

MANAGEMENT PLAN FOR  
NOCKUM HILL WILDLIFE REFUGE  
BARRINGTON, RHODE ISLAND

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## INTRODUCTION

This document presents a plan for the management and protection of Nockum Hill, a 75-acre upland/salt marsh peninsula extending into the Barrington River/Hundred Acre Cove estuary in Barrington, Rhode Island, (Fig. 1). This area represents one component of an estuarine habitat complex which has been identified by multiple agencies as a highly significant natural area in Rhode Island (Golet 1988, Dowhan 1991, EPA, RI Natural Heritage Program); it ranked highest on the list of important wetland systems in Rhode Island compiled by the Department of Environmental Management (RI DEM 1988). An expansive strip of shrub-dominated habitat extends easterly from Nockum Hill along a power-line right-of-way, forming an open corridor for wildlife movement to the Palmer River and its associated environs. Coupled with its setting in the Barrington River, the site represents a critical component of the Town's largest remaining area of open space. Additionally, Nockum Hill is the only nesting site of the Diamondback Terrapin (*Malaclemys terrapin*) in the state; the terrapin population is one of the largest in New England, estimated at 120 nesting females (Bush and Auger 1990). Bird studies conducted in the adjacent salt marshes of Hundred Acre Cove documented the presence of nesting populations of several special interest species (e.g. Clapper Rail, Seaside Sparrow, Marsh Wren) and the greatest overall species richness of any East Bay marsh (Reinert 1981). Finally, the area represents a scenic focal point to thousands of daily travellers using the Wampanoag Trail, and also embodies those values generally associated with coastal wetlands, including floodwater storage, nutrient retention and removal, sediment trapping, shoreline anchoring, and educational opportunities.

The Town of Barrington recognizes these values, and via conservation zoning plans to manage the area as a wildlife refuge. Wildlife inventories have been conducted, and this document sets forth a plan for the management of Nockum Hill as a Wildlife Refuge; the plan is designed to maintain or enhance the area's numerous existing values in perpetuity.

Principal management objectives for the refuge will be the protection of the terrapin population and maintenance of habitat diversity. Other objectives include educational, scientific and passive recreational use. The 35 acres of land already leased for agriculture will continue to be farmed, using agricultural practices accepted by the Management Committee. Periodic alterations of plant communities (e.g. burning, harrowing, cutting) will be required to meet these objectives; however, such habitat manipulations will be kept to a minimum. Additional conservation challenges in this estuary involve the protection of the water quality of the cove, limitation of further residential development along adjacent unprotected upland tracts, acquisition of adjacent lands, and appropriate management of the estuarine waters surrounding the point.

