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Management Plan for Robert J. Stahl Natural Area

Block 41, Lot 34 and
Block 53, Lots 1.02 and 2
Township of Bedminster
Somerset County, New Jersey

Prepared by Michelle Brook
Former Member of the Bedminster Environmental Commission
and Amy S. Greene Environmental Consultants, Inc.

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SUMMARY

The Robert J. Stahl Natural Area in Bedminster Township provides habitat for many wildlife species, including several State-listed endangered and threatened species. This habitat can be enhanced if properly maintained. Grassland areas will need special care to prevent them from maturing into woodlands. Suggested maintenance activities include mowing and prescribed burns on a rotational basis. The placement and maintenance of several nest boxes is recommended. Woodland management is limited to the encouragement of adjacent landowners to conserve forests on their properties to increase the overall effective size of the Natural Area's forests. Several plantings are recommended to enhance feeding opportunities for non-grassland species.

Public usage in the form of passive recreation and nature observation is encouraged. The existing trail network should be expanded and portions of trails in wet areas should be rerouted or bridged with boardwalks or natural fill material. The addition of certain objects such as benches, observation blinds, and information boxes has been recommended to enhance opportunities for nature observation and concentrate human activity to a small central portion of the Natural Area.

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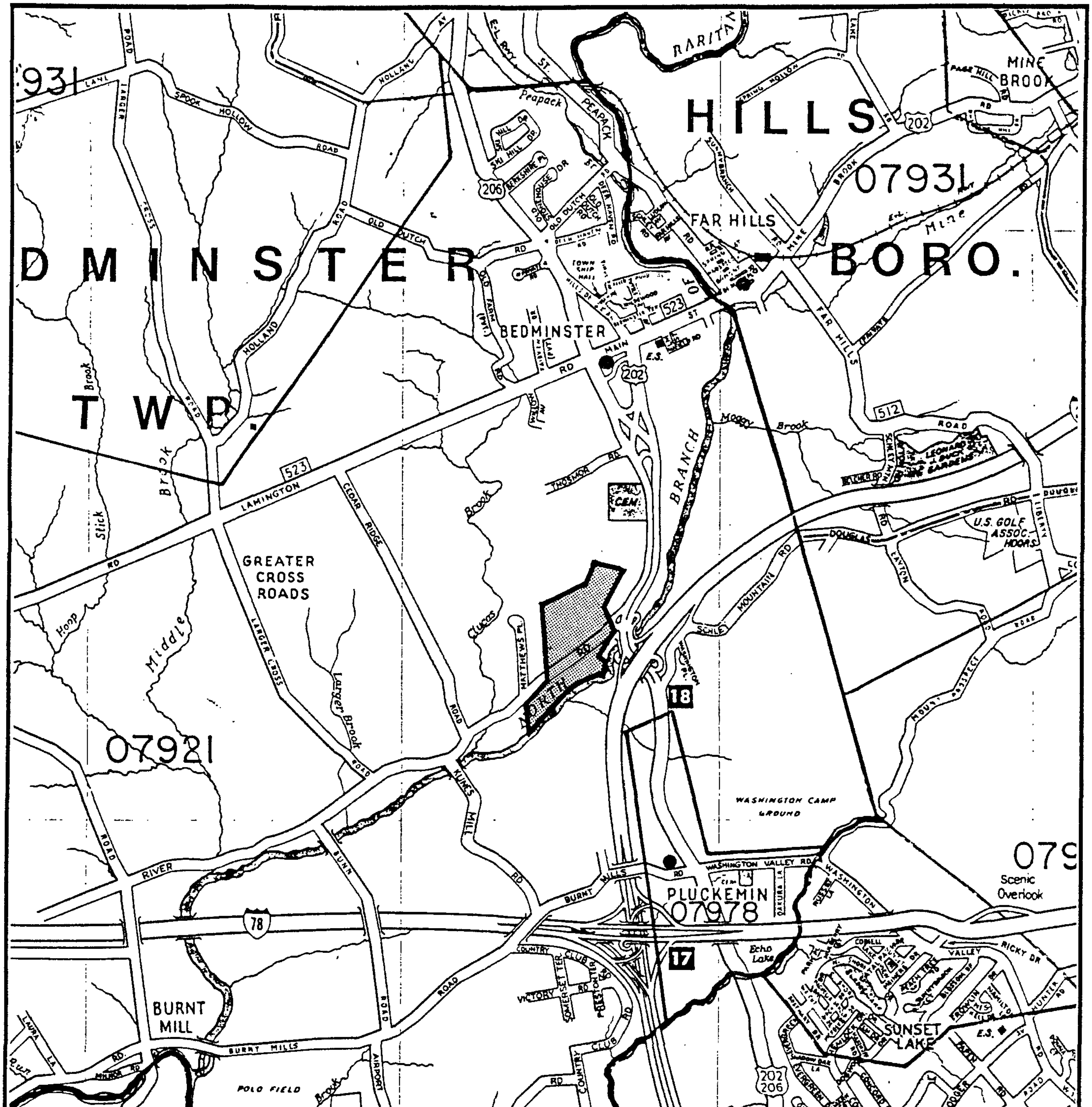
1.0 INTRODUCTION

This management plan was created to describe the resource features present at the Robert J. Stahl Natural Area as well as to recommend proposed uses and practices to maintain and enhance these features. The plan also recommends improvements and management practices to provide for passive recreation and nature observation.

The Robert J. Stahl Natural Area is located west of Route 287 in Bedminster Township, Somerset County, New Jersey (Figure 1). It consists of Block 41, Lot 34 (147.9 acres) and Block 53, Lots 1.02 (5.7 acres) and 2 (29.9 acres) (Figure 2). River Road separates Block 41, Lot 34 from Block 53, Lots 1.02 and 2. The 183.5-acre site (Figure 2) is bordered on the south by the North Branch of the Raritan River and on the east by Block 41, Lot 34.01 where active recreation areas are under construction along Route 202/206. A thick treeline separates the active recreation area from the Natural Area. The western boundary of the site is delimited by a treeline adjacent to a residential area. At the northern wooded boundary, signs are posted identifying the area as a wildlife preserve. The Natural Area is made up of a variety of habitats: woodlands, fields, shrub areas, wetlands (emergent, scrub-shrub, and forested), streams, ponds, and river.

The Natural Area and the adjacent lot to the east were purchased with a Green Acres low-interest loan for $7.5 million. This purchase was initiated by local residents opposed to potential site development as a Shopping Mall.

The Township of Bedminster is responsible for administering this management plan and implementing policy pursuant to the documented objectives for the site. It is also responsible for making land management decisions after consultation with other organizations and individuals (i.e. members of the Natural Resources Conservation Service, who have been integral in the management of this area to date).



SOURCE:
Map of Somerset County, New Jersey,
Hagstrom Map Company, Inc., 1983

0' 3500'

FIGURE 1
LOCATION MAP

Robert J. Stahl Natural Area
Green Acres Site
Bedminster Township
Somerset County, New Jersey

ASGECI Project #1370

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2.0 SITE DESCRIPTION AND MANAGEMENT CONCERNS

2.1 Topography and Surface Hydrology

Robert J. Stahl Natural Area lies within the Piedmont physiographic province. The rocks in this province are predominantly soft red shales, interbedded sandstone and siltstones, and resistant argillites and volcanic rocks (lava flows and intrusive sills and dikes).

Elevations on the site range from 106 feet, at the North Branch of the Raritan River, to 140 feet above mean sea level at the northeast corner of the site (Figure 3). In general, the land gently slopes towards the river, with a notable drop immediately north of the ponded areas in the southwestern portion of Lot 34. This break in topography continues from the southwestern corner of Lot 34 across the site to the northeastern corner of Lot 34.

The Area is within the watershed of the North Branch of the Raritan River, which is classified as an FW2 non-trout stream by the New Jersey Department of Environmental Protection (NJDEP) (N.J.A.C. 7:9B). The site contains a variety of wetlands, streams, and ponded areas as well as parts of the North Branch of the Raritan River. A wetland restoration project was initiated at the site in 1994 with the aid of the Natural Resource Conservation Service, the NJ Division of Fish, Game & Wildlife and the US Fish and Wildlife Service under the Partners for Wildlife program. This project created the two ponded areas just north of River Road in the western portion of the site, and enhanced vegetation by planting native wetland flora such as: swamp milkweed, spotted Joe pyeweed, NY ironweed and highbush blueberry. These open water/ wetland areas are actively used by wildlife.

2.2 Geology and Soils

According to the Bedrock Geologic Map of the Gladstone Quadrangle (Houghton and Volkert, 1990), the bedrock in the area is Newark Supergroup Mudstone (formerly identified as the Brunswick formation). This formation is described as "silty mudstone and argillaceous siltstone, brownish-red, thin-bedded, indistinctly laminated to slightly fissile where micaceous. Mudflat-deposited mudstone beds are soft, crumbly, and commonly calcareous." The thickness in this layer exceeds 2,500 feet.

According to the Somerset County Soil Survey (Kirkham, 1976), the soils on the site are Parsippany silt loam (Ph), Raritan silt loam, 0-4% slopes (RbA), Birdsboro silt loam, 2-6% slopes (BdB), Birdsboro silt loam, 6-12% slopes (BdC), Lansdowne silt loam, 2-6% slopes (LbB), and Rowland silt loam (Ro). Figure 4 indicates where these soils are located. A table describing the soils and how they relate to the area follows:

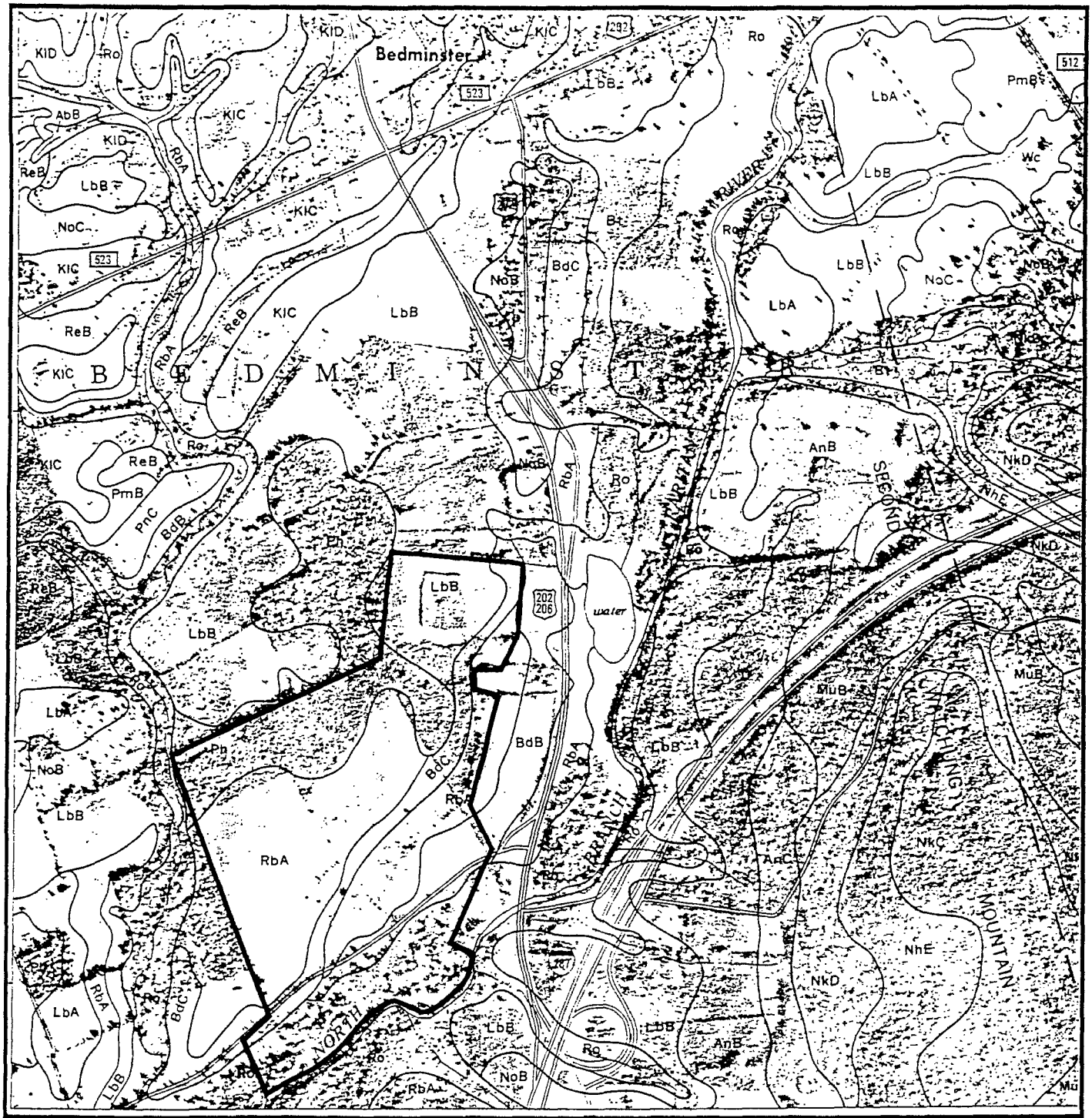
TABLE 1: SOILS OF THE ROBERT J. STAHL NATURAL AREA

SYMBOL	NAME	SEASONAL HIGH WATER TABLE	LOCATION IN THE LANDSCAPE	DRAINAGE CLASS	LISTED AS HYDRIC* (YES/NO)
BdB	Birdsboro silt loam, 2-6% slopes	not stated	steep terraces of the Raritan River; on benches scattered along major streams	well drained	N
BdC	Birdsboro silt loam, 6-12% slopes	not stated	steep terraces of the Raritan River; on benches scattered along major streams	well drained	N
LbB	Landsdowne silt loam, 2-6% slopes	1.5-2 feet	on broad uplands, low-lying flats, in depressions, and along drainageways	moderately well to poorly drained	N (Hydric inclusions of unnamed soils)
Ph	Parsippany silt loam	0-1 foot	low-lying flats and slight depressions in old glacial Lake Passaic	poorly drained	Y
RbA	Raritan silt loam, 0-4% slopes	1.5-3 feet	stream terraces, 10-15 feet above normal stream level	moderately well and poorly drained	N
Ro	Rowland silt loam	1-3 feet	floodplains of rivers and major streams, 3-8 feet above normal stream level	moderately well to poorly drained	N (Hydric inclusions of Bowmans-ville soils)

NOTES:

* Hydric soil classification based on List of Hydric Soils of New Jersey (Soil Conservation Service, 1993).

Hydric inclusions based on NJ County Based Hydric Soils List (Soil Conservation Service, 1993).



LEGEND:

BdB - Birdsboro silt loam, 2-6% slopes
BdC - Birdsboro silt loam, 6-12% slopes
LbB - Lansdowne silt loam, 0-2% slopes
Ph - Parsippany silt loam
RbA - Raritan silt loam, 0-4% slopes
Ro - Rowland silt loam

SOURCE: USDA SCS, Somerset County Soil Survey, Kirkham, 1976, sheet #38.

0' 1320'

FIGURE 4
SCS SOILS MAP

Robert J. Stahl Natural Area
Green Acres Site
Bedminster Township
Somerset County, New Jersey

ASGECI Project #1370

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2.3 Biotic Communities

The following vegetation communities are present on the site and are delineated on Figure 5. Vegetation communities were identified by Amy S. Greene Environmental Consultants, Inc. based on interpretation of aerial photography and limited field reconnaissance by Amy S. Greene Environmental Consultants, Inc (ASGECI). in the fall of 1996 and the spring of 1997. Wetland lines are based mainly on a delineation by Thonet Associates in 1991. Some emergent wetland lines were added by ASGECI. There may be additional upland areas on the parcel of land between River Road and the North Branch of the Raritan River. This should be investigated further by a qualified wetland delineator. Animals likely to utilize the various vegetation communities are noted at the end of each community description. A list of animals observed on the site is included in Appendix A. This list is based on observations made by ASGECI during field visits as well as information provided by Mr. Alan Schreck, of the Bedminster Environmental Commission. A list of plants observed on the site by ASGECI and others is included in Appendix B.

The majority of plants observed on the Natural Area are native species. However, some non-native species inhabit the site. The most notable of these is Japanese barberry, a prickly shrub that inhabits woodlands, and in a lesser degree, open fields and hedge rows.

Early Successional Field

Early Successional fields make up an extensive portion of the site, approximately 69 acres. These fields are in the western and central portions of the property, north of River Road. Red cedar, Russian olive, black walnut, red maple, red oak, pin oak, honey locust, hawthorn, and pear trees are present within treerows or borders of the fields. Shrubs noted within the fields include red cedar, multiflora rose, Japanese barberry, and bayberry. Herbaceous species present within the fields include the following: smooth brome, yellow foxtail, Faber's foxtail, awned wheatgrass, greasy grass, broom sedge, little bluestem, common crabgrass, timothy, *Agrostis* sp., bluegrass, sheep sorrel, thistle, horse nettle, tall blue lettuce, common chickory, common dandelion, Queen Anne's lace, wild strawberry, cinquefoil, dogbane, common milkweed, red clover, crown vetch, beardtongue, sweet everlasting, common ragweed, small white aster, and rough goldenrod.

A variety of wildlife are commonly found in this habitat. Mammals include: woodchuck, eastern cottontail rabbit, mice, moles, voles, shrews, striped skunk, eastern chipmunk, eastern gray squirrel, red fox, opossum, and whitetail deer. Reptiles and amphibians include eastern box turtle, eastern garter snake, and eastern milk snake. Avian species include such species as tree swallow, rough-winged swallow, bank swallow, eastern bluebird, field sparrow, killdeer, American robin, red-tailed hawk, and eastern meadowlark.

As discussed in Section 2.4 of this document, the early successional field communities on the site have supported State-listed threatened species of grassland birds, and have the

potential, if properly managed, of supporting other endangered and threatened species. These fields must be maintained as fields in order to continue to support these threatened or endangered grassland bird species, since they would otherwise succeed to shrublands and forests.

Late Successional Field

Late successional fields are older fields that have a larger percentage of woody species. these were mainly observed in patches within the flood plain forest between the Raritan River and River Road, and intermingled with early successional fields, forests, and hedgerows in the northeastern corner of the site. Woody plant species commonly found in late successional fields include young red cedar, red maple, oak, sassafras, black cherry, willow, and black locust trees, and multiflora rose, wineberry, and blackberry bushes. Common herbaceous species include crow garlic, beardgrass, garlic mustard, and various goldenrods.

Animal species that would commonly use late successional fields include white-tailed deer, raccoon, muskrat, woodchuck, opossum, mice, shrews, moles, eastern box turtle, and various birds including mockingbird, song sparrow, common yellowthroat warbler, and several others.

Hardwood Forest and Mature Hardwood Forest

A forest survey was done by Richard D. Goodenough Associates in 1990. Much of the following information is taken from that report. Hardwood forests are located mainly along the edges of wetland forests, and account for only a small percentage of the forests on the site. Dominant canopy and sapling species include red maple, hickory, red oak, white oak, black oak, and black cherry trees. Japanese barberry, wineberry, and blackberry are common shrub species along the edges of upland forests. Herbaceous species common in the hardwood forest include crow garlic, beardgrass, and garlic mustard. Grape vine is common in some portions of the forest. In the northeastern portion of site, there is a large square composed nearly entirely of young red maple trees surrounded by earlier successional fields.

Animals utilizing hardwood forests include white-tailed deer, raccoon, opossum, American robin, and a variety of other songbirds.

Mature hardwood forests can be distinguished from hardwood forests by the size of the canopy trees. In hardwood forests, the average diameter (diameter at breast height, or DBH) is less than six inches, and the largest trees are usually under 10 inches DBH. In mature hardwood forests, the average diameter is greater than six inches, and the largest trees are often greater than 18 inches. Species composition in mature hardwood forests and hardwood forests is roughly the same, with the exception that hardwood forests tend to contain more red maples, and mature hardwood forests contain more large oak trees.

Animal species that utilize mature hardwood forests include white-tailed deer, red tailed and Cooper's hawks, pileated woodpecker, downy woodpecker, hairy woodpecker, flicker, barred owl, screech owl, great horned owl, American crow, ovenbird, warblers, wood thrush, and many other songbirds.

Ponded Open Water

Ponded open water habitat includes open unvegetated standing water and shallow water characterized by the presence of aquatic plants. There are a number of areas on the site which are ponded. The largest, deepest contiguous open water ponds are located 150 - 200 feet from River Road on both sides of the old farm house driveway. These two ponds were enhanced by the wetland restoration project and are bordered by emergent wetlands. There are many other small ponded areas within the forested wetlands of the site. Aquatic vegetation in the larger ponds includes common cattail, arrow arum, and pickerel weed.

Wildlife associated with this habitat type would include reptiles such as the snapping turtle, green frogs, wood frogs, and spring peepers. Several species of salamanders may also use this habitat. Avian species frequenting the ponds and river include: great blue heron, Canada goose, mallard, wood duck, killdeer, and common snipe. A wood duck was seen with young on one of the ponds in 1996. Several species also feed on insects that fly over the water, including tree swallow, rough-winged swallow, bank swallow, and bats

Riparian Open Water

Riparian open water on the site consists mainly of the North Branch of the Raritan River, which is the southern boundary of the Natural Area. This is a large stream with many undercut banks and alluvial islands. Several intermittent streams and ditches on the Natural Area site drain to the North Branch or to its large unnamed tributary, which is located between 100 and 1,000 feet from the western site boundary. These waterways are generally unvegetated.

Animals utilizing riparian open water include herons, ducks, Canada geese, catbirds, turtles, and, of course, many species of fish. (No information on fish in this section of the North Branch was collected for the purposes of this report.) Riparian areas and lands adjacent to riparian areas on the site may provide potentially suitable habitat for wood turtles.

Emergent Wetland

Emergent wetlands surround the two large ponded areas at the site, and in many small areas within the early successional fields. One of the emergent wetland areas is fairly large and is located in the central portion of the site. There are a variety of herbaceous plants in these areas, including: beardgrass, yellow foxtail, deer-tongue grass, stout woodreed, smooth brome, fringed sedge, porcupine sedge, wool grass, soft rush, umbrella sedge,

three-way sedge, steeplebush, small water plantain, arrow-leaved tearthumb, swamp milkweed, swamp smartweed, slender mountain mint, blue vervain, New York ironweed, slender-leaved goldenrod, and rough goldenrod.

Wildlife common to this habitat area includes the species named under ponded open water.

Scrub-Shrub Wetlands

Scrub-shrub wetlands were mainly located in patches within the forested wetlands, and in a large finger of wetlands extending into the central portion of the site. These areas are dominated by shrubs and young trees including highbush blueberry, willow, green ash, red maple, silky dogwood, and southern arrowwood. Common herbaceous plants in these wetlands include sensitive fern, soft rush, and beardgrass.

Animal species using this community type would include white-tailed deer, raccoon, opossum, box turtles, red-winged blackbirds, bluejays, common yellow-throat warblers, and a variety of songbirds.

Forested Wetlands

A majority of the forests at the site are wetlands. The largest areas of wetland forests are located along the northern boundary of the Natural Area and the floodplain between River Road and the North Branch of the Raritan River. Trees that are dominant in these woods are red maple, pin oak, and shagbark hickory. The floodplain forest on the south side of River Road is also supports many large eastern sycamore trees. Other trees present in smaller quantities include American beech, honey locust, swamp white oak, elm, and green ash. Some of the shrubs in the wetland forests are Japanese barberry, silky dogwood, highbush blueberry, and southern arrowwood. Herbaceous vegetation at the forest floor is dominated by stout woodreed. Some of the other herbs present are sensitive fern, bugleweed, beardgrass, and Jack-in-the-pulpit. Common greenbrier is an abundant vine.

Wildlife utilizing wetland forests include white-tailed deer, Cooper's hawk, red-tailed hawk, sharp-shinned hawk, pileated woodpecker, downy woodpecker, hairy woodpecker, northern flicker, barred owl, screech owl, great horned owl, American crow, ovenbird, warblers, wood thrush, and many other songbirds.

