



Natural Heritage & Endangered Species Program

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Massachusetts Division of Fisheries & Wildlife

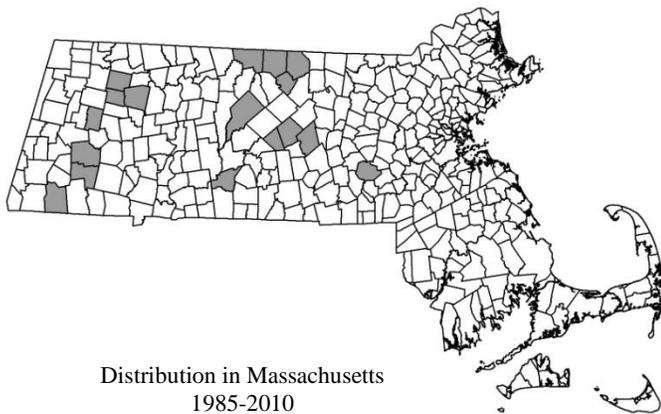
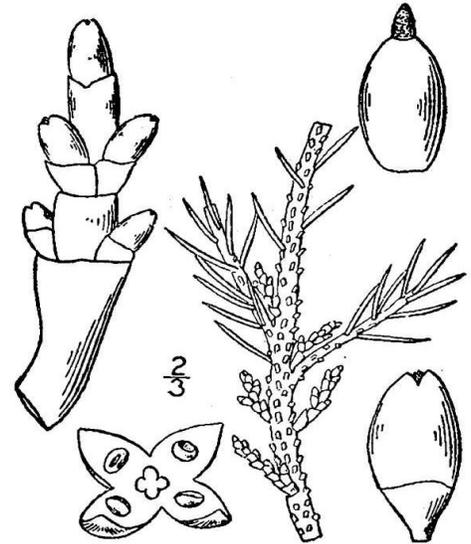
Eastern Dwarf Mistletoe *Arceuthobium pusillum*

Peck

State Status: **Special Concern**

Federal Status: **None**

DESCRIPTION: A member of the Christmas Mistletoe family (Viscaceae), Eastern Dwarf Mistletoe is a very small fleshy shrub, usually no more than 2 cm (0.8 in.) tall that parasitizes conifer trees. Its generic name reflects this parasitic habit, coming from the Greek words for juniper (*arkeuthos*) and life (*bios*). This simple or sparingly branched plant has greenish to chestnut-colored, or even purplish, stems that are circular when fresh and four-angled when dry. The opposite leaves are reduced to thin, connate, obtuse (blunt-tipped) scales with a width of only 1 mm (0.04 in.). Eastern Dwarf Mistletoe spreads beneath the bark of its host by means of a haustoria, an organ used to obtain nutrients from the host. The formation of globose clumps of swollen, infected branches or “witches’ brooms” saps the trees’ strength, and, eventually, a tree covered with them may weaken and die. Eastern Dwarf Mistletoe is a dioecious plant (a plant with unisexual flowers in which the individual plants are either male or female). Mistletoes reproduce by means of seeds expelled from explosive fruits. The sticky seeds cling to needles, eventually sliding down the needles to germinate on twigs. During the first year, the parasite penetrates the wood with a root-like structure and develops food and water transport systems. An



Distribution in Massachusetts
1985-2010

Based on records in Natural Heritage Database



Top: USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. An illustrated flora of the northern United States, Canada and the British Possessions. 3 vols. Charles Scribner's Sons, New York. Vol. 1: 638.

Bottom: Black Spruce shoot with Eastern Dwarf Mistletoe. Photo by and courtesy of Thomas J. Rawinski.

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

Massachusetts Division of Fisheries & Wildlife

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aerial fruiting structure arises in the early spring of the second year. The structure is green and about as long as the spruce needles. Male and female plants are located on separate branches or on separate trees. During the third year, pollen and flowers are produced. Male (pollen-producing) structures, which survive only a short time, are large and orange-yellow. Pollen is spread to the tiny flowers by wind, insects, and birds. Each flower then bears one barrel-shaped fruit. The fruit, which matures in the fall, is a hard seed covered with a sticky substance. The seed is shot out of the coat for a distance of up to 30 feet. The fruiting structure then withers and falls off, leaving only the cup-shaped base. Seeds may also be carried on the feathers of birds and the fur of mammals. Eastern Dwarf Mistletoe will only germinate on live host branches.

