

**A COMPREHENSIVE SURVEY OF A TALUS SLOPE  
A UNIQUE NATURAL COMMUNITY ON THE HUDSON RIVER**



**SITE DESCRIPTION**

The study site is located in the northern part of the New Jersey Section of the Palisades Interstate Park system. It was decided early on in the project that the area surveyed would extend beyond the talus slope site. Our only practical access to the site was down a steep, narrow trail leading from a mixed oak forest at the top of the 500 foot cliffs, through a steep, wooded slope bordered by the talus slope to the south and a natural ravine and temporary (seasonal) stream to the north. It was logical to include these areas in the survey since they are immediately adjacent to the talus slope.

The upper section of the study site is referred to in the literature and on maps as the Women's Federation Monument. This cliff edge site was one of the first to be acquired in 1909 by the Palisades Interstate Park. The monument is a memorial, built in 1929, to acknowledge the role of the New Jersey Womens Clubs in

Principal Investigators: Nancy Slowik and Sandy Bonardi, 1994.

preserving the Palisades. This is one of the highest vistas in the New Jersey section, rising to 500 feet above the Hudson River. The site is located approximately 1 mile south of the New York - New Jersey state line. (figure 1)

Additionally, areas contiguous with a .4 mile length of the Hudson River shore trail, running below the talus slope, were surveyed. These areas included a small floodplain and a vine/thicket community and fall within a section of the Interstate Park known as Forest View. Located at the base of the cliff, this area is approximately 2½ miles north of the Alpine Boat Basin. Once a small fishing hamlet, it became the most active recreational area in the early days of the Park's history. The Wild Palisades of the Hudson describes this area with ball fields, picnic areas, fire places, pavilion, camping, boat basin, office and rest rooms. It was accessible from the Yonkers Ferry directly across the Hudson River. Soon after World War II the site was abandoned due to polluted river waters.

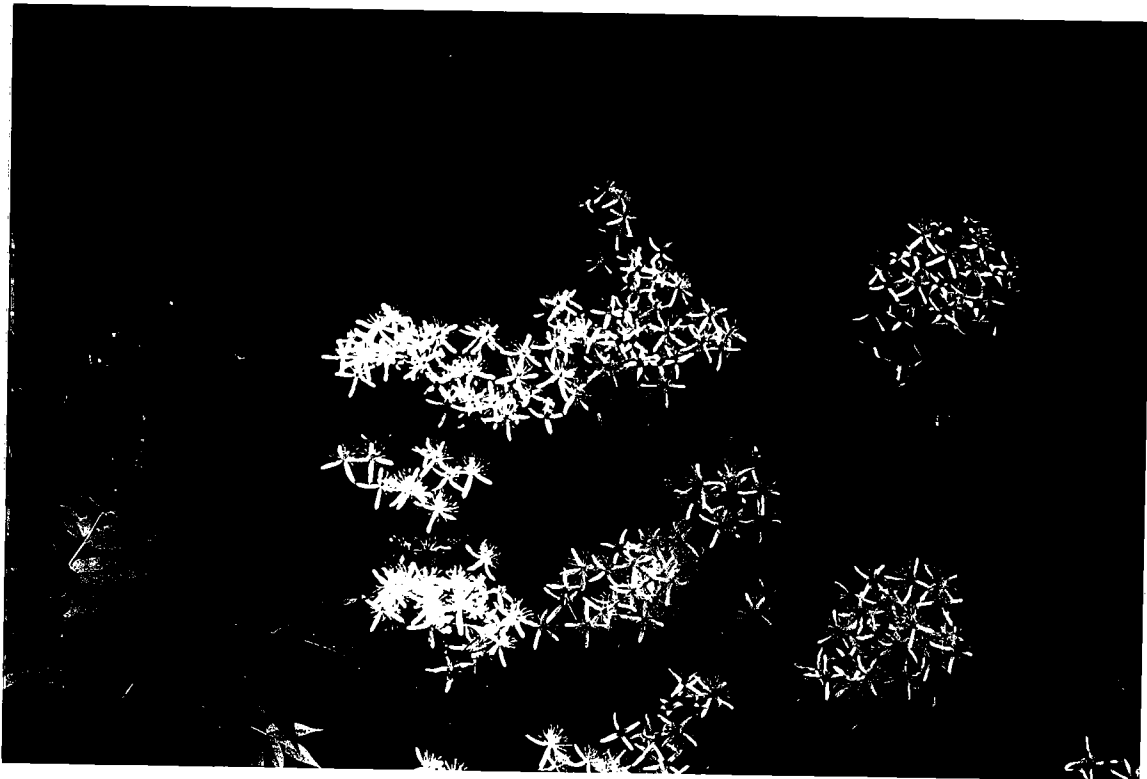
Today only the hardest hikers reach this area with its difficult trails and no immediate road access.

PHOTOGRAPHS



Talus Slope: Common Polypody Fern

NS



Talus Slope: Clematis sp.

