

## **Waterboro/Shapleigh Barrens Focus Area**

Shapleigh, Newfield & Waterboro, Maine

### ***Description:***

The Waterboro/Shapleigh Barrens Focus Area is a large geographic area with numerous features of ecological significance including six exemplary natural communities, nine rare animals, and eleven rare plants. Many of these sensitive natural features are located at multiple sites within the focus area. Of greatest significance are the Pitch Pine-Scrub Oak Barrens that extend over vast acreages in two sections of the focus area. Waterboro Barrens is considered the best and largest example of this habitat in Maine. Some of the factors contributing to Waterboro Barren's importance include at least 3,000 acres of pine barrens vegetation, a large number of rare invertebrate species, minimal degradation and fragmentation, and its proximity to Shapleigh Barrens. Shapleigh Barrens lies in part within the Vernon Walker Wildlife Management Area of Maine Department of Inland Fisheries and Wildlife (MDIFW). This barrens is relatively large at



**Pitch Pine-Scrub Oak Barrens, Waterboro (from MNAP files)**

1,170 acres. However, only half of Shapleigh Barrens is currently protected, and the majority of the pitch pine/scrub oak habitat that is unprotected lies along Route 11, a major north-south highway. Although Waterboro Barrens and Shapleigh Barrens lie within three miles of one another, it is unknown how much of an influence their proximity has on invertebrate movements. Small pockets of pine barrens habitat exist on the land owned by the Town of Shapleigh which

lies between the two barrens and likely facilitates some population movements between the two sites.

The pitch pine/scrub oak barrens in Waterboro and Shapleigh grow on droughty, nutrient poor soils in areas with glacial outwash deposits. Poor soils and cold pockets create harsh growing conditions that limit the number of plant species that can tolerate this environment. However, at Waterboro Barrens, the presence of numerous wetlands and riparian areas interspersed with the barrens vegetation increase species and community diversity. Most noteworthy are Round Pond and Little Teeny Poverty Pond, both of which support outwash plain pond shore natural communities.

### **Natural Communities within the Waterboro/Shapleigh Barrens Focus Area:**

**Pitch Pine-Scrub Oak Barrens:** Woodlands on sandy outwash with patchy vegetation in which pitch pine is the canopy dominant. In openings, a dense shrub/sapling layer of scrub oak and/or gray birch is typical. The low layer of heath shrubs is dominated by lowbush blueberry, with bracken fern and woodland sedge as characteristic herbs. Mosses are virtually absent. Soils tend to be excessively drained and accumulate very little organic matter.

**Three-way Sedge-Goldenrod Outwash Plain Pondshore:** This community is made up of concentric zones of different herbs around shallow, sandy-bottomed ponds in outwash plains, whose shores are inundated for part of the growing season and exposed for part of the growing season. A band of shrubs (e.g. highbush blueberry, maleberry, buttonbush, leatherleaf) is typical at the upland edge. The next lower zone is dominated by narrow-leaved goldenrod and three-way sedge; golden-pert and meadow beauty are characteristic. The lowest zone, exposed less frequently than those above, is dominated by pipewort and spikerush.

**Mixed Tall Sedge Fen:** This community is made up of expanses of tall grasses and sedges growing on peat soils. Slender sedge typically dominant, and beaked sedge and lake-bank sedge are also characteristic; bluejoint grass is often present in small amounts. The herb layer is continuous, and most shrubs are less than one meter tall except for an occasional alder or meadowsweet. Dwarf shrubs are always less abundant than the herbaceous plants. The moss layer is in inverse proportion to the amount of standing water. This community is generally found on peaty deposits adjacent to open water; sometimes a floating mat.

**Tussock Sedge Meadow:** This community is a marsh dominated by well defined hummocks of tussock sedge mixed with bluejoint grass and other grass-like plants. Other wetland herbs vary among sites, and include royal fern, cinnamon fern, sensitive fern, St. Johnswort, flat-topped goldenrod, or wool-grass. This community is generally found on saturated soils, with standing water through much of the growing season. Soils may be entirely organic, or organic over mineral soil. This natural community typically occurs in large flat basins with drainage streams.