2.4 Endangered and Threatened Species

The State of New Jersey maintains a list of Endangered and Threatened animal species at N.J.A.C. 7:25-4.13. "Endangered" is defined as "a species whose prospects for survival within the State are in immediate danger due to one or many factors: A loss of or change in habitat, overexploitation, predation, competition, [or] disease. An endangered species requires immediate assistance or extinction will probably follow." "Threatened" is defined as "a species that may become endangered if conditions surrounding it begin to or continue to deteriorate."

A list of Endangered plants is maintained at N.J.A.C. 7:5C-5.1. In this section of the NJ Administrative Code, "Endangered species" is defined as "any native plant species whose survival in the State or the nation is in jeopardy, including, but not limited to: plant species designated as listed, proposed, or under review by the Federal government as endangered or threatened throughout its range in the United States pursuant to the "Endangered Species Act of 1973," P.L. 93-205 (16 U.S.C. section 1533 et seq.), as amended; any additional species known or believed to be rare throughout its worldwide range; and any species having five or fewer extant populations within the State."

The New Jersey Department of Environmental Protection, Office of Natural Lands Management, Division of Parks and Forestry maintains a database of sightings of rare, endangered, and threatened plant and animal species. ASGECI made an inquiry of the database regarding the Natural Area site; the correspondence received from NJDEP is included in Appendix C of this document. There are several endangered and threatened species that have the potential of utilizing the site, seasonally or otherwise. The correspondence indicates endangered and threatened species sighted at the Natural Area, within the same USGS Topographic Quadrangle (Gladstone) as the Area, and within the same County. In the list below (Table 2), the species observed within the Natural Area and within the Gladstone USGS Topographic Quadrangle are noted.

TABLE 2: ENDANGERED AND THREATENED SPECIES
DOCUMENTED AS UTILIZING,
OR THAT COULD POTENTIALLY UTILIZE,
THE ROBERT J. STAHL NATURAL AREA.

Avian Species

Cooper's hawk (E)	1
Red-shouldered hawk (E)	2 **
Great blue heron (T)	*
Barred owl (T)	
Bobolink (T)	1
Grasshopper sparrow (T)	1
Upland sandpiper (E)	
Savannah Sparrow (T)	2
Vesper Sparrow (E)	2

Amphibians/Reptiles

Wood Turtle (T)

Plants

Puff-sheathed dropseed (*Sporobolus neglectus*, also called small rush-grass) (E)

NOTES:

1) The species marked with a (1) have been sighted on the Robert J. Stahl Natural Area and are recorded in the NJ Natural Heritage Database (see Appendix C).

2) The species marked with a (2) have been sighted on the Robert J. Stahl Natural Area , but are <u>not</u> recorded in the NJ Natural Heritage Database.

3) The species marked with an asterisk (*) are only threatened as a breeding population. In other words, only nesting habitat is protected.

4) The species marked with a double asterisk (**) are endangered as a breeding population; the non-breeding population is threatened.

4) The other species listed are listed on the Gladstone US Geological Survey Topographic Quadrangle, but are not recorded at the Natural Area specifically.

Bobolink, grasshopper sparrow, upland sandpiper, savannah sparrow, and vesper sparrow are grassland bird species. The early successional fields on the site provide potentially suitable habitat for these species. Cooper's hawk, red-shouldered hawk, and barred owl require large tracts of mature forests (both wetland and upland) for nesting and early or late successional fields for hunting. The North Branch of the Raritan River and the ponds on the site provide potentially suitable feeding habitat for great blue herons.

Wood turtles spend the winter and breed in streams with undercut banks. The utilize sunny clearings for nesting, and spend the rest of the time in various habitats. The North Branch of the Raritan River and the large tributary located just west of the Natural Area provide potentially suitable wintering and breeding habitat for wood turtles.

Puff-sheathed dropseed is a State-listed endangered short grass that occurs in dry places. The NJ Natural Heritage database records a sighting of this plant within the Gladstone USGS Topographic Quadrangle in September of 1918. No search for puff-sheathed dropseed was performed at the site, and no intensive research was performed regarding the habitat requirements of this plant for the purposes of this management plan Therefore, its presence within the Natural Area undetermined at this time.

2.5 Human Use

The Natural Area is currently used for passive recreational activities such as hiking, bird-watching, horseback riding, cross country skiing, and fishing. Because few trails have been maintained and posted, there is currently limited access. The number of visitors accessing the site is not currently documented.

Hunting is prohibited at the site, but numerous hunting platforms exist. These platforms appear old and unused, but the potential for illegal hunting exists.

2.6 Man-Made Features

There are several man-made features found at the Natural Area. They are each described below.

Old Farmhouse Buildings and Utility Wires

There is a roofless, cinder block structure that was formerly used as a milk house when the site was a working farm. This structure is currently housing lumber donated for use at the site. Plants are growing around and within this structure. The Bedminster Township Historian, Dutzie Robbie, has written a report on the history of this site that was submitted to the Bedminster Township Committee in 1993.

A silo exists immediately adjacent to the above structure. It is currently used by various birds who perch on the top, potentially using it for hunting purposes. The silo also

provides potential for nesting by various owl species, with the addition of nesting structures.

A gravel drive is located along the north side of River Road and is approximately 400 feet long. This road leads up to the silo and cinder block structure.

Inactive utility wires are located along the gravel driveway. These wires are used by perching birds at the site. The droppings of these birds contain seeds that become deposited beneath the wires and encourage plant growth there. There are no plans to remove or alter the wires in the future.

Wetlands Restoration Project

There are two ponded areas just north of River Road, to either side of the gravel driveway. Both ponds at the site can be considered man-man features, noting that the ponds part of a restoration project initiated in 1994 with the assistance of the Natural Resource Conservation Service, the NJ Division of Fish, Game and Wildlife, and the US Fish and Wildlife Service under the Partners for Wildlife Program. The ponds are restorations of ponds had been there within the past 200 years. There is an overflow pipe extending into the eastern ponded area. This pipe allows for water to flow into the stream which runs east of the pond. This will help prevent excessive flooding of the area and the adjacent portion of River Road. Rocks have been placed on the western edge of the western ponded area to help prevent erosion.

Trails

Several trails (located in the fields) are currently mowed and maintained by the township public works department. Several other trails lead through forested areas and appear to be used by equestrians. Some trails extend onto the Natural Area site from a lot owned by the NJ Department Transportation (located along the North Branch of the Raritan River immediately east of the Natural Area). Trails are indicated on Figure 6.

Blue Bird Nest Boxes

There have been two 'rounds' of blue bird box placement on the site. The first group of boxes were placed in the late 1980's and another group were placed in 1995. These boxes are located throughout the site (Figure 6).

Information Boxes and Signs

An information box was placed on the site in 1995. The cover has deteriorated and it is no longer useful.

Hunting Platforms

There are several hunting platforms located throughout the site. They are old and potentially dangerous.

Trash Piles

Two areas on the site are littered with old cars and other large items. These areas are located along the field/forest edge at corners of the fields. Some of the items are very large, and removal could involve disturbance of wetlands via the use of heavy machinery. The Environmental Commission has opted to allow the larger items to remain if the removal would cause wetland disturbance.

3.0 MANAGEMENT CONSIDERATIONS AND TECHNIQUES

Management of this site requires careful insight and coordination. For each section below, either a description of the subject is given, or various wildlife and human usage considerations are listed, and management techniques which address each consideration are provided at corresponding numbers.

3.1 Management Objectives and Area Classification

Management efforts will be directed toward maintaining the diverse character of the area while still allowing for a variety of passive recreational opportunities. Public use will only be allowed to the extent that it will not impair the integrity of the Natural Area. The land directly to the east of the Natural Area has been set aside to accommodate active recreation. Other objectives for the Natural Area are to protect the integrity and diversity of habitat for state-listed threatened and endangered species as well as other wildlife. All work on the site must be performed within the limits specified in the Individual Wetland Permit (Appendix D), the NJ Freshwater Wetlands Protection Act Rules (N.J.A.C. 7-7A), and the Flood Hazard Area Control Act Rules (N.J.A.C. 7:13).

A large portion of the Natural Area (approximately 69 acres) is grassland and supports a variety of endangered and threatened bird species. Therefore, the site will be actively managed primarily for these species. Plans for the site also include enhancement of non-grassland wildlife as well as enhanced opportunities for low-intensity human usage, such as nature observation and hiking.

3.2 Rules and Regulations

Consideration:

The Township of Bedminster has provided regulations for this park in Township Ordinance #34-@1-S13 as follows:

1. The park shall be open from sunrise to sunset.
2. Parking is permitted only in designated parking areas.
3. Motorized vehicles are prohibited.
4. Alcoholic beverages are prohibited.
5. Firearms are prohibited.
6. Horseback riding is permitted only on designated paths.
7. Dogs or other pets must be kept on leashes.
8. Dog waste shall be removed by the dog owner.
9. Littering is prohibited.
10. Glass containers are prohibited.
11. A permit is required for group use of the park.
12. Violators of these provisions will be prosecuted.

Technique:

These rules and regulations should be posted at the main Natural Area access points. Equestrian paths need to be posted as such (this is discussed further in Section 3.4).

3.3 Boundaries

The Robert J. Stahl Natural Area includes Block 41, Lot 34 and Block 53, Lots 1.02 and 2 (Figure 2). An adjacent lot to the east, Block 41, Lot 34.01, is being developed for active recreation and provides a border between the Natural Area and Route 202/206. Block 41, Lot 34 is located to the north of River Road. Block 53, Lot 2 is located to the south of River Road and North of the North Branch of the Raritan River. Lot 1.02 is located to the south of River Road and to the west of Block 53, Lot 2. Its western Boundary is even with Miller Road.

Consideration:

Block 53, Lot 2.01 is located between Lot 2 and Route 202/206 along the North Branch of the Raritan River. Although this lot is owned by the New Jersey Department of Transportation, it contains several trails that are frequently used by fishermen. These trails are connected to trails located on Lot 2.

Technique:

Block 53, Lot 2.01 should be connected to the Green Acres site via purchase, a conservation easement, or a special agreement with the State.

3.4 Human Use

All current recreational uses can continue since these activities appear to have no serious short or long term negative effects on the integrity of the area (on the diversity of wildlife habitat and species). With implementation of this management plan, human use may increase slightly, but provided that the nature of the activity remain passive, there should be few negative effects on the Natural Area. Camping, off-road vehicles, and bicycles should not be permitted within the site. However, bicycles may be permitted only on a specific route through the site if such an easement is granted by the Township Environmental Commission. Picnicking is not encouraged; picnic tables and trash removal are not planned at this time. The active recreation portion of the Green Acres Site is better suited to these activities.

Considerations:

1. Human use of the site needs to be restricted in order to avoid excessive impacts to the site. Use of bicycles and motorized vehicles should be prohibited, since they could

disturb nesting of grassland birds. Visitors need to stay on mowed paths when walking in the fields to avoid disturbing or stepping on nests.

2. There is currently no parking provided in the Natural Area. A wire cable is placed at the existing gravel driveway entrance. The only possible parking is along the grass at the edge of River Road. This situation is unsafe, since River Road does not have a shoulder and the situation restricts access to passive recreation opportunities. In addition, if any sort of educational activities occur at the site, more parking may be required for school buses.

3. Interest of Bedminster Township residents in maintaining and preserving the Natural Area site will be enhanced by promoting nature observation at the site. However, this activity needs to be limited to low-intensity usage in order to avoid disturbance to wildlife, especially endangered and threatened species.

4. Equestrian usage needs to be limited to certain trails to avoid disturbance to grassland birds as well as hikers, and to limit fecal contamination of waters. However, existing connections to other riding areas need to be maintained.

5. Hunting stands which present opportunities for illegal hunting are present within the Natural Area. These stands also present a hazard to anyone who might try to use them, as they have not all been maintained.

6. Debris piles including old cars and other large items are located in two areas along the field/forest edge in the northeastern and northcentral portions of the site and present an interruption in the integrity of the site as well as a safety hazard.

Techniques:

1. Signs should be placed at major points of access to the site (the gravel driveway entrance and areas where trails enter the site). These signs need to include park rules and regulations as well as large-print warnings regarding the danger of ticks and some recommended precautions, the need to stay on trails to avoid disturbing nesting grassland birds (April through August), and the prohibited use of bicycles and motorized vehicles within the Natural Area. In addition, signs should be placed (facing out) at the borders of the Natural Area, so that it is clearly separated from the active recreation area and surrounding properties. If the Environmental Commission approves an easement for a bicycle path, it should be laid out in a way that would encourage bicyclists to stay on the path. Keeping the vegetation mowed short on paths will encourage visitors to keep on set paths, thus avoiding potential damage to nests.

2. Minimal additional gravel-lot parking should be added to the site. The location of a proposed five spaces gravel parking area along River Road is noted on Figure 6. This lot would provide safe access to the site. It should include one parking space reserved

for handicapped access and four other spaces. Stobbing should be placed around the parking area to restrict the use of motorized vehicles from the site while still allowing handicapped access.

3. Park benches should be placed on the site. Benches can be placed in the Natural Area at points along the trails at far corners of the trails and in places where visitors could sit and observe wildlife, such as near the wetland/pond restorations. These benches should be placed so that they are in the shade most of the day. Ten locations are proposed on Figure 6. An observation blind/tower should be placed as indicated on this figure. This location would provide easy viewing of several different biotic communities, and is located at a trail intersection which is an easy walk from the gravel driveway and cinder block structure. It would help to concentrate visitor activity to help avoid the potential disruption of wildlife caused by walking through all the fields. Information boxes could be placed alongside the Robert J. Stahl Natural Area sign, and in various potential park entry points. These boxes would replace the one already on the site which is in disrepair. In addition, a simple brochure could be developed and placed in the boxes. It should depict the trails system and information on the history and wildlife at the site.

4. Trails that go through the Natural Area and connect to other trails should be maintained and posted as equestrian trails. These would be mainly those trails in the northern and eastern portions of the site (in the vicinity of the forest). All trails may be used by hikers.

5. Since hunting is not permitted at the site the hunting platforms must be removed whenever possible.

6. Debris piles should be removed as they present both a break in the integrity of the Natural Area and a safety hazard. Larger items will be left in place unless they can be removed without damage to wetlands.

3.5 Man-Made Features

Several man-made features are located on the Natural Area. They include a small cinder block structure adjacent to a silo, trails, signs, and blue-bird boxes. Signs were discussed under the Human Use section. Blue-bird boxes will be discussed under the Habitat Manipulation section.

Considerations:

1. The walls, floor, and foundation of the cinder block building appear to be structurally sound. However, the building does not have windows or a roof. It can be made into a useful structure.

2. The trails on the site require maintenance. The trails in the fields require regular mowing. The trails in the forests require occasional clearing. Some better connections to other parts of the site and other sites would be useful. Some of the trails go through very wet areas, which makes them virtually unusable at times.

Techniques:

1. The cinder block structure has potential to be converted into a bird blind and nature center. This project has been preliminarily designed by Paul Berry, a former member of the Bedminster Township Environmental Commission and currently an active volunteer. His phone number is listed in Appendix H. He should be contacted regarding further design. The bird viewing area would be located on a top floor, and a simple, unmanned nature center could be implemented in the first floor. The renovation of this building would encourage centralized usage of the site.

2. Considerations for placement of new trails are outlined in a letter by NRCS employee Nancy Paolini (Appendix E). Location of existing trails and potential placement of additional trials is provided on Figure 6. A site brochure indicating trail locations and connections should be prepared, and copies should be placed in information boxes along the major trail initiation points as shown on Figure 6. The trails located in the fields will be maintained by the public works department by mowing and debris removal. Field paths should be maintained at 2-6 inches tall. They should be 8 to 20 feet wide. This short grass area is also useful to many grassland birds. Work is needed in order to keep the trails in wooded and shrubby areas clear. If assistance is needed, the Environmental Commission can provide maintenance through the use of volunteers. In addition, trails in wooded areas should be marked with some sort of small durable placard in order to encourage visitors to stay on the paths and allow the paths to become set through consistent maintenance of the same alignment.

   As noted on Figure 6, trails that go through ponded or very wet areas should either be relocated, bridged, or have mulch or other natural materials used to fill the trail area. Where these trails go through wetlands, a Statewide General Permit #17 (from the New Jersey Department of Protection, Land Use Regulation Program) will be required in order to place fill or wooden walkways. As noted in Section 3.4, equestrians often use the trails, and since horses may refuse to walk on bridges or boardwalks, natural fill would be more desirable on trails designated for use by equestrians (mainly along the wooded northern portion of the Natural Area).

3.6 Habitat Enhancement/Maintenance

The Natural Area is already utilized by many wildlife species. Wooded portions of the site do not require maintenance. Portions of the site (fields) must be maintained to continue existing usage. Some additions can be made to the site to enhance usage by wildlife, such as the installation of nest boxes and the planting of food plants.

Forested Habitat Protection

Consideration:

The forested portions of the site require no active management for wildlife habitat. Dead and dying trees in these areas, and others at the site, should be left for wildlife habitat and food. The understory will not be burned or removed. However, forests on the site can be enhanced by the preservation of forested land on adjacent properties. Since many wildlife species require large forest tracts for effective breeding habitat, the overall size of the contiguous forest is more important than the size of the forest on the Natural Area site alone. If the forests on all the adjacent sites were cleared, it would drastically decrease the effective size of the forest on the Natural Area, and would limit the types of wildlife that would use it. Therefore, it is imperative that adjacent forests be preserved if diverse wildlife populations are to remain on the Nature Area tract.

Technique:

Adjacent landowners should be urged to commit to the preservation of forested lands via conservation easements, deed restrictions, forest management plans, or other covenants. This can be done via letters sent by the Environmental Commission. These letters should be sent to landowners that own land with forest contiguous to that on the Natural Area site. This can be established by comparing an aerial photograph to a tax map. The development of a Township Greenway Plan, with the goal of conserving forests and other natural corridors, would also benefit the Natural Area.

Grassland Maintenance

Considerations:

1. Large grassland tracts are required by some of the endangered and threatened species that utilize the Natural Area site. Grasslands need to be actively maintained in order to remain grasslands. Otherwise, woody growth will become established in the fields, and will eventually grow into a forest.

2. Mowing can be used for maintaining grasslands, but prescribed burns create better grassland bird habitat.

3. Bobolinks prefer unburned hayfields and emergent wetlands for habitat.

4. A high-contrast border (such as forest against early successional field) attracts more grassland bird nest predators than a lower contrast border.

Techniques:

1. The early successional fields on the site should be maintained via mowing and prescribed burns on a rotational basis. The Bedminster Township Department of Public Works is responsible for mowing the site. The Bedminster Environmental Commission is responsible for instructing the department on where and when the site should be mowed. **Grasslands should not be mowed or otherwise disturbed between April 15 and August 15, except along established paths and areas indicated on Figure 7.** Mowing (at 10 inches) should occur every two to three years, except after a burn. After a burn, no mowing is required. A mowing/management schedule is included in Appendix F of this report.

2. Prescribed burns have been reported to create the best possible habitat for grassland birds. Burns can remove woody vegetation which is not resistant to the effects of burning. Native grasses are resistant to the effects of burning and can respond with vigorous growth. Burning also returns nutrients to the soil. In addition, burned areas can be replanted to control herbaceous species diversity, although seeding is not usually necessary. Burning should only be conducted every 5 to 10 years, since over-burning may eliminate some insect species that grassland birds feed on. Therefore, mowing needs to be conducted between burns. A burning schedule is included in Appendix F.

   The New Jersey Forest Fire Service is responsible for conducting prescribed burns on public lands in Somerset County. After an application for a burn permit is received, they formulate a burn plan that addresses smoke hazards to adjacent residents and roads as well as other safety considerations. There is no fee for this service, so it will reduce the budget required for maintenance of the site. The Forest Fire Service only conducts burns for the purpose of reducing hazard of wildfire by burning off potential fuel such as dead vegetation. Burns are conducted between November and March, so they would not interfere with breeding season activities. Instructions for applying for a Prescribed Burn Permit are included in Appendix F.

3. One large field can be set aside as specific bobolink habitat. This field will be mowed occasionally, but not burned. Timothy hay should be planted in this field.

4. The high contrast of the field/forest edge can be made less dramatic by creating an approximately 30-foot buffer of late successional field edge. This can be achieved in one of two ways. The first is to allow a prescribed burn to extend from the field into about 30 feet of forest, or cutting canopy trees from the edge. Shrub species can then be planted in the 30-foot buffer. The second method is to mow or burn field edges within 30 feet of the forest edge less frequently and allow woody vegetation to become established (or plant it). The recommended technique is cutting back canopy trees in the first 30 feet of the forest edge and planting shrubs.

A concern is that the fields on the site, while already supporting some grassland birds, are somewhat smaller than would be ideal for grassland bird habitat. Allowing a shrubby edge to grow into the field would reduce the effective field size further. Therefore, the first method (cutting or burning back the forest edge 30 feet) is recommended. Late succession field buffers should be brush-hogged approximately every 6 to 10 years to prevent succession to forest. This can be done at the same time that each field is mowed.

Many small trees and shrubs produce berries that are an important food source for resident and migrating birds. Another effort at planting berry- or fruit-producing shrub clumps should be attempted. However, tall protective fencing should be installed. A minimum of 42 inches is required in order to keep deer from damaging the plants. In addition, several plants should be enclosed in a single fencing. This will cut the cost of fencing and improve cross-pollination. If funding is available, more mature plants (three to four feet tall) should be installed. This should also decrease the effects of deer, mice, and rabbits. A list of appropriate plantings appears below. Most of these plants produce fruit in late summer or fall, and many of the fruits are persistent, providing a food source that will last into the winter.

In wetter areas:
Silky dogwood (*Cornus amomum*), red-osier dogwood (*Cornus stolonifera*), red chokeberry (*Aronia arbutifolia*), serviceberry (*Amelanchier* species), and viburnum species such as southern arrowwood (*Viburnum dentatum*).

In drier areas:
Alternate-leaved dogwood (*Cornus alternifolia*), gray dogwood (*Cornus racemosa*), northern bayberry (*Myrica pensylvanica*), staghorn sumac (*Rhus typhina*), smooth sumac (*Rhus glabra*), crab apple (*Malus species*), blackberry (*Rubus* species),

Nest Boxes/Bat Boxes

Considerations:

1. The site already contains numerous bluebird boxes which are utilized by bluebirds as well as tree swallows and other species. These bluebird boxes require periodic cleaning, eviction of wintering mouse populations, and replacement.

2. The site can be enhanced by placement of screech owl/kestrel nest boxes, and bat boxes. In addition, since wood ducks and chicks have been observed on the site, wood duck nest boxes should be installed.

Techniques:

1. The blue bird boxes must be cleaned out, at minimum, at the end of each winter (in early February to early March, depending on seasonal weather conditions) to prepare

them for the spring nesting season. This is the responsibility of the Environmental Commission. See Appendix G for instructions on cleaning and maintaining the boxes. If volunteers are available from the Environmental Commission, they should observe the boxes in June to check for the types of birds that successfully use the boxes.

2. Screech owls and kestrels use the same type of nest box. These can be bought or made by volunteers and placed along the woods edge in areas noted on Figure 6. Bat boxes are used as roost sites. Bat boxes should be placed on telephone poles or on other high objects surrounded by clearings. Instructions for the construction and maintenance of these boxes are included in Appendix G.

Wildlife Food Plantings

Shrub plantings along forest edges are recommended in the grassland maintenance section above. Following are additional recommendations.

Concern:

Many white-tailed deer use the site. Turkeys, pheasants, and other fowl also utilize the site. These species can be provided with supplemental food supplies at low cost.

Technique:

Rows of corn should be planted in area of the site identified in Figure 8. It should not be planted in the fields that are being managed as grasslands as it must be planted during the breeding season of the birds. This would interfere with nesting activities. The area indicated is accessible from other parts of the Green Acres site. Corn should be planted in late spring and left standing through the winter. It would need to be re-planted at least once every two years.

Apple trees are relatively inexpensive ($10-$15 per tree) and can be planted in corners of fields and cleared areas without interfering significantly with grassland habitat. They will benefit deer, turkeys, pheasants, and many other species. Several different disease resistant varieties, such as Williams Pride (early fruiting - July), Liberty (fruiting in September), and Enterprise (fruiting in October) on standard seedling rootstock should be planted to promote cross-pollination and longer fruiting season. Several white-blossoming crab apple trees should also be planted. These are very good for promoting pollination. White angel is a disease-resistant variety with a long blooming period. Mutsu is a vigorous variety that is sterile, but produces heavy crops of apples that deer are known to eat. Apple trees should be planted away from established field paths, about 20 feet from wood lines and each other. They should be planted in the early spring, mulched well, and watered well during the first year. Wire fencing at 48" above the ground should be installed around each tree for 3-5 years to prevent deer and other animals from chewing the stems.

