



Natural Heritage & Endangered Species Program

www.mass.gov/nhesp

Massachusetts Division of Fisheries & Wildlife

Appalachian Fir-moss *Huperzia appressa* (Desv.) A. & D. Löve

State Status: **Endangered**
Federal Status: **None**

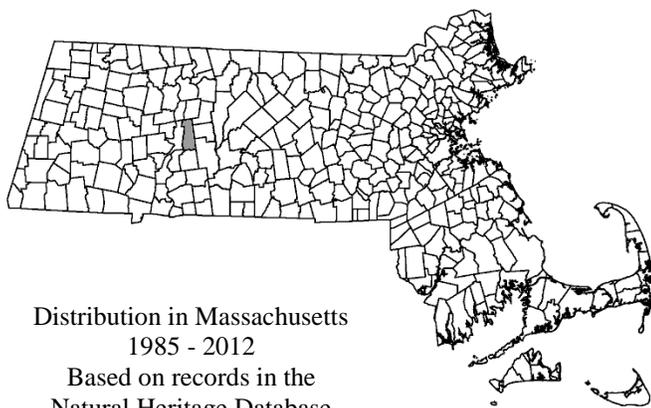
DESCRIPTION: Appalachian Fir-moss is a small, evergreen member of the Fir-moss family (Huperziaceae), found on cliff faces, summits, and other exposed, harsh environments. It has dichotomously branching shoots that are 6 to 10 cm (2.4–4 in.) tall, covered with small, pointed, simple leaves that are 2 to 6 mm long.

AIDS TO IDENTIFICATION: Fir-mosses differ from clubmosses (Lycopodiaceae) in having their sporangia (spore-bearing structures) borne in leaf axils along the stem, rather than in strobili (cones) at the tip. In addition to spores, they produce small, vegetative propagules called “gemmae” on specialized branches called “gemmae.” Leaves (microphylls) have two forms: “sporophylls” are associated with sporangia, which are distributed in distinct areas along the stem; the leaves not associated with sporangia are called “trophophylls”. In Appalachian Fir-moss, the trophophylls near the apex of a shoot are conspicuously shorter and more ascending (appressed) than those near the base. Like other fir-mosses and clubmosses, Appalachian Fir-moss is identifiable throughout the year.



Appalachian Fir-moss is a small, evergreen species of harsh environments. It has sporangia in the leaf axils, and gemmiphores throughout the apical portion of the plant. Photo by Robbin Moran.

SIMILAR SPECIES: Two other fir-moss species occur in Massachusetts: Shining Fir-moss (*H. lucidula*), which is common and found throughout most of the state, and Mountain Fir-moss (*H. selago*), which is rare and listed as Endangered in Massachusetts. *H. lucidula* and *H. selago* differ from Appalachian Fir-moss in having trophophylls that are similar throughout the plant: they are neither conspicuously smaller nor more ascending at the apex than near the base. These species also have gemmiphores borne in a single whorl at the apex of a season’s growth, rather than throughout the apical portion of the plant as in Appalachian Fir-moss. The lateral leaves of the gemmae are sharply pointed and 0.5 to 1.1 mm wide in Appalachian Fir-moss; in the other two species, they are wider (1.3–2.5 mm) and have blunt tips. A hybrid between Appalachian Fir-moss and Shining Fir-moss, *H. x protoporophila*, occurs with Appalachian Fir-moss in Massachusetts. It is intermediate between its parent species in the degree of distinction between the lower and upper trophophylls, as



Distribution in Massachusetts
1985 - 2012
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

1 Rabbit Hill Rd., Westborough, MA; tel: 508-389-6300; fax: 508-389-7890; www.mass.gov/dfw

Please allow the Natural Heritage & Endangered Species Program to continue to conserve the biodiversity of Massachusetts with a contribution for ‘endangered wildlife conservation’ on your state income tax form, as these donations comprise a significant portion of our operating budget.

www.mass.gov/nhesp

well as in the width of the lateral gemmae leaves, and the gemmae are borne in one or two pseudo-whorls at the apex of each season's growth.

POPULATION STATUS IN MASSACHUSETTS:

Appalachian Fir-moss 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. Appalachian Fir-moss occurs in Hampshire County, and was reported historically from Berkshire County.

RANGE: Appalachian Fir-moss occurs in Greenland, eastern Canada, and the northeastern United States from Minnesota to Massachusetts. It also occurs in the southern Appalachians from Virginia to Georgia. It is listed as Endangered in Michigan and Massachusetts, Threatened in New York and Tennessee, and Special Concern in Maine.

HABITAT: Appalachian Fir-moss occurred historically at several mountaintop sites in western Massachusetts. It is currently known from a single station in the Connecticut Valley, where it occurs on a damp, mossy, north-facing cliff along with the hybrid *Huperzia x protoporophila*.

THREATS AND MANAGEMENT

RECOMMENDATIONS: As for many rare species, exact needs for management of Appalachian Fir-moss are not known. At the single site in Massachusetts where it has been confirmed recently, it is unlikely to be directly impacted by human activities. However, like other species with primarily northern distributions, it may be threatened by global climate change. 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:

- Gleason, H.A., and A. Cronquist. 1991. *Manual of Vascular Plants of Northeastern United States and Adjacent Canada*, 2nd edition. The New York Botanical Garden, Bronx, NY.
- Haines, A. 2011. *Flora Novae Angliae – a Manual for the Identification of Native and Naturalized Higher Vascular Plants of New England*. New England Wildflower Society, Yale Univ. Press, New Haven, CT.

Updated 2015

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

Please allow the Natural Heritage & Endangered Species Program to continue to conserve the biodiversity of Massachusetts with a contribution for 'endangered wildlife conservation' on your state income tax form, as these donations comprise a significant portion of our operating budget.