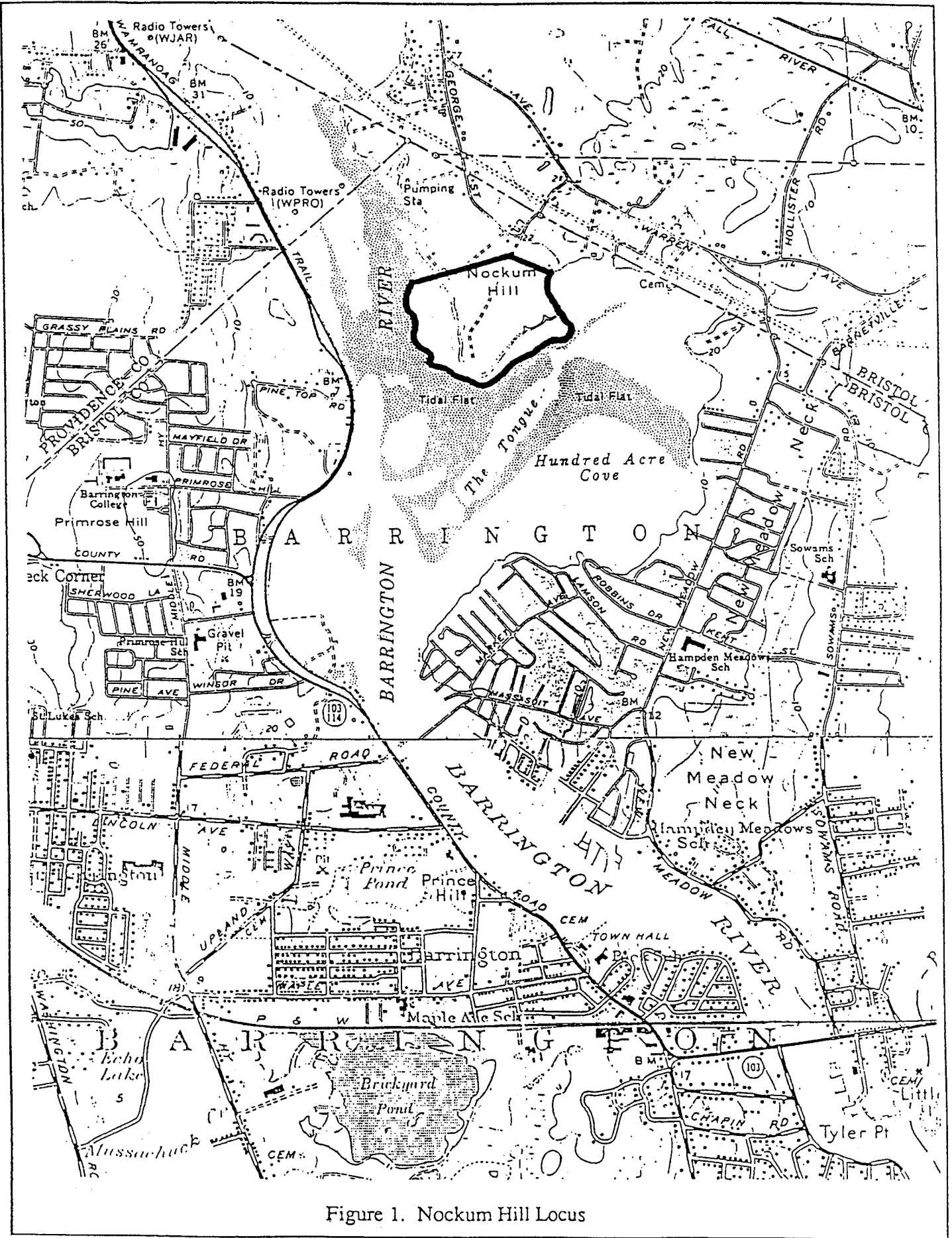
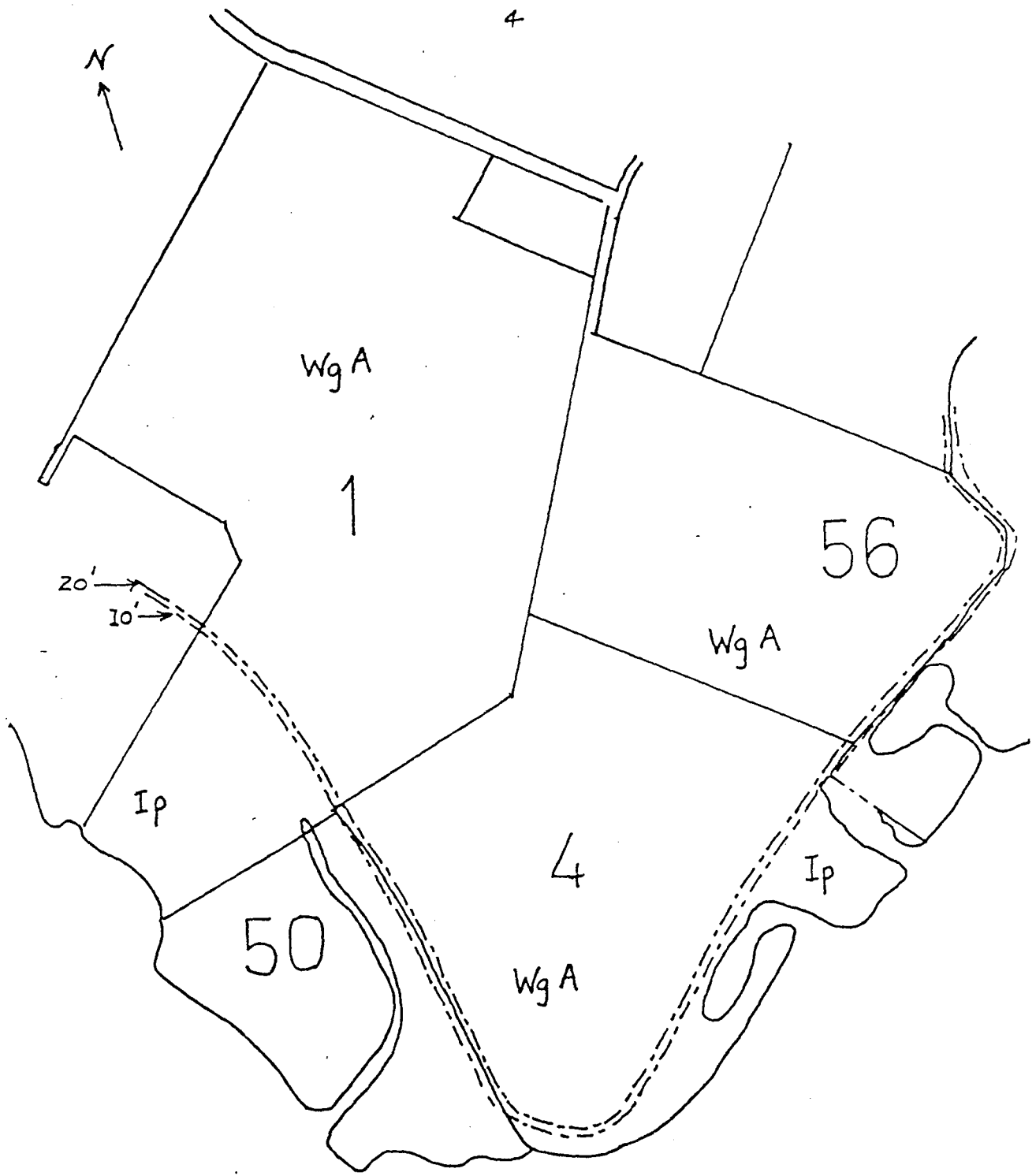