**Red Maple-Sensitive Fern Swamp:** Red maple dominates the somewhat open to nearly closed forest canopy of this swamp. Balsam fir, red spruce, or northern white cedar may be common associates, but are less common than red maple. Winterberry is typical in the patchy shrub layer, and bluejoint grass and sensitive fern are characteristic herbs. This community occurs on

mineral soils, or well-decomposed organic material over mineral soil, in small basins, as narrow ribbons along drainage channels, or on floodplains of medium-sized streams to small rivers.

**Spruce-Fir-Cinnamon Fern Swamp:** This forested swamp community is dominated by red and/or black spruce with red maple as a frequent associate. The shrub layer features mountain holly and wild raisin; cinnamon fern and three-seeded sedge are typical in the herb layer. Sheep laurel and other dwarf shrubs may be present. The ground is typically covered with a carpet of mosses with *Sphagnum* mosses being most common. This community occurs along drainages where the soil remains saturated, on landscape areas with flat to gentle slopes.

### **Vernal Pools and Rare Turtles**

Vernal pools are ephemeral wetlands that typically fill with water from snow melt and spring run-off and often dry out over the course of the summer. They offer critical breeding habitat for some species of amphibians and invertebrates such as wood frogs, spotted and blue spotted salamanders, and fairy shrimp. The seasonal nature of the temporary pools maintains a fishless environment conducive to the successful breeding of these animals. Vernal pools are also used as feeding and breeding habitat by many other animals such as spring peepers, grey tree frogs, and other common amphibians, as well as by several rare species including Blandings turtles (endangered), spotted turtles (threatened), and ringed bog haunter dragonflies (endangered). The amphibians and aquatic invertebrates that are dependent on these ponds for survival are an important food resource for other forest dwellers such as turtles, snakes, birds, and small mammals. The vegetated condition of vernal pools varies from completely vegetated, usually with sedges, grasses, ferns, and scattered shrubs, to non-vegetated, with only dead leaves on the pool bottom. Non-vegetated pools can be just as important for amphibians as those with plant cover.



**Blandings Turtle**



**Wood Turtle**

The wetlands and uplands in this focus area support the state endangered Blandings turtle and the special concern wood turtle. Blandings turtles are generally found only in the southern most part of the state where increasing development contributes to loss of habitat, habitat fragmentation, and an on-going loss of individuals to road kill. Blandings turtles are most frequently associated with complexes of small, acidic wetlands and vernal pools in large, intact forested landscapes. They also use shrub swamps, forested swamps, small streams, and

emergent marshes. Although these turtles spend most of their time in the water, they readily travel overland between wetlands during the spring and summer months. Wood turtles use streams, rivers, and vernal pools as well as riparian forests, and though rare, are more widely distributed around the state. Upland habitats are critical for both types of turtles for basking, aestivating (a period of late summer inactivity), nesting, and as travel corridors between wetlands.

Blandings and wood turtles have evolved relatively long adult life spans to offset the long time it takes to reach reproductive maturity and to offset high levels of nest mortality. Because of this unusual life history, Blandings and wood turtle populations are at low densities, and thus populations are extremely vulnerable to any human sources of adult mortality. Road mortality and collecting for pets, for example, can be extremely deleterious, as the attrition of just a few individuals every year can lead to the long-term decline and extinction of a local population. The secondary effects of human development – increased predators (e.g., dogs, raccoon, skunks), water pollution, filling of small wetlands, and blocking upland travel corridors (roads, rail beds, yards) – also limit populations. Blanding's and wood turtles are strictly protected from take (collecting, possession, or killing) by the Maine Endangered Species Act.

### **Invertebrates**

To date, 6 state-rare species of moths and butterflies have been documented at Waterboro Barrens and Shapleigh Barrens. Sampling for all species of moths and butterflies at Waterboro Barrens alone yielded 364 species – a diversity that exceeds the total number of breeding bird species statewide! Many of these species are highly dependant on the plant species specific to Pitch Pine-Scrub Oak Barrens and associated habitat types. Some of these plant-larvae relationships can be quite complex. For example, Edwards hairstreak caterpillars have been known to hide during the day in ant nests at the base of its host tree- scrub oak. In return for the protection provided to the caterpillar, the ants feed on sugary secretions produced by the caterpillars.

