3	0	4	0	6	0
Shrub Layer										
Striped Maple	1.1	-	-	++.1	+.1	+.1	-	-	2.1	-
Witch-Hazel	+.1	-	2.1	1.1	+.1	+.1	2.1	++.1	1.1	-
Spiraea	-	1.2	-	2.4	-	-	-	+.2	-	-
Raspberry	-	+.3	++.1	+.1	-	3.2	-	-	-	-
Blackberry	-	1.1	-	+.1	-	-	-	+.2	-	++.1
Mountain-Laurel	-	-	2.4	++.1	2.5	2.1	-	-	-	-
American Hazelnut	-	-	2.1	2.3	-	-	+.1	1.1	-	-
Hawthorn	-	-	-	+.1	-	-	-	-	-	-
Gooseberry	-	-	-	+.1	-	-	-	2.1	-	(++.1)
Sweet-fern	-	-	-	2.3	-	-	-	1.3	-	-

Table 8.5. 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.	Xeric (4) Forest A.S.	Xeric (4) ROW A.S.	Xeric (5) Forest A.S.	Xeric (5) ROW A.S.
Blueberry	-	-	-	-	-	-	+.1	-	-	+.2
Teaberry	-	-	+.1	-	-	-	+.1	-	1.2	-
Arrow-wood	-	-	-	-	-	-	-	++.1	-	-
No. Species	2	3	5	10	3	4	4	7	3	3
Trees in the Shrub Layer										
Sweet Birch	2.1	1.1	+.1	3.1	-	3.1	1.1	3.1	++.1	2.1
Red Maple	2.1	-	2.1	1.1	+.1	+.1	2.1	1.1	2.1	2.1
Beech	+.1	-	-	-	3.1	1.1	3.1	+.1	+.1	1.1
Red Oak	-	-	2.1	2.1	-	-	2.1	1.1	3.1	2.1
Chestnut	-	-	-	+.1	-	-	-	-	-	-
Hemlock	-	-	-	-	+.1	-	-	-	-	-
Quaking Aspen	-	-	-	1.1	-	-	-	+.1	-	-
Yellow Birch	-	-	-	1.1	-	-	-	1.1	-	-
Gray Birch	-	-	-	+.1	-	+.1	-	1.1	-	-
Black Oak	-	-	-	-	-	-	+.1	-	-	-
White Oak	-	-	-	-	-	-	++.1	-	-	1.1
White Birch	-	-	-	+.1	-	-	-	1.1	-	-
Chestnut-Oak	-	-	-	-	-	-	-	-	-	1.1
Large-toothed Aspen	-	-	-	-	-	-	-	+.1	-	-
American Hop-Hornbeam	-	-	-	+.1	-	-	-	-	-	-
No. Species	3	1	3	9	3	4	6	9	4	6
Herb Layer[1]										
Interrupted Fern	1.2	+.2	-	-	-	2.2	-	-	-	-
New York Fern	1.4	-	-	-	-	-	-	-	-	-
Christmas Fern	+.2	-	-	-	-	-	-	-	-	-
Star-flower	+.1	-	1.1	-	1.1	-	-	-	++.1	-

Table 8. 5. Continued

Species	Hydric (1)		Mesic (2)		Mesic (3)		Xeric (4)		Xeric (5)	
	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
Sedge	1.2	3.2	-	-	-	-	-	++.1	-	+.1
Foamflower	1.2	+.2	(+.1)	-	-	1.4	-	-	-	-
Wild-Lily-of-the-valley	2.1	-	2.1	3.1	1.1	1.1	-	-	-	-
Mixed Grass	+.2	2.3	-	3.3	-	1.4	+.2	2.3	-	3.4
Twisted-stalk	+.1	-	-	-	-	-	+.1	-	-	-
Violet spp.	1.2	1.2	(1.2)	+.1	-	1.2	-	-	-	-
Whorled Loosestrife	-	+.2	-	2.4	-	1.2	+.2	3.4	-	1.2
Cat-tail	-	2.4	-	-	-	-	-	-	-	-
Cinnamon-Fern	-	+.2	-	-	-	-	-	-	-	-
Sensitive Fern	-	1.3	-	-	-	1.2	-	-	-	-
Rush	-	+.2	-	-	-	-	-	-	-	-
Horsetail	-	2.1	-	-	-	-	-	-	-	-
Pennsylvania Bitter-cress	-	++.1	-	-	-	-	-	-	-	-
Bluebead-Lily	-	(+.2)	-	-	-	-	-	-	-	-
Winter-Cress	-	+.2	-	-	-	1.2	-	-	-	-
Yarrow	-	+.2	-	-	-	-	-	-	-	-
Hay-scented Fern	-	2.3	-	3.4	+.3	4.5	-	2.4	-	3.4
Cinquefoil	-	2.2	-	-	-	-	-	-	-	-
Heal-all	-	+.1	-	-	-	-	-	-	-	-
Blue-eyed Grass	-	++.1	-	-	-	-	-	++.1	-	1.3
Strawberry	-	1.1	-	+.2	-	+.2	-	+.3	-	-
Marginal Shield-Fern	-	-	1.4	-	++.1	-	-	-	2.2	-
Dicranum scoparium	-	-	1.2	-	-	-	-	-	-	-
Hair-cap Moss	-	-	1.3	2.4	1.2	2.4	-	2.3	-	1.4
Mint spp.	-	-	++.1	1.5	-	1.3	-	-	-	-
Partridge-berry	-	-	++.1	-	+.2	-	1.1	-	+.2	-
Painted Trillium	-	-	++.1	-	++.1	-	-	-	-	-
Common Cinquefoil	-	-	-	1.2	-	+.2	-	+.3	-	-
Pearly Everlasting	-	-	-	2.3	-	-	-	1.3	-	2.4
Goldenrod	-	-	-	1.1	-	-	-	+.2	-	++.1
Sheep-Sorrel	-	-	-	1.4	-	1.2	-	-	-	-

Table 8.5. 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.	Xeric (4) Forest A.S.	Xeric (4) ROW A.S.	Xeric (5) Forest A.S.	Xeric (5) ROW A.S.
Thistle	-	-	-	++.2	-	-	-	-	-	1.1
Hypnum imponens	-	-	-	-	1.2	-	-	-	-	-
Bog Club-moss	-	-	-	-	3.4	-	-	-	-	-
Bristly Club-moss	-	-	-	-	++.1	-	-	-	-	-
Reindeer Lichen	-	-	-	-	++.1	+.2	-	-	-	-
Butter-and-eggs	-	-	-	-	-	++.1	-	-	-	-
Wood-Sorrel	-	-	-	-	-	+.1	-	-	-	-
Bracken	-	-	-	-	-	-	++.1	++.1	-	-
Large-leaved Aster	-	-	-	-	-	-	1.1	-	-	-
White Moss	-	-	-	-	-	-	1.2	-	+.2	-
Poverty-Grass	-	-	-	-	-	-	-	1.2	-	-
Columbine	-	-	-	-	-	-	-	++.1	-	-
Devil's Paint-brush	-	-	-	-	-	-	-	-	-	+.1
Hawkweed (yellow)	-	-	-	-	-	-	-	+.1	-	+.1
Upright Yellow Wood-Sorrel	-	-	-	-	-	-	-	-	-	+.1
Knotweed	-	-	-	-	-	-	-	-	-	+.2
Common Mullein	-	-	-	-	-	-	-	-	-	++.1
No. Species	10	20	10	13	11	17	7	14	4	14
Total No. Species										
Trees[2]	9	1	4	9	4	4	6	9	7	6
Shrubs	2	3	5	10	3	4	4	7	3	3
Herbs	10	20	10	13	11	17	7	14	4	14
Totals	21	24	19	32	18	25	17	30	14	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 8.6. 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	-
Witch-Hazel	+.1	-
Herbs[1]		
New York Fern	1.4	-
Christmas Fern	+.2	-
Star-flower	+.1	-
Wild-Lily-of-the-valley	2.1	-
Twisted-stalk	+.1	-
No. Species	7	
Mesic (2)		
Shrubs		
Teaberry	+.1	-
Herbs		
Star-flower	1.1	-
Foamflower	(+.1)	-
Marginal Shield-Fern	1.4	-
Dicranum scoparium	1.2	-
Partridge-berry	++.1	-
Painted Trillium	++.1	-
No. Species	7	
Mesic (3)		
Shrubs		
Herbs		
Star-flower	1.1	-
Marginal Shield-Fern	++.1	-
Partridge-berry	+.2	-
Painted Trillium	++.1	-
Hypnum imponens	1.2	-
Bog Club-moss	3.4	-
Bristly Club-moss	++.1	-
No. Species	7	

Table 8.6. Continued

Species	Forest A.S.	ROW A.S.
Xeric (4)		
Shrubs		
Blueberry	+.1	-
Teaberry	+.1	-
Herbs		
Twisted-stalk	+.1	-
Partridge-berry	1.1	-
Large-leaved Aster	1.1	-
White Moss	1.2	-
No. Species	6	
Xeric (5)		
Shrubs		
Striped Maple	2.1	-
Witch-Hazel	1.1	-
Teaberry	1.2	-
Herbs		
Star-flower	++.1	-
Marginal Shield-Fern	2.2	-
Partridge-berry	+.2	-
White moss	+.2	-
No. Species	7	

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

Table 8.7. 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	1.2	-
Raspberry	+.3	-
Blackberry	+.1	-
Herbs[1]		
Whorled Loosestrife	+.2	-
Cat-tail	2.4	-
Cinnamon-Fern	+.2	-
Sensitive Fern	1.3	-
Rush	+.2	-
Horsetail	2.1	-
Pennsylvania Bitter-cress	++.1	-
Bluebead-Lily	(+.2)	-
Winter-Cress	+.2	-
Yarrow	+.2	-
Hay-scented Fern	2.3	-
Cinquefoil	2.2	-
Heal-all	+.1	-
Blue-eyed Grass	++.1	-
Strawberry	1.1	-
No. Species	18	
Mesic (2)		
Shrubs		
Striped Maple	++.1	-
Spiraea	2.4	-
Blackberry	+.1	-
Hawthorn	+.1	-
Gooseberry	+.1	-
Sweet-fern	2.3	-
Herbs		
Whorled Loosestrife	2.4	-
Hay-scented Fern	3.4	-

Table 8.7. Continued

Species	ROW A.S.	Forest A.S.
Strawberry	+.2	-
Common Cinquefoil	1.2	-
Pearly Everlasting	2.3	-
Goldenrod	1.1	-
Sheep-Sorrel	1.4	-
Thistle	++.2	-
Mixed Grass	3.3	-
No. Species	15	
Mesic (3)		
Shrubs		
Raspberry	3.2	-
Herbs		
Interrupted Fern	2.2	-
Foamflower	1.4	-
Mixed Grass	1.4	-
Violet spp.	1.2	-
Whorled Loosestrife	1.2	-
Sensitive Fern	1.2	-
Winter-Cress	1.2	-
Strawberry	+.2	-
Mint spp.	1.3	-
Common Cinquefoil	+.2	-
Sheep-Sorrel	1.2	-
Butter-and-eggs	++.1	-
Wood-Sorrel	+.1	-
No. Species	14	
Xeric (4)		
Shrubs		
Spiraea	+.2	-
Blackberry	+.2	-
Gooseberry	2.1	-
Sweet-fern	1.3	-
Arrow-wood	++.1	-
Herbs		
Sedge	++.1	-
Hay-scented Fern	2.4	-

Table 8.7. Continued

Species	ROW A.S.	Forest A.S.
Blue-eyed Grass	++.1	-
Strawberry	+.3	-
Hair-cap Moss	2.3	-
Common Cinquefoil	+.3	-
Pearly Everlasting	1.3	-
Goldenrod	+.2	-
Hawkweed (yellow)	+.1	-
Columbine	++.1	-
Poverty-Grass	1.2	-
No. Species	16	
Xeric (5)		
Shrubs		
Blackberry	++.1	-
Gooseberry	(++.1)	-
Blueberry	+.2	-
Herbs		
Blue-eyed Grass	1.3	-
Hair-cap Moss	1.4	-
Pearly Everlasting	2.4	-
Goldenrod	++.1	-
Thistle	1.1	-
Sedge	+.1	-
Mixed Grass	3.4	-
Whorled Loosestrife	1.2	-
Hay-scented Fern	3.4	-
Devil's Paint-brush	+.1	-
Hawkweed (yellow)	+.1	-
Upright Yellow Wood-Sorrel	+.1	-
Knotweed	+.2	-
Common Mullein	++.1	-
No. Species	17	

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

Table 8.8. Major vegetational types for the Hancock to Stilesville study area based on percent of study plots occupied by each plant community and other components.

Community	Site Classification				
	Hydric (1)	Mesic (2)	Mesic (3)	Xeric (4)	Xeric (5)
	Percent of Total Area				
Sedge-Mixed Grass-Herb	81.5				
Hay-scented Fern	5.3	10.4	60.5		21.7
Access Road (healed)	5.3	5.0			
Cat-tail-Sedge-Mixed Herb	4.2				
Whorled Loosestrife-Mixed Grass-Herb	1.0				
Rock	0.8		3.0	1.2	0.8
Water-Cat-tail	0.1				
Sedge-Mixed Herb	1.8				
Mixed Grass-Herb		65.0	17.5	29.4	4.8
Sweet-fern		5.4		1.3	
Sweet-fern-Hay-scented Fern-Mixed Herb		5.0			
Access Road (invading)			6.4		
Hay-scented Fern-Sweet-fern		4.0			
Sweet-fern-Mixed Herb		2.6			
Sweet-fern-Mixed Grass-Herb		1.6			
Hazelnut		0.6			
Hazelnut-Sweet-fern		0.4			
Open			3.1		
Brush-Blackberry			2.8		
Open-Hair-cap Moss-Blackberry-Whorled Loosestrife			2.6		
Rock-Hair-cap Moss			2.6		
Sweet Birch			0.9	2.7	
Beech			0.6		
Whorled Loosestrife				43.3	
Whorled Loosestrife-Hay-scented Fern				4.6	
Hair-cap Moss				2.1	
Open (invading)				12.5	
Hay-scented Fern-Sweet-fern-Whorled Loosestrife				1.4	
Sweet-fern-Whorled Loosestrife-Mixed Grass				1.2	

Table 8.8. Continued

Community	Site Classification				
	Hydric (1)	Mesic (2)	Mesic (3)	Xeric (4)	Xeric (5)
	Percent of Total Area				
Gooseberry				0.3	
Everlasting-Mixed Grass-Herb					45.7
Hay-scented Fern-Mixed Herb					19.8
Sweet Brich-Mixed Grass-Herb					7.2
Total	100.0	100.0	100.0	100.0	100.0

Table 8.9. Number of pellet groups found on deer plots at study area 8.

ROW	ROW Edge	Woods
66	86	75

Table 8.10. Number of pellet groups found on ROW, at ROW edge and interior woods on the north and south sides of the ROW.

North			South		
ROW	Edge	Woods	ROW	Edge	Woods
31	56	40	35	30	35

Table 8.11. Deer use on the ROW, in the forest edge, and in the interior adjacent woods.

No. of Pellet Groups Per Acre[1]			Deer Days of Use Per Acre[2]		
ROW	Edge	Woods	ROW	Edge	Woods
330	430	375	23	31	27

[1] Pellet groups per acre = $\frac{\text{Number pellet groups on transects}}{\text{Acres in transects}}$

[2] Deer days of use per acre = $\frac{\text{Number pellet groups per acre}}{\text{Number pellet groups deposited by one deer in one day (average of 14).}}$

Table 8.12. 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	%
Beech			37/38	97	19/22	86	56/60	93
American Hornbeam			4/4	100	4/4	100	8/8	100
Barberry	1/1	100	1/1	100			2/2	100
Birch (Sweet, Yellow)	20/20	100	65/71	92	9/11	81	94/102	92
Blackberry	14/53	26	3/13	23			17/66	26
Black Cherry					0/1	0	0/1	0
Hazelnut			33/33	100	10/10	100	43/43	100
Hemlock					0/1	0	0/1	0
American Hop-Hornbeam			1/1	100	2/2	100	3/3	100
Serviceberry	1/1	100	6/6	100	21/21	100	28/28	100
Blueberry			0/1	0	19/19	100	19/20	95
Mountain-Laurel	1/1	100	14/35	40	25/26	96	40/62	65
Partridge-berry			0/3	0	0/7	0	0/10	0
Raspberry	69/84	82	23/51	45			92/135	68
Red Maple	2/2	100	3/3	100	0/1	0	5/6	85
Red Oak	2/2	100	9/9	100	1/1	100	12/12	100
Striped Maple			2/3	66	6/6	100	8/9	89
Sugar-Maple					1/1	100	1/1	100
Sweet-fern	36/36	100	28/30	93			64/66	97
Teaberry			1/2	50	1/21	5	2/23	8
White Oak					2/2	100	2/2	100
White Pine	1/1	100					1/1	100
Witch-Hazel			3/3	100	1/1	100	4/4	100
Totals	147/201	73	233/307	76	121/157	77	501/665	75

Table 8.13. 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		Birches (Sweet, Yellow)		Sweet-fern		Beech		Blackberry	
Location	Ratio	%	Ratio	%	Ratio	%	Ratio	%	Ratio	%
ROW	69/84	82	20/20	100	36/36	100			14/53	26
ROW Edge	23/51	45	65/71	92	28/30	93	37/38	97	3/13	23
Woods			9/11	81			19/22	86		
Total	92/135	68	94/102	92	64/66	97	56/60	93	17/66	26

Table 8.14. Birds observed and/or heard on the ROW and on the ROW edge during the study period.

Species	Species
Turkey vulture	Blue jay
Red-tailed hawk	Black-capped chickadee
Sharp-shinned hawk	Robin
Sparrow-hawk	Wood thrush
Turkey	Red-eyed vireo
American woodcock	Red-winged blackbird
Great horned owl	Indigo bunting
Downy woodpecker	Chipping sparrow
Pileated woodpecker	Field sparrow
Yellow-shafted flicker	Song sparrow
Eastern phoebe	Rufous-sided towhee
Eastern wood pewee	Slate-colored junco

Table 8.15. Potential wildlife use of plant species[1] present on the ROW and adjacent woods for the major game species on the Hancock to Stilesville study area.

Species	Wildlife Species		
	Deer	Squirrel	Raccoon
Trees			
Red Maple	****	**	
Hemlock	+		
Beech	+	**	+
Sweet Birch	*		
Yellow Birch	*		
White Oak	*		
American Hop-Hornbeam	+		
Red Oak	*	****	****
Quaking Aspen	**		
Large-toothed Aspen	**		
Black Oak	*	****	****
White Oak	*	****	****
Chestnut-Oak	*	****	****
Gray Birch	*		
Shrubs			
Striped Maple	****	**	
Witch-Hazel	**		
Spiraea	+		
Raspberry	+	+	
Blackberry	+	+	
Mountain-Laurel	*		
Hazelnut	+		+
Hawthorn	+		
Sweet-fern	+		
Blueberry	+		
Teaberry	**		
Arrow-wood	*		
Herbs[2]			
Interrupted Fern	*		
New York Fern	*		
Christmas Fern	*		
Cinnamon-Fern	*		
Sensitive Fern	*		
Hay-scented Fern	*		
Marginal Shield-Fern	*		
Bracken	*		
Mixed Grass	*		

Table 8. 15. Continued

Species	Wildlife Species		
	Deer	Squirrel	Raccoon
Goldenrod	+		
Blue-eyed Grass	*		
Sedge		+	

[1] Those plants not included in this table provide a certain amount of cover (Table 8. 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 8.16. Water data collected from September 25, 1975, to August 3, 1976, at site 8, Hancock to Stilesville ROW, Delaware County, New York.

Date	September 25, 1975					January 28, 1976					May 19, 1976					August 3, 1976				
Sampling Location	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Hour	0830	0850	0900	0935	0950	0950	1010	0930	1020	1040	1210	1225	1240	1255	1310	1435	1450	1425	1505	1455
Water Temp. (C)	9.5	10.0	10.0	10.0	10.0	-1.0	0.0	-2.0	0.0	0.0	6.0	6.6	7.3	7.5	8.0	13.0	13.5	14.0	14.0	14.0
Dissolved Oxygen (ppm)	12.0	12.5	12.9	12.8	12.8	13.4	13.8	13.9	14.0	13.9	10.4	10.7	11.2	11.4	11.8	6.4	8.8	8.6	9.2	9.9
% Saturation D.O.	114	120	124	123	123	103	103	101	105	104	91	94	102	103	109	66	92	91	97	104
pH	6.4	6.3	6.3	-	-	4.7	4.7	5.3	4.7	4.6	4.9	4.9	4.8	4.8	5.3	4.9	4.4	4.3	4.3	5.6

		September 25, 1975	January 28, 1976	May 19, 1976	August 3, 1976
Water Temp. (C)	range	9.5-10.0	-2.0-0.0	6.0-8.0	13.0-14.0
	mean	9.9	-0.6	7.1	13.7
% Saturation D.O.	range	114-124	101-105	91-109	66-104
	mean	121	103	100	90
pH	range	6.3-6.4	4.6-5.3	4.9-5.3	4.3-5.6
	mean	6.3	4.8	4.9	4.7
Comments		rain 60 hrs. preceding sampling, stream swollen, flow over banks, light sediment load	snowing, rain on 27 Jan. caused stream to swell, snow covering ground 8 to 24 inches	snowing, air temp. 2 C	sunny, air temp. 26 C

Table 8.17. 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	-----7.7 ****3.4
(C,I)	Commercial & Industrial	
(F)	Forest Land	---92.1 ***96.4
(E)	Extractive Industry	
(N)	Non-productive	
(OR)	Outdoor Recreation	
(P)	Public & Semi-public	-.2 *.2
(W)	Water Resources	
(U)	Urban Inactive	
(T)	Transportation	
(R)	Residential	

[1] Source: ASCA/USDA, Salt Lake City, Utah, air photo No. ELP-3MM-58, Aug. 13, 1971
SCS, Chemus County, air photo No. 1P-107, 1955

FIG. 8.1.1. General view of the ROW and adjacent forest, looking east, in spring, 1975 (Photo Station 3).

FIG. 8.1.2. General view of the ROW and adjacent forest, looking west, in the spring, 1975 (Photo Station 10).

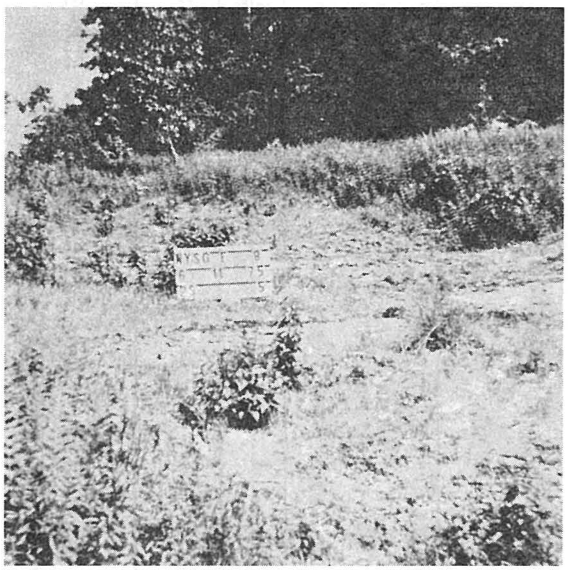


FIG. 8.1.3. Equipment cut exhibiting moderate sheet erosion on ROW, in the spring, 1975 (Photo Station 5).

FIG. 8.1.4. Equipment cut exhibiting moderate sheet erosion on ROW, in the spring, 1975 (Photo Station 12).

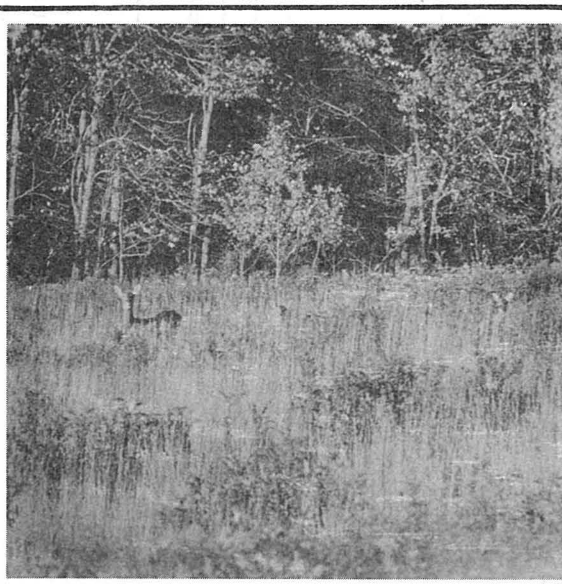


FIG. 8.1.5. Doe and 2 fawns on ROW, in the fall of 1975.

FIG. 8.1.6. Heavy deer browse on sweet-fern on ROW during the spring of 1976.

FIG. 8.1. Visual characteristics.

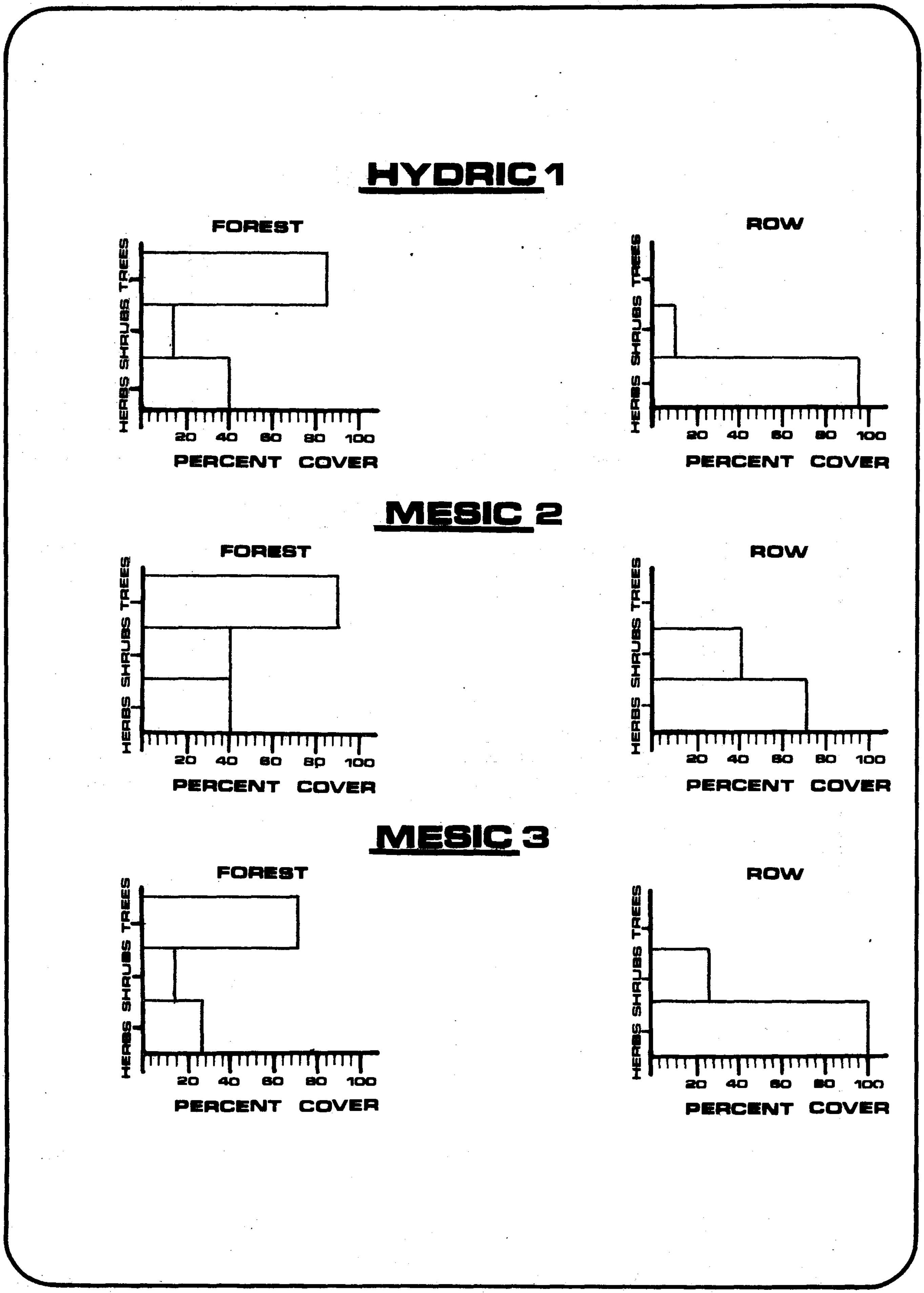


Fig. 8.2. Changes in cover value of tree, shrub, and herb layers from forest to ROW.

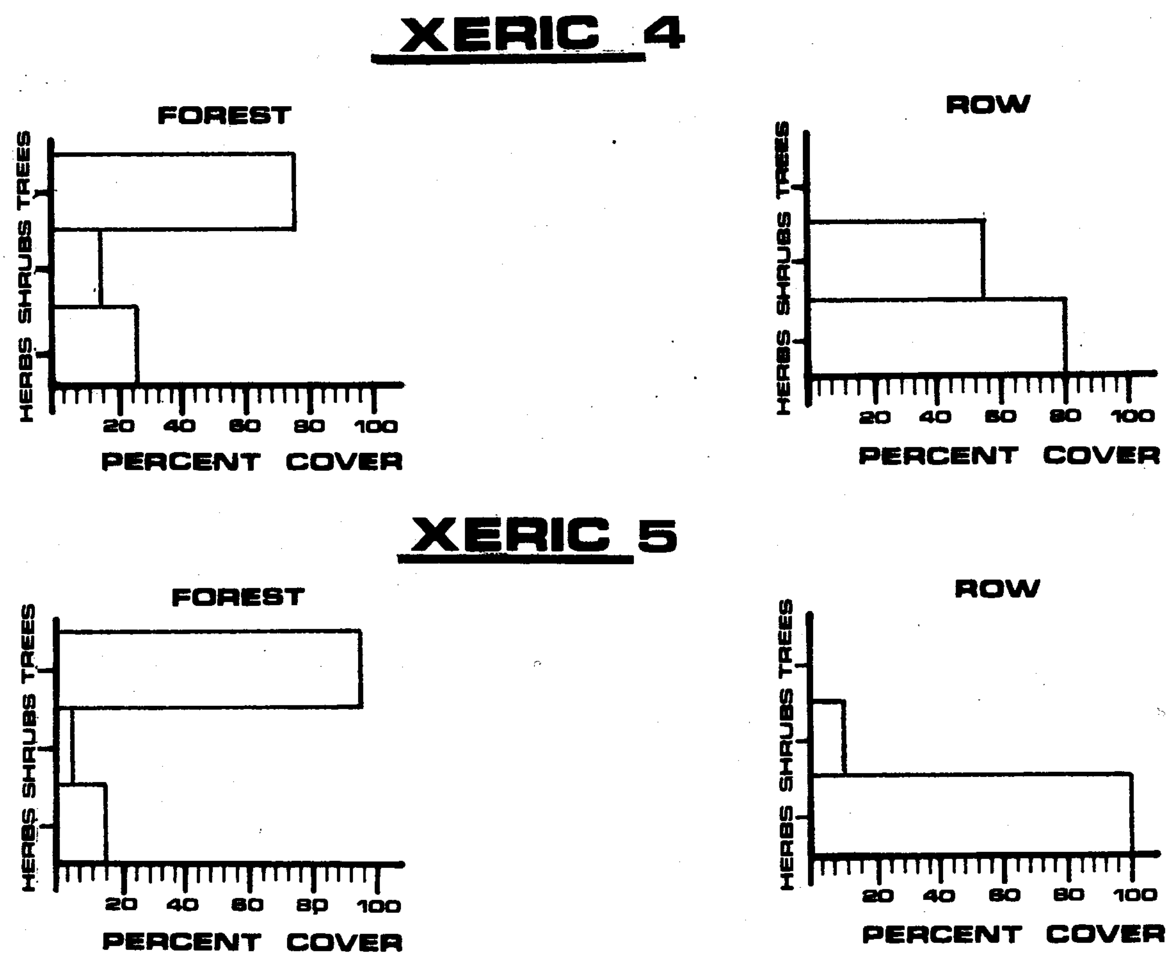


Fig. 8.2a. Changes in cover value of tree, shrub, and herb layers from forest to ROW.

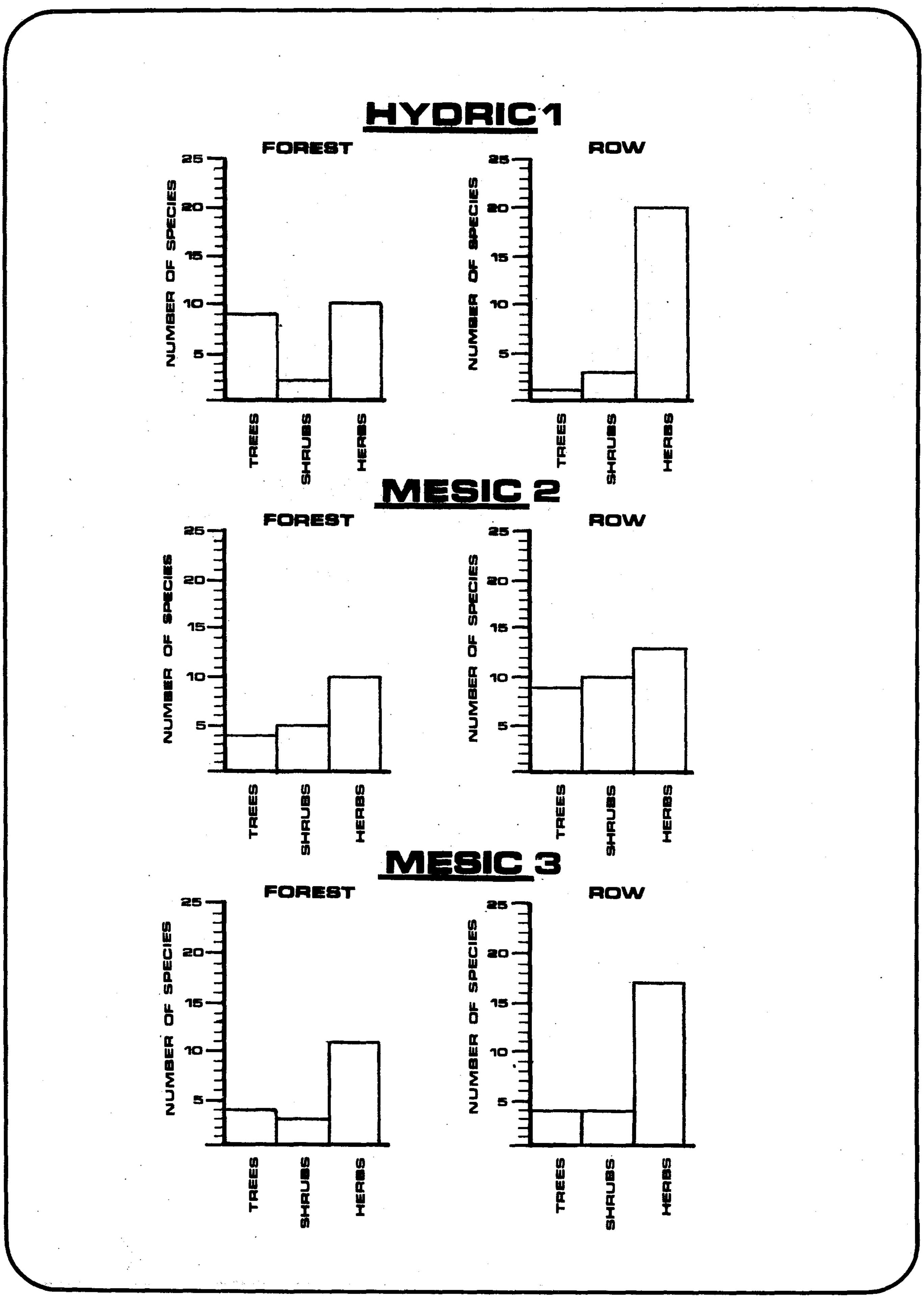


Fig. 8.3. Species diversity in the forest and on the ROW.

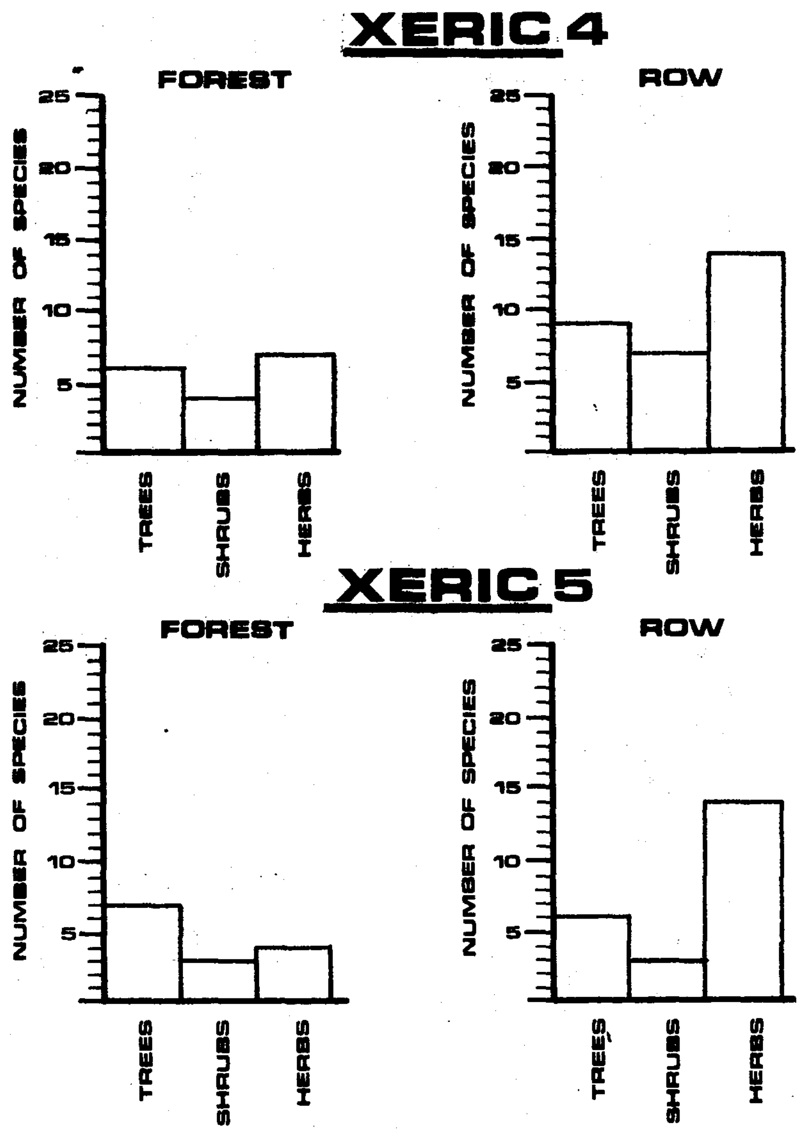


Fig. 8.3a. Species diversity in the forest and on the ROW.

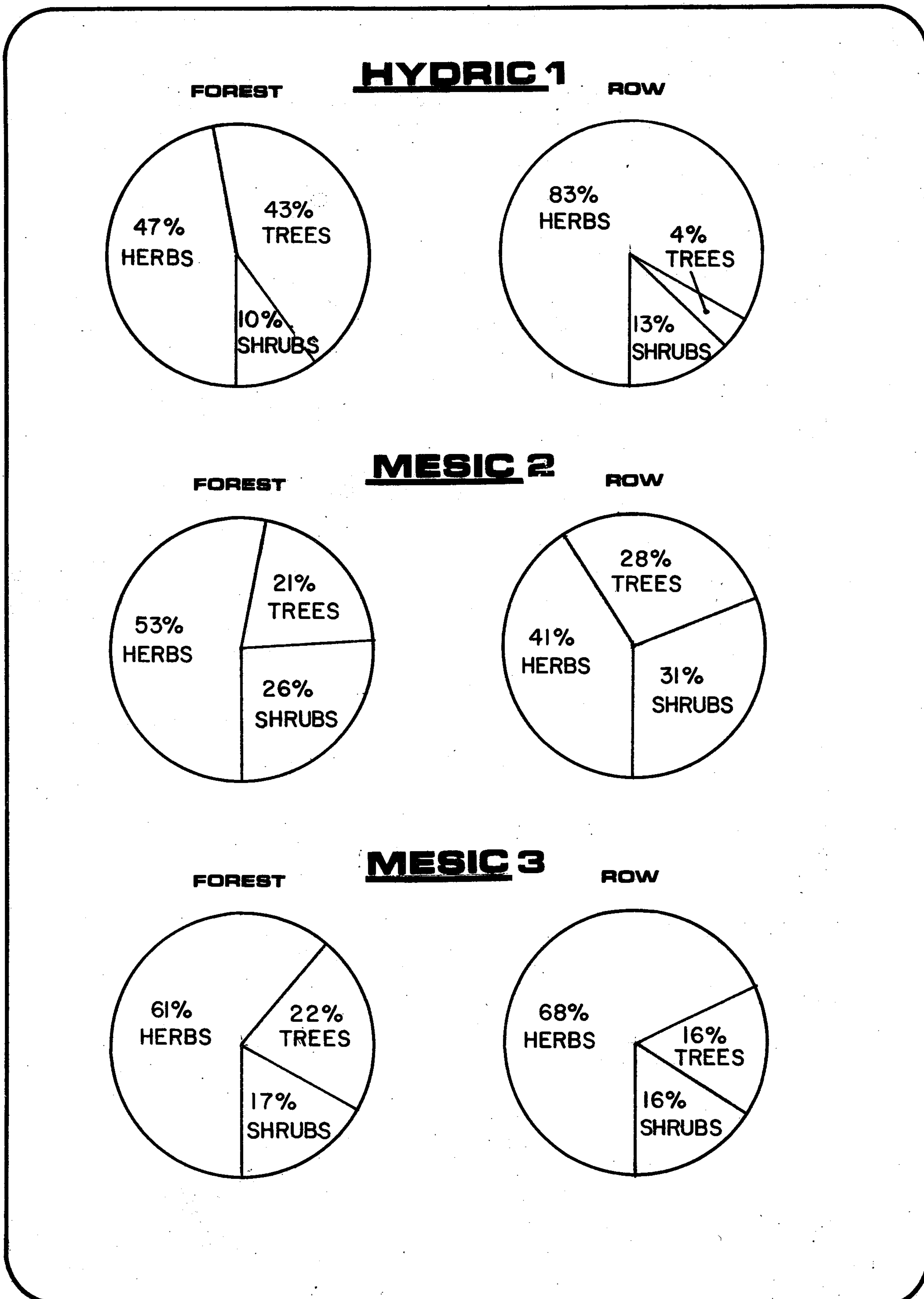


Fig. 8.4. **Life form spectrum of the ROW as compared to the adjacent forest to compare species make-up of each, based on the number of species in each life form expressed as a percent of total species.**

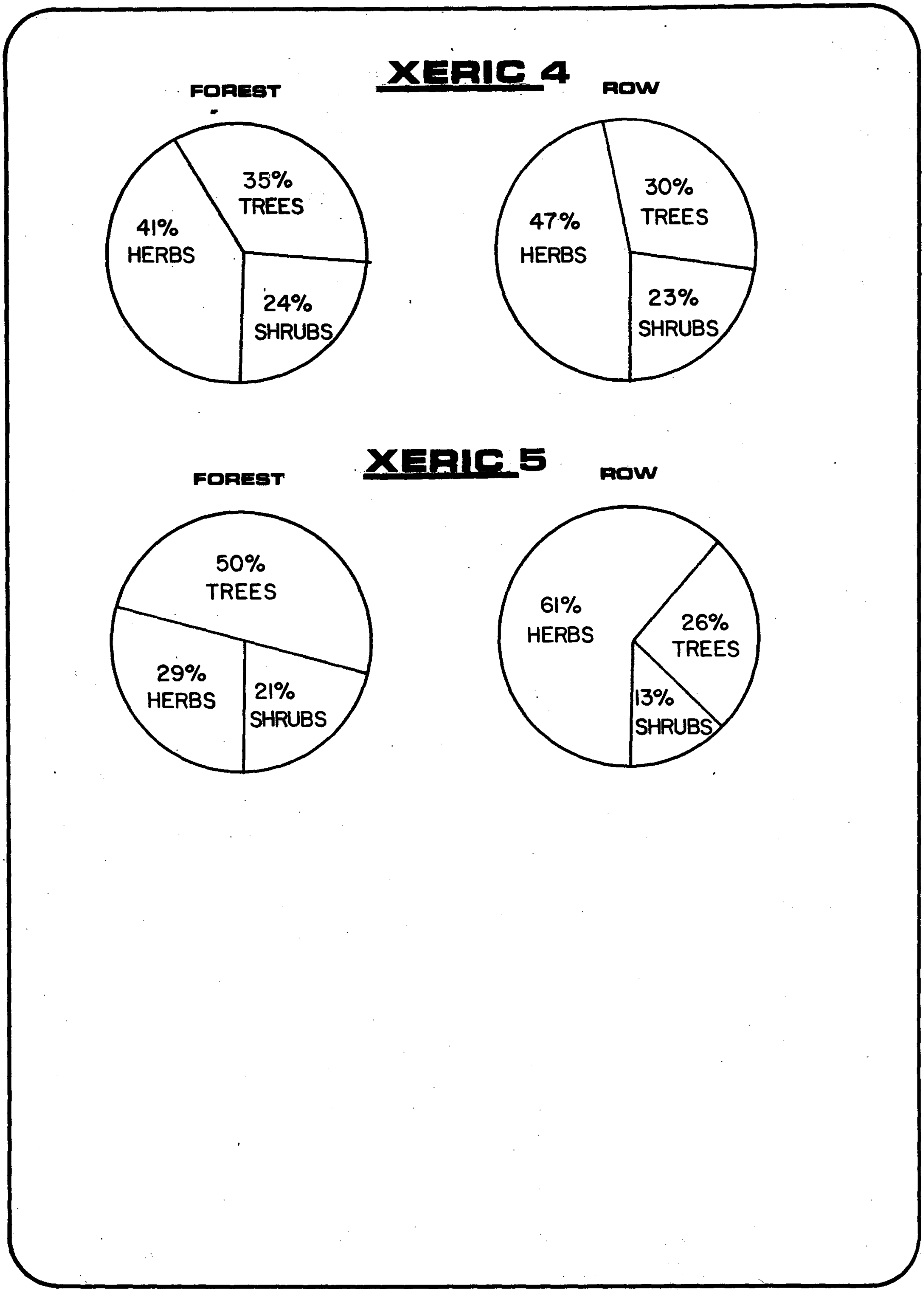


Fig. 8.4a. **Life form spectrum of the ROW as compared to the adjacent forest to compare species make-up of each, based on the number of species in each life form expressed as a percent of total species.**

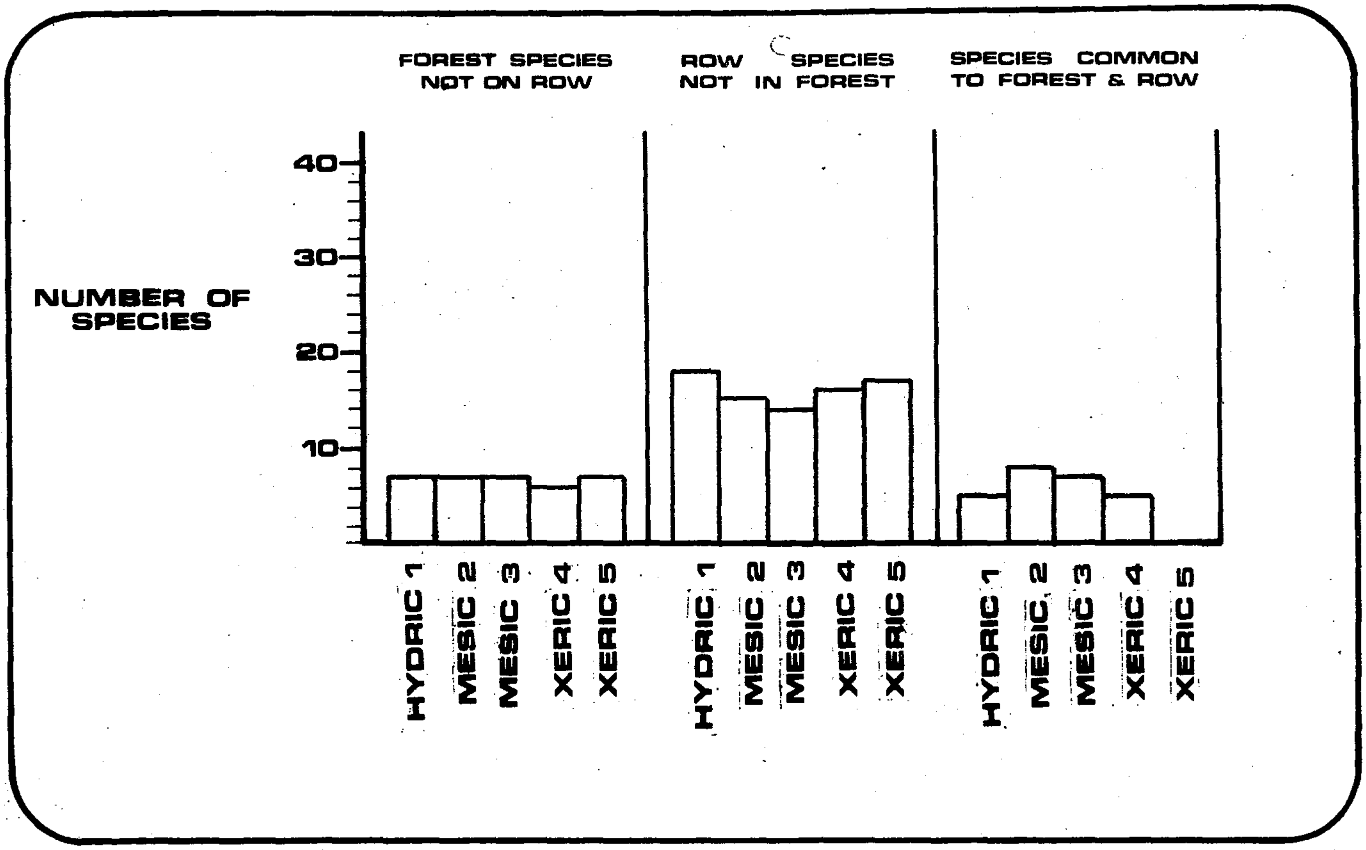


Fig. 8.5 Comparison of shrub and herb species in the forest and on the ROW.