3.7 Suggested Research/Proposed Projects

The following list includes suggested research and other projects recommended above for the Natural Area. These projects are aimed at better trail access, improved opportunities for nature observation, and habitat enhancement.

1. Block 53, Lot 2.01, which is located just east of the Natural Area along the river, is currently owned by the NJ Department of Transportation. An agreement with the State should be sought to protect trails that connect to the Natural Area.

2. Signs bearing site regulations and warnings regarding ticks need to be designed and installed at trail and roadway entry points. These signs should note that groups of 5 or more people must obtain a permit from the Township to use the site.

3. Minimal additional gravel-lot parking should be added as noted on Figure 6.

4. Park benches should be purchased and placed.

5. An observation blind/tower should be designed and constructed.

6. Information boxes should be placed in various park entry points.

7. Brochures should be designed for placement in the information boxes. These brochures should contain simple trail maps and interpretive wildlife or historical information.

8. Hunting platforms must be removed where possible.

9. Debris piles should be removed.

10. The cinder block structure on the site should be used as a bird blind and nature center. (Paul Berry has begun the design work on this.)

11. New trails should be placed and all trails need to be maintained. The trails located in wooded or shrubby area need to be cleared at least once every other year.

12. Trails in the northern portion of the site should be marked as designated for equestrian usage. Signs indicating that equestrian usage is prohibited should be posted on other trails.

13. Markers should be designed and placed for both equestrian and hiking trails. These markers should be small (less than five inches in diameter), easily visible, and durable.

14. Trails that go through ponded or very wet areas should be either relocated, bridge, or filled with natural materials. This requires a $250.00 Statewide General Permit from NJDEP, Land Use Regulation Program.

15. Adjacent landowners should be urged to maintain forested lands as forests via conservation easements, deed restrictions, forest management plans, or other covenants.

16. A Township Greenways Plan should be developed in order to foster protection of forests and other natural corridors in the vicinity.

17. A representative of the Environmental Commission should apply for a Prescribed Burn Permit in order to use prescribed burns to maintain grasslands and reduce fire hazards on the site.

18. The mowing/management plan needs to be evaluated every few years. A representative of the Natural Resource Conservation Service or other qualified biologist should do this.

19. Canopy trees should be thinned within the first 30 feet of forest/field edge to reduce the possibility of nest predation. Berry-producing shrubs should be planted in this area.

20. Existing bluebird boxes need to be cleaned out annually and replaced as they age.

21. Kestrel/screech owl boxes, wood duck boxes, and bat boxes can be constructed, placed, and maintained.

22. Apple trees should be purchased and planted in areas indicated on Figure 6. Wildlife grade corn should be planted as indicated on Figure 6. A local farmer could be contracted to do these very small plantings annually.

The following list includes topics on which more information is needed in order to further enhance the site. Research is recommended.

1. Research habitat requirements and recommended protection of puff-sheathed-dropseed, *Sporobolus neglectus*, as well as survey site to determine if this species is present on the site.

2. Determine whether more uplands are present between River Road and the North Branch of the Raritan River. This should be done be a qualified wetland delineator. Proposed addition trails should be placed in uplands rather than wetlands where possible.

3. Obtain information regarding fish, invertebrates, and other wildlife species at the site.

4. Perform survey of plant species on the site, particularly grass and herbaceous species.

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5.0 Appendices

Appendix A - List of Animals Observed at the Robert J. Stahl Natural Area Site

Appendix B - List of Plants Observed at the Robert J. Stahl Natural Area Site

Appendix C - Natural Heritage Letter

Appendix D - Wetland Permit

Appendix E - Letter Regarding Trail Placement from Nancy Paolini

Appendix F - Mowing/Maintenance Plan

Appendix G - Instructions for Construction and Maintenance of Bird and Bat Boxes

Appendix H - Phone Numbers of Contacts for Management Support

Appendix A
List of Animals Observed at the Robert J. Stahl Natural Area

BIRDS

COMMON NAME	SCIENTIFIC NAME	STATUS IN NEW JERSEY
green heron	Butorides striatus	stable
wood duck	Aix sponsa	stable
mallard	Anas platyrhynchos	increasing
turkey vulture	Cathartes aura	stable
Cooper's hawk	Accipiter cooperii	endangered
red-shouldered hawk	Buteo lineatus	endangered/threatened
red-tailed hawk	Buteo jamaicensis	increasing
American kestrel	Falco sparverius	increasing/stable
killdeer	Charadrius vociferus	stable
mourning dove	Zenaida macroura	stable
black-billed cuckoo	Coccyzus erythropthalmus	stable
great horned owl	Bubo virginianus	increasing/stable
red-bellied woodpecker	Malanerpes carolinus	increasing/stable
downy woodpecker	Picoides pubescens	stable
hairy woodpecker	Picoides villosus	stable
northern flicker	Colaptes auratus	stable
pileated woodpecker	Dryocopus pileatus	stable
willow flycatcher	Empidonax traillii	increasing/stable
eastern phoebe	Sayornis phoebe	stable
great crested flycatcher	Mylarchus crinitus	stable
eastern kingbird	Tyrannus tyrannus	decreasing
tree swallow	Tachycineta bicolor	stable
N. rough-winged swallow	Stelgidopteryx serripennis	stable
bank swallow	Riparia riparia	stable
barn swallow	Hirundo rustica	stable
blue jay	Cyanocitta cristata	increasing/stable
American crow	Corvus brachyrhynchos	stable
black-capped chickadee	Parus atricapillus	increasing/stable
tufted titmouse	Parus bicolor	increasing/stable
white-breasted nuthatch	Sitta carolinenesis	stable
Carolina wren	Thryothorus ludovicianus	stable

BIRDS, continued

COMMON NAME	SCIENTIFIC NAME	STATUS IN NEW JERSEY
house wren	Troglogytes aedon	stable
blue-gray gnatcatcher	Polioptila caerulea	increasing/stable
eastern bluebird	Sialia sialis	stable
veery	Catharus fuscescens	stable
wood thrush	Hylocichla mustelina	stable
American robin	Turdus migratorius	stable
gray catbird	Dumatella carolinenesis	stable
northern mockingbird	Mimu polyglottos	stable
brown thrasher	Toxostoma rufum	increasing/stable
cedar waxwing	Bombycilla cedrorum	stable
European starling	Sturnus vulgaris	introduced
yellow-throated vireo	Vireo flavifrons	stable
warbling vireo	Vireo gilvus	stable
yellow warbler	Dendroica petechia	stable
prairie warbler	Dendroica discolor	stable
common yellowthroat	Geothlypis trichas	stable
scarlet tanager	Piranga olivacea	stable
northern cardinal	Cardinalis cardinalis	increasing
rose-breasted grosbeak	Pheucticus ludovicianus	stable
rufous-sided towhee	Pipilo erythrophthalmus	stable
chipping sparrow	Spizella passerina	stable
field sparrow	Spizella pusilla	stable
vesper sparrow	Pooecetes gramineus	endangered
savannah sparrow	Passerculus sandwichensis	threatened
grasshopper sparrow	Ammodramus savannarum	theatened
song sparrow	Melospiza melodia	stable
dark-eyed junco	Junco hyemalis	stable
bobolink	Dolichonyx oryzivorus	threatened
red-winged blackbird	Agelaius phoeniceus	stable
eastern meadowlark	Sturnella magna	decreasing/stable
common grackle	Quiscalus quicula	increasing/stable
brown-headed cowbird	Molothrus ater	increasing/stable
orchard oriole	Icterus spurius	stable
Baltimore oriole	Icterus galbula	stable
house finch	Carpodacus mexicanus	increasing/stable
American goldfinch	Carduelis tristis	stable

REPTILES

COMMON NAME	SCIENTIFIC NAME	STATUS IN NEW JERSEY
eastern box turtle	Terrapene ornata	stable
eastern garter snake	Thamnophis sirtalis	stable

AMPHIBIANS

COMMON NAME	SCIENTIFIC NAME	STATUS IN NEW JERSEY
American toad	Bufo americanus	stable
spring peeper	Hyla cricifer	stable
Northern gray tree frog	Hyla versicolor	stable
wood frog	Rana sylvatica	stable

MAMMALS

COMMON NAME	SCIENTIFIC NAME	STATUS IN NEW JERSEY
eastern gray squirrel	Sciurus carolinensis	stable
eastern cottontail	Sylvagus floridanus	stable
white-tailed deer	Odocoileus virginianus	declining *

NOTES:

1. Status in New Jersey according to New Jersey Administrative Code 7:25-4.17 - Defining Status of Indigenous Wildlife Species of New Jersey (supp. 6-17-96). For game species, a brochure entitled, "New Jersey's Wildlife, A Checklist of Birds, Mammals, Reptiles, and Amphibians" published by NJ Department of Environmental Protection, was used.

2. Where two status indicators are noted, the first is for the breeding population while the second is for the non-breeding population.

3. * The status of white-tailed deer may have changed since this source was published.

4. Bird list provided mainly by Mr. Alan Schreck, Bedminster Environmental Commission, August 13, 1996. Other observations by Amy S. Greene Environmental Consultants, Inc. during field visits in fall, 1996 and spring, 1997.

Appendix B
List of Plants Observed at the Robert J. Stahl Natural Area

SCIENTIFIC NAME (1)	COMMON NAME	INDICATOR STATUS (2)	
		REGIONAL	NATIONAL
Polypodiaceae			
Onoclea sensibilis	sensitive fern	FACW	FACW
Cupressaceae			
Juniperus virginiana	red cedar	FACU	FACU-,FAC
Typhaceae			
Typha latifolia	common cattail	OBL	OBL
Poaceae			
Bromus inermis	smooth brome	NL	
Festuca arundinacea	tall fescue	NL	
Poa pratensis	Kentucky bluegrass	FACU	FACU,FAC-
Dactylis glomerata	orchard grass	FACU	FACU,FACU+
Phragmites australis	common reedgrass	FACW	FACW,FACW+
Tridens flavus	greasy grass	FACU	UPL,FACU
Agropyron trachycaulum	slender wheatgrass	FACU	FACU,FAC
Secale cereale	rye	NL	
Agrostis sp.	bentgrass	NIS	
Cinna arundinacea	stout woodreed	FACW+	FACW,FACW+
Phleum pratense	timothy	FACU	FACU
Leersia virginica	white grass	FACW	FACW
Digitaria sanguinalis	common crabgrass	FACU-	FACU-,FAC-
Dichanthelium acuminatum	wooly panic grass	FAC	FAC,FACW
Dichanthelium clandestinum	deer tongue grass	FAC+	FAC+,FACW
Echinochloa crusgalli	barnyard grass	FACU	FACU,FACW
Setaria glauca	yellow foxtail	FAC	FACU,FAC
Setaria faberii	Fabers foxtail	UPL	UPL,FACU+
Eulalia viminea	beardgrass	FAC	FAC,FAC+
Schizachyrium scoparium	little bluestem	FACU-	FACU-,FACU+
Andropogon virginicus	broom sedge	FACU	FACU,FAC
Cyperaceae			
Dulichium arundinaceum	three-way sedge	OBL	OBL
Scirpus cyperinus	woolgrass	FACW+	FACW+,OBL
Scirpus validus	soft-stem bulrush	OBL	OBL
Scirpus atrovirens	green bulrush	OBL	OBL
Carex stricta	tussock sedge	OBL	OBL
Carex crinita	fringed sedge	OBL	FACW+,OBL
Carex hystricina	porcupine sedge	OBL	OBL
Carex squarrosa	squarrose sedge	FACW	FACW, OBL
Carex lurida	shallow sedge	OBL	FACW+,OBL
Carex annectens	yellow-fruit sedge	FACW	FAC+,FACW+
Carex vulpinoidea	fox sedge	OBL	OBL

SCIENTIFIC NAME (1)	COMMON NAME	INDICATOR STATUS (2)	
		REGIONAL	NATIONAL
Araceae			
Arisaema triphyllum	Jack-in-the-pulpit	FACW-	FAC,FACW
Symplocarpus foetidus	skunk cabbage	OBL	OBL
Juncaceae			
Juncus effusus	common rush	FACW+	FACW+,OBL
Juncus tenuis	slender rush	FAC-	FAC-,FACW
Liliaceae			
Allium vineale	crow garlic	FACU-	FACU-,FACU
Smilax rotundifolia	common greenbrier	FAC	FAC
Salicaceae			
Salix sp.	willow	NIS	
Myricaceae			
Myrica pensylvanica	bayberry	FAC	FAC
Juglandaceae			
Juglans cinerea	butternut	FACU+	FACU-,FACU+
Carya ovata	shagbark hickory	FACU-	FACU-,FACU+
Betulaceae			
Carpinus caroliniana	blue beech	FAC	FAC
Fagaceae			
Fagus grandifolia	American beech	FACU	FACU,FAC+
Quercus alba	white oak	FACU-	FACU-,FACU+
Quercus bicolor	swamp white oak	FACW+	FACW+,OBL
Quercus velutina	black oak	NL	
Quercus rubra	red oak	FACU-	FACU-,FACU+
Quercus palustris	pin oak	FACW	FAC,FACW
Ulmaceae			
Ulmus americana	American elm	FACW-	FAC,FACW
Moraceae			
Morus sp.	mulberry	NIS	
Polygonaceae			
Rumex acetosella	sheep sorrel	UPL	UPL,FACW
Polygonum pensylvanicum	pinkweed	FACW	FACW-,OBL
Polygonum hydropiper	water pepper	OBL	FACW,OBL
Polygonum hydropiperoides	smartweed	OBL	OBL
Polygonum sagittatum	arrow-leaved tearthumb	OBL	OBL
Berberidaceae			
Berberis thunbergii	Japanese barberry	FACU	UPL,FACU
Lauraceae			
Lindera benzoin	spicebush	FACW-	FACW-,FACW
Sassafras albidum	sassafras	FACU-	FACU-,FACU
Rosaceae			
Spirea tomentosa	hardtack	FACW	FACW
Potentilla simplex	common cinquefoil	FACU-	UPL,FACU
Rubus allegheniensis	blackberry	FACU-	UPL,FACW

SCIENTIFIC NAME (1)	COMMON NAME	INDICATOR STATUS (2)	
		REGIONAL	NATIONAL
Rosaceae, continued			
Rubus phoenicolasius	wineberry	NL	
Rosa multiflora	multiflora rose	FACU	UPL,FACU
Prunus serotina	black cherry	FACU	FACU
Malus pumila	apple	NL	
Crataegus sp.	hawthorn	NIS	
Fabaceae			
Trifolium pratense	red clover	FACU-	FACU-,FAC
Trifolium repens	white clover	FACU-	FACU-,FAC
Coronilla varia	crown vetch	NL	
Robinia pseudoacacia	black locust	FACU-	UPL,FAC
Gleditsia triacanthos	honey locust	FAC-	FACU,FAC
Anacardiaceae			
Toxicodendron radicans	poison ivy	FAC	FACU,FACW
Aceraceae			
Acer rubrum	red maple	FAC	FAC
Acer negundo	box elder	FAC+	FAC,FACW
Balsaminaceae			
Impatiens capensis	spotted jewelweed	FACW	FACW,FACW+
Vitaceae			
Vitis spp.	wild grape		
Elaeagnaceae			
Elaeagnus umbellata	autumn olive	NL	
Cornaceae			
Cornus amomum	silky dogwood	FACW	FACW,FACW+
Cornus stolonifera	red osier	FACW+	FAC,FACW+
Cornus foemina	grey dogwood	FAC	FAC,FACW
Ericaceae			
Vaccinium corymbosum	highbush blueberry	FACW-	FACW-,FACW
Oleaceae			
Fraxinus pennsylvanica	green ash	FACW	FAC,FACW
Apocynaceae			
Apocynum cannabinum	dogbane	FACU	FACU,FAC+
Asclepiadaceae			
Asclepias incarnata	swamp milkweed	OBL	FACW+,OBL
Asclepias syriaca	common milkweed	NL	
Verbenaceae			
Verbena hastata	blue vervain	FACW+	FAC,FACW+
Lamiaceae			
Pycnanthemum flexuosum	slender mountain mint	FACW	FACU,FACW
Lycopus virginicus	bugleweed	OBL	OBL
Scrophulariaceae			
Penstemon hirsutus	hairy beard-tongue	NL	

SCIENTIFIC NAME (1)	COMMON NAME	INDICATOR STATUS (2)	
		REGIONAL	NATIONAL
Caprifoliaceae			
Viburnum lentago	nannyberry	FAC	FACU,FAC+
Viburnum dentatum	southern arrowwood	FAC	FAC
Lonicera japonica	Japanese honeysuckle	FAC-	FACU,FAC+
Lonicera tartarica	tartarian honeysuckle	NL	
Dipsacaceae			
Dipsacus sylvestris	teasel	NL	
Asteraceae			
Ambrosia artemisiifolia	ragweed	FACU	FACU-,FAC
Solidago rugosa	wrinkled goldenrod	FAC	FAC,FAC+
Solidago canadensis	Canada goldenrod	FACU	FACU,FACU+
Aster vimineus	fairy aster	FAC	FAC,FACW-
Gnaphalium obtusifolium	sweet everlasting	NL	
Vernonia noveboracensis	New York ironweed	FACW+	FAC+,FACW+
Lactuca scariola	prickly lettuce	NL	
Hieracium pratense	field hawkweed	NL	
Taraxacum officinale	dandelion	FACU-	FACU-,FACU+
Sonchus arvensis	field sow thistle	UPL	UPL,FAC
Cichorium intybus	chicory	NL	

NOTES:

1. Nomenclature conforms to that of the National List of Scientific Plant Names (USDA/SCS, 1982).

2. Indicator status derived from the U. S. Fish and Wildlife Service's National List of Plant Species that Occur in New Jersey Wetlands: 1988 Draft; (Reed, 1988).
   NL = species not listed.
   NIS = not identified sufficiently to determine indicator status.

3. This list based on limited field investigations by ASGECI (1996-1997), wetland report by Thonet Associates (1991), and forest management plan by Richard D. Goodenough Associates (1990).

Appendix C - Natural Heritage Letter

#1370

State of New Jersey

Christine Todd Whitman
Governor

Department of Environmental Protection
Division of Parks and Forestry
Office of Natural Lands Management
Natural Heritage Program
CN 404
Trenton, NJ 08625-0404
Tel. #609-984-1339
Fax. #609-984-1427

Robert C. Shinn, Jr.
Commissioner

September 20, 1996

Peg Brancheau
Amy S. Greene Environmental Consultants, Inc.
18 Commerce Street Plaza
Flemington, NJ 08822-1743

Re: R.J. Stahl Natural Area Management Plan (ASGECI Project #1370)

Dear Ms. Brancheau:

Thank you for your data request regarding rare species information for the above referenced project site in Bedminster Township, Somerset County.

The Natural Heritage Data Base has records for occurrences of Cooper's hawk, grasshopper sparrow and bobolink which may be on site. The attached list provides more information about these occurrences. **Because some species are sensitive to disturbance or sought by collectors, this information is provided to you on the condition that no specific locational data are released to the general public.**

Also attached is a list of rare species and natural communities which have been documented from Somerset County and a list of the occurrences of rare species and natural communities from the Gladstone, NJ-PA USGS Quadrangle. If suitable habitat is present at the project site, these species have potential to be present. If you have questions concerning the wildlife records or wildlife species mentioned in this response, we recommend you contact the Division of Fish, Game and Wildlife, Endangered and Nongame Species Program.

The Natural Heritage Program reviews its data periodically to identify priority sites for natural diversity in the State. Included as priority sites are some of the State's best habitats for rare and endangered species and natural communities. One of these sites is located within or near the area you have outlined. Please refer to the enclosed Priority Site Map of the Gladstone USGS quadrangle for the location and boundary of this site. Also attached is a report describing the significance of the Priority Site, and the rare species documented from within the site.

In order to red flag the general locations of documented occurrences of rare and endangered species and natural communities, we have prepared computer generated Natural Heritage Index Maps. Enclosed please find these maps for the Gladstone USGS quadrangle. If individual projects are to be located in the shaded areas of these maps, the Natural Heritage Program can be contacted for additional information.

PLEASE SEE THE ATTACHED 'CAUTIONS AND RESTRICTIONS ON NHP DATA'.

Thank you for consulting the Natural Heritage Program. The attached invoice details the payment due for processing this

data request. Feel free to contact us again regarding any future data requests.

Sincerely,

Thomas F. Breden
Supervisor

cc: Lawrence Niles
Thomas Hampton
NHP File No. 96-4007466

CAUTIONS AND RESTRICTIONS ON NATURAL HERITAGE DATA

The quantity and quality of data collected by the Natural Heritage Program is dependent on the research and observations of many individuals and organizations. Not all of this information is the result of comprehensive or site-specific field surveys. Some natural areas in New Jersey have never been thoroughly surveyed. As a result, new locations for plant and animal species are continuously added to the data base. Since data acquisition is a dynamic, ongoing process, the Natural Heritage Program cannot provide a definitive statement on the presence, absence, or condition of biological elements in any part of New Jersey. Information supplied by the Natural Heritage Program summarizes existing data known to the program at the time of the request regarding the biological elements or locations in question. They should never be regarded as final statements on the elements or areas being considered, nor should they be substituted for on-site surveys required for environmental assessments. The attached data is provided as one source of information to assist others in the preservation of natural diversity.

This office cannot provide a letter of interpretation or a statement addressing the classification of wetlands as defined by the Freshwater Wetlands Act. Requests for such determination should be sent to the DEP Land Use Regulation Program, CN 401, Trenton, NJ 08625-0401.

This cautions and restrictions notice must be included whenever information provided by the Natural Heritage Database is published.

