



## Natural Heritage & Endangered Species Program

Massachusetts Division of Fisheries & Wildlife  
1 Rabbit Hill Road, Westborough, MA 01581  
tel: (508) 389-6360, fax: (508) 389-7891  
www.nhesp.org

## Scrub Oak Shrubland (S1)

State Status: None  
Federal Status: None

**Description:** Scrub oak shrublands are generally dominated by scrub oak (also called bear oak) (*Quercus ilicifolia*) and may be co-dominated by dwarf chinquapin oak (*Quercus prinoides*), along with characteristic heaths and graminoids. They form almost impenetrable thickets with shrubs ranging from 2-3 feet (about 1m) to greater than 6 feet (2m) in height. There may be a few scattered trees. If pitch pine (*Pinus rigida*) cover exceeds a low percentage, the community will be characterized as a Pitch Pine - Scrub Oak Community; if cover of trees exceeds about 25%, the community will be characterized as some form of woodland.

**Environment:** Scrub Oak Shrublands occur in two very different environments, both dry because of lack of water holding capacity of the soils. Scrub oak, which does not tolerate poorly drained conditions, is an indicator of dry (xeric) conditions on both sand plains and ridgetops where the communities get established. In coastal areas, the community forms on sandy areas, away from salt spray, and intermixed with Pitch Pine - Scrub Oak Communities. These sandy soils are coarse, and water from precipitation infiltrates quickly. While the groundwater may approach the surface in some areas, generally these Scrub Oak Shrublands are dry. Available nutrients are also limited as the soils are acidic and the coarse material does not bind the nutrients as well as finer or organic material does. Scrub Oak Shrublands also occur away from the coast on ridgetops where soils are shallow to bedrock and generally acidic. They may be associated with or embedded within Ridgetop Pitch Pine - Scrub Oak Communities or Ridgetop Chestnut Oak Forests.

Within coastal areas, Scrub Oak Shrublands may include or be in frost pockets. These form in glacial kettle holes, left as ice from the Wisconsin glaciations melted after recession of the main ice sheet. These small depressions collect cold air, and



Top: Edge of a dense Scrub Oak Shrubland from a fire break. Below: Scrub oak and huckleberry growing in a Scrub Oak Shrubland treated to reduce fuel. Photos: top, Joanne Singfield and bottom, Patricia Swain, both NHESP.

frost may form throughout the growing season, limiting the abundance of trees, and sometimes scrub oak. Coastal storms, including snow and ice storms can significantly impact this community by breaking branches of trees and shrubs, thereby limiting their stature.

Scrub Oak Shrublands are considered fire dependent communities as the component shrub species both foster and are adapted to fire.

During the dormant season, the leaf litter and stems are highly flammable, and high intensity wildfires may burn at 3-10 year intervals. Scrub oak and heath species resprout readily after fire, and within a few years, the litter and fine woody fuels build sufficiently for fire to occur again. While fires ignited by lightning are uncommon in the east, historic records and records from cores of wetlands and bogs where pollen and charcoal have been analyzed, indicate fire was frequent. Native Americans are thought to have set fires intentionally to make travel and hunting easier, and to foster berry crops. On ridgetops, fire may have been started by lightning, set intentionally, or resulted from fires started in valleys that became more widespread. It is likely that this community burned under a variety of conditions, including droughts and possibly during the growing season as well as the dormant season, so that structural and compositional variation may have been greater than what we see today. Scrub Oak Shrublands are often embedded within pitch pine and tree oak communities that also burn frequently, so fires may have occurred at a landscape scale.

**Characteristic Species:** Either scrub oak or dwarf chinquapin oak will have at least 50% cover, and any trees will be quite sparse. Tree species may include scattered pitch pine (*Pinus rigida*), gray birch (*Betula populifolia*), and quaking aspen (*Populus tremuloides*). Other species include black huckleberry (*Gaylussacia baccata*), low bush blueberry (*Vaccinium angustifolium*), early sweet blueberry (*Vaccinium pallidum*), chokeberry (*Photinia melanocarpa*), sheep laurel (*Kalmia angustifolia*), and sweet fern (*Comptonia peregrina*), along with Pennsylvania sedge (*Carex pensylvanica*), little bluestem (*Schizachyrium scoparium*), poverty oats (*Danthonia spicata*), cow wheat (*Melampyrum lineare*), bracken fern (*Pteridium aquilinum*), bearberry (*Arctostaphylos uva-ursi*), and areas of lichens, either on sand or rock. Coastal occurrences that contain frost pockets may include a diverse herbaceous flora.