Figure 1. Nockum Hill Locus

Nockum Hill is an 80-plus acre promontory in Barrington, Rhode Island, which extends into the Barrington River immediately to the northwest of the Hundred Acre Cove estuarine complex (Fig. 1) (Plat 37, Lots 1,4,50,56; USGS topographic quadrangle=East Providence; lat-long=3414-0711) The upland plateau is bordered by broad strips of salt marsh on its east and west margins. A narrow *Spartina alterniflora* fringe marsh borders the southern edge. Throughout the perimeter of the peninsula, the low salt marsh habitats give way to a forested slope of approximately 10-20 m in width. The slope is greatest at the southern tip of the point which, with little marsh to buffer the actions of the tidal waters, has eroded substantially in recent decades. The top of the slope gives way to a broad highland, featuring little topography.

The soils of the Nockum Hill upland are sandy throughout (Fig. 2) and support a diversity of habitats, principally due to past and present management practices (Fig. 3). An abandoned orchard, now grown to deciduous forest, covers 3.3 ha (8.1 acres) in the northern sector of the study area. The orchard forest is interrupted by a wide strip of shrub and shrub/herbaceous habitats which have overgrown an area used for sewage sludge composting in the early 1980's. Large areas of vegetation and soil were stripped from the southern sector of the point in the 1970's. Much of this area has now succeeded to a mixed shrub/herbaceous cover; disturbed areas remain as bare sand (Fig. 3). An oak-dominated deciduous forest covers the slope, and at its low end grades into a narrow (3-6m) zone of *Phragmites australis* which borders the salt marsh. The marsh to the east side of the peninsula is co-dominated by low marsh *S. alterniflora* and salt meadow habitats (salt meadow is comprised of the high marsh grasses *Spartina patens*, *Distichlis spicata*, and the rush, *Juncus gerardi*), with lesser coverage of the high marsh form of *S. alterniflora*. The west marsh is dominated by salt meadow, with strips of low marsh *S. alterniflora* bordering the tidal creeks and ditches. Two upland islands interrupt this sector of marsh, each bordered by substantial zones of high tide bush (*Iva frutescens*) (Fig. 3). Salt marsh habitats total 23.1 acres (9.4 ha).

Nockum Hill has figured prominently in Barrington's history. It is the site of one of the first Baptist Meeting Houses in the New World, and the first shots of King Philip's War were fired nearby. Since that time, it has been used for various forms of agriculture. In the 1930's it hosted a tearoom and later, a fried chicken restaurant. The town purchased the land in the 1960's, removed much of the topsoil, and created a pistol range for target practice for local police. The central area was the site for an aborted effort to compost sewer sludge in the 1970's; a building remains from that project.