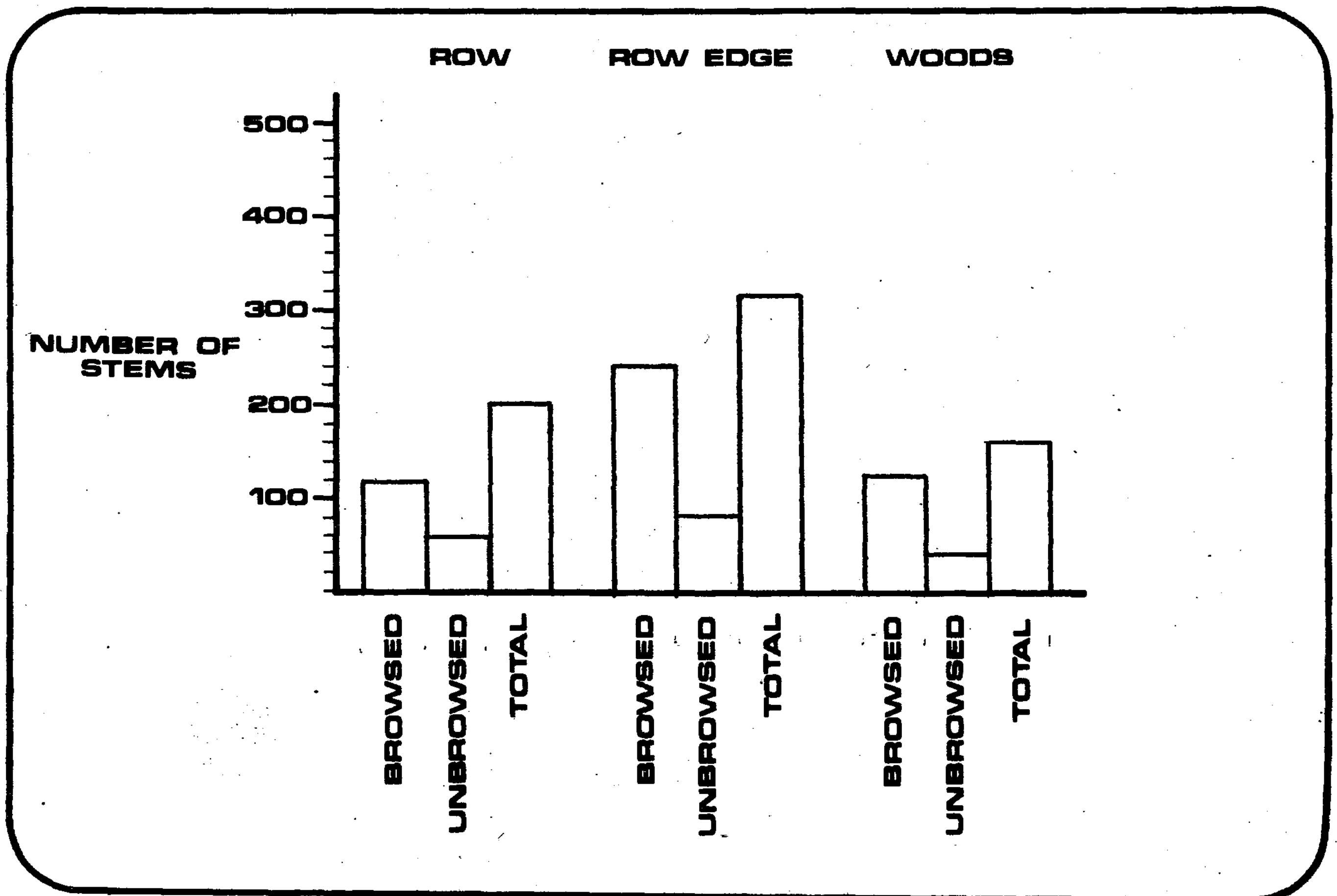
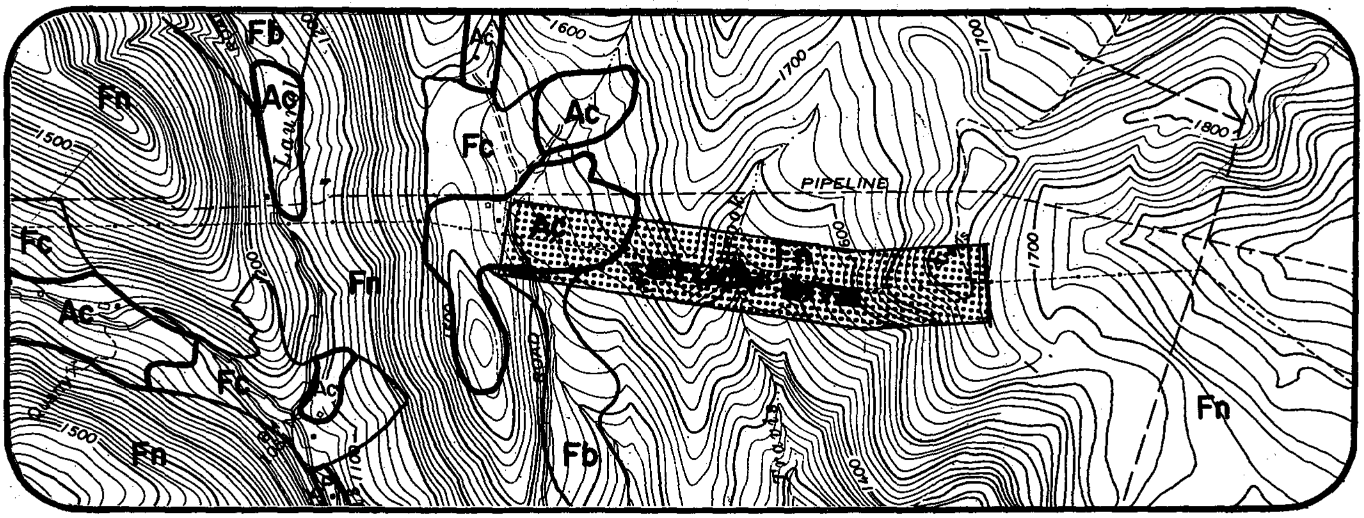
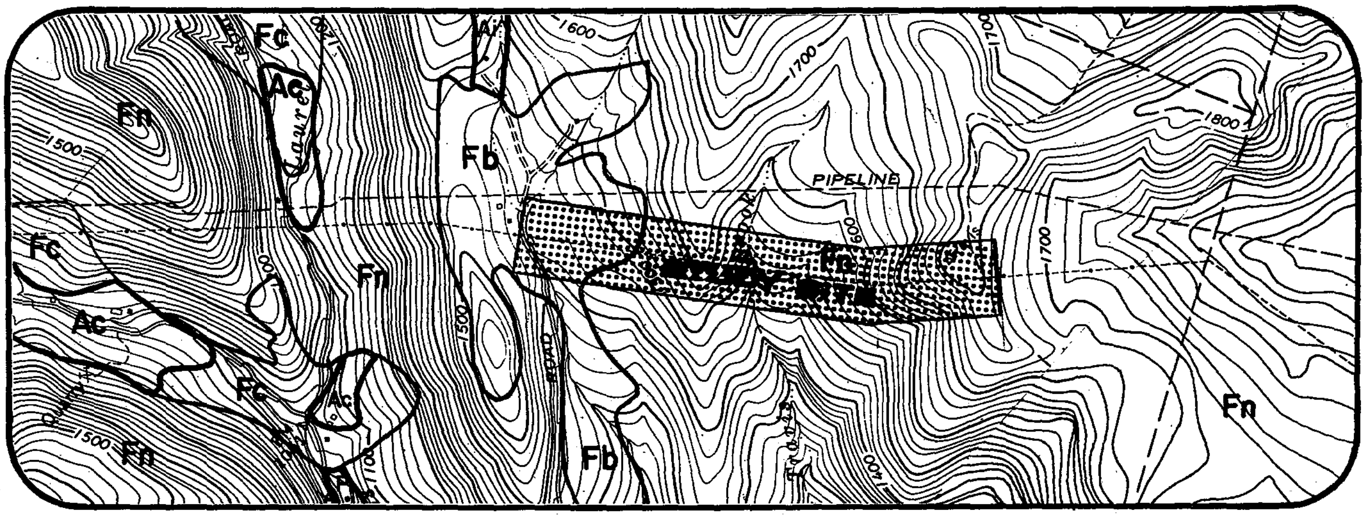


Fig. 8.6 Browse survey showing number of browsed, unbrowsed, and total stems for the ROW, ROW edge, and forest for 10 browse transects.



LAND USE PRIOR TO ROW CONSTRUCTION . (1945) 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

FOREST LAND
- Fc - Fprest brushland
- Fn - Forest lands

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

SOURCES:
- ASCA/USDA, Salt Lake City, Utah, air photo No. ELP-3MM-58, Aug. 13, 1971
- SCS, Delaware County, air photo No. 449, 1945
- Area Land Use Map, LUNR, Cornell University, N.Y., 1974
- U. S. G. S. Topographic Map, Cannonsville Reservoir, N. Y., 1965

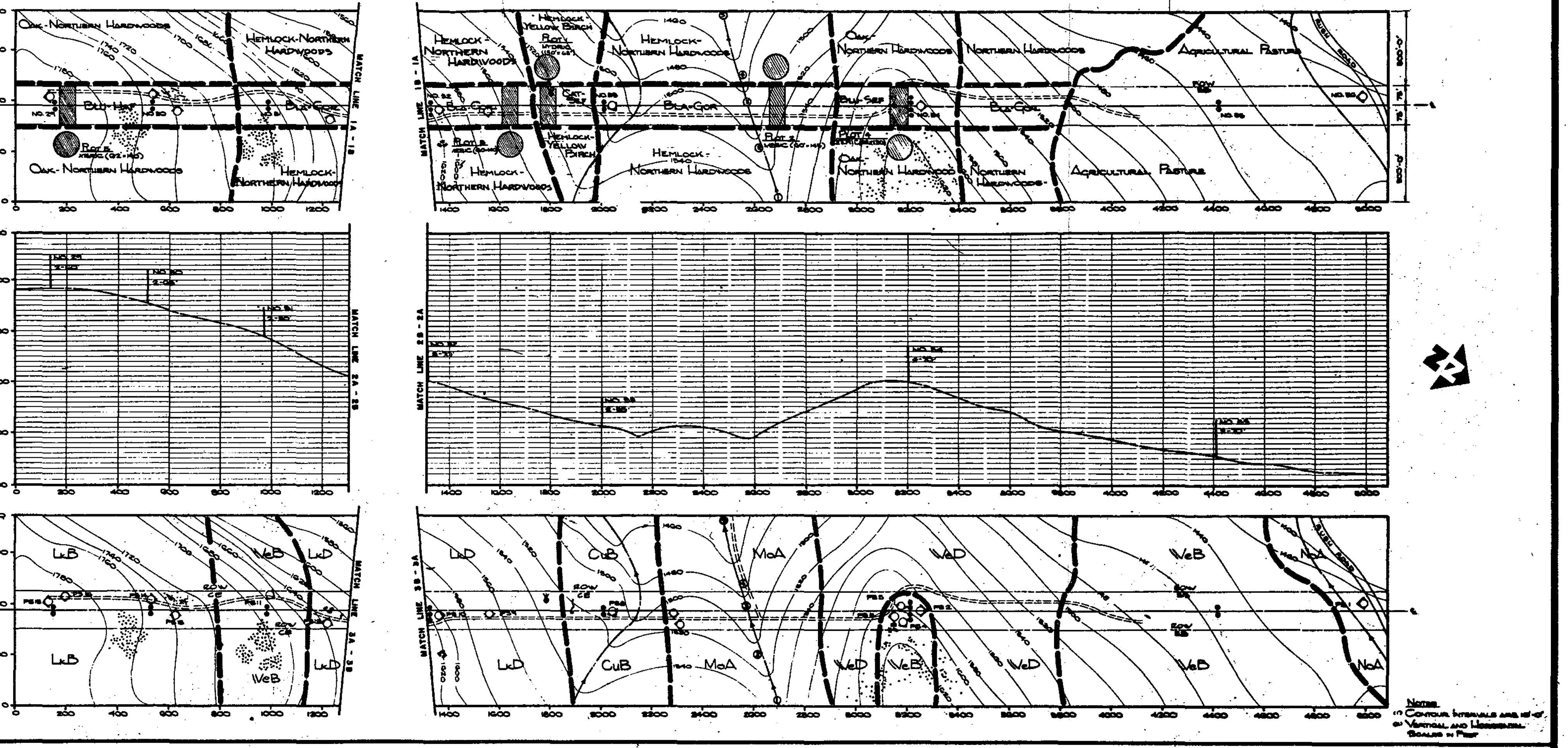
Fig. 8.7. Land use change.

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
- 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
- STONEWALL

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

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

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 SYMBOL AND NAME

LkB	LACKAWANNA channery silt loam (8 to 15% slope)
WeB	WELLSBORO silt loam (8 to 15%)
LkD	LACKAWANNA channery silt loam (25 to 35%)
CuB	CULVERS stony silt loam (8 to 15%)
MoA	MORRIS stony silt loam (0 to 8%)
WeD	WELLSBORO silt loam (25 to 35%)
NoA	NORWICH 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 *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 19090

N.Y.S. Elec. & G. Corp. Engineering Plan & Profile

U.S.G.S. 7.5 min. Topographic Map, Cannonsville Reservoir, N.Y. 1965

U.S.D.A. Bureau of Chemistry & Soils in cooperation with Cornell Univer. Agr. Exp. Sta. Soil Survey for Delaware County, N.Y. US Gov't Services No. 7

ASCS/USDA, Salt Lake City, Utah. Delaware Co. Air Photo No. ELD-3MM-58 (Scale 1:20,000) 8/13/71

Asplundh Environmental Services, A.E.S. Project No. 81-0025 Field Studies 1975-76

MAP 8.1

SITE 8 HABITAT CONDITIONS

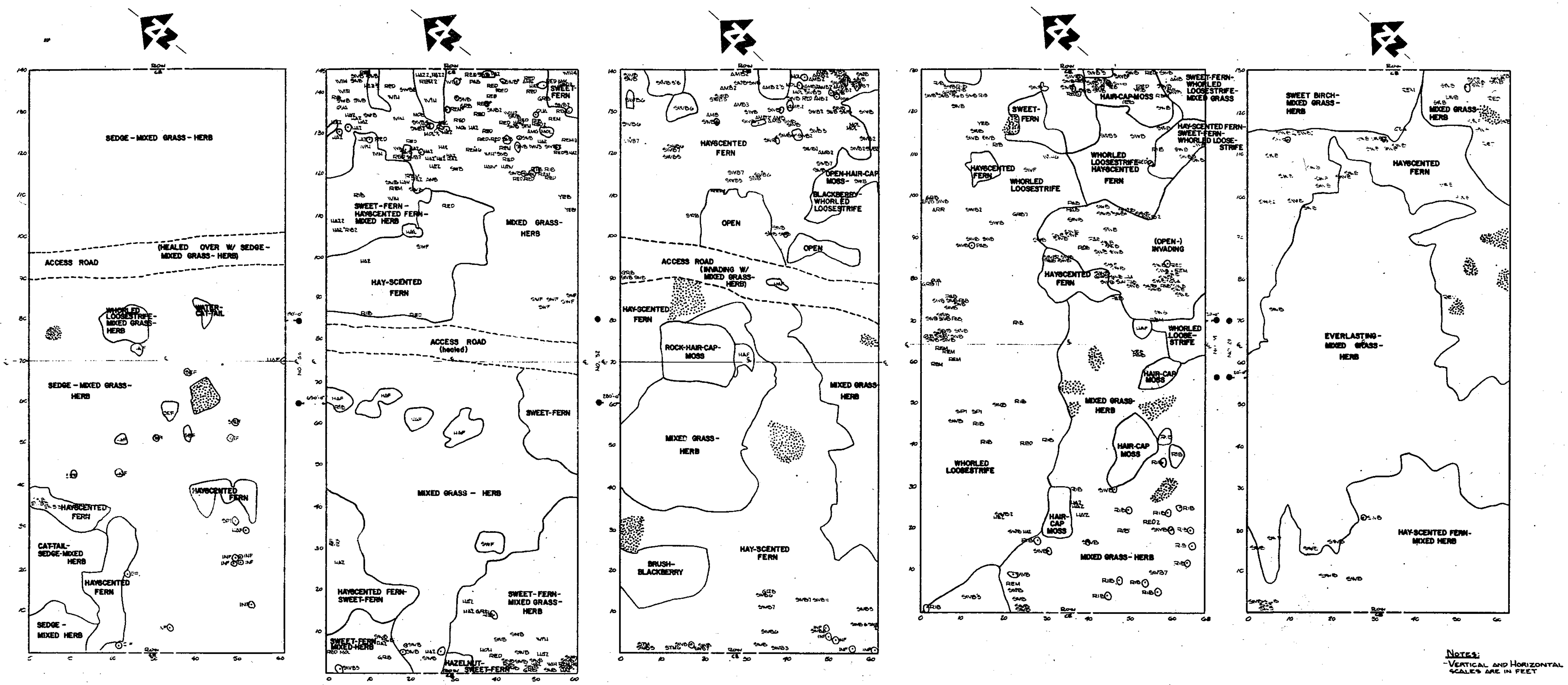
UTILITY: N Y State Electric & Gas Corp.

ROW DESCRIPTION: Hancock-Stilesville 115 K.V

Wooden Pole 'H' Frame 150' ROW

SCALE: 1" = 200'-0"

200 100 0 100 200 400 800 1000



PLOT 1 HYDRIC

PLOT 2 MESIC

PLOT 3 MESIC

PLOT 4 XERIC

PLOT 5 XERIC

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
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BRO	BROOM-SEDGE	Arthrolophis virginicus
CAT	CAT-TAIL	Typha spp.
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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

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"

UTILITY: N.Y. STATE ELECTRIC & GAS CORP.

ROW DESCRIPTION: HANCOCK TO STILESVILLE 115KV.

WOODEN POLE H FRAME 150' ROW

SCALE: 1" = 10'-0"

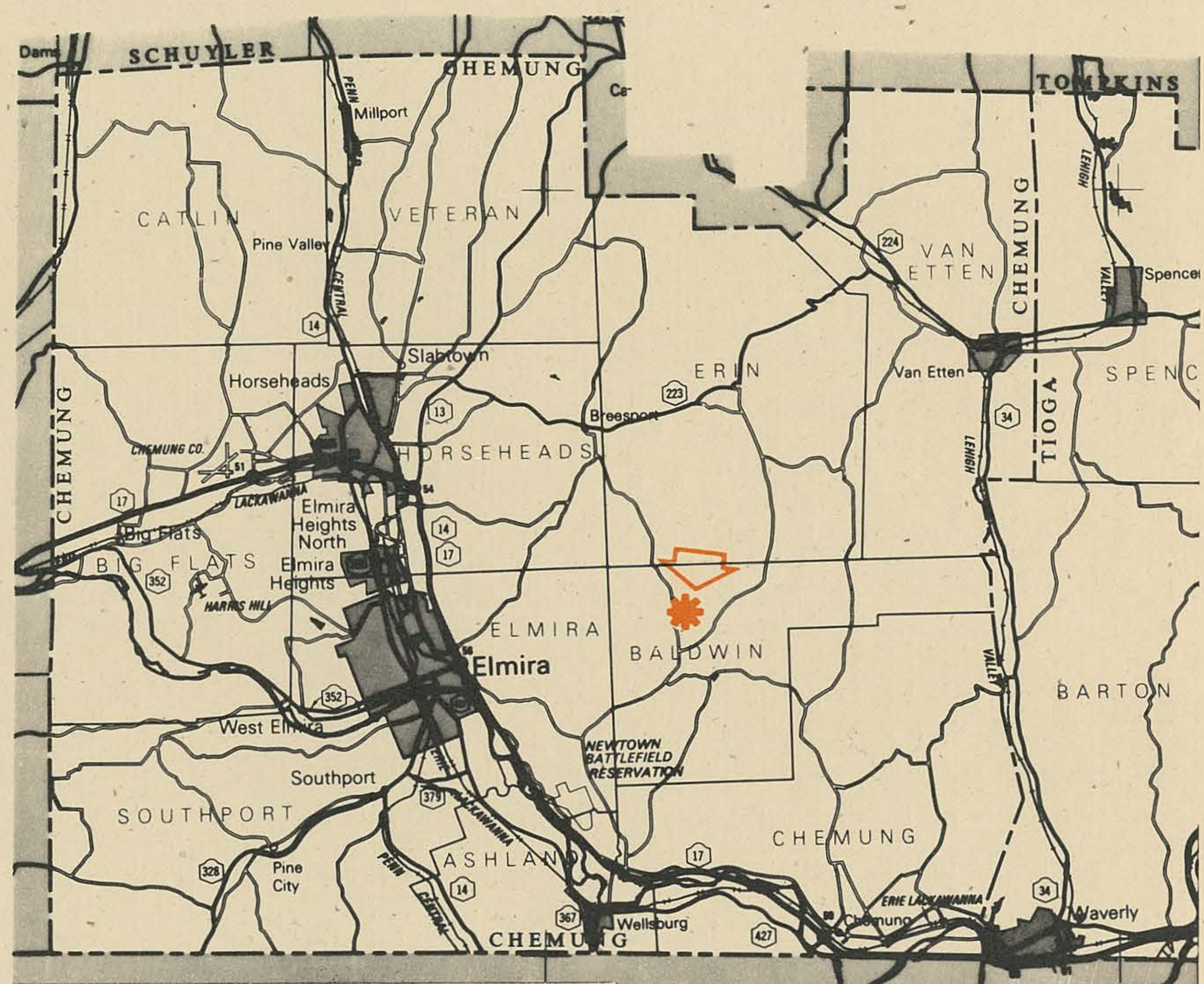
10 5 0 5 10 20 40 50

MAP 8.2

SITE 8

MAPPED PLOTS

SITE 9
HILLSIDE to OAKDALE



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

CHEMUNG and TIOGA COUNTIES

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 9 Hillside to Oakdale

Study area extends from structure 36 west of Breezeport Road to structure 43 east of Breezeport Road near Lowman. To reach the study area, proceed west on route 17 toward Elmira, go past Red Jacket Motel and turn right at the first right past the Motel, following that road to the end, then turning right (north) on Breezeport Road and proceeding to study area.

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Site 9 Hillside to Oakdale

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Site 9 Hillside to Oakdale

1 Introduction

Site 9 is located in the Allegheny Plateau physiographic area of New York (Cline, 1970) in the Oak-Northern Hardwoods forest type area (Stout, 1958). The general landscape of the ROW and adjacent area is shown in Figs. 9.1.1 and 9.1.2.

This area generally has an irregular and broadly rolling topography which distinguishes it from the flat region to the north and from the more rugged hills and mountains to the east. More specifically, the immediate area varies from long gentle slopes to very steep ridges which are extensively forested.

Oak-Northern Hardwoods is the typical forest type in the area, with Hemlock-Northern Hardwoods, White Pine Northern Hardwoods, Aspen-White Pine Northern Hardwoods and Northern Hardwood types.

2 Location and Identification

Site 9 is approximately 1½ miles northeast of North Chemung, in the town of Baldwin, Chemung County, New York (76^{o} 41' 00" W. Longitude; 42^{o} 06' 30" N. Latitude).

The site is on the Hillside to Oakdale ROW which is operated by the New York State Electric & Gas Corporation (NYSEG). This 250-foot easement consists of 2 single circuit lines, one a 230 kV line (south) and the other a 345 kV line (north), each having wood pole H-frame structures. The project site is approximately 5,000 feet in length and extends from structure 43 (of the 230 kV line) to include structure 36.

3 Background

The following discussion outlines documentable management techniques of clearing, construction, restorarion, and maintenance for site 9, as received from NYSEG (letter dated March 11, 1976, from Richard H. Mider, New York State Electric and Gas Corporation, Ithaca, N.Y.). All available pertinent information and cost data are included under each operation of clearing, construction, restoration, and maintenance.

3.1 Clearing

The 230 kV line was clear cut under contract between May, 1961, and February, 1962. The 345 kV line was clear cut under contract between 1960 and 1967. Bulldozers were used for piling of cut vegetation for both the 230 kV and 345 kV lines.

Brush was either piled and burned, or, if logs were 6 inches and over in diameter and suitable for sawing into lumber, they were cut into standard lengths and piled.

In 1961 for the 230 kV line, and in 1967 for the 345 kV line, stumps of trees over 3/4 inch in diameter were treated to prevent resurgent growth. The chemical spray consisted of a low volatile propylene glycol butyl ether ester of 2,4,5-Trichlorophenoxyacetic acid (2,4,5-T) with diesel oil or No. 2 fuel oil. The acid concentrate was made up of 4 pounds of

2,4,5-T as the acid equivalent per gallon of concentrate. The concentrate was mixed with the oil carrier in the proportion of 4 gallons of concentrate to 96 gallons of the carrier.

The chemical solution was applied by nozzle men walking the ROW. The source of material was either power-driven equipment or knapsack spray tanks. Spray nozzles were adjusted to produce a coarse spray of large droplets at 50 pounds or less pressure.

Clearing and disposal for the 230 kV line was completed at a cost of $400 per acre. Stump spraying was completed at $40 per acre and follow-up spraying at $65 per acre.

3.2 Construction

The 230 kV line was constructed between May, 1961, and February, 1967. The 345 kV line was constructed between June, 1968, and July, 1969. The lines were constructed by NYSEC company personnel.

3.3 Restoration

No special restoration practices were employed for either the 230 kV or the 345 kV ROW.

3.4 Maintenance

In 1962 the 230 kV ROW had a follow-up basal spray of 2,4,5-T and oil at 16 pounds acid equivalent per 96 gallons of oil.

Between 1962 and 1973, NYSEC company records are incomplete regarding maintenance for this period for the 230 kV ROW.

In 1969, the 345 kV ROW had a selective basal spray with 2,4,5-T and oil at 16 pounds acid equivalent per 96 gallons of fuel oil.

In 1973, both the 230 kV ROW and the 345 kV ROW were aerially sprayed with 3 gallons of Tordon 101 and 12 gallons of water per acre. This was applied through a micro foil boom.

4 General Reconnaissance

A general reconnaissance was made in accordance with the methodology and is set forth in Map 9.1 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 9.1 and described in Appendix 17. Specific reference is made to some of these photo stations throughout the report and illustrated in Fig. 9.1. 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 not necessarily pleasing or objectionable to view. The ROW does evidence much growth of shrubs and trees and opens up a vista through the forest to the top of the hill on either side of Breezeport Road. The area does not feature any unique natural landforms, or man-made features which may make the viewer particularly sensitive to the existance of the ROW. The ROW is very visible since it ascends a steep hill on both sides of Breezeport

Road and thus can be easily seen from that road. On either side of the road the terrain is rather flat and open to view thus making the ROW even more visible. The potential number of people viewing the ROW site is somewhat low, even though it is near a small trailer park and several residences. The site is located in a rural area, and Breezeport Road, which it crosses, is traveled mainly by local residents.

5 Field Studies - Results and Discussion

5.1 Soils

5.1.1 Geology and Soils

Site 9, Hillside to Oakdale ROW, is located in Chemung County in the southwestern plateau section of New York, in the northern, glaciated part of the Allegheny Plateau (Pearson et al., 1973; Cline, 1970). Bedrock geology is of Early Upper Devonian age, 395 to 345 million years ago, consisting predominantly of shale, siltstone, and fine-grained sandstone. Surficial geology is glacial drift, largely glacial till composed of an unsorted mixture of clay, silt, sand, gravel, and boulders. Inclusions of soils developed in deposits of silts and very fine sands on stream terraces occur (Pearson et al., 1973; Broughton et al., 1973).

All but one of the soils on this site are classified in the order Inceptisols, suborders Ochrepts (Arnot, Chenango, Lordstown, and Mardin series) and Aquipts (Volusia series), reflecting the absence of marked accumulation of lacy, and iron and aluminum oxides. One wet soil (Papakating) is in the order Entisols, suborder Aquents, indicating mineral soils without natural genetic horizons or with only the beginnings of such horizons (Soil Survey Staff, 1975; Buckman and Brady, 1969). The site is located in an area occupied by 2 broad soil associations, Lordstown-Volusia-Mardin, which occurs mainly on uplands, and Volusia-Lordstown, again occurring on uplands. Soil series comprising the associations on site 9 are Lordstown-Mardin-Volusia-Arnot (Pearson et al., 1973). Brief descriptions (Anon., 1972; Pearson et al., 1973) of soil types occurring on the ROW study site (Map 9.1; Table 9.1) follow:

Chenango channery silt loam (CeA): These soils developed in channery and gravelly materials on old alluvial fans, on nearly level to gently sloping terrain. Chenango soils are well drained and somewhat excessively drained, and available moisture capacity is moderate. Soil reaction is medium acid to strongly acid throughout a typical profile, ranging from pH 5.0 to pH 6.0 in the surface 30 inches; it was pH 4.9 in the surface mineral soil on this site Chenango channery silt loam is assigned to Woodland Suitability Group 3o1, designating moderately high productivity for timber (Class 3) and slight or no limitations for woodland use or management (Subclass o). The estimated site index is 59 to 66 for sugar-maple as the indicator species.

Lordstown channery silt loam (LnB): These soils developed in thin glacial till derived mainly from sandstone, siltstone, and shale bedrock, on gently sloping to very steep terrain on ridges, hilltops and steep side slopes in the main north-south valleys. They are well-drained soils, and available water capacity is low to moderate. Bedrock lies at 30 inches or more. Soil reaction ranges from very strongly acid to strongly acid, pH 4.5 to pH 5.5, throughout a typical profile, and was pH 5.0 in the surface horizon on this site. Lordstown soils are in Woodland Suitability Group 3o1, indicating moderately high productivity for woodland, and no significant limitations or restrictions. Predicted site index for sugar-maple on this soil is 59 to 66 feet.

Lordstown-Arnot very rocky channery silt loam (LoE): These soils formed in glacial till on steep terrain, and are well drained. Bedrock ranged from a depth of a few inches to more than 40, but a thin mantle of rocky soil covers most areas. Soil reaction is generally strongly acid, and evidenced a pH 4.6 in the upper 3 inches at this site. These soils are assigned to Woodland Suitability Group 4x1, indicating moderate productivity for woodland, and management limitations and restrictions due to high rock and stone content on the surface. Sugar-maple is the indicator species, and the estimated site index is 52 to 59 feet.

Mardin channery silt loam (MdA, MdB, MdC, MdD, and MdE): These soils developed in compact glacial till in which shale and sandstone rock are dominant, on uplands or smooth slopes extending from the edge of the valley floor to the highest parts of the plateau, on gently sloping to moderatley steep terrain. Mardin soils are moderately well drained, and available water capacity is low to moderate in the rooting zone. Soil reaction is medium acid, from pH 5.0 to pH 5.5 in the surface 15 inches; it ranged from pH 4.6 to pH 5.1 in the upper 3 inches of the surface sampled in 4 locations on this site. Mardin soils on this site were assigned to Woodland Suitability Group 3o1, reflecting moderately high productivity for woodland and slight or no restrictions or limitations for woodland use or management. In areas of a slope of 15% or greater, the Woodland Suitability Group assignation is 3r1, again designating moderately high productivity, but with restrictions or limitations related to the steep slope. The estimated site index for sugar-maple is 59 to 66 feet.

Papakating silt loam (PgA): Papakating soils developed in alluvial sediment on first bottoms, on flat to slightly depressed terrain, and are subject to periodic flooding. Poorly drained to very poorly drained, these soils have a water table at or near the surface most of the year. Soil reaction ranges from medium acid to neutral throughout a typical profile, and was pH 5.3 in the surface mineral soil on this site. Papakating soils are in Woodland Suitability Group 4w1, designating moderate productivity for timber and the presence of excessive water adversely affecting stand development or management. Red maple is the indicator species on this soil, and predicted site index is 60 to 70 feet.

Volusia channery silt loam (VoB): These soils formed in dense glacial till that is derived mainly from shale, siltstone, and sandstone, and occupy gently sloping to moderately steep terrain, on valley sides and broad divides on ridgetops on uplands. Volusia soils are somewhat poorly drained, with a strongly expressed fragipan and low to moderate available water capacity. Throughout a typical profile soil reaction varies from strongly acid to neutral, and is pH 4.9 in the mineral soil on this site. Volusia channery silt loam has been assigned to Woodland Suitability Group 3w2, indicating moderately high woodland productivity but with the presence of excessive wetness as a limitation on woodland development or management. Sugar-maple is the indicator species and estimated site index for this soil is 59 to 66 feet.

5.1.2 Humus Types

Organic layers present on the soil surface of the ROW and adjacent woodland were measured on 4 mesic upland locations. Average thickness of the organic layers and A1 horizons was based on 5 samples taken at the edges, mid-points, and center of both woods and ROW study plots at each location (Table 9.2). 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 plot.

All organic layers (litter, fermentation, and humus) plus an A1 horizon (mixed mineral and organic) were present at all but 1 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". On the ROW mesic plot 5, where average slope was 25% on Lordstown and Arnot very rocky channery silt loam, neither a humus layer nor an A1 horizon was noted. It is likely that the surface soil and organic deposits at this location were disturbed by past erosion that is now healing and exhibits some litter cover (Map 9.1). The forest area adjacent to mesic 5 had all organic layers present and a typical "thin duff mull" humus type. Otherwise, organic layers on the ROW were similar in occurrence and thickness to those of the woodland, but were composed primarily of leaves and stems of grasses, herbs, and shrubs in contrast to tree parts in 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, except for mesic 5. 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 Hillside to Oakdale study area in August, 1976. Eroding areas were identified as to location, soil type, average slope, and present plant cover (Table 9.3). 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 habitat conditions map (Map 9.1).

Under natural forest conditions, active erosion was evident at 4 locations on 2 soil types with slopes of 18 to 45%; the ground was predominantly bare, with some scattered litter cover, and erosion was slight. Although not related to forest conditions, severe gully erosion was occurring in intermittent streams that channel upland runoff water through the adjacent forest. In most areas of the general forest, however, no erosion was evident, apparently due to the protective canopy of trees and shrubs and undisturbed organic layers present on the soil.

Active or recent erosion was observed on 2 areas of the general ROW; 1 with moderate to severe gully erosion, possibly caused by runoff water from uplands, occurred on a 12% slope in Volusia channery silt loam; while the other, exhibiting slight sheet erosion, occurred on a 50% slope covered with grass and herbs. Otherwise, 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. Generally, good vegetation cover, composed of grasses, with herbs and low shrubs, had developed on the general ROW following chemical treatments for brush control, and a protective litter mulch from these plants parts was present (Table 9.2).

The most prevalent active erosion on this ROW occurred on areas that had been subjected to past and/or recent mechanical disturbance of the soil i.e., access roads, drainage ditch, and excavations (Table 9.3; Figs. 9.1.3 and 9.1.4). Slight to moderate sheet, rill, and gully erosion was evident on several segments of the access road where plant cover was sparse. Severe erosion had occurred along the bank of Baldwin Creek, apparently as a result of grading activities followed by flooding. Severe sheet, rill, and gully erosion also was evident along the course of an intermittent stream that carries concentrated runoff water from upland areas.

Sediment resulting from erosion on the ROW and from stream banks and channels in several instances was transported into Baldwin Creek which crosses the ROW. Some sediment resulting from erosion also entered a pond on the ROW edge. Otherwise, soil particles dislodged in erosion on the ROW accumulated on lower slopes and did not leave the ROW area. Erosion and sedimentation on stream banks and floodplain is discussed further in the section on water quality.

There was no restoration in the form of seeding and planting following construction of the ROW; therefore, denuded areas were dependent on natural plant invasion. Some grass cover has developed on access roads, but in many areas the access roads remain bare. Some use of access roads is made by local landowners, as observed during site visitation, but it appears that continuing and progressive erosion in these areas may prevent plant establishment. Progressive sheet and rill erosion on the excavated area (Fig. 9.1.4) apparently prevents natural plant invasion, since that area was generally devoid of plant cover. No areas of mass land movement such as landslides were observed on this site.

5.2 Vegetation

5.2.1 Habitat and Forest Types on the Site

Mesic Habitat There were 4 mesic, or medium moist, locations on this ROW. Mesic 1 habitat was located on the crest of a steep hill. Slope was approximately 10% of a east-facing slope. Drainage was free but not excessive. The forest type was Hemlock-Northern Hardwoods. Mesic 2 habitat was located on the lower slope of a steep hill. Slope was approximately 12% on a west-facing slope. Drainage was free but not excessive and the forest type was Hemlock-White Pine and Northern Hardwoods. Mesic 4 habitat was located on the middle slope of a steep hill. Slope was approximately 25% on a west facing slope. Drainage was free but not excessive and the forest type was Aspen-White Pine and Northern Hardwoods. Mesic 5 habitat was located on the crest of a steep hill. Slope was approximately 25% on a west-facing slope. Drainage was free but not excessive and the forest type was Northern Hardwoods.

Hydric Habitat The hydric, or wet site, was located in a stream bottom. Slope was negligible and aspect was flat. Drainage was good and the vegetation type was Alder-Sensitive Fern.

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. 9.2), 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 9.4). Obviously, hemlock was an important species on mesic plot 1, white pine on mesic plot 2, quaking aspen on mesic plot 4, and sugar-maple on mesic plot 5. Red maple was an important species on all mesic plots. No forest plot was established for the hydric habitat.

On the mesic habitats, the forest types were changed to a Blackberry-Goldenrod plant community with mixed grass prevalent. On the hydric habitat, an Alder-Sensitive Fern plant community developed (Map 9.1; Table 9.5).

Quantitative Changes There was a marked increase on the mesic habitats in the number of shrub and herb species on the ROW as compared to the adjacent forest (Table 9.5; Figs. 9.3 and 9.4). No comparison was made on the hydric habitat as no off-ROW control plot was established due to the lack of a hydric forest type.

Qualitative Changes On mesic 1 habitat, 4 shrub and herb species occurred both in the forest and on the ROW (Fig. 9.5), while 1 shrub, teaberry, and 3 herbs appeared in the forest but were absent from the ROW (Table 9.6). On the other hand, 6 shrubs and 13 herbs occurred on the ROW but not in the forest (Table 9.7).

On mesic 2 habitat, 6 shrub and herb species occurred both in the forest and on the ROW (Fig. 9.5), while no shrubs and 12 herbs appeared in the forest but were absent from the ROW (Table 9.6). However, 4 shrub and 17 herb species occurred on the ROW but not in the forest (Table 9.7).

On mesic 4 habitat, 9 shrub and herb species occurred both in the forest and on the ROW (Fig. 9.5), while 1 shrub, gray dogwood, and 3 herbs appeared in the forest but were absent from the ROW (Table 9.6). Three shrubs and 8 herbs occurred on the ROW but not in the forest (Table 9.7).

On mesic 5 habitat, 4 shrub and herb species occurred both in the forest and on the ROW (Fig. 9.5), while 1 shrub, blueberry, and 7 herbs appeared in the forest but were absent from the ROW (Table 9.6). On the other hand, 5 shrubs and 21 herbs occurred on the ROW but not in the forest (Table 9.7).

There was no comparison made on the hydric habitat as no off-ROW control plot was established due to lack of a hydric forest type.

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

Table 9.8 presents a breakdown of major vegetational communities (Map 9.2) for mesic and hydric sites on the Hillside to Oakdale ROW. Much of the present composition of herbaceous and woody plant communities reflects the spraying history. The last herbicide treatment on this line area was an aerial application of 3 gallons of Tordon 101 and 12 gallons of water per acre. Earlier herbicide treatments consisted of stump treatments after initial clearing with 2,4,5-T and oil, and selective basal treatment with the same formulation.

Mixed grass is a dominant component of the vegetation on this ROW (Table 9.8). Since grasses are relatively resistant to herbicides, it is not uncommon that pure grass populations are found under aerially sprayed ROW's, and, if aerial maintenance is continued, grasses are likely to remain an important part of the vegetation.

A large portion of the hydric plot is covered by a stream and open area. The open area is apparently caused by periodic high waters from the stream and subsequent grading by agencies other than the utility. Thus, the formation of the open area was apparently unrelated to the ROW.

5.2.4 Comparison of Forest Type with ROW Vegetation

The 230 kV line was clear cut in 1961 and the 345 kV line was clear cut in 1966 and 1967. The line was maintained by selective basal treatments with 2,4,5-T until 1973. In 1973 the ROW was aerially sprayed with 3 gallons of Tordon 101 and 12 gallons of water per acre.

The general impact of the above treatments was to change the forest types (Hemlock-Northern Hardwoods, Aspen-White Pine, Northern Hardwoods, and Scotch Pine) to shrub-herb-grass communities. Some shrub plants of the forest were replaced by plants favored by open conditions.

On the mesic habitats, the forest types were changed to a Blackberry-Goldenrod community. 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 to the forest with some shrubs and herbs of the forest not on the ROW and light-loving species on the ROW and not in the forest.

The hydric habitat remained an Alder-Sensitive Fern community on the ROW.

5.3 Wildlife

The major game species for site 9, Hillside to Oakdale, as determined by Asplundh Environmental Services (AES) in conjunction with the New York State Department of Environmental Conservation (DEC), are white-tailed deer, cottontail rabbit, and gray squirrel.

5.3.1 Actual Use

White-tailed Deer White-tailed deer observations consisted solely of signs, i.e., tracks, browse, and pellet groups. Deer tracks were observed both on and off the ROW in moderate abundance throughout the period of this study, approximately 18 months (Fig. 9.1.5). Deer browse was moderate throughout the ROW, especially on white ash. Deer pellets were moderate throughout the ROW in the grass communities.

Browse Survey Ten browse transects were established on NYSEG ROW study area 9 (Table 9.9; Fig. 9.6). These transects were established at each permanent study plot location, with 1 transect on each side of the ROW, on April 13, 1976.

Overall browse utilization by percentage of actual use was lowest on the ROW, at 25%, medium at the ROW edge, at 30%, and highest in the interior adjacent woods, at 40% (Table 9.9; Fig. 9.6). More stems were available at the ROW edge than either in the interior woods or on the ROW.

Blueberry far surpassed all other species insofar as total abundance and amount used for brosse are concerned (Table 9.9 and 9.10). Of the total of 760 stems. blueberry comprised 83, and of those, 57 stems were browsed. Apple, bush-honeysuckle, serviceberry, red oak, and staghorn-sumac, although not that abundant, had a high percent of actual use (Table 9.9).

Cottontail Rabbit Cottontail rabbit observations on this site were largely limited to indirect evidence of rabbit activity. Rabbit tracks were found in moderate abundance crossing the ROW during the winter of 1976. Rabbit pellets were moderately abundant on the hydric habitat near the south edge of the woods during the spring of 1976. During the summer of 1976, 1 rabbit was flushed from a heavy cover of grass on the ROW. Rabbit and other small animal trails were very abundant throughout the grass communities of the ROW.

Gray Squirrel One gray squirrel was observed running on the ROW near photo station 11 during the fall of 1975. No other squirrel sightings occurred during the remainder of the study.

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 9.11.

During the spring of 1975, woodchuck burrows were numerous throughout the ROW. One garter snake was observed on the ROW and bullfrog activity was moderate on and off the ROW in a man-made pond west of structure 40.

During the spring of 1976, 1 garter snake was seen sunning itself on the access road near Baldwin Creek. Red-spotted newts were seen on the ROW in a small wet depression where cat-tails were prevalent. One fox scat was found on the ROW at this time. Skunk redolence was noted on and off the ROW between structures 28 and 29.

5.3.2 Potential Use

Potential wildlife use of the plant species present on site 9 for the 3 major game species, white-tailed deer, cottontail rabbit, and gray squirrel, is contained in Table 9.12. 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 (Martin et al., 1951).

5.4 Water

Baldwin Creek on the Hillside to Oakdale site was sampled for water quality on September 27, 1975, and February 12, May 19, and August 3, 1976 (Table 6, General Methods; Map 9.1).

5.4.1 Stream Description and Sampling Points

Baldwin Creek is located in the Susquehanna River Basin and is a tributary of the Chemung River near Wellsburg, New York. The creek flows south at a gradient of 0.6%. Upstream of the ROW, Baldwin Creek is a second-order stream and downstream of the ROW it is third-order.

Sampling locations were sited as follows:

1. 100 yards upstream, north, of the ROW;
2. mid ROW;
3. 50 yards downstream, south, of the ROW (Map 9.1).