A globally rare dragonfly, the ringed boghaunter, has also been documented within the focus area. This dragonfly uses small peaty wetlands to complete its life cycle. The ringed boghaunter is among the earliest flying dragonflies in the state, with adult emergence occurring in early May. Reproductive sites are typically small, acidic pocket swamps where patches of “*Sphagnum* soup” are interspersed with sedges, ferns, or shrubs. Although portions of these wetlands tend to dry up during summer months, some permanent open water generally persists. Adult dragonflies typically frequent upland forested areas up to several hundred feet from their natal wetland to bask and forage before returning to breed.



**Underwing Moth**



**Small Whorled Pogonia**

**Rare Plants**

Eleven species of rare plants occur within the focus area (for list see table below) including one of the eastern United States rarest orchids, small whorled pogonia. Small whorled pogonia typically occurs in mid-successional mixed woods with sparse shrub and herb layers and thick leaf litter. It often occurs near intermittent streamlets or where a hardpan impedes water percolation into the soil. Associated understory plants include Indian cucumber-root, New York fern, partridge berry, and rattlesnake plantain.

***Rare Species Table for Waterboro/Shapleigh Barrens Area:***

Common Name	Latin Name	Status	S-Rank	G-Rank
<b>Natural Communities</b>				
Tall Sedge Fen	Mixed Tall Sedge Fen		S4	
Pitch Pine-Scrub Oak Barren	Pitch Pine-Scrub Oak Barren		S1	G2
Red Maple Swamp	Red Maple-Sensitive Fern Swamp		S4	
Spruce-Fir Wet Flat	Spruce-Fir-Cinnamon Fern Swamp		S4	
Three-way Sedge-Goldenrod Outwash Plain Pondshore	Three-way Sedge-Goldenrod Outwash Plain Pondshore		S1	G3
Sedge Meadow	Tussock Sedge Meadow		S3	
<b>Rare Plants</b>				
Branching needle-grass	<i>Aristida basiramea</i>	SC	S3	G5

Fern-leaved False Foxglove	<i>Aureolaria pedicularia</i>	SC	S2	G5
Dry Land Sedge	<i>Carex siccata</i>	T	S1	G5
Spotted Wintergreen	<i>Chimaphila maculata</i>	E	S1	G5
Autumn Coralroot	<i>Corallorhiza odontorhiza</i>	E	S1	G5
Narrow-Leaved Goldenrod	<i>Euthamia tenuifolia</i>	T	S2	G5T5
Fall Fimbry	<i>Fimbristylis autumnalis</i>	T	S2	G5
Rattlesnake Hawkweed	<i>Hieracium venosum</i>	E	S1	G5T4Q
Small Whorled Pogonia	<i>Isotria medeoloides</i>	E	S2	G2
Spicebush	<i>Lindera benzoin</i>	SC	S3	G5
Swamp Saxifrage	<i>Saxifraga pensylvanica</i>	T	S2	G5
<b>Rare Animals</b>				
Similar Underwing Moth	<i>Catocala similis</i>	SC	S2S3	G5
Wood Turtle	<i>Clemmys insculpta</i>	SC	S4	G4
Blanding's Turtle	<i>Emydoidea blandingii</i>	E	S2	G4
Thaxter's Pinion Moth	<i>Lithophane thaxteri</i>	SC	S4	G4
Edwards' Hairstreak Butterfly	<i>Satyrrium edwardsii</i>	E	S1	G4
Ribbon Snake	<i>Thamnophis sauritus</i>	SC	S3	G5
Ebony Boghaunter Dragonfly	<i>Williamsonia fletcheri</i>	SC	S3?	G4G5
Ringed Boghaunter Dragonfly	<i>Williamsonia lintneri</i>	E	S1	G2
Acadian Swordgrass Moth	<i>Xylena thoracica</i>	SC	S3	G4
Red-Winged Swallow	<i>Xystopeplus rufago</i>		S1S3	G5
Pine Barrens Zanclognatha Moth	<i>Zanclognatha martha</i>	T	S1	G3Q