19 SEP 1996

ON OR IN THE IMMEDIATE VICINITY OF PROJECT SITE
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK	DATE OBSERVED	IDENT.
*** Vertebrates								
ACCIPITER COOPERII	COOPER'S HAWK		E		G4	S2	1993-05-03	
AMMODRAMUS SAVANNARUM	GRASSHOPPER SPARROW		T/T		G5	S2	1992-06-21	Y
DOLICHONYX ORYZIVORUS	BOBOLINK		T/T		G5	S2	1987-06-??	Y

5 Records Processed

9 SEP 1996

GLADSTONE USGS QUADRANGLE
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
THE NEW JERSEY NATURAL HERITAGE DATABASE

AME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK	DATE OBSERVED	IDENT.
** Vertebrates								
CCIPITER COOPERII	COOPER'S HAWK		E		G4	S2	1990-07-06	Y
°ITER COOPERII	COOPER'S HAWK		E		G4	S2	1993-05-03	
..ODRAMUS SAVANNARUM	GRASSHOPPER SPARROW		T/T		G5	S2	1987-06-30	Y
MMODRAMUS SAVANNARUM	GRASSHOPPER SPARROW		T/T		G5	S2	1987-SUMMR	Y
MMODRAMUS SAVANNARUM	GRASSHOPPER SPARROW		T/T		G5	S2	1987-06-30	Y
MMODRAMUS SAVANNARUM	GRASSHOPPER SPARROW		T/T		G5	S2	1988-07-??	Y
MMODRAMUS SAVANNARUM	GRASSHOPPER SPARROW		T/T		G5	S2	1987-05-28	Y
MMODRAMUS SAVANNARUM	GRASSHOPPER SPARROW		T/T		G5	S2	1981-SUMMR	Y
MMODRAMUS SAVANNARUM	GRASSHOPPER SPARROW		T/T		G5	S2	1981-SUMMR	Y
MMODRAMUS SAVANNARUM	GRASSHOPPER SPARROW		T/T		G5	S2	1988-06-??	Y
MMODRAMUS SAVANNARUM	GRASSHOPPER SPARROW		T/T		G5	S2	1981-SUMMR	Y
MMODRAMUS SAVANNARUM	GRASSHOPPER SPARROW		T/T		G5	S2	1988-07-??	Y
MMODRAMUS SAVANNARUM	GRASSHOPPER SPARROW		T/T		G5	S2	1988-07-??	Y
MMODRAMUS SAVANNARUM	GRASSHOPPER SPARROW		T/T		G5	S2	1988-08-??	Y
MMODRAMUS SAVANNARUM	GRASSHOPPER SPARROW		T/T		G5	S2	1992-07-03	Y
MMODRAMUS SAVANNARUM	GRASSHOPPER SPARROW		T/T		G5	S2	1992-06-21	Y
MMODRAMUS SAVANNARUM	GRASSHOPPER SPARROW		T/T		G5	S2	1991-07-04	Y
RDEA HERODIAS	GREAT BLUE HERON		T/S		G5	S2	1992-04-27	Y
TAMIA LONGICAUDA	UPLAND SANDPIPER		E		G5	S1	1980-??-??	Y
ARTRAMIA LONGICAUDA	UPLAND SANDPIPER		E		G5	S1	1982-??-??	Y
LEMMYS INSCULPTA	WOOD TURTLE		T		G4	S3	1994-09-10	Y
LEMMYS INSCULPTA	WOOD TURTLE		T		G4	S3	1987-03-26	Y
LEMMYS INSCULPTA	WOOD TURTLE		T		G4	S3	1990-08-13	Y
LEMMYS INSCULPTA	WOOD TURTLE		T		G4	S3	1993-04-29	Y
OLICHONYX ORYZIVORUS	BOBOLINK		T/T		G5	S2	1994-05-08	Y
OLICHONYX ORYZIVORUS	BOBOLINK		T/T		G5	S2	1988-??-??	Y
OLICHONYX ORYZIVORUS	BOBOLINK		T/T		G5	S2	1987-SUMMR	Y
OLICHONYX ORYZIVORUS	BOBOLINK		T/T		G5	S2	1991-07-04	Y
OLICHONYX ORYZIVORUS	BOBOLINK		T/T		G5	S2	1987-SUMMR	Y

SEP 1996

GLADSTONE USGS QUADRANGLE
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
THE NEW JERSEY NATURAL HERITAGE DATABASE

ME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK	DATE OBSERVED	IDENT.
LICHONYX ORYZIVORUS	BOBOLINK		T/T		G5	S2	1988-??-??	Y
LICHONYX ORYZIVORUS	BOBOLINK		T/T		G5	S2	1988-06-??	Y
CHONYX ORYZIVORUS	BOBOLINK		T/T		G5	S2	1987-SUMMR	Y
CHONYX ORYZIVORUS	BOBOLINK		T/T		G5	S2	1987-SUMMR	Y
LICHONYX ORYZIVORUS	BOBOLINK		T/T		G5	S2	1987-SUMMR	Y
LICHONYX ORYZIVORUS	BOBOLINK		T/T		G5	S2	1987-SUMMR	Y
LICHONYX ORYZIVORUS	BOBOLINK		T/T		G5	S2	1988-??-??	Y
LICHONYX ORYZIVORUS	BOBOLINK		T/T		G5	S2	1987-06-??	Y
LICHONYX ORYZIVORUS	BOBOLINK		T/T		G5	S2	1987-SUMMR	Y
LICHONYX ORYZIVORUS	BOBOLINK		T/T		G5	S2	1987-SUMMR	Y
LICHONYX ORYZIVORUS	BOBOLINK		T/T		G5	S2	1988-07-??	Y
LICHONYX ORYZIVORUS	BOBOLINK		T/T		G5	S2	1988-06-??	Y
LICHONYX ORYZIVORUS	BOBOLINK		T/T		G5	S2	1987-06-??	Y
LICHONYX ORYZIVORUS	BOBOLINK		T/T		G5	S2	1988-06-??	Y
LICHONYX ORYZIVORUS	BOBOLINK		T/T		G5	S2	1988-06-??	Y
LICHONYX ORYZIVORUS	BOBOLINK		T/T		G5	S2	1988-06-??	Y
LICHONYX ORYZIVORUS	BOBOLINK		T/T		G5	S2	1990-06-05	Y
LICHONYX ORYZIVORUS	BOBOLINK		T/T		G5	S2	1994-05-11	Y
LICHONYX ORYZIVORUS	BOBOLINK		T/T		G5	S2	1993-07-06	Y
ERCULUS SANDWICHENSIS	SAVANNAH SPARROW		T/T		G5	S2	1980-??-??	Y
SSERCULUS SANDWICHENSIS	SAVANNAH SPARROW		T/T		G5	S2	1991-05-09	
OECETES GRAMINEUS	VESPER SPARROW		E		G5	S2	1970-??-??	Y
OECETES GRAMINEUS	VESPER SPARROW		E		G5	S2	1987-07-??	Y
RIX VARIA	BARRED OWL		T/T		G5	S3	1993-04-05	Y
* Ecosystems								
VE AQUATIC COMMUNITY	CAVE AQUATIC COMMUNITY				G4?	S2	19??-??-??	Y
VE AQUATIC COMMUNITY	CAVE AQUATIC COMMUNITY				G4?	S2	190?-??-??	Y
VE TERRESTRIAL COMMUNITY	CAVE TERRESTRIAL COMMUNITY				G4?	S3	19??-??-??	Y
VE TERRESTRIAL COMMUNITY	CAVE TERRESTRIAL COMMUNITY				G4?	S3	190?-??-??	Y

9 SEP 1996

GLADSTONE USGS QUADRANGLE
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
THE NEW JERSEY NATURAL HERITAGE DATABASE

AME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK	DATE OBSERVED	IDENT.
LOODPLAIN FOREST	FLOODPLAIN FOREST				G4	S3?	1988-04-13	Y
Invertebrates								
...SMIDONTA UNDULATA	TRIANGLE FLOATER				G4	S3	1994-05-27	Y
OMPHUS ABBREVIATUS	SPINE-CROWNED CLUBTAIL				G3G4	S?	1984-06-12	Y
PHIOGOMPHUS MAINENSIS	TWIN-HORNED SNAKETAIL				G3G4	S1?	1959-06-21	Y
** Vascular plants								
STER INFIRMUS	CORNEL-LEAVED ASTER				G5	S2	198?-??-??	Y
AREX FRANKII	FRANK'S SEDGE				G5	S3	1976-06-14	Y
BOLARIA VIRGINICA	VIRGINIA PENNYWORT				G5	S2	1991-04-29	Y
ELAGINELLA RUPESTRIS	LEDGE SPIKE-MOSS				G5	S2	198?-??-??	Y
POROBOLUS NEGLECTUS	PUFF-SHEATHED DROPSEED		E		G5	S1	1918-09-??	Y

5 Records Processed

EXPLANATIONS OF CODES USED IN NATURAL HERITAGE REPORTS

FEDERAL STATUS CODES

The following U.S. Fish and Wildlife Service categories and their definitions of endangered and threatened plants and animals have been modified from the U.S. Fish and Wildlife Service (F.R. Vol. 50 No. 188; Vol. 55, No. 35; F.R. 50 CFR 17.11 and 17.12). Federal Status codes reported for species follow the most recent listing.

LE Taxa formally listed as endangered.

LT Taxa formally listed as threatened.

PE Taxa already proposed to be formally listed as endangered.

PT Taxa already proposed to be formally listed as threatened.

C1 Taxa for which the Service currently has on file substantial information on biological vulnerability and threat(s) to support the appropriateness of proposing to list them as endangered or threatened species.

C1* Taxa which may be possibly extinct (although persuasive documentation of extinction has not been made--compare to 3A status).

C2 Taxa for which information now in possession of the Service indicates that proposing to list them as endangered or threatened species is possibly appropriate, but for which substantial data on biological vulnerability and threat(s) are not currently known or on file to support the immediate preparation of rules.

C3 Taxa that are no longer being considered for listing as threatened or endangered species. Such taxa are further coded to indicate three subcategories, depending on the reason(s) for removal from consideration.

3A Taxa for which the Service has persuasive evidence of extinction.

3B Names that, on the basis of current taxonomic understanding, do not represent taxa meeting the Act's definition of "species".

3C Taxa that have proven to be more abundant or widespread than was previously believed

and/or those that are not subject to any identifiable threat.

S/A Similarity of appearance species.

STATE STATUS CODES

Two animal lists provide state status codes after the Endangered and Nongame Species Conservation Act of 1973 (NSSA 23:2A-13 et. seq.): the list of endangered species (N.J.A.C. 7:25-4.13) and the list defining status of indigenous, nongame wildlife species of New Jersey (N.J.A.C. 7:25-4.17(a)). The status of animal species is determined by the Nongame and Endangered Species Program (ENSP). The state status codes and definitions provided reflect the most recent lists that were revised in the New Jersey Register, Monday, June 3, 1991.

D Declining species-a species which has exhibited a continued decline in population numbers over the years.

E Endangered species-an endangered species is one whose prospects for survival within the state are in immediate danger due to one or many factors - a loss of habitat, over exploitation, predation, competition, disease. An endangered species requires immediate assistance or extinction will probably follow.

EX Extirpated species-a species that formerly occurred in New Jersey, but is not now known to exist within the state.

I Introduced species-a species not native to New Jersey that could not have established itself here without the assistance of man.

INC Increasing species-a species whose population has exhibited a significant increase, beyond the normal range of its life cycle, over a long term period.

T Threatened species-a species that may become endangered if conditions surrounding the species begin to or continue to deteriorate.

P Peripheral species-a species whose occurrence in New Jersey is at the extreme edge of its present natural range.

S Stable species-a species whose population is not undergoing any long-term increase/decrease within its natural cycle.

U Undetermined species-a species about which there is not enough information available to determine the status.

Status for animals separated by a slash(/) indicate a duel status. First status refers to the state breeding population, and the second status refers to the migratory or winter population.

Plant taxa listed as endangered are from New Jersey's official Endangered Plant Species List N.J.S.A. 131B-15.151 et seq.

E Native New Jersey plant species whose survival in the State or nation is in jeopardy.

REGIONAL STATUS CODES FOR PLANTS

LP Indicates taxa listed by the Pinelands Commission as endangered or threatened within their legal jurisdiction. Not all species currently tracked by the Pinelands Commission are tracked by the Natural Heritage Program. A complete list of endangered and threatened Pineland species is included in the New Jersey Pinelands Comprehensive Management Plan.

EXPLANATION OF GLOBAL AND STATE ELEMENT RANKS

The Nature Conservancy has developed a ranking system for use in identifying elements (rare species and natural communities) of natural diversity most endangered with extinction. Each element is ranked according to its global, national, and state (or subnational in other countries) rarity. These ranks are used to prioritize conservation work so that the most endangered elements receive attention first. Definitions for element ranks are after The Nature Conservancy (1982: Chapter 4, 4.1-1 through 4.4.1.3-3).

GLOBAL ELEMENT RANKS

G1 Critically imperiled globally because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because of some factor(s) making it especially vulnerable to extinction.

G2 Imperiled globally because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it very vulnerable to extinction throughout its range.

G3 Either very rare and local throughout its range or found locally (even abundantly at some of its locations) in a restricted range (e.g., a single western state, a physiographic region in the East) or because of other factors making it vulnerable to extinction throughout it's range; with the number of occurrences in the range of 21 to 100.

G4 Apparently secure globally; although it may be quite rare in parts of its range, especially at the periphery.

G5 Demonstrably secure globally; although it may be quite rare in parts of its range, especially at the periphery.

GH Of historical occurrence throughout its range i.e., formerly part of the established biota, with the expectation that it may be rediscovered.

GU Possibly in peril range-wide but status uncertain; more information needed.

GX Believed to be extinct throughout range (e.g., passenger pigeon) with virtually no likelihood that it will be rediscovered.

G? Species has not yet been ranked.

STATE ELEMENT RANKS

S1 Critically imperiled in New Jersey because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres). Elements so ranked are often restricted to very specialized conditions or habitats and/or restricted to an extremely small geographical

area of the state. Also included are elements which were formerly more abundant, but because of habitat destruction or some other critical factor of its biology, they have been demonstrably reduced in abundance. In essence, these are elements for which, even with intensive searching, sizable additional occurrences are unlikely to be discovered.

S2 Imperiled in New Jersey because of rarity (6 to 20 occurrences). Historically many of these elements may have been more frequent but are now known from very few extant occurrences, primarily because of habitat destruction. Diligent searching may yield additional occurrences.

S3 Rare in state with 21 to 100 occurrences (plant species in this category have only 21 to 50 occurrences). Includes elements which are widely distributed in the state but with small populations/acreage or elements with restricted distribution, but locally abundant. Not yet imperiled in state but may soon be if current trends continue. Searching often yields additional occurrences.

S4 Apparently secure in state, with many occurrences.

S5 Demonstrably secure in state and essentially ineradicable under present conditions.

SA Accidental in state, including species (usually birds or butterflies) recorded once or twice or only at very great intervals, hundreds or even thousands of miles outside their usual range; a few of these species may even have bred on the one or two occasions they were recorded; examples include european strays or western birds on the East Coast and visa-versa.

SE Elements that are clearly exotic in New Jersey including those taxa not native to North America (introduced taxa) or taxa deliberately or accidentally introduced into the State from other parts of North America (adventive taxa). Taxa ranked SE are not a conservation priority (viable introduced occurrences of G1 or G2 elements may be exceptions).

SH Elements of historical occurrence in New Jersey. Despite some searching of historical occurrences and/or potential habitat, no extant occurrences are known. Since not all of the historical occurrences have been field surveyed, and unsearched potential habitat remains, historically ranked taxa are considered possibly extant, and remain a conservation priority for continued field work.

SN Regularly occurring, usually migratory and typically nonbreeding species for which no significant or effective habitat conservation measures can be taken in the state; this category includes migratory birds, bats, sea turtles, and cetaceans which do not breed in the state but pass through twice a year or may remain in the winter (or, in a few cases, the summer); included also are certain lepidoptera which regularly migrate to a state where they reproduce, but then completely die out every year with no return migration. Species in this category are so widely and unreliably distributed during migration or in winter that no small set of sites could be set aside with the hope of significantly furthering their conservation. Other nonbreeding, high globally-ranked species (such as the bald eagle, whooping crane or some seal species) which regularly spend some portion of the year at definite localities (and therefore have a valid conservation need in the state) are not ranked SN but rather S1, S2, etc.

SR Elements reported from New Jersey, but without persuasive documentation which would provide a basis for either accepting or rejecting the report. In some instances documentation may exist, but as of yet, its source or location has not been determined.

SRF Elements erroneously reported from New Jersey, but this error persists in the literature.

SU Elements believed to be in peril but the degree of rarity uncertain. Also included are rare taxa of uncertain taxonomical standing. More information is needed to resolve rank.

SX Elements that have been determined or are presumed to be extirpated from New Jersey. All historical occurrences have been searched and a reasonable search of potential habitat has been completed. Extirpated taxa are not a current conservation priority.

SXC Elements presumed extirpated from New Jersey, but native populations collected from the wild exist in cultivation.

T Element ranks containing a "T" indicate that the infraspecific taxon is being ranked differently than the full species. For example *Stachys palustris* var. *homotricha* is ranked "G5T? SH" meaning the full species is globally secure but the global rarity of the var. *homotricha* has not been determined; in New Jersey the variety is ranked historic.

Q Elements containing a "Q" in the global portion of its rank indicates that the taxon is of questionable, or uncertain taxonomical standing, e.g., some authors regard it as a full species, while others treat it at the subspecific level.

.1 Elements documented from a single location.

Note: To express uncertainty, the most likely rank is assigned and a question mark added (e.g., G2?). A range is indicated by combining two ranks (e.g., G1G2, S1S3).

IDENTIFICATION CODES

These codes refer to whether the identification of the species or community has been checked by a reliable individual and is indicative of significant habitat.

Y	Identification has been verified and is indicative of significant habitat.
BLANK	Identification has not been verified but there is no reason to believe it is not indicative of significant habitat.
?	Either it has not been determined if the record is indicative of significant habitat or the identification of the species or community may be confusing or disputed.

Revised September 1991

Appendix D - Wetland Permit

Let's protect our earth

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION AND ENERGY
(See Issuing Division below)

PERMIT*

The New Jersey Dept. of Environmental Protection & Energy grants this permit in accordance with your application, attachments accompanying same application, and applicable laws and regulations. This permit is also subject to the further conditions and stipulations enumerated in the supporting documents which are agreed to by the permittee upon acceptance of the permit.

Permit No.	Application No.
1801-94-0004.1	

Issuance Date	Effective Date	Expiration Date
AUG 23 1994	AUG 23 1994	AUG 23 1999

Name and Address of Applicant	Name and Address of Owner	Name and Address of Operator
Mike Valent N.J. Division of Fish, Game and Wildlife CN 400 Trenton, NJ 08625-0400		

Location of Activity/Facility *(Street Address)*	Issuing Division	Statute(s)
Bedminster Township Somerset County Lot 41 Block 34	Land Use Regulation Program	N.J.S.A. 13:9B-1 et. seq.

Type of Permit	Maximum Approved Capacity, if applicable
Freshwater Wetlands Individual Permit	

This permit grants permission to:

construct three berms within wetlands at a location approximately 1000 feet west of Route 206 on River Road in Bedminster Township, Somerset County as shown on the plan entitled "NJ Division of Fish, Game, and Wildlife River Road Park Wetland Restoration Bedminster Township, Morris County Block 41 Lot 34", dated September 9, 1993, and prepared by Christine Hafner U.S. Fish and Wildlife Service.

THE AUTHORIZED SIGNATURE OF THE ADMINISTRATOR APPEARS ON PAGE 2 OF THIS PERMIT.

Prepared By: _____
Andrew Clark

Revised Date	Approved by the Department of Environmental Protection and Energy
	Name (Print or Type) Page 1 of 2 Title _____
	Signature See page 2 for signature Date _____

* *The word permit means "approval, certification, registration, etc."*

(General Conditions are on the Reverse Side)

This permit is subject to the following general conditions:

1. This permit is revocable, or subject to modification or change at any time, pursuant to the applicable regulations, when in the judgement of the Department of Environmental Protection and Energy of the State of New Jersey such revocation, modification or change shall be necessary.

2. The issuance of this permit shall not be deemed to affect in any way action by the Department of Environmental Protection and Energy of the State of New Jersey on any future application.

3. The works, facilities, and/or activities shown by plans and/or other engineering data, which are this day approved, subject to the conditions herewith established, shall be constructed and/or executed in conformity with such plans and/or engineering data and the said conditions.

4. No change in plans or specifications shall be made except with the prior written permission of the Department of Environmental Protection and Energy of the State of New Jersey.

5. The granting of this permit shall not be construed to in any way affect the title or ownership of property, and shall not make the Department of Environmental Protection and Energy or the State a party in any suit or question of ownership.

6. This permit does not waive the obtaining of Federal or other State or local government consent when necessary. This permit is not valid and no work shall be undertaken until such time as all other required approvals and permits have been obtained.

7. A copy of this permit shall be kept at the work site, and shall be exhibited upon request of any person.

8. In cases of conflict, the conditions of this permit shall supersede the plans and/or engineering data.

See page 2 for signature

THIS PERMIT IS SUBJECT TO THE FOLLOWING TERMS AND CONDITIONS

Permit Conditions

The activities allowed by this authorization shall comply with the following condition. Failure to comply with this condition shall constitute a violation of the Freshwater Wetlands Protection Act (N.J.S.A. 13:9B-1 et. seq.)

1. The proposed activity must meet Soil Erosion and Sediment Control Standards and be approved by the Somerset-Union County Soil Conservation District.

2. The permittee shall complete and sign the Department approved conservation easement for the mitigation site (attached to permit). The restriction shall be included on the deed, and recorded in the office of the County Clerk (the Registrar of Deeds and Mortgages in some counties), in the county wherein the lands of the mitigation project are located, within 10 days of approval of the wetland mitigation proposal.

3. Monitor the wetland mitigation project for (5 years for forested mitigation and 3 years for all other types) after the wetland mitigation project has been constructed. Monitoring reports will be submitted to the Land Use Regulation Program no later than September 15th of each monitoring year (Monitoring report requirements are attached to this permit);

4. The final monitoring report will include the following information:

   a. Documentation to demonstrate that the goals of the wetland mitigation project, as stated in the approved wetland mitigation proposal and the permit, have been satisfied. Documentation will also include a field wetland delineation of the wetland mitigation project based on techniques as specified in the Federal Manual for Identifying and Delineating Jurisdictional Wetlands (1989);

   b. A description of the existing ecosystem of the mitigation site. Include a discussion of the vegetation, soils, hydrology, wildlife and adjacent land use.

5. In the event that the project fails to result in the restoration of 2 acres of freshwater wetlands, the permittee shall be responsible to take what ever corrective measures are necessary to achieve this goal to the satisfaction of the Program.

Approved by:

Ernest P Hahn — 8/23/94

Ernest P. Hahn, Administrator — Date
Land Use Regulation Program

State of New Jersey

DEPARTMENT OF ENVIRONMENTAL
PROTECTION AND ENERGY

CHRISTINE TODD WHITMAN
Governor

ROBERT C. SHINN, JR.
Commissioner

Mike Valent
N.J. Division of Fish, Game and Wildlife
CN 400
Trenton, NJ 08625-0400

Re: Individual Freshwater Wetlands Permit
Applicant: Mike Valent
File No.: 1801-94-0004.1
Bedminster Township, Somerset County

Dear Mr. Valent:

The Land Use Regulation Program, acting under the provisions of the New Jersey Freshwater Wetlands Protection Act, has decided to conditionally approve your application for an Individual Freshwater Wetlands Permit.

The conditional permit is enclosed. The project, as conditioned, meets the requirements of the Freshwater Wetlands Protection Act. Approval is granted to construct three berms within wetlands at a location approximately 1000 feet west of route 206 on River Road in Bedminster Township, Somerset County. The rationale for this decision is detailed within the attached July 1994 Staff Summary Report.

In accordance with the Rules which implement the Freshwater Wetlands Protection Act, specifically 7:7A-12.8, the applicant or any other affected party, if aggrieved by this decision to authorize the activities specified within this permit may, within 30 days of this decision, request an administrative hearing by addressing a written request to:

Office of Legal Affairs
Attention: Adjudicatory Hearing Request
NJDEP, 401 East State Street
CN 402
Trenton, New Jersey 08625-0402

This written request must include a completed copy of the attached Administrative Hearing Request checklist and all the information identified in Section III of that list.

If you should have any further questions on this permit please contact Andrew Clark, of my staff at (609) 633-6754.

Sincerely,

Ernest P. Hahn, Administrator
Land Use Regulation Program

dd
c: U.S. Army Corps of Engineers; New York District
Bedminster Township Clerk
Bedminster Township Planning Board
Somerset County Planning Board

State of New Jersey
Department of Environmental Protection and Energy
Land Use Regulation Program
Bureau of Inland Regulation

Summary Report

August, 1994

Individual Freshwater Wetlands Permit
Applicant: N.J. Division of Fish, Game & Wildlife
Project Name: River Road Park Wetland Restoration
Bureau of Inland Regulation File No. 1801-94-0004.1-FWIP
Bedminster Township; Somerset County
North Branch Watershed; Raritan River Drainage Basin

Decision by the Administrator approving a Freshwater Wetlands Permit.

I. INTRODUCTION

The Freshwater Wetlands Protection Act (N.J.S.A. 13:9B et seq.) requires that a permit be obtained from the Department for the following activities within a freshwater wetland: 1) the removal, excavation, disturbance or dredging of soil, sand, gravel, or aggregate material of any kind; 2) the drainage or disturbance of water level or water table; 3) the dumping, discharging or filling with materials; 4) the driving of pilings; 5) the placing of obstructions; and 6) the destruction of plant life which would alter the character of a freshwater wetlands.

The applicant, N.J. Division of Fish, Game and Wildlife (hereafter "applicant"), proposes the filling of 0.10 acres of freshwater wetlands for the construction of 3 berms or dikes which would be used to block an existing drainage ditch and form an impoundment to restore wetlands which had been converted to uplands by the ditch.

In accordance with the Freshwater Wetlands Protection Act Rules (N.J.A.C. 7:7A-1.1 et. seq., hereafter "Rules") which implement the Freshwater Wetlands Protection Act (N.J.S.A. 13:9B, hereafter "Act"), discharge of material for construction of a berm or dike within wetlands to impound water requires the issuance of an Individual Freshwater Wetlands Permit in order for the work to be legally accomplished.