Rubble and gravel are the dominant substrate and boulders and silt are present (Environmental Protection Agency, 1973). Rocks, stumps, and small logs, and vegetation trap sediment.

Willow, elm, alder, hemlock, and white pine partially shade the creek at location 1. Shading is limited on the ROW and at location 3 alder, American hornbeam, and willow partially shade the creek. Herbs in the study area include touch-me-not, goldenrod, dandelion, aster, Joe-Pye-weed, common blue violet, and mixed grasses and mosses.

A second-order stream enters the study area from the east. It is a tributary of Baldwin Creek at location 2.

On the west bank an intermittent stream enters the creek between locations 1 and 2. Most of the runoff from the ROW west of the stream to the top of the ridge is collected by this stream. The intermittent stream is contained in a deep, eroded gully both on and off the ROW.

The access road fords Baldwin Creek immediately downstream of location 2.

Baldwin Creek in the study area is utilized by wildlife and hunters, Although no one was observed angling, fish are present. The New York Department of State "official classification" for Baldwin Creek is Class D, Agricultural and/or Industrial Water Supply.

5.4.2 Analysis of Water Quality

On September 26, 1975, site 9 was visited at 12:00 noon following 84 hours of rain. The creek was flooding (Fig. 9.1.6) and was milky-brown. Sampling was not conducted.

Sampling on September 27, 1975, was conducted from 11:30 a.m. to 12:50 p.m. and it was cloudy (Table 9.13). Creek depth at locations 1,2, and 3 was 54, 48 and 48 inches and width was 27.0, 35.0, and 40.0 feet, respectively. Water temperature was 12.0 C at locations 1 and 2 and decreased to 11,3 C at location 3. Dissolved oxygen concentration and percent saturation ranged from 11.0 to 12.1 ppm and 101 to 119%, respectively. The pH ranged from 5.8 to 6.0. At location 1, ¼ inch of sediment was deposited on the flood plains and bank erosion was not evident. The east bank was eroded near location 2 and both banks were eroded near location 3.

Sampling on February 12, 1976, was conducted from 12:15 to 1:00 p.m.; it was clear and sunny (Table 9.13). Sometime between September 27, 1975, and February 12, 1976, the creek bed was bulldozed. The creek was graded from upstream of location 2 to immediately upstream of location 3, and the tributary entering Baldwin Creek from the east was also graded, apparently to clear the channel of debris. Creek depth at locations 1, 2, and 3 was 38, 8, and 24 inches and width was 20.4, 18.5, and 21.0 feet, respectively. Ice was present in the stream and water temperature was 0.0 C. Dissolved oxygen concentration and percent saturation were 13.4 to 14.6 ppm and 99 to 107%, respectively. The pH at locations 1 and 2 was 7.3, and at location 3 it was 7.0.

On May 19, 1976, from 9:15 to 9:55 a.m., the air temperature averaged 7 C and it was cloudy with occasional snow (Table 9.13). Creek depth at locations 1, 2, and 3 was 42, 8, and 12 inches and width was 27.0, 20.0, and 17.5 feet, respectively. Water temperature at locations 1 and 2 was 7.0 C and at location 3 it was 7.5 C. Dissolved oxygen concentration and percent saturation ranged from 11.6 to 11.8 ppm and from 103 to 106%, respectively. The pH ranged from 6.2 to 6.7. Fish were observed at locations 1 and 2. Sediment stakes were missing at locations 2 and 3. However, no sediment was observed.

On August 3, 1976, from 11:30 to 11:48 a.m., the air temperature was 21 C and it was sunny (Table 9.13). Creek depth at locations 1, 2, and 3 was 36, 5, and 4 inches and width was 26.5, 8.0, and 18.0 feet, respectively. Water temperature increased from 15.5 C at location 1 to 16.0 C at location 2 and 16.5 C at location 3. Dissolved oxygen concentrations and percent saturation ranged from 10.1 to 10.6 ppm and from 111 to 114%, respectively. The pH ranged from 6.5 to 7.2. No sediment was present at location 1 and stakes were absent at locations 2 and 3.

5.5 Land Use

5.5.1 Location

Site 9 is located in a rural farm section of the town of Baldwin, Chemung County, New York. Between 1960 and 1970 there was a 2.9% increase in population of Chemung County with a 1970 distribution of 74.3% urban, 24.6% rural nonfarm, and 1.1% rural farm (U.S. Bureau of the Census, 1972).

5.5.2 Land Use Prior to Construction

The ROW was constructed during 1961. The earliest available data obtained from 1955 aerial photography indicates that the ROW and the land adjacent to the ROW was primarily rural farm (Table 9.14; Fig. 9.7). Land use distribution included the following subtypes:

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

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

Residential:
- Rs - Strip development

Water Resources:
- Wn - Natural ponds and lakes
- Wb - Marshes, shrub wetlands, and bogs

5.5.3 Land Use After Construction

The adjacent land use to site 9 has had a minimal change from 1955 data with an increase in forested areas and residential areas and a decrease in agricultural uses. With the increase in population of Chemung County, it has been defined as urban, though the area adjacent to site 9 is defined as rural farm (Table 9.14; Fig. 9.7), 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

Residential:
- Rh - High density
- Rs - Strip development

Water Resources:
- Wn - Natural ponds and lakes
- Wb - Marshes, shrub wetlands, and bogs

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

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

The general study area occupies hill and valley terrain typical of the glaciated section of the Allegheny Plateau. Well- to moderately well-drained Arnot, Lordstown, and Mardin silt loam soils developed in glacial till on the hilltops and steep upper slopes with east and west exposures, and somewhat poorly drained Volusia silt loam, exhibiting a strong fragipan, developed on lower slopes. Valley soils formed in alluvial deposits; Chenango developed on well-drained, generally level, gravelly outwash terraces and the poorly drained Papakating soil on first bottoms and depressions that are subject to periodic flooding. The Chenango and Volusia soils on the study area were utilized for cropland and a flat hilltop part of Lordstown-Arnot for pasture in 1976.

In the bordering forest, which may represent conditions prior to ROW clearing in 1961, the upland mesic Lordstown-Arnot and Mardin soils supported a natural Northern Hardwoods forest type with white pine and aspen as prominent components. A small Scotch Pine plantation also was present on an upper-slope segment of Mardin soil. The hydric Papkating and swampy part of Chenango bordering Baldwin Creek supported a Hemlock-White Pine-Northern Hardwoods forest containing such typical bottomland species as red maple, white ash, and hemlock. Potential productivity based on Site Index, total tree height achievable in 50 years, was estimated at 59 to 66 feet for sugar-maple on upland mesic and well-drained bottomland sites, and 60 to 70 feet for red maple on the poorly drained hydric soils.

A consistent "thin duff mull with very shallow A1" humus type was characteristic of mesic sites in the forest. Organic layers from tree litter averaged 1.0 inch in thickness and exhibited shallow incorporation of organic matter in the mineral soil. Slight erosion was evident as a natural occurrence in the undisturbed forest on 18 to 45% slopes of Lordstown-Arnot and Mardin silt loams where litter cover was sparse and mineral soil exposed. More severe gully erosion, with sediment movement into Baldwin Creek, was occurring in an intermittent stream, at the base of the east-facing slope, that channels runoff water from upland areas through the forest.

6.1.2 Vegetation

At the time of clearing many of the level or gently sloping portions of this corridor were in agricultural land or pasture. Cleared land occurred in the valleys and also on the level ridgetops. Most of the study area, however, is on steep slopes. These were in forest prior to 1960, when the first parts of this corridor were cleared.

On most mesic sites Hemlock-northern hardwood mixtures were present prior to line clearing. These included red and chestnut-oaks, black cherry, red maple, white ash, beech, and hemlock. On some mesic sites mixtures of aspe, white pine, and northern hardwoods formed the forest cover, These areas were possibly pasture or croplands many years prior to corridor establishment.

On those hydric sites which were forested at the time this corridor was established, white pine and northern hardwoods were the dominant species, with willow and elm along Baldwin Creek.

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., white-tailed deer, 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 Water

No information is available.

6.1.5 Land Use

Data available showing land use prior to construction of the ROW in 1961 is 1955 aerial photography. The ROW and adjacent land area were rural farm with a land use distribution of forest land (56.9%), agriculture (42.6%), water resources (.3%), and residential (.2%).

6.2 Conditions Which Exist at Present

6.2.1 Soils

Physiography, soil types, and drainage conditions on the ROW in 1976 were the same as those previously summarized for the general study area. Plant community development on the ROW following construction and subsequent maintenance related to soil types and moisture regimes; Blackberry-Goldenrod was dominant on well-drained upland Lordstown-Arnot and Mardin soils, and Alder-Sensitive Fern on poorly drained Papakating and hydric phases of Chenango along Baldwin Creek.

A "thin duff mull with very shallow A1" humus type, equivalent to that in the adjacent forest, was present on mesic areas of the general ROW. Organic layers, about 1.0 inch thick and composed of grass-herb-shrub litter, provided an effective mulsh on most areas. However, as in the forest, organic layers were sparse on some steep slopes and exposed bedrock parts of Lordstown-Arnot soil and slight erosion was occurring. Runoff water from these uplands also caused some gully erosion on lower slopes of the general ROW occupied by Volusia silt loam soil.

Erosion was prominent on several segments of the ROW access road, especially steep areas of exposed Lordstown-Arnot and Mardin soils on the west end of the study area. Also, severe gully erosion was evident in the intermittent stream that intersects the ROW from the adjacent forest and transports runoff water from upland fields. A portion of the erosion sediment entered Baldwin Creek and a small pond near the creek. Additional slight erosion occurred on the ROW in the vicinity of drainage ditches and excavations where bare soil was exposed.

6.2.2 Vegetation

Various mixtures of grasses and herbs are the dominant cover on mesic sites. Since the last herbicide treatment (1973) many tree seedlings and shrubs have invaded. The most common of these species are quaking aspen, red maple, maple-leaved viburnum, sweet birch, yellow birch, and white ash. Open areas are slowly being invaded by various grasses.

Mixed herbs form the major cover on hydric sites. Scattered clumps of willow, black cherry, spiraeas, and staghorn-sumac are present.

6.2.3 Wildlife

White-tailed deer, cottontail rabbit, and gray squirrel are the major game animals that currently occupy the study area. Indirect observations of deer, i.e., tracks, browse, and pellets, indicated their presence on the ROW. Browse surveys indicated that on this site more stems were available at the ROW edge than either in the interior woods or on the ROW. Low sweet blueberry far surpassed all other species insofar as total abundance and browse utilization are concerned. Among those species with a high percent of actual use, even though not numerous along the transects, were red oak, stag-horn-sumac, sugar-maple, bush-honeysuckle, and serviceberry..

Rabbit tracks, pellets, and trails were observed on the ROW and 1 rabbit was flushed from a heavy grass cover on the ROW. One gray squirrel was also observed 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 Water

A 300-foot segment of Baldwin Creek and 150 feet of a tributary is located on the Hillside to Oakdale ROW. Off the ROW the creek is partly shaded by overstory vegetation and shrubs and herbs adjacent to the creek. On the ROW, overstory vegetation is lacking. Herbs and shrubs that provided shade on September 27, 1975, were removed by bulldozing and new vegetation was absent. The substrate was predominantly rubble and gravel, and silt was common on the bottom of deeper pools. Fish were observed in the study area.

The tributary entering Baldwin Creek from the east modified water quality in the study area. Measurements at location 2 were possibly affected by the tributary, while measurements at location 3 were probably modified.

Bulldozing that occurred between September 27, 1975, and February 12, 1976, also modified water quality. Water temperature was most likely affected because vegetation providing shade was removed from the stream banks.

The average water temperature, dissolved oxygen concentration and percent saturation, and pH were nearly equal at all locations.

6.2.5 Land Use

Recent land use of the ROW and adjacent land area indicates a very slight shift in distribution percentages from 1955 data. The area is still classified primarily as rural farm with a distribution of forest land (57.3%), agriculture (42.1%), water resources (.3%), and residential (.3%). With reference to the total inventoried area, percentage shifts in the distribution of land use are noted as follows:

Agriculture -	-.5%
Forest Land -	+.4%
Water Resources -	no change
Residential -	+.1%

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

6.3 Environmental Effect and Probable Causes

6.3.1 Soils

The most prominent effect of ROW management on soils is the occurrence of active erosion on segments of the access road constructed on moderate to steep slopes of erodable upland silt loam soils. Additional slight erosion is occurring along a drainage ditch and excavation on the ROW. Although generally not related to ROW conditions, severe gully erosion was evident in an intermittent stream that channels runoff water from upland areas across part of the ROW and adjacent woodland. Mineral soil was exposed during construction activities on these areas and only light plant cover from invading grass and herbs is present. The active erosion process on these sites apparently interferes with successful plant establishment which is dependent on natural invasion since no restoration seeding was performed.

Significant amounts of sediment from erosion are transported into Baldwin Creek that flows through the valley area across the ROW. Also, serious stream bank erosion occurred along Baldwin Creek following channel grading and flooding.

6.3.2 Vegetation

The general impact of ROW management was to produce a Blackberry-Goldenrod community on the mesic habitat areas which were occupied by Hemlock-Northern Hardwoods forest types. On the hydric ROW habitat area, an Alder-Sensitive Fern community developed in a disturbed stream bottom area subject to over-flow.

The number of species (species diversity) increased on the ROW as compared to the adjacent forest on the mesic habitat area. The hydric habitat appeared not to be related to the adjacent forest, which was Hemlock-White Pine and Northern Hardwoods.

Some important differences in kinds of species on the mesic ROW and in the forest were recorded; shrubs such as blackberry, elderberry, dewberry, spiraea, and Virginia creeper were found only on the ROW in significant number, while teaberry and gray dogwood were found only in the forest. Herbs of the open areas such as wild strawberry, goldenrod, sheep-sorrel, butter-and-eggs, and pokeweed were common only on the ROW. New York fern, marginal shield-fern, and wild sarsaparilla were found only in the forest.

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

The stream bed and banks were modified by bulldozing during the study. Average water temperature, dissolved oxygen concentration and percent saturation, and pH were nearly equal at each location.

Line Management Factors Shading by overstory vegetation was limited on the ROW.

Other Influences The tributary entering Baldwin Creek at location 2, was of sufficient volume to possibly modify water temperature, dissolve oxygen and pH at location 3 and possibly location 2.

Bulldozing that occurred between September 27, 1975, and February 12, 1976, altered the stream bed on the ROW and removed vegetation that shaded the creek and stream.

6.3.5 Land Use

Because 1955 data was used to identify land use prior to construction in 1961, many of the changes noted as having occurred since the ROW was constructed may have actually occurred during the 6 years prior to construction. Without additional information, there is no way of knowing what changes actually took place since 1955.

Changes within the area may be attributed to other changing land use characteristics in Chemung 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 and hunting.

Table 9.1. Soil series present on the Hillside to Oakdale study area.

Soil Series	Map Symbol[1]	Drainage Class[2]	Surface Soil pH	Surface Soil Texture	Woodland Suitability Group
Chenango	CeA	G-E	4.9	channery silt loam	3o1
Lordstown	LnB	G	4.0	channery silt loam	3o1
Lordstown-Arnot	LoE	G	4.6	very rocky channery silt loam	4x1
Mardin	MdA	MG	5.1	channery silt loam	3o1
Mardin	MdB	MG	4.6	channery silt loam	3o1
Mardin	MdC	MG	5.0	channery silt loam	3r1
Mardin	MdD	MG	4.7	channery silt loam	3r1
Mardin	MdE	MG	5.0	channery silt loam	3r1
Papakating	PgA	PD-VPD	5.3	silt loam	4w1
Volusia	VoB	SPD	4.9	channery silt loam	3w2

[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 9.2. Average thickness of organic layers and A1 horizon and humus types for mesic sites on ROW and adjacent woodland of site 9.

Moisture Regime	Location	Layer Thickness (in.) L	F	H	A1	Humus Type
1. Mesic (1)[1]	ROW	.5	.2	.3	.6	Thin duff mull with very shallow A1
	Woodland	.8	.2	.5	.3	Thin duff mull with very shallow A1
2. Mesic (2)	ROW	.7	.1	.2	.3	Thin duff mull with very shallow A1
	Woodland	.6	.2	.2	.4	Thin duff mull with very shallow A1
3. Mesic (4)	ROW	.4	.2	.3	.3	Thin duff mull with very shallow A1
	Woodland	.8	.1	.1	.3	Thin duff mull with very shallow A1
4. Mesic (5)	ROW	.6	.1	0	0	Disturbed area - no humus type
	Woodland	.5	.2	.2	.2	Thin duff mull with very shallow A1
All Plots Combined	ROW	.6	.2	.2	.3	Thin duff mull with very shallow A1
	Woodland	.5	.2	.3	.3	Thin duff mull with very shallow A1

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

Table 9.3. Areas exhibiting active erosion in August, 1976, on the Hillside to Oakdale 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	Volusia channery silt loam	12	Bare-grass-herb	Gully	Moderate/ Severe	1-18
General ROW	Lordstown & Arnot very rocky channery silt loam	50	Grass-herb	Sheet	Slight	-
Access Road	Mardin channery silt loam	12	Bare-grass-herb	Sheet & Gully	Moderate	6
Access Road	Mardin channery silt loam	15	Bare-grass-herb	Sheet & Gully	Moderate	8
Access Road	Mardin channery silt loam	35	Bare-grass-herb	Sheet & Gully	Moderate	6
Access Road	Lordstown & Arnot rocky channery silt loam	25	Bare-grass-herb	Sheet & Gully	Moderate	5
Access Road	Mardin channery silt loam	25	Bare-grass-herb	Sheet & Rill	Slight	-
Access Road	Lordstown & Arnot rocky channery silt loam	40	Bare-grass-herb	Sheet & Rill	Slight	-
Ditch	Mardin channery silt loam	15	Bare-grass-herb	Sheet & Rill	Slight	-

Table 9.3. Continued

Location	Soil Type	Average Slope (%)	Plant Cover	Erosion on Site: Kind	Erosion on Site: Class	Erosion on Site: Gully Depth (in.)
Excavation/Equipment Cut	Lordstown & Arnot very rocky channery silt loam	40	Bare-herb	Sheet & Rill	Slight	-
Stream Bed/ Stream Bank	Chenango channery silt loam	3	Bare	Sheet, Rill & Gully	Severe	1-8
Intermittent Stream/ Wash	Mardin channery silt loam	8	Bare	Sheet, Rill & Gully	Severe	36-60
		FOREST				
General Forest	Lordstown & Arnot very rocky channery silt loam	45	Bare-litter (twigs,leaves)	Sheet & Gully	Slight	1-4
General Forest	Mardin channery silt loam	18	Bare-litter (leaves, twigs)	Sheet & Rill	Slight	-
General Forest	Mardin channery silt loam	25	Bare-hard-woods-herb	Sheet	Slight	-
General Forest	Lordstown & Arnot very rocky channery silt loam	45	Bare-hardwoods herb-litter	Sheet	Slight	-
Stream Bed/ Stream Bank	Chenango channery silt loam	3	Bare	Sheet,Rill & Gully	Severe	1-8
Intermittent Stream/ Wash	Mardin channery silt loam	8	Bare	Sheet, Rill & Gully	Severe	36-60

Table 9.4. 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	Hemlock	83.91	57	140.91
	Red Maple	10.50	17	27.50
	Red Oak	1.26	7	8.26
	Sweet Birch	.55	7	7.55
	Chestnut-Oak	3.50	4	7.50
	White Ash	.14	4	4.14
	White Pine	.14	4	4.14
Mesic 2	White Pine	48.08	50	98.08
	Red Maple	39.13	20	59.13
	Hemlock	12.50	25	37.50
	Apple	.29	5	5.29
Hydric 3[1]	No forest plot was established for Hydric 3.			
Mesic 4	Quaking Aspen	62.69	55	117.69
	Red Maple	14.07	18	32.07
	White Pine	17.35	9	26.35
	Scotch Pine	4.33	9	13.33
	Apple	1.56	9	10.56
Mesic 5	Red Maple	40.49	28	68.49
	Sugar-Maple	38.17	24	62.17
	Sweet Birch	6.07	12	18.07
	Hemlock	2.97	12	14.97
	Large-toothed Aspen	6.07	8	14.07
	Yellow Birch	5.48	8	13.48
	Beech	.38	4	4.38
	Quaking Aspen	.38	4	4.38

[1] No forest plot was established due to the lack of a hydric forest type.

Table 9.5. 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.	Mesic (2) Forest A.S.	Mesic (2) ROW A.S.	Hydric (3) ROW A.S.	Mesic (4) Forest A.S.	Mesic (4) ROW A.S.	Mesic (5) Forest A.S.	Mesic (5) ROW A.S.
Tree Layer									
Hemlock	3.1	-	1.1	-	-	-	-	+.1	-
Red Maple	1.1	-	1.1	-	-	+.1	-	1.1	-
Red Oak	+.1	-	-	-	-	-	-	-	-
Sweet Birch	+.1	-	-	-	-	-	-	+.1	-
Chestnut-Oak	+.1	-	-	-	-	-	-	-	-
White Ash	+.1	-	-	-	-	-	-	-	-
White Pine	+.1	-	2.1	-	-	+.1	-	-	-
Apple	-	-	++.1	-	-	++.1	-	-	-
Quaking Aspen	-	-	-	-	-	1.1	-	++.1	-
Scotch Pine	-	-	-	-	-	++.1	-	-	-
Sugar-Maple	-	-	-	-	-	-	-	1.1	-
Large-toothed Aspen	-	-	-	-	-	-	-	+.1	-
Beech	-	-	-	-	-	-	-	+.1	-
Yellow Birch	-	-	-	-	-	-	-	+.1	-
No. Species	7	0	4	0	0	5	0	8	0
Shrub Layer									
Maple-leaved Viburnum	1.2	2.2	-	-	-	-	-	1.2	+.3
Blueberry	1.4	+.4	-	-	-	-	+.2	(+.2)	-
Hawthorn	-	++.1	-	-	-	-	-	-	+.1
Grape	-	++.1	-	-	-	-	-	-	-
Bush-Honeysuckle	-	+.3	-	-	-	-	-	-	-
Staghorn-Sumac	-	++.1	-	-	+.1	-	-	-	-
Blackberry	-	1.4	-	1.3	-	1.2	+.1	-	2.3
Witch-Hazel	-	-	2.1	++.1	++.1	-	-	-	-
Elderberry	-	-	-	+.1	-	-	-	-	+.1
Tartarian Honeysuckle	-	-	-	++.1	-	-	-	-	-
Dewberry	-	-	-	1.3	-	-	4.4	-	1.1
Common Alder	-	-	-	-	1.3	-	-	-	-

Table 9.5. Continued

Species	Mesic (1) Forest A.S.	Mesic (1) ROW A.S.	Mesic (2) Forest A.S.	Mesic (2) ROW A.S.	Hydric (3) ROW A.S.	Mesic (4) Forest A.S.	Mesic (4) ROW A.S.	Mesic (5) Forest A.S.	Mesic (5) ROW A.S.
Willow spp.	-	-	-	-	1.1	-	-	-	-
Spiraea	-	-	-	-	+.1	-	1.1	-	++.1
Virginia Creeper	-	-	-	-	1.4	-	-	-	-
Gray Dogwood	-	-	-	-	-	1.3	-	-	-
Buckthorn	-	+.1	-	-	+.1	-	-	-	-
Teaberry	1.1	-	-	-	-	-	-	-	-
No. Species	3	8	1	5	7	2	4	2	6
Trees in the Shrub Layer									
Red Oak	1.1	+.1	-	+.1	-	-	-	-	+.1
Sweet Birch	+.1	1.1	-	-	-	-	-	-	+.1
Hemlock	2.1	-	3.1	-	-	-	-	-	-
White Ash	1.1	+.1	2.1	1.1	-	1.1	1.1	3.1	2.1
Beech	2.1	+.1	-	-	-	-	-	2.1	+.1
Red Maple	1.1	2.1	1.1	+.1	-	+.1	1.1	2.1	2.1
Chestnut-Oak	++.1	-	-	-	-	-	-	-	-
White Pine	-	++.1	-	-	-	+.1	+.1	-	-
Quaking Aspen	-	3.1	-	+.1	+.1	3.1	-	-	++.1
Black Cherry	-	2.1	-	1.1	1.1	-	2.1	-	1.1
Large-toothed Aspen	-	+.1	-	-	-	-	-	-	-
Serviceberry	-	1.1	-	-	-	+.1	+.1	1.1	+.1
American Hornbeam	-	-	3.1	3.1	-	-	-	2.1	++.1
Pin-Cherry	-	-	-	+.1	-	-	-	-	-
American Hop-Hornbeam	-	-	++.1	-	-	-	-	-	-
Apple	-	-	-	-	-	-	2.1	-	+.1
Scotch Pine	-	-	-	-	-	-	+.1	-	-
Red Pine	-	-	-	-	-	-	1.1	-	-
Yellow Birch	-	-	-	-	-	-	-	-	2.1
American Elm	-	-	-	-	-	-	-	-	++.1
No. Species	7	10	5	7	2	5	8	5	12

Table 9.5. Continued

Species	Mesic (1) Forest A.S.	Mesic (1) ROW A.S.	Mesic (2) Forest A.S.	Mesic (2) ROW A.S.	Hydric (3) ROW A.S.	Mesic (4) Forest A.S.	Mesic (4) ROW A.S.	Mesic (5) Forest A.S.	Mesic (5) ROW A.S.
Herb Layer[1]									
Wild Lily-of-the-valley	2.4	-	2.3	-	-	-	-	+.2	+.2
Tree Club-moss	+.1	-	-	-	-	-	-	-	-
Star-flower	++.1	-	++.1	-	-	-	-	-	-
Hair-cap Moss	+.2	1.3	2.3	2.4	-	2.4	1.3	-	1.3
Mixed Grass	-	4.4	-	4.4	-	-	4.4	-	4.4
Strawberry	-	2.3	++.1	+.2	-	2.2	1.3	-	-
Upright Yellow Wood-Sorrel	-	2.3	-	++.2	-	2.2	1.1	-	1.2
Cinquefoil	-	1.2	++.1	-	-	2.3	2.2	-	1.2
Daisy spp.	-	+.2	-	++.1	-	-	-	-	-
Common Mullein	-	+.1	-	++.1	-	-	-	-	1.1
Devil's Paint-brush	-	++.2	-	-	-	-	1.2	-	-
Thistle	-	++.1	-	++.1	-	-	2.1	-	+.1
False Spikenard	-	++.1	-	-	-	-	-	-	-
Goldenrod spp.	-	2.3	-	2.2	2.4	+.1	3.2	-	2.2
Aster spp.	-	2.2	1.1	2.2	1.2	+.1	2.2	1.1	1.2
Sheep-Sorrel	-	1.2	-	1.4	-	+.2	-	-	1.2
Butter-and-eggs	-	1.3	-	-	-	-	-	-	3.3
New York Fern	-	-	1.2	-	-	-	-	-	-
Wood-Fern	-	-	++.1	-	-	-	-	-	-
Christmas Fern	-	-	++.2	-	-	-	-	+.2	-
Dog's-tooth-Violet	-	-	1.3	2.4	-	-	-	-	-
Sensitive Fern	-	-	++.2	++.1	1.2	-	-	-	-
Barren Strawberry	-	-	1.3	-	-	-	-	-	-
Partridge-berry	-	-	++.2	-	-	-	-	+.2	-
Violet spp.	-	-	1.2	-	-	-	-	-	-
Twisted-stalk	-	-	+.1	-	-	-	-	-	-
Hepatica sp.	-	-	++.1	-	-	-	-	-	-
Helleborine	-	-	++.1	-	-	-	-	-	-
Pokeweed	-	-	-	1.3	-	-	-	-	-
Spreading Dogbane	-	-	-	+.1	4.4	-	-	-	-

Table 9.5. Continued

Species	Mesic (1) Forest A.S.	Mesic (1) ROW A.S.	Mesic (2) Forest A.S.	Mesic (2) ROW A.S.	Hydric (3) ROW A.S.	Mesic (4) Forest A.S.	Mesic (4) ROW A.S.	Mesic (5) Forest A.S.	Mesic (5) ROW A.S.
Maidenhair-Fern	-	-	-	+.2	-	-	-	-	-
Everlasting	-	-	-	+.2	-	-	-	-	-
Speedwell	-	-	-	++.2	-	-	-	-	-
Spotted Touch-me-not	-	-	-	++.2	-	-	-	-	-
Hawkweed	-	-	-	++.1	-	-	-	-	-
St. John's-wort	-	-	-	1.2	-	-	-	-	1.1
Carolina Spring-Beauty		-	-	1.2	-	-	-	-	-
Blue-eyed Grass	-	-	-	+.2	-	-	+.1	-	-
Dame's Violet	-	-	-	-	2.1	-	-	-	-
Meadow-Rue	-	-	-	-	++.2	-	-	-	-
Yarrow	-	-	-	-	-	1.2	1.2	-	+.2
Black-eyed Susan	-	-	-	-	-	++.1	1.1	-	+.3
Sedge	-	-	-	-	-	2.2	-	-	-
Indian-tobacco	-	-	-	-	-	+.1	-	-	1.1
Ground-Pine	-	-	-	-	-	-	1.3	-	-
Panic-Grass	-	-	-	-	-	-	1.2	-	-
Queen Anne's-lace	-	-	-	-	-	-	1.1	-	1.1
Daisy-Fleabane	-	-	-	-	-	-	+.1	-	1.1
Marginal Shield-Fern	-	-	-	-	-	-	-	1.2	-
Bracken	-	-	-	-	-	-	-	+.1	+.1
Wild Sarsaparilla	-	-	-	-	-	-	-	1.1	-
Solomon's-seal	-	-	-	-	-	-	-	+.1	-
Bedstraw	-	-	-	-	-	-	-	+.2	-
White Baneberry	-	-	-	-	-	-	-	+.1	-
Stonecrop	-	-	-	-	-	-	-	-	+.2
Basil	-	-	-	-	-	-	-	-	1.1
Evening-Primrose	-	-	-	-	-	-	-	-	+.1
Heal-all	-	-	-	-	-	-	-	-	+.2
Hawkweed (yellow)	-	-	-	-	-	-	-	-	+.1
Ceratodon purpureus	-	-	-	-	-	-	-	-	++.2
No. Species	4	14	17	22	6	11	16	10	24

Table 9.5. Continued

Species	Mesic (1) Forest A.S.	Mesic (1) ROW A.S.	Mesic (2) Forest A.S.	Mesic (2) ROW A.S.	Hydric (3) ROW A.S.	Mesic (4) Forest A.S.	Mesic (4) ROW A.S.	Mesic (5) Forest A.S.	Mesic (5) ROW A.S.
Total No. Species									
Trees[2]	8	10	7	7	2	7	8	11	12
Shrubs	3	8	1	5	7	2	4	2	6
Herbs	4	14	17	22	6	11	16	10	24
Totals	15	32	25	34	15	20	28	23	42

[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 9.6. 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		
Teaberry	1.1	-
Herbs[1]		
Wild Lily-of-the-valley	2.4	-
Tree Club-moss	+.1	-
Star-flower	++.1	-
No. Species	4	
Mesic (2)		
Shrubs		
Herbs		
Wild Lily-of-the-valley	2.3	-
Star-flower	++.1	-
Cinquefoil	++.1	-
New York Fern	1.2	-
Wood-Fern	++.1	-
Christmas Fern	++.2	-
Barren Strawberry	1.3	-
Partridge-berry	++.2	-
Violet	1.2	-
Twisted-stalk	+.1	-
Hepatica sp.	++.1	-
Helleborine	++.1	-
No. Species	12	
Hydric (3)[2]		

Table 9.6. Continued

Species	Forest A.S.	ROW A.S.
Mesic (4)		
Shrubs		
Gray Dogwood	1.3	-
Herbs		
Sheep-Sorrel	+.2	-
Sedge	2.2	-
Indian-tobacco	+.1	-
No. Species	4	
Mesic (5)		
Shrubs		
Blueberry	(+.2)	-
Herbs		
Christmas Fern	+.2	-
Partridge-berry	+.2	-
Marginal Shield-Fern	1.2	-
Wild Sarsaparilla	1.1	-
Solomon's-seal	+.1	-
Bedstraw	+.2	-
White Baneberry	+.1	-
No. Species	8	

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

[2] No forest plot was established due to the lack of hydric forest hydric plot.

Table 9.7. 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		
Hawthorn	++.1	-
Grape	++.1	-
Bush-Honeysuckle	+.3	-
Staghorn-Sumac	++.1	-
Blackberry	1.4	-
Buckthorn	+.1	-
Herbs[1]		
Mixed Grass	4.4	-
Strawberry	2.3	-
Upright Yellow Wood-Sorrel	2.3	-
Cinquefoil	1.2	-
Daisy spp.	+.2	-
Common Mullein	+.1	-
Devil's Paint-brush	++.2	-
Thistle	++.1	-
False Spikenard	++.1	-
Goldenrod spp.	2.3	-
Aster spp.	2.2	-
Sheep-Sorrel	1.2	-
Butter-and-eggs	1.3	-
No. Species	19	
Mesic (2)		
Shrubs		
Elderberry	+.1	-
Tartarian Honeysuckle	++.1	-
Dewberry	1.3	-
Blackberry	1.3	-
Herbs		
Mixed Grass	4.4	-
Upright Yellow Wood-Sorrel	++.2	-
Daisy spp.	++.1	-

Table 9.7. Continued

Species	ROW A.S.	Forest A.S.
Common Mullein	++.1	-
Thistle	++.1	-
Goldenrod spp.	2.2	-
Sheep-Sorrel	1.4	-
Pokeweed	1.3	-
Spreading Dogbane	+.1	-
Maidenhair-Fern	+.2	-
Everlasting	+.2	-
Speedwell	++.2	-
Spotted Touch-me-not	++.2	-
Hawkweed	++.1	-
St. John's-wort	1.2	-
Carolina Spring-Beauty	1.2	-
Blue-eyed Grass	+.2	-
No. Species	21	
Hydric (3)[2]		
Mesic (4)		
Shrubs		
Blueberry	+.2	-
Dewberry	4.4	-
Spiraea	1.1	-
Herbs		
Mixed Grass	4.4	-
Thistle	2.1	-
Blue-eyed Grass	+.1	-
Ground-Pine	1.3	-
Panic-Grass	1.2	-
Devil's Paint-brush	1.2	-
Queen Anne's-lace	1.1	-
Daisy-Fleabane	+.1	-
No. Species	11	

Table 9.7. Continued

Species	ROW A.S.	Forest A.S.
	Mesic (5)	
Shrubs		
Hawthorn	+.1	-
Blackberry	2.3	-
Elderberry	+.1	-
Dewberry	1.1	-
Spiraea	++.1	-
Herbs		
Hair-cap Moss	1.3	-
Mixed Grass	4.4	-
Upright Yellow Wood-Sorrel	1.2	-
Cinquefoil	1.2	-
Common Mullein	1.1	-
Thistle	+.1	-
Goldenrod spp.	2.2	-
Sheep-Sorrel	1.2	-
Butter-and-eggs	3.3	-
St. John's-wort	1.1	-
Yarrow	+.2	-
Black-eyed Susan	+.3	-
Indian-tobacco	1.1	-
Queen Anne's-lace	1.1	-
Daisy-Fleabane	1.1	-
Stonecrop	+.2	-
Basil	1.1	-
Evening-Primrose	+.1	-
Heal-all	+.2	-
Hawkweed (yellow)	+.1	-
Ceratodon purpureus	++.2	-
No. Species	26	

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

2 No forest plot was established due to the lack of a hydric forest type

Table 9.8. Major vegetational types for the Hillside to Oakdale study area based on percent of study plots occupied by each plant community and other components.

Community	Site Classification				
	Mesic (1)	Mesic (2)	Hydric (3)	Mesic (4)	Mesic (5)
	Percent of Total Area				
Mixed Grass-Herb	91.4				67.5
Access Road (invading with grass)	5.1	7.3			
Blueberry	2.2				
Poles (wood pole H-frame)	.6				
Red Maple	.4				.1
Maple-leaved Viburnum	.2				
Quaking Aspen	.1				
Mixed Grass		80.5			3.2
Mixed Herb		10.8	39.2		
Open (with Pokeweed invading)		1.1			
American Hornbeam		.2			
Black Cherry		.1	.1	.1	
Stream			28.7		
Open			27.0		
Black Cherry-Virginia Creeper			3.8		
Willow			.6		
Smooth Alder			.5		
Staghorn-Sumac			.1		
Dewberry-Mixed Grass-Herb				99.7	
Apple				.2	
White Ash					.2
Yellow Birch					.2
Open (invading with Grass)					28.8
Totals	100.0	100.0	100.0	100.0	100.0

Table 9.9. 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	%
Beech			1/6	17	10/13	77	11/19	58
American Hornbeam	0/6	0	3/24	13	0/6	0	3/36	8
Apple	1/1	100	5/5	100	8/16	50	14/22	64
Birch (Sweet, Yellow)	1/1	100	0/1	0	1/1	100	2/3	66
Blackberry	5/31	16	18/59	31	12/18	67	35/108	32
Black Cherry	2/8	25	3/17	29	2/8	25	7/33	21
Bush-Honeysuckle	18/18	100			0/3	0	18/21	86
Dewberry	5/78	6	0/21	0	1/19	5	6/118	5
Elderberry			2/3	67			2/3	67
Hemlock			1/2	50	0/5	0	1/7	14
American Hop-Hornbeam	0/6	0	9/14	64	5/10	50	14/30	47
Serviceberry	3/3	100	1/2	50	2/4	50	6/9	67
Blueberry	4/12	33	27/32	84	26/39	66	57/83	67
Maple-leaved viburnum			8/18	44	7/9	78	15/27	56
Raspberry	10/47	21	5/17	29	11/33	33	26/97	27
Red Maple	1/2	50	2/3	66	1/5	20	4/10	40
Red Oak			1/1	100	3/3	100	4/4	100
Common Alder			0/3	0			0/3	0
Spiraea	0/1	0	0/1	0	0/4	0	0/6	0
Staghorn-Sumac	5/5	100					5/5	100
Sugar-Maple					7/8	88	7/8	88
Teaberry			0/46	0	0/26	0	0/72	0
Quaking Aspen	2/6	33	0/3	0			2/9	22
White Ash			1/4	25	1/5	20	2/9	22
White Pine			0/1	0	0/3	0	0/4	0
Witch-Hazel			0/15	0	2/9	22	2/14	14
Total	57/225	25	87/288	30	99/247	40	243/762	32

Table 9.10. 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		Blackberry		Blueberry	
	Ratio	%	Ratio	%	Ratio	%
ROW	5/78	6	5/31	16	4/12	33
ROW Edge	0/21	0	18/59	31	27/32	84
Woods	1/19	5	12/18	67	26/39	66
Total	6/118	5	35/108	32	57/83	67

Table 9.11. Birds observed and/or heard on the ROW and on the ROW edge during the study period.

Species	Species
Red-tailed hawk	Robin
Sharp-shinned hawk	Wood thrush
Sparrow hawk	Starling
Ruffed grouse	Red-eyed vireo
Belted kingfisher	Cape may warbler
Yellow-shafted flicker	Red-winged blackbird
Eastern kingbird	Cardinal
Eastern phoebe	Indigo bunting
Blue jay	Song sparrow
Common crow	Rufous-sided towhee
Black-capped chickadee	

Table 9.12. Potential wildlife use of plant species[1] present on the ROW and adjacent woods for the major game species on the Hillside to Oakdale study area.

Species	Wildlife Species		
	Deer	Rabbit	Squirrel
<u>Trees</u>			
Red Maple	****	*	**
Sugar-Maple	****		**
Hemlock	+		
Red Oak	*	+	****
Sweet Birch	*		
Chestnut-Oak	*	+	****
White Ash	*		
White Pine	+		*
Apple	*	+	
Quaking Aspen	**		
Large-toothed Aspen	**		
Beech	+		**
Yellow Birch	*		
Black Cherry	*	*	+
Scotch Pine			*
Serviceberry	+		
American Hornbeam	*		*
Pin-Cherry	*		
American Hop-Hornbeam	+		
Red Pine			*
American Elm	+		+
<u>Shrubs</u>			
Maple-leaved Viburnum	*		
Blueberry	+	*	
Hawthorn	+		
Bush-Honeysuckle	+		
Staghorn-Sumac	**	+	
Blackberry	+	**	+
Witch-Hazel	**		
Tartarian Honeysuckle	+		
Dewberry	+	**	+
Willow spp.	*	+	
Spiraea	+		
Gray Dogwood	*	+	
Teaberry	**		
<u>Herbs</u>[2]			
Mixed Grass	*	**	
New York Fern	*		

Table 9.12. Continued

Species	Wildlife Species		
	Deer	Rabbit	Squirrel
Wood-Fern	*		
Christmas Fern	*		
Sensitive Fern	*		
Maidenhair-Fern	*		
Marginal Shield-Fern	*		
Goldenrod	+	*	
Sheep-Sorrel		**	
Panic-Grass		*	
Blue-eyed Grass		**	
Bracken	*		
Strawberry		+	
Sedge			+

[1] Those plants not included in this table provide a certain amount of cover (Table 9.5) 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 9.13. Water quality data collected from September 27, 1975, to August 3, 1976, at site 9, Hillside to Oakdale ROW, Chemung County, New York.

Date		September 27, 1975			February 12, 1976			May 19, 1976			August 3, 1976		
Sampling Location		1	2	3	1	2	3	1	2	3	1	2	3
Hour		1130	1215	1250	1215	1230	1300	0940	0915	0955	1158	1130	1145
Water Temp. (C)		12.0	12.0	11.3	0.0	0.0	0.0	7.0	7.0	7.5	15.5	16.0	16.5
Dissolved Oxygen (ppm)		11.1	11.0	12.1	13.9	14.6	13.4	11.8	11.6	11.8	10.6	10.5	10.1
% Saturation D.O.		111	101	119	102	107	99	105	103	106	114	114	111
pH		6.0	5.8	6.0	7.3	7.3	7.0	6.4	6.7	6.2	7.2	6.5	7.0
Water Temp. (C)	range	11.3-12.0			0.0			7.0-7.5			15.5-16.5		
	mean	11.8			0.0			7.2			16.0		
% of Saturation D.O.	range	101-119			99-107			103-~~106~~ 106			111-114		
	mean	110			103			105			112		
pH	range	5.8-6.0			7.0-7.3			6.2-6.7			6.5-7.2		
	mean	5.9			7.2			6.4			6.9		
Comments		cloudy, rain preceded sampling from 23 to 26 Sept., bank erosion at sampling locations 2 & 3			clear, sunny ice in stream, stream bed was graded from upstream sampling location 2 to upstream of sampling location 3			cloudy with snow showers, air temp. 7 C			sunny, air temp. 21 C		

Table 9.14. 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	-42.6 *42.1
(C,I)	Commercial & Industrial	
(F)	Forest Land	-56.9 *57.3
(E)	Extractive Industry	
(N)	Non-productive	
(OR)	Outdoor Recreation	
(P)	Public & Semi-public	
(W)	Water Resources	-.3 *.3
(U)	Urban Inactive	
(T)	Transportation	
(R)	Residential	-.2 *.3

1 Source: Air Photographics, Inc., Purcellville, Va., air photo No. 2-452, Nov. 14, 1971
SCS, Chemus County, air photo No. IP-107, 1955

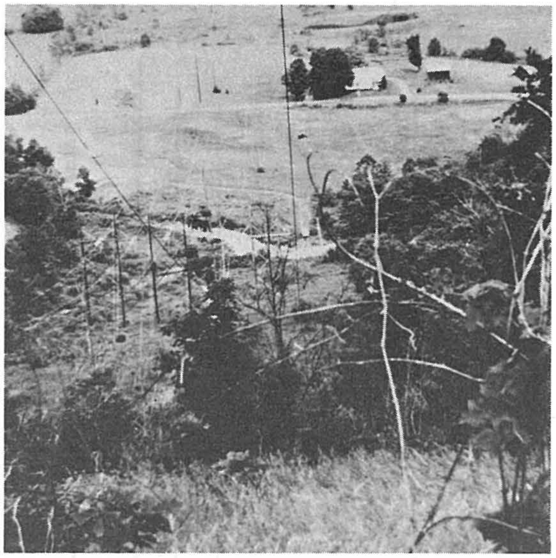


FIG. 9.1.1. General view of the ROW and adjacent forest, looking east, in spring, 1975 (Photo Station 8).

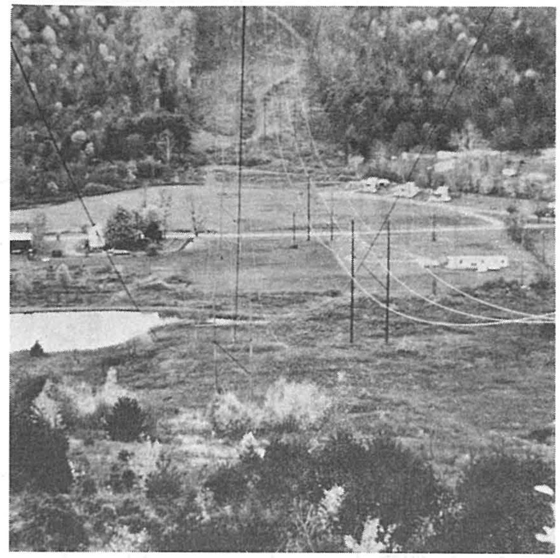


FIG. 9.1.2. General view of the ROW and adjacent forest, looking west, in fall, 1975 (Photo Station 15).

FIG. 9.1.3. Slight sheet and rill erosion on access road on ROW, in summer, 1976 (Photo Station 16).

FIG. 9.1.4. Equipment cut on ROW exhibiting slight sheet and rill erosion, in the spring, 1975 (Photo Station 17).

FIG. 9.1.5. Deer tracks crossing the ROW during the winter of 1976.

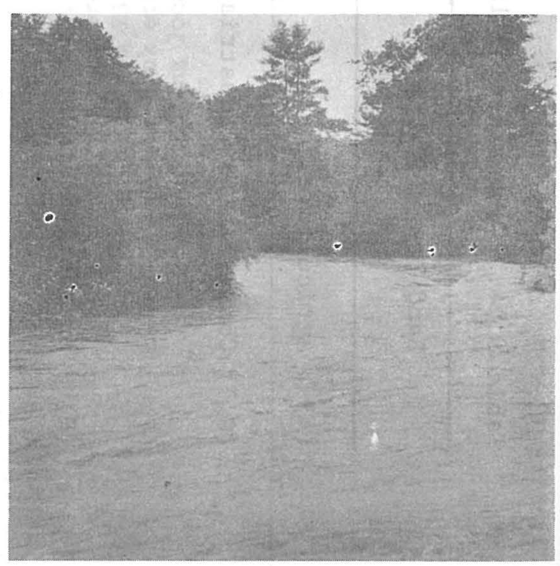


FIG. 9.1.6. Stream crossing ROW during heavy flood conditions, in fall, 1975 (Photo Station 3).

FIG. 9.1. Visual characteristics.