NS



Talus Slope: Wild Sarsparilla & Marginal Shield Fern NS



Talus Slope: Jewelweed

NS



Talus Slope: Paper Birch

SB



Talus Slope: Paper Birch

SB



Talus Slope: Eastern Wood Rat

SB



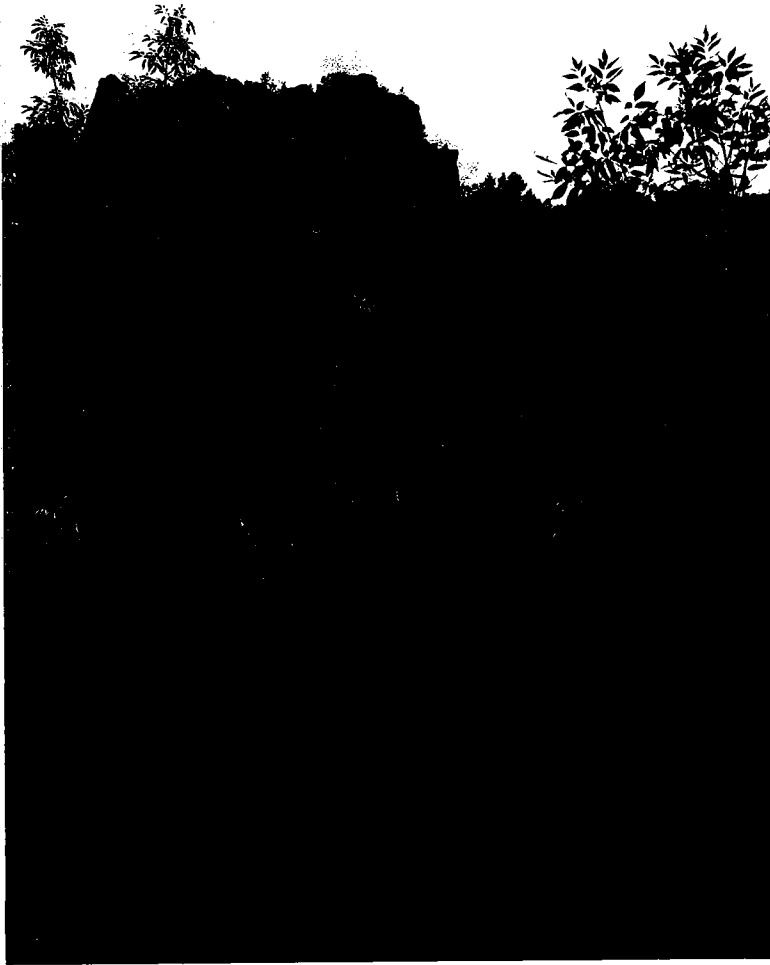
Talus Slope: Wood Rat scat

SB



Talus Slope: Northern Copperhead

SB



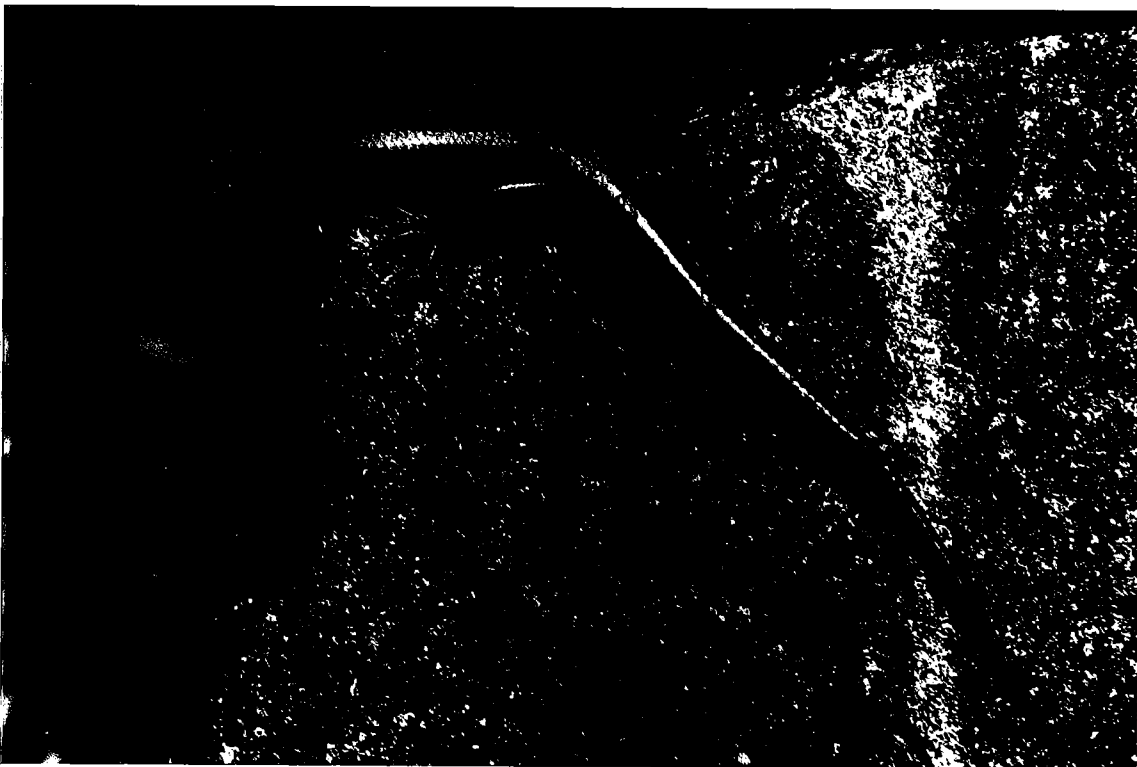
Cliff edge: Overall view of upper cliffs

NS





Cliff edge: Closeup of area where cliff has recently broken away. This process creates the talus slope. SB



