

BEAR SWAMP

COUNTY: Cumberland

MUNICIPALITY: Downe, Commercial Twps.

PHYSIOGRAPHIC PROVINCE: Outer Coastal Plain

QUAD: Cedarville, Dividing Creek

COORDINATES: 39 17' 30" lat.; 75 5' 0" long.

ACREAGE: 3,369 Total acreage. Eastern portion 1,769 ac; western portion 1,600 ac.

OWNERSHIP: Bear Swamp is privately owned. (Dividing Creek Road roughly divides Bear Swamp into eastern and western segments). Although the area comprises many separate properties, the tract is predominantly owned by three parties. The principal owner of Bear Swamp West is the Penn Glass Sand Corporation Berkeley Springs, WV 25411). Bear Swamp East has two principal owners: Whitehead Brothers (64 River Road, East Hanover, NJ 07936) and M. J. Dilks Company (c/o Keron D. Chance, Esq., 85 W. Broad St., P.O. Box 278, Bridgeton, NJ 08302). The Philadelphia Conservationists (1339 Chestnut Street, Philadelphia, PA 19107), a non-profit conservation organization, has begun to acquire some lots in the Bear Swamp West. DEP has proposed acquisition of approximately 1,500 acres surrounding the Bald Eagle nesting site in Bear Swamp East. This tract has been referred to as the Millville Additions (Terrestrial Environmental Specialists, 1984).

LAND USE: The primary economic base of the area appears to be sand and gravel mining. Active and abandoned mining operations are scattered throughout both eastern and western segments, resulting in the formation of numerous water bodies in various stages of naturalization. The Unimin Corporation (50 Locust Ave., New Canaan, CT 06840) has proposed sand mining of 146 acres in Bear Swamp East and has submitted an EIS to the New Jersey Division of Coastal Resources for review. Timber operations, both legal and illegal, were noted during field examination of Bear Swamp West. Forman et al. (1981) also noted a 1981-logging of a beech-oak forest in Bear Swamp East. Trails provide easy access to some interior portions of the tract although some

large areas appear to lack trails. This fact, combined with the intrinsic difficulty in traversing the wet muck soils has resulted in what appears to be a complete inaccessibility to much of Bear Swamp. Forman *et al.* (1981) noted only one deer-shooting platform during their field examination of Bear Swamp East and concluded that hunting pressure is low. Bear Swamp is adjacent to the Millville Wildlife Management Area to the north and is in close proximity to several State and private preserves along Delaware Bay to the south. The site lies within the boundaries designated by the New Jersey Coastal Area Facilities Review Act (CAFRA) (N.J.S.A. 13:19-1 *et seq.*).

NATURAL RESOURCE ELEMENTS

1. Plant Community Types: Bear Swamp contains what is believed to be the oldest and most well developed lowland hardwood forests in New Jersey. These forest tracts have been described as primeval in character and contain up to three strata or vertical layers of trees--a condition very rarely observed in the eastern United States (Philadelphia Conservationists, 1981).

Bear Swamp East contains a 194-acre tract of mature swamp forest which has been mapped and described by Terrestrial Environmental Specialists (1984). The north-central portion of the forest is primarily dominated by medium-sized hardwoods with large individuals of pond pine (*Pinus serotina* scattered throughout. Hardwood species include red maple (*Acer rubrum*), tulip poplar (*Liriodendron tulipifera*) and sweet gum (*liquidambar styraciflua*). Forman *et al.* (1981) have reported very large trees, perhaps some of the largest in New Jersey, within the central and southern portions of the swamp forest at Bear Swamp East. Canopy species reported include red maple, tulip poplar, black gum (*Nyssa sylvatica*), sweet gum, beech (*Fagus grandifolia*), and basket oak (*Quercus michauxii*). The understory is composed of a more open canopy of sweet bay magnolia (*Magnolia virginiana*), American holly (*Ilex opaca*), and ironwood (*Carpinus caroliniana*). Common shrub species include sweet pepperbush (*Clethra alnifolia*), blueberry (*Vaccinium corymbosum*), and spicebush (*Lindera benzoin*). Finally, the forest floor is characterized by an almost complete cover of ferns including cinnamon fern (*Osmunda cinnamomea*). Sphagnum moss is common to the extremely moist muck soils of the forest floor. Forman *et al.* (1981) report that individuals of the canopy species listed above are found in all forest layers, indicating an equilibrium condition with the forest dominants regenerating themselves.

Although generally less mature than the primeval swamp, additional community and habitat types reported within Bear Swamp East include (in order of decreasing acreage) swamp hardwood/pitch pine forest, pitch pine forest, oak-pine forest, beech hardwood forest, swamp hardwood forest, tidal marsh, old-fields, and ponds created by sand mining operations (Terrestrial Environmental Specialists, 1984).