II. SUMMARY

Based on the analysis which follows, the Administrator is able to make the applicable findings required under subchapter 3

of the Rules to implement the Act for approval of an Individual Permit for this project, and applicable findings for simultaneous issuance of a Water Quality Certificate, subject to the conditions listed in the conclusion.

III. ADMINISTRATIVE HISTORY

On March 3, the Bureau received an application for a Freshwater Wetland Individual Permit, LURP file #1801-94-0004.1-FWIP, submitted by the N.J. Division of Fish, Game and Wildlife. The applicant proposed work in wetlands on Lot 34 in Block 41 in Bedminster Township, Somerset County. A site inspection was conducted by Andrew Clark of the Land Use Regulation Program and Mike Valent of the Division of Fish, Game and Wildlife on April 27, 1994.

IV. DESCRIPTION OF THE SITE AND PROJECT

The site of the proposed work is northeast of the intersection of State Highway 202-206 and River Road in Bedminster Township, Somerset County (figure 1). The site is currently an unimproved township park. The park consists of open fields in the western portion of the property and a mixed hardwood wetland forest to the east along Rt. 202-206. The forest encompasses approximately 50% of the park. The only existing structure on the property is an old spring house which provides part of the hydrology for the wetland area along River Road, which is the proposed impact area. The topography of the impact area is moderately sloping down towards River Road.

The area of the proposed wetland restoration project is shown is figure 2. Historically, a herbaceous wetland complex approximately two acres in size existed along River road. This complex was divided into east and west halfs by a farm road, currently abandoned. The majority of the hydrology for the two acre wetland was provided by a spring, inside the spring house, located on the eastern side of the farm road. When the farm road was installed most of the hydrology to the western portion of the two acre wetland complex was removed. In an apparent attempt to further drain the wetland complex, a ditch was installed along the eastern boundary of the eastern wetland complex. Consequently, an acre of former wetlands adjacent to the farm road is now upland. The uplands, which were formerly wetlands, are vegetated with goldenrod, foxtail and aster. In addition, the two wetland segments (total of one acre) that remain west of the larger ditch have become drier.

The wetland restoration project is being carried out by the U.S. Fish & Wildlife Service (Service) in conjunction with the U.S. Soil Conservation Service, N.J. Division of Fish Game and Wildlife and the Township of Bedminster, as part of the U.S. Fish and Wildlife Service's "Partners for Wildlife Program". The project is being proposed in order to restore wetland hydrology

and vegetation to the two acres. This effort will increase the wetland hydroperiod so that the wildlife habitat value of the area will be improved.

To achieve this goal, the project consists of the construction of three berms which will impound water in the existing and former wetland areas. Two of the berms would block water from reaching the ditch that had been draining the eastern wetland complex. The third berm would be installed roughly parallel to River road, to prevent this wetland from draining into an existing 18" pipe under River road.

A primary water-control structure would be placed through dike #1 to permit the flow of excess water from the spring to the ditch. The primary water-control structure would be set at an elevation to ensure that the average depth of water impounded by the dike is 0.5 feet. Primary water-control structures are not required for dike #2 and #3 due to the low volume of water that will be impounded.

The applicant estimates that the berms will alter the hydrology sufficiently to restore the former wetland area and increase the duration of inundation in the existing wetland area. This will not only double the one acre wetland area to two acres, but will enhance the value of the existing wetland area by increasing its hydroperiod. The total disturbance to wetlands from the berm construction is 0.10 of an acre.

Emergent wetland vegetation that is expected to colonize the restored site includes lurid sedge, soft rush, woolgrass, and cattail. Material to construct the berms will come directly from the front of their proposed locations. From these borrow areas, an area of open water approximately 0.10 of an acre in size will be created. Emergents such as pickerelweed and spatterdock are expected to colonize the shallow, open-water zone at the base of the dikes. Plantings along the wetland perimeter would include highbush blueberry, red-osier dogwood, arrowwood and elderberry.

V. ANALYSIS

The analysis which follows is based on the Rules, specifically Subchapter 3, which were adopted by the Department on June 8, 1988 and the Transition Area Rules in Subchapter 7, which were adopted July 3, 1989 (N.J.A.C. 7:7A-6.2 et seq., hereafter "TA Rules"). This analysis refers to applicable subchapters of the administrative code.

In accordance with section 7:7A-1.4 of the Rules, disturbance of wetlands for the placement of berms in order to enhance an existing wetland is a water dependent activity, and therefore, the permit application has been reviewed under criteria contained in 7:7A-3.1 and 3.2 of the Rules.

Requirements for Water Dependent Activities (7:7A-3.2)

Section 3.2 (a) states that the Department shall issue a freshwater wetlands or open water fill permit only if the proposed project is water dependant or requires access to a freshwater wetland or open water as a central element of it's basic function, and has no practicable alternative which would:

1. Not involve a freshwater wetland or State open water; or

2. Involve a freshwater wetland, or State open water but would have a less adverse impact on the aquatic ecosystem; and

3. Not have other significant adverse environmental consequences.

In accordance with N.J.A.C. 3.1(a)1 the Department shall issue a permit only if it determines that there is no practicable alternative to the proposed activity. An alternative shall be practicable if it is available and capable of being carried out after taking into consideration cost, existing technology, and logistics in light of overall project purposes.

In accordance with N.J.A.C. 7:7A-3.1(a)2, alternate sites for the enhancement of an existing wetland to provide increased habitat functions shall not be excluded from consideration under this provision merely because they require the purchase of an area not owned by the applicant which could reasonably have been or be obtained, utilized, expanded, or managed in order to fulfill the basic purpose of the proposed activity.

The applicant has looked into the feasibility of installing retaining walls instead of berms, this alternative was rejected due to the cost of the retaining walls vs. amount of impact ratio. Smaller size berms can not be utilized because the berms must be a certain height in order to impound a sufficient amount of water. Narrower berms would not be structurally stable. The applicant has also demonstrated that the berms that are to be installed can not be placed in uplands and serve the project purpose. Filling in the existing ditch in the eastern portion of the property would result in more wetland impact than already proposed and would not guarantee success of the project.

The applicant has therefore concluded that the alternatives to this project are limited to the following:

1. No Action, i.e, allow the former wetland area to remain as an upland field;

2. Construction of the three dikes to restore one acre of wetlands.

These alternatives are discussed below:

Alternative #1 (No Action):

The alternative to the proposed project is no restoration of the former wetland area.

Findings

If no restoration is done, then a net loss of wetland values and functions will continue to occur at this location. Restoration of the wetland hydrology will allow wetlands to reclaim the site. Therefore, the Program finds that this alternative is unacceptable because it provides no improvement to the quality of waters of the State.

Alternative #2 (Construction of the project as proposed):

The wetland restoration project is being carried out by the U.S. Fish & Wildlife Service (Service) in conjunction with the U.S. Soil Conservation Service, N.J. Division of Fish Game and Wildlife and the Township of Bedminster. The project is being proposed as part of the U.S. Fish and Wildlife Service's "Partners for Wildlife Program".

The basic project purpose is to enhance an existing one acre wetland area and to restore a former one acre wetland thereby increasing the existing wetland area from one acre to two acres. This will be accomplished by restoring the wetland hydrology in the former wetland and by increasing the hydroperiod in the existing wetland. As it exists presently the existing one acre wetland generally dries sufficiently to eliminate surface water by mid-June. The Service proposes to inundate the entire two acre area by the installation of berms so that the area will remain ponded into mid-July.

Restoring the wetland hydrology will provide increased wildlife habitat values. Particularly, the restoration/enhancement effort will provide improved habitat for wading birds such as the Great Blue Heron, whose breeding populations in N.J. are listed as threatened and who are known to have a rookery within 1 mile of the project site.

Findings

The Program finds that the proposed activity, as designed, is acceptable since they represent the only feasible alternative which would fulfill the basic project purpose while minimizing the impact on the aquatic ecosystem, and while not creating other types of significant adverse environmental consequences. Therefore, this alternative is the most environmentally sensitive design and is acceptable under N.J.A.C 7:7A-3.1 and -3.2, as well

as the applicable Water Quality Standards.

Standard Requirements (7:7A-3.5)

In addition to the other requirements set forth in Subchapter 3 of the Freshwater Wetlands Protection Act Rules, the Department shall issue a permit for a regulated activity only if the activity complies with all of the requirements listed under this Rule.

Findings

The Program has considered all of the requirements listed under this section and made the following determinations:

1. Based upon a review of the proposed project, the alternatives considered, and the fact that the project involves the enhancement of an existing wetland and the restoration of a degraded wetland through the restoration of hydrology to the area, this project will cause minimal impacts too, or impairment of, the aquatic ecosystem, including contour, vegetation, fish and wildlife resources, and aquatic circulation of the freshwater wetland and hydrologic patterns of the watershed.

2. The project will not affect or jeopardize threatened or endangered species or their habitat. In fact, the project actually has the potential to benefit threatened and endangered species as the wildlife habitat value of the wetlands will be enhanced and there is a known Blue Heron (State threatened specie) rookery within one mile of the site.
The wetlands of the proposed project are considered intermediate resource value since they are neither present nor documented habitat of threatened or endangered species listed pursuant to the "The Endangered and Nongame Species Conservation Act", N.J.S.A. 23:2A-1 et seq., or which are listed on the Federal endangered species list as defined at N.J.A.C. 7:7A-1.4.

3. The proposed activity will not result in the destruction or adverse modification of a critical habitat.

4. The proposed activity will improve water quality by the increased hydroperiod.

5. The fill material is from soil located on-site. Therefore, there will be no discharge that will cause or contribute to a violation of any effluent discharge standard.

6. The project will not violate any requirement imposed by the U.S. government to protect any marine sanctuary.

7. The proposed activity will not cause significant degradation of ground or surface waters. The proposed project should improve surface and water quality by increasing the time of inundation.

8. The project will not impact any properties which are listed or eligible for listing on the National Register of Historic Places.

9. The activity is lawful, and;

10. The project is in the public interest as determined by the Program in consideration of the following:

i. The berm construction is necessary to restore hydrology to a degraded wetlands area. Completion of the project will enhance the hydrology and vegetation of the two acre area. Therefore, this project will not only preserve but enhance natural resources.

ii. The applicant has demonstrated that the project is necessary to improve the values and functions of the degraded wetland area.

iii. The applicant has satisfactorily demonstrated that the project as proposed is the best alternative.

iv. The project will improve the public uses of the property by enhancing and preserving a natural resource.

v. The resource value classification of the wetlands will at minimum remain the same.

vi. The long term cost of the project will be more than off-set by the long term economic value gained by the enhanced and restored wetland values and functions.

vii. The impacts of the project will only improve public health and fish and wildlife by enhancing and restoring wetland values and functions.

Waiver of Transition Area (7:7A-7.1(f))

The Program has determined that the wetlands affected by this permit authorization are of **intermediate** resource value The resource value classification is the basis for determining the standard width of transition area required for the wetlands affected by this permit authorization. The authorization of activities under this Freshwater Wetlands Individual Permit includes a transition area waiver. This waiver allows encroachment only in that portion of the transition area that has been determined by the Program to be necessary to accomplish the authorized activities. This will allow the applicant access to the wetlands in order to install the proposed berms.

Any additional prohibited activities conducted within the standard transition area on-site shall require a separate

transition area waiver from the Program. Prohibited activities within a transition area are defined at N.J.A.C. 7:7A-6.2(a).

Mitigation (7:7A-14)

In accordance with N.J.A.C. 7:7A-14.1(a), wetlands mitigation is required for the issuance of all Individual Freshwater Wetlands Permits. The Department distinguishes between four types of mitigation, restoration, creation, enhancement, and contribution. Depending on the circumstances under which wetlands are lost or disturbed, different types of mitigation may be required by the Department.

The applicant proposes the permanent filling of .10 of an acre of wetlands. The purpose of the project is to create an additional 1 acre of wetlands. The applicant is proposing a net gain of .90 of an acre of wetlands. For this reason the Department has determined that the mitigation portion of this permit condition is met. In order to insure the project is successful, the applicant will be required to submit to the Department a monitoring report on the success or failure of the project. Monitoring requirements will be found in the condition portion of this permit.

WATER QUALITY CERTIFICATE & OPEN WATER FILL PERMIT

This permit to conduct a regulated activity in a wetland includes the Program's approval of a Water Quality Certificate and an Open Water Fill permit for these activities.

VI. CONCLUSION

Based upon the above analysis, the Administrator of the Land Use Regulation Program is able to make the positive findings under the New Jersey Freshwater Wetlands Protection Act, for approval of an Individual Freshwater Wetlands Permit, provided all the conditions listed within the permit are met to satisfaction of the Program.

An Individual Permit containing permit conditions is issued expressly contingent upon compliance with those conditions, and failure to comply with any or all of the permit conditions may result in appropriate enforcement actions, or suspension or revocation of the permit. The attached permit is issued subject to and provided the conditions as set forth in the permit can be met to the satisfaction of the Land Use Regulation Program.

Permit Conditions

The activities allowed by this authorization shall comply with the following conditions. Failure to comply with this condition shall constitute a violation of the Freshwater Wetlands Protection Act (N.J.S.A. 13:9B-1 et. seq.)

condition shall constitute a violation of the Freshwater Wetlands Protection Act (N.J.S.A. 13:9B-1 et. seq.)

1. The proposed activity must meet Soil Erosion and Sediment Control Standards and be approved by the Somerset-Union County Soil Conservation District.

2. The permittee shall complete and sign the Department approved conservation easement for the mitigation site (attached to permit). The restriction shall be included on the deed, and recorded in the office of the County Clerk (the Registrar of Deeds and Mortgages in some counties), in the county wherein the lands of the mitigation project are located, within 10 days of approval of the wetland mitigation proposal.

3. Monitor the wetland mitigation project for (5 years for forested mitigation and 3 years for all other types) after the wetland mitigation project has been constructed. Monitoring reports will be submitted to the Land Use Regulation Program no later than September 15th of each monitoring year (Monitoring report requirements are attached to this permit);

4. The final monitoring report will include the following information:

   a. Documentation to demonstrate that the goals of the wetland mitigation project, as stated in the approved wetland mitigation proposal and the permit, have been satisfied. Documentation will also include a field wetland delineation of the wetland mitigation project based on techniques as specified in the Federal Manual for Identifying and Delineating Jurisdictional Wetlands (1989);

   b. A description of the existing ecosystem of the mitigation site. Include a discussion of the vegetation, soils, hydrology, wildlife and adjacent land use.

5. In the event that the project fails to result in the restoration of 2 acres of freshwater wetlands, the permittee shall be responsible to take what ever corrective measures are necessary to achieve this goal to the satisfaction of the Program.

Prepared by:

Andrew Clark
Principal Environmental Specialist
Raritan Region

Decision recommended by:

Robert Piel Jr., Manager
Bureau of Inland Regulation
Approved by:

8/23/94
Date

Ernest P. Hahn, Administrator
Land Use Regulation Program

Appendix E - Letter Regarding Trail Placement from Nancy Paolini

United States Department of Agriculture

Natural Resources Conservation Service

308 Milltown Road
Bridgewater, NJ 08807
Tel. (908) 725-3848

June 16, 1995

Ms. Brook
29 Morgan Ct.
Bedminster, NJ 07921

RE: Robert Stahl Natural Area (formerly River Road Park) Trails

Dear Ms. Brook,

You called the other day regarding trail recommendations for River Road Park. Some aspects to keep in mind are as follows:

Trail width should be 4 ft. for Hiking and 8 to 12 ft. wide for Horses. Horse trails also need at least 12 ft. clearance for height. You don't need to worry about steep slopes on this property. It is best to keep Horse and Hiking trails separate but you may consider combining them in some places for efficiency and cost of maintenance. It is especially important to keep horses out of wet areas whereas people may be able to walk through these areas by choice. I would also suggest a few natural looking benches at the extreme ends for people to rest.

The trails should stay near edges because there is generally more diversity. Also, it is more aesthetic to walk along edges than to have long straight paths through open fields.

I would also suggest running a walking trail through the woods between fields 3 and 4 as shown on the enclosed map. This area may be a bit wet but would provide a nice site for amphibians and reptiles. I've outlined a very draft trail on the enclosed map. I was not sure where the existing trails are so I made up a few but of course the existing trails which should be used as much as possible. The main point is to include as much varied habitat as possible, even across the Road toward the River. Also, when laying out the trails you should look for interesting items such as trees blown down or hit by lightening, etc.

In addition, you may wish to consider building a photography bind near one of the wetlands. This could allow people to view and photograph some of the more shy wildlife such as wood ducks. A blind near the road would allow the less athletic to enjoy the site while creating the least amount of disturbance. Another possible place is above the springhouse. This would provide a good view of the butterfly area, wetland and some woods edges. Of course vandalism is always a consideration.

Please call me if you have any questions.

Sincerely,

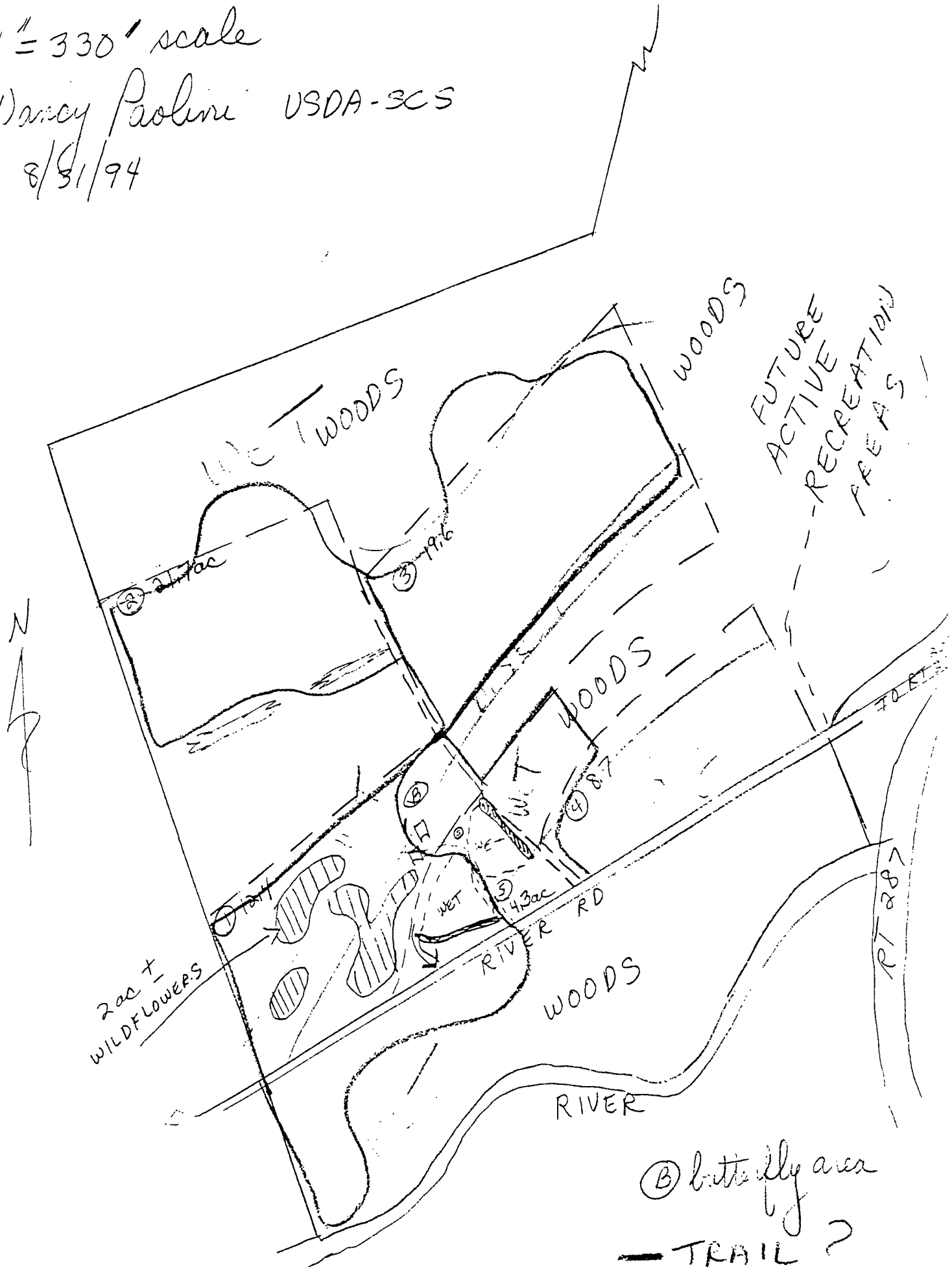
Nancy Paolini

Nancy Paolini
Soil Conservationist

c: enc.
Alan Schreck

Bedminster Twp.
River Road Park
1" = 330' scale
Nancy Paolini USDA-SCS
8/31/94

WILDFLOWER MAP



SOIL MAP 41948 04

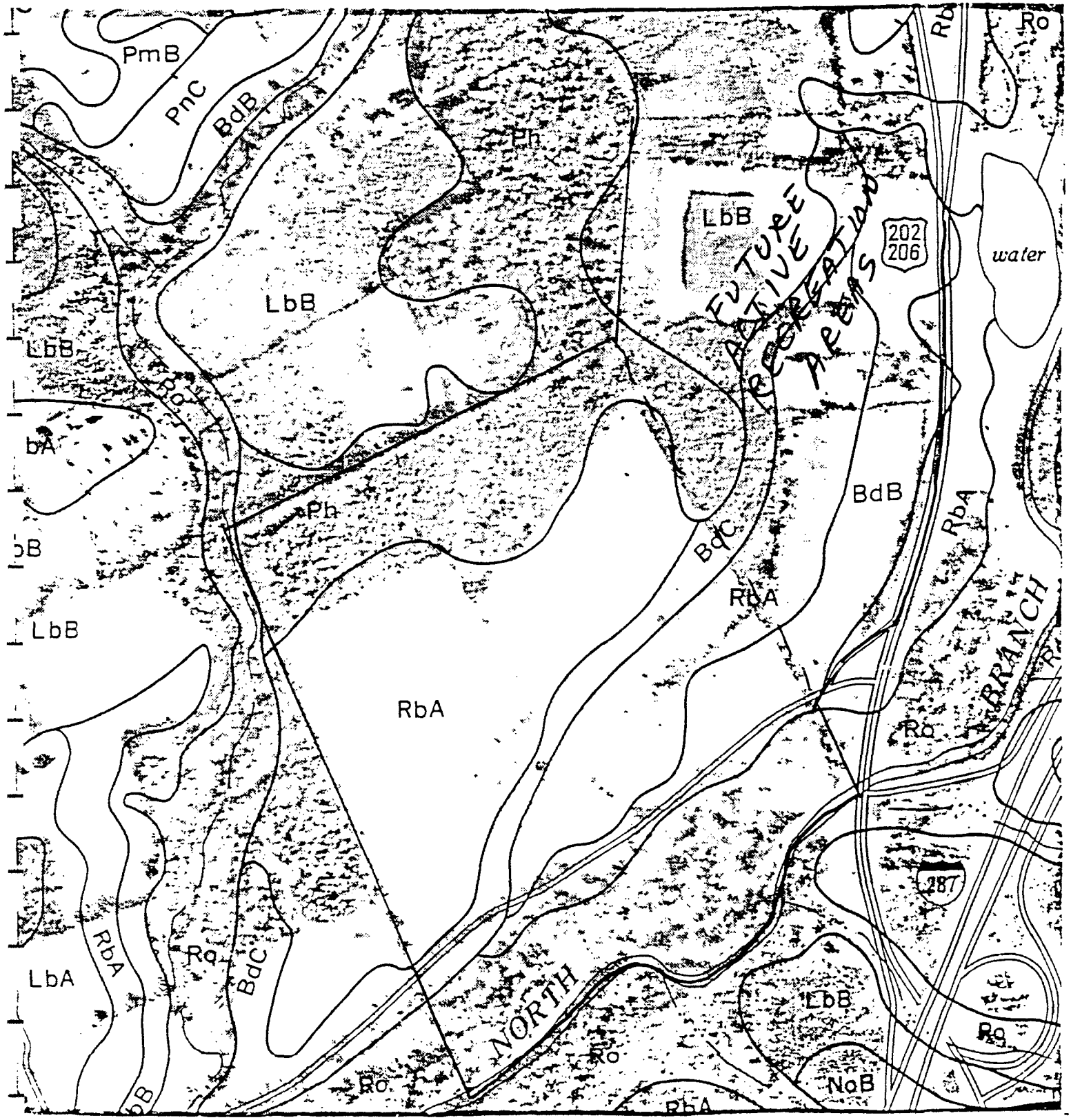
Owner BEDMINSTER TWP. Operator

County/Parish SOMERSET State NJ Date 7/92

Soil Survey Sheet(s) or Code No.(s) 7 Approximate Scale 1"=660'

Prepared by U.S. Department of Agriculture, Soil Conservation Service Cooperating

with SOMERSET-UNION Conservation District



Appendix F - Mowing/Maintenance Plan

MOWING/MAINTENANCE PLAN

MOWING

Short Grass Maintenance

Trails located in fields need to be mowed to maintain a 2 to 8 inch grass height. This can occur throughout the summer, as needed. These, along with the short grass area surrounding the existing barn, are indicated on Figure 7. Operators need to be careful to avoid cutting any other grassland areas. Mowing these areas short will encourage concentrated human usage of the site in these areas and discourage it in tall grassland areas. Paths should be mowed at 8 to 10 feet wide (to be adjusted as needed to accommodate mower width).