SOIL TYPES - Ip Ipswich peat  
 WgA Windsor loamy sand  
 ELEVATION above sealevel -----  
 PLAT #37, LOT #'s 3

Fig. 2. Soils



HABITAT CODES	
	Tidal Water
	Dirt Road
AF	Agricultural Field
AO	Abandoned Orchard
	Forest
BS	Bare Sand
DF	Deciduous Forest
IF	Iva frutescens
PA	Phragmites australis
PE	Planted Evergreen
	Trees
S	Shrub Community
SA	Spartina alterniflora (low salt marsh)
S/H	Shrub/Herbaceous
SM	Salt meadow (high salt marsh)

Fig. 3. Knockum Hill Habitat Map

## OBJECTIVES FOR PRESERVATION

- A. **Protection**  
Primary - Manage land and surrounding waters to allow for optimal nesting habitat for Northern Diamondback Terrapin  
Secondary - Maintain and enhance wildlife habitat for native species, especially for sharptail and seaside sparrows, osprey, and common terns. Generally allow for natural succession of vegetation except for terrapin nesting sites, wildlife diversity and agricultural land.
- B. **Educational Use**  
Emphasis will be placed on educational interpretation of the wildlife habitat as a whole, but especially the diamondback terrapin.
- C. **Scientific studies** will be allowed, when appropriate, and not interfering with terrapin nesting.
- D. **Passive Recreation**  
Walking trails will be maintained (See Fig. 4, p. 8) for the general public to observe and enjoy nature at Nockum Hill, but not so as to impinge upon wildlife habitat, particularly in the terrapin nesting area.
- E. **Agricultural fields** - Land shown on 1992 map as being at that time leased for growing vegetable crops will continue in that use. The objective is to provide for locally grown crops and/or to increase wildlife habitat diversity by growing native wild grasses. Either use is compatible with the wildlife refuge concept, being good for hawks and groundbirds.



## PLANS FOR IMPLEMENTATION OF OBJECTIVES

### Protection

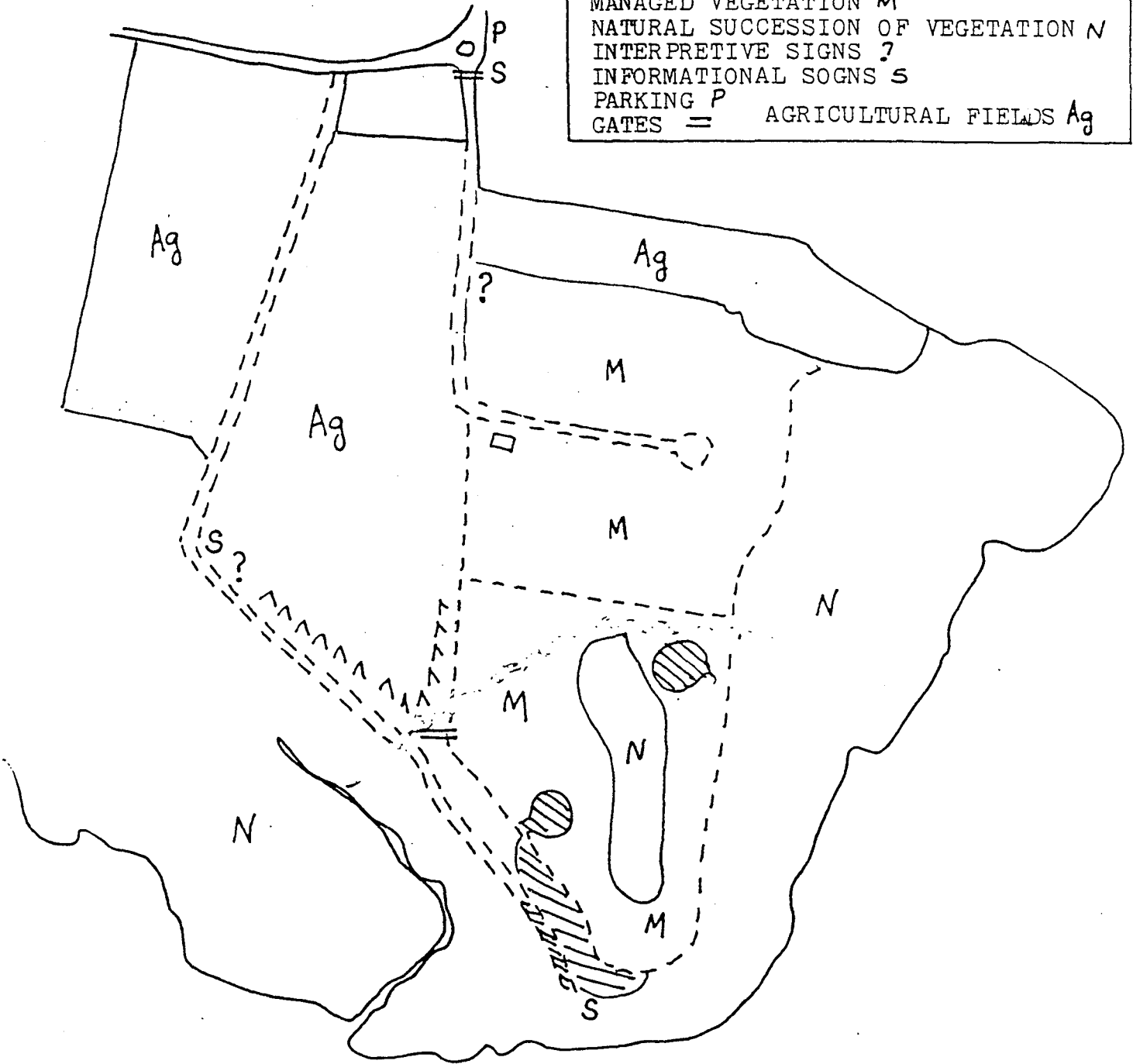
1. **Entrance signs** - NOCKUM HILL WILDLIFE REFUGE, TOWN OF BARRINGTON, RHODE ISLAND
2. **Visitor control behavior signs** - See Appendix C for Rules for the Refuges
3. **Vehicle control** - gates located at critical locations, locks to be held by D.P.W.; no vehicles except by permission of D.P.W. or the Town Council; \$500 fine.
4. **Surveillance** - schedule of visits by Conservation Officer, Team and/or Police. Listing of fine schedule on signs for violations.
5. **Pistol range** - not to be used at all between June 1st and July 30th. Restricted to Barrington Police Department.
6. **Motorboat speed zone** - 5 mile speed limit on Barrington River, north of southern tip of the Tongue, and in Hundred Acre Cove proper, north of line straight across from end of George Finnerty Road to old Peck boat house at north end of Osamequin Nature Trail. See Fig. 5, p.

