

EXPLORING THE PYGMY FOREST: SLIDE PRESENTATION NOTES

1. EXPLORING THE PYGMY FOREST, slide presentation by Terry O'Leary, Naturalist, and Bob Birdsall, Nature Photographer.
2. The Pine Barrens Plains, or Pygmy Forest is located in the heart of the Outer Coastal Plain in Ocean and Burlington Counties, New Jersey.
3. There are four areas of Pygmy Forest covering 12,400 acres: West Plains, East Plains, Little Plains, and Spring Hill Plains.
4. Contributing factors to the formation of Pygmy Forests have been researched for more than 100 years. They include Soil Infertility, Wind Conditions, Elevation along the New Jersey Divide, and a history of Frequent and Intense Fires.
5. Jersey Sandstone is a concretion of calcium carbonate, silica, and iron oxide found in gravel hills of up to 200 feet in elevation, called Cuestas. Bog Iron is encountered in slow moving Pine Barrens streams when iron oxide and tannic acid form a precipitate that may form in 40 years or more.
Green Sand Marl, or Glauconite, occurs in ancient shorelines along the edge of the Inner Coastal Plain. This dark green, clayey sand was mined as an agricultural fertilizer.
Woodmansi Sand is a coarse, acidic, well drained soil found along divides and side slopes.
Beacon Hill Gravel consists of quartz pebbles and yellow, coarse, acidic sands found on top of hills known as Cuestas. A number of these hills have been mined for the sand and gravel, as well as Jersey Sandstone
Manahawkin Muck, found in stream basins and low depressions is a poorly drained, fibrous, acidic black soil.
6. Basal Crooks develop after intense fires that severely burn the vegetation. New shoots may emerge several feet from the original root system.
7. Difficult to suppress, fires in the Pygmy Forest can occur as frequently as in 8 year intervals.
8. Pygmy Forest fires burn intensely, resulting in stunted basal sprouts, and new seedlings that average 9-12 feet in height or less. Resprouting on some surviving Pitch Pine stems allows growth on average of 18-24 years.
9. Before the invention of motorized water pumps at the beginning of the 20th century, fires were nearly impossible to control.
10. Extremely hot fires favor low growing heath-like (ericaceous) vegetation.
11. Pitch Pines have adapted to fires by their ability to produce adventitious sprouts from the base of the trees, as well as by epicormic sprouting along the stems and trunks.
12. Within several months after an intense wildfire, native grasses have sprouted in forest openings.
13. Fire does not necessarily destroy a forest; the pines have the remarkable ability to recover.
14. Adaption of some Pitch Pines is the production of serotinous cones, which only open from exposure to heat.
15. Winged seed capsules from Pitch Pines may sprout in direct sunlight.
16. Northern Fence Lizard (4-7") is found in forest openings on fallen logs, stumps, and fences. These reptiles mainly feed on flies and other insects. Males have a distinctive blue throat and belly.
17. Scrub Oak (3-10') is a pioneer tree with leathery, bristle-tipped leaves, producing large crops of acorns, and found on burned-over areas.
18. Black Jack Oak (20-30') grows on burned over or eroded, acidic soils. The thick, leathery, shiny, bristle-tipped leaves are highly flammable, even when green.
19. Dark-eyed Junco is slate-gray with a white belly and white outer tail feathers. Juncos may be observed foraging for seeds in forest edges and underbrush.
20. Shadbush, also known as Serviceberry, (6-20') grows in bogs, swamps, and coastal thickets. This early blooming tree has clusters of white flowers, and produces reddish-black fruit in June.
21. Sassafras (40-50') has yellowish green twigs and leaves in 3 shapes: unlobed, mitten-shaped, and three-lobed. Sassafras has been traditionally used to make tea, as a flavoring and thickener for soups and stews, for furniture, and as a dye.

22. Red Maple(40-75') grows in damp, sandy soils and swamps. The red, double samaras are spread by wind and are eaten by deer, turkey, and squirrels.