Cliff edge: Five-lined Skink

SB



Shore Trail: View of shore trail looking north

NS



Shore Trail: Hackberry Butterfly

NS



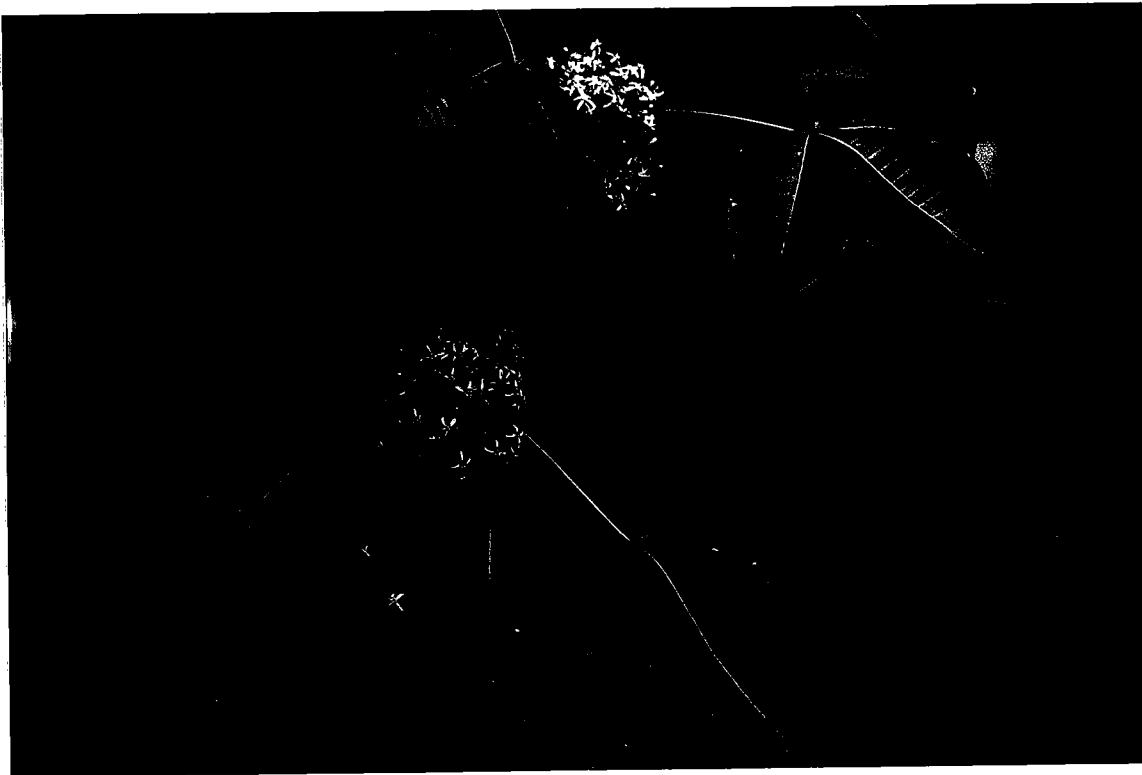
Shore Trail: Goldenrod sp.

NS



Slope Trail: Wild Columbine

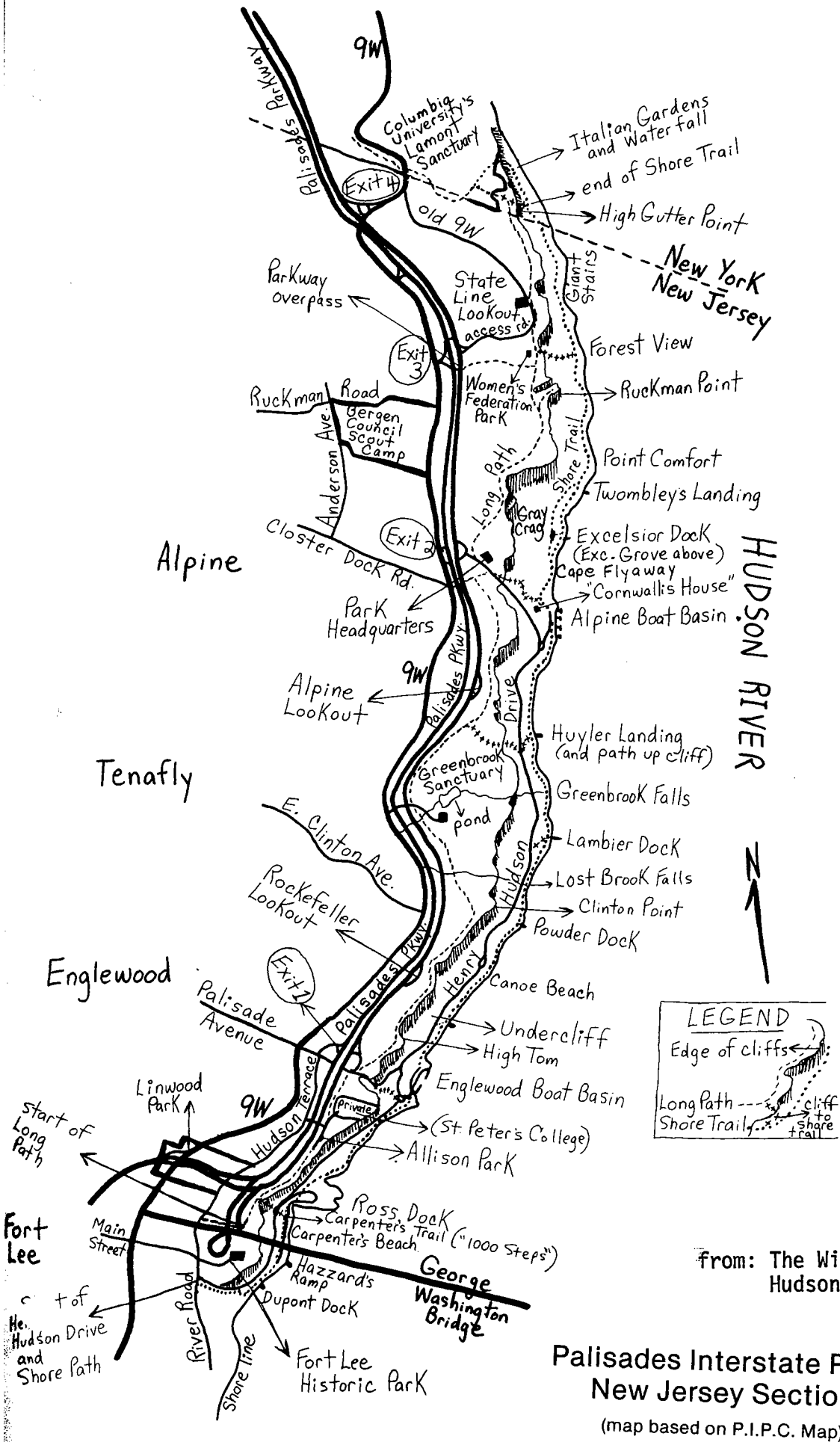
SB



Outside of Study Site: Wafer Ash tree

SB

Figure 1.



From: The Wild Palisades of the Hudson. John Serrao, 1986.

**Palisades Interstate Park,  
New Jersey Section**  
(map based on P.I.P.C. Map)

## BOTANICAL METHODS:

The use of standard vegetation sampling methods in this study was limited by the steep topography and inaccessible nature of the study site. Rather than establish permanent quadrats or transect lines, we established a survey route to sample vegetation. Walking the route every two weeks from April to November 1993 we recorded all new species of plants encountered. Since the study was conducted over an extended period of time (eight month period), we relied on the flowering period of plants to help locate new species. The survey route was divided into four sites and each one is referred to in this study as a habitat site.

