



## Natural Heritage & Endangered Species Program

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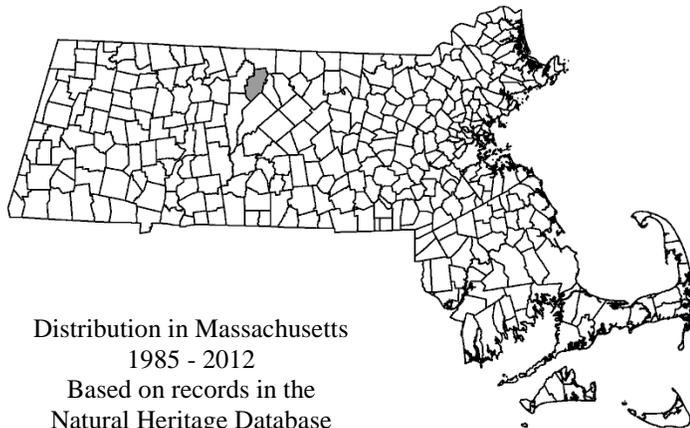
Massachusetts Division of Fisheries & Wildlife

## Mountain Fir-moss *Huperzia selago* (L.) Bernh ex Schrank & Mart.

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

**DESCRIPTION:** Mountain Fir-moss is a small, evergreen member of the Fir-moss family (Huperziaceae) that is at the southern limit of its distribution in Massachusetts. Its dichotomously branching shoots are 8 to 12 cm (3–5 in.) tall and covered with small, pointed, simple leaves, 3.5 to 7.5 mm long.

**AIDS TO IDENTIFICATION:** Fir-mosses differ from clubmosses (Lycopodiaceae) in having their sporangia (spore-bearing structures) borne in leaf axils along the main stem, rather than in strobili (cones) at the tip. In addition to spores, they produce small, vegetative propagules (gemmae) on specialized branches called “gemmiphores”. 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 Mountain Fir-moss, the trophophylls are usually untoothed, widest below the middle, relatively uniform from the base of a shoot to the apex, and have numerous stomates on the upper leaf surface.



*Mountain Fir-moss is a small, evergreen species with sporangia in the leaf axils, and gemmiphores borne in a single whorl at the apex of a season's growth. Photo by Paul Somers.*

**SIMILAR SPECIES:** Two other fir-moss species occur in Massachusetts: Appalachian Fir-moss (*H. appressa*), which is also listed as Endangered, and Shining Fir-moss (*H. lucidula*), which is more common. The trophophylls of Mountain Fir-moss and Shining Fir-moss are similar from the base to the tip of a shoot, whereas in Appalachian Fir-moss, the trophophylls near the apex are shorter and more ascending (appressed) than those near the base. Mountain Fir-moss and Shining Fir-moss also have gemmiphores borne in a single whorl at the apex of a season's growth, rather than throughout the apex. The lateral leaves of the gemmae are sharp-pointed and narrow (0.5–1.1 mm) in Appalachian Fir-moss, and wider (1.3–2.5 mm) and blunt-tipped in the other species. Unlike Mountain Fir-moss, Shining Fir-moss has trophophylls that are widest beyond the middle, lack stomates on the upper surface, and have one to eight obvious teeth. A hybrid between Mountain Fir-moss and Shining Fir-moss, *H. x buttersii*, has been

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

## Massachusetts Division of Fisheries & Wildlife

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reported from Massachusetts. It is intermediate, with trophophylls with almost parallel margins, obscure teeth, and fewer stomates on the upper surface than Mountain Fir-moss.

**POPULATION STATUS IN MASSACHUSETTS:**

Mountain 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. The only current site for Mountain Fir-moss is in Worcester County; it was also collected historically from Franklin County, along with the hybrid *Huperzia x buttersii*.

**RANGE:** Mountain Fir-moss occurs across Canada and in the northeastern United States, from Minnesota to Massachusetts. It is listed as Endangered in Massachusetts and New York, Threatened in Maine, Special Concern (and believed to be extirpated) in Connecticut, and Extirpated in Pennsylvania.

**HABITAT:** The only confirmed current site for Mountain Fir-moss in Massachusetts is on a wet, north-facing roadcut. Elsewhere in its range, this species occurs in wet habitats such as ditches, low fields, and lakeshores, and occasionally in forests and mountain gullies.

**THREATS AND MANAGEMENT**

**RECOMMENDATIONS:** As for many rare species, exact needs for management of Mountain Fir-moss are not known. The single known population in Massachusetts is on a roadcut, and activities associated with highway maintenance are potential threats. Management recommendations include avoiding wood-chipping, fertilizing, hydro-seeding, and other disturbances in the vicinity of the plants, and allowing nearby saplings to grow as long as possible before they become a road hazard, to provide the plants with shade. Like other plants with primarily northern distributions, Mountain Fir-moss may also 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*, 2<sup>nd</sup> 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.

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