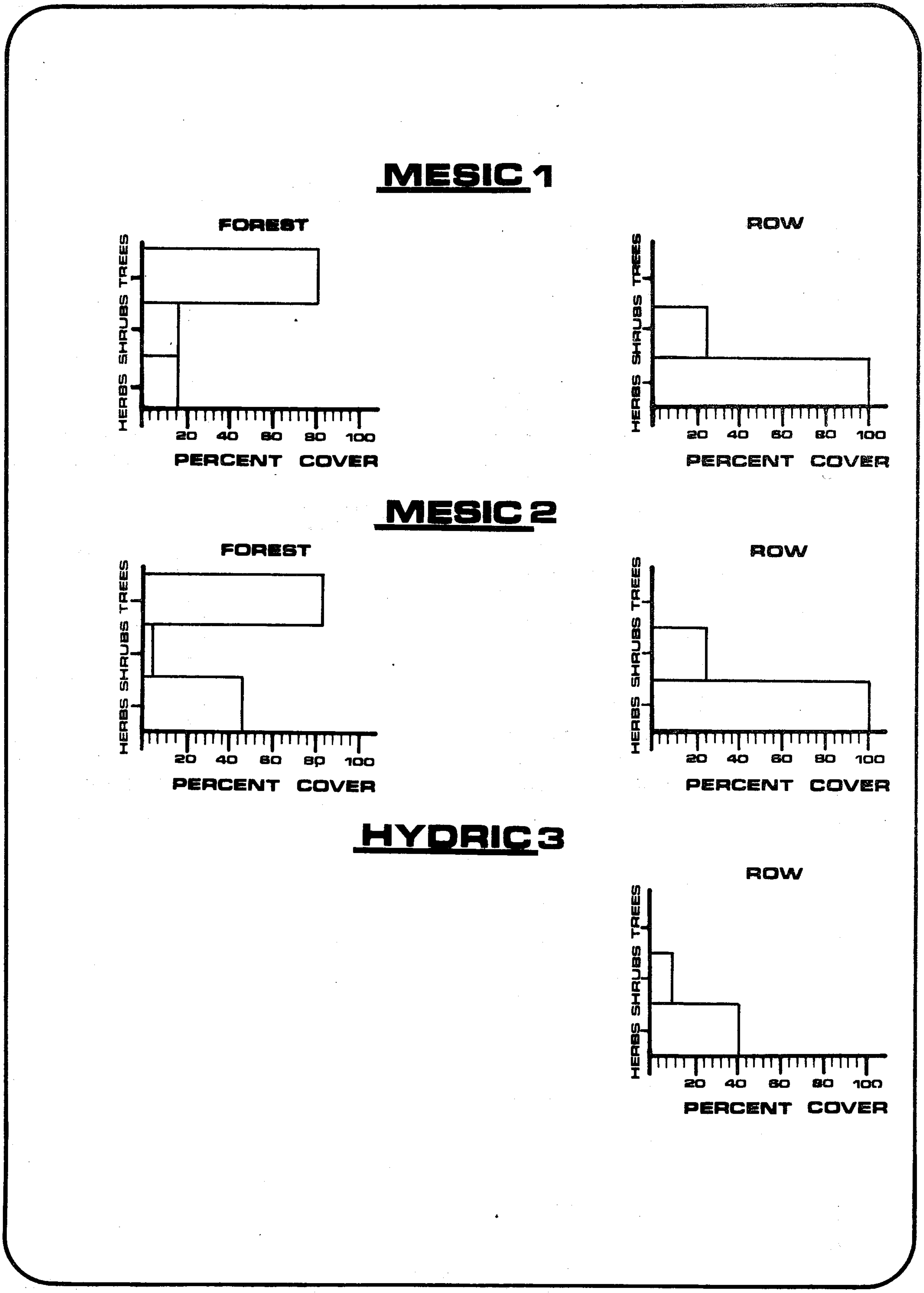


Fig. 9.2. Changes in cover value of tree, shrub, and herb layers from forest to ROW.

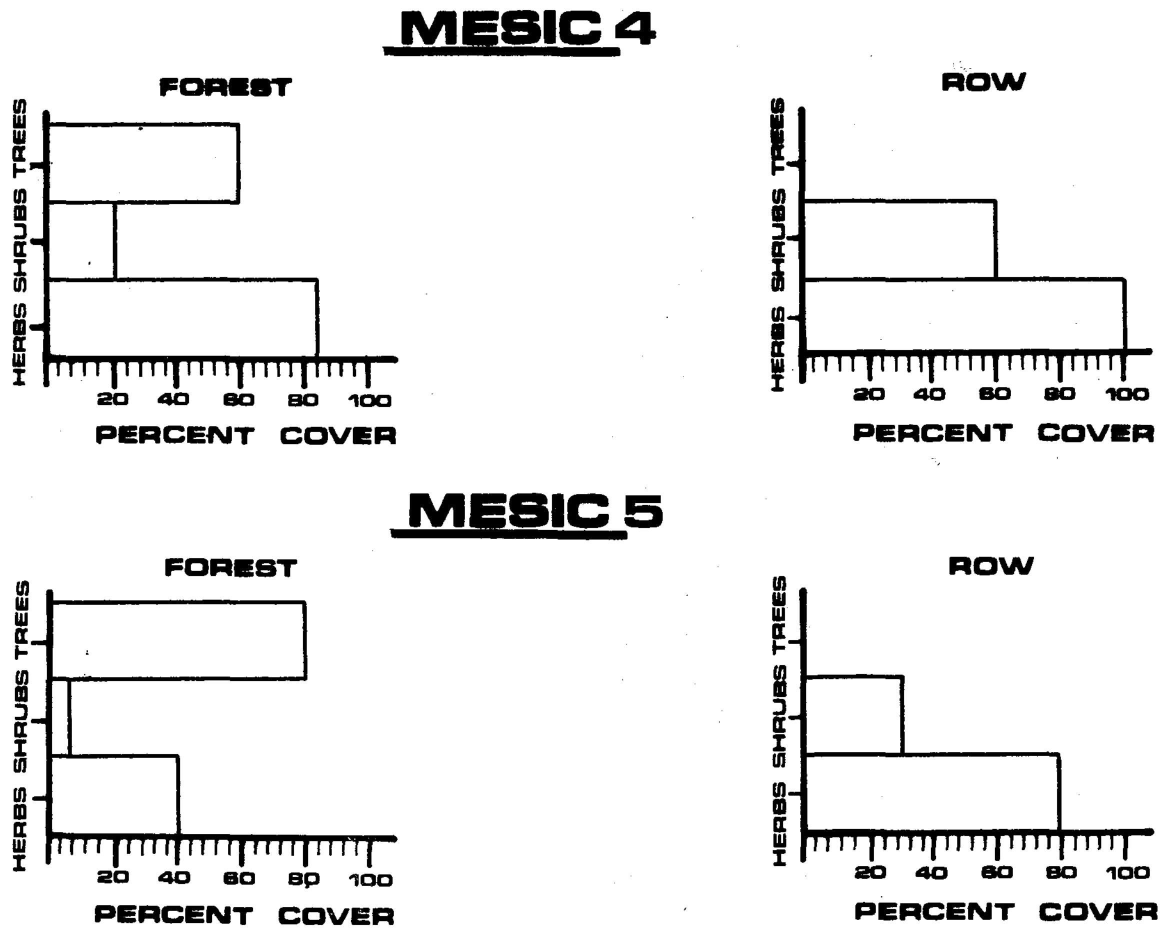


Fig. 9.2a. Changes in cover value of tree, shrub, and herb layers from forest to ROW.

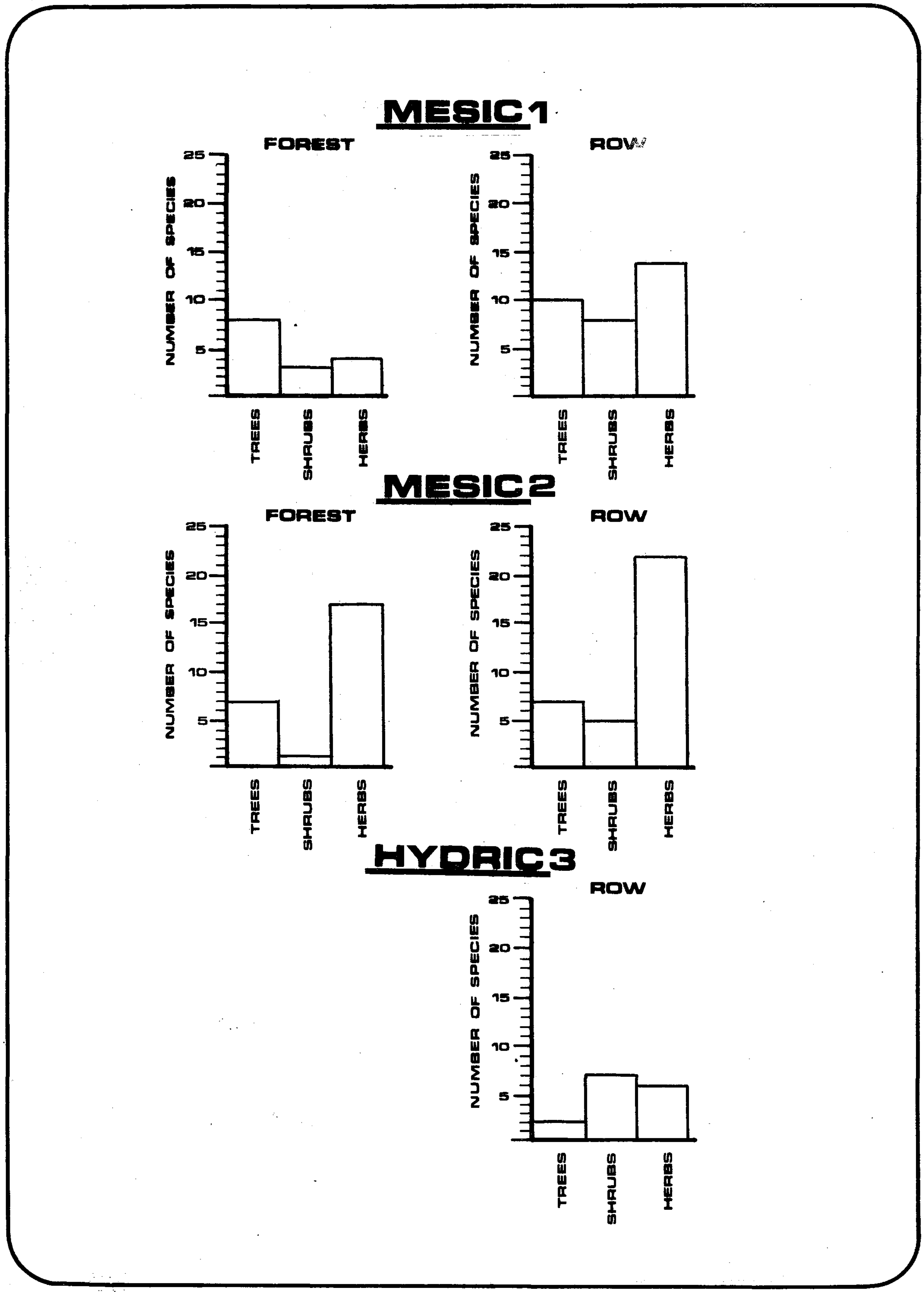


Fig. 9.3. Species diversity in the forest and on the ROW.

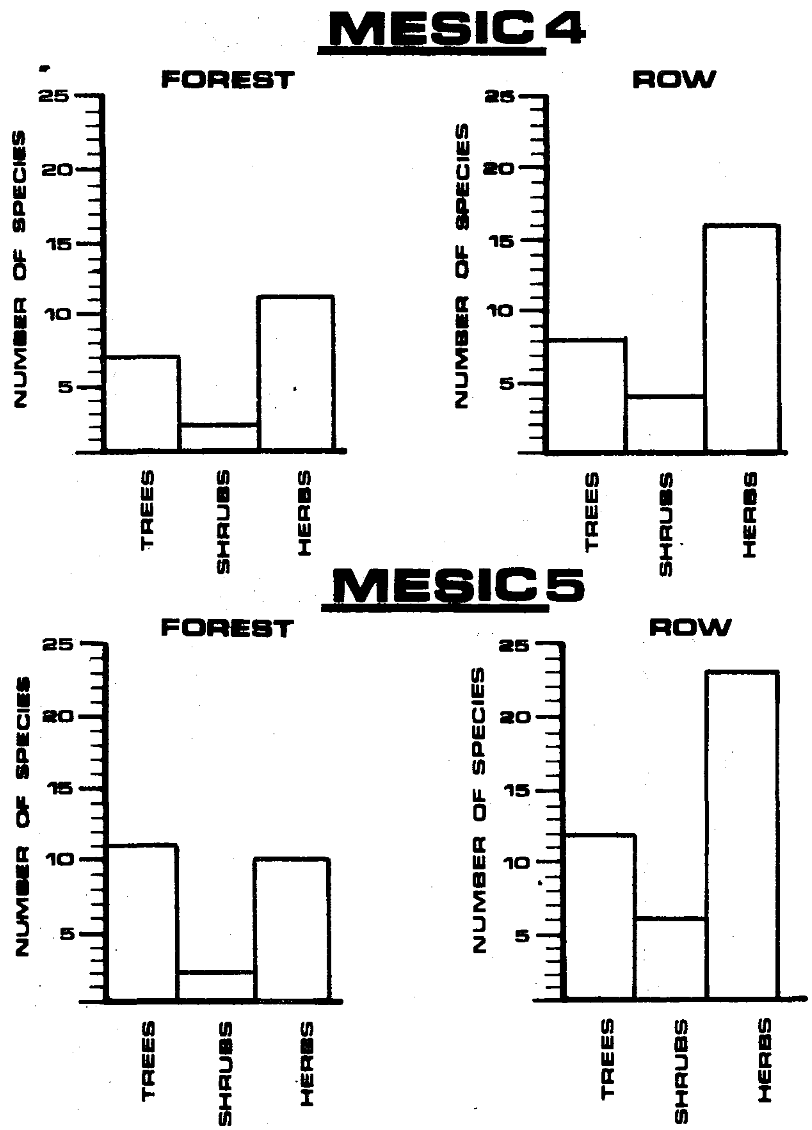


Fig. 9.3a. Species diversity in the forest and on the ROW.

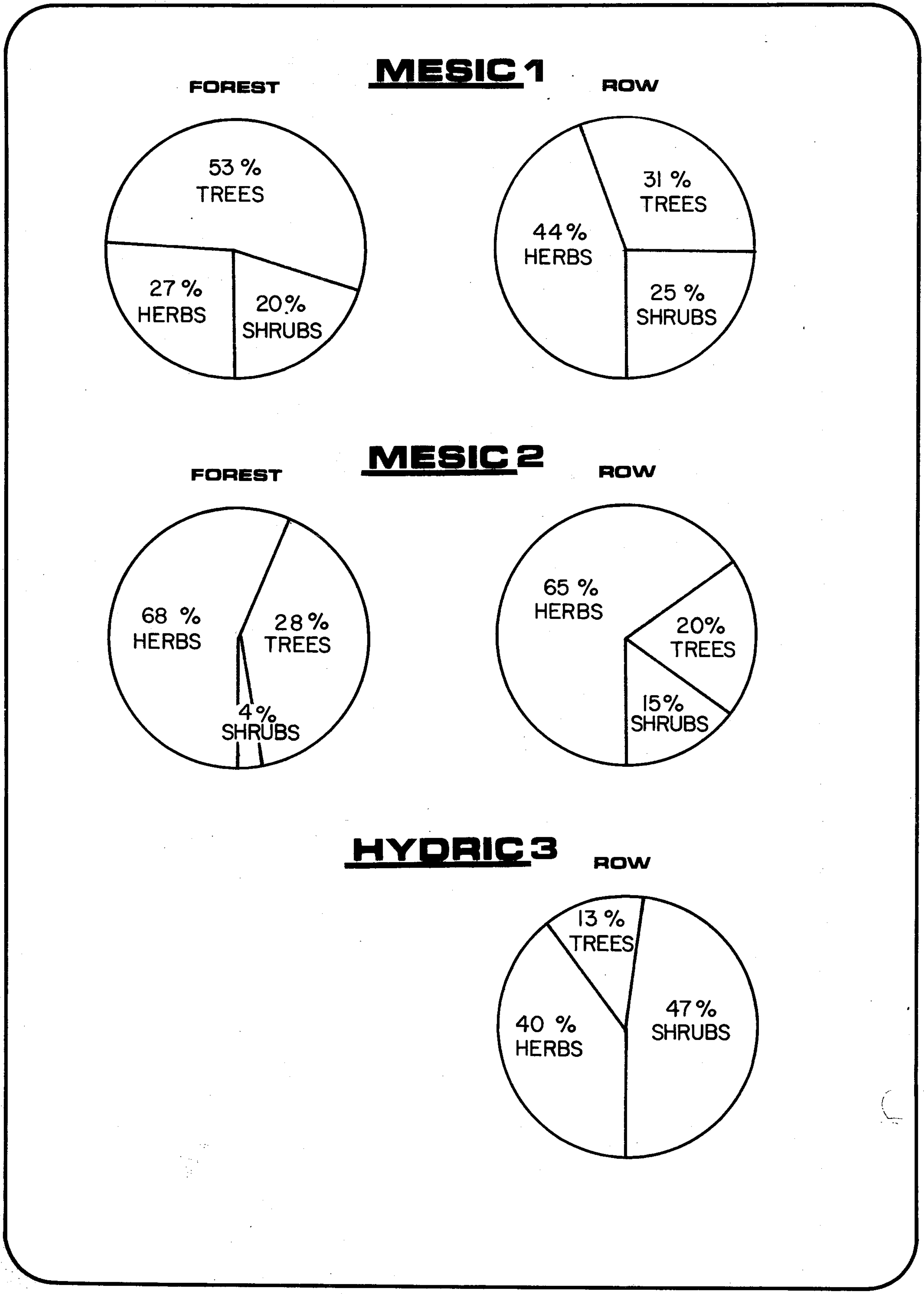


Fig. 9.4. Life form spectrum of the ROW as compared to the adjacent forest to compare species make-up of each, based on the number of species in each life form expressed as a percent of total species.

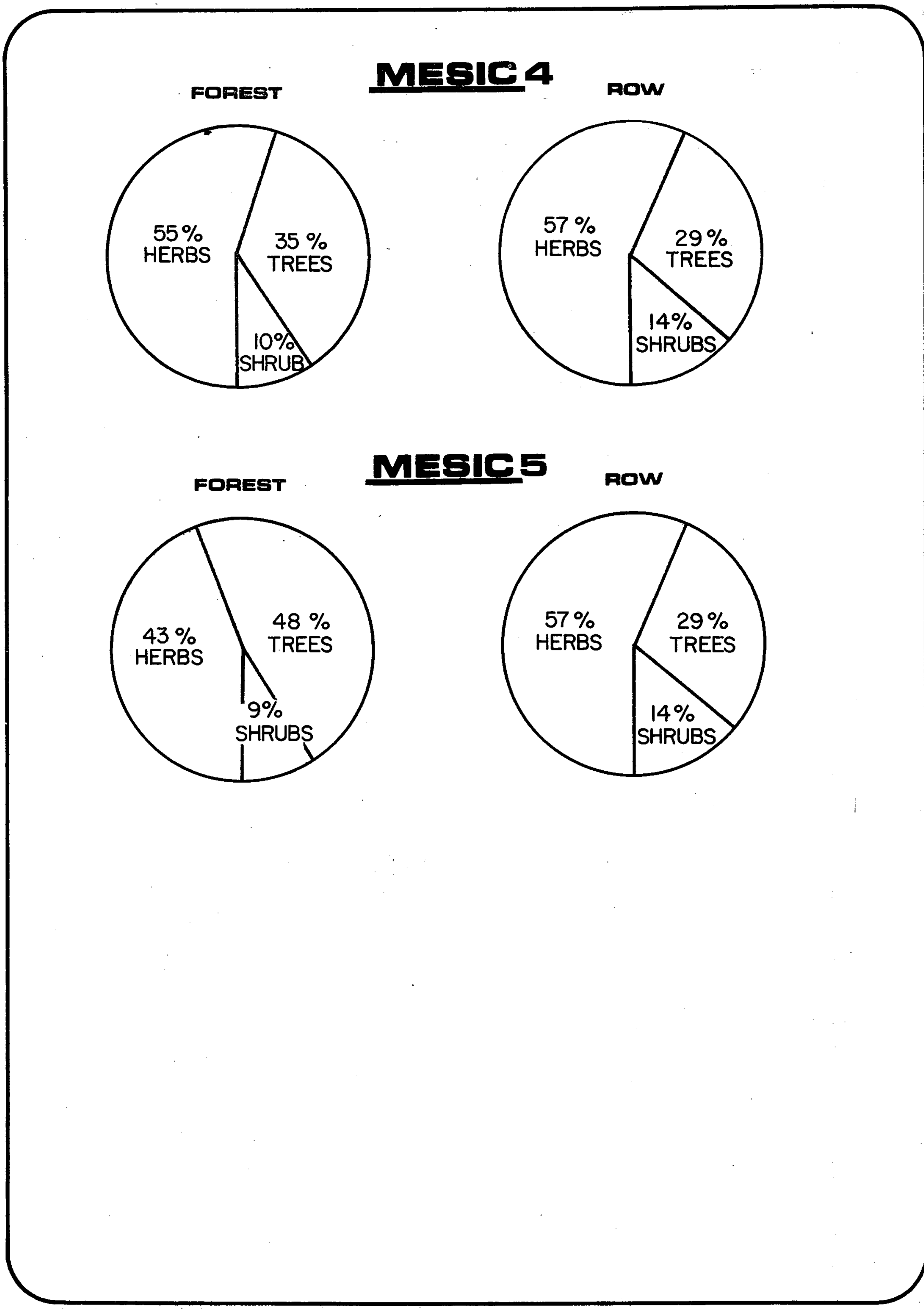


Fig. 9.4a. **Life form spectrum of the ROW as compared to the adjacent forest to compare species make-up of each, based on the number of species in each life form expressed as a percent of total species.**

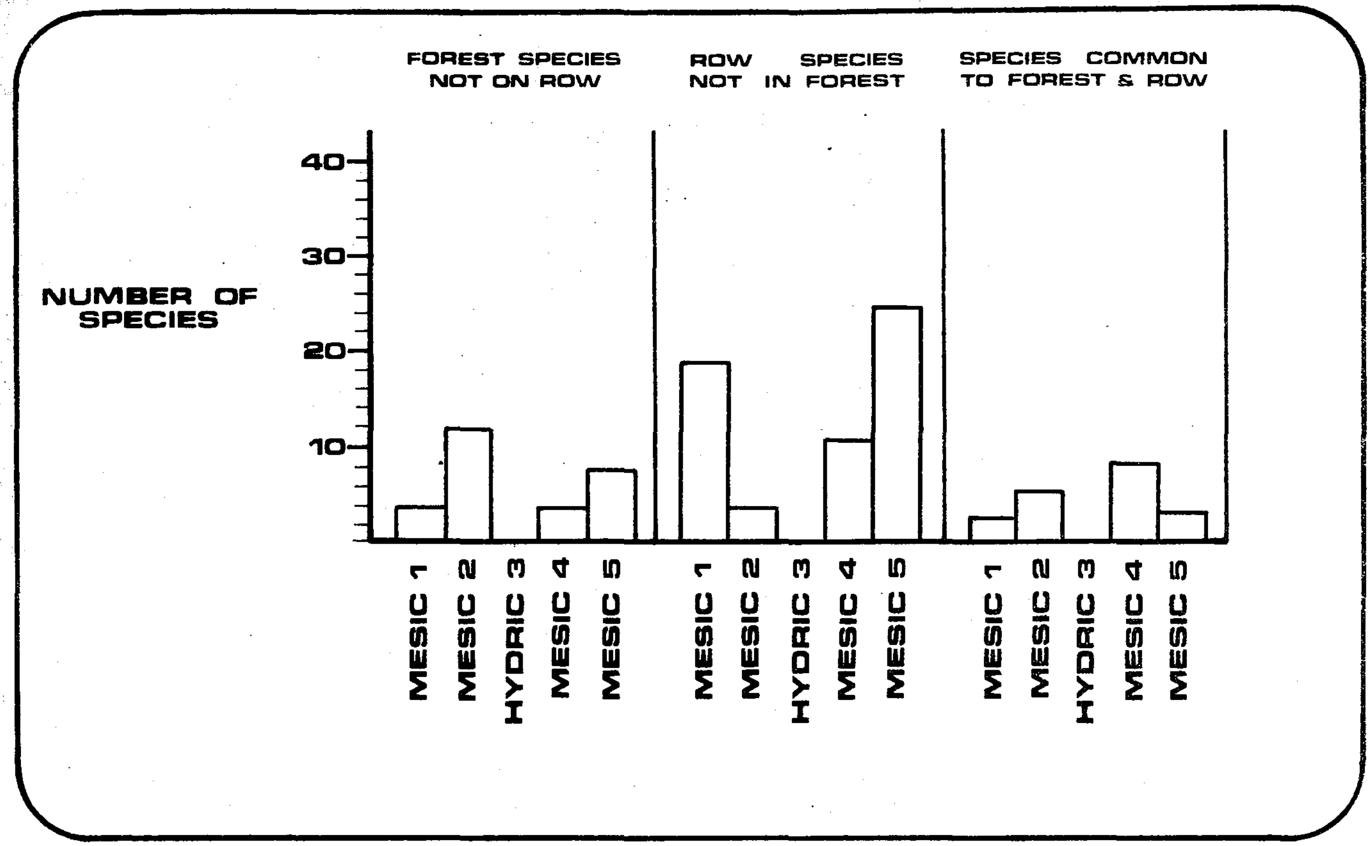


Fig. 9.5. Comparison of shrub and herb species in the forest and on the ROW.

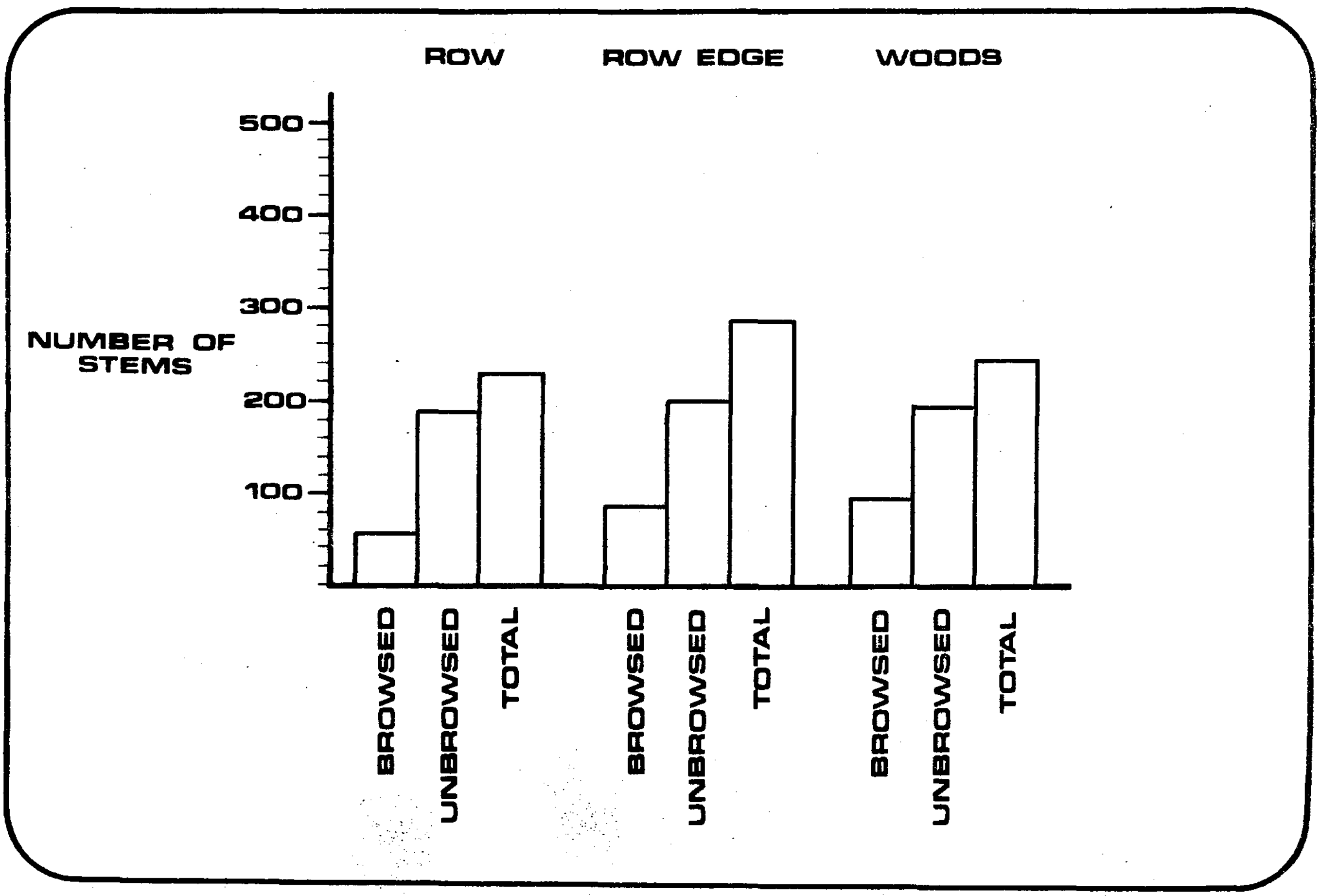
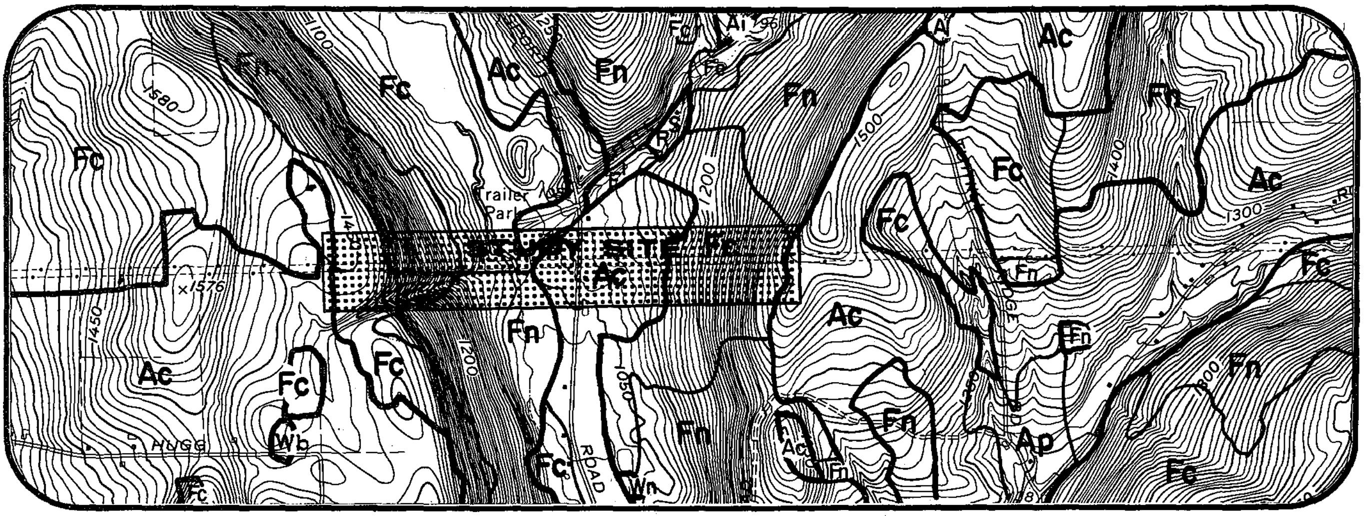
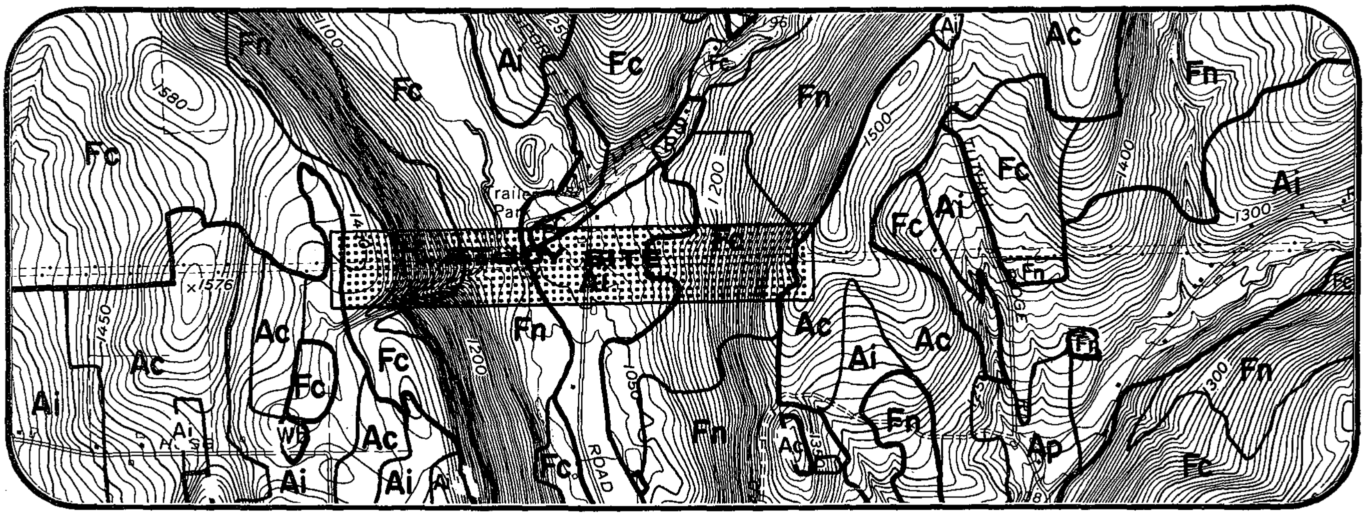


Fig. 9.6. Browse survey showing number of browsed, unbrowsed, and total stems for the ROW, ROW edge, and forest for 10 browse transects.



1955 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

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

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

RESIDENTIAL LAND USE
- Rh - High density
- Rs - Strip development

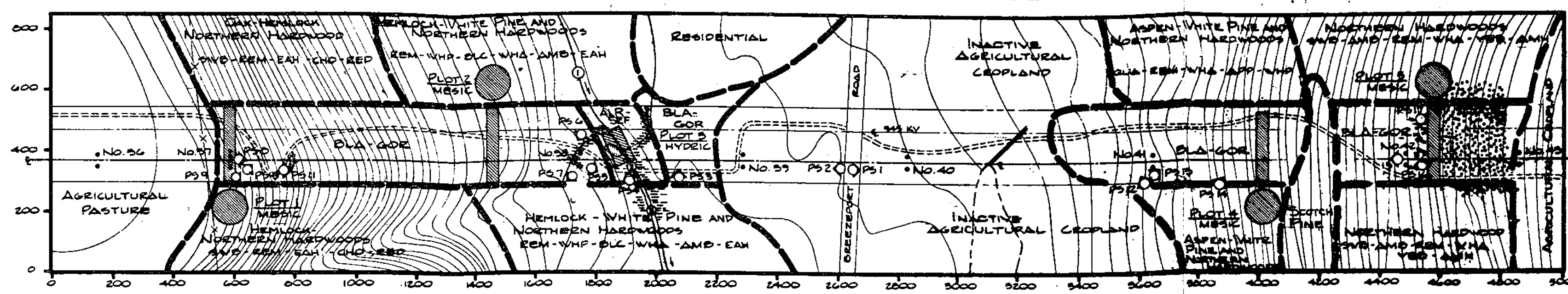
WATER RESOURCES
- Wb- Marshes, shrub wetlands and bogs
- Wn- Natural ponds and lakes

SOURCES:
- Air Photographics, Inc., Purcellville, Va., air photo No. 2-452, Nov. 14, 1971
- SCS, Chemus County, air photo No. 1P-107, 1955
- Area Land Use Map, LUNR, Cornell University, N.Y., 1974
- U. S. G. S. Topographic Map, Wellsburg, N. Y. - Pa., 1964

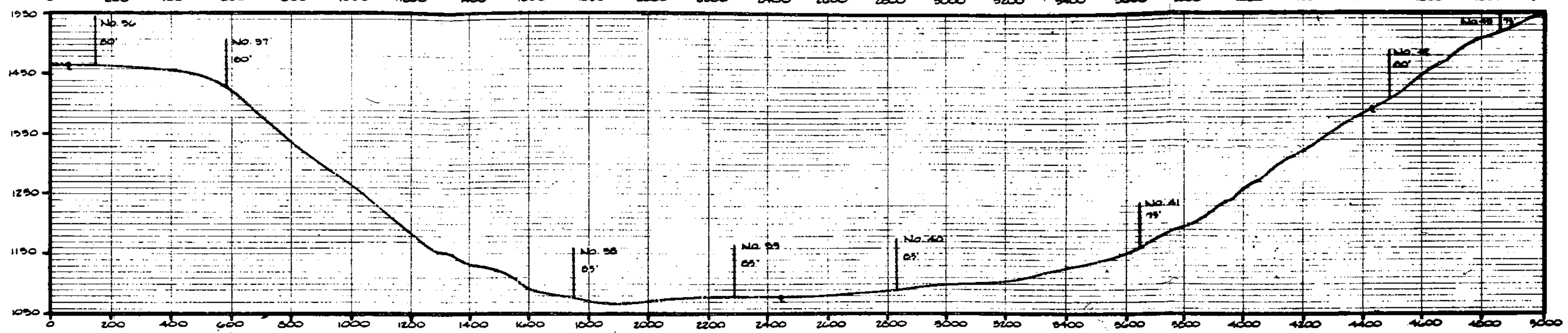
Fig. 9.7. Land use change.

ASPLUNDH ENVIRONMENTAL SERVICES
BLAIR MILL ROAD WILLOW GROVE PA

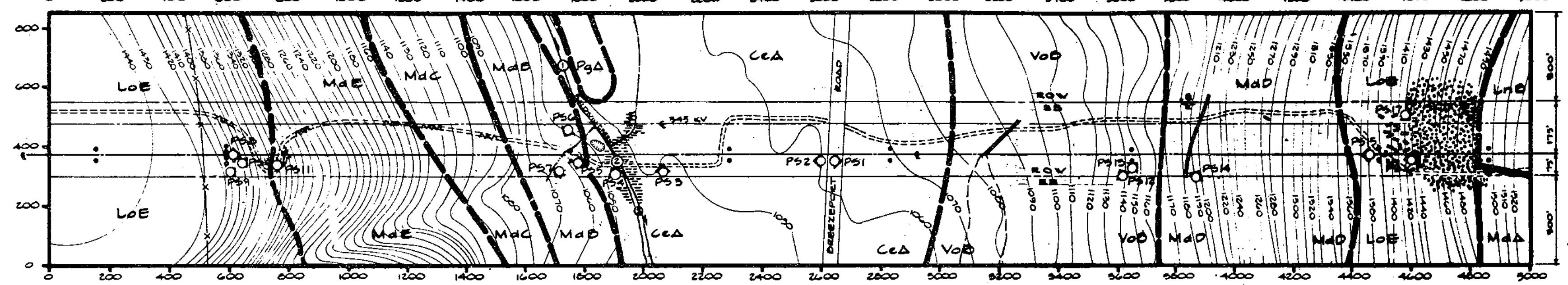
VEGETATION



CENTERLINE PROFILE



SOILS



NOTES:
1) CONTOUR INTERVALS ARE 10'
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. (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
- 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

CeA	CHENANGO	channery silt loam (0 to 8% slope)
LnB	LORDSTOWN	" " " (8 to 15% ")
LoE	LORDSTOWN - ARNOT	very rocky channery silt loam (35 to 50% slope)
MdB	MARDIN	channery silt loam (8 to 15% slope)
MdC	MARDIN	" " " (15 to 25% slope)
MdD	MARDIN	" " " (25 to 35% slope)
MdE	MARDIN	" " " (35 to 50% slope)
PgA	PAPAKATING	silt loam (0 to 8% slope)
VoB	VOLUSIA	channery silt loam (8 to 15% slope)
MdA	MARDIN	channery 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	*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.Y. ST. ELEC & GAS CORP. ENGINEERING PLAN & PROFILE
- USGS 7.5 MIN TOPOGRAPHIC MAP, WELLSBURG N.Y. '69
- USDA SCS IN COOPERATION WITH CORNELL UNIVER AGR EXP STA, SOIL SURVEY FOR CHEMUNG COUNTY, N.Y. SEPT '73
- AIR PHOTOGRAPHICS, INC., PURCELLVILLE, VA AIR PHOTO NO. 2-452 (SCALE 1:24,000) NOV 19, 1971
- ASPLUNDH ENVIRONMENTAL SERVICES A.E.S. PROJECT NO. 81-002B FIELD STUDIES 1975-76

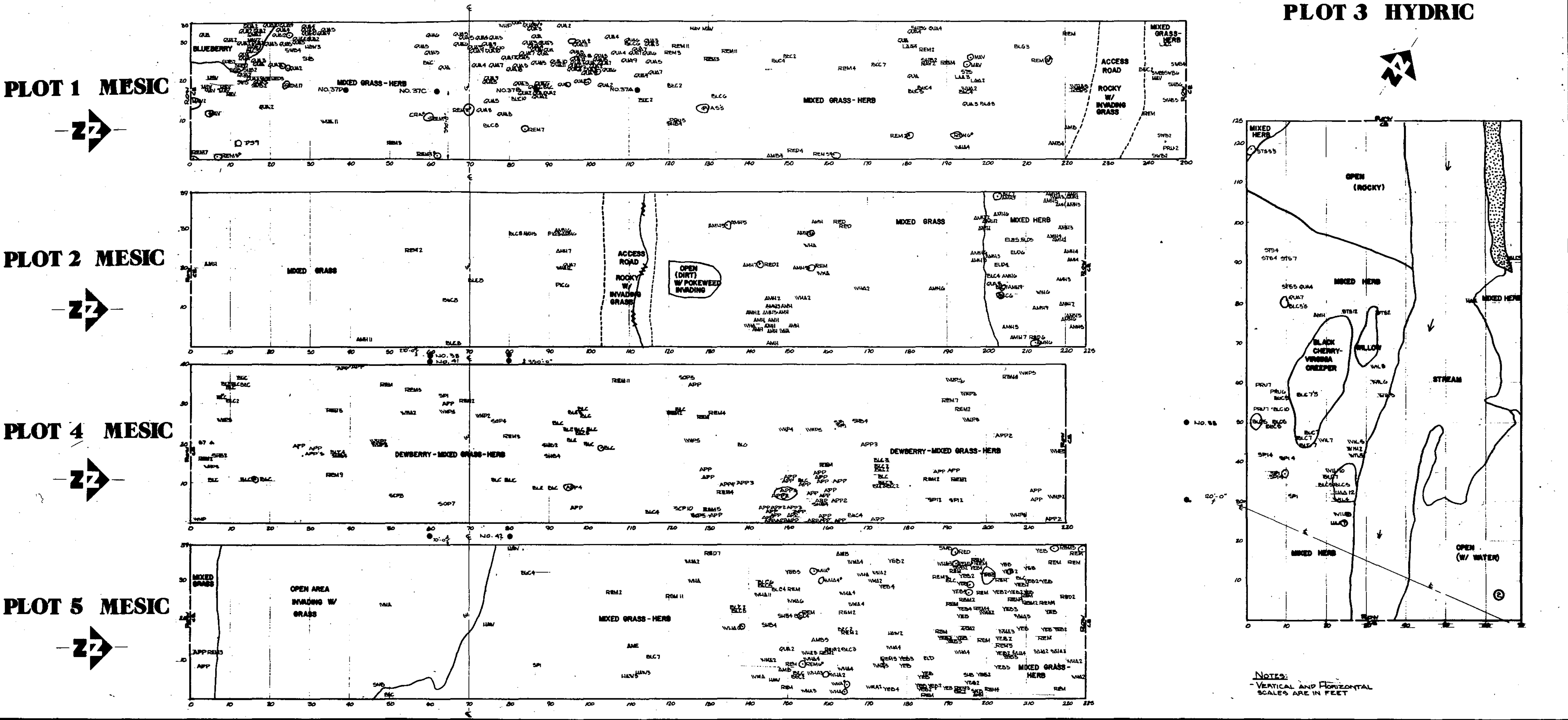
This information is a part of the ESEERCO "STUDY OF ENVIRONMENTAL AND ECONOMIC ASPECTS OF CONTEMPORANEOUS ELECTRIC TRANSMISSION LINE RIGHT-OF-WAY MANAGEMENT TECHNIQUES"

MAP 9.1

SITE 9 HABITAT CONDITIONS

UTILITY: NEW YORK STATE ELEC & GAS CORP.
ROW DESCRIPTION: HILLSIDE TO OAKDALE 230 KV
WOODEN POLE 'H' FRAME 230' ROW

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



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

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 triphylium
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

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

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 9.2

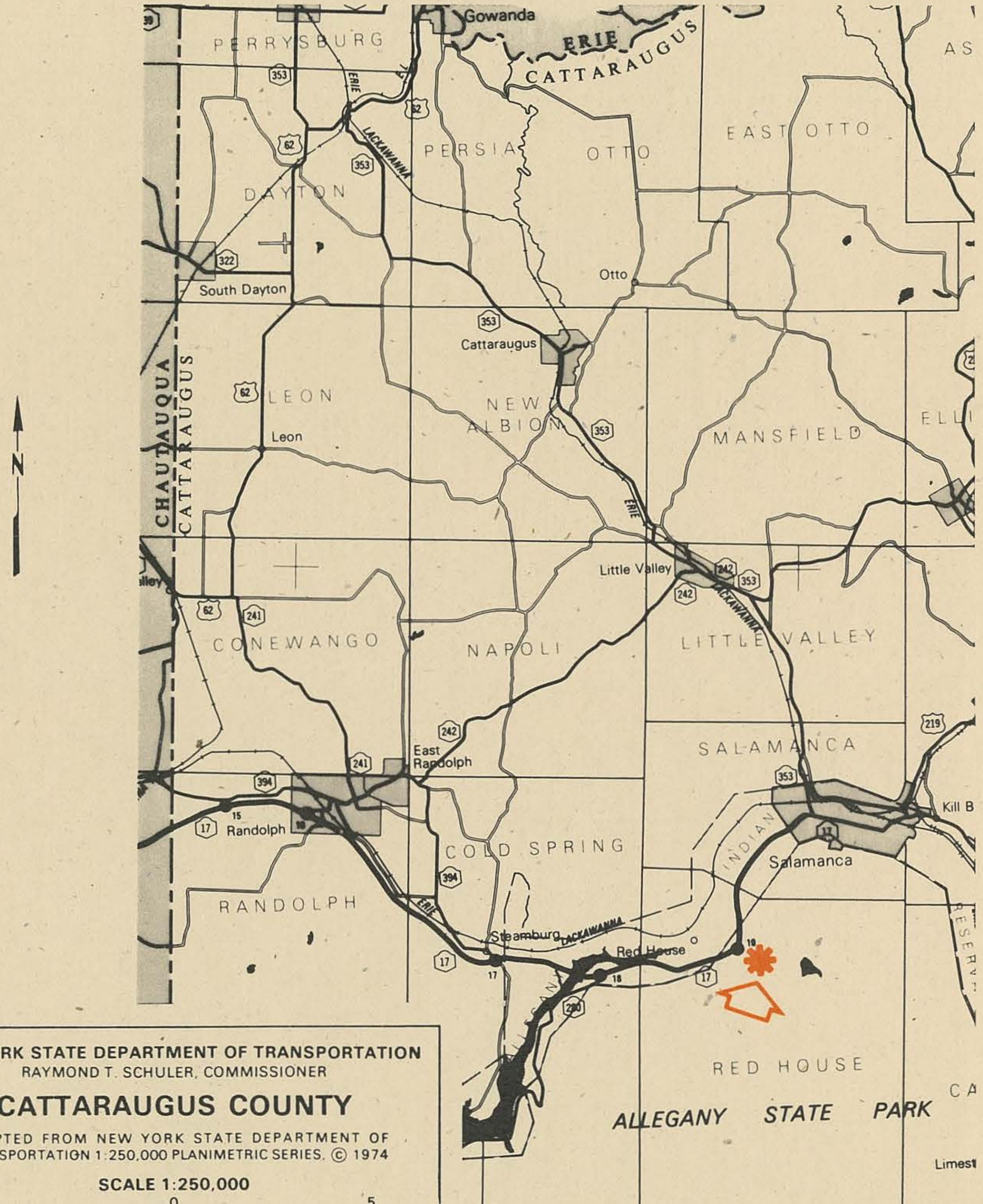
SITE 9

MAPPED PLOTS

UTILITY: NY STATE ELECTRIC & GAS CORP.
ROW DESCRIPTION: HILLSIDE TO OAKDALE 230 K.V.
WOODEN POLE H FRAME 250' ROW.