***Other Resources Mapped by MDIFW:***

Deer Wintering Area

Wading Bird / Waterfowl Habitat

**Conservation Considerations :**

**Fire Suppression:** Fire suppression is one of the most serious sources of stress at Waterboro Barrens. Since the last great fire in 1947, suppression of wildfire has all but eliminated this important natural disturbance at Waterboro Barrens. In addition, the scale of the 1947 fire created a relatively homogeneous pine barrens in terms of age class structure and successional stages. Without the reintroduction of fire or some equivalent vegetation management program, pine barrens community types will succeed to more mesic forest types dominated by red and white oak, and white pine. Only those sites that are the most xeric or frost prone will likely

maintain pine barrens habitat. A loss of pine barrens community types will lead to a loss of habitat for pine barrens dependent moths and butterflies. Small pockets of barrens may persist, but the distribution of these pockets may not be adequate to maintain the viable populations of these species. In addition, habitat for rare barrens flora may be lost. It is likely that Waterboro Barrens will eventually burn again in a catastrophic fire. The buildup of fuel since 1947 and the volatility of the vegetation will likely result in a severe and intense wildfire under drought conditions. Depending on the scale of such a fire, large shifts in pine barrens community types may occur.

**Residential Development:** Of all the sources of stress at Waterboro Barrens, residential development results in the most permanent degradation. The scattering of small ponds and lakes throughout the site has resulted in the development of numerous seasonal cottages and lakefront communities. While Waterboro Barrens is relatively intact, with development most severe around its margins, increased development to the west will result in a loss of connectivity with Shapleigh Barrens. Development will also result in increased road construction and fragmentation which has a negative impact on the movements of animals. While non-native species are not a current stress on the system, there is an increased likelihood that exotics may play a role at Waterboro Barrens as development increases. Frequently, trails and roads are avenues for the dispersal of exotic weeds.

Many neighbors have dogs and cats that roam freely and will have an impact on the movement of wildlife and may directly impact wildlife. Ground nesting birds are particularly vulnerable, and an increase in domestic animals may lead to a decrease in regionally rare populations of whip-poor-wills and common nighthawks. Many people who live in neighboring developments use the preserve and Vernon Walker Wildlife Management Area for recreation, including uses that are illegal and incompatible with the purpose of the site (e.g. dumping, off trail use by ORV's, camping, etc.).

The large number of permanent and seasonal dwellings at the margins of the preserve could be vulnerable in the event of a wildfire. In addition, activities near these dwellings may contribute to an increase in the number of fires ignited. In the past six years, there have been four wildfires on or near the preserve. In each case, the fires were extinguished by local fire departments before they got out of control, and each was restricted to less than five acres.

**Gravel Mining:** There currently is one active gravel mine within this site. However, gravel deposits are extensive within Waterboro Barrens and the surrounding area. One adjacent landowner has been denied a mining permit, but future changes in regulations may make it easier to obtain a permit. Although the gravel industry is currently booming, several towns in the area, including Waterboro, have tried to place a moratorium on future gravel mines until further study of the impacts of mining on the quality of life can be assessed. Mining has a direct negative impact through permanent loss of habitat, as well as potentially impacting stream sedimentation and water quality. In some cases, restoration of abandoned gravel pits may be possible but the feasibility of such projects may be restrictive.

**Timber Management:** Timber management can lead to increased fragmentation and isolation of habitat patches and conversion to other forest types. However, timber management, applied properly within pitch pine habitats may actually help regenerate some barrens community types. There is evidence that past timber management at Waterboro Barrens and Ossipee Pine Barrens were instrumental in perpetuating pitch pine stands. Strip cuts completed in the late 1980s at Vernon Walker Wildlife Management Area succeeded in promoting early successional pitch pine community types.

**Wetlands and Aquatic Systems:** The integrity of wetlands and aquatic systems including all the processes and life forms they support are dependent on the maintenance of the current hydrology and water quality of these systems. Intensive timber harvesting, vegetation clearing, soil disturbance, new roads, and development on buffering uplands can result in greater runoff, sedimentation, and other non-point sources of pollution.