Bear Swamp West has been less extensively studied than Bear Swamp East, although preliminary field and aerial map examination indicates that it may well equal or surpass Bear Swamp East in quality. A field visit led by Dr. Stevens Heckscher of the Philadelphia Conservationists/Natural Lands Trust, Inc. revealed the presence of a large tract of primeval swamp hardwood forest with no visible evidence of cutting. The forest composition closely resembles that described by Forman et al. (1981) for the primeval swamp area at Bear Swamp East, although no pond pine was observed. The site contains exceptionally large trees, many having the potential to be of record size. Bear Swamp West also contains abandoned water-filled gravel pits in various stages of naturalization. Although additional study is needed, current knowledge indicates that the entire Bear Swamp tract should be the focus of preservation efforts.

2. Wildlife: Because of its large size, undisturbed nature, close proximity to other natural sites, diversity of community types, and structural diversity of the communities, Bear Swamp East represents an important wildlife habitat (Terrestrial Environmental Specialists, 1984). Its location near Delaware Bay results in use of the area by many species at their northern range limit. However, a comprehensive species list does not currently exist.

Forman et al. (1981) identified 36 avian species during a single reconnaissance in the Bear Swamp East on June 26, 1981. Included were the red-bellied woodpecker, acadian flycatcher, carolina chickadee, blue-gray gnatcatcher, yellow-throated vireo, white-eyed vireo, black and white warbler, prothonotary warbler and Kentucky warbler. In addition, Bear Swamp is used by approximately 17 species which are uncommon in New Jersey, including several which have been determined to be endangered and threatened in the State (Forman et al. 1981).

According to Forman et al. (1981), lists of amphibians, fish, and invertebrates are not available. Also unavailable at this time is information on wildlife species at Bear Swamp West.

3. Rare Plants: Due to the large size of Bear Swamp and the fact that it has been relatively unknown until recently, extensive field study of rare plant species has not been conducted. However, O'Connor (1981) and Heckscher (1984) have reported the following species which have been determined to be threatened in New Jersey by Snyder (1983): American mistletoe (Phoradendron flavescens) (threatened in New Jersey and in need of immediate protection), pond pine (Pinus serotina), crane fly orchid (Tipularia discolor), basket oak (Quercus michauxii), purple bladderwort (Utricularia purpurea), algae-like pondweed (Potamogeton confervoides) (all five threatened in New Jersey), and little ladies' tresses (Spiranthes tuberosa) (potentially threatened in N.J.). Future field work will most certainly reveal additional rare plant populations.

4. Rare Wildlife: Current knowledge of endangered and threatened wildlife at Bear Swamp is restricted to the Bear Swamp East and is summarized by Terrestrial Environmental Specialists (1984). Bear Swamp East supports New Jersey's only known breeding pair of Bald Eagles (Haliaeetus leucocephalus). This species is listed by both the U. S. Fish and Wildlife Service and the State Endangered and Nongame Species Project as endangered. The eagle nest is located in a large pond pine within the mature swamp forest.

Additional State endangered species reported to occur in Bear Swamp East include the osprey (Pandion haliaetus), golden eagle (Aquila chrysaetos), Pine Barrens treefrog (Hyla andersoni), and southern gray treefrog (Hyla chrysoscelis) (O'Connor, 1981). State threatened species include the red-shouldered hawk (Buteo lineatus), barred owl (Strix varia), red headed woodpecker (Melanerpes erythrocephalus), and northern pine snake (Pituophis melanoleucus) (O'Connor, 1981). Finally, the Eastern tiger salamander (Ambystoma tigrinum), least tern (Sterna albifrons) (both State endangered), and great blue heron (Ardea herodias) (State threatened) have potential to occur within Bear Swamp East (Terrestrial Environmental Specialists, 1984).

Although information is lacking, many of the species reported above could presumably also use Bear Swamp West since both portions comprise one contiguous forest tract. Due to the abundance of water-filled sand pits and surrounding woodlands in Bear Swamp West, field examination may well reveal additional rare herptile populations.

5. Geological/Topographic Features: A brief description of geology and hydrology is provided by O'Connor (1981). Bear Swamp is principally underlain by the Cohansey Formation aquifer. Portions are overlain by sand and gravel of the Cape May Formation which may attain depths up to four feet. Cohansey sand is suitable for sand mining used in the manufacture of glass. Most of the area including the primeval hardwood swamps contain muck soils. Some additional series include Hammonton, Fallsington, Klej and Pokomoke soils. Cedar Creek is bordered by Tidal Marsh soils. Elevations are generally less than 50 feet. Bear Swamp East lies in the Cedar Creek watershed which, in turn, flows into Dividing Creek and finally Delaware Bay. Bear Swamp West appears to drain to the south via Mill Creek (another tributary of Dividing Creek) and Oranoakon Creek which drains directly into Delaware Bay.