### Habitat Sites:

1. Upper Trail- The top of the Palisades cliff edge.
2. Slope Trail- Trail descending from the top of the Palisades to the lower trail near the Hudson River.
3. Talus Slope- Fallen boulders located below the cliff edge and above the Shore Trail.
4. Shore Trail- The trail that parallels the Hudson River and the talus slope.

Plants were identified to the species level whenever possible (Gleason and Cronquist, 1991); and voucher specimens were collected when adequate plants were available. When small quantities of plants were present, no specimen was collected. All plant species were divided into two categories, herbaceous and woody. They were then further categorized by their habitat site.

Although all areas were sampled as thoroughly as possible, emphasis was placed on the Talus Slope site due to its status as a rare, natural community in New Jersey. Initially the study was to encompass only this habitat. We broadened our study area to include all four habitat sites, since they were along the route and we found them to be equally interesting and diverse.

All incidental sightings of invertebrates and vertebrates were recorded (Table 1).

Table 1. Incidental Sightings

Species	Common Name
VERTEBRATES	
Mammals:	
<u>Didelphis marsupialis</u>	Opossum
<u>Neotoma floridana</u>	Eastern wood rat (scat 6/8)
<u>Odocoileus virginianus</u>	White-tailed deer (8/31)
<u>Peromyscus leucopus</u>	White-footed mouse
<u>Procyon lotor</u>	Raccoon
<u>Sciurus carolinensis</u>	Gray Squirrel
<u>Sylvilagus floridanus</u>	Cottontail rabbit (8/3)
<u>Tamias striatus</u>	Eastern chipmunk
<u>Vulpes vulpes</u>	Fox (sign) (5/28,6/27)
Reptiles/Amphibians	
<u>Agkistrodon contortrix modasen</u>	Northern copperhead (8/3)
<u>Bufo americanus</u>	American toad (8/31)
<u>Diadophis punctatus edwardsi</u>	Northern ringneck snake (dead 5/28)
<u>Elaphe obsoleta</u>	Black rat snake (6/8)
<u>Eumeces fasciatus</u>	Five-lined skink (6/4, 8/31)
<u>Lampropeltis t. triangulum</u>	Northern milk snake (8/3)
<u>Thamnophis s. sirtalis</u>	Eastern garter snake (6/8)
INVERTEBRATES	
Insects:	
<u>Asterocampa celtis</u>	Hackberry Emperor (8/13)
<u>Celastrina ladon</u>	Spring azure (6/15)
<u>Colias eurytheme</u>	Orange sulfur (8/3)
<u>Danaus plexippus</u>	Monarch (7/11,8/3,8/31)
<u>Euphyes vestris</u>	Dun skipper 7/11
<u>Megisto cymela</u>	Little wood satyr (5/28)
<u>Limenitis arthemis astyanax</u>	Red-spotted purple (6/8)
<u>Papilio glaucus</u>	Tiger swallowtail (5/11, 6/8, 6/15, 7/11, (8/3 - 35 plus), 8/13)
<u>Papilio troilus</u>	Spicebush swallowtail (8/3,8/13)
<u>Pieris rapae</u>	Cabbage white (6/15,7/11,8/3)
<u>Poanes zabulon</u>	Zabulon skipper (8/13)
<u>Polites peckius</u>	Peck's skipper (8/13)
<u>Speyeria cybele</u>	Great spangled fritillary (7/11,8/3)
<u>Thymelicus lineola</u>	European skipper (6/15)
	Giant ichnuman wasp 5/28
	Giant millipede 8/31, 9/7

## BOTANICAL RESULTS

A total of 168 species of plants were identified in the study site. There were almost twice as many herbaceous species (105) as there were woody species (63). Some species overlapped in habitat sites, such as Jack-in-the-pulpit and Jewelweed which were found in all four habitats. Most species, however, were site specific with 110 species occurring in only one of the habitat sites.

The following are overall descriptions of the four habitat sites sampled:

1. Upper Trail- The upper trail habitat is located on top of the Palisades cliff and is primarily a xeric woodland with thin soils. As you approach the cliff edge there are diabase outcrops and increased sunlight in some areas. Vegetatively there are two distinct plant associations. Several horticultural plants that are remnants of estate ruins dominate sections of this area. The other plant association consists primarily of chestnut oak, red oak, hickory, pinkster azalea, and viburnum, with an old field bordering this woodland. As you approach the cliff edge, species include shadbush, huckleberry, red cedar, and lowbush blueberry. (Table 2).

2. Slope Trail- As the trail descends 500 feet from cliff top to the Hudson River, there are extreme changes in topography. The upper trail has extremely thin soils with little or no organic matter. In areas where plants have been removed, serious erosion has occurred. As the trail transverses xeric woodland conditions, trail-side openings allow increased sunlight to enter. This habitat supports a diverse wildflower and fern understory which includes wild columbine, early saxifrage, jack-in-the-pulpit, pale jewelweed, herb robert, wild geranium, sweet white violet, true and false solomon's seal, yellow stargrass, glandular wood fern, Christmas fern, and marginal shield fern. (Table 2). As the trail levels off in lower elevations, organic matter increases and so does the shade in the late spring and early summer.

3. Talus Slope- This habitat is located at the base of the Palisade cliff and consists mainly of large barren boulders with little or no soil. Rock slides continue to occur over the years, making this an unstable and constantly changing habitat. Water and ice trapped between the boulders keeps the area 10 to 15 degrees cooler than the surrounding areas. Dominant species growing in this area include paper birch, black birch, white pine, Eastern hemlock, sassafras, American basswood, Virginia creeper, and an unconfirmed species of currant. Herbaceous plants include wild sarsparilla, common polypody fern, and marginal shield fern. Less common species are round-leaved dogwood, rattlesnake fern, helleborine orchid, smooth rock cress, doll's eyes, and pale jewelweed. (Table 3).

