

PINE BARREN PLAINS

- COUNTY: Burlington; Ocean.
- MUNICIPALITY: Burlington County: Woodland, Bass River, Washington Twps. Ocean County: Lacey, Barnegat, Stafford, Little Egg Harbor Twps.
- PHYSIOGRAPHIC PROVINCE: Outer Coastal Plain
- QUADRANGLES: Woodmansie, Oswego Lake, West Creek.
- COORDINATES: Central point. West Plains: 39° 48' 00" lat.; 74° 25' 00" long. East Plains: 39° 42' 30" lat.; 74° 24' 00" long. Spring Hill Plains: 39° 46' 00" lat.; 74° 27' 15" long. Little Plains: 39° 45' 45" lat.; 74° 23' 00" long.
- ACREAGE: There is considerable variation in estimates of the size of the Plains based on the various definitions of Plains vegetation. Most researchers recognize the existence of three separate Plains regions: The West Plains, East Plains and Spring Hill Plains (McCormick and Buell, 1968). According to a recent estimate by Good, Good and Andresen (1979), the West Plains is about 6168 acres, the East Plains 5920 acres and the Spring Hill Plains 270 acres. In addition, an unpublished map prepared by Thomas Givnish of Harvard University recognizes the existence of another non-contiguous area of approximately 1000 acres known locally as the Little Plains. This puts the total acreage of Plains vegetation at approximately 13,358 acres. Earlier determinations have ranged up to 20,000 acres, although it is now known that these overestimated the extent of the Plains.
- OWNERSHIP: Over 6,000 acres within and surrounding the West Plains was recently acquired by the State of New Jersey and has been incorporated into Bass River State Forest (administered by the Division of Parks and Forestry, N.J. Dept. of Environmental Protection). Portions of the West Plains, west of the Plains Branch of the Oswego River, remain in private ownership. Coyle Airfield, located within the West Plains, is also State owned. The majority of the East Plains (generally those areas west of

the Burlington-Ocean County line) is owned by the Federal government and encompasses the Warren Grove Weapons Range. Plains areas east of the County line are privately owned. The Little Plains is predominantly State-owned and the remainder is under Federal ownership. The Spring Hill Plains is entirely privately owned.

LAND USE:

Within the West Plains, use is predominantly open space forest. Coyle Airfield, which is excluded from Register designation, is used by aircraft for forest fire control and as a drop zone for the Air National Guard. Some zones within this site are highly disturbed and devoid of vegetation, including a state operated gravel pit just north of the airstrip. Route 72 and several sand roads traverse the tract. The portion of the East Plains that lies within the Warren Grove Weapons Range is currently used by the Air National Guard, one Marine Air Reserve unit and the Johnsville Naval Air Development Center for bombing and strafing training activities. (U.S. Dept. of the Interior, 1985). These activities have resulted in the creation of about 150 acres of open clearings, a network of sand roads, towers and other facilities in a large highly disturbed area. The Air National Guard and the N.J. Department of Defense are currently cooperating with State agencies in the implementation of a reclamation program for the disturbed zones within the East Plains (U.S. Dept. of the Interior, 1985). However, the vast majority of this federal land is currently undisturbed. Outside of the Weapons Range, most of the Plains area remains in open space. Route 539 and numerous sand roads traverse the area. The Spring Hill and Little Plains tracts appear to be open forest with some sand road access. Spring Hill contains a borrow pit and the Little Plains houses an existing Federal communications facility. The Plains has received attention from ecologists and botanists since before the turn of the century, and is still used today for research by biologists worldwide.

NATURAL RESOURCE ELEMENTS:

1. Plant Community Types: The characteristic feature of the Pine Barren Plains is the stunted nature of the vegetation. The pines and oaks which comprise the canopy of this so-called "Pygmy Forest" rarely exceed 11 feet in height and are typically 2-7 feet tall compared to a canopy height of 30-60 feet for pine-oak forests outside of the Plains. The N.J. Pine Barrens contains the largest area of this community type in the world; similar vegetation is only known to occur at smaller sites in New York near Albany and on Long Island.

The Plains are generally defined by the following characteristics: (a) stunted nature of the canopy which is typically dominated by pitch pine (*Pinus rigida*), (b) presence of scrub-form oaks in the canopy including blackjack oak (*Quercus marilandica*) and scrub oak (*Q. ilicifolia*), (c) absence of certain tree species common to the Pine Barrens including shortleaf pine (*Pinus echinata*) and black, scarlet, white and chestnut oak (*Q. velutina*, *Q. cocinea*, *Q. alba*, and *Q. prinus*), (d) serotinous (closed cone) nature of the pitch pines, (e) abundance of root crown sprouts, and (f) greater presence of low shrub species such as pyxie moss (*Pyxidantha barbulate*) and broom crowberry (*Corema conradii*) (McCormick and Buell, 1968; Good, et al., 1979). In addition, the Plains contains more than twice the number of lichen species compared to the rest of the Barrens. Shrub species in the Plains which are also common to upland habitats of the Barrens include lowbush blueberry (*Vaccinium vacillans*), black huckleberry (*Gaylussacia baccata*), mountain laurel (*Kalmia latifolia*), sheep laurel (*K. angustifolia*) and bearberry (*Arctostaphylos uva-ursi*).