### Educational and Passive Recreation Use

1. **Walking trails** - Fig. 4, p.8 - Trails will be cleared on a yearly basis, to be done in winter or early spring. Overhanging branches to be cut back, to reduce tick hazard. Suggestion that clearing be an annual Boy Scout service project.
2. **Interpretive signs** - should be made of weather-proof materials, explaining need for terrapin protection, protection and appreciation of other wildlife, plus historical notes.
3. **Informational signs** - see Entrance Sign and Rules for the Refuges at Appendix C.
4. **A Trail Guide** shall be developed, describing trail layout, plant and animal survey, geological features, historical notes, etc. Copies of the guide shall be available at the Town Hall and Town Library.
5. **Policy for group use** - not a place for group gatherings, except for guided nature walks, in small groups.

Fig 4.

WALKING TRAILS	----
ROADS	====
SOIL EROSION PREVENTION SHRUBS	^^
MANAGED BARE SOIL	≡≡
MANAGED VEGETATION	M
NATURAL SUCCESSION OF VEGETATION	N
INTERPRETIVE SIGNS	?
INFORMATIONAL SOGNS	S
PARKING	P
GATES	=
AGRICULTURAL FIELDS	Ag



6. **Parking** - All vehicles must be parked on George Street or in entrance parking area.

**Scientific Use** -Full study plans should be submitted to: Barrington Town Council, Barrington Conservation Commission, R.I. Fish and Wildlife,(and Coastal Resources Management Council, if relevant.) Permissions are required in writing from all four agencies listed above, and must be renewed on an annual basis if the study lasts more than one year.

**Agricultural fields** - \*1992-2011, Fields are leased by 1992 town agreement to Four Town Farm at no yearly fee. After 2011, fields will be leased to local farmer(s), subject to yearly approval by the Management Committee. Fee will be assessed by the Town Council on a yearly basis.