4. Shore Trail-This habitat runs parallel to the Hudson River and the edge of the talus slope. It is a mix of wetland edge and vine/thicket community where plants in need of more sunlight prosper. At times during extreme tides, areas along the shore trail



are flooded, creating temporary estuarine conditions. Typical species include porcelain berry, blackberry, phragmites, spartina, Japanese honeysuckle, wineberry, and common milkweed, poison ivy, box elder. (Table 2).

#### Talus Slope Community

Forty-seven species of plants were identified in the Talus Slope community. Of those species, one was positively identified as a rare plant in New Jersey. Paper Birch (Betula papyrifera) is ranked as an S2 species that is imperiled in New Jersey, with 6 - 20 occurrences. A species of currant (Ribes sp.) will be confirmed this spring and may be skunk currant (Ribes glandulosum), a state endangered species ranked as S1 (critically imperiled in the state). Unfortunately, the flowering period was missed for this species this past spring even though we monitored every two weeks. (Table 3)

#### Rare and Endangered Plants

Outside the Talus Slope habitat, but within the study site there were additional rare species of plants. Wild Pink (Silene caroliniana) was found in the Upper Trail site and is ranked as an S3 species with 21 to 50 occurrences in New Jersey. One species of violet was located along the Slope Trail site. Although the sites were visited every two weeks, the flowering period was missed for this species. It may be Northern blue violet (Viola septentrionalis), another S1 or critically endangered species. We will verify this species in the spring of 1994.

Although not classified as endangered in New Jersey the following plants are uncommon in the state and merit mentioning. Pale-leaved sunflower (Helianthus strumosus), pale touch-me-not (Impatiens pallida), One-flowered cancerroot (Orobanche uniflora), Sweet cicely (Osmorhiza claytoni), early saxifage (Saxifraga virginensis), American germander (Teucreum canadense), sweet white violet (Viola blanda), round-leaved dogwood Cornus rugosa, red elderberry (Sambucus racemosa), and rattlesnake fern (Botrychium virginianum).

Table 2. Botanical Survey

Key: ST=Slope Trail, SH=Shore Trail, TS=Talus Slope, UT=Upper Trail

Herbaceous Plants:

<u>Achillea millefolium</u>	Yarrow	SH
<u>Actea alba</u>	Doll's eyes	ST,TS
<u>Agrostis sp</u>	Ticklegrass	UT
<u>Alliaria officinalis</u>	Garlic mustard	SH,UT
<u>Allium vineale</u>	Field garlic	SH
<u>Anthoxanthum odoratum</u>	Sweet vernal grass	SH,UT
<u>Apocynum cannabinum</u>	Indian hemp	SH,UT
<u>Aquilegia canadensis</u>	Columbine	ST
<u>Arabis laevigata</u>	Smooth rock cress	SH,TS,UT
<u>Aralia nudicalis</u>	Wild sarsparilla	SH,TS
<u>Arctium minus</u>	Burdock	ST,UT
<u>Arisaema triphyllum</u>	Jack-in-the-pulpit	ST,SH,TS,UT
<u>Asclepias syriaca</u>	Common milkweed	SH,UT
<u>Aster cordifolius</u>	Heart-leaved aster	TS,UT
<u>Aster divaricatus</u>	White wood aster	ST,TS,UT
<u>Aster macrophyllus</u>	Large-leaved aster	UT
<u>Aster simplex</u>	Panicled aster	SH
<u>Aster undulatus</u>	Wavy-leaved aster	UT
<u>Athyrium thelypteroides</u>	Lady fern	ST,SH
<u>Bidens bipinnata</u>	Spanish needles	ST,SH,TS
<u>Botrychium virginianum</u>	Rattlesnake fern	TS
<u>Celastrus orbiculatus</u>	Asiatic bittersweet	SH
<u>Circaea lutetiana</u>	Enchanter's nightshade	ST,TS
<u>Cirsium vulgare</u>	Bull thistle	UT
<u>Claytonia virginica</u>	Spring beauty	SH
<u>Collinsonia canadensis</u>	Horse balm	ST,UT
<u>Commelina communis</u>	Asiatic dayflower	UT
<u>Conopholis americana</u>	Squawroot	UT
<u>Convallaria majalis</u>	Lily-of-the-valley	ST
<u>Convolvulus arvensis</u>	Field bindweed	SH
<u>Dactylis glomerata</u>	Orchard grass	UT
<u>Daucus carota</u>	Queen Anne's lace	UT
<u>Dennstaedtia punctilobula</u>	Hayscented fern	ST,TS
<u>Desmodium glutinosum</u>	Pointed-leaved tick trefoil	ST
<u>Dryopteris intermedia</u>	Glandular wood fern	ST
<u>Dryopteris marginalis</u>	Marginal shield fern	ST,TS
<u>Elymus hystrix</u>	Bottlebrush grass	UT
<u>Epipactis helleborine</u>	Helleborine orchid	TS
<u>Erigeron annuus</u>	Daisy fleabane	ST,SH
<u>Erythronium americanum</u>	Trout lily	ST
<u>Eupatorium purpureum</u>	Sweet Joe-pye-weed	ST,UT
<u>Eupatorium rugosum</u>	White snakeroot	ST
<u>Geranium maculatum</u>	wild geranium	UT,ST
<u>Geranium robertianum</u>	Herb-Robert	ST,SH,TS
<u>Heleanthus strumosus</u>	Pale-leaved sunflower	UT
<u>Hemerocallis fulva</u>	Day lily	SH,UT
<u>Hieracium venosum</u>	Rattlesnake weed	UT
<u>Hypoxis hirsuta</u>	Yellow stargrass	ST,UT