SITE 10

FALCONER to HOMER HILL



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

CATTARAUGUS 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 10 Falconer to Homer Hill

Study area extends from route 17 (structure 198) to structure 207 and is located near Red House. To reach the area, proceed west on route 17 through Salamanca. The site is past Salamanca on route 17 East at the green road marker, 17/5102/1151.

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Site 10 Falconer to Homer Hill

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Site 10 Flaconer to Homer Hill

1 Introduction

Site 10 is located in the Allegheny 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 area is shown in Figs. 10.1.1 and 10.1.2.

The topography of the area is typically rough and hilly, and the elevation is the highest in western New York. The land is largely forested and is thus devoted primarily to recreation (Stout, 1958).

Typical forest regions of the area are Northern Hardwoods, and Oak-Northern Hardwoods (Stout, 1958). Also found on the site were the following forest types: Aspen-Gray Birch-Paper Birch and Northern Hardwoods, and Hemlock-Northern Hardwoods.

2 Location and Identification

Site 10 is approximately 1 mile southwest of Red House, on the Allegany Indian Reservation, in Cattaraugus County, New York (78^{o} 48' 00" W. Longitude; 42^{o} 5' 30" N. Latitude).

The site is on the Falconer to Homer Hill ROW which is operated by the Niagara Mohawk Power Corporation (NMPC). This 160-foot ROW consists of 2 single circuit lines, the 115 kV line having steel lattice structures and the 34.5 kV line having wooden pole structures. The project site is approximately 4,600 feet in length and extends from structure 198 southwest of Route 17 to structure 207 (of the 115 kV line) west of said road.

3 Background

The following discussion outlines documentable management techniques of clearing, construction, restoration, and maintenance for site 10, as received from NMPC (information sent May 6, 1976, by Kenneth Finch and James Brogan, Niagara Mohawk Power Corporation, Syracuse, N.Y.; telephone conversation on December 14, 1976, with James Brogan, NMPC, Syracuse, N.Y.) All available pertinant information and unit cost data are included under each operation of clearing, construction, restoration, and maintenance.

3.1 Clearing

The original ROW was clear cut and constructed between October, 1926, and December, 1927. The clearing probably included use of handsaws, axes, and brush hooks. Work probably relied heavily upon hand labor and horses.

This original ROW was again clear cut by hand in 1939 and the brush was wind rowed. Both this clearing and the initial clearing were contracted work.

Between October, 1963, and November, 1964, NMPC cleared a new ROW to relocate portions of this line for the Kinzua Dam Project of the Army Corps. of Engineers. The route of the new ROW was approved by the Corps. of Engineers, and the cost of relocation was paid for b, the Corps.

The new and additional portions of the ROW were cleared by a crew of Seneca Indians, working under the supervision of NMPC. The ROW was clear cut and stump treated. The slash was hand piled and burned and salvageable logs were marketed. No further information is available.

3.2 Construction

The original 90-foot ROW was cleared and constructed between October, 1926, and December, 1927, when it was energized. No additional information is available.

When new construction commenced in 1964, structures 198 to 203 (153 and 154 lines) were situated on a portion of the new 160-foot ROW. The Randolph to Salamanca 804, 34.5 kV line was also relocated to this new ROW. At structure 203 the relocated 115 kV lines returned to the old 90-foot ROW, and an additional 65 feet were purchased on the north side of the 115 kV ROW, to accomodate the relocation of the 34.5 kV line parallel to the 153 and 154 lines.

NMPC forces relocated the 34.5 kV line and completed a temporary detour of the 115 kV lines. Buffalo Electric Company contracted the relocation of the 115 kV lines and removal of the old lines.

Records in 1964 indicate that construction started on April 21, 1964, and was completed on November 13, 1964.

The Buffalo Electric Company delivered the steel for the towers to the work site by truck. The towers were fabricated on the ground and erected in sections using an aluminum, sectional gin. A backhoe, high lift loader, bulldozer, and air compressor with "powder puff" tamps were used to excavate and backfill the structures. A pump was necessary at structure 199 to keep water out of the hole for the grillage work. Tensioning equipment and a bulldozer were used to pull in the new conductor.

NMPC used conventional truck-mounted diggers and pole-setting equipment to erect the 34.5 kV line. The digger was winched up over the steep side-hill between structures 202 and 209, by a bulldozer stationed at the top of the hill. The wood poles were set by the digger as soon as the holes were dug, and the structures were framed in the air. A bulldozer was used to pull in the conductor.

Access to structures 198 and 202, was obtained off of the service road just south of the ROW. Once on the ROW, the work forces drove wherever necessary. A stream crossing was bulldozed out at Bay State Brook. Access to structure 203 was gained by extending an existing trail onto the ROW south of the line. No cost information is available.

3.3 Restoration

No information is available on initial periods of construction. However, following construction work in 1964 the ROW was rough graded to remove ruts and any construction debris.

3.4 Maintenance

Under contract in 1950 the ROW was sheardozed and the slash raked to the edge of the ROW. Mechanical clearing cost averaged $123.62 per acre. Some hand clearing and stump treatment was done at an average cost of $373.49 per acre. Hand clearing was done only where the terrain was too steep for bulldozers. The operation began in mid-July, 1950, and was completed in mid-October.

In 1960, the ROW was broadcast foliage sprayed with 2,4-Dichlorophenoxyacetic acid (2,4-D) and 2,4,5-Trichlorophenoxyacetic acid (2,4,5-T).

In 1968, the ROW was broadcast foliage sprayed with Ammate by NMPC personnel.

4 General Reconnaissance

A general reconnaissance was made in accordance with the methodology and is set forth in Map 10.1 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 10.1 and described in Appendix 17. Specific reference is made to some of these photo stations throughout the report and illustrated in Fig. 10.1. 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 may be objectable to view although the ROW itself is not unattractive. The existing ROW appears in noticable contrast with the surrounding area since the existance of manmade structures and openings on the mountain appear out of place. In addition, features within the area which may make the ROW somewhat more sensitive to view include its proximity to the Allegany State Park and associated recreation traffic moving through the area. The site is located on the Allegany Indian Reservation and is in a largely undeveloped area of the Allegheny Mountains. The site is visible within the area, although trees provide some screening as the ROW follows a flat area and then ascends a steep hill, continuing over the crest until lost from view. The potential number of people viewing the ROW site is somewhat high, although it is located in a rural area with only 1 residence located near the site. It is near the Allegany State Park and can be seen by motorists along Route 17 which is fairly well traveled and is the major highway in the vicinity.

5 Field Studies - Results and Discussion

5.1 Soils

5.1.1 Geology and Soils

Site 10, Falconer to Homer Hill ROW, is located in Cattaraugus County in southwestern New York. Physiographically the area is composed of maturely dissected plateaus designated the Allegheny Plateau (Pearson et al., 1940; Cline, 1970), or the Allegheny Hills subdivision of the Appalachian Upland region (Thompson, 1966), and is drained by the Allegheny River (Pearson et al., 1940). This study area is located on the Allegany Indian Reservation, established in 1797. Bedrock geology of the area is of Devonian age, 395 to 345 million years ago, consisting predominantly of shale, siltstone, and sandstone (Broughton et al., 1973). Surficial geology is the weathering in place of the underlying rocks in this unglaciated area (Pearson et al., 1940).

Soils on this site are classified in the order Inceptisols, suborders Ochrepts (Dekalb, Tioga, and Unadilla series), reflecting the absence of horizons of marked accumulation of clay and iron and aluminum oxides, and Aquepts (Tyler series), that developed in wet conditions (Buckman and Brady, 1969; Soil Survey Staff, 1975). The wet Tyler soils described by Pearson et al. (1940) as basically of the Gray-Brown Podzolic type, apparently are no longer utilized as a soil series in New York, and currently are included in the Canandaigua series (telephone conversation, February 9, 1977, with Dale Clark, Soil Conservation Service, Cattaraugus County, Ellicottville, N.Y.). According to Cline (1970), this area is included in the Lordstown Association, which is dominated by steep shallow soils on hillsides and imperfect to poorly drained soils in the valleys. Brief descriptions (Pearson et al., 1940; Anon., 1972) of soil types occurring on the ROW study site (Map 10.1; Table 10.0) are:

Dekalb stony silt loam (DkB): These soils formed only in the southern half of the county, entirely within the unglaciated section, and developed in place through soil-forming processes acting directly on the underlying rocks, which include shales, sandstone, and quartz conglomerates on flat ridge tops and smooth slopes. Surface drainage is generally good, and was excessive on this site, and subsoil drainage ranges from imperfect to good. Depth to bedrock ranges from 12 to 24 inches from the surface in this area, but numerous sandstone slabs and large stones are scattered throughout the soil and over the surface. Soil reaction is strongly acid, ranging in a typical profile from pH 4.5 to pH 5.5; it was pH 5.0 in the surface mineral soil on this site. Dekalb stone silt loam is assigned to Woodland Suitability Group 301, designating moderately high productivity for timber (Class 3) and no significant restrictions or limitations for woodland use or management (Subclass o).

Rough stony land (RsE): This is a miscellaneous land type, and not a soil series. It includes steep precipitous slopes, where little soil formation has taken place, as well as bluffs and rock ledges. Much of the land is littered with boulders in the section occupied by the Dekalb soils, and ledges of conglomerate are also common. The land is entirely nonagricultural and in places is even too steep to support adequate forest growth. Seasonal springs and seeps resulting in wet spots are common on this land type.

Tioga gravelly silt loam (TiA): Tioga soils developed from recent alluvium, the sediments of which were derived from nearby upland soils, along bottom areas, generally on flat terrain. These soils are well drained in both the surface and subsurface, although they may be subject to periodic flooding. Soil reaction is strongly acid, and ranges from pH 5.5 to pH 6.5 throughout the first 30 inches of a typical profile. However, in the surface

3 inches on this site, it was pH 5.1. This soils is in Woodland Suitability Group 2o2, designating high productivit for timber and no significant restrictions or limitations for woodland use or management.

Tyler silty clay loam (TyA): These soils developed from slack-water depostis, the materials of which were derived principally from the surrounding Dekalb soils of the upland, and occupy flat or depressed areas. Both surface and internal drainage are poor, and the soil consists of puddled and cloudy silty clay loam over a mottled, firm silty clay loam underlain at a depth of 16 inches by a dense, tight, highly mottled clay. Soil reaction is generally strongly acid, and was pH 5.1 in the surface 3 inches on this site. The soil has management limitations relating to poor drainage. Tyler is currently mapped with the Canandaigua series, which is included in Woodland Suitability Group 4w1, designating moderate productivity for timber.

Unadilla silt loam (UnA): These soils developed from outwash materials deposited along the valley of the Allegheny River, and lake-laid sediments formed when the valleys of streams tributary to the Allegheny River were dammed by outwash deposits, forming temporary lakes. Relief ranges from level to gently sloping, and both surface and subsoil drainage is good. Soil reaction is strongly acid in this area, although it may range from pH 5.0 to pH 6.0 throughout a typical profile; it was pH 5.4 in the surface mineral horizon on this site. Unadilla silt loam is assigned to Woodland Suitability Group 2o1, designating high productivity for timber and no significant restrictions or limitations.

5.1.2 Humus Types

Organic layers present on the soil surface of the ROW and adjacent woodland were measured on 2 mesic lowland and 2 xeric upland locations. Average thickness of the organic layers and A1 horizon was based on 5 samples taken at each location (Table 10.2). 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.

All organic layers (litter, fermentation, and humus) plus an A1 horizon (mixed mineral and organic) were present at xeric sites on both the ROW and the 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 of both mesic areas sampled, the predominant humus type was also a "thin duff mull with very shallow A1". In the woodland, however, where the humus and fermentation layers were generally absent, the predominant humus type was designated a "very deep medium mull". All of the ROW and part of the forest plots were located in the Tioga gravelly silt loam soil type, while part of the forest areas sampled were located in the Tyler silty clay loam soil type, which is subject to periodic flooding. This may, at least in-part, account for the difference in humus types between the ROW and the woodland on the mesic sites. In the forest, evidence of past burning (charcoal) was noted and earthworm activity was high; these factors may result in more rapid breakdown and mixing of organic matter and produce a mull humus type.

On the xeric sites, organic layers on the ROW were nearly equivalent in thickness to those in the woodland, but were composed primarily of leaves and stems of the predominant grasses and herbs, with some shrubs, in contrast to tree parts in the forest. On the mesic sites, all organic layers were present on the ROW but fermentation and humus were absent from the woodland. A litter layer was present on both, but was slightly thicker on the ROW, while the A1 horizon of the woodland mull was significantly thicker than that on the ROW.

Based on these limited observations, it appears that ROW construction and periodic maintenance for brush control did not materially alter the occurrence or thickness of surface organic layers on dry sites. On the moist areas, however, differences did occur in presence and thickness of organic layers and A1 horizon resulting in distinctly different humus types. It is likely that the ROW itself does not account for all difference noted; however, it is probable that microclimate and soil properties, especially soil organisms, varied between the 2 habitats, ROW and woodland, and these in turn could affect organic matter relationships. On both mesic and xeric areas, elimination of the forest cover did result in a change in kind of organic material; however, regrowth and persistence of predominantly mixed grass-herb cover, with some shrubs, has resulted in annaul litter deposition and continuation of a protective organic mulch 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 Falconer to Homer Hill study area in August, 1976. Eroding areas were identified as to location on the ROW and in the woodland, soil type, average slope, and present plant cover (Table 10.3). Erosion was classified as to kind (sheet, rill, gully) and class (slight, moderate, severe); average depth of gullies were recorded and the location of 1 major gully was plotted on the base map (Map 10.1).

No 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 some low shrubs, had developed on the general ROW following construction and maintenance activities and a protective litter mulch from these plant parts was present (Table 10.2).

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, tower sites, and bank cut excavations used in ROW construction on this site (Table 10.3). Sediment resulting from erosion largely accumulated on lower slopes, but some sediment did leave the ROW via streams or collect in a ponded area on the ROW. Erosion and sedimentation on stream banks and floodplains are 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 were dependent on natural plant invasion. Grass cover has developed on access roads in most areas of the site. Moderate sheet and rill erosion is occurring on 1 area of the access road with a cover of grasses and herbs where slope is approximately 20% on rough stony land, as it is on a bank cut (Fig. 10.1.3) with the same cover and a slope of approximately 45% on similar soil. Moderate sheet erosion is occurring along equipment tracks, apparently of recent origin, which enter standing water in a wet portion of the ROW; this area remains bare. Progressive gully erosion at 1 tower site apparently prevents natural plant invasion, since that area generally was devoid of plant cover. Erosion here appears to be due to animal usage or water run-off from a hill above, and not from the structure itself.

On the bank of a small stream on the study area, grass is apparently invading despite slight sheet and rill erosion. Along the banks of a large stream near Route 17, bare and eroding gullies are being invaded by grass and herbs.

No areas of mass land movement such as landslides were observed on this site.

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 nearly level terrain which gently sloped toward the east and southeast, where slope was 3%. Drainage was free except in the western corner of the forest plot where it was somewhat impeded. The forest type was Hemlock-Northern Hardwoods, consisting predominantly of hemlock, with white ash, red maple, American hornbeam, American hop-hornbeam, black cherry, and shagbark-hickory as associate species.

Hydric Habitat The hydric, or wet, habitat (2) was located on nearly level terrain. Slope was negligible and aspect was flat. Drainage was impeded, with a high water table, and wet meadow conditions have developed. The forest type was Hemlock-Northern Hardwoods, with hemlock and sugar-maple as predominant species, in association with American hornbeam, serviceberry, red maple, and white ash.

Xeric Habitat The xeric, or dry, habitat (3) was located on the top of a mountain on a nearly level area. Slope was negligible and aspect was flat. Drainage was excessive. The forest type was a typical Oak-Northern Hardwoods, consisting predominantly of red oak, white oak, chestnut-oak, red maple, and beech, with serviceberry and white ash.

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 samll trees which were not removed by maintenance spraying, or which have arisen since the last spray application (Fig. 10.2).

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 10.4). Obviously, hemlock, shagbark-hickory, and red maple were important species on the mesic plot; sugar-maple, red maple, and hemlock were important species on the hydric plot; while red oak and chestnut-oak were important on the xeric plot.

On the mesic habitat, an Aspen-Gray Birch-Paper Birch and Northern Hardwoods forest type was changed to a Blackberry-Goldenrod plant community, as was a Hemlock-Northern Hardwoods forest type. On the hydric habitat, a Hemlock-Northern Hardwoods forest type was changed to a Dewberry-Sensitive Fern plant community. On the xeric habitat, an Oak-Northern Hardwoods forest type was changed to a Blueberry-Sweet-fern plant community (Map 10.1; Table 10.5).

Quantitative Changes There was a marked increase in the number of shrubs and herbs on the mesic habitat on the ROW as compared to the forest; there were 4 shrubs and 25 herbs on the ROW and 2 shrubs and 17 herbs in the forest (Table 10.5; Figs. 10.3 and 10.4). A notable increase in the shrub and herb layers also occurred on the hydric habitat, 4 shrubs and 18 herbs on the ROW as compared to 1 shrub and 14 herbs in the forest. On the xeric habitat there was no significant difference in the number of shrub species on the ROW and in the adjacent forest; there was, however, an increase in the number of herbs on the ROW, 16 as compared to 10 in the forest (Table 10.5).

Qualitative Changes On mesic 1 habitat, 7 shrub and herb species occurred both in the forest and on the ROW (Fig. 10.5), while no shrubs appeared in the forest alone (Table 10.6) and 2 shrubs, raspberry and blackberry, occurred on the ROW but not in the forest (Table 10.7). In the herb layer on the mesic habitat, 12 species occurred in the forest but not on the ROW; 20 species appeared on the ROW but not in the forest (Tables 10.6 and 10.7).

On hydric 2 habitat, 5 shrub and herb species occurred both in the forest and on the ROW (Fig. 10.5). No shrubs occurred in the forest and not on the ROW (Table 10.6), and 3 shrubs occurred only on the ROW (Table 10.7). However, in the herb layer, 10 forest species did not occur on the ROW and 14 species occurred only on the ROW, of which sphagnum comprised the largest part, covering up to ½ of the plot (Table 10.5).

On xeric 3 habitat, 5 shrub and herb species occurred both in the forest and on the ROW (Fig. 10.5). In the shrub layer, 4 shrubs occurred in the forest alone (Table 10.6); 5 occurred on the ROW and not in the forest (Table 10.7). In the herb layer, 7 forest species did not occur on the ROW and 13 species occurred on ROW and not in the forest (Table 10.5).

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

Table 10.8 presents a breakdown of major vegetational communities (Map 10.1) for the mesic, hydric, and xeric sites on the Falconer to Homer Hill ROW. Much of the present composition of herbaceous and woody plant communities reflects the spraying history. The last treatment on this line was a foliar spray with Ammate. Before this the ROW was treated with a 2,4,5-T and a 2,4-D foliar application in 1964.

Mixed grass comprises a large majority of the vegetation on the xeric and mesic sites. There is more sedge on the mesic site than on the xeric site. Occurring within the mixed grass communities are various broadleaf herbs on the mesic and xeric sites. The hydric site is occupied mainly by sedge-herb with various ferns scattered throughout. These species are generally not affected to a large extent by herbicides. They should remain an integral part of the vegetational matrix of the ROW.

Shrubs such as witch-hazel, hawthorn, blueberry, sweet-fern, and species from the genus Rubus (Table 10.5) do not affect line security and if not removed from the vegetation complex during herbicide treatment, will most likely occupy a large portion of the future vegetation association on this ROW area.

Those undesirable tall growing tree species (Table 10.5) that occur on the ROW, if removed from the vegetation during maintenance treatment, will not interfere with future line security.

5.2.4 Comparison of Forest Type with ROW Vegetation

The ROW was originally clear cut in 1926. It was again clear cut in 1939. In 1963 and 1964, a new ROW was cleared to relocate a portion of the line. Since that time, the ROW has been under chemical maintenance treatment.

The general impact of the above treatments of the ROW was to change the forest types (Hemlock-Northern Hardwoods, Northern Hardwoods, Oak-Northern Hardwoods, and Aspen-Gray Birch-Paper Birch and Northern Hardwoods) to shrub-herb-grass and -sedge communities. Some shrub plants of the forest were replaced by plants favored by open conditions.

On the mesic habitat, which was formerly occupied by a Hemlock-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 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 10.5).

5.3 Wildlife

The major game species for site 10, Falconer to Homer Hill, 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, wild turkey, and raccoon.

5.3.1 Actual use

White-tailed Deer White-tailed deer activity was determined by direct and indirect observations. Deer activity was moderate to heavy both on and off the ROW throughout the length of the study. During the spring of 1975, 1 fawn was found bedding down in a heavy cover of mixed herbs on the ROW east of structure 203. One large buck was seen bedded on the ROW during the fall of 1975. The deer ran from cover upon approach and escaped to the adjacent woodland. Another deer was sighted, in the spring of 1976, walking in the woods and then to the ROW. Indirect observations consisted of tracks, pellets, and browse, and indicated moderate to heavy use throughout the study area both on and off the ROW.

Browse Survey Six browse transects were established on study area 10, on April 14, 1976 (Tables 10.9 and 10.10; Fig. 10.6). The transects were established at each permanent study plot location, with 1 transect on each side of the ROW.

Overall browse utilization was greatest in the interior adjacent woods, 57%, medium at the ROW edge, 40%, and lowest on the ROW, 20%. However, there were more stems available and more stems utilized by the deer on the ROW than either in the woods or at the ROW edge (Table 10.9; Fig. 10.6).

Dewberry, raspberry, American hornbeam, and blackberry were the most abundant species present (Table 10.10). Of these, American hornbeam was the most utilized. Black cherry and blueberry were heavily browsed and were of moderate abundance (Table 10.9).

Wild Turkey Wild turkey activity was moderately heavy during the winter of 1976 as evidenced by tracks (Fig. 10.1.4). Turkeys were using the spring seep area on the open ROW where vegetation was still available for food. The remainder of the ground was covered with heavy snow. One turkey was flushed from 1 of these spring seeps and it flew across the ROW to escape cover in the adjacent forest. Tureky droppings were also found in slight abundance off the ROW in the south woods.

Raccoon No raccoon activity was noted on this study area during the visits to the site. However, this area should provide good habitat for raccoons because of the nature of the surrounding area, which includes some agricultural activity.

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 10.11.

One muskrat was observed swimming toward its burrow in the small pond on the ROW near structure 200, during the spring of 1975. Two garter snakes were seen mating on the ROW during the same period. Figure 10.1.5 shows a garter snake on the ROW in a cover of mixed grass-herb.

Three active woodchuck burrows were located on the study area; 1 was located on mesic plot 1 and another was in the woods north of plot 1. The third woodchuck burrow was located on the ROW near structure 200.

Rabbit browse was heavy on blackberry during the spring of 1976, and rabbit pellets were moderate on the ROW on hydric plot 2. Also, during the spring, spring peeper activity was moderate off the ROW as indicated by vocalization. Mosquito larvae were noted swimming in the pond on the ROW near structure 200. Also at this time, 1 ruffed grouse was flushed from his "drumming log" in a dense cover of hemlock, off the ROW to the south of structure 201.

5.3.2 Potential Use

Potential wildlife use of the plant species present on site 10 for the 3 major game species, deer, turkey, and raccoon, is contained in Table 10.12. 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 turkey. 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 on the Falconer to Homer Hill site was sampled for water quality on September 26, 1975, and February 11, May 18, and August 3, 1976 (Table 10.13, Map 10.1).

5.4.1 Stream Description and Sampling Points

Site 10 is located in the Allegheny River Basin. The stream originates in both woods and open fields south of the ROW; several tributaries converge upstream of the ROW. On the ROW, flow is north through a ponded area (Fig. 10.1.6) and wet meadow; downstream of the ROW, the stream continues to flow north through the wet meadow and follows the New York State Route 17 embankment east. It enters Bay State Brook approximately 500 feet downstream of the ROW.

Sampling locations were sited as follows:

1. 100 yards upstream, south, of the ROW;
2. mid-ROW;
3. 50 yards downstream, north, of the ROW (Map 10.1).

At sampling location 1, the stream is well shaded by an overstory of hemlock, yellow birch, American hornbeam, and ash. Herbs are present in the understory. On the stream bottom, organic components are abundant and fallen branches and roots trap sediment.

On the ROW, rush, sedge, and mixed grass are common and American hornbeam, red maple, witch-hazel, and willow occur in isolated clumps. Location 2 is sited in a man-made pond approximately 75 feet long, 20 to 30 feet wide, and up to 1 foot in depth. The pond is not well shaded and algae is abundant. Vegetation traps sediment and the pond functions as a sediment basin.

Downstream of the pond the stream is well shaded by herbs. Overstory vegetation such as American elm and willow is sparse near location 3. Low growing vegetation and roots trap sediment.

The study area is presently utilized by wildlife. The New York Department of State has no "official classification" for the water contained in this stream.

5.4.2 Analysis of Water Quality

Site 10 was sampled for water quality on September 26, 1975, from 4:00 to 6:00 p.m. (Table 10.13). At locations 1, 2, and 3 water temperature was 12.5, 14.5, and 13.0 C, respectively. Dissolved oxygen concentration ranged from 6.0 ppm at location 1 to 10.0 ppm at location 2. Percent saturation of dissolved oxygen ranged from 60 to 105%. The pH was low and averaged 5.3. Stream depth at locations 1 and 3 was 2 and 4 inches and width was 1.4 and 2.7 feet, respectively. Sediment stakes were placed at all sampling locations.

On February 11, 1976, sampling began at 1:45 p.m. and was conducted during a snow storm (Table 10.13). Water temperature was 0.0 C. Dissolved oxygen concentration and percent saturation ranged from 9.5 to 9.8 ppm and 70 to 72%, respectively. The pH averaged 6.8. Depth at locations 1 and 2 was 3 and 5 inches, and width was 1.5 and 3.0 feet, respectively.

On May 18, 1976, sampling was conducted from 3:50 to 4:10 p.m.; it was cloudy and the air temperature was 8 C (Table 10.13). Stream depth at locations 1 and 3 was 8 and 9 3/4 inches, and width was 8.0 and 14.0 feet, respectively. The stream was over the bank at some locations due to spring runoff. Water temperature ranged from 8.9 to 9.6 C. Dissolved oxygen concentration and percent saturation ranged from 9.9 to 11.0 ppm, and 87 to 105%, respectively. The water was acidic and pH averaged 5.7. No change in substrate was measured at locations 2 and 3, and 1 inch was removed at location 1.

On August 3, 1976, sampling was conducted from 7:05 to 7:25 a.m. (Table 10.13). Fog was present and the air temperature was 10 C. Water temperature was 12.0 C at locations 1 and 3 and 13.5 C at location 2. Dissolved oxygen concentration and percent saturation were the lowest recorded during this study and averaged 6.1 ppm and 61%, respectively. The pH ranged from 5.6 to 5.7. Stream depth at locations 1 and 3 was 5½ and 2 inches, and width was 1.3 and 1.5 feet, respectively. One-half inch of sediment was measured at location 3.

5.5 Land Use

5.5.1 Location

Site 10 is located in a rural nonfarm section of the town of Red House, Cattaraugus County, New York. Between 1960 and 1970 there was a 1.8% increase in population of Cattaraugus County with a 1970 distribution of 35.7% urban, 58.2% rural nonfarm, and 6.1% rural farm (U.S. Bureau of the Census, 1972).

5.2.2 Land Use Near the Time of Construction

The ROW was constructed during 1939. Data prior to this date was unavailable. The earliest available data obtained from 1956 aerial photography indicates that the land adjacent to the ROW was primarily rural nonfarm (Table 10.14; Fig. 10.7). Land use distribution included the following subtypes:

Forest Land:
- Fn - Forest lands

Outdoor Recreation:
- Or - Outdoor recreation

Water Resources:
- Wc - Artificial ponds

5.5.3 Land Use After Construction

The adjacent land use to site 10 has had a minimal change from the 1956 data, with an increase in transportation and a decrease in water resources. The land adjacent to the ROW is still rural nonfarm (Table 10.14; Fig. 10.7), with a land use distribution that includes the following subtypes:

Forest Land:
- Fn - Forest lands

Outdoor Recreation:
Or - Outdoor recreation

Transportation:
Th - Highways

Water Resources:
Wc - Artificial ponds

In addition to use of the ROW for the transmission of electrical power, portions of the ROW are currently intersecting the Allegany State Park land and Allegany Indian Reservation. The ROW is used for some hunting and agricultural use.

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 study area is located on an unglaciated portion of the Allegheny Plateau dominated by shale, siltstone, sandstone and conglomerate bedrock with ridge top, hillside, and bottomland habitats. Shallow, excessively drained Dekalb silt loam soil formed in place on flat ridges from weathered bedrock. The east-facing slope with gradients of 35 to 50+ %, high surface boulder content, and seepage areas is designated Rough Stony Land. Well-drained Tioga and Unadilla silt loams developed in valleys on recent alluvium and river outwash, respectively, while the poorly drained Tyler silty clay loam formed mostly in depressional slack-water deposits.

In the bordering forest, which may reflect conditions before ROW clearance in 1932 and relocation in 1964, the xeric Dekalb soils support an Oak-Northern Hardwoods forest type of moderately high productivity. Well-drained mesic bottoms, Tioga and Unadilla soils, are rated high in productivity and support Northern Hardwoods with hemlock, aspen, gray birch, and paper birch as major components in some areas. The wet Tyler soils are occupied by Hemlock-Northern Hardwoods of moderate productivity.

The forest floor on mesic bottomlands, which exhibit high earthworm activity, consists of thin tree litter and excellent organic matter incorporation, over 4 inches, resulting in a "very deep medium mull" humus type. In contrast, the forest floor on xeric uplands had greater surface accumulation and much less soil incorporation, less than 1 inch, of organic matter and was classified a "thin duff mull with very shallow A1" humus type. Active erosion in the undisturbed forest was negligible, with only slight sheet erosion evident on 1 area of Tyler soil where ground cover was sparse. Additional sheet and gully erosion was occurring along the banks of a stream flowing through the forest.

6.1.2 Vegetation

Prior to the initial clearing of this ROW in 1926 to 1929, the areas occupied by the study sites were forested. On hydric sites stands of Hemlock-Northern Hardwoods occurred on the corridor area. Red maple, white ash, serviceberry, and American hornbeam were associates of these stands.

Prior to ROW clearing, mesic sites supported stands of the Hemlock-Northern Hardwoods type, as well as Nothern Hardwoods, and Aspen-Gray Birch-Paper Birch and Northern Hardwoods. Associated species included white ash, red maple, American hornbeam, and hop-hornbeam. Oak-Northern Hardwoods stands occurred on the 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 forested areas adjacent to the ROW. It can be assumed that those species that probably currently occupy the site, i.e., white-tailed deer, wild turkey, and raccoon, occupied 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 depicting land uses near the time of construction in 1939 is 1956 aerial photography. The ROW and adjacent land area was rural nonfarm with a land use distribution of forest land (26.8%), outdoor recreation (35.3%), and water resources (37.9%).

6.2 Conditions Which Exist at Present

6.2.1 Soils

Relief positions, parent geologic material, soil types, and moisture regimes identified in the bordering forest are also typical on the ROW. Predominant plant communities on the ROW in 1976 were generally related to these site conditions: Blueberry-Sweet-fern existed on the xeric and strongly acid Dekalb silt loam; Blackberry-Goldenrod developed on moist bottomland Tioga and Unadilla silt loams and mesic portions of the steep hillside; and, Dewberry-Sensitive Fern was present on the hydric Tyler soil and wet seepage spots of the Rough Stony Land.

Organic layers on upland xeric parts of the ROW were ½ as thick, 0.6 inch, as those in the forest, 1.2 inches, and soil incorporation was slightly less; but, the overall humus type, "thin duff mull with very shallow A1", was similar to that in the forest. The predominate humus type on mesic bottomlands of the ROW, however, was distinctly different from the forest, a "thin duff mull with very shallow A1" on the ROW versus a "very deep medium mull" in the forest. This differential in organic matter accumulation, breakdown, and incorporation is likely due to variation in soil properties, since a portion of the woods plot occurred in Tyler soil in contrast to Tioga on the ROW. Litter on the ROW was composed mostly of grass, herb, and shrub remains.

As with the undisturbed forest, active erosion on the ROW was negligible, and was limited to moderate sheet erosion in equipment tracks on the heavy Tyler soil. Additional moderate to severe rill and gully erosion was evident on 3 steep slopes, 20 to 60% gradients, of the access road, bank cut excavation, and tower site on the Rough Stony Land area. Some streambank erosion was also occurring along the stream crossing the ROW in Tioga soil. Most erosion sediment accumulated on lower slopes of the ROW, but some did enter streams or collect in a ponded area on the ROW.

6.2.2 Vegetation

The broadcast sprayings have eliminated stump and root sprouts of the original vegetation occupying this site, and reduced the present cover to low herbaceous communities. On hydric sites, the Sedge-Mixed Herb community is widespread; broken by scattered colonies of New York or interrupted ferns and by blackberry thickets. American hornbeam and red maple are the primary wood species invading these communities.

Mesic sites contain large communities of Mixed Grass-Sedge-Herb. Centers of blackberry and scattered colonies of New York and hay-scented ferns occur within these communities. The occasional woody species include hawthorn, black cherry, witch-hazel, white ash, and American hornbeam.

Mixed Grass-Herb communities dominate xeric sites. Large numbers of woody seedlings have invaded since the last broadcast spraying. These include red maple, white ash, quaking aspen, and yellow birch.

6.2.3 Wildlife

White-tailed deer, wild turkey, and raccoon are the major game species that currently utilize the study area. Indirect observations for deer, i.e., tracks, pellets, and browse, indicated deer using the ROW area. Deer were also seen on the site. Browse surveys indicated that there were more stems available and more stems utilized by deer on the ROW than either in the woods or at the ROW edge. Stems of the genus Rubus far surpassed all other species in total abundance, but in general were not heavily browsed. Species highly utilized by deer included black cherry, blueberry, and red oak. Heavily growsed, although only sparsely present, were black gum, hemlock, and American hop-hornbeam.

Wild turkey tracks and droppings evidenced the species' presence on the ROW at a spring seep and in the adjacent forest, as did the observation of 1 turkey flying from the ROW, from which it was flushed, to the forest.

No raccoon activity was noted, although the habitat appeared conducive to its presence.

A variety of other animals were observed, 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

Upstream of the ROW, shading is provided by overstory vegetation. Several tributaries are present and organic litter common. At the upstream edge of the ROW, 1 stream was observed. About a 150-foot segment of the stream which flows through a man-made pond and wet meadow is located on the ROW. Shading from overstory vegetation is sparse. Water in the pond receives minimal shading. However, downstream it is well shaded by herbs. Downstream of the ROW, the stream continues to flow through the wet meadow. Overstory shading is sparse and some shading is furnished by shrubs. The stream is narrow and heavy shade is provided by herbs.

Water temperature was from 0.5 to 2.0 C warmer on the ROW than off the ROW except on February 11, 1976, when it was 0.0 C at all locations.

Greater change in water temperature on the ROW is expected. Solar radiation is expected to have its greatest effect at midday, during the midsummer, when stream discharge is minimal (Brown, 1970). During the present study, downstream effect of increased temperature was insignificant.

No consistent trend in dissolved oxygen concentration or percent saturation was evident. However, dissolved oxygen concentration and percent saturation averaged 13% and 14% greater at location 2 and 3 than at location 1. Low dissolved oxygen concentration, 4.2 ppm, and percent saturation, 43% at location 2 on August 3, 1976, was probably caused by the combination of early morning sampling and respiration of aquatic plants in the pond (Hynes, 1970).

6.2.5 Land Use

Recent land use of the ROW and adjacent land area has shifted from the 1956 percentages. The area is still classified primarily as rural nonfarm with a distribution of forest land (26.8%), transportation (4.7%), outdoor recreation (35.3%), and water resources (33.2%). With reference to the total inventory area, percentage shifts in the distribution of land use are noted as follows:

Water Resources -	-4.7%
Outdoor Recreation -	no change
Forest Land -	no change
Transportation -	+4.7%

Land use of transportation (4.7%) is a new land use type which was not present in 1956. In addition to use of the ROW are currectly intersecting the Allegany State Park and Allegany Indian Reservation. The ROW is used for some hunting and agricultural uses.

6.3 Environmental Effect and Probable Causes

6.3.1 Soils

The major effect of ROW management on soils of this site is related to removal of plant cover and organic mulch and exposure of underlying mineral soil on segments of the access road, tower site, and excavations on the steep hillside. These disturbed areas have not been stabilized by invading plants and active erosion is occurring. In addition, some erosion was evident in equipment tracks on the poorly drained silty clay loam bottomland soil, presumably due to soil compaction from vehicle use. Also, moderate to severe erosion was occurring on the banks of streams flowing across the ROW. Some erosion sediment entered streams or collected in a pond on the ROW.

Organic layers on xeric segments of the ROW were thinner than comparable locations in the forest, but overall humus types were similar. Distinct differences in humus types between ROW and forest on mesic sites is likely due to variation in soil properties and not directly related to ROW conditions. Litter deposits on the ROW are composed of grass, herb, and some shrub remains in contrast to tree litter in the forest.

6.3.2 Vegetation

Herbicide treatments have reduced corridor vegetation to a low cover consisting primarily of grasses and herbs. Broadcast sprayings with 2,4-D and 2,4,5-T (1960) and with Ammate (1968) have effectively removed sprouts and root suckers from the original stand occupying this site, and most present woody material is of recent seed origin.

The use of broadcast treatments with phenoxies and Ammate have apparently had no long-term effect on site conditions, since woody vegetation of the same species which originally occurred here have invaded rapidly since the last herbicide treatment. This rapid invasion of forest species is particularly evident on xeric sites where the grass and herbaceous cover is less dense and affords less competition to seedlings during the establishment period.

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

New habitat is provided on the ROW due to the presence of the man-made pond.

Increase in water temperature and dissolved oxygen on the ROW probably resulted from ponding.

<u>Line Management Factors</u> Shading by overstory vegetation was limited on the ROW.

The pond was probably created during ROW construction.

<u>Other Influences</u> The stream did not originate in the woods south of the ROW and the stream received runoff from open fields.

6.3.5 Land Use

Due to the fact that 1956 data was the earliest available, there are 17 years which are not reflected in land use changes from the time of ROW construction in 1939.

However, based on information available, the presence of the ROW has had a minimal affect on adjacent land areas. Changes within the area reflect an increase in transportation areas with the construction of a new highway. The inventory area remains rural nonfarm which is characteristic of Cattaraugus County as a whole.

Table 10.1. Soil series present on the Falconer to Homer Hill study area.

Soil Series	Map Symbol[1]	Drainage Class[2]	Surface Soil pH	Surface Soil Texture	Woodland Suitability Group
Dekalb	DkB	G-E	5.0	stony silt loam	3o1
Rough Stony Land	RsE	SPD-E	-	-	-
Tioga	TiA	G	5.1	gravelly silt loam	2o2
Tyler	TyA	PD	5.1	silty clay loam	4w1
Unadilla	UnA	G	5.4	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 10.2. Average thickness of organic layers and A1 horizon and humus types for mesic and xeric sites on ROW and adjacent woodland of site 10.

Moisture Regime	Location	Layer Thickness (in.) L	F	H	A1	Humus Type
1. Mesic (1)[1]	ROW	.5	.1	.4	.6	Thin duff mull with very shallow A1
	Woodland	.3	0	0	4.0	Very deep medium mull
2. Mesic	ROW	.5	.1	.3	.5	Thin duff mull with very shallow A1
	Woodland	.3	0	0	4.2	Very deep medium mull
All Mesic Plots Combined	ROW	.5	.1	.4	.6	Thin duff mull with very shallow A1
	Woodland	.3	0	0	4.1	Very deep medium mull
3. Xeric (3)	ROW	.4	.1	.1	.4	Thin duff mull with very shallow A1
	Woodland	.6	.2	.2	.4	Thin duff mull with very shallow A1
4. Xeric	ROW	.2	.1	.2	.4	Thin duff mull with very shallow A1
	Woodland	.5	.3	.3	.7	Thin duff mull with very shallow A1
All Xeric Plots Combined	ROW	.3	.1	.2	.4	Thin duff mull with very shallow A1
	Woodland	.6	.3	.3	.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 10.3. Areas exhibiting active erosion in August, 1976, on the Falconer to Homer Hill 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				
Tower Site (203)[1]/ Bank Cut	Rough stony land	45	Grass-herb	Sheet & Rill	Moderate	-
Tower Site (205)	Rough stony land	60	Bare	Gully	Severe	12-18
Access Road	Rough stony land	20	Grass-herb	Sheet & Rill	Moderate	-
Equipment Tracks	Tyler silty clay loam	4	Bare	Sheet	Moderate	-
Stream Bank	Tyler silty clay loam	5	Bare-grass	Sheet & Rill	Slight	-
Stream Bank	Tioga silt loam	10	Bare-grass-herb	Gully	Moderate	2-8
		FOREST				
General Forest	Tyler silty clay loam	0	Bare-grass-herb	Sheet	Slight	-
Natural Bank	Unadilla silt loam	6	Bare-grass	Sheet	Slight	-
Stream Bank	Tioga silt loam	10	Bare-grass-herb	Gully	Moderate	2-8

1 The numbers of tower structures are indicated by figures in parentheses.

Table 10.4. 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 Densit (% of total) 2	Importance Value 1+2
Mesic 1	Hemlock	82.55	44	126.55
	Shagbark-Hickory	8.41	19	27.41
	Red Maple	4.52	19	23.52
	White Ash	1.84	6	7.84
	Sugar-Maple	1.34	6	7.34
	Red Oak	1.34	6	7.34
Hydric 2	Sugar-Maple	33.86	43	76.86
	Red Maple	26.22	29	55.22
	Hemlock	39.49	14	53.49
	White Ash	.43	14	14.43
Xeric 3	Red Oak	44.31	35	79.31
	White Oak	37.49	30	67.49
	Chestnut-Oak	17.16	23	40.16
	Black Cherry	.53	4	4.53
	Red Maple	.37	4	4.37
	White Ash	.14	4	4.14

Table 10.5. 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)	
	Forest A.S.	ROW A.S.	Forest A.S.	ROW A.S.	Forest A.S.	ROW A.S.
Tree Layer						
Shagbark-Hickory	1.1	-	-	-	-	-
White Ash	+.1	-	++.1	-	+.1	-
Hemlock	2.1	-	+.1	-	-	-
Sugar-Maple	+.1	-	1.1	-	-	-
Red Maple	+.1	-	1.1	-	+.1	-
Red Oak	+.1	-	-	-	2.1	-
White Oak	-	-	-	-	2.1	-
Chestnut-Oak	-	-	-	-	1.1	-
Black Cherry	-	-	-	-	+.1	-
No. Species	6	0	4	0	6	0
Shrub Layer						
Witch-Hazel	+.1	1.1	1.1	+.1	2.1	++.1
Hawthorn sp.	1.1	2.1	-	-	-	++.1
Blackberry	-	1.1	-	-	-	1.4
Raspberry	-	2.3	-	+.4	-	1.4
Gray Dogwood	-	-	-	+.1	-	-
Dewberry	-	-	-	2.3	-	1.1
Striped Maple	-	-	-	-	1.1	-
Maple-leaved Viburnum	-	-	-	-	3.3	-
Black-haw	-	-	-	-	1.3	-
Mountain-Laurel	-	-	-	-	+.1	-
Blueberry sp.	-	-	-	-	1.2	+.1
Sweet-fern	-	-	-	-	-	2.2
No. Species	2	4	1	4	6	7
Trees in the Shrub Layer						
American Hop-Hornbeam	2.1	-	-	-	-	-
American Hornbeam	2.1	2.1	4.1	2.1	-	-
White Ash	1.1	-	-	-	+.1	+.1
Red Maple	1.1	1.1	-	1.1	2.1	2.1
Serviceberry	+.1	-	2.1	+.1	1.1	+.1
Red Oak	-	+.1	-	++.1	(+.1)	2.1
Bitternut Hickory	-	+.1	-	-	-	-
Black Cherry	-	1.1	-	-	-	+.1
Sweet Birch	-	1.1	-	-	-	+.1
Chestnut-Oak	-	-	-	-	+.1	-

Table 10.5. 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.
Beech	-	-	-	-	+.1	-
Flowering Dogwood	-	-	-	-	1.1	-
Quaking Aspen	-	-	-	-	-	2.1
White Oak	-	-	-	-	-	+.1
Shagbark-Hickory	-	-	-	-	-	+.1
Yellow Birch	-	-	-	-	-	+.1
No. Species	5	6	2	4	7	10
Herb Layer[1]						
Christmas Fern	2.2	-	-	-	++.2	-
Strawberry	2.2	2.3	-	1.4	-	1.2
Marginal Shield-Fern	+.2	-	-	-	-	-
Maidenhair-Fern	+.2	-	-	-	-	-
May-apple	+.2	1.3	-	(+.3)	-	-
Wild Lily-of-the-valley	(1.3)	-	4.1	-	2.3	-
Partridge-berry	(+.2)	-	+.2	-	+.2	-
Sharp-lobed Hepatica	(3.2)	-	-	-	-	-
Squirrel-corn	(++.1)	-	-	-	-	-
Violet spp.	+.3	-	-	++.2	+.2	-
Twisted-stalk	+.1	-	-	-	+.1	-
Barren Strawberry	1.2	2.3	-	-	-	-
Trout-Lily	4.4	4.4	2.1	3.3	-	-
Wild Leek	1.5	-	-	-	-	-
Wild Cranesbill	2.3	-	-	-	-	-
Foamflower	+.2	-	(+.2)	-	-	-
Large-flowered Wake-robin	+.3	++.2	-	-	-	-
Common Mullein	-	1.1	-	-	-	++.1
Pokeweed	-	1.3	-	-	-	-
Hair-cap Moss	-	3.4	-	(+.2)	1.2	1.1
Sheep-Sorrel	-	1.4	-	-	-	+.1
Blue-eyed Grass	-	+.1	-	-	-	-
Deer-tongue Grass	-	1.3	-	-	-	-
Buttercup spp.	-	+.1	-	-	-	-
New York Fern	-	1.3	2.2	+.4	-	-
Hay-scented Fern	-	+.2	-	-	-	-
Old-field-Cinquefoil	-	1.4	-	-	-	-
Upright Yellow Wood-Sorrel	-	+.2	-	-	-	-
Goldenrod	-	2.3	-	-	-	2.3
Aster	-	1.2	-	-	-	2.3
Sedge	-	3.2	+.2	3.2	2.2	1.2
Purple Trillium	-	-	2.1	-	-	-