Taller Grass Maintenance

The fields on the site should be mowed every two to three years to control woody vegetation, and mowing should occur in the fall after August 15th. **In order to protect native field-nesting wildlife, no maintenance should occur between April 15 and August 15! Grass should be mowed to a height of 10 to 12 inches.** Mowing should be done only until a prescribed burn has occurred on the particular field. After burning, no further mowing is required.

PRESCRIBED BURNS

Prescribed burns are conducted by the NJ Forest Fire Service after a Burn Permit has been obtained. The Service provides a Burn Plan which covers all safety aspects of the burn and provides instructions to its technicians describing the manner in which the burn is to be conducted. The Service conducts burns between November and March 31, when weather conditions are appropriate. They would provide the Environmental Commission with a 3 to 4 day notice of when they expect to conduct the burn. A representative of the Environmental Commission should apply for a burn permit immediately so that the Service can begin in the fall of 1997. Information regarding this application is included on the last page of this appendix.

Fields should only be burned after having been unmowed for two to three years. Prescribed burns should occur every 4 to 6 years. The burn should be conducted in either the fall or the spring. Spring and fall burns produce slightly different effects, and these effects should be evaluated after a few years of burning in order to determine whether one is more desirable than the other, or if a mix is best. This necessitates some record-keeping on behalf of the Environmental Commission. Experts from the Natural Resource Conservation Service or other experienced biologists should perform this evaluation.

The ten-year schedule below is set up to maintain 6 fields on a rotating basis. This schedule should be evaluated 2 years after the first prescribed burn, and 5 years after the first prescribed burn, in order to determine if the recommended regime is effective on this site. Experts in natural area management from the Natural Resources Conservation Service (Appendix 4) should review the plan and revise as needed.

Because the site is small compared to the area requirements for many grassland birds, it is very important that the field be divided into smaller sections and only maintained one portion at a time. Using this technique allows invertebrates and small mammals from adjacent fields to re-inhabit the burned or mowed areas after a maintenance activity. Figure 7 indicates field boundaries.

Field 1 should not be burned. It will maintained as habitat for bobolinks. This field should be mowed every 3 to 4 years.

MOW/BURN SCHEDULE

The following is a ten-year schedule outlining the mowing/management plan at the site. Please refer to Figure 7 for identification of the fields.

MOW/BURN SCHEDULE

YEAR	FIELD(S) TO MOW	FIELDS TO BURN
1997		5
1998	4	2
1999 (review plan)	1, 3	6
2000		4
2001		3
2002 (review plan)	1	5
2003		2
2004		6
2005		4
2006	1	3

SHRUB BORDERS

Edges of the fields need to be maintained as grasslands. Canopy trees at the edges of the forest (within 30 feet of the field edge) should be cut back, and berry-producing shrubs should be planted in these areas. Once planted, these edges should be mowed at a tall height (approximately 2 feet) with a brush-hog every 5 to 7 years, as needed, to keep them from succeeding to forests.

Hedgerows should be maintained, since they provide habitat for many wildlife species. However, if large trees (over 20 feet tall) become common, they will create an edge that may keep some grassland birds from using the site. They should be thinned out as needed.

RESEEDING

It may be beneficial to manipulate the plant species in the fields occasionally, depending on what species are promoted by the maintenance techniques above. This should be evaluated by a biologist from the Natural Resource Conservation Service (NRCS). If it is determined that a field should be reseeded, it can be disced and seeded with one of the following mixtures:

August 15 - October 1 Planting

Permanent Species	Seeding Rate (Lbs/Acre)
orchardgrass or endophyte free fescue	20
birdsfoot trefoil	8
cereal rye (temporary, fast cover)	15

March 1 - April 15 Planting

	Species	Seeding Rate (Lbs/Acre)
I	wheat or spring oats	30
	foxtail millet	15
	little bluestem	10
	birdsfoot trefoil	6
	switchgrass	5
OR		
II	orchardgrass or endophyte free fescue	20
	foxtail millet	15
	alfalfa	15
	birdsfoot trefoil	8
	and <u>one</u> of the two below (for temporary cover):	
	spring oats	32
	perennial ryegrass	10

Mixture for Wet or Poorly Drained Areas And Pond Borders

I	redtop	2
	OR reed canarygrass	15
	green foxtail	10
	round-headed bush clover	10
	alsike clover	4

OR

II	reed canarygrass	15
	alsike clover	7
	redtop	3

These mixtures are partially derived from information provided by the NRCS and "Guide to Developing Wildlife Habitat on Coal Mined Land" (produced by the Kentucky Department of Fish and Wildlife Resources).

A representative of the NRCS should also evaluate soil conditions and suggest appropriate additions of fertilizer and/or lime. The representative can also suggest the best planting technique for each mixture.

How to Obtain a Prescribed Burn Permit

Contact Mr. Edward Schoonmaker for information or to submit an application for a Prescribed Burn Permit:

NJ Forest Fire Service
20 Route 23
Franklin, NJ 07416

(201) 827-6100

The Forest Fire Service requires that the permittee send them a request for a prescribed burn permit that includes a map, the reasons for the burn request, and a management plan (the above section would probably suffice).

It is important that the applicant stress that the primary purpose of the burn is public safety via the reduction of the hazard of wildfire. By burning off accumulated dead vegetation, hazard of wildfire is limited. This is especially of concern to adjacent landowners. State secondary reasons of wildlife management for grassland species (some of which are endangered and threatened).

The Forest Fire Service will complete a Plan to Burn, which is a document which describes when what areas, and exactly how each area will be burned. The plan will also take into account any safety considerations, including smoke hazard to adjacent residents and roadways. Once their plan is filed, it is retained in their records. When the weather is right, they will contact the Township and conduct the burn. They will only burn between November and March 31.

The burn process will likely take less than one hour. The Service charges no fee for this service, since the Natural Area is public land.

Appendix G - Instructions for Construction and Maintenance of Bird and Bat Boxes

Diagrams for construction of bluebird/tree swallow boxes, wood duck boxes, American kestrel/screech owl boxes, and bat boxes are included in the following pages. These boxes should be placed as noted on Figure 6. All bird boxes should be cleaned out just prior to breeding season and before migrants arrive, which would be mid-February to mid-March in most cases. The kestrel/screech owl boxes should be cleaned out in the fall and/or in December. Mammal species such as mice and squirrels may use all bird boxes and must be evicted prior to the beginning of breeding season.

Blue bird boxes should be placed along forest or shrub edges or in hedgerows. Mounting the boxes on metal poles or installing metal predator guards would discourage predation and use of the houses by mice.

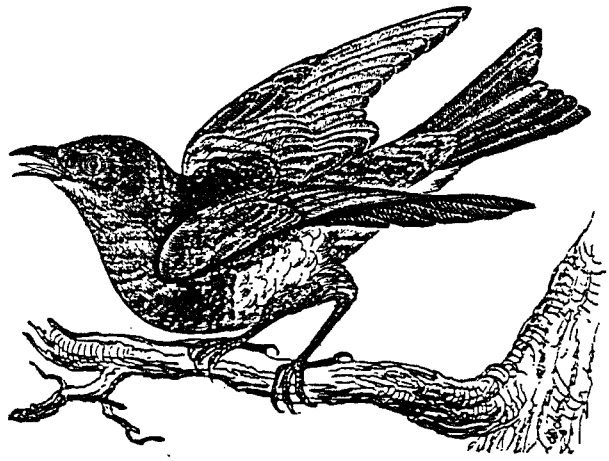
Kestrel/screech owl boxes should be placed along forest edges where fields are easily accessible for hunting.

A wood duck box should be placed in tall grasses bordering each of the two constructed ponds. These should be placed in the fall, winter, or early spring.

Bat boxes should be placed at least 10 feet high. Two potential locations are on the silo and/or on the utility line pole to the west of the gravel driveway. These boxes should face south or southeast so they provide warmth for brooding or hibernating bats.

EASTERN BLUEBIRDS

The Eastern Bluebird, slightly larger than a sparrow with a rusty red breast and bluish wings and back is a welcome resident of New Jersey. Bluebird populations decreased drastically in the 1950's and 1960's due to loss of farmland, increased use of pesticides like DDT, and competition for nesting sites with other birds, especially Starlings and House Sparrows. Try attracting these energetic song birds to your backyard. If your backyard is not a suitable location try convincing your local golf course, cemetery or park to allow you to place and maintain some nest boxes.



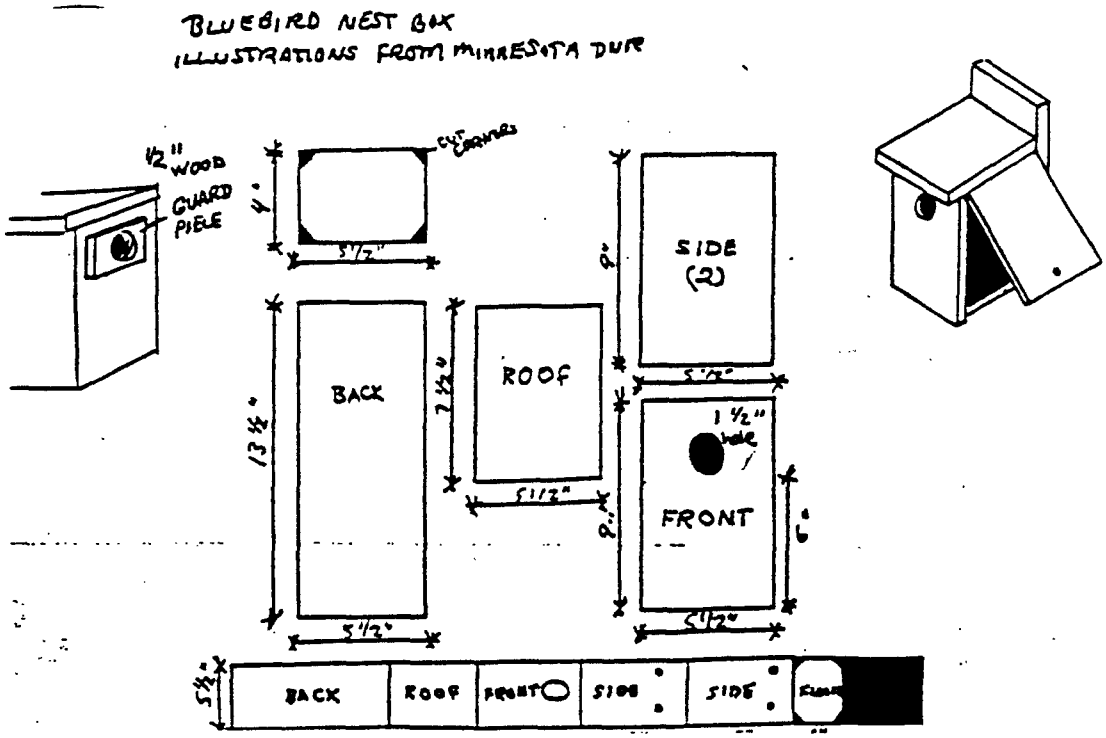
LOCATION

Bluebirds prefer large fields. You can place a nest box in a reasonably open area but not woods or deep shade. An open area with scattered trees, a considerable distance (about 100 yards) from buildings and where the ground is not covered with underbrush, tall grass or weeds. Pastures, fields, open waste lands, large lawns, cemeteries and golf courses are usually good locations.

The box should face an open area with a large tree, shrub or fence from 25 to 100 feet in front of the box. The young birds will usually reach this on their first flight and have a better chance of surviving their first few critical hours out of the nest. Do not place boxes closer than 100 yards or 300 feet apart.

PLACEMENT

Place the box 4 to 6 feet above the ground and install a predator guards on the pole or supporting structure. You can place the box a little higher where there is danger of vandalism or serious predator problems such as cats and dogs.



BLUEBIRD BOX DESIGN

- There are several good designs for building bluebird nesting boxes. Most important aspects are the entrance hole size, predator guard, and location.

- DO NOT use a perch in the front of the box. Bluebirds will not need it and other birds can land here and kill or harass the nest. Also, starlings and other birds can sit on the perch and enlarge the entrance for their own use.

- Install the box by the third week in February. Clean out the nest after each use by carefully lifting the roof. Remember to replace the roof securely when you are done. Bluebirds may even use the box more than once each season if cleaned out and ready. Avoid checking the box when birds are sitting on eggs or feeding young. Bluebirds are shy and your trail may lead predators to the nest.

- The hole size must be 1 1/2 inch in diameter. Larger holes will attract starlings or allow them to enter and destroy the bluebirds' nest.

- See designs on back for specific dimensions and instructions.

PREPARED BY: NANCY PAOLINI, United States Department of Agriculture, Soil Conservation Service 308 Milltown Road Bridgewater, NJ 08807 908-725-3848

References:

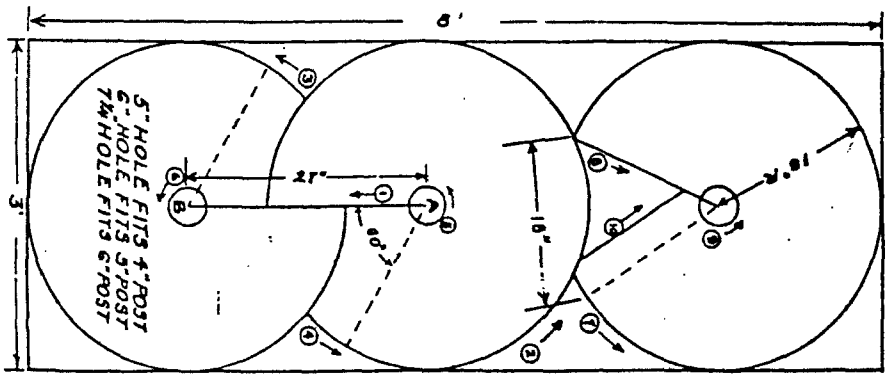
"A Field Guide to the Birds" by R. T. Peterson ; The Peterson Field Guide Series #1 Houghton Mifflin Co., Boston

"Bluebird Nesting Box Plans and Instructions" by The North American Bluebird society; Box 6295, Silver Spring, Md., 20906

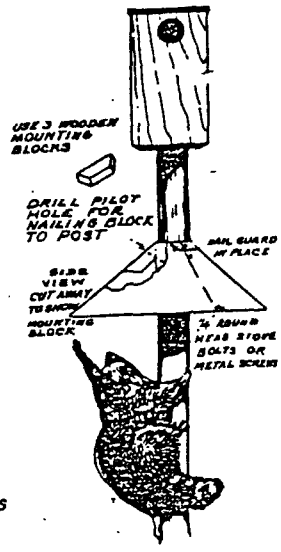
"Eastern Bluebirds - Creating a Wild Backyard" produced by Maryland Dept. of Natural Resources; Forest, Park and Wildlife Service

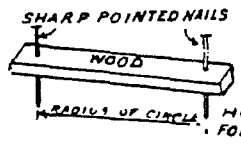
DRAWING: *"Animals: 1419 Copyright -Free Illustrations of Mammals, Birds, Fish, and Insects, etc."* Dover Publications, Inc. 31 East 2nd St. Mineola, NY 11501

HOMEMADE ANIMAL/PREDATOR GUARD



Cone-shaped sheet-metal guard for protecting nest structures from predators. At left is layout for cutting three predator guards from a 3 by 8 foot sheet of 26 gauge galvanized metal. When installing the guard, overlap cut edge to dotted line. See hole sizes. To facilitate cutting (on solid lines only) follow sequence of numbers. Make circular cuts in counterclockwise direction. To make initial cut on line A-B, make slot at A with a cold chisel for inserting shears.





HOME MADE COMPASS FOR SCRIBING METAL

Nest Boxes for Raptors:

A helpful management technique.

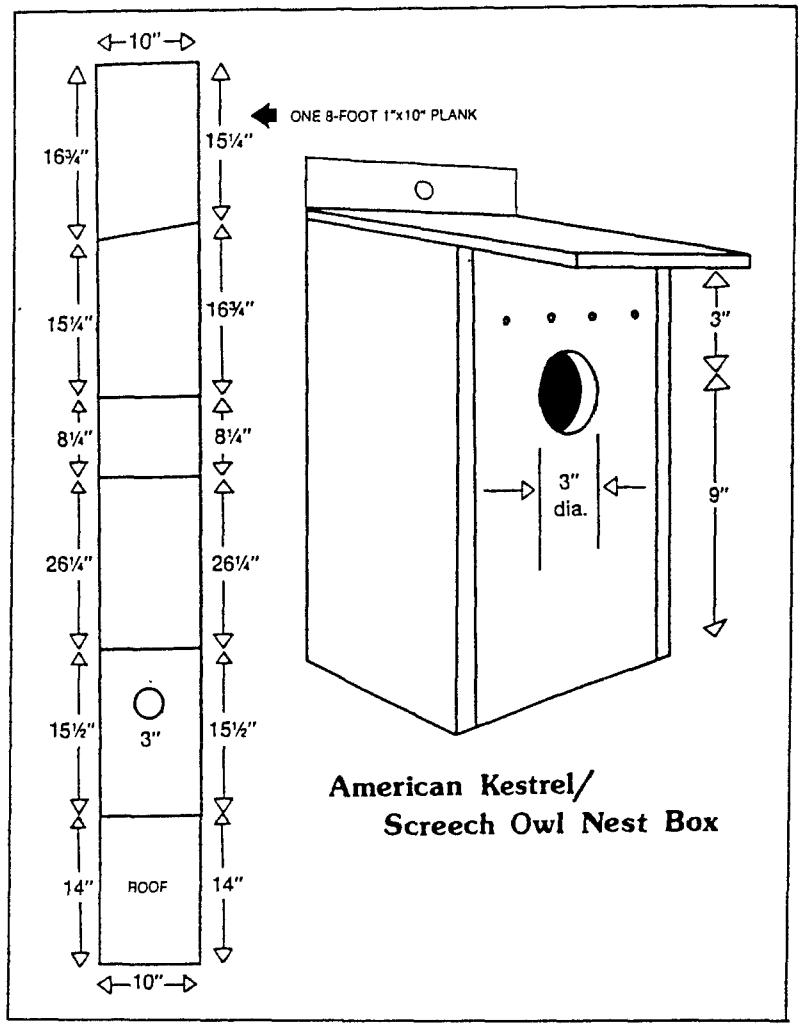
Many species of raptors-hawks and owls-that live in New Jersey have declined in numbers because of habitat loss. Within the habitat that remains, hole-nesting raptors cannot find suitable places to breed.

Even when hunting habitat and prey are available, the lack of a nest site can be the major reason for the non-productivity of a hawk or owl species in a given area. Old, dead trees, which provide the best natural sites for cavity-nesters, are often the first to be felled by landowners. With the recent emphasis on wood burning stoves, the accelerated loss of these sites could impact *all* hole-nesting species of birds. Whenever possible, we should try to preserve existing nest sites. Where sites do not at present exist, or have been destroyed, furnishing artificial nest sites is a feasible method for maintaining, or even increasing, populations.

Hole nesting raptors such as Barn Owls, Screech Owls, Barred Owls and American Kestrels do not build nests of their own. They rely on natural sites or those created by other birds or animals, including humans. All these birds will accept man-made nest boxes. When properly constructed and erected these raptor "bird houses" are readily inhabited and may be used year after year. Barn Owls, and to some degree Kestrels and Screech Owls, not only use these boxes but have adapted to man so well, that many spend their entire lives in close proximity to their human landlords. Attracting these birds is desirable not only for their ability to control rodents, but because they are interesting species to have close by for observation.

Many different types of nest boxes have been tried. The designs proposed here are simple, but functional, and can be made by anyone with tools found in most homes. Except for entrance hole size and placement, dimensions are not critical and may vary an inch or two one way or the other. You need not be a bonafide carpenter to construct a house any hawk or owl would be proud to live in. These designs are by no means the only acceptable ones but from experience, I can say these work.

Breeding failures in artificial boxes from predation, too much disturbance, and competition from other species can be minimized if the box is properly erected and monitored. It may be difficult to place a Barn Owl box in a silo or barn where it will be safe from a raccoon or cat, but this effort must be made to insure success. Starlings and Kestrels compete for nest sites and you may have to "evict" a few *Sturnus vulgaris* from your newly erected Kestrel box in the spring.



American Kestrel/ Screech Owl Nest Box

The number of boxes that can be placed in a given area is limited only by how many you are willing to build. Most raptors will defend their breeding territory and not allow others of their species to occupy that territory. The size of the area they defend varies depending on the species of raptor, availability of prey and other factors. I have found Barn Owls, Kestrels and Screech Owls all living in fairly small areas, occasionally all three species within one acre. Also on three adjacent farms I have found three Barn Owl families living within sight of each other. One owl box per silo or barn is enough and two or three Kestrel boxes spaced within a one or two acre field is adequate. But, within reason, the more boxes provided, the better the chances of some being found and used.

Materials and General Instructions

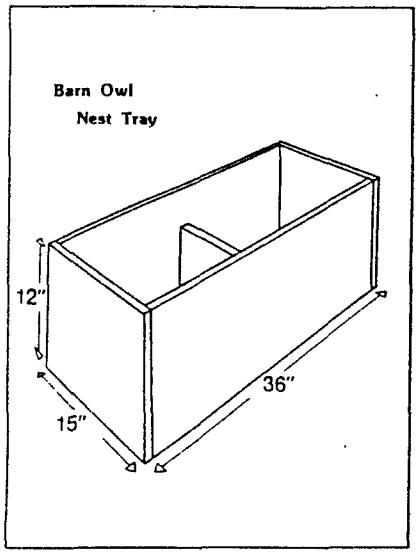
For boxes erected outside the best materials are 1" thick rough cut western cedar, cypress or redwood. All these will withstand weathering. Boxes which are placed inside buildings can be made of less expensive pine or plywood. If a wood preservative or paint is used, apply it only to the *exterior* of the box. When constructing closed boxes, the size of entrance holes and their height above the floor of the box are important and the dimensions given should be used. Proper hole size and placement will allow the birds to come and go freely and still keep a raccoon from entering or reaching the young.

Closed boxes should have the roof, or one side, hinged, providing access to the inside for cleaning and maintenance. Roofs can be shingled for added protection from the weather. Be sure nails and screws used in construction do not protrude inside the box. Generally, boxes should be mounted so the holes face southeast. In new or freshly cleaned boxes, a layer of pine shavings should be applied to the floor which will help contain the eggs and make incubation easier. Use only a one inch thick layer, no more, as eggs can get lost in shavings that are too deep. *Do not* use cedar shavings or sawdust. If ingested along with food, cedar oil can be dangerous and sawdust harmful to nostrils and eyes of the young birds.

For any nest box to be successful there are a few requirements which must be met regarding where and how the box is placed. First, proper habitat of each raptor must be chosen and within that habitat the proper type of nest box supplied for that bird. For instance, even a well constructed Barn Owl box will not be productive if placed in a wooded area. Barn Owls do not hunt or nest in woods, but are birds of open country.

So it is important to know something about the lifestyle of each raptor we are dealing with.

Let's then look at each individual species, see where it lives, what type of nest box it requires and how and where to place the boxes.