<u>Impatiens pallida</u>	Pale jewelweed	ST
<u>Impatiens capensis</u>	Jewelweed	ST,SH,TS,UT
<u>Iris pseudacorus</u>	Yellow iris	SH
<u>Leonurus cardiaca</u>	Motherwort	SH
<u>Lobelia inflata</u>	Indian tobacco	SH
<u>Lysimachia quadrifolia</u>	Whorled loosestrife	UT
<u>Lythrum salicaria</u>	Purple loosestrife	SH
<u>Maianthemum canadensis</u>	Canada mayflower	TS,UT
<u>Melilotus alba</u>	White sweet clover	SH
<u>Oenothera fruticosa</u>	Evening primrose	SH
<u>Onoclea sensibilis</u>	Sensitive fern	SH
<u>Orobanche uniflora</u>	One-flowered cancerroot	UT
<u>Osmorhiza claytonii</u>	Sweet cicely	ST
<u>Phragmites communis</u>	Phragmites	SH
<u>Phytolacca americana</u>	Pokeweed	ST
<u>Plantago major</u>	Common plantain	SH
<u>Polygonatum biflorum</u>	True Solomon's seal	ST,UT
<u>Polygonum persicaria</u>	Lady's thumb	UT
<u>Polygonum virginianum</u>	Jumpseed	ST,TS
<u>Polypodium virginianum</u>	Common polypody fern	TS
<u>Polystichum acrostichoides</u>	Christmas fern	TS,ST
<u>Ranunculus abortivus</u>	Small flowered crowfoot	ST
<u>Ranunculus hispidus</u>	Hispid buttercup	ST,SH
<u>Ranunculus recurvatus</u>	Hooked crowfoot	SH
<u>Rosa multiflora</u>	Multiflora rose	SH
<u>Rosa palustris</u>	Swamp rose mallow	SH
<u>Rubus allegheniensis</u>	Common blackberry	SH,UT
<u>Rubus odoratus</u>	Flowering raspberry	ST,SH,TS
<u>Rubus phoenicolasius</u>	Wineberry	ST,SH
<u>Rumex crispus</u>	Curly dock	ST
<u>Sanicula marilandica</u>	Black snakeroot	ST,UT
<u>Saxifraga virginiana</u>	Early saxifrage	ST
<u>Silene caroliniana</u>	Wild Pink	UT
<u>Silene cucubalus</u>	Bladder campion	SH,TS
<u>Smilacina racemosa</u>	False Solomon's seal	UT
<u>Solanum carolinense</u>	Horse nettle	ST
<u>Solanum dulcamara</u>	Bittersweet nightshade	SH
<u>Solidago sempervirens</u>	Seaside goldenrod	SH
<u>Solidago altissimum</u>	Tall goldenrod	SH
<u>Solidago bicolor</u>	Silverrod	UT
<u>Solidago caesia</u>	Blue stem goldenrod	TS,UT
<u>Solidago gigantea</u>	Late goldenrod	SH
<u>Solidago graminifolia</u>	Grass-leaved goldenrod	SH
<u>Solidago juncea</u>	Early goldenrod	TS,UT
<u>Solidago puberula</u>	Downy goldenrod	TS,UT
<u>Solidago rugosa</u>	Rough-stemmed goldenrod	SH
<u>Stellaria media</u>	Common chickweed	SH
<u>Tanacetum vulgare</u>	Tansy	UT
<u>Taraxacum officinale</u>	Common dandelion	SH
<u>Teucrium canadense</u>	American germander	SH
<u>Thalictrum dioicum</u>	Early meadow rue	ST
<u>Tragopogon pratensis</u>	Goatsbeard	SH
<u>Verbena urticifolia</u>	White vervain	ST
<u>Vinca minor</u>	Periwinkle	UT

<u>Viola blanda</u>	Sweet white violet	ST
<u>Viola papilionacea</u>	Common Blue Violet	ST,UT
<u>Viola septentrionalis c.e.</u>	Northern Blue Violet	ST

Woody Plants to Include: Trees, Shrubs and Vines

<u>Acer negundo</u>	Box elder	SH
<u>Acer saccharum</u>	Sugar maple	SH, UT, TS
<u>Acer palmatum</u>	Japanese maple	UT
<u>Ailanthus altissima</u>	Ailanthus	SH
<u>Amelanchier sp.</u>	Shadbush	UT
<u>Amorpha fruticosa</u>	False indigo	SH
<u>Ampelopsis brevipedunculata</u>	Porcelain-berry	SH,TS
<u>Andromeda sp.</u>	Andromeda	UT
<u>Berberis vulgaris</u>	Common barberry	ST
<u>Betula papyrifera</u>	Paper birch	TS
<u>Betula lenta</u>	Black birch	TS
<u>Carya glabra</u>	Pignut hickory	TS
<u>Carya tomentosa</u>	Carya tomentosa	UT
<u>Celastrus orbiculatus</u>	Asiatic bitter-sweet	SH
<u>Celtis occidentalis</u>	Hackberry	TS
<u>Clematis sp.</u>	Clematis	SH,TS
<u>Cornus rugosa</u>	Round-leaved dogwood	TS
<u>Cynanchum nigrum</u>	Black swallowwort	TS
<u>Deutzia scabra</u>	Deutzia	SH, TS
<u>Euyonymous alatus</u>	Winged euyonymous	TS
<u>Fagus grandifolia</u>	American beech	UT
<u>Fraxinus americana</u>	White ash	UT, TS
<u>Gaylussacia baccata</u>	Black huckleberry	UT
<u>Hamamelis virginiana</u>	Witchhazel	ST, SH, UT, TS
<u>Juniperus virginiana</u>	Red cedar	UT
<u>Kalmia latifolia</u>	Mountain laurel	UT, TS
<u>Lindera benzoin</u>	Spicebush	UT
<u>Liriodendron tulipifera</u>	Tulip tree	UT, ST
<u>Lonicera japonica</u>	Japanese honeysuckle	TS, SH
<u>Lonicera xylosteum c.e.</u>	European Fly honeysuckle	UT
<u>Malus sp.</u>	Apple tree	SH
<u>Menispermum canadense</u>	Moonseed	SH,TS
<u>Myrica pensylvanica</u>	Bayberry	SH
<u>Parthenocissus quinquefolia</u>	Virginia creeper	TS
<u>Paulownia tomentosa</u>	Empress tree	ST,SH,TS
<u>Picea abies</u>	Norway spruce	UT
<u>Pinus strobus</u>	White pine	TS
<u>Prunus serotina</u>	Black cherry	UT
<u>Pyrus malus</u>	Apple tree	SH
<u>Quercus alba</u>	White oak	ST, UT
<u>Quercus prinus</u>	Chestnut oak	UT, ST
<u>Quercus rubra</u>	Red oak	ST, UT
<u>Quercus velutina</u>	Black oak	UT
<u>Rhododendron periclymenoides</u>	Pinkster azalea	UT
<u>Rhododendron sp.</u>	Rhododendron	UT
<u>Rhododendron sp.</u>	Azalea	UT
<u>Rhus radicans</u>	Poison ivy	TS
<u>Rhus typhina</u>	Staghorn summac	SH