Table 10.5. 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.
Hypnum imponens	-	-	1.3	-	-	-
Shining Club-moss	-	-	2.3	-	-	-
Carolina Spring Beauty	-	(2.2)	(1.2)	1.2	-	-
Bluebead-Lily	-	-	+.2	-	++.2	-
Beech-Fern	-	-	1.2	-	-	-
Sensitive Fern	-	-	-	2.3	-	-
Horsetail	-	-	-	3.1	-	-
Cinquefoil spp.	-	-	-	1.4	-	1.3
False Hellebore	-	-	-	2.2	-	-
Golden Ragwort	-	-	-	++.2	-	-
Mint spp.	-	1.4	-	-	-	-
Sphagnum	-	-	-	3.5	-	-
Swamp-Buttercup	-	-	-	1.2	-	-
Chinese Mustard	-	-	-	+.2	-	-
Mixed Grass	-	4.4	-	+.2	1.2	3.3
White Moss	-	-	-	-	+.2	-
Bracken	-	-	-	-	-	1.1
Whorled Loosestrife	-	-	-	-	-	1.3
Devil's Paint-brush	-	-	-	-	-	1.2
Dogbane	-	-	-	-	-	+.1
King Devil	-	-	-	-	-	++.1
Daisy	-	-	-	-	-	+.2
Pearly Everlasting	-	-	-	-	-	1.3
Goldie's Fern	-	+.3	-	-	-	-
Marsh-Fern	-	+.3	-	-	-	-
Cinnamon-Fern	-	+.3	-	-	-	-
Wild Sarsaparilla	-	-	+.1	-	-	-
Star-flower	-	-	+.1	-	-	-
Interrupted Fern	-	-	-	+.3	-	-
No. Species	17	25	14	18	10	16
Total No. Species						
Trees[2]	9	6	6	4	9	10
Shrubs	2	4	1	4	6	7
Herbs	17	25	14	18	10	16
Totals	28	35	21	26	25	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 10.6. 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]		
Christmas Fern	2.2	-
Marginal Shield-Fern	+.2	-
Maidenhair-Fern	+.2	-
Wild Lily-of-the-valley	(1.3)	-
Partridge-berry	(+.2)	-
Sharp-lobed Hepatica	(3.2)	-
Squirrel-corn	(++.1)	-
Violet spp.	+.3	-
Twisted-stalk	+.1	-
Wild Leek	1.5	-
Wild Cranesbill	2.3	-
Foamflower	+.2	-
No. Species	12	
Hydric (2)		
Shrubs		
Herbs		
Star-flower	+.1	-
Wild Sarsaparilla	+.1	-
Wild Lily-of-the-valley	4.1	-
Foamflower	(+.2)	-
Purple Trillium	2.1	-
Hypnum imponens	1.3	-
Shining Club MOss	2.3	-
Bluebead-lily	+.2	-
Beech fern	1.2	-
Partridge-berry	+.2	-
No. Species	10	
Xeric (3)		
Shrubs		
Striped Maple	1.1	-
Maple-leaved Viburnum	3.3	-

Table 10.6. Continued

Species	Forest A.S.	ROW A.S.
Black-haw	1.3	-
Mountain-Laurel	+.1	-
Herbs		
Christmas Fern	++.2	-
Wild Lily-of-the-valley	2.3	-
Partridge-berry	+.2	-
Violet spp.	+.2	-
Twisted-stalk	+.1	-
Bluebead-lily	++.2	-
White Moss	+.2	-
No. Species	11	

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

Table 10.7. Charcteristic 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	1.1	-
Raspberry	2.3	-
Herbs[1]		
Marsh-Fern	+.3	-
Common Mullein	1.1	-
Mixed Grass	4.4	-
Pokeweed	1.3	-
Goldie's Fern	+.3	-
Hair-cap Moss	3.4	-
Mint spp.	1.4	-
Sheep-Sorrel	1.4	-
Blue-eyed Grass	+.1	-
Cinnamon-Fern	+.3	-
Deer-tongue Grass	1.3	-
Buttercup spp.	+.1	-
Hay-scented Fern	+.2	-
Old-field-Cinquefoil	1.4	-
Upright Yellow Wood-Sorrel	+.2	-
Carolina Spring Beauty	(2.2)	-
Goldenrod	2.3	-
Aster	1.2	-
New York Fern	1.3	-
Sedge	3.2	-
No. Species	22	
	Hydric (2)	
Shrubs		
Gray Dogwood	+.1	-
Raspberry	+.4	-
Dewberry	2.3	-
Herbs		
Strawberry	1.4	-
May-apple	(+.3)	-
Violet spp.	++.2	-
Hair-cap Moss	(+.2)	-

Table 10.7. Continued

Species	ROW A.S.	Forest A.S.
Sensitive Fern	2.3	-
Horsetail	3.1	-
Cinquefoil	1.4	-
False Hellebore	2.2	-
Golden Ragwort	++.2	-
Sphagnum	3.5	-
Swamp-Buttercup	1.2	-
Chinese Mustard	+.2	-
Mixed Grass	+.2	-
Interrupted Fern	+.3	-
No. Species	17	
Xeric (3)		
Shrubs		
Hawthorn	++.1	-
Blackberry	1.4	-
Raspberry	1.4	-
Dewberry	1.1	-
Sweet-fern	2.2	-
Herbs		
Strawberry	1.2	-
Common Mullein	++.1	-
Sheep-Sorrel	+.1	-
Goldenrod	2.3	-
Aster	2.3	-
Cinquefoil	1.3	-
Bracken	1.1	-
Whorled Loosestrife	1.3	-
Devil's Paint-brush	1.2	-
Dogbane	+.1	-
King Devil	++.1	-
Daisy	+.2	-
Pearly Everlasting	1.3	-
No. Species	18	

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

Table 10.8. Major vegetational types for the Falconer to Homer Hill 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)
	Percent of Total Area		
Mixed Grass-Sedge-Mixed Herb	82.5		
New York Fern	3.5	.8	
Blackberry-Mixed Herb	3.3		
Hay-scented Fern	.9		
Sedge-Mixed Herb		97.9	
Interrupted Fern		.6	
Mixed Grass-Herb			97.0
Blackberry	9.8	.7	3.0
Total	100.0	100.0	100.0

Table 10.9. 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	%
Beech			0/2	20	4/4	100	4/5	67
American Hornbeam			6/10	60	17/26	65	23/36	64
Bitternut Hickory	0/1	0					0/0	0
Blackberry	7/26	27	2/6	33			9/32	28
Black Cherry			9/11	82	11/14	79	20/25	80
Black Gum			2/2	100			2/2	100
Dewberry	13/199	7	6/79	8	1/11	9	20/189	7
Hemlock					1/1	100	1/1	100
American Hop-Hornbeam			0/4	0	1/2	50	1/6	17
Serviceberry			2/2	100			2/2	100
Lowbush Blueberry			8/10	80	6/9	67	14/19	74
Maple-leaved Viburnum			0/1	0	4/6	67	4/7	57
Raspberry	46/108	43	10/17	59	4/4	100	60/129	47
Red Maple			1/1	100	0/1	0	1/2	50
Red Oak	4/4	100	9/11	82	1/3	33	14/18	78
Sugar-Maple			4/5	80	5/8	63	9/13	69
Sweet-fern	1/10	10					1/10	10
Teaberry					0/6	0	0/6	0
Quaking Aspen			4/4	100	3/6	50	7/10	70
Witch-Hazel			5/6	83			5/6	83
Total	71/348	20	68/171	40	58/101	57	197/518	32

Table 10.10. 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							
	Dewberry		Raspberry		American Hornbeam		Blackberry	
Location	Ratio	%	Ratio	%	Ratio	%	Ratio	%
ROW	13/199	7	46/108	43			7/26	27
ROW Edge	6/79	8	10/17	59	6/10	60	2/6	33
Woods	1/11	9	4/4	100	17/26	65		
Total	20/289	7	60/129	47	23/36	64	9/32	28

Table 10.11. Birds observed and/or heard on the ROW and on the ROW edge during the study period.

Species	Species
Great blue heron	Wood thrush
Green heron	Starling
Turkey vulture	Red-eyed vireo
Ruffed grouse	Myrtle warbler
Turkey	Red-winged blackbird
Mourning dove	Scarlet tananger
Yellow-shafted flicker	Indigo bunting
Blue jay	American goldfinch
Common crow	Field sparrow
Black-capped chickadee	Song sparrow
Mockingbird	Slate-colored junco
Robin	

Table 10.12. Potential wildlife use of plant species[1] present on the ROW and adjacent woods for the major game species on the Falconer to Homer Hill study area.

Species	Wildlife Species		
	Deer	Turkey	Raccoon
Trees			
Red Maple	****		
Sugar-Maple	****		
Red Oak	*	****	****
White Oak	*	****	****
Chestnut-Oak	*	****	****
Black Cherry	*		
Hemlock	+		
White Oak	*		
American Hornbeam	*		
American Hop-Hornbeam	+		
Serviceberry	+		
Sweet Birch	*		
Beech	+		+
Flowering Dogwood	*	*	
Quaking Aspen	**		
Yellow Birch	*		
Shagbark-Hickory			+
Bitternut Hickory			+
Shrubs			
Witch-Hazel	**		
Hawthorn	+		
Blackberry	+		
Raspberry	+		
Dewberry	+		
Striped Maple	****		
Black-haw	*	*	
Blueberry	+	*	
Sweet-fern	+		
Herbs			
Goldenrod	+		
Blue-eyed Grass	*	***	
Deer-tongue Grass	*	***	
Mixed grass	*	***	
Sedge		+	
Sheep-Sorrel		+	
Pokeweed			+

1 Those plants not included in this table provide a certain amount of cover (Table 10.5) for the 3 major game species, and may also provide seasonal food value, specific information pertaining to which is not available. This applies also with regard to non-game species.

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

Table 10.13. Water quality data collected from September 26, 1975, to August 1, 1976, at site 10, Falconer to Homer Hill ROW, Cattaraugus County, New York.

Date		September 26, 1975			February 11, 1976			May 18, 1976			August 3, 1976		
Sampling Location		1	2	3	1	2	3	1	2	3	1	2	3
Hour		1600	1640	1800	1345	1400	-	1600	1610	1550	0725	0715	0705
Water Temp. (C)		12.5	14.5	13.0	0.0	0.0	0.0	9.1	9.6	8.9	12.0	13.5	12.0
Dissolved Oxygen (ppm)		6.0	10.0	8.5	9.6	9.8	9.5	10.0	11.0	9.9	5.8	4.2	8.3
% Saturation D.O.		60	105	88	71	72	70	97	105	87	58	43	83
pH		5.2	5.2	5.6	6.7	6.9	6.8	5.6	5.8	5.8	5.7	5.7	5.6
Water Temp. (C)	range	12.5-14.5			0.0			8.9-9.6			12.0-13.5		
	mean	13.3			0.0			9.2			12.5		
% of Saturation D.O.	range	60-105			70-72			87-105			43-83		
	mean	84			71			96			61		
pH	range	5.2-5.6			6.7-6.9			5.6-5.8			5.6-5.7		
	mean	5.3			6.8			5.7			5.7		
Comments		partly cloudy			snow, stream frozen			cloudy, windy, air temp. 8 C, spring run-off, water over banks at some locations			foggy, air temp. 10 C		

Table 10.14. 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	
(C,I)	Commercial & Industrial	
(F)	Forest Land	-----------------26.8 *****************26.8
(E)	Extractive Industry	
(N)	Non-productive	
(OR)	Outdoor Recreation	------------------------35.3 ************************35.3
(P)	Public & Semi-public	
(W)	Water Resources	-------------------------37.9 ***********************33.2
(U)	Urban Inactive	
(T)	Transportation	****4.7
(R)	Residential	

1 Source: Cattaraugus Co. Real Property Tax Service, Little Valley, N.Y., air photo No. 1038 6 1-146, Apr. 20, 1973
USDA-SCS, Cattaraugus County air photo, Sept. 27, 1956

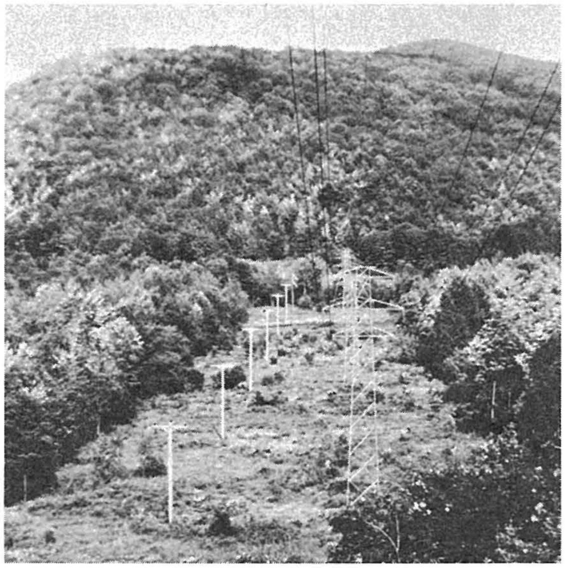


FIG. 10.1.1. General view of the ROW and adjacent forest, looking east, in spring, 1975 (Photo Station 9).

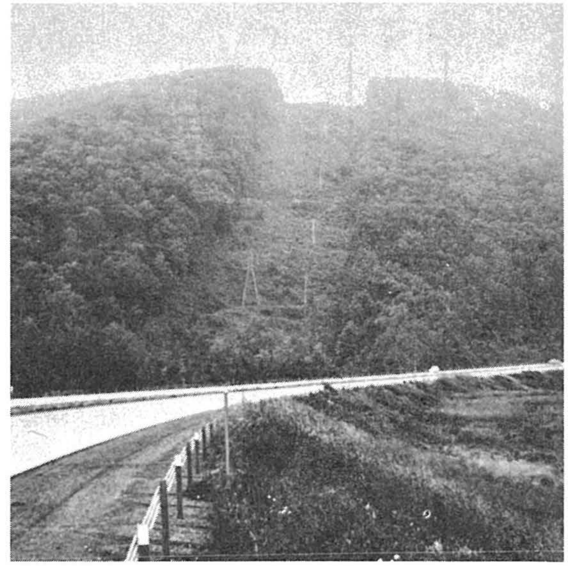


FIG. 10.1.2. General view of the ROW and the adjacent forest, looking west from Route 17 (Photo Station 1).

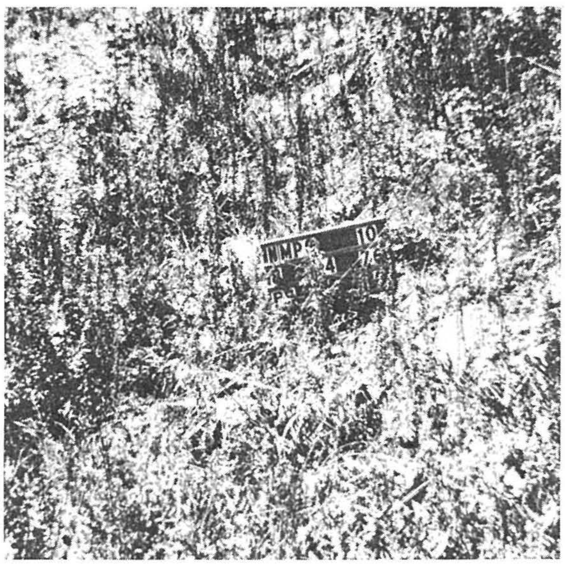


FIG. 10.1.3. Moderate sheet and rill erosion on ROW at a bank cut at tower 203, in summer, 1975 (Photo Station 10).

FIG. 10.1.4. Turkey tracks on ROW during the winter of 1976.

FIG. 10.1.5. Garter snake on ROW in a cover of mixed grass-herb during the fall of 1975.

FIG. 10.1.6. Ponded area on the ROW during the spring of 1975 (Photo Station 6).

FIG. 10.1. Visual characteristic.

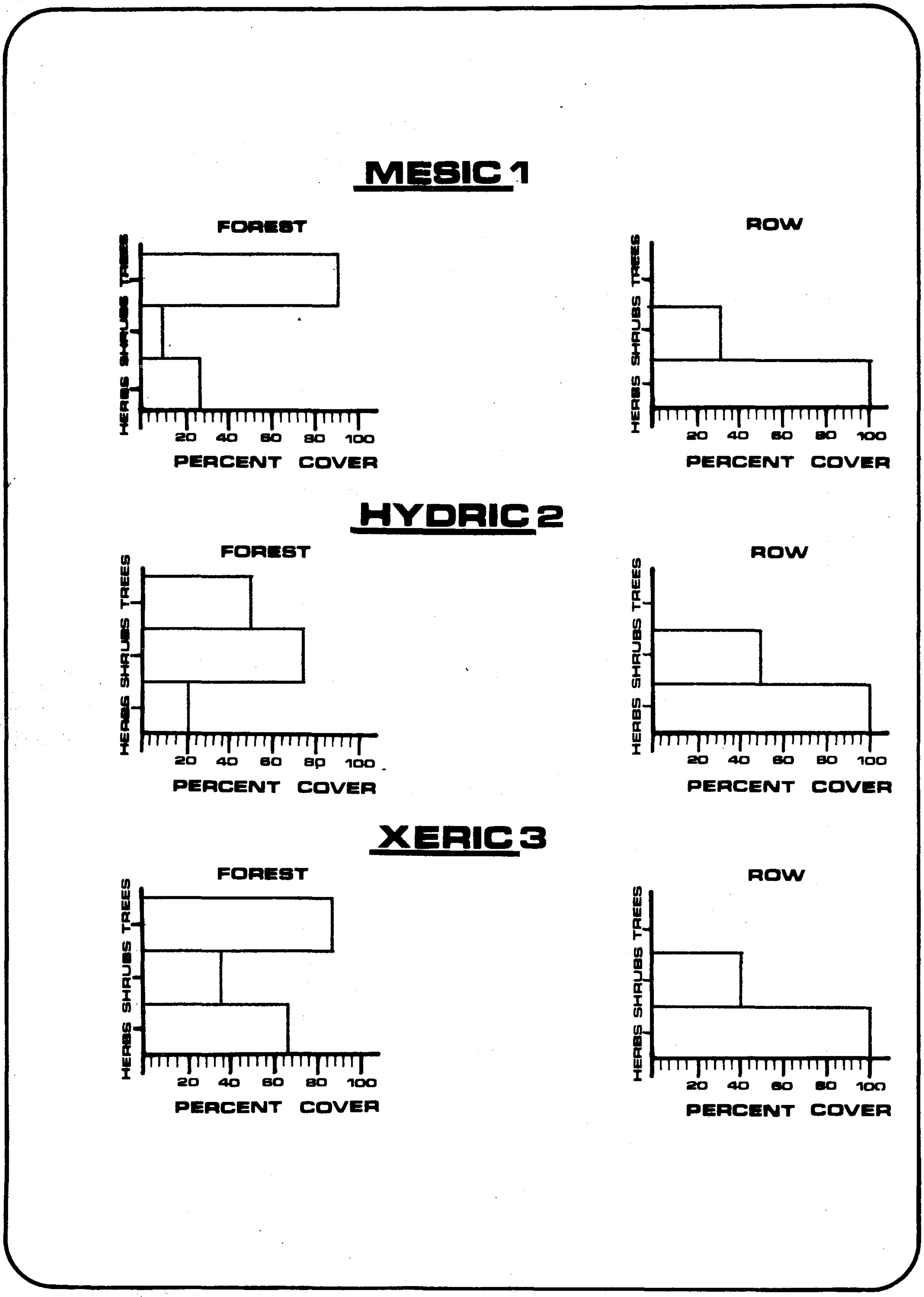


Fig. 10.2. Changes in cover value of tree, shrub, and herb layers from forest to ROW.

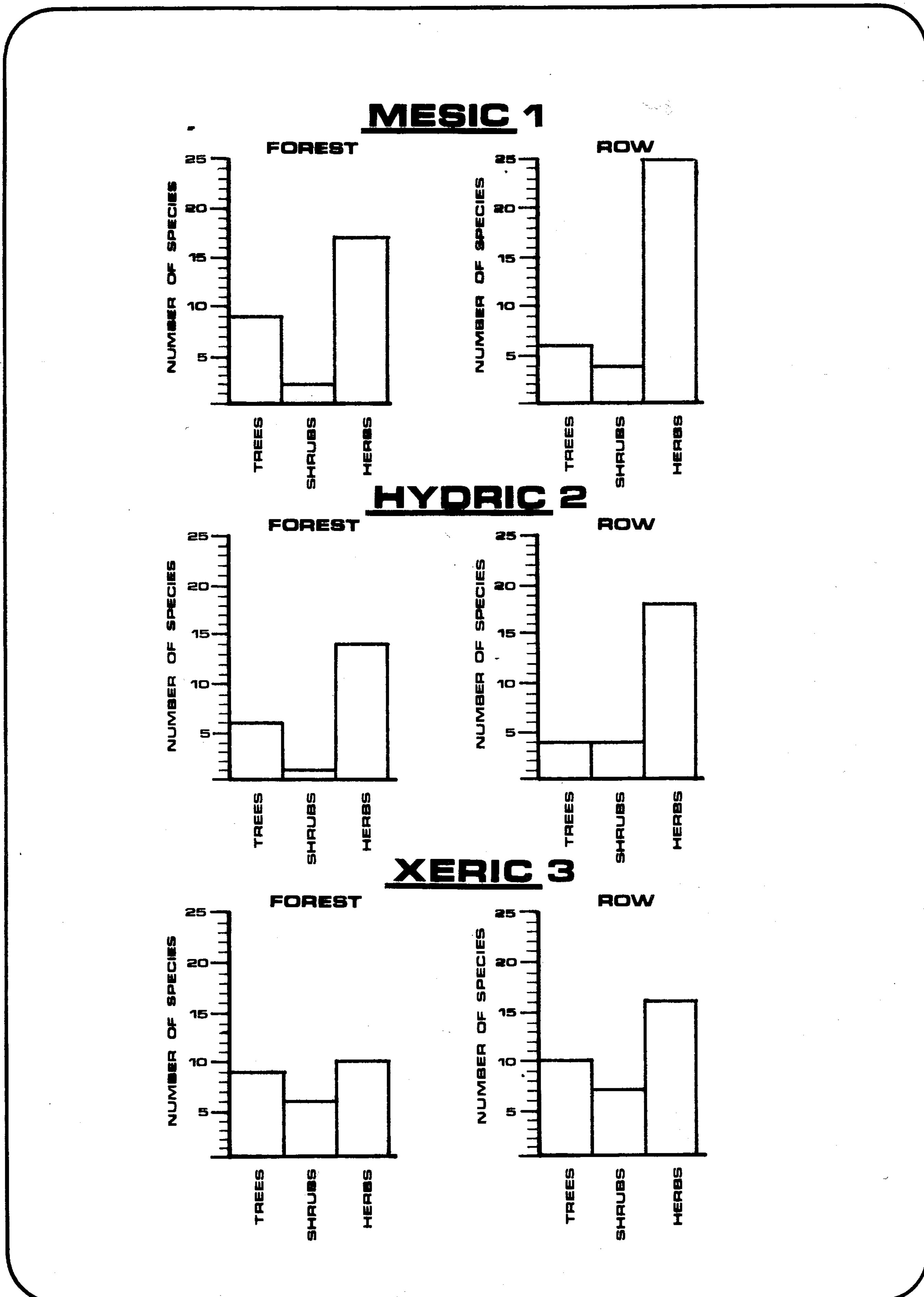


Fig. 10.3. Species diversity in the forest and on the ROW.

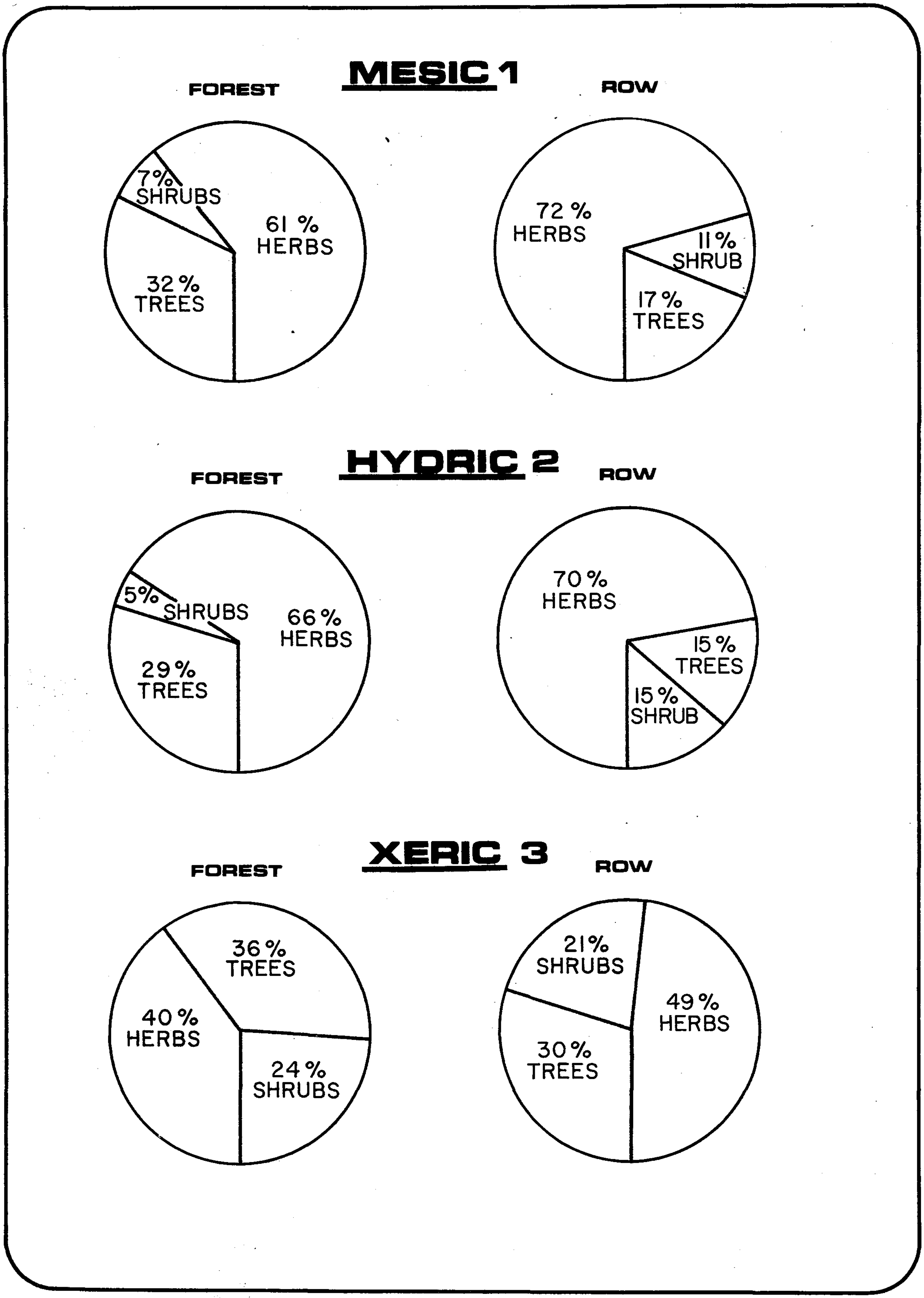


Fig. 10.4. Life form spectrum of the ROW as compared to the adjacent forest to compare species make-up of each, based on the number of species in each life form expressed as a percent of total species.

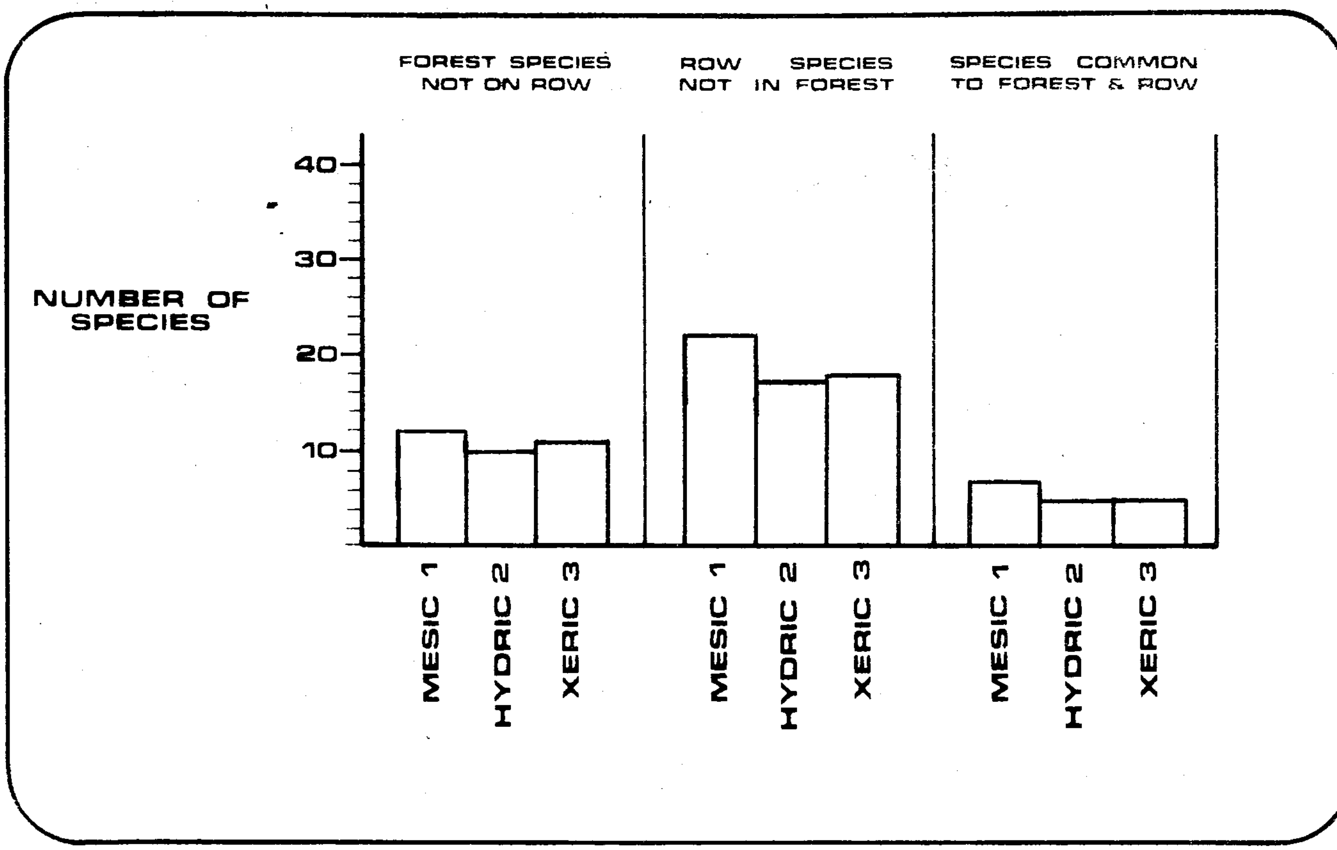


Fig. 10.5. Comparison of shrub and herb species in the forest and on the ROW.

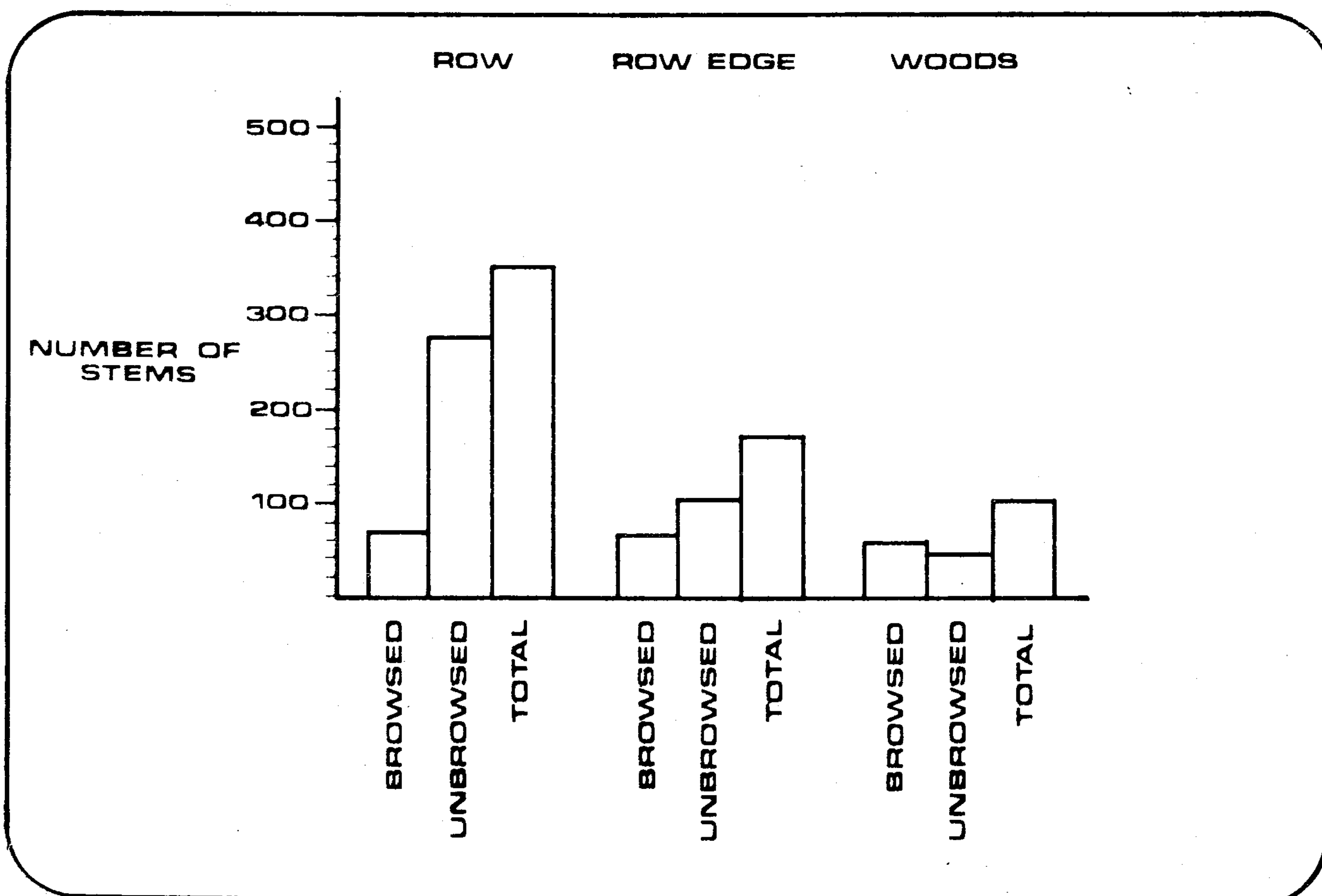
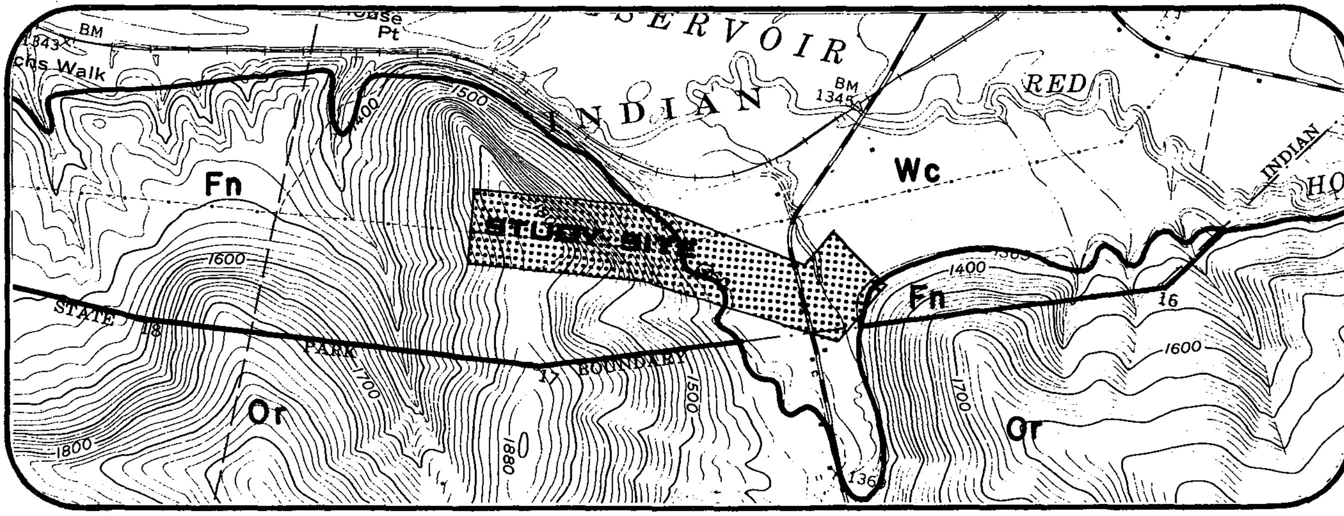
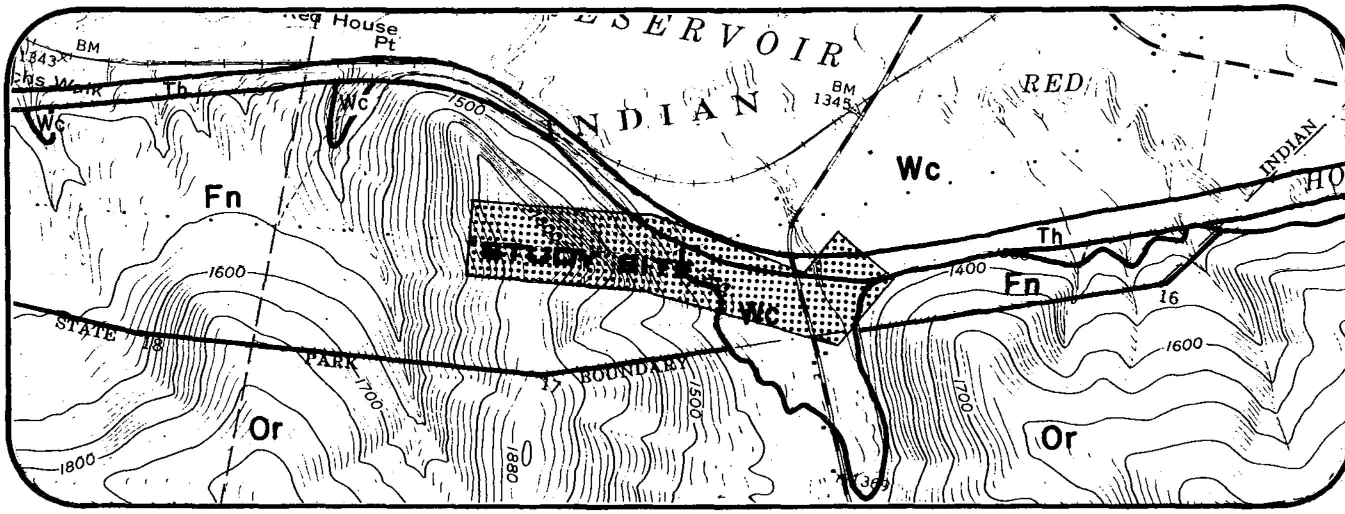


Fig. 10.6. Browse survey showing number of browsed, unbrowsed, and total stems for the ROW, ROW edge, and forest for 6 browse transects.



1956 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

FOREST LAND
Fn - Forest lands

OUTDOOR RECREATION LAND USE
Or - Outdoor recreation

TRANSPORTATION LAND USES
Th - Highways

WATER RESOURCES
Wc - Artificial ponds

SOURCES:
Cattaraugus Co. Real Property Tax Service, Little Valley, N.Y., air photo No. 1036 6 1-146, April 20, 1973
USDA-SCS, Cattaraugus County air photo, Sept. 27, 1956
Area Land Use Map, LUNR, Cornell University, N.Y., 1974
U. S. G. S. Topographic Map, Red House, N. Y., 1962

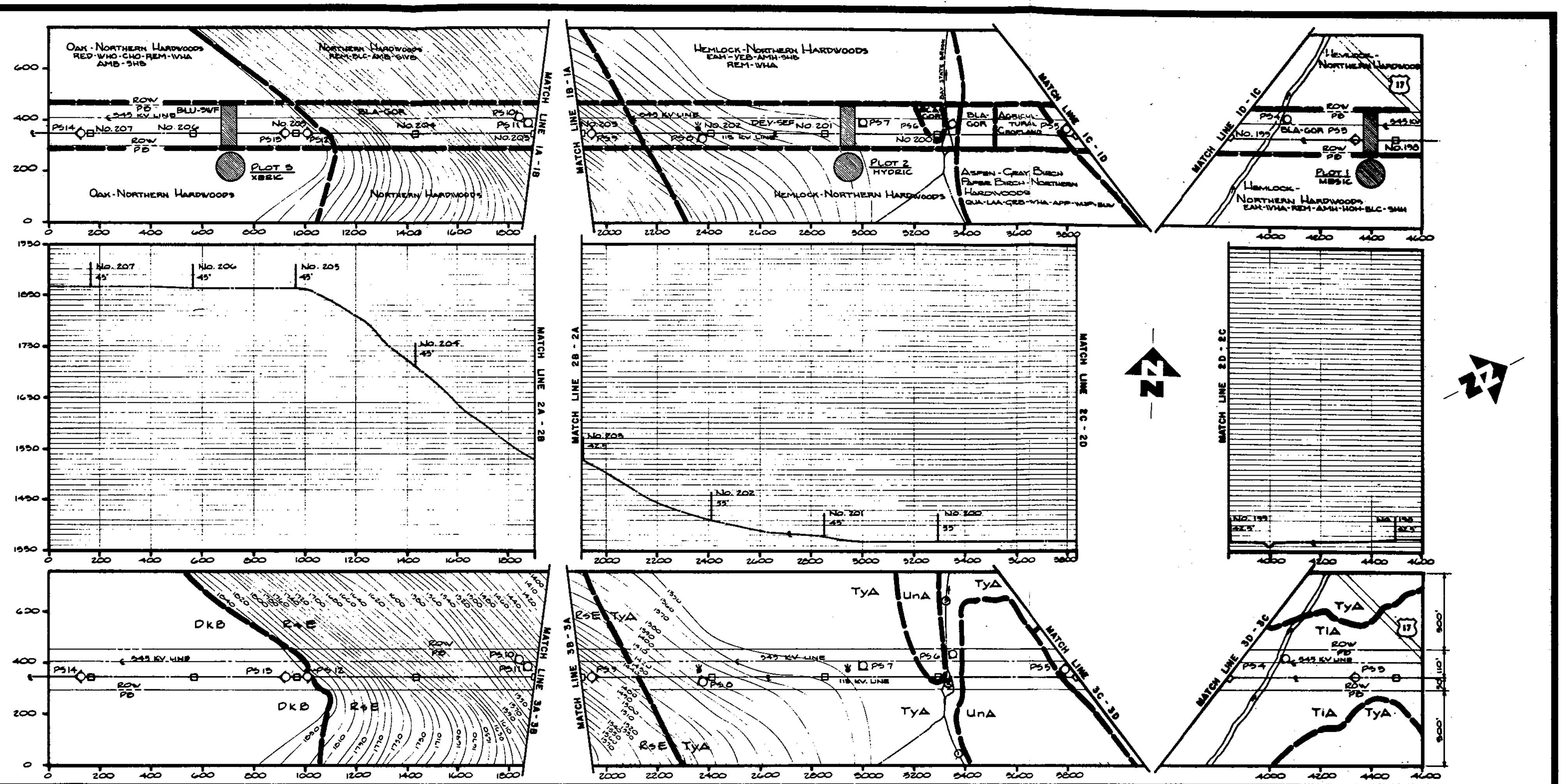
Fig. 10.7. Land use change.

ASPLUNDH ENVIRONMENTAL SERVICES

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
- cem. SMALL PARKS, CEMETERY, ETC.
- FENCE

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
- 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

- 23 CONTOUR
- DEPRESSION CONTOUR

SOIL SYMBOL AND NAME

DkB	DEKALB stony silt loam (8 to 15% slope)
RsE	ROUGH STONY LAND
TiA	TIOGA gravelly silt loam (0 to 8% slope)
TyA	TYLER silty clay loam (0 to 8% slope)
UnA	UNADILLA 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

- NMPC Engineering Plan & Profile 9/26/69
- USGS 7.5 Topographic Map, Red House, N.Y. 1962
- USDA in cooperation with Cornell Univer. Agr. Exp. Sta., Soil Survey for Cattaraugus Co. N.Y. U.S. Gov't Services Series 1940 No 12
- Cattaraugus Co Real Property Tax Service, Little Valley, N.Y. Air Photo No. 1038 G 1-146 (Scale 1:24,000) April 20, 1973
- 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"

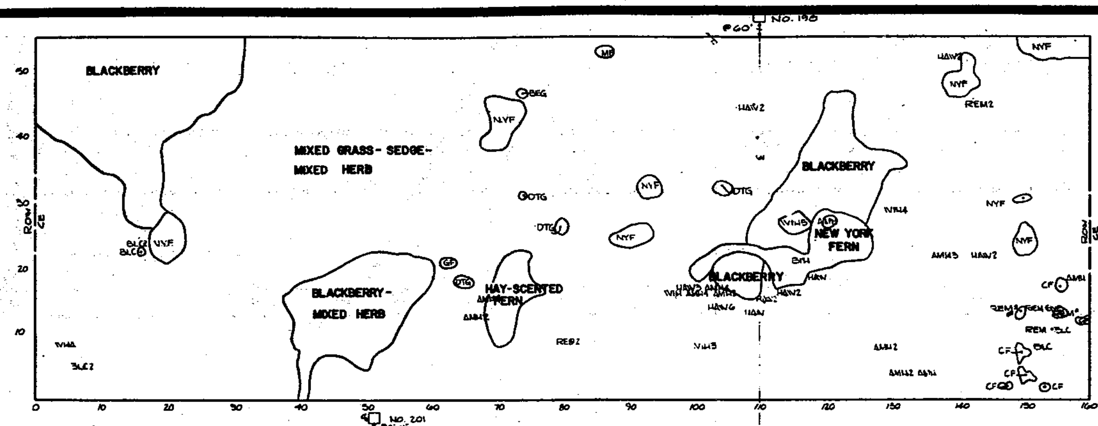
MAP 10.1

SITE 10 HABITAT CONDITIONS

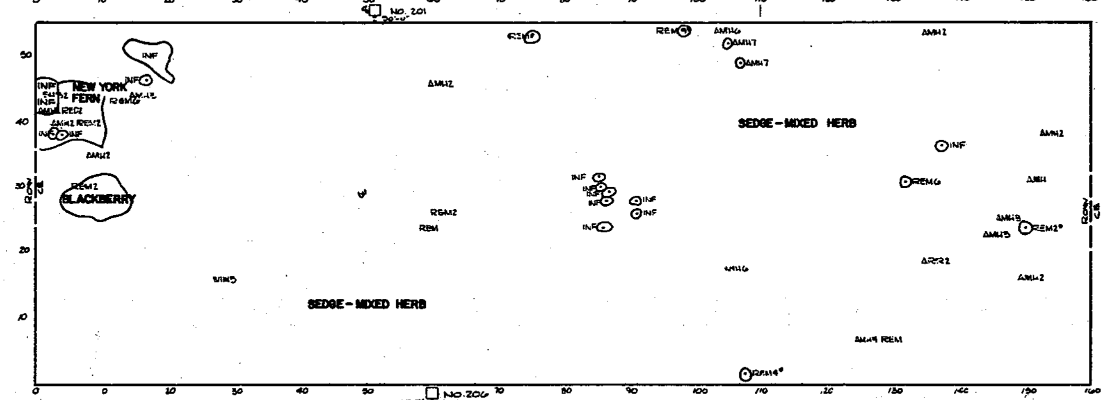
UTILITY: Niagara Mohawk Power Corp.
ROW DESCRIPTION: Falconer to Homer Hill 115 KV
Steel Lattice 160' ROW

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

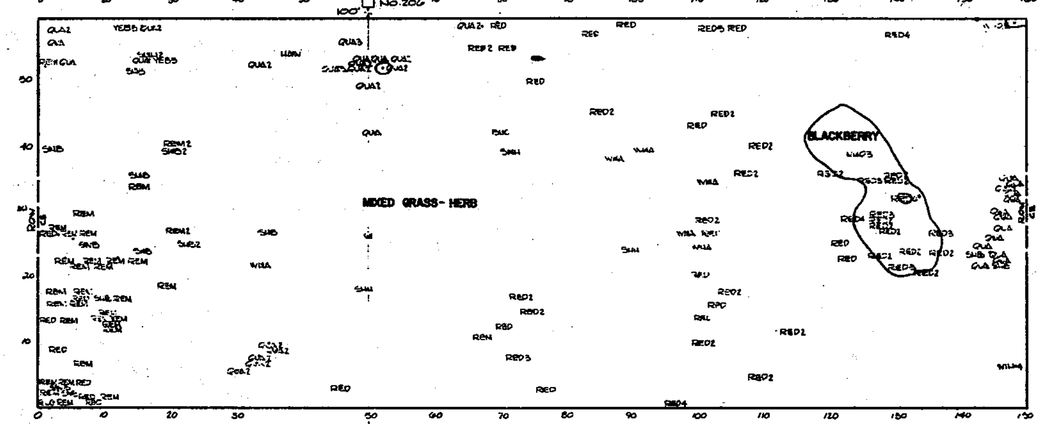
PLOT 1 MESIC



PLOT 2 HYDRIC



PLOT 3 XERIC



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 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

herbs

BLG	BLUE - JOINT GRASS	Calamagrastis canadensis
BON	BONESET	Eupatorium perfoliatum
BRN	BRACKEN	Pteridum aquilinum
BRO	BROOM - SEDGE	Artholophis virginicus
CAT	CAT-TAIL	Typha spp.
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HAF	HAY - SCENTED FERN	Dennstaedtia punctilobula
HOT	HORSETAIL	Equisetum spp.
INF	INTERRUPTED FERN	Osmunda Claytoniana
IRS	IRIS	Iris spp.
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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.