23. Sour Gum, also known as Pepperidge or Tupelo (20-60') is found growing in damp, poorly drained soils, and is the first tree to turn red in the fall. The dark blue fruit is consumed by a variety of wildlife.
24. Gray Birch (20-30') is a pioneer tree that sprouts in old fields, and along streams and ponds. The triangular, dark green leaves turn bright yellow in autumn.
25. Swamp Magnolia (20-35') also known as Sweet Bay grows in freshwater swamps. Its large creamy white flowers appear in early summer. The broad, waxy, green leaves are whitish on the undersides. The mature bright red seeds are formed in clusters on a cone attached to a long, thin cord.
26. Halgas Scout Reservation is a primitive camping facility located in the West Plains along Stephenson Road.
27. King Snake (36-82") a Species of Concern, is typically spotted in dry woodlands near water. King Snakes feed chiefly on other snakes, including Timber Rattlesnakes.
28. Black-capped Chickadee (4-5") is easily identified by its black head and white underparts, as well as its distinctive call. Found in open pine woods and field edges, Chickadees feed on insects, seeds, and berries.
29. The old field along the pond was once the site of a farm owned by the Cranmer family.
30. Atlantic White Cedar grows in dense stands along streams. This swamp was burned and the thin-barked White Cedar was killed
31. Rose-breasted Grosbeak (7-9") seen perching on a White Cedar is named for its coloration and bill. These seed eaters are found in open deciduous woodlands.
32. Coyle Field, located along Rt. 72 in the West Plains is used by NJ Forest Fire Service to launch aerial attacks on forest fires in the Pine Barrens.
33. The hangar at Coyle Field houses the helicopter fleet.
34. In the East Plains, along Bombing Range Road, Fire Pond is used to supply water to help suppress forest fires.
35. Warren Grove Gunnery Range is located in the East Plains on the South Jersey Divide between the Westecunk Creek and the Oswego River.
36. From the Control Tower at the Bombing Range, there is a panoramic view looking to the north.
37. Aerial view of NJ Air National Guard Bombing and Gunnery Range at Warren Grove.
38. Pilots practice firing 3 types of weapons: rockets, bullets, and bombs. The practice bombs emit a white smoke spotting charge.
39. The NJ Air National Guard works in cooperation with the NJ Forest Fire Service to create fire breaks and to conduct prescribed burning.
40. Significant scientific research is ongoing at the Range, led by Dr. Walter Bien of Drexel University.
41. Pine Snake (48-66") is a constrictor that feeds on mice, birds and their eggs. Listed as Threatened in New Jersey, Pine Snakes can excavate their own nest burrow under tree stumps or in open sandy fields.
42. Wet Savanna provides open habitat for a number of rare and unusual species, including gentians, orchids, and carnivorous plants.
43. Pine Barrens Gentian (6-18") is an endangered perennial found in open bogs and savannas. The striking blue or rarely white flower blooms in early Autumn.
44. Timber Rattlesnake (35-74") has become increasingly scarce and is listed as Endangered in New Jersey. This venomous, large-bodied snake is found in swamps and Pine Barrens forests where it feeds on warm-blooded prey.
45. These plots were planted by NJ Forest Service in the 1980's. The project, led by Dr. John Kuser of Rutgers University, was designed to test the effects of soil amendments, irrigation, and mulching on Pitch Pine seedlings.
46. Prescribed Burning is conducted under the guidance of NJ Forest Fire Service to reduce hazard fuels by burning the forest duff, ground cover, and understory shrubs. Close monitoring of wind speed and direction, relative humidity, temperature precedes setting fires in blocks separated by north-south plow lines to control the low burning flames.

47. Plots in the Pygmy Forest are burned in blocks; however, due to the stunted trees, the entire forest is burned.
48. For a number of years, NJ Forest Service has worked with NJ Air National Guard to provide interactive interpretive programs with local schools, directly to the east of the Warren Grove Range.
49. Students work in teams in different plots to collect data, such as depth of leaf litter, inventory of native species, and age of survivor trees.
