



Natural Heritage & Endangered Species Program

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Massachusetts Division of Fisheries & Wildlife

Foxtail Clubmoss *Lycopodiella alopecuroides* (L.) Cranfill

State Status: **Endangered**

Federal Status: **None**

Description: Foxtail Clubmoss is a perennial, non-flowering plant with tiny (~6 mm long) triangular leaves covering wiry stems. It is in the clubmoss family (Lycopodiaceae) and is one of three species in Massachusetts commonly called “bog clubmosses” (i.e., genus *Lycopodiella*). Stems are of two types: horizontal stems, which sprawl along the ground, and upright stems, each of which produces a single spore-bearing structure at the tip, called a strobilus. The strobili are bushy and prominent, 12 to 20 mm in diameter and 20 to 60 mm in height. The resemblance of the strobili to the seed heads of foxtail grasses in the genus *Alopecurus* gave rise to the species’ Latin name. In the southern part of the range, plants are at least partly evergreen; in Massachusetts, plants die back in winter with the exception of the stem tips, which become packed with starch and persist over winter. Plants reestablish each year from these overwintering stem tips (called turions).

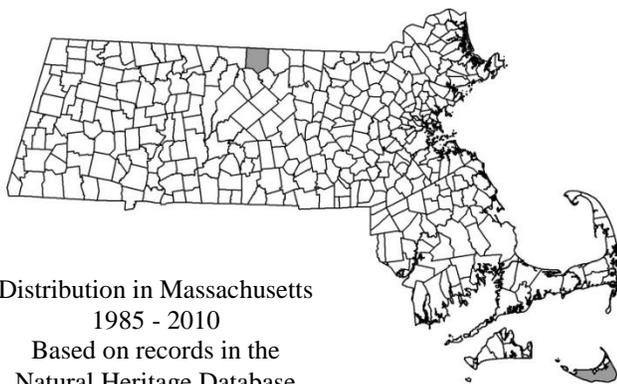
Similar species: There are several genera and many species of clubmoss in Massachusetts. The bog clubmosses (*Lycopodiella*) can be distinguished from all other genera based on two characters: the upright,



Foxtail Clubmoss showing arching rhizomes, with an inset of a leaf from the horizontal stem showing the coarse teeth along the edges.
Illustration: Elizabeth Farnsworth.

strobilus-bearing stems are not branched and the sporophylls (tiny scale-like leaves of the strobilus) are green rather than straw-colored.

Appressed Bog Clubmoss (*L. appressa*) and Northern Bog Clubmoss (*L. inundata*) are the congeners known from Massachusetts. The three bog clubmosses are similar in form and habitat affinities, and are often found growing together. The Foxtail Clubmoss is the only one with arching horizontal stems, which produce roots only at points between the arches where the stem touches the ground. The other species have horizontal stems that grow tightly appressed to the ground and root frequently along their lengths. Further, Foxtail Clubmoss has coarse teeth along the edges of the leaves on the horizontal stems. The very common and widespread Northern Bog



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

Massachusetts Division of Fisheries & Wildlife

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Clubmoss has toothless stem leaves. Appressed Bog Clubmoss has toothed leaves like Foxtail Clubmoss, but its leaves are appressed (strongly ascending so they are nearly parallel to the stem) whereas leaves of the Foxtail Clubmoss spread away from the stem.

Hybrids between bog clubmoss species are frequent, and many of the known locations for Foxtail Clubmoss have hybrid plants. The hybrids have intermediate characteristics, which can complicate identification.

Habitat in Massachusetts: Massachusetts populations of Foxtail Clubmoss are on wet, acidic sand and peat; areas with a thin accumulation of peat over saturated sand are particularly favorable. Suitable habitat can be natural, as in bogs and sandy pond shores, or artificial, such as borrow pits and similar excavated areas. Foxtail Clubmoss is a poor competitor and documented populations occur in sparsely vegetated areas in full sun. Suitable, but unoccupied habitat is abundant in Massachusetts. Recent discoveries in northern Worcester County, Massachusetts, and coastal Maine, well beyond the historic northern range limit in south-coastal Massachusetts, suggest the possibility for additional new discoveries throughout Massachusetts.

Range: Foxtail Clubmoss ranges from Maine to Florida on the Atlantic coastal plain and west to Texas along the Gulf Coast. Its range extends inland in the Mississippi River Valley to Arkansas and Tennessee. It is also reported for Cuba and the West Indies.

Population status: Foxtail Clubmoss is listed under the Massachusetts Endangered Species Act as Endangered. 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. It is currently known from Nantucket and Worcester Counties and is historically known from Middlesex County. A historic site has been reported from Barnstable County but it has not been substantiated with a voucher specimen.

Management recommendations: The combination of Massachusetts Wetland Protection Act regulations and the Massachusetts Endangered Species Act should provide very good protection for many known populations. However, the propensity of Foxtail Clubmoss to establish in human-altered habitats such as borrow pits, utility rights-of-way, and cranberry bogs

could leave many populations vulnerable to harm. Land owners and managers of at-risk populations should be informed and shown the locations of populations so they can avoid accidental damage from routine operations and maintenance activities. Any activity that changes the hydrology of occupied sites has the potential to harm populations. At sites where natural ecological processes (such as periodic prolonged flooding or erosion) are not sufficient to maintain sparse, low-stature vegetation and produce occasional mineral soil exposures, natural succession is likely to result in decline and eventual loss of local populations. At these sites, removal of competing vegetation and applying artificial disturbance commensurate with that which originally created suitable habitat conditions might be effective management.

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:

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