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 10.2

SITE 10

MAPPED PLOTS

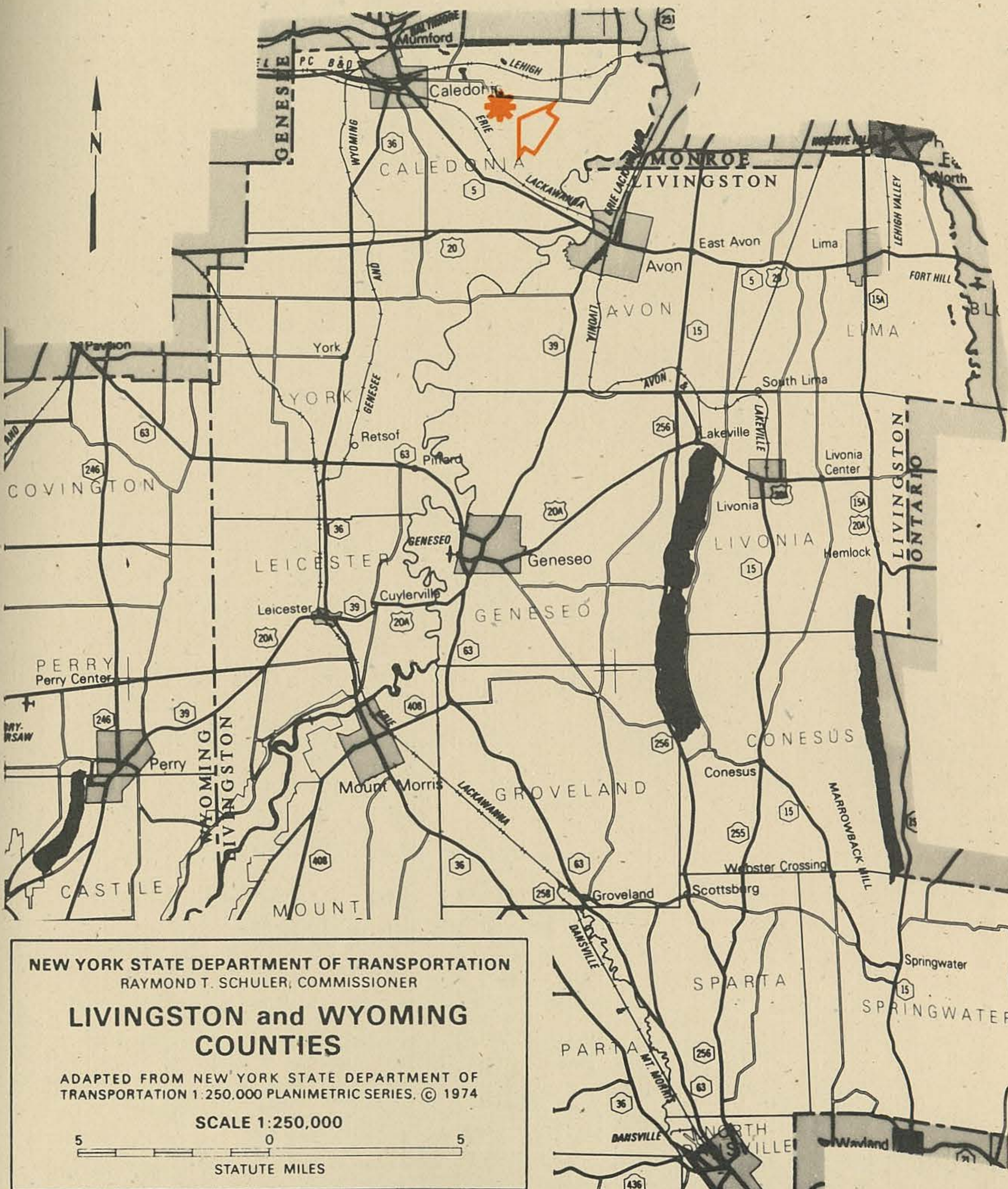
UTILITY: NIAGARA MOHAWK POWER CORP.

ROW DESCRIPTION: FALCONER TO HOMER HILL 115 KV.

STEEL LATTICE 160' ROW

SITE 11

STATION 82 to STATION 162



Site 11 Station 82 to Station 162

Study area extends from Feeley Road (structure 144) to the railroad track (structure 150) near Caledonia. To reach the study area, take route 15 south to Avon and turn right on routes 20 and 5. Proceed to Caledonia and turn right on Iriquois Road; proceed to Feeley Road and turn right on Feeley Road and proceed toward the site.

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Site 11 Station 82 to Station 162

1 Introduction

Site 11 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. 11.1.1 and 11.1.2.

The topography of the area is typically flat to rolling lands, and 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). Forest types located on the site are: Northern Hardwoods, Elm-Red Maple, and Northern White-Cedar.

2 Location and Identification

Site 11 is approximately 3 miles east of Caledonia, in the town of Caledonia, Livingston County, New York (77° 48' 00" W. Longitude; 42° 58' 00" N. Latitude).

The site is on the Station 82 to Station 162 ROW, which is operated by the Rochester Gas & Electric Corporation (RG&E). This 100-foot easement consists of a single circuit 115 kV line, having wood pole H-frame structures. The project site is approximately 4,440 feet in length and extends from structure 145, south of Feeley Road, to structure 150.

3 Background

The following discussion outlines documentable management techniques of clearing, construction, restoration, and maintenance for site 11, as received from RG&E (letter dated October 7, 1975, from Roy 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 under contract during June and July, 1962. Equipment used included chain saws and bulldozers. Brush was disposed of by burning. Tordon 155 in oil was used on the cut stumps in a selective treatment. It is not known whether or not the cedar swamp was sprayed.

3.2 Construction

The ROW was constructed in 1962. No additional information is available.

3.3 Restoration

Restoration was made by natural revegetation.

3.4 Maintenance

The line was recut once, but the date is not known.

4 General Reconnaissance

A general reconnaissance was made in accordance with the methodology and is set forth in Map 11.1 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 11.1 and described in Appendix 8. Specific reference is made to some of these photo stations throughout the report and illustrated in Fig. 11.1. 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 not necessarily pleasing or objectionable to view. Much of the ROW is very wet, and particularly in the summer is congested with sedges and marsh grasses, hawthorn, gray dogwood, and red osier dogwood, providing good cover. There are no prominent landforms, or man-made features near the site which would make the viewer unusually sensitive to the ROW. The ROW site crosses a white cedar swamp as well as active agricultural land, but is some distance from the closest residence. The ROW is clearly visible as it crossed Feeley Road, although the terrain does drop off to the west of the first structure screening the ROW from view of the road. The potential number of people viewing the ROW site is low. Although a number of residences are located along the road in the vicinity of the ROW, the site is located in a rural area, and crosses Feeley Road which is not heavily traveled.

5 Field Studies - Results and Discussion

5.1 Soils

5.1.1 Geology and Soils

Site 11, Station 82 to Station 162 ROW, is located in Livingston County in that physiographic area termed the Erie-Ontario Plain by Cline (1970), and the Erie-Ontario Lowland region, Southern Ontario Plain subdivision by Thompson (1966), in the Genesee River drainage basin. Bedrock geology is of Devonian age, 395 to 345 million years ago, consisting predominantly of limestone overlain by shale, siltstone, and sandstone. Surficial geology is glacial drift, and soils in this area have developed both in glacial till and glaciofluvial outwash (Broughton et al., 1973; Pearson et al., 1956).

Soils on this site are classified in 3 orders; those in the order Alfisols, suborder Udalfs (Howard, Palmyra, and Wassaic series), generally have gray to brown surface horizons, medium to high base status, and contain an illuvial horizon in which silicate clays have accumulated; those in the order Inceptisols, suborders Ochrepts (Farmington) and Aquepts (Lyons and Martisco), are noted for the absence of horizons of marked accumulation of clay and iron and aluminum oxides; and 1 in the order Histosols, suborder Saprists (Edwards), that developed in areas of fluctuating ground water and consist almost completely of decomposed plant remains (Buckman and Brady, 1969; Soil Survey Staff, 1975). The site borders 2 broad soil associations, namely the Farmington and Honeoye-Lima associations (Cline, 1970; Cline, 1961). Brief descriptions (Anon., 1972; Pearson et al., 1956; letter dated January 19, 1976, from James Booth, District Conservationist, Livingston County, Mt. Morris, N.Y.) of soil types occurring on the ROW study site (Map 11.1; Table 11.1) are:

Edwards and Martisco muck (EaA): These soils are mapped together in Livingston County, and formed in organic material overlying marl at depths of 50 inches or less; they occupy depressions on glacial outwash plains, till plains, and lake plains. Rather deep, and very poorly drained, these soils consist of from 16 to 50 inches of moderately rapidly permeable organic material over marl that has variable permeability rates. The seasonal water table is at the surface. Soil reaction is slightly acid to moderately alkaline, and was pH 7.1 in the surface 3 inches on this site. Assigned to Woodland Suitability Group 5w2, these soils have a low potential for timber productivity (Class 5) and management limitations or restrictions based on the presence of excessive wetness (Subclass w) due to restricted drainage and a high water table.

Farmington silt loam (FaA): Farmington soils developed in a thin deposit of glacial till over hard limestone bedrock, on nearly level to steep slopes in association with limestone outcrops. These soils are well drained, but are shallow, being only 12 to 24 inches over bedrock. Generally medium to slightly acid, soil reaction may vary from pH 5.5 to pH 7.5 throughout a typical profile; it was pH 6.2 in the surface mineral horizon on this site. Farmington silt loam is assigned to Woodland Suitability Group 5d1, designating low timber productivity and restricted rooting depth due to shallowness to hard rock causing a limitation for woodland use or management.

Lyons silt loam (LoA): These soils developed in strongly calcareous glacial till; they occupy nearly level areas or depressions in undulating to rolling till plains. Lyons soils are poorly drained, and contain slowly permeable, dense, very firm, gravelly silt loam glacial till at about 18 to 30 inches. The surface soil is high in organic material; the depth to the seasonal water table varies from the surface to 6 inches. Soil reaction is slightly acid to calcareous, ranging from pH 6.0 to calcareous throughout a typical profile, and it was pH 7.0 in the surface mineral soil on this site. Lyons silt loams are in Woodland Suitability Group 4w1, which is moderate for timber productivity with management limitations related to wetness.

Palmyra gravelly loam (PcA): These soils formed in strongly calcareous deposits of glacial outwash sand and gravel; they occupy nearly level valley floors where glacial rivers once ran, or hilly areas where meltwaters emerged from the glacier and deposited hills of gravel. Drainage is good. The soil reaction is most commonly slightly alkaline, although the lower 6 inches may be mildly calcareous; on this site in the surface horizon it was pH 6.4. Palmyra soils are in Woodland Suitability Group 2r4, indicating high productivity for woodland and relief or slope acting as a limitation to woodland use or management.

Palmyra-Howard gravelly loam (SsB): These soils are mapped as an undifferentiated unit in this county, and are generally quite steep. They developed in gravelly outwash material on nearly level to sloping or undulating outwash plains and valley trains and rolling to steep kames and kettles. These soils are deep and well drained. They are medium acid to neutral, and generally range from pH 5.0 to pH 6.5 throughout the first 45 inches; on this site soil reaction was pH 6.6 in the upper mineral soil. Palmyra and Howard soils as a unit are assigned to Woodland Suitability Group 2r4, which is high for woodland production with management limitations related to slope.

Wassaic silt loam (WaA): Wassaic soils formed in strongly calcareous glacial till, on nearly level to strongly sloping areas on the uplands. These soils are well and moderately well drained. Bedrock is found at 24 to 36 inches. Soil reaction varies from slightly acid to neutral, pH 6.0 to pH 7.0 throughout the first 14 inches, and it was pH 6.9 in the surface 3 inches on this site. Wassaic soils are in Woodland Suitability Group 2o1, designating high productivity and no significant limitations.

5.1.2 Humus Types

Organic layers present on the soil surface of the ROW and adjacent woodland were measured on 3 mesic locations. Average thickness of the organic layers and A1 horizon was based on 5 samples taken at each location (Table 11.2). 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; thus, similar measurements were not made on the hydric plot. In addition, even though plowing and grazing occurred in areas of this site and on adjoining land, there is no evidence that either occurred on the 3 locations sampled. Evidence of past burning, probably at the time of initial clearing, was found scattered throughout.

In general, only the litter layer plus an A1 horizon (mixed mineral and organic) were present at each site on both the ROW and woodland. Based upon the absence of the fermentation and humus layers, and the thickness of the A1 horizon, the predominant humus types were designated "deep medium mull" on the ROW and "very deep medium mull" in the forest. The litter layer on the ROW was equivalent in depth to that in the woodland in all cases. However, the 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.

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, but organic matter incorporation in surface mineral soil (A1 horizon) was less on the ROW, 4.0 inches, than in the forest, 4.6 inches. Elimination of the forest cover did result in a change in kind of litter as noted above. 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 Station 82 to Station 162 study area in June, 1976. In 1 area of the woodland where slope was approximately 16%, moderate sheet erosion occurred in an area of predominatly shrub cover (gray dogwood and hawthorn), in the Palmyra-Howard gravelly loam soil type. Otherwise, no active erosion was evident in the woodland on any slope or soil type, apparently due to the protective canopy of trees and shrubs and undisturbed litter layer present on the soil. Moderate sheet and rill erosion occurred on the general ROW in 1 instance, again in the Palmyra-Howard gravelly loam soil type, with a cover of gray dogwood and hawthorn, and a slope of 10%. Otherwise, no active or recent erosion was observed on the general ROW, areas in which woody brush was controlled, with little or no disturbance to the soil surface. Good vegetation cover, composed of grasses, herbs, ans shrubs, had developed on the general ROW following cutting for brush control, and a protective litter mulch from these plant parts was present (Table 11.2).

On other parts of the ROW, eroding areas were identified by location, soil type, average slope, and present plant cover (Table 11.3). Erosion was classified as to kind (sheet, rill, gully) and class (slight, moderate, severe); the location of a gravel pit where moderate sheet and rill erosion is occurring was plotted on the base map, as well as a spring seep on the ROW where erosion occurs due largely to a path, used by animals and man, which crosses the seep so that "rutting" has occurred (Map 11.1). Active erosion on the ROW was basically limited to areas that had been subjected to past and/or recent mechanical disturbance of the soil, except as noted above, and included a logging road, gravel excavation, and path through a spring seep (Table 11.3). As to the latter, however, it should be noted that it is likely that much of the soil disturbance is caused by animal usage. Sediment resulting from erosion accumulated on lower slopes and did not leave the ROW via streams or collect in water impoundments.

There was apparently no restoration in the form of seeding and planting following construction of this ROW, and denuded areas are thus dependent on natural plant invasion. In general, access roads have healed with grasses and herbs, except where still utilized for logging. Progressive sheet erosion on the 1 excavated area, along with recent use, apparently prevent natural plant invasion, since this area is generally devoid of plant cover. In most areas, even where erosion has occurred, a protective plant cover of grasses, herbs, and shrubs has developed. Where erosion occurs on the general ROW and forest, the herb layer is virtually absent, while a substantial shrub layer, composed primarily of gray dogwood and hawthron, persists. 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 There are 2 mesic, or medium moist, habitats on this site. Mesic 1 habitat was located on the lower slope of a long hill. Degree of slope was approximately 7% on a south-facing aspect. Drainage was free but not excessive. The forest type was Northern Hardwoods.

Mesic 3 habitat was located on upper slope of a gently sloping hill. Slope was approximately 12% on a south-facing slope. Drainage was free but not excessive. The forest type was Northern Hardwoods.

Hydric Habitat The hydric 2, or wet habitat was located on a very slightly depressed lowland area. Slope was negligible and aspect was flat. Drainage was impeded, largely due to a seasonally high water table. The forest type was Northern 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 which were not removed by maintenance treatment, or which have arisen since the last maintenance (Figs. 11.1.3 and 11.2).

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 11.4). Obviously, white ash and black locust were important species on mesic plot 1, white cedar on hydric plot 2, and red oak and black cherry on mesic plot 3.

On mesic 1 habitat, a Northern Hardwoods forest type was changed to a Sumac-Goldenrod plant community. On hydric 2 habitat, a Northern White-Cedar forest type was changed to a Red Osier Dogwood-Sensitive Fern plant community. On mesic 3 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 shrubs and herbs on mesic 1 habitat as compared to the forest, 10 shrubs and 14 herbs on the ROW as compared to 5 shrubs and 6 herbs in the forest (Table 11.5; Figs. 11.3 and 11.4). There was a slight difference in the number of shrubs on the hydric habitat, with 9 shrubs on ROW and 7 in the adjacent forest, while there was a marked decrease in the number of herbs in the forest as compared to the ROW, with 32 herbs in the forest versus 14 on the ROW. There was a slight increase in the number of shrubs and herbs on the ROW as compared to the adjacent woods on mesic 3 habitat; there were 7 shrubs on the ROW and 4 in the woods, while 19 herbs were on the ROW as compared to 15 in the woods (Table 11.5).

Qualitative Changes On mesic 1 habitat, 8 species from the shrub and herb layers occurred both in the forest and on the ROW; while 3 species occurred in the forest but not on the ROW and 16 species were on the ROW and not in the forest (Fig. 11.5). Two shrubs and 1 herb, raspberry, poison ivy, and bloodroot, occurred in the forest alone; while 7 shrubs and 9 herbs occurred on the ROW only (Table 11.6 and 11.7). Prominent shrubs on the ROW were gray dogwood, hawthorn, and northern prickly ash.

On hydric 2 habitat, 19 species from the shrub and herb layers occurred both in the forest and on the ROW; while 20 species occurred in the forest but not on the ROW and 4 species were on the ROW but not in the forest (Fig. 11.5). Two shrubs, hawthorn and choke-cherry, occurred in the forest but were absent from the ROW; while 4 shrubs, Virginia creeper, red osier dogwood, buckthorn, and elderberry, were found on the ROW only. There were 18 herbs in the adjacent forest that were not present on the ROW and no herbs were found that were unique only to the ROW (Tables 11.6 and 11.7).

On mesic 3 habitat, 1 shrub, witch-hazel, was found in the forest only, while 4 shrubs were unique to the ROW, namely, staghorn-sumac, wild-raisin, rose, and arrow-wood. There were 11 herbs in the forest that did not occur on the ROW (Table 11.6), and 15 on the ROW only (Table 11.7; Fig. 11.5).

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. The 1 exception is the herb layer of the hydric habitat which had more species in the forest than on the ROW.

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

Table 11.8 presents a breakdown of major vegetational communities for the mesic and hydric plots on the Station 82 to Station 162 ROW. Much of the present composition of herbaceous and woody plant communities on this area reflects the clearing and maintenance history.

The ROW was clear cut and material burned in 1962. It had 1 maintenance treatment since that time, which consisted of hand cutting.

The major plant communities now dominating mesic plot 1, hydric plot 2, and mesic plot 3 are: Gray dogwood-Mixed Herb-Mixed Grass; Sedge, and Sedge-Red Osier Dogwood; and Gray Dogwood-Mixed Grass-Herb, respectively. Since there is no past history of herbicide used in maintaining this ROW, this may account for the large amount of shrubs, mainly gray dogwood, which now occupy this ROW. These shrub species are likely to make up a large part of the ROW vegetation if selective line maintenance is employed in the future development of this ROW.

5.2.4 Comparison of Forest Type with ROW Vegetation

The ROW was clear cut during the summer of 1962 and material was burned. No information is available as to the maintenance of this line, but it is believed to have been re-cut once.

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

On mesic 1 habitat, which was formerly occupied by a Northern Hardwoods forest type, a Sumac-Goldenrod 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 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. 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 hydric 2 habitat, which was formerly occupied by a Northern White-Cedar forest type, a Red Osier Dogwood-Sensitive Fern plant community was produced. There was a notable change in the number of shrub species on the ROW as compared with the forest with more shrubs on the ROW. The same was true for the herb layer, except that there were more herbs in the forest than on the ROW. There was also a qualitative difference in the shrub and herb species between the ROW and the forest.

On mesic 3 habitat, which was formerly occupied by a Northern Hardwoods forest type, a Sumac-Goldenrod plant community was produced. There was a quantitative and qualitative difference in the shurb and herb layers of the ROW as compared to the adjacent forest. There were more shrubs and herbs present on the ROW than in the forest.

5.3 Wildlife

The 3 major game species for site 11, Station 82 to Station 162, 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, ring-necked pheasant, and woodcock.

5.3.1 Actual Use

White-tailed Deer White-tailed deer activity was moderate to heavy both on and off the ROW during the length of the study period. Deer were seen frequently during the periodic visitations to the site. Indirect observations consisted of tracks, browse, and pellets. These signs also indicated a moderate to heavy use of the study area by deer.

Browse Survey Five browse transects were established on study area 11 (Tables 11.9 and 11.10). These transects were established at each permanent study plot location on May 18, 1976, with 1 transect on each side of the ROW, except that no transect was established west of mesic plot 3, as that area was disturbed.

Overall browse utilization by percent actual use was highest on the ROW, 63%, and nearly equal between the edge and the woods, 43% and 39%, respectively. More stems were available at the ROW edge than either on the ROW or in the interior adjacent woods (Table 11.9; Fig. 11.6).

Gray dogwood, white cedar, red osier dogwood, and hawthorn were the most abundant species present (Table 11.10). White cedar was absent from the ROW, and red osier dogwood was present only on the ROW (Table 11.9).

Ring-necked Pheasant Ring-necked pheasants were seen and indirectly observed by crowing and tracks on the ROW and adjacent area. The surrounding area being agricultural, with such crops as corn playing a major role in the area's produce, makes this study area ideal for ring-necked pheasants. Pheasant activity was heavy on the ROW at a spring seep near structure 144 during the winter as evidenced by tracks (Fig. 11.1.5).

Woodcock On March 20, 1976, from 6:30 p.m. to 7:15 p.m. woodcock singing ground surveys were conducted on study area 11. Peenting was in progress upon arrival at the site. Three birds were located singing adjacent to the study area. One singing ground was located and marked with red ribbon. The 2 other locations were recorded for verification at a later date. One bird was seen flying across the ROW and 2 females were flushed at the singing ground that was pin-pointed and marked. Peenting stopped at 7:08 p.m. The weather was overcast, with a temperature of 65^{o} and with no snow cover.

This area was checked again on May 17, 1976. Two birds were noted singing at this time, 1 off the ROW, north of structure 144, and 1 off the ROW near structure 145 in the pasture adjacent to the study area.

Miscellaneous Wildlife Observations Various birds were seen and/or heard on the study area throughout the period of this study. The large amount of gray dogwood thickets present on this site provide excellent nesting cover for many different song birds. Birds observed on the ROW, ROW edge, and adjacent to the ROW are included in Table 11.11.

Cottontail rabbit activity was moderate as indicated by pellets and gnawing during the winter of 1976 (Fig. 11.1.6).

Raccoon tracks were moderate on the ROW during the spring of 1976. Ruffed grouse activity was slight during this period of time.

Two active woodchuck burrows were found on the study area; 1 was on the ROW near mesic plot 1 and 1 was in the woods east of mesic plot 1.

Moderate bullfrog activity was noted on the ROW in the wet area between structures 145 and 146 during the spring of 1976.

5.3.2 Potential Use

Potential wildlife use of the plant species present on site 11 for the 3 major game species, deer, pheasant, and woodcock, is contained in Table 11.12. In addition to asterisk ratings from Pennsylvania and Maine were included for deer for plant species occurring on the study area which were not rated in the New York ratings. The same is true for pheasants, with the inclusion of asterisk ratings for the northeast 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 those game species (Martin et al., 1951).

5.4 Water

A swamp on site 11 was sampled for water quality on September 28, 1975, and February 1, May 17 and August 2, 1976 (Table 11.13, Map 11.1).

5.4.1 Description and Sampling Points

The study area is located at the edge of a swamp about 1.7 miles in length by 0.3 miles in width in the Genessee River Basin. Slope is almost flat with a gradient of less than .01% to the southeast.

Sampling locations were sited as follows:

1. 100 yards northwest of the Row;

2. mid-ROW;
3. 100 yards southeast of the ROW (Map 11.1).

Decaying organic matter is abundant in the swamp and the flow is negligible. Samples were taken in depressions containing water.

Vegetation in the study area was dense. Location 1 is shaded by sedge and grasses. Partial shading is provided by shrubs, saplings, and white cedar. On the ROW, the swamp is shaded by shrubs, saplings, and herbs. Location 3 is well shaded by overstory vegetation such as American elm, red maple, and ash. Shrubs and herbs are present in the understory.

The swamp is presently utilized by wildlife and hunters. The New York State Department of Environmental Conservation has no "official classification" for water in the swamp.

5.4.2 Analysis of Water Quality

On September 28, 1975, sampling was from 8:30 to 10:45 a.m., and it was sunny (Table 11.13). Water temperature was 8.5 C at locations 1 and 2 and 9.0 C at location 3. Dissolved oxygen concentration and percent saturation were low and ranged from less than 1.0 to 3.5 ppm, and from less than 9 to 31%, respectively. The pH was low and averaged 5.0. The depth at locations 1, 2, and 3 was 8, 18, and 12 inches, respectively.

Sampling on February 10, 1976, was conducted in the early afternoon (Table 11.13). Water temperature was 1.0 C at all locations. Dissolved oxygen concentration and percent saturation were high and ranged from 8.5 to 9.5 ppm and 64 to 70%, respectively. The pH averaged 8.4.

Sampling was from 2:15 p.m. to 2:55 p.m. on May 17, 1976 (Table 11.13). It was raining and the air temperature was 18 C. Water temperature was 14.5 C at location 1 and 17.0 C at location 2 and 3. Dissolved oxygen concentration and percent saturation were low, 1.3 ppm and 13% at location 1, compared to 5.1 ppm and 56% at locations 2 and 3. The pH averaged 7.0. The depth at locations 1, 2, and 3 was 10, 18, and 12 inches, respectively.

On August 2, 1976, sampling was conducted from 5:30 to 5:55 p.m. (Table 11.13). Air temperature was 23 C and it was sunny. Water temperature was 14.0 C at location 3 and 17.0 at locations 1 and 2. Dissolved oxygen concentration and percent saturation was low, and ranged from 1.3 to 2.2 ppm and 13 to 35%, respectively. The pH averaged 6.8. The depth at locations 1, 2, and 3 was 8, 18, and 12 inches, respectively.

5.5 Land Use

5.5.1 Location

Site 11 is located in a rural farm area of the town of Caledonia, Livingston County, New York. Between 1960 and 1970 there was a 22.7% increase in population of Livingston County with a 1970 distribution of 33.1% urban, 59.6% rural nonfarm, and 7.3% rural farm (U.S. Bureau of the Census, 1972). The closest community is Caledonia (2,327), which is approximately 3 miles to the east.

5.5.2 Land Use Prior to Construction

The ROW was constructed during 1962. The earliest available data obtained from 1954 aerial photography indicates that the location of the ROW and adjacent land to the ROW was primarily rural farm (Table 11.14; Fig. 11.7). Land use distribution included the following sub types:

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

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

Residential:
- Rs - Strip development

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

5.5.3 Land Use After Construction

The adjacent land use to site 11 has not changed from the 1954 data. The land adjacent to the ROW is still rural farm with the same land use distribution subtypes as described prior to construction (Section 5.5.2; Table 11.14; Fig. 11.7).

In addition to the use of the ROW for the transmission of electrical power, portions of the ROW are currently being used for agricultural uses and the potential exists for hunting 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

The study area on this ROW occupies gently rolling to nearly level and depressional terrain composed primarily of calcareous glacial till and outwash over limestone, shale, and sandstone bedrock. Well-drained Farmington and Wassaic silt loam soils formed in glacial till on nearly level to sloping uplands with limestone bedrock occurring as outcrops or at shallow depths beneath the surface. Palmyra and Howard gravelly loams developed in well-drained, level to undulating, glacial outwash deposits. The poorly drained depressional soils include Edwards and Martisco muck and Lyons silt loam, both of which have high organic content in the surface soil.

In the bordering forest, which likely represents conditions at the time of ROW clearance in 1962, the mesic Palmyra, Howard, and Wassaic soils supported an Oak-Northern Hardwoods forest type of high productivity, and the shallow Farmington soil supported Northern Hardwoods with black locust of generally low productivity. The hydric Edwards and Martisco and Lyons soils were occupied predominantly by Elm-Red Maple and a small area of Northern White-Cedar. Edwards and Martisco muck, which exhibit very poor drainage and high water table, are rated low for timber production, while Lyons silt loam is rated moderate.

The forest floor of mesic sites in the woodland consists of a thin litter layer and thick A1 horizon, resulting in a "very deep medium mull" humus type. It is apparent that annual litter deposits, composed of leaves, twigs, and other tree parts, decompose rapidly and are incorporated in the surface mineral soil under environmental conditions existing on this site. Active soil erosion in the general forest was negligible, limited to moderate sheet erosion on one 16% slope-segment of Palmyra-Howard gravelly loam with shrub cover.

6.1.2 Vegetation

The land-use pattern which existed in this area prior to ROW establishment (1962) is similar to the present pattern. Hydric sites supported open stands of the Northern White-Cedar type or of the American Elm-Red Maple type. Natural openings, abundant in cedar areas, contained sedges and scattered wild-raisin, red osier dogwood, and willow. The canopy of the American Elm-Red Maple type was completely closed. Larch and basswood were common associates of this type.

On mesic sites pole-stage stands of Northern Hardwoods formed the cover. White oak, red oak, red maple, black cherry, and shagbark-hickory were major 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, ring-necked pheasant, and woodcock, 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 Water

No information is available.

6.1.5 Land Use

The earliest data available prior to construction of the ROW in 1962 is 1954 aerial photography. The ROW and adjacent land area was rural farm with a land use distribution of agriculture (60.0%), forest land (21.8%), water resources (18.1%), and residential (.1%).

6.2 Conditions Which Exist at Present

6.2.1 Soils

The ROW is characterized by the same geologic, soil, and relief conditions described in the adjacent forest, except for Farmington silt loam soil which does not extend onto the ROW. Dominant plant communities occurring on the ROW in 1976 were associated with existing soil types and moisture regimes: Sumac-Goldenrod on mesic Palmyra, Howard, and Wassaic soils, and Red Osier Dogwood-Sensitive Fern on the wet, poorly drained, Edwards, Martisco, and Lyons soils.

Organic layers on mesic ROW sites were essentially similar to those in the forest, consisting only of a thin litter layer and moderately thick A1 horizon. The humus type was a "deep medium mull", resulting from rapid organic matter decomposition and incorporation. Active erosion on the general ROW was limited to moderate sheet and rill erosion on one 10% slope of Palmyra-Howard gravelly loam with gray dogwood and hawthorn cover. Additional moderate sheet and rill erosion occurred on 3 disturbed areas of the same soil type, i.e., a rutted path through a spring seep, a portion of the access road recently used logging, and a gravel pit excavation. Erosion sediment collected on lower slopes of the ROW and did not enter streams or swamps.

6.2.2 Vegetation

On hydric sites the predominant herbaceous cover is sedge. Along much of the corridor margin the Sedge community has been invaded by red osier dogwood. On portions of hydric areas a mixture of white cedar seedlings, grasses, and various herbs form the low cover. Common woody plants on these sites include elm, willow, and wild-raisin.

The predominant vegetation on mesic sites is the Gray-Dogwood-Mixed Grass-Herb community. Many woody plants are invading this community. These include hawthorn, white ash, black cherry, red oak, red maple, and American hornbeam.

6.2.3 Wildlife

White-tailed deer, ring-necked pheasant, and woodcock are the major game species that currently occupy the study area. Indirect observations, namely tracks, browse, and pellets, indicated deer use of the ROW area. Deer were also seen on the site. Browse surveys indicated that more stems were available on the ROW edge than either on the ROW or in the interior woods. Gray dogwood, white cedar, red osier dogwood, and hawthorn were the most abundant species present, and of these all but gray dogwood were heavily browsed.

Direct and indirect observations (crowing and tracks) of ring-necked pheasant evidenced their presence in the ROW vicinity.

Woodcock singing ground surveys indicated the birds' presence in the ROW vicinity and their use of open areas adjacent to the ROW for peenting activities.

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

Water flow was not detected in the swamp on the Station 82 to Station 162 ROW. Water in the depressions was sampled. The ROW is 100 feet wide and maintenance is by selective cutting. Heavy shade is provided by herbs, shrubs, and saplings. West of the ROW white cedar is common and east of the ROW overstory vegetation shades the swamp. Aquatic plants are common throughout the study area.

Evaluation of the data indicates that the Station 82 to Station 162 ROW has a minimum effect on water quality. Although the swamp is continguous, data indicates it is complex.

Water temperature on the ROW, location 2, was equal to that off the ROW, locations 1 or 3 or both, on each day sampled. Average dissolved oxygen concentration and percent saturation was greater on the ROW than off the ROW. The pH fluctuated during this sampling program, and ranged from pH 4.7 to pH 8.6.

6.2.5 Land Use

Presently, the adjacent land uses to site 11 have not changed from the 1954 data. The land adjacent to ROW is still considered to be rural farm.

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

6.3 Environmental Effect and Probable Causes

6.3.1 Soils

The impact of ROW management on soils of this site 14 years after ROW construction was minimal. The only evident effect was moderate sheet and rill erosion on one part of the general ROW and 3 disturbed areas; a path through a wet spring seep, part of access road used for logging, and a gravel pit excavation. Erosion conditions on the general ROW were comparable to those in the adjacent forest, and erosion on the disturbed areas appeared to be related to other uses of the ROW and not directly associated with ROW construction and maintenance. Sediments accumulated on lower slopes of the ROW with no apparent detrimental effects.

Organic matter incorporation in the mineral soil, A1 horizon, was less on the ROW than in the forest, 4.0 and 4.6 inches, respectively. However, both areas exhibited well-developed medium mull humus types and thin litter deposits consisting of grass, herb, and shrub remains on the ROW in contrast to tree parts in the forest.

6.3.2 Vegetation

The environmental impact of ROW construction has been the least on those sections of the ROW which penetrate Northern White-Cedar swamps, since these stands were relatively open, and the present ROW cover of sedges, red osier dogwood, and willows already existed in natural openings in these stands.

Where the forest cover was complete, on hydric sites formerly covered by Anerican Elm-Red Maple and on mesic sites where Northern Hardwoods were dominant, ROW establishment and maintenance has resulted in a low herbaceous cover of gray dogwood, herbs, and grasses. Many woody plants are invading these areas. Red maple, elm, and oaks, species prominent in the previous stand, are abundant. In addition, such light-demanding species as white birch, staghorn-sumac, black locust, and shrubby cinquefoil have invaded the corridor clearing.

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

Minimal effect on water quality was measured on the ROW, probably due to the dense vegetation.

Line Management Factors Vegetation present on the ROW at the time of sampling prevented unfavorable effects on water quality.

Other Influences No other influence was observed.

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.

Table 11.1. Soil series present on the Station 82 to Station 162 study area.

Soil Series	Map Symbol[1]	Drainage Class[2]	Surface Soil pH	Surface Soil Texture	Woodland Suitability Group
Edwards and Martisco	EaA	SPD	7.1	muck	5w2
Farmington	FaA	G	6.2	silt loam	5d1
Lyons	LoA	PD	7.0	silt loam	4w1
Palmyra	PcA	G	6.4	gravelly loam	2r4
Palmyra-Howard	SsB	G	6.6	gravelly loam	2r4
Wassaic	WaA	G-MG	6.9	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 11.2. Average thickness of organic layers and A1 horizon and humus types for mesic sites on ROW and adjacent woodland of site 11.

Moisture Regime	Location	Layer Thickness (in.) L	F	H	A1	Humus Type
1. Mesic (1)[1]	ROW	.3	0	0	4.1	Very deep medium mull
	Woodland	.3	0	0	4.6	Very deep medium mull
2. Mesic (3)	ROW	.3	.1	0	3.8	Deep medium mull
	Woodland	.3	0	0	4.5	Very deep medium mull
3. Mesic	ROW	.3	0	0	4.0	Deep medium mull
	Woodland	.3	0	0	4.6	Very deep medium mull
All Plots Combined	ROW	.3	0	0	4.0	Deep medium mull
	Woodland	.3	0	0	4.6	Very deep medium mull

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

Table 11.3. Areas exhibiting active erosion in June, 1976, on the Station 82 to Station 162 ROW study area.

Location	Soil Type	Average Slope (%)	Plant Cover	Erosion on Site Kind	Class	Gully Depth (in.)
		ROW				
General ROW	Palmyra-Howard gravelly loam	10	Gray dogwood-hawthorn	Sheet & Rill	Moderate	--
Logging Road	Palmyra-Howard gravelly loam	15	Mixed herb	Sheet & Rill	Moderate	--
Gravel Excavation	Palmyra-Howard gravelly loam	5	Bare	Sheet & Rill	Moderate	--
Spring Seep	Palmyra-Howard gravelly loam	12	Gray dogwood-hawthorn	Sheet	Moderate	--
		FOREST				
General Forest	Palmyra-Howard gravelly loam	16	Gray dogwood-hawthorn	Sheet	Moderate	--

Table 11.4. 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	White Ash	46.95	50	96.95
	Black Locust	46.95	41	87.95
	Black Cherry	6.10	9	6.10
Hydric 2	White Cedar	100.00	100	200.00
Mesic 3	Red Oak	42.90	25	67.90
	Black Cherry	16.20	25	41.20
	White Oak	14.30	17	31.30
	Shagbark-Hickory	22.90	8	20.90
	Basswood	3.10	17	20.10
	White Ash	.60	8	8.60

Table 11.5. 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)		Hydric (2)		Mesic (3)	
	Forest A.S.	ROW A.S.	Forest A.S.	ROW A.S.	Forest A.S.	ROW A.S.
Tree Layer						
Black Cherry	+.1	–	–	–	+.1	–
Black Locust	1.1	–	–	–	–	–
White Ash	1.1	–	–	–	–	–
White Cedar	–	–	3.1	–	–	–
White Oak	–	–	–	–	+.1	–
Basswood	–	–	–	–	+.1	–
Shagbark-Hickory	–	–	–	–	+.1	–
Red Oak	–	–	–	–	+.1	–
Black Ash	–	–	–	–	++.1	–
No. Species	3	0	1	0	6	0
Shrub Layer						
Gray Dogwood	4.3	4.3	3.3	2.2	2.2	4.3
Hawthorn	3.2	2.2	1.1	–	2.1	2.1
Raspberry	+.1	–	–	–	–	–
Virginia Creeper	1.2	+.2	–	+.1	–	–
Poison Ivy	+.2	–	–	–	–	–
Willow spp.	–	++.1	3.1	1.3	–	–
Northern Prickly Ash	–	1.2	–	–	–	–
Buckthorn	–	+.1	–	1.4	–	–
Staghorn-Sumac	–	+.1	–	–	–	1.1
Grape	–	++.1	+.2	+.2	+.1	+.2
Choke-Cherry	–	+.1	+.1	–	–	–
Shrubby Cinquefoil	–	+.2	1.2	1.2	–	–
Wild-raisin	–	–	1.1	1.2	–	++.1
Red Osier Dogwood	–	–	–	1.2	–	–
Elderberry	–	–	–	(+.2)	–	–
Witch-Hazel	–	–	–	–	2.1	–
Rose spp.	–	–	–	–	–	1.2
Arrow-wood	–	–	–	–	–	++.1
No. Species	5	10	7	9	4	7
Trees in the Shrub Layer						
Black Cherry	3.1	2.1	+.1	+.1	–	–
American Elm	1.1	1.1	2.1	1.1	–	1.1
White Ash	1.1	3.1	–	–	++.1	2.1
Black Ash	1.1	–	1.1	1.1	+.1	2.1
Red Maple	++.1	+.1	–	+.1	–	3.1
White Birch	–	++.1	–	–	–	–

Table 11.5. Continued

Species	Mesic (1) Forest A.S.	Mesic (1) ROW A.S.	Hydric (2) Forest A.S.	Hydric (2) ROW A.S.	Mesic (3) Forest A.S.	Mesic (3) ROW A.S.
Black Locust	-	3.1	-	1.1	-	-
Red Oak	-	+.1	-	-	1.1	+.1
Alternate-leaved Dogwood	-	++.1	-	-	-	-
Flowering Dogwood	-	++.3	-	-	-	-
White Cedar	-	-	3.1	1.1	1.1	+.1
Scotch Pine	-	-	++.1	-	-	-
White Oak	-	-	-	+.1	+.1	-
American Hornbeam	-	-	-	-	4.1	3.1
Bitternut Hickory	-	-	-	-	-	++.1
Basswood	-	-	-	-	-	+.1
Chestnut-Oak	-	-	-	-	-	++.1
No. Species	5	9	5	7	6	10
Herb Layer						
Burdock	+.2	(1.3)	-	-	-	-
Strawberry	+.2	2.2	+.2	-	-	2.2
Moss	1.2	1.2	-	-	-	-
Sedge	+.2	+.2	4.2	4.4	-	-
Bloodroot	+.2	-	-	-	-	-
Aster spp.	+.2	2.2	++.2	1.2	-	1.1
Goldenrod spp.	-	3.3	+.2	1.2	-	1.2
Wild Cranesbill	-	1.1	1.2	-	1.1	+.1
Yarrow	-	1.2	+.2	-	-	1.2
Violet spp.	-	+.2	(+.2)	-	++.2	1.2
Rough Bedstraw	-	1.2	1.2	+.2	1.2	-
Upright Yellow Wood-sorrel	-	+.2	-	-	-	1.1
Columbine	-	(+.2)	++.1	-	-	+.2
Star-flowered Solomon's Seal	-	(1.4)	-	-	1.1	-
Mixed Grass	-	2.2	+.2	+.2	-	2.2
Early Meadow-Rue	-	-	1.2	-	-	-
Iris	-	-	+.2	+.2	-	-
Sensitive Fern	-	-	+.2	2.2	+.1	-
Spotted Touch-me-not	-	-	1.2	1.1	-	-
Daisy-Fleabane	-	-	++.1	+.1	-	-
Climacium dendroides	-	-	+.2	-	-	-
Ox-eye-Daisy	-	-	+.2	-	-	-
Horsetail	-	-	1.1	1.1	-	-
Great Lobelia	-	-	1.1	-	-	-
Daisy spp.	-	-	+.1	-	-	+.1
Marsh-Fern	-	-	1.2	1.2	-	-
Joe-Pye-weed	-	-	2.2	2.2	-	-

Table 11.5. Continued

Species	Mesic (1) Forest A.S.	Mesic (1) ROW A.S.	Hydric (2) Forest A.S.	Hydric (2) ROW A.S.	Mesic (3) Forest A.S.	Mesic (3) ROW A.S.
Boneset	-	-	1.2	1.2	-	-
Common Fern Moss	-	-	2.2	-	-	-
Cowslip	-	-	(+.3)	-	-	-
Winter-Cress	-	-	+.1	-	-	-
Skunk-cabbage	-	-	+.2	-	-	-
Big-Leaf Nyam	-	-	+.2	-	-	-
Spring-Cress	-	-	+.2	-	-	-
Common Mouse-Ear Chickweed	-	-	+.2	-	-	-
Golden Ragwort	-	-	1.2	-	-	-
Dandelion	-	-	++.1	++.1	-	-
May-apple	-	-	-	-	3.1	-
Large-flowered Wake-robin	-	-	-	-	3.1	-
Barren Strawberry	-	-	-	-	2.2	-
Hairy Solomon's-Seal	-	-	-	-	+.1	(+.2)
False Spikenard	-	-	-	-	+.1	-
Smooth Yellow Violet	-	-	-	-	+.1	-
Rue-Anemone	-	-	-	-	1.2	(1.2)
Rattlesnake-Fern	-	-	-	-	++.1	-
Large-leaved Aster	-	-	-	-	1.4	-
Black Cohosh	-	-	-	-	(+.1)	-
Large Yellow Lady's-slipper	-	-	-	-	-	+.2
Broom-sedge	-	-	-	-	-	3.2
Poverty-Grass	-	-	-	-	-	1.2
Hepatica	-	-	-	-	-	(1.2)
Trout-Lily	-	-	-	-	-	(+.3)
Butterfly-weed	-	-	-	-	-	(+.2)
St. John's-wort	-	-	-	-	-	(+.1)
No. Species	6	14	32	14	15	19
Total No. Species						
Trees	6	9	5	7	9	10
Shrubs	5	10	7	9	4	7
Herbs	6	14	32	14	15	19
Totals	17	33	44	30	28	36

Table 11.6. 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		
Raspberry	+.1	-
Poison Ivy	+.2	-
Herbs		
Bloodroot	+.2	-
No. Species	3	
	Hydric (2)	
Shrubs		
Hawthorn	1.1	-
Choke-cherry	+.1	-
Herbs		
Strawberry	+.2	-
Wild Cranesbill	1.2	-
Yarrow	+.2	-
Columbine	++.1	-
Early Meadow-Rue	1.2	-
Climacium dendroides	+.2	-
Ox-eye Daisy	+.2	-
Great Lobelia	1.1	-
Daisy spp.	+.1	-
Common Fern Moss	2.2	-
Cowslip	(+.3)	-
Winter-Cress	+.1	-
Skunk-cabbage	+.2	-
Big-leaf nyam	+.2	-
Violet spp.	(+.2)	-
Spring-Cress	+.2	-
Common Mouse-ear Chickweed	+.2	-
Golden Ragwort	1.2	-
No. Species	20	

Table 11.6. Continued

Species	Forest A.S.	ROW A.S.
	Mesic (3)	
Shrubs		
Witch-Hazel	2.1	-
Herbs		
Star-flowered Solomon's Seal	1.1	-
Sensitive Fern	+.1	-
Rough Bedstraw	1.2	-
May-apple	3.1	-
Large-flowered Wake-robin	3.1	-
Barren Strawberry	2.2	-
False Spikenard	+.1	-
Smooth Yellow Violet	+.1	-
Rattlesnake-Fern	++.1	-
Large-leaved Aster	1.4	-
Black Cohosh	(+.1)	-
No. Species	12	

Table 11.7. 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		
Willow spp.	++.1	-
Northern Prickly Ash	1.2	-
Buckthorn	+.1	-
Staghorn-Sumac	+.1	-
Choke-Cherry	+.1	-
Shrubby Cinquefoil	+.2	-
Grape	++.1	-
Herbs		
Goldenrod spp.	3.3	-
Wild Cranesbill	1.1	-
Yarrow	1.2	-
Violet spp.	+.2	-
Rough Bedstraw	1.2	-
Upright Yellow Wood-Sorrel	+.2	-
Columbine	(+.2)	-
Star-flowered Solomon's Seal	(1.4)	-
Mixed Grass	2.2	-
No. Species	16	
Hydric (2)		
Shrubs		
Virginia Creeper	+.1	-
Red Osier Dogwood	1.2	-
Buckthorn	1.4	-
Elderberry	(+.2)	-
Herbs	-	-
No. Species	4	
Mesic (3)		
Shrubs		
Staghorn-Sumac	1.1	-
Wild-raisin	++.1	-
Rose spp.	1.2	-
Arrow-wood	++.1	-

Table 11.7. Continued

Species	ROW A.S.	Forest A.S.
<u>Herbs</u>		
Strawberry	2.2	-
Goldenrod spp.	1.2	-
Yarrow	1.2	-
Upright Yellow Wood-Sorrel	1.1	-
Columbine	+.2	-
Mixed Grass	2.2	-
Daisy spp.	+.1	-
Aster spp.	1.1	-
Yellow Lady's-slipper	+.2	-
Broom-sedge	3.2	-
Poverty-Grass	1.2	-
Hepatica	(1.2)	-
Trout-Lily	(+.3)	-
Butterfly-weed	(+.2)	-
St. John's-wort	(+.1)	-
No. Species	19	

Table 11.8. Major vegetational types for the Station 82 to Station 162 study area based on percent of study plots occupied by each plant community or other components on the ROW.