<u>Ribes sp.</u>	currant	TS
<u>Robinia pseudocacia</u>	Black locust	SH
<u>Rubus allegheniensis</u>	Blackberry	UT
<u>Sambucus racemosa</u>	Red elderberry	TS, ST
<u>Sassafras albidum</u>	Sassafras	SH, TS
<u>Sicyos angulatus</u>	One-seeded bur cucumber	SH
<u>Smilax rotundifolia</u>	Catbriar	UT
<u>Taxus sp.</u>	Yew	UT
<u>Tilia americana</u>	American basswood	UT, TS
<u>Toxicodendron radicans</u>	Poison ivy	SH, TS
<u>Tsuga canadensis</u>	Eastern hemlock	TS
<u>Ulmus rubra</u>	Slippery elm	UT
<u>Vaccinium stamineum</u>	Deerberry	UT
<u>Viburnum acerifolium</u>	Mapleleaf viburnum	UT, SH, TS
<u>Viburnum prunifolium</u>	Black haw	UT, SH, TS

Table 3. Talus Slope Habitat  
Herbaceous Plants:

<u>Actea alba</u>	Doll's Eyes
<u>Arabis laevigata</u>	Smooth rock cress
<u>Aralia nudicalis</u>	Wild sarsparilla
<u>Arisaema triphyllum</u>	Jack-in-the-pulpit
<u>Aster cordifolius</u>	Heart-leaved aster
<u>Aster divaricatus</u>	White wood aster
<u>Bidens bipinnata</u>	Spanish needles
<u>Botrychium virginianum</u>	Rattlesnake fern
<u>Circaea lutetiana</u>	Enchanter's nightshade
<u>Dennstaedtia punctilobula</u>	Hayscented fern
<u>Dryopteris marginalis</u>	Marginal shield fern
<u>Epipactus helleborine</u>	Helleborine orchid
<u>Geranium robertianum</u>	Herb-Robert
<u>Impatiens pallida</u>	Pale jewelweed
<u>Impatiens capensis</u>	Jewelweed
<u>Maianthemum canadensis</u>	Canada mayflower
<u>Polygonum virginianum</u>	Jumpseed
<u>Polypodium virginianum</u>	Common polypody fern
<u>Polystichum acrostichoides</u>	Christmas fern
<u>Rubus odoratus</u>	Flowering raspberry
<u>Silene cucubalus</u>	Bladder campion
<u>Solidago caesia</u>	Blue stem goldenrod
<u>Solidago puberula</u>	Downy goldenrod

Woody Plants and Vines:

<u>Ampelopsis brevipedunculata</u>	Porcelain-berry
<u>Betula papyrifera</u>	Paper birch
<u>Betula lenta</u>	Black birch
<u>Carya sp.</u>	Hickory
<u>Celtis occidentalis</u>	Hackberry
<u>Clematis sp.</u>	Clematis
<u>Cornus rugosa</u>	Round-leaved dogwood
<u>Cynanchum nigrum</u>	Black swallowwort
<u>Deutzia scabra</u>	Deutzia
<u>Euyonymous sp.</u>	Winged euyonymous
<u>Hamamelis virginiana</u>	Witchhazel
<u>Kalmia latifolia</u>	Mountain laurel
<u>Lonicera japonica</u>	Japanese honeysuckle
<u>Menispermum canadensis</u>	Moonseed
<u>Parthenocissus quinquefolia</u>	Virginia creeper
<u>Paulownia tomentosa</u>	Royal Paulownia
<u>Pinus strobus</u>	White pine
<u>Rhus radicans</u>	Poison ivy
<u>Ribes sp.</u>	Currant
<u>Sambucus racemosa</u>	Red elderberry
<u>Sassafras albidum</u>	Sassafras
<u>Tilia americana</u>	American basswood
<u>Tsuga canadensis</u>	Eastern hemlock
<u>Viburnum acerifolium</u>	Mapleleaf viburnum
<u>Viburnum prunifolium</u>	Black haw

## BOTANICAL DISCUSSION

The remote nature of this study site and limited access, have enabled diverse plant populations to thrive after 50 years of benign neglect. The physical characteristics of the diabase cliff edge located above, and the large barren boulders below, set the stage for unique plant and animal communities to develop.

Initially we intended to census only the talus slope habitat. However, as we walked through the other habitats it became apparent that all four habitats should be included in the scope of this survey.

### Rare Communities

Field ecologists now focus on entire communities rather than just one or two endangered species. Recently the Natural Heritage Program published a natural community classification for New Jersey (Breden, 1989). In the report, they listed rare communities and ranked them according to rarity in the state. After completing the initial botanical survey, we feel that there may be two rare communities in our study area. The Talus Slope Community fits the description with both rare plant and animal species. The cliff edge community of the upper trail may fit the description of a Traprock Glade/Rock Outcrop Community. (Appendix II).

### Talus Community

Frequently environments that contain one endangered species tend to have other associated endangered plants and animals. This is certainly true of the Talus Slope, which is considered a rare community in New Jersey. This particular site has the only extant population of Eastern woodrat in the state, and the population is currently being monitored by NJ DEPE Nongame Division. Only one plant species (Paper Birch) has been confirmed as rare in this habitat. Ranked as an S2, this species has fewer than 20 occurrences in the state. The overall rank assigned to the entire Talus Slope community is S2 in New Jersey.

Paper birch is rarely seen outside northern woodlands and usually grows only in cool, moist slopes of mountainous regions. Here this northern tree survives in a more southern range because it is rooted in the cooler slopes of the talus. In fact these slopes remain extremely cool, even on the hottest summer day. Large openings between the boulders trap rain and snow in the winter that remains frozen well into the spring and summer months. In an article on rarity in New Jersey plants, Rick Radis likens the effect to that of an old-fashioned icebox which stays cool during the summer months. (Radis, 1993).