RANGE: Eastern Dwarf Mistletoe, one of the most widespread of the New World species of *Arceuthobium*, is found throughout most of the range of its hosts. The documented range of Eastern Dwarf Mistletoe extends from Newfoundland and Quebec to Minnesota and Saskatchewan and south to northern New Jersey, Pennsylvania and Michigan.

HABITAT IN MASSACHUSETTS: In Massachusetts, Eastern Dwarf Mistletoe occurs in peatlands varying from kettlehole peat bogs to spruce-fir-birch headwater swamps, generally on the branches of black spruce (*Picea mariana*). Elsewhere in its range, this plant occasionally occurs on red spruce (*Picea rubens*), white spruce (*Picea glauca*) and tamarack (*Larix laricina*). Throughout its range, it favors wetland communities dominated by conifer trees and influenced by acidic water. Specific habitats in Massachusetts include acidic conifer swamps, bog forests, and headwater swamps, including a headwater seepage swamp with both acidic and calciphilic plants. In addition to black spruce, associated species include larch (*Larix laricina*), balsam fir (*Abies balsamea*), yellow birch (*Betula alleghaniensis*), hemlock (*Tsuga canadensis*), red maple (*Acer rubrum*), bog laurel (*Kalmia polifolia*) and Labrador tea (*Ledum groenlandicum*).

POPULATION STATUS IN MASSACHUSETTS: Eastern Dwarf Mistletoe is currently listed as a Species of Special Concern in Massachusetts. All listed species are protected from killing, collecting, possessing, or sale and from activities that would destroy habitat and thus directly or indirectly cause mortality or disrupt critical behaviors. There are 20 current stations (1985-2010) and 11 historical stations (unverified since 1978). The distribution of Eastern Dwarf Mistletoe is determined by the presence of its hosts, frequently spruces, which themselves are limited in distribution in Massachusetts. Due to its inconspicuous size, it is likely that some occurrences have as yet gone undiscovered. Eastern Dwarf Mistletoe is also considered rare in Vermont, Rhode Island, Connecticut, New Jersey and Pennsylvania.

MANAGEMENT RECOMMENDATIONS: Various species of *Arceuthobium* are the only flowering plants that produce the phenomenon known as “witch’s broom.” Also caused by other parasites, such as fungi and mites, this deformity can eventually kill the affected branches and, later, the entire tree. While Eastern Dwarf Mistletoe is considered to be a serious threat by foresters, particularly in eastern Canada and the Lake states, it is not a problem in Massachusetts, where its rarity has resulted in its being placed on the state’s rare species list. The vast majority of “witch’s brooms” seen in Massachusetts are caused by other parasites.

The distribution of Eastern Dwarf Mistletoe is limited by that of its host species--in Massachusetts, primarily black spruce. Hence, in order to preserve a local population, it may become necessary to ensure that its host persists in the immediate vicinity. All active management of rare plant populations (including invasive species removal) is subject to review under the Massachusetts Endangered Species Act, and should be planned in close consultation with the Massachusetts Natural Heritage & Endangered Species Program.

REFERENCES:

- Baker, F. A., J.G. O’Brien, Robert Mathiasen, and M.E. Ostry. 2006. Eastern Spruce Dwarf Mistletoe. USDA Forest Service Forest Insect and Disease Leaflet NA-PR-04-06. USDA Forest Service Northeastern Area State and Private Forestry, 11 Campus Boulevard, Suite 200 Newtown Square, PA 19073. Available from: http://www.na.fs.fed.us/pubs/fidls/ed_mistletoe/ed_mistletoe.pdf
- Tinnin, R.O., F.G. Hawksworth and D.M. Knutson. 1982. Witches’ Broom Formation in Conifers Infected by *Arceuthobium* spp.: An Example of Parasitic Impact upon Community Dynamics. The American Midland Naturalist, 107(2) 351-359.
- USDA, NRCS. 2010. The PLANTS Database (<http://plants.usda.gov>, 3 December 2010). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

Updated 2015

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