Crop plans will be submitted to the Management Committee not later than March 1st each year. A list of pesticides, herbicides, fungicides and fertilizers the farmer anticipates using, and has used in the past year will also be submitted. The farmer should also list erosion control techniques used and what alternative measures he takes to reduce insect and fungus diseases as well as predator damage., If no farmer wishes to lease the fields for vegetable crops, the fields will be kept as hayfields (grassland communities) to be mown annually by farmer or town D.P.W.

**Diamondback Terrapin** (from Peter Auger, pers. communication)

1. **Nesting habitat** - Management is required to maintain open areas for terrapin nesting sites. Techniques employed may include the use of bushhog tractor to cut brush, use of harrows to remove vegetation, and controlled burning. These methods should be used to maintain existing open terrapin nesting sites, as well as create one large and several small additional sites. Additionally, the roadways to the beach should be kept open. All harrowing activity should be done in the fall. Newly cleared areas may require additional work in the spring, but not later than mid-May.

2. **Boat speed** - During the spring/summer breeding season, terrapin are congregated in the estuarine waters surrounding Nockum Hill and in the Cove. The animals tend to stay at the surface of the water at this time, and thus are vulnerable to motorboat propellers. Damage to the shells of captured terrapin indicates that propeller damage is occurring. As of 1992 approximately 10% of the captured terrapin had shell damage attributable to propellers. Because of the long life span of these turtles, the loss of even one breeding-aged female is significant. Therefore, it is highly recommended that boat speeds in this area be limited to 5 m.p.h. or No Wake.