50. Students participate in activities to learn how to identify characteristic species and their traditional uses.
51. Each field trip is culminated with teams of students properly planting and mulching Pitch Pine seedlings produced at the NJ Tree Nursery in Jackson. Over 100,000 seedlings have been planted to date.
52. Wood Frogs (1 $\frac{3}{4}$ -3 $\frac{1}{4}$ ") are found in moist woodlands, returning in large numbers to vernal pool in early spring to breed. Males begin a loud chorus of "quacking". After mating and egg laying, all adults return to nearby uplands. Newly hatched black tadpoles feed on algae and float in shallow areas of a cool "spung" to warm themselves.
53. Pine Barrens Tree Frog (1-2") requires acidic water to survive. The call by the male is a repetitive "quonk". These tiny colorful amphibians, threatened due to habitat loss, breed in late spring and early summer.
54. American Cranberry is a low, trailing, evergreen vine. Flowers are pinkish white with 4 curling lobes, resembling the head of a crane. The red, buoyant fruit ripens in early Autumn, and is harvested in cultivated bogs.
55. Thread-leaved Sundew (6-16") is a carnivorous plant that grows in "Spongs" and open, acidic, wet sand. The leaves are covered with tentacles. The sticky droplets at the tips of the tentacles catch and digest insects.
56. Broom Crowberry (4-12") , listed as Endangered in New Jersey, is a low evergreen shrub, found almost exclusively in the Pygmy Forest, growing in mounds on bare sand.
57. A small Broom Crowberry seedling is surrounded by Pyxie Moss that is beginning to bloom.
58. Pyxie Moss is a prostrate shrub with creeping stems (6-10" long). This evergreen is found in damp, bleached sand in open areas. The early May blooming white to rose-colored flowers have 5 extended petals.
59. Bearberry (6-12") is a low growing evergreen shrub that flourishes in dry acidic sand. In late April, small urn-shaped flowers bloom. In July, bright red fruit ripens. Bearberry is an Arctic plant that reaches its southernmost limits in the Pine Barrens.
60. Pine Barrens Heather (4-8") is a low growing evergreen shrub that grows in dry, acidic sand, and flowers profusely with bright yellow, 5 petaled blossoms, beginning in mid May.
61. Turkey Beard (2-4") is identified by clumps of tall evergreen leaves. In late May, dense heads of tiny white flowers appear on tall flower stalks. Turkey Beard is not shade-tolerant.
62. Sand Myrtle (2-3') is a small evergreen shrub that favors damp, sandy open areas. In May, this leathery-leaved shrub will bloom with pinkish white flowers.
63. Mountain Laurel (6-10'), also called Spoon Wood or Calico Bush, has shiny, dark green, leathery leaves. This evergreen blooms in early June with clusters of large white flowers with purple lines.
64. Sheep Laurel (1-3'), also called Lamb Kill, is an evergreen with thin, olive green drooping leaves. The deep pink flowers appear in late May.
65. Trailing Arbutus (6-12") , also called May Flower, is a low prostrate shrub with leathery evergreen leaves. The pink flowers appear on the tips of branches in late April.
66. Fowler's Toad (2-4") may be observed in sandy habitats; it breeds in vernal pools. A distinctive white line runs down the back over an earth-toned body with 3 or more warts in each dark blotch. The call of the male is a harsh nasal "bwaah".
67. Wintergreen (2-8") , also called Teaberry has dark green, shiny leaves, white urn-shaped flowers, and bright red berries. This tiny shrub is found in shady woodlands.

68. Highbush Blueberry (6-12') blooms in May with white to pink, bell-shaped flowers on green stems. The tasty fruits are blue without discernible seeds. Branches turn brilliant red in late Autumn.
69. Black Huckleberry (2-3') blooms in early May with greenish-white, urn shaped flowers on black stems. Black edible fruit has 10 discernible seeds.
70. Swamp Azalea (3-8') has shiny green leaves and is found in swamps and wet thickets. In June, the fragrant, showy flowers bloom in small clusters of white to pinkish white flowers.