Little is known about why the Eastern woodrat survives only in this one location in New Jersey. There has been much speculation that includes remote location, role of parasites, and food sources. All may have a synergistic affect on the population. However, little

information has been collected on the potential food sources that sustain this rodent. Known to climb trees, they may be supplementing their winter food supply with seed from the paper birch, which commonly occurs in this habitat. Paper birch seed commonly supports finches, sparrows and small rodents in winter (Grimm, 1907).

#### Trap Rock Glade/Rock Outcrop Community

The upper trail habitat is an interesting mix of xeric woodland and horticultural plants gone wild. However, it is the area nearest the cliff edge where the most interesting plant species occur. This site has some similarities to the community described by the Natural Heritage Program as a Traprock Glade/Rock Outcrop Community. Common plants of the surrounding forest area include chestnut oak, red oak and red cedar. Although not found in this particular study site, characteristic species such as Four-leaved milkweed and Downy Viburnum have been found elsewhere on Palisades cliff edges. This is an extremely rare community in New Jersey with fewer than five occurrences in the state or an S1 rank. Another interesting species found in this habitat is the wild pink which is ranked as S3 in the state. This is a plant that was once more common but has been in decline due to habitat loss.

#### ADDITIONAL RARE PLANTS

During the course of other field trips we have encountered additional rare plants outside of the study site. These include climbing fumitory (S2), wafer ash tree (S1), rattlesnake master (SX), and three-toothed cinquefoil (S1.1). (Please see appendix I. for explanation of ranking system).



## BREEDING BIRD SURVEY - METHODS

The breeding bird survey was begun in mid-April. Weekly visits to the site were conducted through May. During the month of June the number of surveys was increased to two per week since by this time most of the migrants had passed through and the remaining birds were actively engaged in their breeding behavior. Weekly surveys were continued from July through mid-September with periodic visits to the site continuing through early December to document wintering populations of birds.

All surveys were carried out by walking an established route through the site in the early morning when bird activity was at a peak. Two visits were made to the site at dusk to check for nocturnal species. Criteria used for breeding evidence were those established by the Atlas for New Jersey's Breeding Birds. A list of these methods is attached. (Appendix I)

## RESULTS

O = Observed at the site but not suspected of breeding  
 X = Possible breeder. Seen or heard in breeding habitat, but no other evidence of breeding recorded.

ST = Slope trail  
 SH = Shore trail  
 UT = Upper trail  
 HR = Hudson River

Species	Breeding Status	Location
Double-crested Cormorant	O	HR
Great Blue Heron	O	HR
Black-crowned Night Heron	O	HR
Canada Goose	O	HR
Osprey	O	HR
Broad-winged Hawk	X	UT
Red-tailed Hawk	X	UT
Spotted Sandpiper	O	HR
Herring Gull	O	HR
Great Black-backed Gull	O	HR
Mourning Dove	Probable - 2 pairs	UT
Ruby-throated Hummingbird	Probable - 1 pair	SH
Belted Kingfisher	O	HR
Red-bellied Woodpecker	Probable - 2 pairs	UT
Downy Woodpecker	Probable - 2 pairs	UT, SH
Northern Flicker	Probable - 3 pairs	SH
Eastern Wood Pewee	X	SH
Eastern Phoebe	X	UT
Great-crested Flycatcher	Probable - 1 pair	UT
Blue Jay	Probable - 1 pair	UT
American Crow	Probable - 1 pair	UT
Black-capped Chickadee	Confirmed - 2 pairs	UT, SH
Tufted Titmouse	Confirmed - 2 pairs	UT, ST

Carolina Wren	Confirmed - 3 pairs	ST, SH
Winter Wren	0	SH
Ruby-crowned Kinglet	0	SH
Veery	0	UT
Swainson's Thrush	0	UT
Wood Thrush	Confirmed - 2 pairs	ST
Gray Catbird	Probable - 3 pairs	SH
Northern Mockingbird	0	SH
Brown Thrasher	0	SH
Red-eyed Vireo	Confirmed - 4 pairs	UT, ST, SH
Blue-winged Warbler	Probable - 1 pair	UT
Prairie Warbler	X	UT
Yellow Warbler	Probable - 1 pair	SH
Black-and-white Warbler	Confirmed - 2 pairs	ST
American Redstart	X	SH
Worm-eating Warbler	Confirmed - 4 pairs	ST, SH
Northern Waterthrush	0	SH
Common Yellowthroat	Probable - 3 pairs	UT, SH
Scarlet Tanager	Probable - 1 pair	UT
Northern Cardinal	Confirmed - 6 pairs	UT, ST, SH
Rose-breasted Grosbeak	X	UT
Indigo Bunting	Probable - 5 pairs	UT, SH
Song Sparrow	Probable - 1 pair	SH
White-throated Sparrow	0	SH
Dark-eyed Junco	0	SH
Red-winged Blackbird	Probable - 1 pair	SH
Common Grackle	X	UT
Brown-headed Cowbird	Probable - 1 pair	SH
Northern Oriole	X	SH

## DISCUSSION

Although the area covered by the survey was relatively small, a surprising diversity of bird species was found to be breeding there. This is a reflection of both the habitat diversity and remote location of the site. Of the 34 possible breeding species, 8 or 23% were eventually confirmed and 17 or 50% were upgraded to probable breeders. Confirmation of breeding was often difficult to obtain due to the steep topography of the site. Following is a brief summary of the results.

Raptors - both the Broad-winged and Red-tailed Hawks prefer the deciduous forest atop the Palisades. Although these birds were listed only as possible breeders within the survey site, Red-tails were confirmed as breeders at a nearby location within the Interstate Park in the summer of 1993. Broad-wings were last confirmed breeding in the area in 1985.

Doves - both pairs of Mourning Doves were observed in the open woods at the cliff edge. Birds that prefer to nest in open woodlands, clearings and edges frequently make use of the cliff edge habitat since the abrupt drop-off creates an opening or "edge effect".