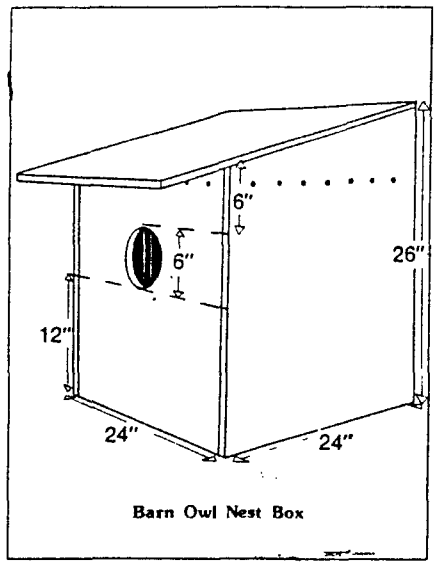
Barn Owl

Barn Owls live and breed throughout the entire state. Most are migratory, but some birds remain resident year around. They are birds of open terrain, hunting in fields, meadows and farmlands. It is not uncommon to find Barn Owls living in parks, deserted lots and along railroad tracks. These raptors, more than any others, spend their lifetimes in close proximity to man.

They nest in a wide variety of places including church towers, farm structures, semi-derelict (and often occupied) buildings, water tanks, under bridges, on drive-in movie screens and in silos and barns. Many potential nesting sites already exist and may only need slight modifications to allow Barn Owls to utilize them. Often, simply affording the birds access by unscreening a window, removing a slat from a steeple, or poking a hole here or there, will create an acceptable site.

Erecting nest boxes not only increases the available breeding sites for resident birds, but may attract birds into areas where they have not bred before. It may take a while for the box to be discovered and used, but not always. Two years ago in early June I installed a box in an unused silo where Barn Owls had been roosting. Three weeks later an owl was in the box, incubating eggs. She must have been waiting for me to show up with her nest.

Two designs work well for Barn Owls. The open tray type is the easiest and least expensive to construct. This type should be used inside a barn, silo or other building where a roof or covering already exists. Place the box high in the structure where it will be inaccessible to house cats, raccoons, or too much human disturbance. The box can be nailed fast or hung with rope, wire or brackets.



The closed box type can be used in a topless silo, attached to the outside of an existing structure, erected on a pole or placed in a tree. When erecting on poles or trees remember to choose open areas, fields, meadows, etc. and face the entrance hole south.

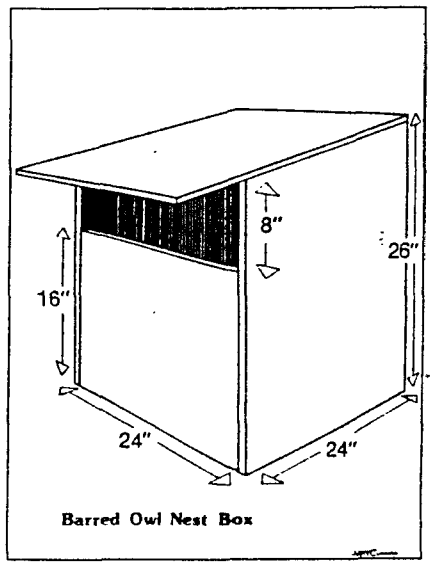
American Kestrel and Screech Owl

New Jersey's resident falcon, the American Kestrel; and our smallest breeding owl, the Screech Owl, occur statewide. Kestrels are resident throughout the year although some migrate. Screech Owls are basically non-migratory and remain in the same areas all their lives. The habitat in which both birds live is similar and the best boxes made for them are identical.

Kestrels are birds of open terrain, seldom entering woods. They hunt fields, shorelines, meadows, roadsides and other open areas. They are regularly seen perched atop telephone poles and utility wires or hovering in mid-air, searching the ground below for prey. Boxes should be placed in open spaces. Good locations are: trees along the edge of a woodlot, a lone tree in a field, on a barn or other farm building, or mounted on a pole. Constructing your own pole offers the advantage of being able to place the nest box anywhere. Open fields and meadows afford the hawks proper habitat to hunt mice, moles and their summer favorites – grasshoppers.

Boxes should be placed 12 to 20 feet above the ground. When using a pole or post for erection, a metal sleeve 30 inches wide should be wrapped around it and secured, to keep mammal predators from climbing to the box.

Screech Owls live in open woodland terrain. They are found not only in open country, but in lightly wooded areas, city and rural parks, small woodlots, and a particular favorite – apple orchards.



Barred Owl

This is not a common owl in New Jersey, but occurs rather locally throughout the state. Its status is officially listed as "threatened" (may become endangered if conditions surrounding the species begin or continue to deteriorate). Barred Owls are birds of dense wooded swamps and deep forests. Woodlands which border lakes, streams, marshes, or swamps are favored. The woods may be deciduous or coniferous, or mixed. They are sedentary owls and permanent residents in New Jersey.

Barred Owls almost always nest in hollow trees. They are large owls and require large cavities in which to breed. The decreasing number of such natural sites, plus the very specialized habitat requirements of this bird, have caused its numbers to diminish drastically.

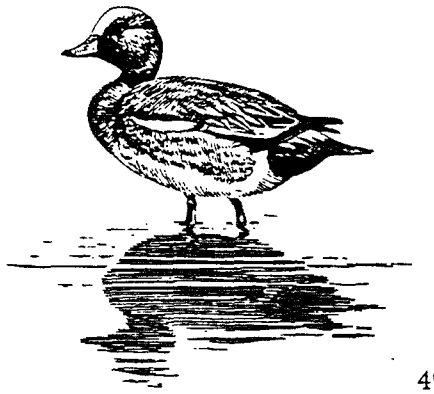
Historically, most artificial nest boxes for raptors have been built for Barn Owls, Screech Owls and Kestrels. To my knowledge, very few nest sites have ever been provided for Barred Owls. It may not be possible to expand the distribution of this species to any great extent, because of its habitat requirements, but supplying boxes in areas where these owls do exist could be highly beneficial in maintaining or even increasing their populations. It would be a worthwhile effort on our part to assist this beleaguered bird in any way we can.

The Raptor Trust
1390 White Bridge Road
Millington, N.J. 07946
908-647-2353

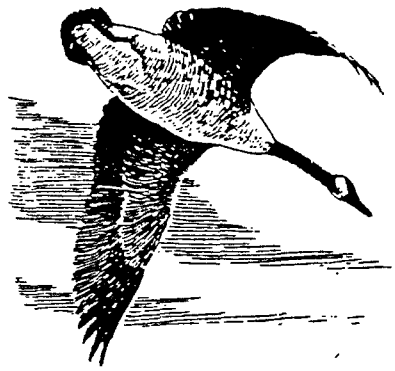
The following two pages are reproduced directly from the book entitled "Woodlands and Wildlife", produced by Penn State College of Agricultural Sciences in cooperation with the Department of Environmental Resources, Bureau of Forestry, and the Pennsylvania Game Commission in 1979 (pages 49, 50, and 51).

The scarcity of hollow trees often prevents wood ducks from living in otherwise suitable habitat. Wood duck habitat usually has equal parts of open water, emergent aquatic plants, and woody cover including some mature trees. You should save large mature trees that grow along stream bottoms or at the edges of lakes or ponds. Species that are adapted to moist sites and which are most likely to develop natural cavities include: sycamore, red maple, black gum, willows, and some oaks. Wood ducks need a 4-inch diameter entry hole and a 10-inch diameter nest cavity so look for trees 14- to 16-inch in diameter as potential nest sites.

Artificial nest boxes can substitute as wood duck nest cavities. Boxes of wood and metal are acceptable to wood ducks. Construct wooden boxes using the plans of the universal nest box illustrated on page 50. Metal boxes may last longer but they need special fabrication. Nest predation



can be minimized by the use of metal cones or guards on trees and posts. Mount boxes on posts at a height of 4 to 5 feet above water or 15 to 45 feet high on trees. Place several boxes in a group rather than singly, then add groups at 100-feet intervals as the boxes are occupied. Place the boxes so that the entrances are visible to the wood ducks. Put 3 to 5 inches of wood shavings in each box and replace this nesting litter each winter. Have your boxes up by March 1 so they are available when the first wood ducks return to seek nest sites.



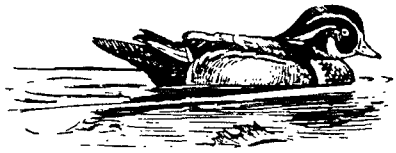
Nest structures constructed as cylinders, about 12 inches in diameter and 36 inches long, and erected horizontally attract both wood ducks and mallards. The materials may be 12-inch diameter furnace pipe or heavy-gauge mesh wire covered with graveled roofing paper. For wood ducks these cylinders should have wooden ends: one with an elliptical entrance hole and the other end partially open at the top to allow light in the box (to discourage starlings from nesting). For mallards, build the cylinders of chicken wire. Roll and fasten a 3-foot-by-3-foot piece to make a cylinder. Lay a 4-foot-by-3-foot piece flat and cover with 3 to 4 inches of long hay. Roll the second piece, with hay, around the first (inside) cylinder and fasten. Mount the assembled cylinder between stakes with cross bars to support the nest about 12 inches above the water surface. Face the cylinders at right angles to the prevailing winds. Wild mallards may be more reluctant to use darkened nest structures than mallards that have been propagated and released.

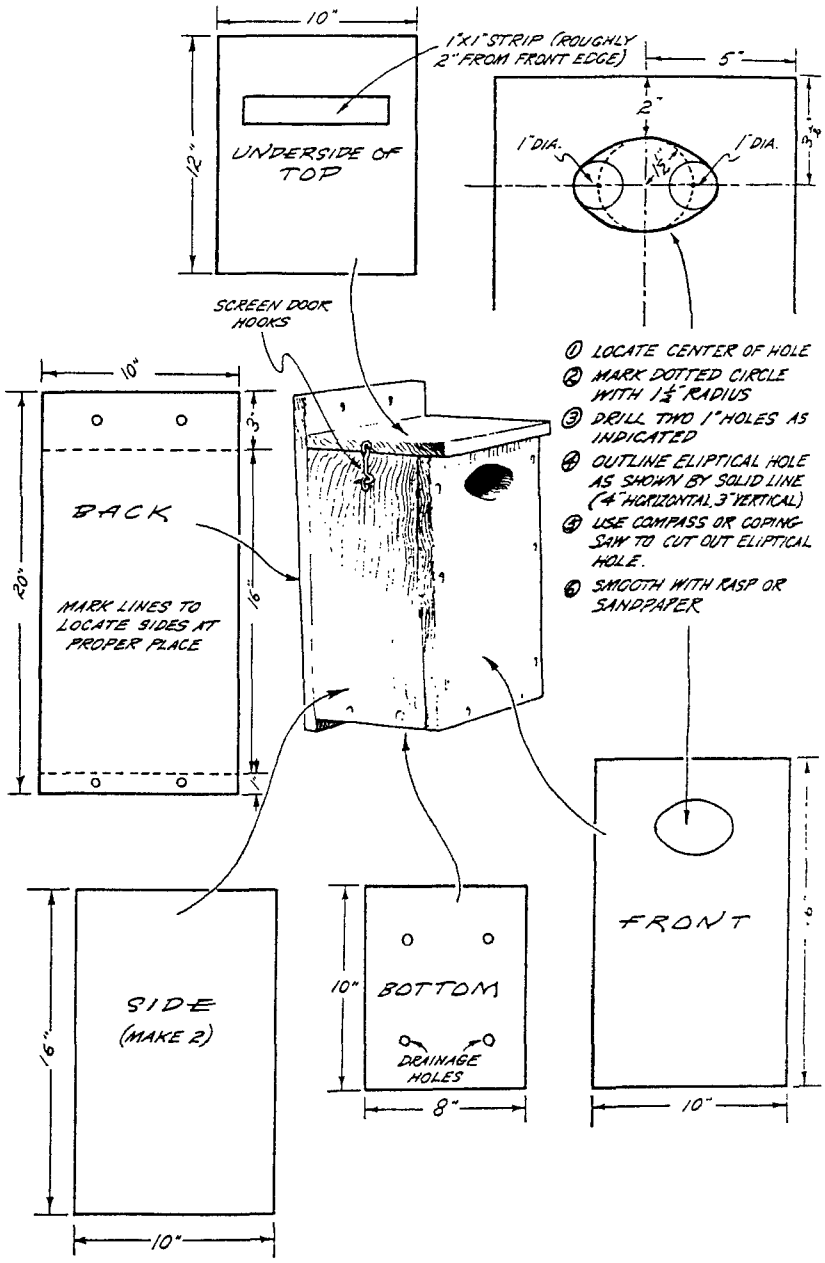
Universal Nest Box for Wood Ducks, Squirrels, Screech Owls, and Sparrow Hawks

Materials

1 piece	1 x 10 x 20 inches	— back
3 pieces	1 x 10 x 16 inches	— front and sides
1 piece	1 x 10 x 12 inches	— top
1 piece	1 x 10 x 8 inches	— bottom
1 piece	1 x 1 x 8 inches	— strip inside top

20 8-penny galvanized or alumnium nails
4 lath nails for strip inside top
2 screen-door hooks and eyes to attach top





Directions for Assembly

1. An 8-foot board, rough cut 1 x 10 inches, is enough for each box. Select well-seasoned, air-dried, white oak which will withstand years of weathering. Use rough sawn, unplaned wood. Cut pieces to size.

2. Cut the hole. For wood ducks cut an elliptical hole according to the diagram. For screech owls and sparrow hawks cut a 3-inch round hole in the front. For squirrels cut a 3-inch round hole on one side near the back. Top edge of the hole should be 2 inches from the top of the front or side. Tack a 3-inch strip of window screen from hole to bottom of box to enable young wood ducks to climb out.

3. Drill several ¼-inch holes in the bottom for drainage.

4. Drill ¼-inch holes at the top and bottom of back piece to erect the box.

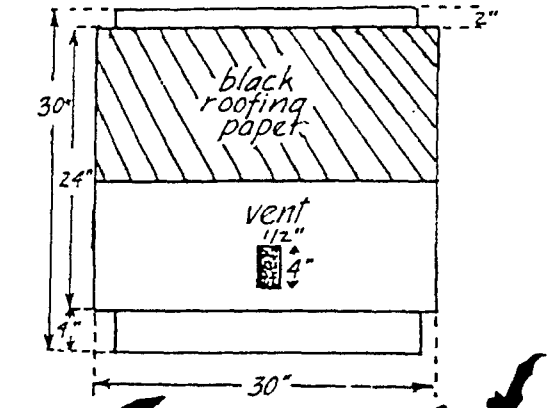
5. Nail strip on underside of the top.

6. Drill ⅛-inch holes for all 8-penny nails to facilitate nailing in oak.

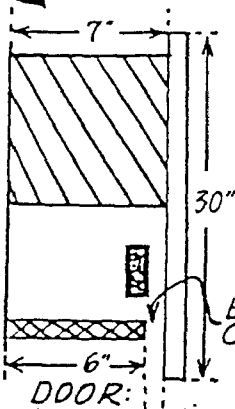
7. Install screen-door hooks to hold top securely.

PENNSYLVANIA BAT BOX, PENN STATE UNIVERSITY & PA GAME COMMISION

FRONT

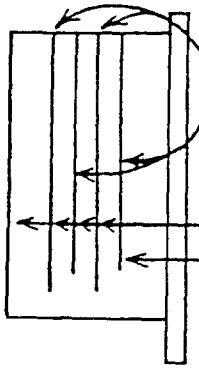


SIDE



DOOR: plastic netting 1/4" diam. mesh

SIDE (CUTAWAY)



CAPACITY: 150-200 BATS

ORIENT BOX TO SE or SW. NEEDS 6 HRS. IN SUN IN AM & PM. ORIENT TO GET +SUN N of PA; -SUN S of PA

ATTACH BOX AT LEAST 10' HIGH ON POLE or BLDG.

TOOLS REQUIRED:
- CIRCULAR SAW
- JIG SAW
- DRILL
- SCREWDRIVER.

MATERIALS: *do NOT use wood glue for any part of this project!!*
- 3/4" BOARD or EXTERIOR GRADE PLYWOOD for FRONT, BACK & SIDES
- 3/4" BOARD or 1/2"-3/4" EXTERIOR PLYWOOD FOR ROOF
- 1/4" LIGHT PLYWOOD FOR INTERIOR BAFFLES
- LATEX SILICONIZED CAULK • BLACK ROOFING PAPER
- LATEX PAINT or STAIN - DARK BROWN
- EXTERIOR GRADE DECK SCREWS • GALVANIZED FINISHING NAILS

ASSEMBLY:
1. CUT OUT PIECES. CUT VENTS in FRONT & SIDES USING JIGSAW
2. USING KNIFE or SAW, ROUGHEN ALL INTERIOR SURFACES w/ HORIZONTAL SCRATCHES: 1/4-1/2 APART FOR BATS TO CLING TO. PAY SPECIAL ATTENTION to LANDING BOARD AT BOTTOM of BOX
3. ATTACH FRONT TO SIDES w/ DECK SCREWS; CAULK SEAMS
4. ATTACH ROOF (slant to promote water runoff) TO SIDES & FRONT w/ DECK SCREWS; CAULK SEAMS
5. INSTALL 2: 1"x1"x22" INTERIOR SPACER STRIPS on INSIDE of FRONT PIECE w/ FINISHING NAILS. MAKE SURE STRIPS FIT SNUG AGAINST SIDE PIECES.
6. ATTACH 1ST 1/4" x 28 1/2" x 22" BAFFLE TO SPACER STRIP w/ FINISHING NAILS.
7. INSTALL 2, 1"x1"x22" INTERIOR SPACER STRIPS on BAFFLE & UP AGAINST SIDES OF BOX w/ FINISHING NAILS.
8. ATTACH 1/4"x28 1/2"x21" BAFFLE TO SPACER STRIPS w/ FINISHING NAILS.
9. INSTALL 2, 1"x1"x22" INTERIOR SPACER STRIPS on PRECEEDING BAFFLE, BE SURE SPACER STRIPS FIT SNUGLY AGAINST SIDES
10. ATTACH 1/4"x28 1/2"x22" BAFFLE TO SPACER STRIPS
11. INSTALL 2, 1"x1"x22" INTERIOR SPACER STRIPS on BAFFLE & UP AGAINST SIDES OF BOX w/ FINISHING NAILS.
12. ATTACH 1/4"x28 1/2"x21" BAFFLE TO SPACER STRIPS w/ FINISHING NAILS
13. ATTACH BACK of BOX TO ROOF & SIDES. CAULK SEAMS.
14. PAINT/STAIN EXTERIOR w/ LATEX BASED STAIN. DO NOT STAIN INTERIOR
15. ATTACH ROOF PAPER to ROOF. CAULK SEAM WHERE ROOF MEETS BACK PANEL
16. TACK ROOF PAPER: TO FRONT & SIDES; EXTEND 12" DOWN FROM TOP. THIS CREATES A TEMPERATURE GRADIENT FROM TOP to BOTTOM of BOX. (this is very important!)
17. TACK PLASTIC MESH: BOTTOM of BOX: LEAVE 1" CRACK for BATS TO ENTER

INSTALLATION:
1. INSTALL BOX BEFORE (SEASON) COLONY TO BE EVICTED
2. DO NOT PLACE IN AN AREA WHERE DROPPINGS WILL BE A NUISANCE

MAINTENANCE:
1. DO NOT DISTURB: BATS ARE PRESENT. INSPECT WINTER: REPAIR
2. FALL/WINTER: REMOVE WASP'S NEST w/ STICK - NO SPRAYS

ALL THIS WAS DESIGNED BY LISA WILLIAMS: home: 814-364-2344 work: 814-865-2130

Appendix H - Phone Numbers of Contacts for Management Support

Amy S. Greene Environmental Consultants, Inc. 18 Commerce Street Plaza Flemington, NJ 08822 Cartographer - Lee Brancheau Biologist - Peg Brancheau	(908) 788-9676
USDA - Natural Resource Conservation Service 1370 Hamilton Street Somerset, NJ 08873 Tim Dunne	(908) 735-0733
Paul Berry (preliminary plans for nature observation station at cinder block building)	(908) 781-2585
New Jersey Forest Fire Service 20 Route 23 Franklin, NJ 07416 Edward Schoonmaker	(201) 827-6100
NJ Department of Environmental Protection, Office of Natural Land Management, Endangered and Threatened Species Program CN 404 Trenton, NJ 08625-0404 Thomas Breden or Elena Williams	(609) 984-1339
NJ Department of Environmental Protection Office of Natural Land Management CN 404 Trenton, NJ 08625-0404 Martin Rupp	(609) 984-0097
NJ Department of Environmental Protection Division of Fish, Game, and Wildlife CN 400 Trenton, NJ 08625 Senior Zoologist - Mike Valent	(609) 292-2965

R.J. STAHL NATURAL AREA

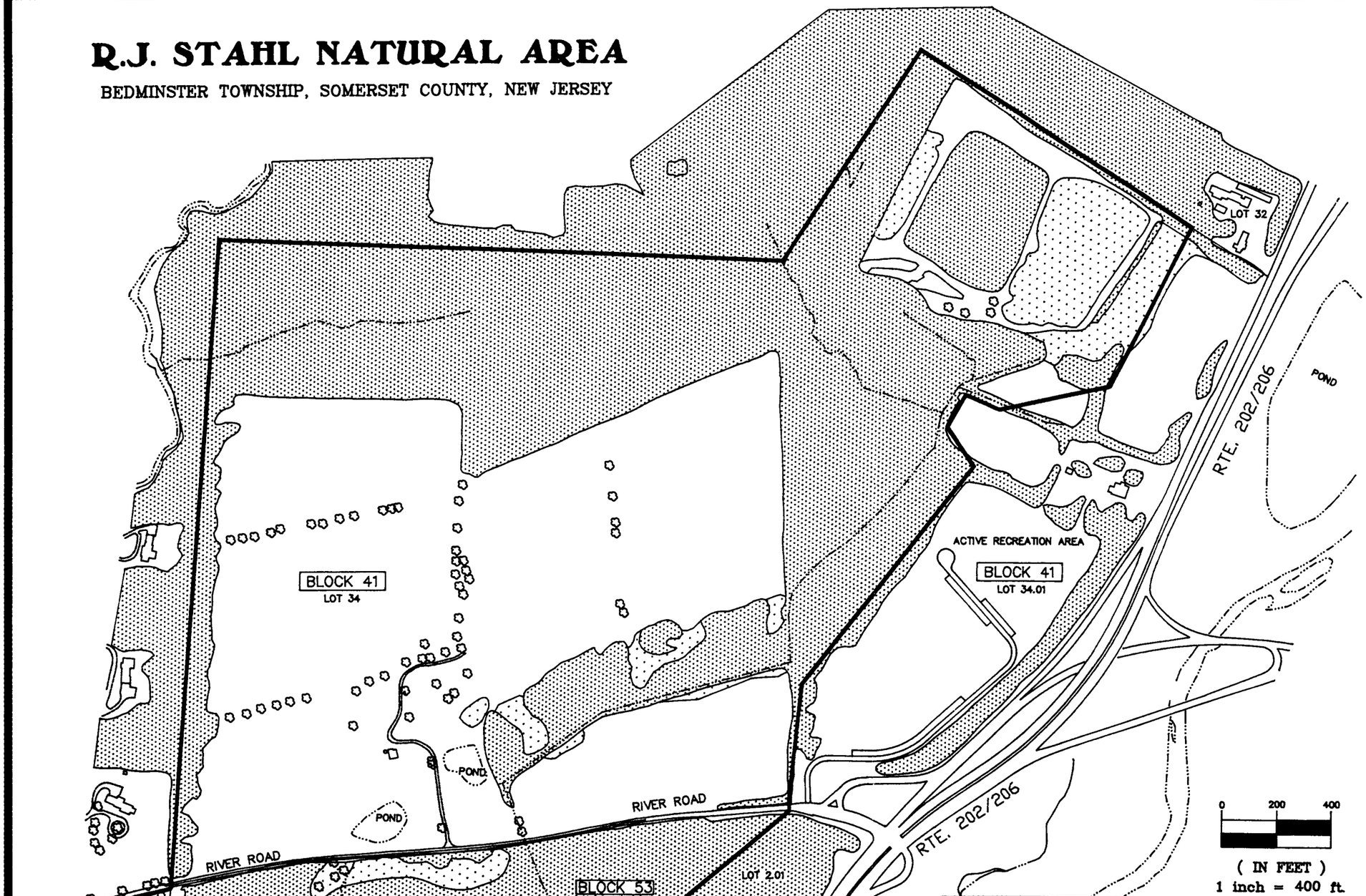
BEDMINSTER TOWNSHIP, SOMERSET COUNTY, NEW JERSEY

GENERAL COVER TYPES:

FOREST

FIELD

SHRUB



NOTES:

DIGITAL BASE MAP PROVIDED BY THE BEDMINSTER TOWNSHIP ENVIRONMENTAL COMMISSION & PREPARED BY FERIERO ENGINEERING INC., PLAN ENTITLED "R.J. STAHL NATURAL AREA, LOT 34 BLOCK 41, BEDMINSTER TOWNSHIP, SOMERSET COUNTY, NEW JERSEY", SHEET 1 OF 1, DATED 9/14/94, LAST REVISED 9/22/94.