The most commonly held theory explaining the short tree heights considers fire as a limiting factor as well as genetic variation (Good et al., 1979). The serotinous cones of the pitch pines within the Plains are sealed with a resin and heat is required to trigger their opening. Therefore, serotinous cones release their seeds following fires, making these pines particularly adapted to recolonization of sites following a major fire (Ledig and Fryer, 1974). Fire frequency within the Plains was estimated at the turn of the century to be approximately double that of the Barrens, and these fires tend to be severe because of the low canopy height (Lutz, 1934). Fire frequency and the shorter juvenile period of the Plains trees demonstrated by Good and Good (1975) could be coupled providing a natural selection

feature which favors the reduced growth form (Good et al., 1979).

2. Wildlife: The Pine Plains are not noted as being significant for the wildlife supported there. However, the area contains many species which typically occur throughout the Pine Barrens uplands. Common mammalian species include the white-footed mouse (Peromyscus leucopus), opossum (Didelphis virginiana), raccoon (Procyon lotor), striped skunk (Mephitis mephitis), gray fox (Urocyon cinereoargenteus), red squirrel (Tomiasciurus hudsonicus), eastern chipmunk (Tamias striatus) white-tailed deer (Odocoileus virginianus) to name a few (Pinelands Commission, 1980; U.S. Dept. of the Interior, 1985). Acorns of the blackjack and scrub oaks form an important food source for the mammals. Common bird species include the brown thrasher (Toxostoma rufum), towhee (Pipilo erythrophthalmus) and chickadee (Parus carolinensis), although 100 bird species, 34 of which are breeding, are known to occur in the pine-oak habitat (Pinelands Commission, 1980). Of 30 herptile species selected by the Pinelands Commission for intensive study, 17 were found to occupy the pine-oak forest habitat (Pinelands Commission, 1980).
3. Rare Plants: Within New Jersey the broom crowberry (Corema conradii) is almost completely restricted to the Pine Plains (Snyder and Vivian, 1981). This species is unofficially listed as Threatened and in need of immediate protection in New Jersey, and although it is not currently listed or under review by the federal government, it is believed to be rare throughout its entire worldwide range (Snyder, 1984). In addition, this species is officially listed as endangered within the Pinelands National Reserve, resulting in the prohibition of any development that adversely impacts populations (Pinelands Commission, 1980). Maine, Massachusetts and New York are the only states known to contain Corema, making the New Jersey Plains its southern range extreme (Snyder and Vivian, 1981).
4. Rare Wildlife: The Plains is not known to be significant in supporting any rare species of wildlife.
5. Geological/Topographic Features: The principal geological formation throughout the Plains is Cohansey sand, which overlies deposits of the older Kirkwood formation located 170 to 330 feet below the surface (McCormick and Buell, 1968). Elevated portions of Cohansey sand in the West and East Plains are overlain by Beacon Hill gravel and deposits of the Bridgeton formation (McCormick and Buell, 1968). Soils include

the Woodmansie-Lakehurst association, characterized as having well drained to somewhat poorly drained sandy soils, high permeability, and a sand to sandy loam subsoil. Elevations range from approximately 100 to 200 feet above mean sea level (relatively high for the Pine Barrens region) and the topography is gently rolling. The Plains lies within the Atlantic drainage basin, Wading River watershed. The West and Spring Hill Plains drain to the east and south via tributaries of the Wading and Oswego Rivers. The East and Little Plains drain into the Oswego and to the south by tributaries leading to the Wading.

PROTECTABILITY:

Because of its recent acquisition and incorporation into Bass River State Forest, the West Plains can now be managed to perpetuate the Plains ecosystem. This is also true of those portions of the Little Plains which are under state ownership. A cooperative agreement and management plan has been prepared by the U.S. Dept. of the Interior for that portion of the Plains which lies within the Warren Grove Weapons Range (U.S. Dept. of the Interior, 1985). The plan, which is mandated through both federal and state laws, is designed to enhance, protect, and maintain the natural resources of the Plains and provide for controlled public access. The plan, now being implemented, also outlines responsibilities of all cooperating parties, including the N.J. Air National Guard, N.J. Dept. of Defense, Pinelands Commission and the DEP, and demonstrates the willingness of the federal government to preserve and manage the Plains. Additional portions of the East Plains are also being considered for State acquisition. The privately-owned Spring Hill Plains does not appear to be in jeopardy. One issue of concern is the potential use of fire management in the Plains; the greater fire frequency combined with the intensity of fires in the Plains make prescribed burning difficult.