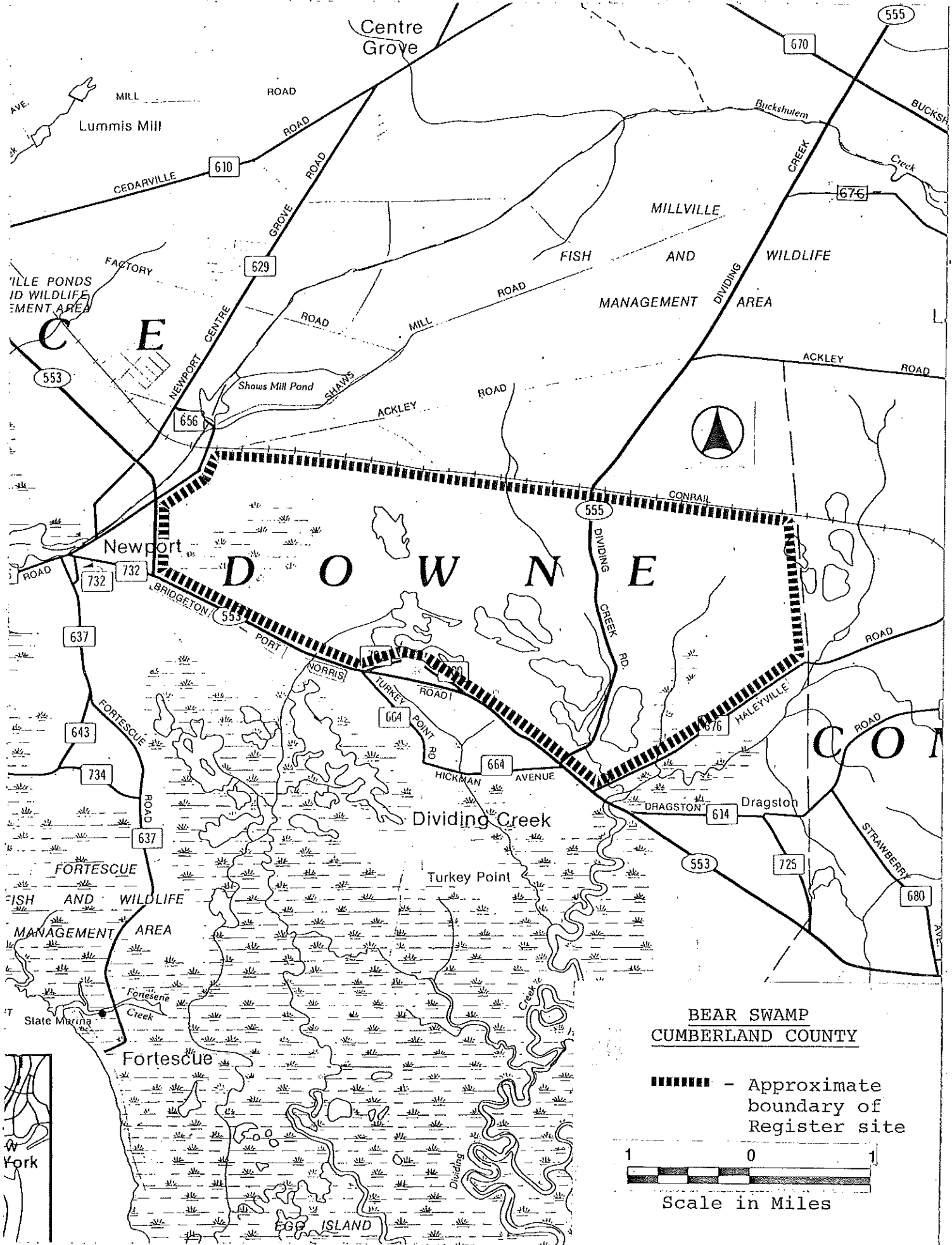
REASONS FOR INCLUSION OF AREA IN NATURAL AREAS REGISTER:

Bear Swamp satisfies three of four standards for inclusion of sites within the Register of Natural Areas (fulfillment of only one of the standards is sufficient for a site to be considered for the Register):

1. The site is a highly significant habitat for several plant and animal species which have been determined to be rare in the State.
2. Bear Swamp supports probably the oldest and most well developed lowland hardwood forests in New Jersey, making this a highly significant representative plant community site.
3. Bear Swamp is a highly significant wildlife habitat.

REFERENCES CITED:

- Forman, R.T.T., L. Goodrich, M.J. McDonnell and G. Wein. 1981. Bear Swamp East, Cumberland County, New Jersey: A preliminary ecological evaluation. Report prepared for The Nature Conservancy.
- Heckscher, S. 1984. Fortescue Glades and Bear Swamp, Cumberland County, New Jersey: Vascular plant list, 1980-1983. Unpublished list of plants observed by the Natural Lands Trust, Inc.
- O'Connor, D. 1981. A brief ecological inventory of Bear Swamp East. In Forman *et al.* Bear Swamp East, Cumberland County, New Jersey: A preliminary ecological evaluation. Report prepared for The Nature Conservancy.
- Philadelphia Conservationists. 1981. Bear Swamp: A critical area. The Beacon No. 78.
- Snyder, D.B. 1983. New Jersey's threatened plant species. Unpublished report prepared for the New Jersey Department of Environmental Protection.
- Terrestrial Environmental Specialists. 1984. Vegetation and wildlife assessment of the Millville Additions, Cumberland County, New Jersey. A report prepared for the New Jersey Department of Environmental Protection, Endangered and Nongame Species Program.



**BEAR SWAMP
CUMBERLAND COUNTY**

----- - Approximate
boundary of
Register site



Scale in Miles