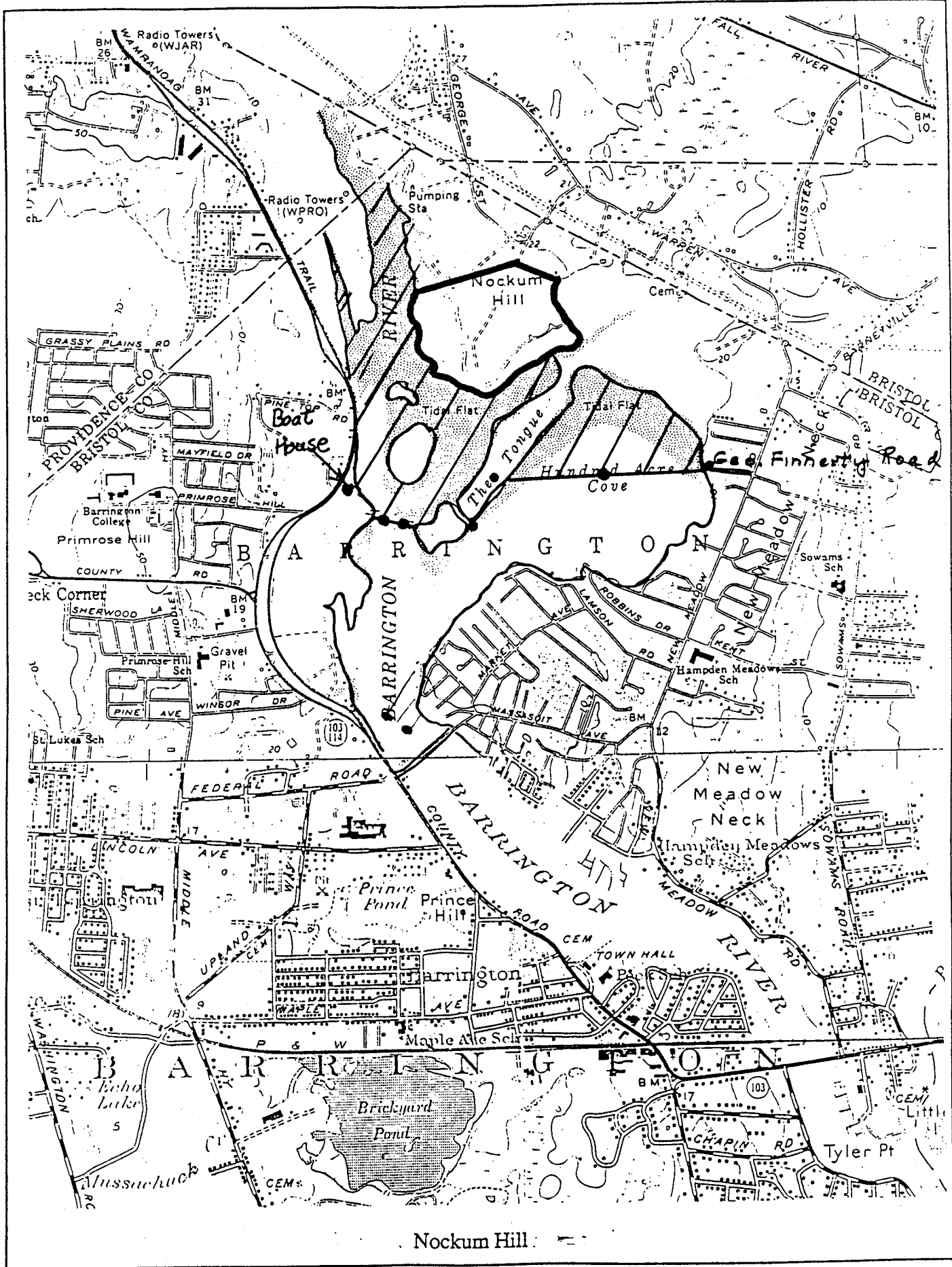
#### **Habitat diversity**

Techniques described for maintaining terrapin nesting habitat may be used elsewhere on the refuge to maintain or enhance habitat diversity. Principal objectives would be the prevention of herbaceous communities from succeeding to shrublands throughout the refuge, and the encouragement of graminoid (grass) species which could attract new forms of wildlife to the area. Techniques to be considered are cutting and controlled burning.

#### **Other management consideration**

**Predator control** - Townspeople and Animal Control Officer should be periodically reminded that Nockum Hill (or any other natural place) is not a place to leave displaced domestic or wild animals, e.g., skunks, raccoons, housecats, etc.

**Pistol range** - The location of the pistol range is not consistent with the designation of wildlife refuge; however, there is some compensatory value to occasional police presence on the hill. Use of the range will be limited to Barrington Police, and restricted entirely from June 1st to July 30th, the height of the terrapin nesting season. Users must keep vehicles to prescribed roadways and restrict activity exclusively to the range. They must be aware at all times that there may be people on the trails. The police chief has said that plans for a new police station may include a practice range.



5mph zone



- Site markers
- Buoy

**Sewage sludge** - There should be no further addition of sewage sludge to Nockum Hill. It will be permissible to relocate the piles of existing sludge.

### **Responsibility for Maintenance and Funding**

I. The Barrington Land Conservation Trust will oversee management of Nockum Hill via a management committee to include at least 1 representative each from: the Conservation Commission, the Barrington Preservation Society and the Department of Public Works, a member-at-large from the community and 3 members of the Land Trust.

The committee will meet as often as needed, but at least twice a year, once late winter to confer with farmer leasing the fields and again in the fall. It will be their responsibility to follow the mandates of the management plan.

The management committee is encouraged to seek advice as needed, from The Nature Conservancy R.I. Field Office, the R.I. Natural Heritage Program (D.E.M.) and the R.I. Department of Fish and Wildlife for information on the diamondback terrapin, bird, animal and wildflower populations. Other agencies that may be helpful are the R.I. Wild Plant Society, the R.I. Department of Agriculture, and the Audubon Society of R.I.

### **Suggestions for sources for maintenance and funding**

Reasonable requests can be made to D.P.W.; they may be willing to do harrowing, mowing, erect fences, etc. Enforcement of regulations will be carried out by the Conservation Officer or Team (including the Barrington Police) directed by the head of D.P.W. It is essential that there be good communication between the management committee and the person (s) patrolling the area.

Boy Scout troops are a good source of help for trail clearing, either as Eagle Scout or Service projects. Clear directions and personal supervising are essential to get the work done properly. Be sure to give advice for tick protection to persons working on Nockum Hill.

Funding for interpretive signs may be available from The Nature Conservancy, the Rhode Island Foundation, the Champlain Foundation, the Barrington Land Conservation Trust, and others. Simple signs can be made by members of D.P.W., members of the Land Trust and other volunteers.

Controlled burning must be carried out by professionals. Funding may be available from one of the groups listed above or R.I. Fish and Wildlife Non-Game Fund.

Groups that may be willing to write/sponsor a Trail Guide are the Land Trust, Hamcho or Barrington Garden Clubs. This could be a joint project of two or three of these groups.

#### LITERATURE CITED

- Golet, F.C. 1988 *Inventory of wetlands and deepwater habitats of Barrington, Rhode Island*, University of Rhode Island Department of Natural Resource Science; Prepared for Barrington Conservation Commission. 36pp.
- Reinert, S.E. 1981 *Avian use of ditched and unditched salt marshes in southeastern New England; a preliminary report*. Proc. Northeastern Mosq. Control Assoc. 27:1-23.