FOREST, SHRUB, POND, AND WETLAND LINES WERE MODIFIED BY AMY S. GREENE ENVIRONMENTAL CONSULTANTS, INC. BASED ON AERIAL PHOTO INTERPRETATION OF THE 1995 SOMERSET COUNTY PLANNING BOARD AERIAL #95-A45B6, SHEET F5, AND FIELD INVESTIGATION.

FIGURE 2
NATURAL AREA MAP

AMY S. GREENE
ENVIRONMENTAL CONSULTANTS, INC.
18 COMMERCE STREET PLAZA
FLEMINGTON, NJ 08822
(908) 788-9676

DATE:	DRAWN:	CHECKED:	APPROVAL:
5/8/1997	LWB	MRB	ASG

R.J. STAHL NATURAL AREA

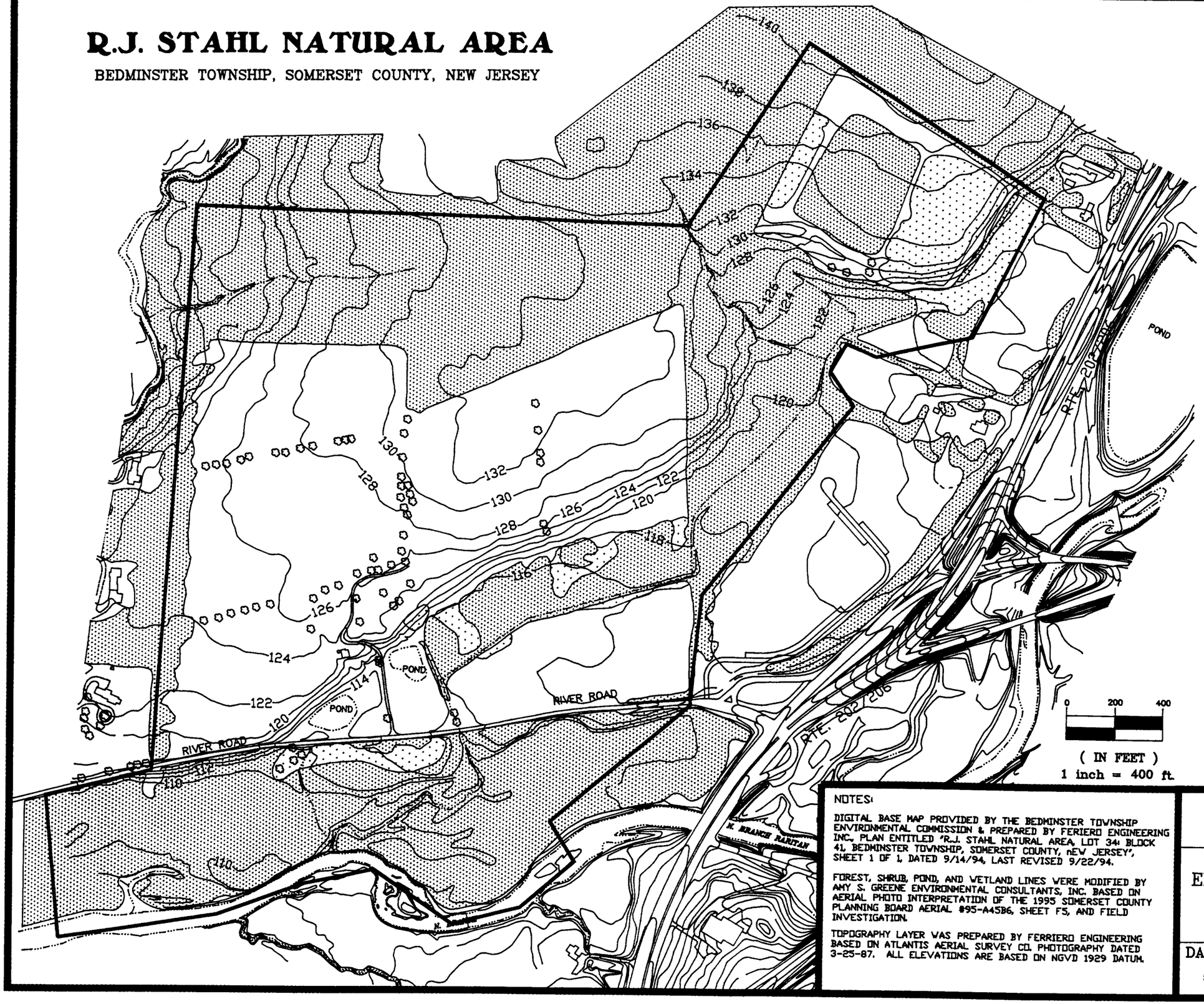
BEDMINSTER TOWNSHIP, SOMERSET COUNTY, NEW JERSEY

GENERAL COVER TYPES:

FOREST

SHRUB

FIELD



NOTES:

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TOPOGRAPHY LAYER WAS PREPARED BY FERRIERO ENGINEERING BASED ON ATLANTIS AERIAL SURVEY CO. PHOTOGRAPHY DATED 3-25-87. ALL ELEVATIONS ARE BASED ON NGVD 1929 DATUM.

FIGURE 3
TOPOGRAPHIC MAP

AMY S. GREENE
ENVIRONMENTAL CONSULTANTS, INC.
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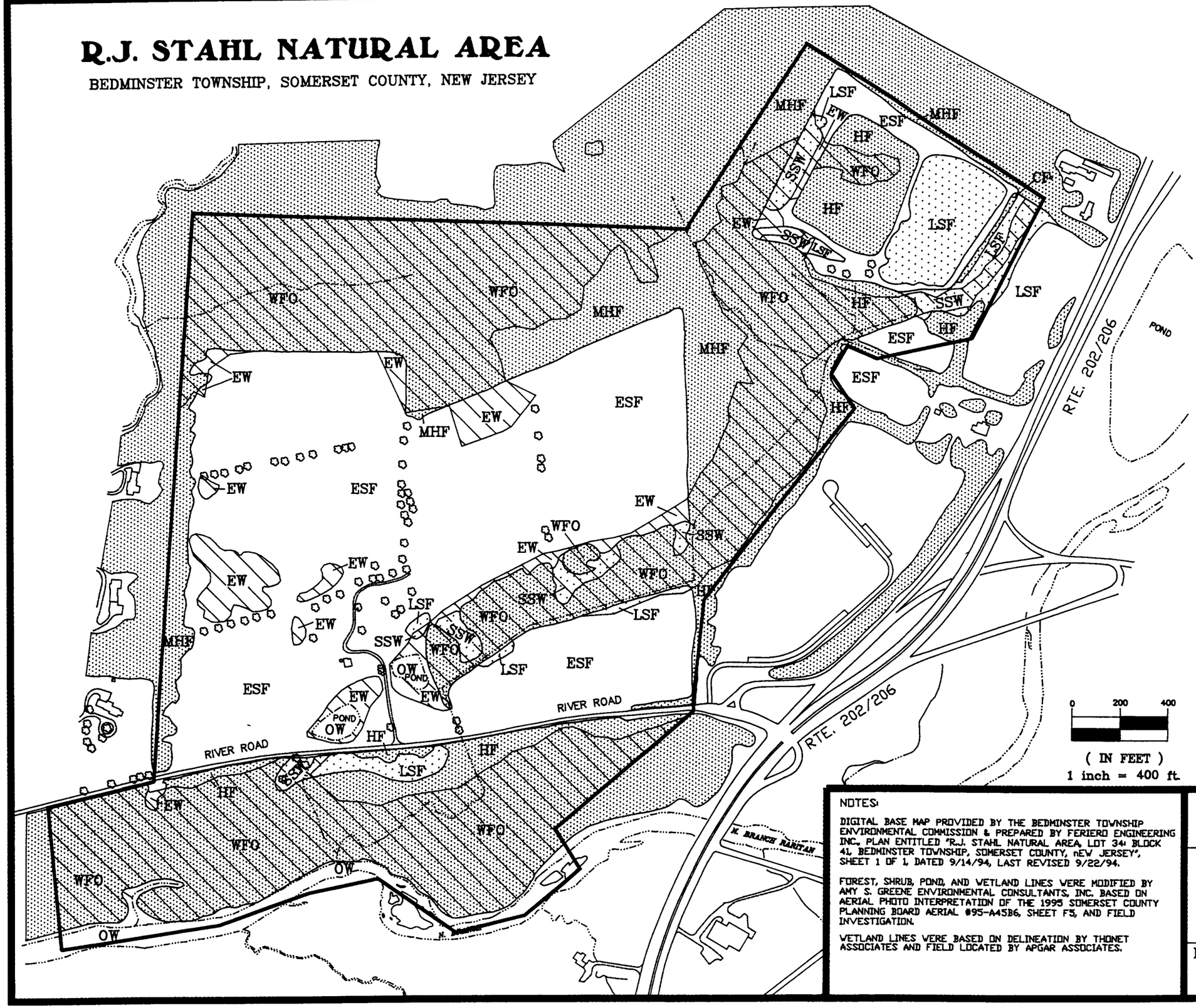
R.J. STAHL NATURAL AREA

BEDMINSTER TOWNSHIP, SOMERSET COUNTY, NEW JERSEY



GENERAL COVER TYPES:

FOREST

FIELD

SHRUB

WETLAND

SPECIFIC VEGETATION COMMUNITIES:

ESF	EARLY SUCCESSIONAL FOREST
LSF	LATE SUCCESSIONAL FOREST
HF	HARDWOOD FOREST
MHF	MATURE HARDWOOD FOREST
CF	CONIFEROUS FOREST
EW	EMERGENT WETLAND
SSW	SCRUB/SHRUB WETLAND
WFO	FORESTED WETLAND
OW	OPEN WATER

NOTES:

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WETLAND LINES WERE BASED ON DELINEATION BY THONET ASSOCIATES AND FIELD LOCATED BY APGAR ASSOCIATES.

FIGURE 5
VEGETATION COMMUNITIES

AMY S. GREENE
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FLEMINGTON, NJ 08822
(908) 788-9676

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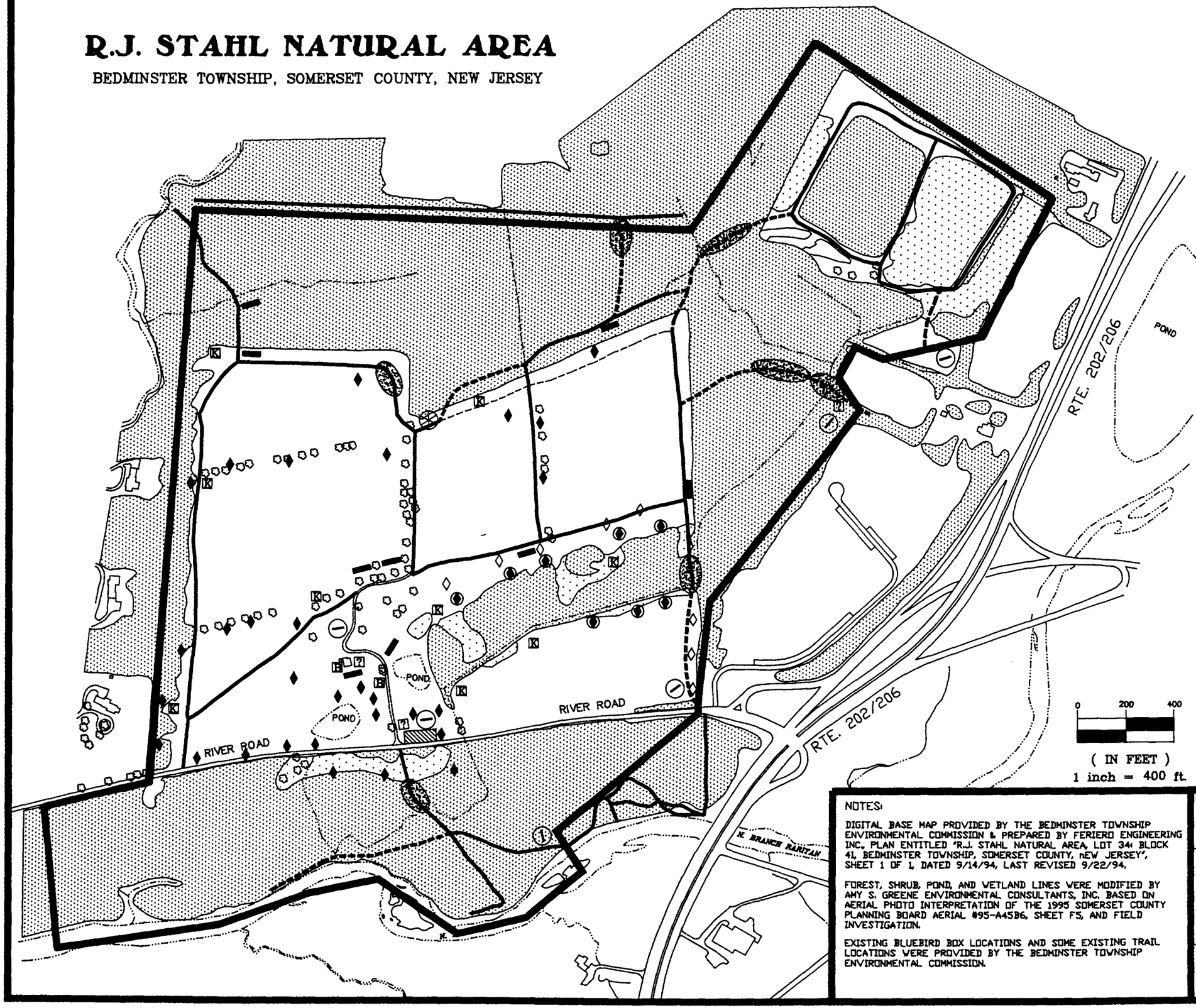
5/8/1997	LWB	MRB	ASG

R.J. STAHL NATURAL AREA

BEDMINSTER TOWNSHIP, SOMERSET COUNTY, NEW JERSEY



GENERAL COVER TYPES:

- FOREST
- FIELD
- SHRUB

TRAILS AND SUGGESTED IMPROVEMENTS:

- EXISTING TRAIL
- PROPOSED TRAIL
- EXISTING TRAIL TO BE CLOSED
- INFORMATION BOX
- BENCH
- OBSERVATION BLIND
- SIGN
- PROPOSED GRAVEL PARKING LOT
- EXISTING BLUEBIRD BOX
- BLUEBIRD BOX TO BE MOVED
- RELOCATED BLUEBIRD BOX
- NATURAL FILL MATERIAL OR BOARDWALK NEEDED.
- BAT BOX
- KESTREL/SCREECH OWL BOX

NOTES:

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EXISTING BLUEBIRD BOX LOCATIONS AND SOME EXISTING TRAIL LOCATIONS WERE PROVIDED BY THE BEDMINSTER TOWNSHIP ENVIRONMENTAL COMMISSION.

FIGURE 6
SUGGESTED IMPROVEMENTS

AMY S. GREENE
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FLEMINGTON, NJ 08822
(908) 788-9676

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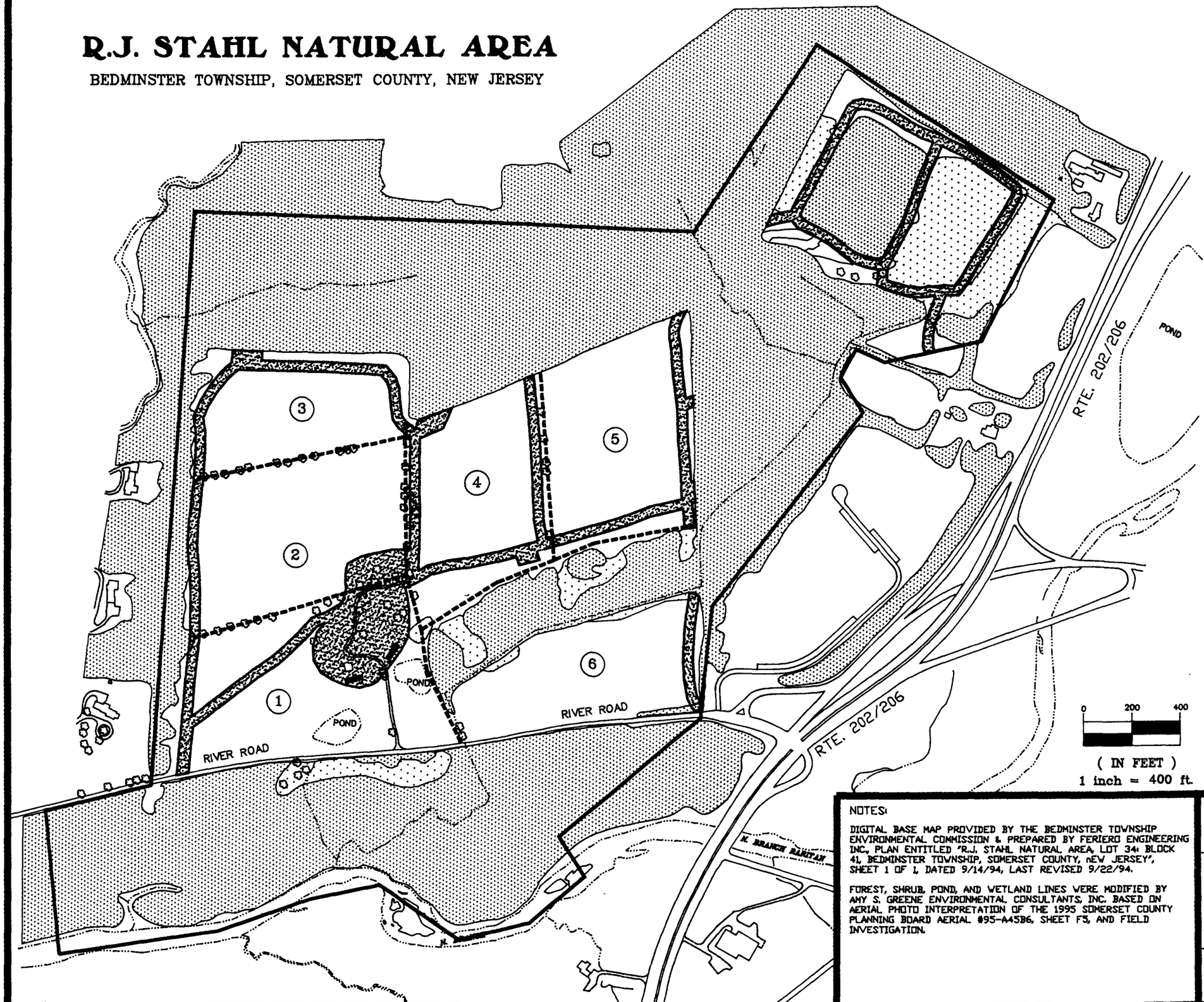

GENERAL COVER TYPES:

- FOREST
- FIELD
- SHRUB

MOWING & MAINTENANCE:

- SHORT GRASS MAINTENANCE (2–6")
- (1) FIELD NUMBER DESIGNATION
- ---- FIELD BOUNDARIES

NOTES:

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FIGURE 7
MOWING PLAN

AMY S. GREENE
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(908) 788-9676

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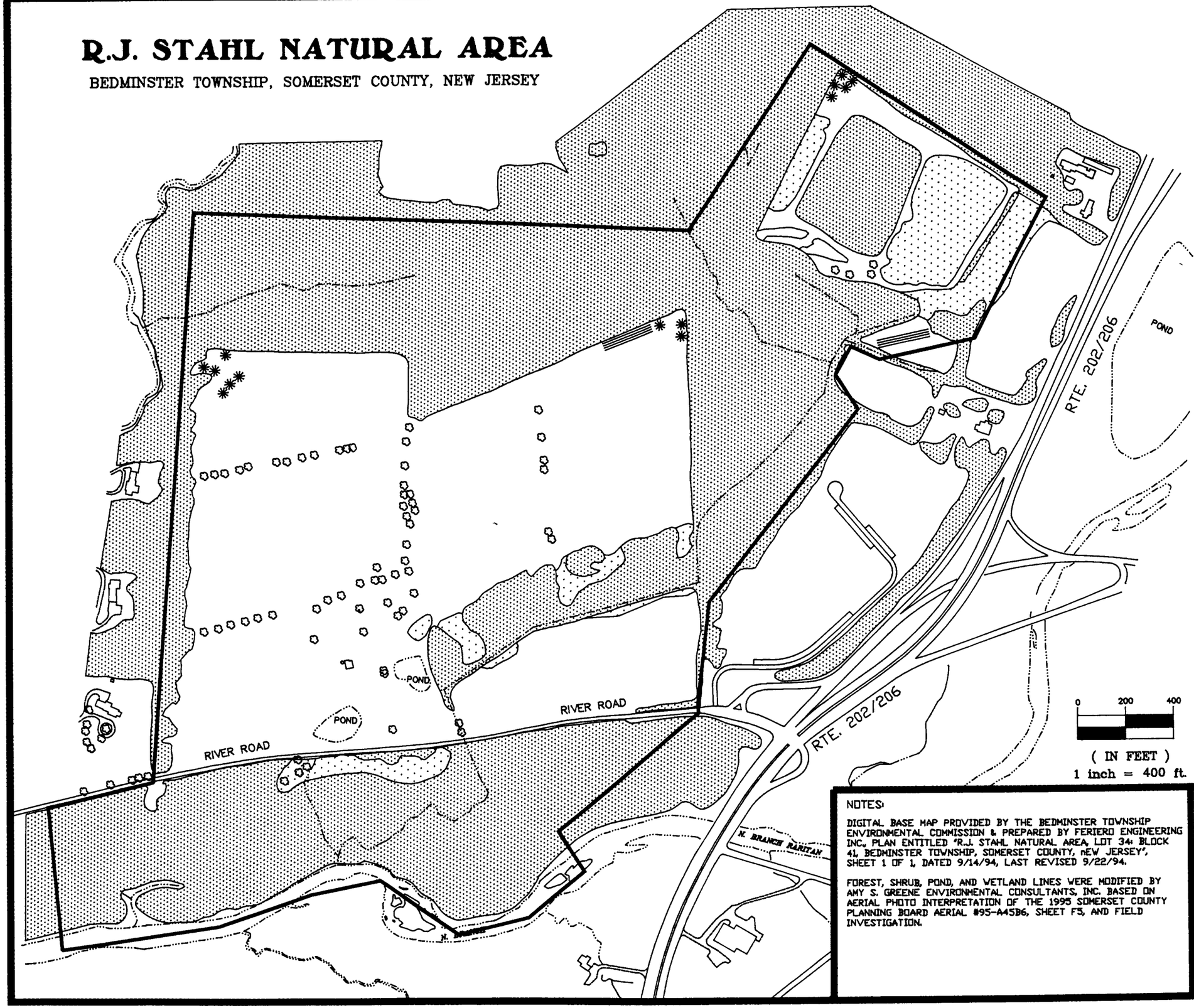
R.J. STAHL NATURAL AREA

BEDMINSTER TOWNSHIP, SOMERSET COUNTY, NEW JERSEY



GENERAL COVER TYPES:

FOREST

FIELD

SHRUB

SUGGESTED PLANTINGS:

APPLE TREE PLANTING

CORN PLANTING

NOTES:

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FIGURE 8
SUGGESTED PLANTINGS

AMY S. GREENE
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