Scrub oak shrublands are important habitat for several rare species of Lepidoptera (butterflies and moths) that feed on oaks and heaths. These include the Barrens Daggermoth (*Acronicta albarufa* T), Pine Barrens Lycia (*Lycia ypsilon* T) and the Coastal BarrensBuckmoth (*Hemileuca maia* SC). They also harbor several birds restricted to shrublands such as the Prairie Warbler (*Dendroica discolor*), which is declining throughout its range due to habitat loss.

Categories of the Massachusetts Endangered Species Act:

SC=Species of Special Concern;

T=Threatened:

Scrub Oak acorns are transported long distances by Blue Jays (*Cyanocitta cristata*), which cache seeds and shorter distances by small mammals.

**Range:** This community type is found in coastal areas from Maine, New Hampshire, Massachusetts, and south through Rhode Island. Inland versions may occur within New Hampshire, Massachusetts, and New York. Similar appearing communities with different shrub oak species occur to the south in New Jersey, and into Pennsylvania, Virginia and West Virginia.



**Related Communities:** On ridgetops, Acidic Rocky Summit/Rock Outcrop and Circumneutral Rocky Summit/Rock Outcrop Communities share some similar species but will have a greater diversity in the sparse canopy layer such as shagbark hickory (*Carya ovata*) and red oak (*Quercus rubra*) and more open patches dominated by herbaceous and graminoid species. The Pitch Pine - Scrub Oak and Ridgetop Pitch Pine - Scrub Oak Communities have higher cover of pitch pine, which is generally lacking in the Scrub Oak Shrubland, along with several species of tree oaks such as red oak and chestnut oak (*Q. montana*). Along the coast, Sandplain Heathlands have similar species, but are more open with areas of graminoid and herbaceous vegetation and bare soil or lichens.

**Threats and Management Recommendations:** The primary threat is direct disturbance from various forms of development. In coastal areas, these sandy communities are prime areas for development. On ridgetops, roads, power line rights-of-way, and ridgetop development can reduce or fragment occurrences.

Scrub oak shrublands are dependent on periodic fire to maintain dominance by scrub oak and associated species. Fire is also important in optimizing nutrients in leaves fed upon by rare larvae, as newer leaves generally have more nutrients than old leaves. Late spring or early summer fires result in resprouting of scrub oak and more available leaves for later feeding larvae. At the same time, some unburned areas need to remain as refugia for Lepidoptera and shrubland nesting birds; therefore, with prescribed fire, the season of burning should be varied to avoid affecting all species vulnerable (generally as eggs, larvae or pupae) in a given season. Dormant season fires can be extremely intense and difficult to control, but mimic some natural fires. Mechanical treatment, followed by fire has been proven effective in reducing fire hazard and providing needed ecological restoration and management. Such treatments can also foster greater habitat structural diversity, including expanded herbaceous openings.

Rare Lepidoptera can be affected by both chemical and biological controls for the non-native, invasive gypsy moth (*Lymantria dispar*).

Protection of this community as part of a complex of forests, shrublands, and openings, with adequate buffers of and connections between patches is essential for maintaining and managing the communities.

Further work and analyses are needed on the optimal structure of Scrub Oak Shrublands. Dense, tall stands can create fires of extremely high intensity and rates of spread. However, some areas of tall scrub oak may be necessary for some species, such as shrubland nesting birds. Therefore, an optimal mixture of heights and density of scrub oak may allow for appropriate ecological management and maintenance of target species populations.

**Status in Massachusetts:** Scrub Oak Shrublands are ranked as S1, indicating there are five or fewer good occurrences.

**For More Information See:**

Barnes, J. 2003. Natural History of the Albany Pine Bush: Albany and Schenectady Counties, NY. New York State Museum, Albany, NY.

Boyd, H.P. 1991. A Field Guide to the Pine Barrens of New Jersey: Its flora, ecology and historic sites. Plexus Publishing, Medford, NJ.

Manomet Center for Conservation Sciences. 2006. A guide to the natural communities of Massachusetts. Manomet Center for Conservation Sciences. Manomet, MA.  
[http://www.conservationmapper.org/natcom\\_resources.htm](http://www.conservationmapper.org/natcom_resources.htm)

Northeast Barrens Fuels Demonstration Project 2009. Managing Fuels in Northeastern Barrens website. Available via  
<http://www.umass.edu/nebarrensfuels/>.

**Swain, Patricia C. and Jennifer B. Kearsley. 2001. Classification of the Natural Communities of Massachusetts. Version 1.3. Natural Heritage & Endangered Species Program, Massachusetts Division of Fisheries and Wildlife. Westborough, MA**

URL:  
<http://www.mass.gov/dfwele/dfw/nhesp/nhclass.htm>