REASON FOR INCLUSION OF AREA IN NATURAL AREAS REGISTER:

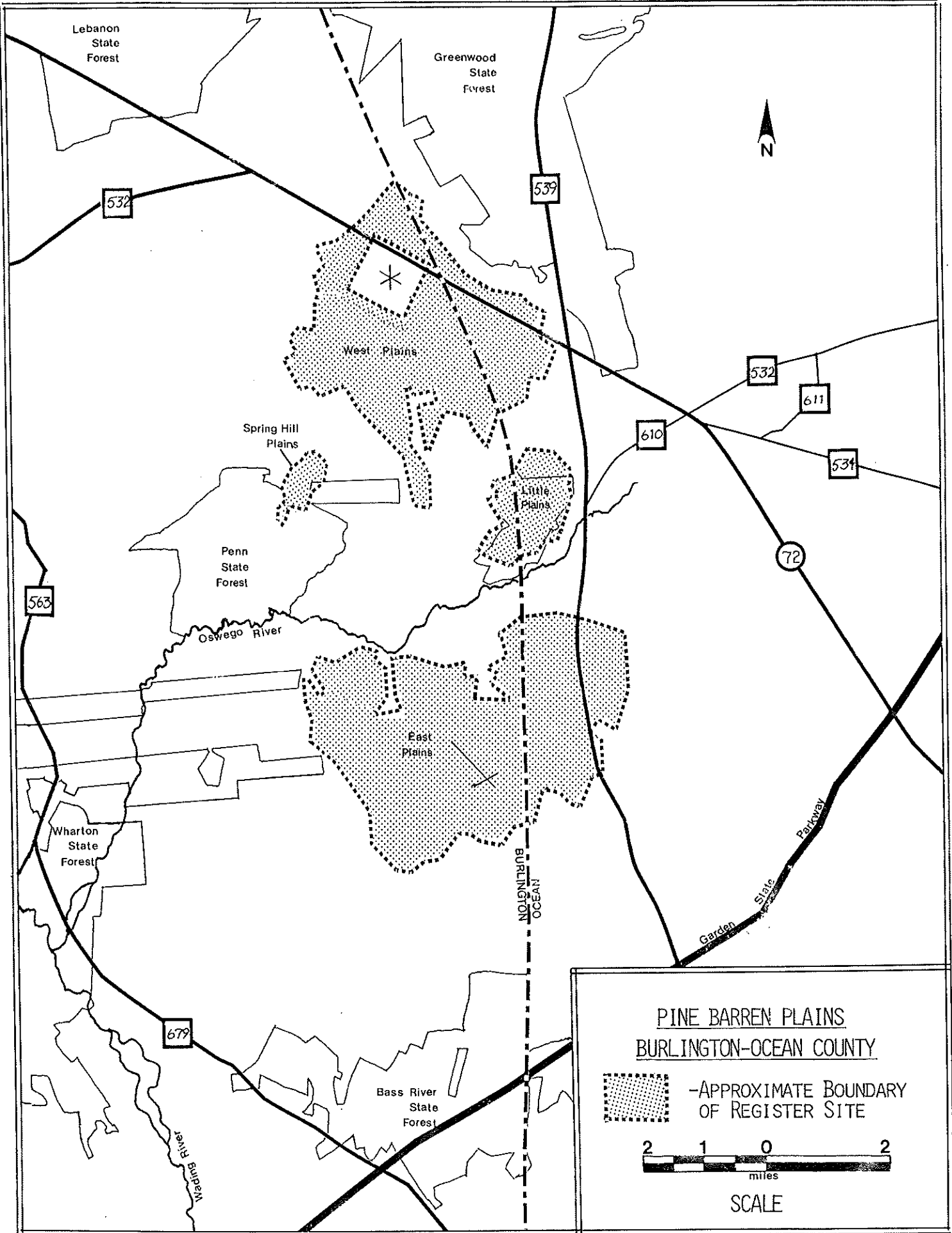
The Pine Plains satisfies two of four standards for inclusion of sites within the Register of Natural Areas (fulfillment of only one of the standards is sufficient for a site to be considered for the Register):

1. The Plains is unique, highly unusual and rare ecosystem, at both the State and Federal level, which is worthy of recognition and protection.
2. The almost complete restriction of Corema conradii to the Plains makes this area a highly significant habitat

for a plant species that is rare in both the State and Nation.

REFERENCES CITED:

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Lebanon State Forest

Greenwood State Forest



532

539

West Plains

532

611

Spring Hill Plains

610

534

Penn State Forest

Little Plains

72

Oswego River

East Plains

563

Wharton State Forest

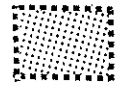
BURLINGTON
OCEAN

Garden State Parkway

679

Bass River State Forest

PINE BARREN PLAINS
BURLINGTON-OCEAN COUNTY



-APPROXIMATE BOUNDARY OF REGISTER SITE



SCALE