**APPENDIX A**

## MAMMALS of Nockum Hill

red and gray fox  
 woodchuck  
 raccoon  
 chipmunk  
 mink  
 meadow vole  
 whitefooted mouse  
 weasel  
 rabbit  
 otter  
 feral cats

**APPENDIX B**

## WILDFLOWERS of Nockum Hill, a partial list

black mustard .....*Brassica nigra*  
 common mullein.....*Verbascum thapsus*  
 yarrow.....*Achillea millefolium*  
 bladder campion.....*Silene cucubalus*  
 bull thistle.....*Cirsium pumilum*  
 nodding thistle.....*Carduus nutans*  
 yellow hawkweed.....*Hieracium pratense*  
 evening primrose.....*Oenothera biennus*  
 whorled loosestrife.....*Lysimachia quadrifolia*  
 bluets.....*Houstonia caerulea*  
 rough-fruited cinquefoil.....*Potentilla rectra*  
 wild strawberry.....*Fragaria virginiana*  
 blue eyed grass.....*Sisyrinchium atlanticum*  
 self heal.....*Prunella vulgaris*  
 partridge pea.....*Cassia fasciculata*  
 spotted milkwort.....*Hypericum punctatum*  
 common cinquefoil.....*Potentilla simplex*  
 tufted vetch.....*Vicia cracca*  
 bittersweet nightshade.....*Solanum dulcamera*  
 field peppergrass.....*Lepidum campestre*  
 Venus' looking glass.....*Specularia perfoliata*  
 white campion.....*Lichnis alba*  
 hoary alyssum.....*Berteroa incana*  
 chicory .....*Chicorium intybus*  
 milkweed.....*Asclepias syriaca*  
 flat topped aster .....*Aster umbellarus*  
 dandelion.....*Taraxacum officinale*  
 red clover.....*Trifolium pratense*  
 white clover .....*Trifolium repens*  
 yellow wood sorrel.....*Oxallis europa*  
 jewelweed .....*Impatiens capensis*  
 skunk cabbage .....*Symplocarpus foetidum*



pokeweed .....	<i>Phytolacca americana</i>
trailing wild bean.....	<i>Strophostyles helvola</i>
blue curls.....	<i>Trichostema dichotomum</i>
beach rose.....	<i>Rosa rugosa</i>
golden rod.....	<i>Solidago spp,</i>
everlasting pea.....	<i>Lathyrus latifolius</i>

## APPENDIX C

### RULES FOR THE REFUGE

The following is a statement used by the Audubon Society of Rhode Island for its refuges. Behavioral signs can be based on these principles.

"A wildlife refuge is a special place. It is not a park or a playground. It is a place to walk quietly on the trails, observe and learn about plants and animals, respect the solitude of the area, photograph wildlife, respect the rights of others, and respect the life that abounds here.

It is not a place to;

- Run or make excessive noise
- Picnic or camp
- Walk dogs or jog
- Hunt, fish or trap
- Ride horses or bicycles
- Drive motor vehicles
- Leave refuse of any kind
- Drink alcohol or smoke
- Collect plants or natural objects

Help us keep this refuge a special place by staying on the trails provided. Take only pictures. Leave only footprints."

### Attachments

The following studies are attached to the report to provide supplemental information on the biota of Nockum Hill:

- A. Reinert, S.E. 1991. *Inventory of Birds at Nockum Hill*, Barrington, Rhode Island. Prepared for the Barrington Land Conservation Trust. 12pp. (This paper reports on Nockum Hill breeding birds of 1990, and presents an historical list of birds observed on the refuge.)
- B. Dowhan, J. 1991. *Northeast Coastal Areas Study: Significant Coastal Habitats of Southern New England and Portions of Long Island, New York; Hundred Acre Cove, Palmer River Complex*; U.S. Fish and Wildlife Service. 3 pp. plus maps. (Presents USFWS findings on values, unique features, threats, and conservation considerations for the area.)
- C. Bush, J.L. and P.J. Auger. 1990. *Nesting of Diamondback Terrapin at Nockum Hill*, Barrington, Rhode Island. Prepared for Barrington Land Conservation Trust. 13pp. (Provides results of an intensive ecological study performed on the terrapin in 1990.)