

7.4 PINE BARRENS

BACKGROUND

Pine barrens are a rare, fire-dependent natural community that support unique flora and fauna.

Pitch pine - scrub oak woodlands, commonly known as pine barrens, are one of New Hampshire's rarest natural communities. These unique forests make up less than half of one percent of the state's landcover. Historically pine barrens were more prevalent, with large pine barrens ecosystems found in the Ossipee River watershed and lower Merrimack River Valley. Today, they exist as scattered fragments.

Pine barrens are characterized by:

- The presence and preponderance of "hard" pine in the overstory, including pitch pine and occasionally red pine.
- An understory that can include dense thickets of scrub oak and low-growing shrubs such as blueberries.
- Grassy openings with herbaceous plants such as wild blue lupine.

Barrens require periodic recurring fires for maintenance and regeneration. The plants and animals found in these ecosystems are uniquely adapted to this disturbance. For example, the thick bark of a pitch pine protects the cambium and prevents girdling during a fire. Such adaptations provide a competitive advantage in fire-prone areas. Without periodic burning, species less tolerant of fire can gain a foothold and displace the pine barrens species.

Pine barrens are home to numerous uncommon species, many of which are restricted to pine barrens habitats. They support more than 50 rare plant and animal species, including a number of rare and declining ground- and shrub-nesting birds and numerous uncommon invertebrates. Whip-poor-will, eastern towhee, and the federally protected Karner blue butterfly are just a few of the well-known, yet uncommon species.

OBJECTIVE

Maintain unique pine barrens natural communities for a variety of uncommon wildlife and plant species, and to protect important groundwater resources.

CONSIDERATION

- Pine barrens require disturbance to: (1) regenerate pitch pine and other pine barrens species, (2) remove fire-intolerant species, and (3) maintain structural diversity.
- Prescribed burning most closely mimics the natural disturbance regime in pine barrens.
- Plants less tolerant of fire than hard pines are common in many pine barrens due to the lack of fire. White pine, American beech, red maple, red and white oak, and aspen are the most common to encroach. These species increase the canopy cover, resulting in changes to the understory. Scrub oaks and other understory shrubs are shade-intolerant and decline with increasing canopy cover. Pitch pine regeneration is suppressed by the lack of suitable conditions created by fires for seed germination.

- Various uncommon wildlife species require the plants and diverse forest structure of pine barrens. Many of the rare invertebrates depend upon just one or two plant species to serve as their host. For example, the caterpillar of the highly uncommon pine pinion moth feeds exclusively on pitch pine needles. Similarly, ground- and shrub-nesting birds depend upon the patches of bare mineral soil and dense shrubby thickets for nesting.
- The limited commercial value of pitch pine creates a financial incentive to convert pine barrens to white pine, a species able to grow on these soils.
- The sand and gravel deposits where pine barrens are found often comprise stratified drift aquifers, highly productive areas for groundwater recharge and storage. Stratified drift aquifers are easily contaminated because they lack a protective bedrock cap.
- The vegetation in pine barrens is highly flammable. Many plants have flammable oils enabling them to burn with high intensity even during the growing season. Without periodic fires, fuels can accumulate to dangerous levels; wildfires may threaten human life and property and cause significant ecological damage. Because of fire suppression, many pine barrens now have high fuel loads and represent serious fire hazards during periods of drought.

RECOMMENDED PRACTICES

- ✓ Maintain pine barrens natural communities. Avoid converting them to other forest types.
- ✓ Provide a diversity of habitat niches by maintaining heterogeneity in the forest canopy and understory. Maintain forest openings, edges and dense stands. The understory should include thickets of tall shrubs (e.g. scrub oak), carpets of low-growing ericaceous (heath) shrubs, grassy openings, and patches of exposed mineral soil. Minimize overstory shading on the shrub layers.
- ✓ Although prescribed burning may not be practical in all areas, a combination of prescribed burning and mechanical treatments is the preferred disturbance method. In the absence of fire, substitute partial timber harvesting and mowing of shrub layers.
- ✓ Use timber harvests to:
 - Remove fire-intolerant species (e.g., white pine, red maple) to favor hard pines and other pine barrens species.
 - Create openings in the canopy, even when the stand is dominated by pitch pine, to encourage the growth of shrub layers in the understory.
 - Scarify the soil to promote the regeneration of pitch pine and other pine barren species. Time harvests to coincide with good pitch pine seed years.
- ✓ Limit the disturbance of any given discrete patch to no more than 20 to 25 percent in the same year. Leave some areas undisturbed within any 20-year period. If the patch extends onto other ownerships, coordinate management across ownerships to the extent possible.
- ✓ For invertebrates, maintain adequate abundance of food plants, especially scrub oak, pitch pine, blueberries, sweet fern, sand cherry, pin cherry, wild lupine, and New Jersey tea.
- ✓ For whip-poor-will and common nighthawk, create areas of reduced litter to provide suitable nesting habitat.
- ✓ For shrub-nesting birds, provide shrubs high enough for nests 3 to 6 feet above the ground.
- ✓ Minimize activities during the bird-breeding season (mid-May to early July).
- ✓ Prior to conducting management, have a plan for hazardous materials spill prevention and control.

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- ✓ Reduce fuel and protect neighboring property.
 - Reduce canopy and shrub fuels, especially next to developed areas.
 - Create fuel breaks.
 - Use whole-tree harvesting techniques.
 - Have fire extinguishers available during management activities.
 - Thoroughly check the harvest area for small fires prior to leaving the site. This is particularly important during times of high fire danger in the spring and late summer, especially when the State Fire Class Danger Rating is above 4.
- ✓ Contact the N.H. Division of Forests and Lands, N.H. Fish and Game, the USDA Forest Service, the Natural Resources Conservation Service, The Nature Conservancy, or UNH Cooperative Extension for information. Prescribed fire can maintain and restore pine barrens, but it requires highly specialized expertise, planning, personnel, and equipment.

CROSS REFERENCES

3.1 Timber Harvesting Systems; 7.1 Natural Communities and Protected Plants.

ADDITIONAL INFORMATION

N.H. Natural Heritage Bureau. 2008. *Biodiversity Tracking and Conservation System (BIOTICS) database*. N.H. Dept. of Resources and Economic Development, Concord, N.H.

N.H. Fish and Game. 2005. *New Hampshire Wildlife Action Plan*. http://www.wildnh.com/Wildlife/wildlife_plan.htm Accessed February 23, 2010.

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