Community	Site Classification		
	Mesic (1)	Hydric (2)	Mesic (3)
	Percent of Total Area		
Gray dogwood-Mixed Herb-Mixed Grass	97.50		
White Ash	.69		.45
Black Cherry	.42		
Buckthorn	.42	.16	
Hawthorn	.28		
American Elm	.28		.15
Black Locust	.28	.16	
Flowering Dogwood	.13		
Sedge		53.44	
Sedge-Red Osier Dogwood		36.25	
White Cedar-Mixed Grass-Herb		9.21	
White Cedar		.31	
Willow		.31	
Red Osier Dogwood		.16	
Gray Dogwood-Mixed Grass-Herb			68.45
Gray Dogwood-American Hornbeam-White Ash			27.83
American Hornbeam			2.23
Red Maple			.74
Basswood			.15
Total	100.00	100.00	100.00

Table 11.9. 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	%
Hawthorn	17/17	100	8/14	57	3/4	75	28/35	80
Gray Dogwood	19/39	49	31/92	34	27/84	32	77/215	36
Black Locust	1/2	50	0/4	0	0/1	0	1/7	14
Black Cherry	7/10	70	6/10	60	5/8	63	18/28	64
White Ash	3/5	60	3/7	43	1/6	17	7/18	39
Sassafras	1/1	100					1/1	100
Alternate-leaved Dogwood	1/1	100					1/1	100
Choke-Cherry			0/1	0			0/1	0
Wild-raisin			1/4	25	0/2	0	1/6	17
Red Osier Dogwood	20/28	71	7/8	88			27/36	75
White Cedar			16/22	73	19/30	63	35/52	67
Sugar-Maple	2/4	50					2/4	50
Arrow-wood	0/2	0					0/2	0
Smooth Sumac	1/1	100					1/1	100
American Hornbeam	0/5	0	3/10	30	0/4	0	3/19	16
White Oak			0/1	0			0/1	0
Red Oak					0/1	0	0/1	0
American Elm					0/1	0	0/1	0
Total	72/115	63	75/173	43	55/141	39	202/429	47

Table 11.10. 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							
	Hawthorn		Gray Dogwood		Red Osier Dogwood		White Cedar	
	Ratio	%	Ratio	%	Ratio	%	Ratio	%
ROW	17/17	100	19/39	49	20/28	71	-	-
ROW Edge	8/14	37	31/92	34	7/8	88	10/22	73
Woods	3/4	75	27/84	32	-	-	19/30	63
TOTAL	28/35	80	77/215	36	27/36	75	35/52	67

Table 11.11. Birds observed and/or heard on the ROW and on the ROW edge during the study period.

Species	Species
Great blue heron	Carolina chickadee
Turkey vulture	Catbird
Cooper's hawk	Veery
Ruffed grouse	Wood thrush
Ring-necked pheasant	Cedar waxwing
Killdeer	Starling
American woodcock	Yellow warbler
Solitary sandpiper	Yellowthroat
Herring gull	Baltimore oriole
Hairy woodpecker	Brown-headed cowbird
Pileated woodpecker	Common grackle
Yellow-shafted flicker	Red-winged blackbird
Eastern kingbird	Cardinal
Eastern woodpewee	Indigo bunting
Great crested flycatcher	Rose-breasted grosbeak
Blue jay	White-throated sparrow
Common crow	Rufus-sided towhee
Black-capped chickadee	

Table 11.12. Potential wildlife use of plant species[1] present on the ROW and adjacent woods for the major game species on the Station 82 to Station 162 study area.

Species	Wildlife Species		
	Deer	Pheasant	Woodcock
Trees			
Red Maple	****		
White Ash	*		
Black Cherry	*	*	
Black Ash	*		
American Elm	+		
Red Oak	*	*	
Scotch Pine	+		
White Cedar	*		
White Oak	*	*	
Basswood	*		
American Hornbeam	*		
Shrubs			
Gray Dogwood	*	+	
Alternate-leaved Dogwood	*	+	
Flowering Dogwood	*	+	
Red Osier Dogwood	*	+	
Grape		**	
Willow	*		
Hawthorn	+		
Blackberry	+	***	+
Raspberry	+	***	+
Choke-Cherry	*	*	
Wild-raisin	*		
Witch-Hazel	**		
Arrow-wood	*		
Staghorn-Sumac	**	*	
Elderberry	+	*	
Herbs[2]			
Sedge		+	+
Violet			+
Mixed Grass	*	+	+
Skunk-cabbage		*	

[1] Those plants not included in this table provide a certain amount of cover (Table 11.5) 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 11.12. Continued

Species	Wildlife Species		
	Deer	Pheasant	Woodcock
Strawberry	+	*	
Dandelion	+		
Ferns	*		
Goldenrod	+		

Table 11.13. Water data collected from September 28, 1975, to August 2, 1976, at site 11, Station 82 to Station 162 ROW, Livingston County, New York.

Date		September 28, 1975			February 10, 1976			May 17, 1976			August 2, 1976		
Sampling Location		1	2	3	1	2	3	1	2	3	1	2	3
Hour		1000	0830	1045	-	1435	-	1455	1440	1415	1740	1730	1755
Water Temp. (C)		8.5	8.5	9.0	1.0	1.0	1.0	14.5	17.0	17.0	17.0	17.0	14.0
Dissolved Oxygen (ppm)		3.5	1.8	1.0	8.5	9.5	8.7	1.3	5.1	5.1	1.3	2.2	1.4
% Saturation D.O.		31	15	8	64	70	65	13	56	56	13	35	14
pH		5.0	4.7	5.2	8.4	8.6	8.3	6.9	7.1	7.0	6.9	6.9	6.6
Water Temp. (C)	range		8.5-9.0			1.0			14.5-17.0			14.0-17.0	
	mean		8.7			1.0			16.2			16.0	
% of Saturation D.O.	range		<8-31			64-70			13-56			13-35	
	mean		<18			66			42			21	
pH	range		4.7-5.2			8.3-8.6			6.9-7.1			6.6-6.9	
	mean		5.0			8.4			7.0			6.8	
Comments		sunny						rain, cloudy, air temp. 18 C			sunny, air temp. 23 C		

Table 11.14. 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% – 100%)
(A)	Agriculture	-60.0 *59.0
(C,I)	Commercial & Industrial	
(F)	Forest Land	-21.8 *22.8
(E)	Extractive Industry	
(N)	Non-productive	
(OR)	Outdoor Recreation	
(P)	Public & Semi-public	
(W)	Water Resources	-18.1 *18.1
(U)	Urban Inactive	
(T)	Transportation	
(R)	Residential	-.1 *.1

1 Source: NYSE & G, Binghamton, N.Y., air photo No. 17-758, Apr. 9, 1973
USDA-SCS, Livingston County air photo, 1959

FIG. 11.1.1. General view of the ROW and adjacent forest, looking northeast, in summer, 1975 (Photo Station 2).

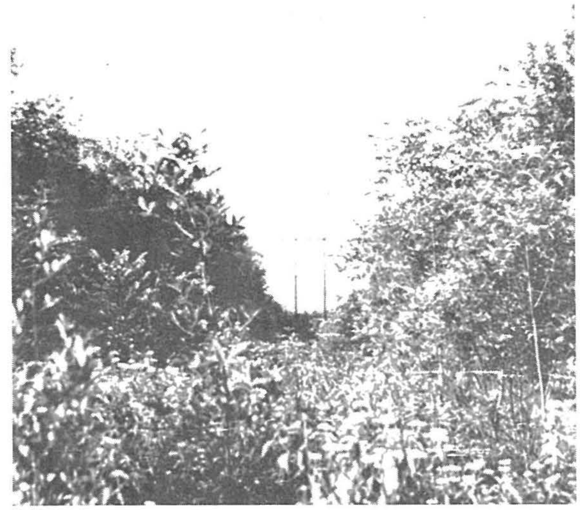


FIG. 11.1.2. General view of the ROW and adjacent forest, looking southwest, in summer, 1975 (Photo Station 3).

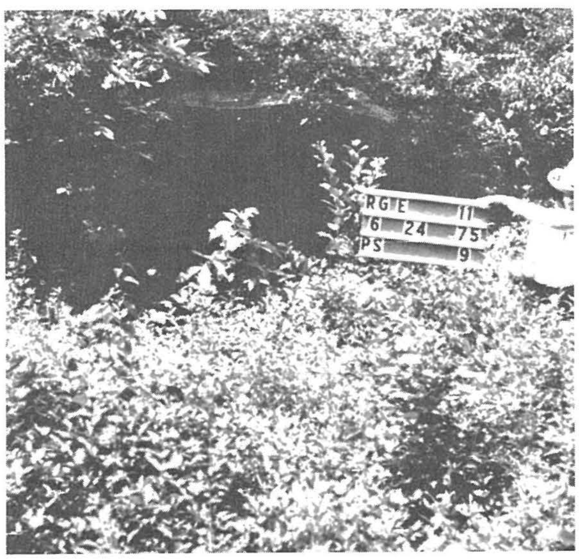


FIG. 11.1.3. Multiple stems of gray dogwood on ROW in summer, 1975 (Photo Station 9).

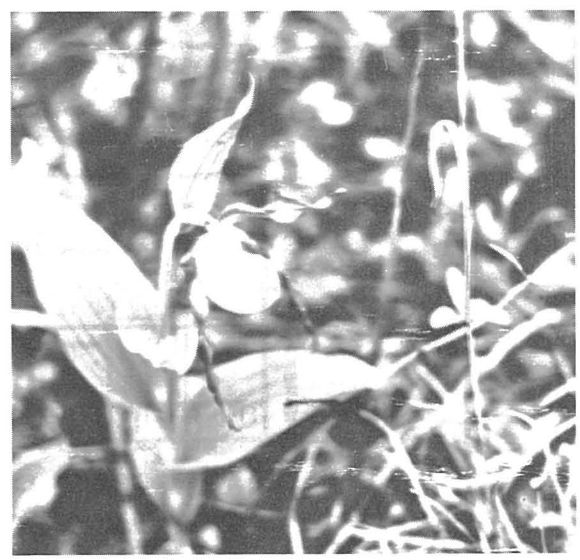


FIG. 11.1.4. Large yellow lady's-slipper on ROW on mesic plot 3 during the spring of 1976.

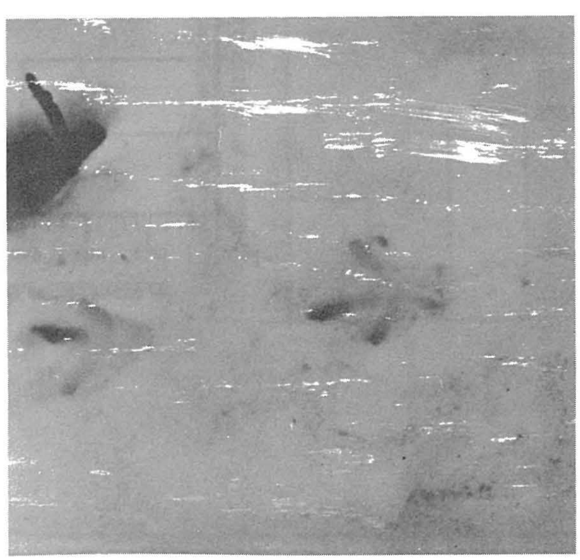


FIG. 11.1.5. Pheasant tracks on the ROW near a spring seep during the winter of 1976.

FIG. 11.1.6. Rabbit gnawings on hawthorn on ROW during the winter of 1976.

FIG. 11.1. Visual characteristics.

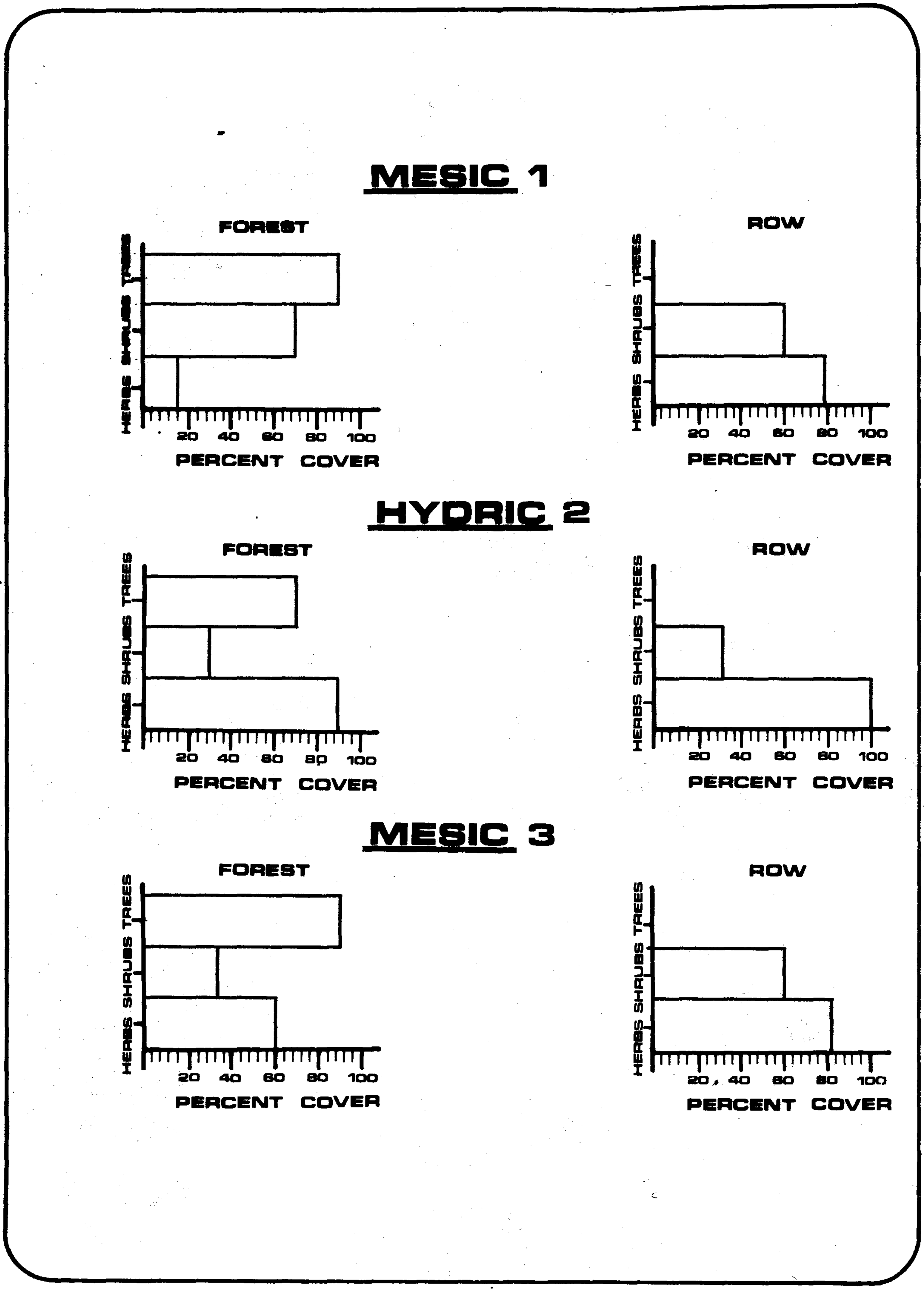


Fig. II. 2. Changes in cover value of tree, shrub, and herb layers from forest to ROW.

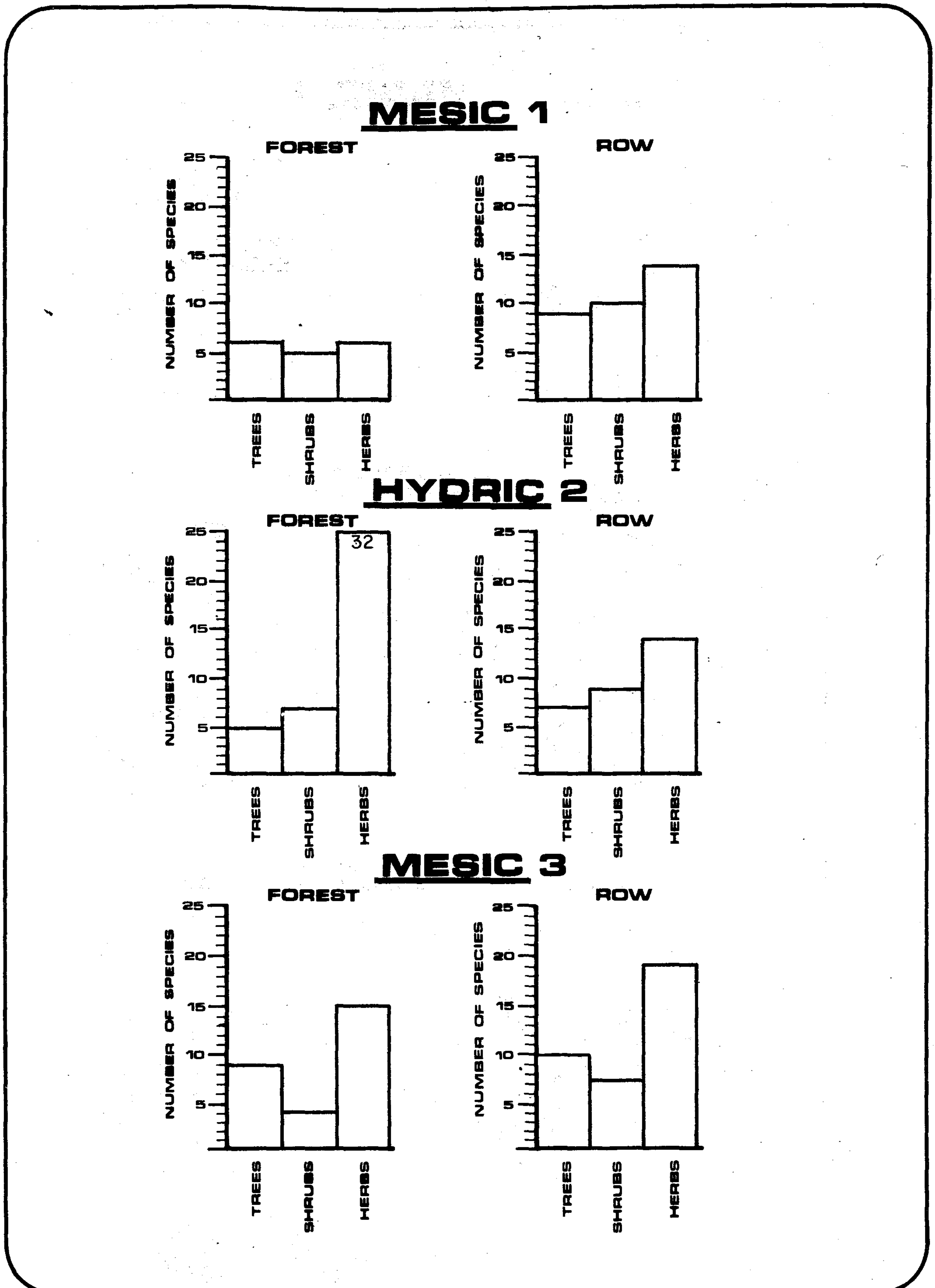


Fig. 11.3. Species diversity in the forest and on the ROW.

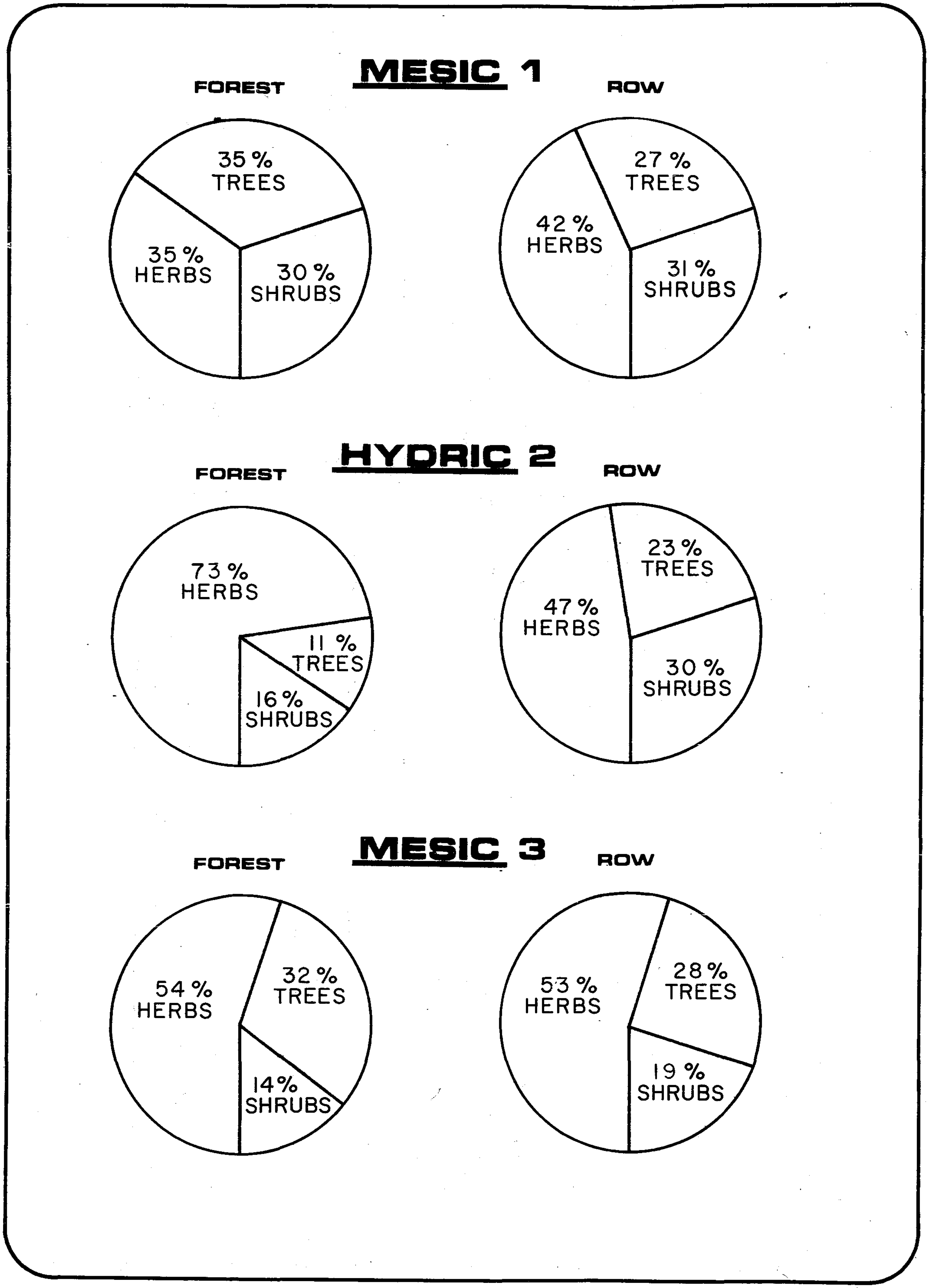


Fig. 11.4. Life form spectrum of the ROW as compared to the adjacent forest to compare species make-up of each, based on the number of species in each life form expressed as a percent of total species.

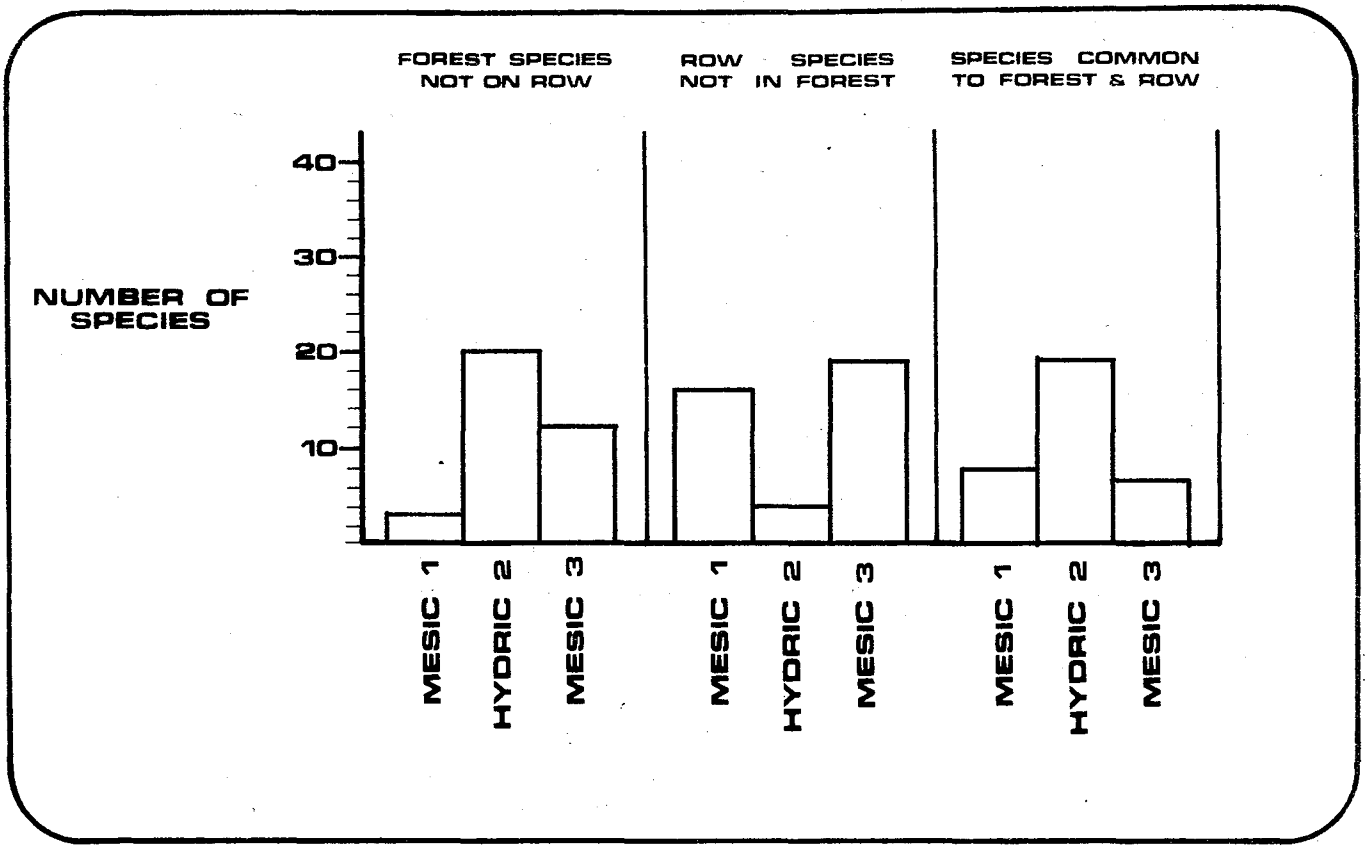


Fig. II.5. Comparison of shrub and herb species in the forest and on the ROW.

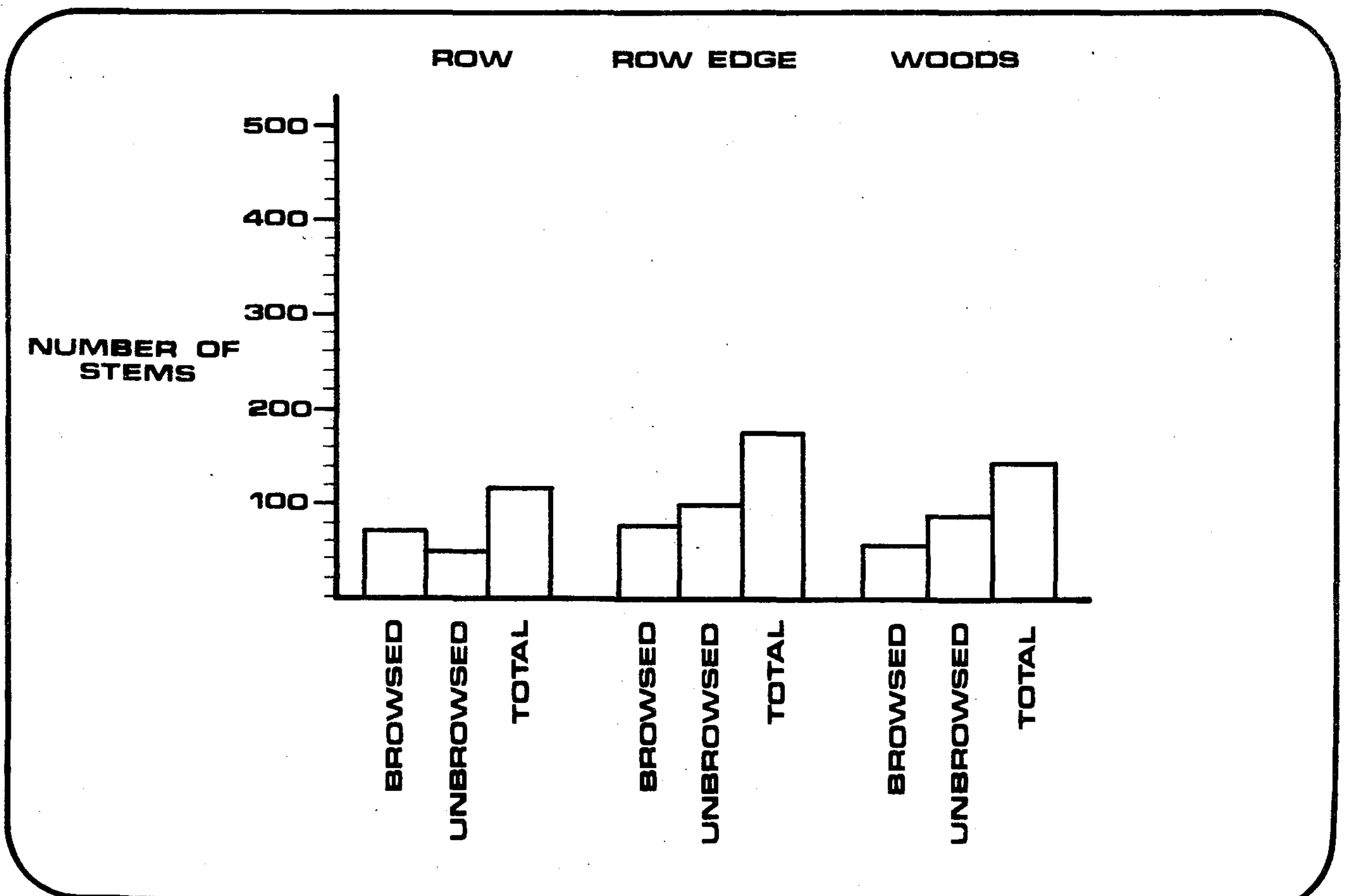
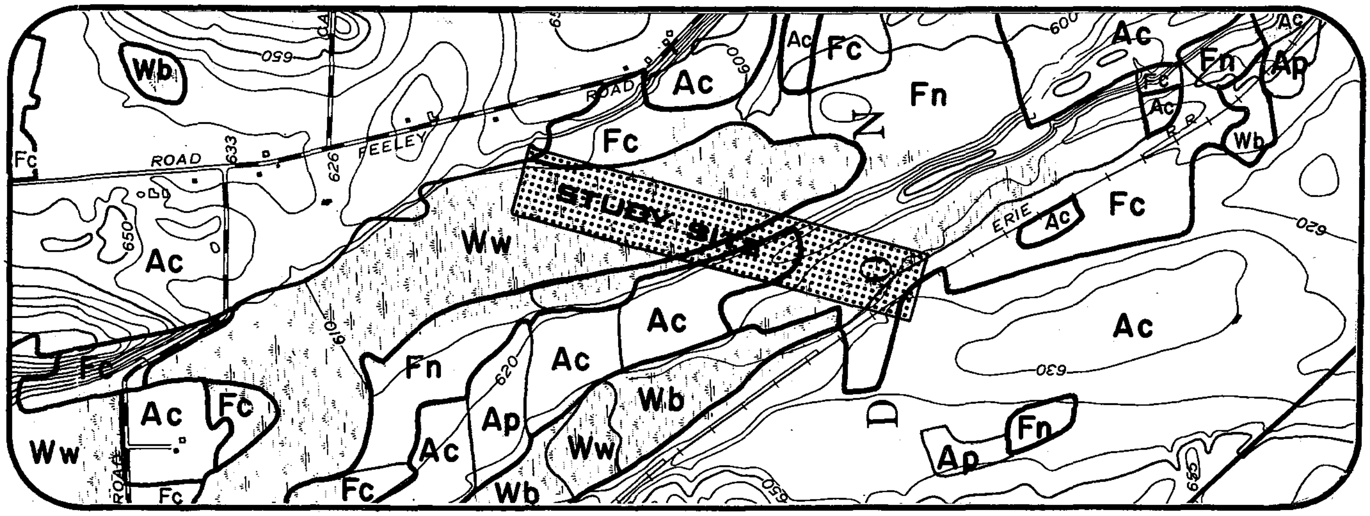
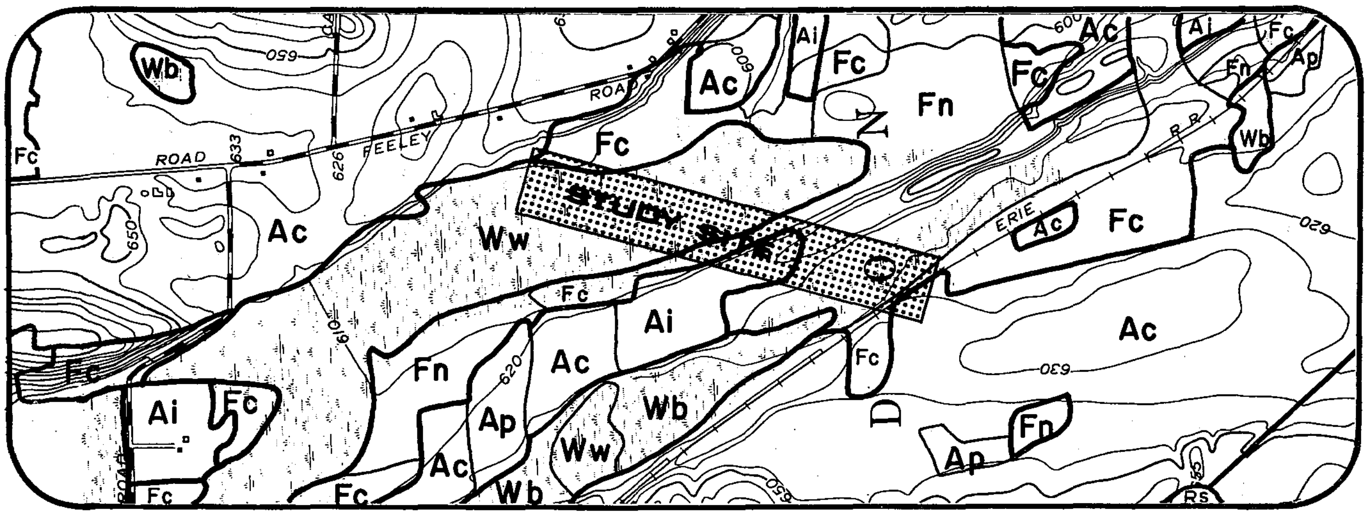


Fig. II.6. Browse survey showing number of browsed, unbrowsed, and total stems for the ROW, ROW edge, and forest for 5 browse transects.



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

AGRICULTURE
- Ac - Cropland and cropland pasture
- Ap - Pasture

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

RESIDENTIAL LAND USE
- Rs - Strip Development

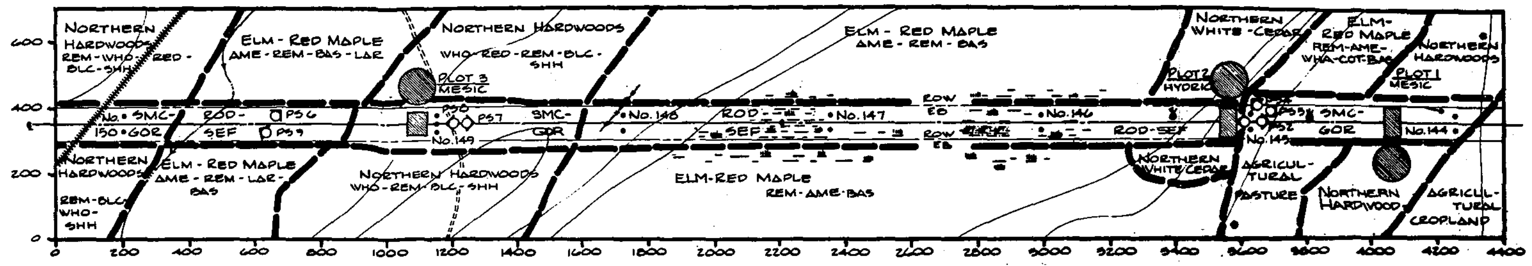
WATER RESOURCES
- Wb- Marshes, shrub wetlands and bogs
- Ww- Wooded wetlands

SOURCES:
- NYSE & G. Binghamton, N.Y., air photo No. 17-758, Apr. 9, 1973
- USDA-SCS, Livingston County air photo, 1969
- Area Land Use Map, LUNR, Cornell University, N.Y., 1974
- U. S. G. S. Topographic Map, Caledonia, N. Y., 1950

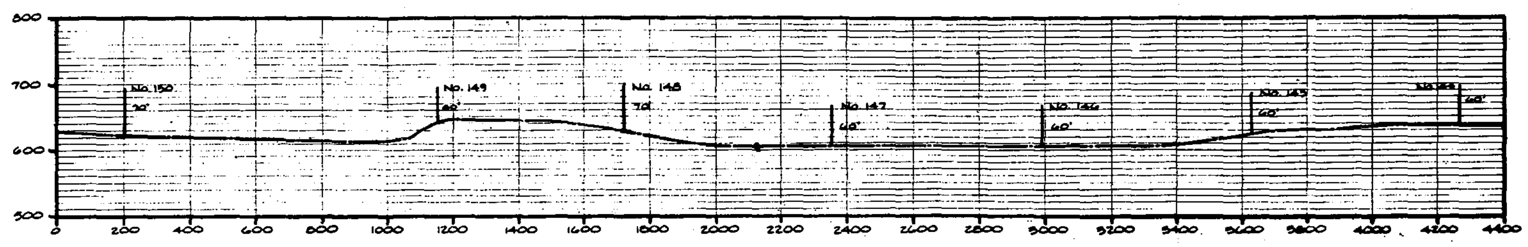
Fig. II.7. Land use change.

ASPLUNDH ENVIRONMENTAL SERVICES

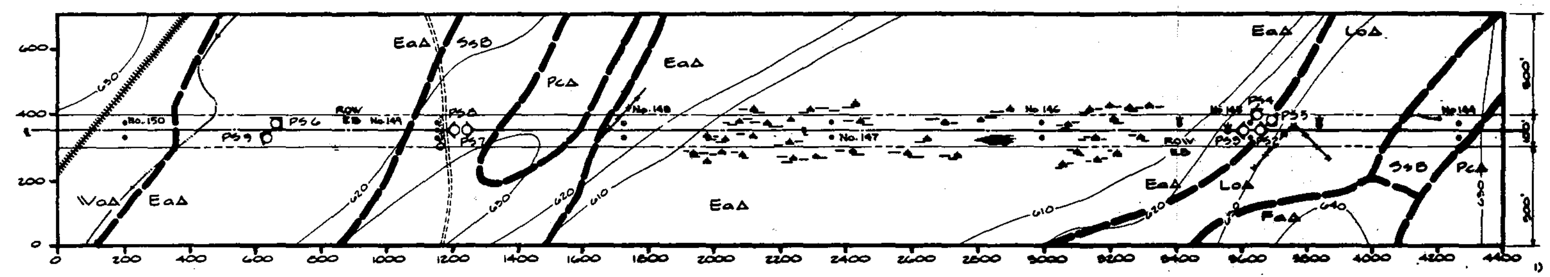
VEGETATION



CENTERLINE PROFILE



SOILS



NOTES:
1) CONTOUR INTERVALS ARE 10'
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
- 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
- cem. SMALL PARKS, CEMETERY, ETC.
- FENCE

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
- 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

EaA	EDWARDS - MARTISCO muck (0 to 8% slope)
FaA	FARMINGTON silt loam (0 to 8% slope)
WoA	WASSAIC silt loam (0 to 8% slope)
LoA	LYONS silt loam (0 to 8% slope)
PcA	PALMYRA gravelly loam (0 to 8% slope)
SsB	PALMYRA - HOWARD gravelly loam (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

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	*Pteridium 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

- CHARLES BRUNING CO. - PLAN & PROFILE
- U.S.G.S. 7.5 MIN. TOPOGRAPHIC MAP, CALEDONIA, N.Y. 1950
- U.S.D.A., S.C.S. IN COOPERATION WITH CORNELL UNIVER. AGR. EXP. STA., SOIL SURVEY FOR LIVINGSTON COUNTY N.Y. U.S. GOVT. SERVICES 1941, No. 15
- NYSE&G, BINGHAMTON, N.Y. LIVINGSTON CO. AIR PHOTO NO. 337 (SCALE 1:24,000) JULY 13 1974
- ASPLUNDH ENVIRONMENTAL SERVICES AES PROJECT NO. 81-0028 FIELD STUDIES 1975-76

MAP 11.1

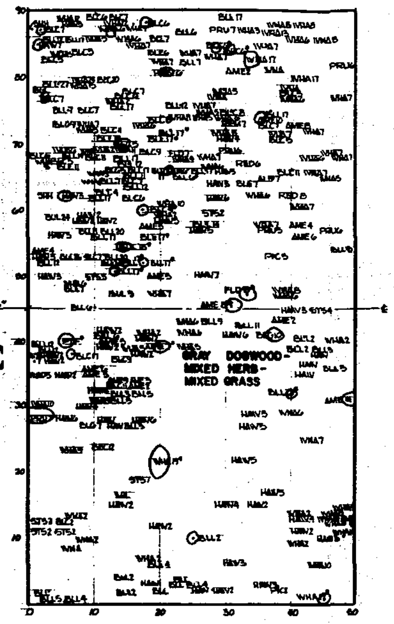
SITE 11 HABITAT CONDITIONS

UTILITY: ROCHESTER GAS & ELEC. CORP.
ROW DESCRIPTION: STATION 82 TO STATION 162 115 KV
WOODEN POLE 'H' FRAME 100' ROW

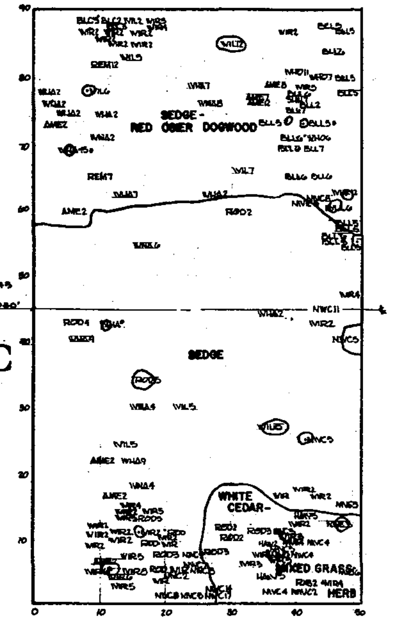
SCALE: 1" = 200'-0"

200 100 0 100 200 400 800 1000

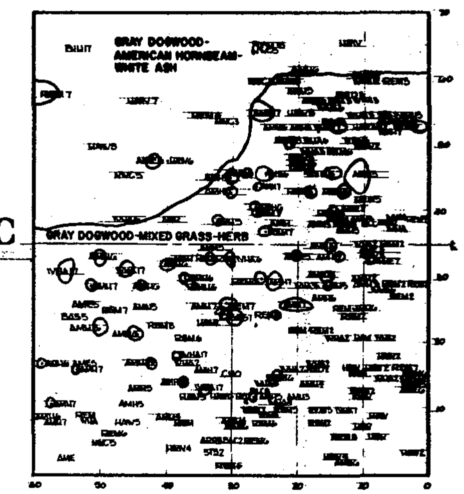
PLOT 1 MESIC



PLOT 2 HYDRIC



PLOT 3 MESIC



NOTE:
- VERTICAL AND HORIZONTAL SCALES ARE 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*
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*

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.

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 11.2

SITE 11

MAPPED PLOTS

UTILITY: ROCHESTER GAS & ELECTRIC CORP.
ROW DESCRIPTION: STATION 82 TO STATION 162 115 KV.
WOODEN POLE 'H' FRAME 100' ROW

SCALE: 1" = 10' - 0"
10 5 0 5 10 20 40 50

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.