



Natural Heritage & Endangered Species Program

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Massachusetts Division of Fisheries & Wildlife

Bur Oak *Quercus macrocarpa* A. Michaux

State Status: **Special Concern**
Federal Status: **None**

DESCRIPTION: Bur Oak, a member of the beech family (Fagaceae) is a deciduous tree with alternately arranged leaves, twigs, and branches. It grows to a maximum height of about 30 m (100 feet) and has gray, scaly or flat-ridged bark. The twigs are finely pubescent and often corky-winged. The leaves are usually fiddle-shaped in outline, dark green above and pale pubescent below, with 4 to 7 rounded lobes on each side of the midrib, and the tips do not have bristles. The center or near-center pair of lobes is cut nearly to the midrib.

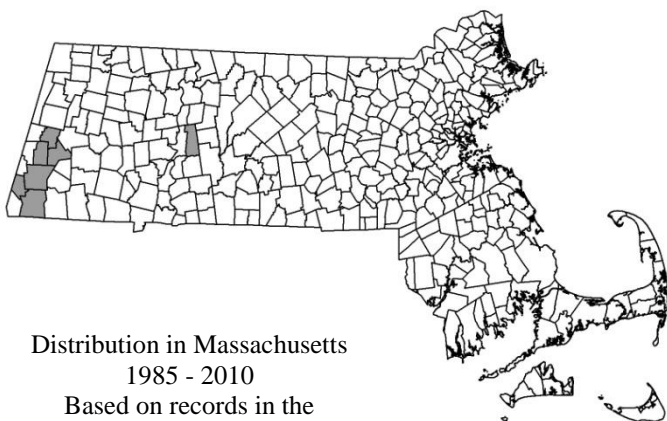
Staminate flowers are born on small, pendant catkins. The pistillate flowers are solitary to few and are in the leaf axils. Acorns are produced singly or in clusters of up to three. The acorns may lack an attaching stalk or may be short-peduncled (on a stalk less than 25 mm or about 1 inch long). The cup holding the acorn encloses one half to nearly the entire nut, and bears on its margins an array of soft awns 5-10 mm (up to about four-tenths of an inch) long, which form a prominent fringe along the bottom of the cup. The acorns can be large, up to 5.1 cm in length, though the fruits are generally much smaller in Massachusetts. They ripen in one growing season and seldom persist on the twig past November.



*Bur Oak spring leaves with typical 'waist' shape.
Photo: Bryan A. Connolly, NHESP.*



Bur oak acorn showing why the tree is sometimes called Mossycup Oak. Photo: Paul Wray, Iowa State University, Bugwood.org



Distribution in Massachusetts
1985 - 2010
Based on records in the
Natural Heritage Database

A Species of Greatest Conservation Need in the Massachusetts State Wildlife Action Plan

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AIDS TO IDENTIFICATION: The genus *Quercus* in Massachusetts includes a large number of species. Among the most common native species are Chestnut, White, Red, Black, Scarlet, and Swamp White Oaks. Naturalists familiar with those and perhaps other less common oaks can distinguish Bur Oak from them by its combination of: 1) occasionally corky twigs; 2) fiddle-shaped leaves with their high “waist;” and 3) a fringed acorn cup.

SIMILAR SPECIES: White Oak (*Quercus alba*) leaves are highly variable and may occasionally take on a fiddle shape. White Oak acorns, however, are not fringed. Swamp White Oak (*Quercus bicolor*) leaves are less deeply lobed than Bur Oak leaves, the branches have peeling bark, the acorns are borne on long stalks, and the acorn caps are fringeless. Hybrids between Bur Oak and Swamp White Oak are known in Massachusetts.

HABITAT IN MASSACHUSETTS: Bur Oak is widespread and common in some parts of North America, where it is found in bottomlands, on well-watered sites, and on less wet upland sites. In Massachusetts, it is most often found in wet locations, and often in calcareous or limestone-influenced soils. Such locations include fen-like seepage swamps; forested swamps, floodplains, and seepage slopes; and wet meadows and moist uplands.

PHENOLOGY: Bur Oak flowers in late May shortly after the leaves appear. Acorns mature in one growing season and drop from the tree from August through November. Like other members of the White Oak group, acorns germinate shortly after dropping and require no cold stratification. Seed leaves or cotyledons remain below ground upon germination.

RANGE IN MASSACHUSETTS: Bur Oak populations were observed and recorded in recent years (1980 or later) in Berkshire County, in the towns of Egremont, Great Barrington, Lee, Lenox, Sheffield, and Stockbridge.

THREATS: Invasion by exotic species (both plant and animal), diseases, and logging are current or potential threats to all native tree species and Bur Oak populations in Massachusetts are no exception. Since many Massachusetts Bur Oak populations are wetlands, beaver and the hydrologic changes they bring may be considered a potential threat. More positively, some studies indicate that reproductive isolation (such as might occur in the fragmented populations of Bur Oak in Massachusetts) and a resulting loss of genetic diversity may not be a major concern for wind-pollinated trees.

High deer densities can reduce the number of seedlings dramatically, thereby limiting recruitment to the sapling and canopy stages. Competition by other species, such as Red Maple, can also reduce long-term recruitment, particularly on wet and mesic sites.

POPULATION STATUS IN MA: Bur Oak is listed under the Massachusetts Endangered Species Act as a Species of Special Concern. All listed species are legally protected from killing, collection, possession, or sale, and from activities that would destroy habitat and thus directly or indirectly cause mortality or disrupt critical behaviors.

Sixteen populations of various degrees of vigor and both with and without reproduction have been recorded in Massachusetts since 1980. One population recorded in 1984 was not found on a repeat visit in 2004. Three other populations were last observed no more recently than 1919.

MANAGEMENT RECOMMENDATIONS: Bur Oak may be attacked by several insects such as Gypsy Moth (*Lymantria dispar*) and Redhumped Oakworm (*Symmerista canicosta*) in the northeast, and other insects in other parts of the range. Oak Wilt (*Ceratocystis fagacearum*) has damaged Bur Oaks in the Midwest, though Bur Oaks are more tolerant of attack than Red Oaks. Bur Oak is moderately shade tolerant and may be replaced by more shade-tolerant species (e.g., Red Maple) on mesic sites. They are tolerant of a wide range of soil conditions and are relatively easy to propagate. As with all oaks, the key is to have sufficient numbers of seedlings and saplings to replace canopy oaks over time. This requires some reduction in competitors and opening of the canopy using mechanical means or periodic fire. High deer densities reduce seedling numbers in oaks.

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REFERENCES:

- Johnson, P.S. 1990. Bur Oak. In *Silvics of North America*. U.S. Department of Agriculture, U.S. Forest Service Agricultural Handbook 654. Online: http://www.na.fs.fed.us/spfo/pubs/silvics_manual/table_of_contents.htm. Accessed January 17, 2010.
- Tirmenstein, D. 1988. *Quercus macrocarpa*. In: *Fire Effects Information System*, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Online: <http://www.fs.fed.us/database/feis/> [2010, January 11].

Updated 2015

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