71. Fetterbush (4-8') grows in swamps and dense thickets. Urn-shaped flowers in long downward facing rows bloom in mid May.
72. Lowbush Blueberry (1-3') has green stems and grows in sandy, acidic, dry soil. In early May, greenish white bell-shaped flowers with pink tips emerge. Later, small, sweet, blue fruits ripen in early July.
73. Sweet Fern (2-5') is a low, well branched shrub that grows in dry, sandy pinelands. The long green, fern-like leaves are fragrant when crushed.
74. The FAA Air Traffic Control Facility is located in the Little Plains, at the end of a long driveway off Beaver Dam Road. A wide swath is brush-hogged along the driveway and around the antennas.
75. Rufous-sided Towhee (7-8 1/2") has a black head, white belly, and rusty, rufous sides. Often found scratching in the leaf litter in open pine forests, Towhees make several calls: "Che-wink", "Drink-your-tea", or "Towee".
76. Warren Grove Recreation Area is a 617 acre primitive Camping Area in the Little Plains off Beaver Dam Road.
77. In May of 2007, a severe wildfire spread over a wide area of southern Ocean County.
78. Beginning just east of the Warren Grove Range, in the Stafford Forge Fish and Wildlife Area, the fire spread all the way to Rt. 72, and to the Garden State Parkway in Manahawkin.
79. By May 17th, 2007 the fire had consumed 17,270 acres of forest, and threatened homes, schools, and businesses. Thousands of people were evacuated in Stafford and Eagleswood Townships.
80. The fire was caused by a practice bomb dropped by an Air National Guard pilot that missed the target area.
81. With extremely dry conditions, and strong westerly winds, the out of control fire spread to the treetops.
82. An intense fire produces thick, chugging, black smoke.
83. The smoke can darken the sky, and reduce visibility, closing roads, including the Garden State Parkway.
84. The blackened sky and intense heat is extremely dangerous for fire fighters.
85. NJ Forest Fire crews deliberately set back fires, burning into the wind to reduce fuels in the path of the rapidly spreading wildfire.
86. From the headquarters at the Warren Grove Range, located just west of the burning forest, a cooperative effort was initiated to contain the wildfire.
87. NJ Forest Fire Service helicopters are dispatched to drop water on hot spots.
88. By the third day, May 17th the fire fighting cooperative effort was trying to fully contain and extinguish the wildfire, which had spread more than 7 miles to the east, northeast, and southeast.
89. Although the village of Warren Grove, and the Ocean Acres development were spared, Brighton at Barnegat, a mobile home park, sustained damage to their clubhouse when shrubbery, cedar shakes, and vinyl siding burned.
90. One home that abutted the forest was destroyed, and several nearby homes sustained damage.
91. NJ Forest Fire Service was able to stop the fire at the edge of this backyard.
92. Three boats, stored in proximity to the forest edge, were completely burned by the intense flames.
93. This aerial photo, taken shortly after the fire burned through, shows how fire spreads under strong directional winds.
94. Near the intersection of Rt. 72 and the Parkway, land had been recently cleared before the fire to develop a shopping center.
95. The fire burned the pile of mulch, and every tree, shrub, and clump of grass until there was no more fuel to burn.

96. In forested wetlands, thick layers of organic peat may burn slowly for a long time. Difficult to access, swamp fires are extremely hard to put out.
97. This hunting club, deep in the Pine Barrens, was spared because of the clearing around the structure eliminated any hazard fuels and had defensible space.
98. For several days forest fire crews patrolled the edge of the burned area, and put out hot spots that flared up from smoldering stumps and embers in hollow logs.
99. The Box Turtle burrowed underground during the fire, and although its shell was singed, it survived and found an opportunistic meal.
100. The White-tailed Deer sought out a pond to escape the flames, but was probably overcome by smoke.
101. In areas that were not burned, wildlife abounds.
102. All of the East and West Plains, and a large portion of Penn State Forest were threatened by the Jetport proposal.