No activities should be permitted that could lead to the loss or degradation of rare turtle or dragonfly wetlands including filling, dredging, sedimentation, changing hydrology unless the activity is approved by MDIFW; A minimum 250-foot forested buffer zone should be maintained around target wetlands with known rare animal populations. All wetlands, regardless of size, within ¼ mile of mapped rare turtle populations should be considered potential habitat, protected from direct impacts, and buffered by forested upland. Impervious surfaces such as yards, buildings, and roads should be minimized in the upland landscape within ¼ mile of these turtle wetlands. Natural forest habitat should predominate the landscape. Intensive developments that concentrate human populations within ¼ mile of turtle and dragonfly wetlands should be avoided including subdivisions and service centers. Towns should strive to maintain important habitat areas identified by MDIFW in a low density, rural setting by identifying important habitat areas in comprehensive plans and zoning accordingly.

**Aerial spraying:** The large concentration of oak in the Waterboro-Shapleigh Barrens Focus Area helps to support a population of gypsy moths- an introduced pest restricted to southern Maine. Periodically, Gypsy moths are capable of attaining outbreak population levels, defoliating a large proportion of scrub oak and other species. During an outbreak period, as we will be entering these next couple of years in southern Maine, several thousand acres will be sprayed with BT (*Bacillus thuringiensis*) from the air to help control Gypsy moth populations. While BT is believed to pose no threat to higher organisms, it is NOT host specific within the order Lepidoptera and thus poses a potentially severe threat to the area's rare butterfly and moth species. For this reason, wide buffers (1/2 mile) should be flown around sections of pitch pine barrens hosting known occurrences of rare butterflies and moths when spraying pesticides for control of gypsy moths and other pests.

***Protection Status:***

The Waterboro / Shapleigh Barrens focus area includes substantial conservation ownership by both the Division of Inland Fisheries and Wildlife and The Nature Conservancy. However, most of the area is in non-conservation private ownership. The focus area is not intended to include the various developed areas in this locality, rather it is intended to include the remaining open space where there is an opportunity for practical conservation. The boundary line is a guide

showing the area with in which additional conservation projects could help ensure the longterm viability of the rare plants, animals, and natural communities occurring here.

#### STATE RARITY RANKS

- S1** Critically imperiled in Maine because of extreme rarity (five or fewer occurrences or very few remaining individuals or acres) or because some aspect of its biology makes it especially vulnerable to extirpation from the State of Maine.
- S2** Imperiled in Maine because of rarity (6-20 occurrences or few remaining individuals or acres) or because of other factors making it vulnerable to further decline.
- S3** Rare in Maine (on the order of 20-100 occurrences).
- S4** Apparently secure in Maine.
- S5** Demonstrably secure in Maine.

**Note:** **State Ranks** are determined by the Maine Natural Areas Program.

#### GLOBAL RARITY RANKS

- G1** Critically imperiled globally because of extreme rarity (five or fewer occurrences or very few remaining individuals or acres) or because some aspect of its biology makes it especially vulnerable to extirpation from the State of Maine.
- G2** Globally imperiled because of rarity (6-20 occurrences or few remaining individuals or acres) or because of other factors making it vulnerable to further decline.
- G3** Globally rare (on the order of 20-100 occurrences).
- G4** Apparently secure globally.
- G5** Demonstrably secure globally.

**Note:** **Global Ranks** are determined by The Nature Conservancy.

#### STATE LEGAL STATUS FOR PLANTS

**Note:** State legal status is according to 5 M.R.S.A. § 13076-13079, which mandates the Department of Conservation to produce and biennially update the official list of Maine's endangered and threatened plants. The list is derived by a technical advisory committee of botanists who use data in the Natural Areas Program's database to recommend status changes to the Department of Conservation.

- E** ENDANGERED; Rare and in danger of being lost from the state in the foreseeable future, or federally listed as Endangered.
- T** THREATENED; Rare and, with further decline, could become endangered; or federally listed as Threatened.
- SC** SPECIAL CONCERN; Rare in Maine, based on available information, but not sufficiently rare to be considered Threatened or Endangered.

Visit our web site for more information on rare, threatened and endangered species!  
<http://www.state.me.us/doc/nrimc/mnap/factsheets/mnapfact.htm>