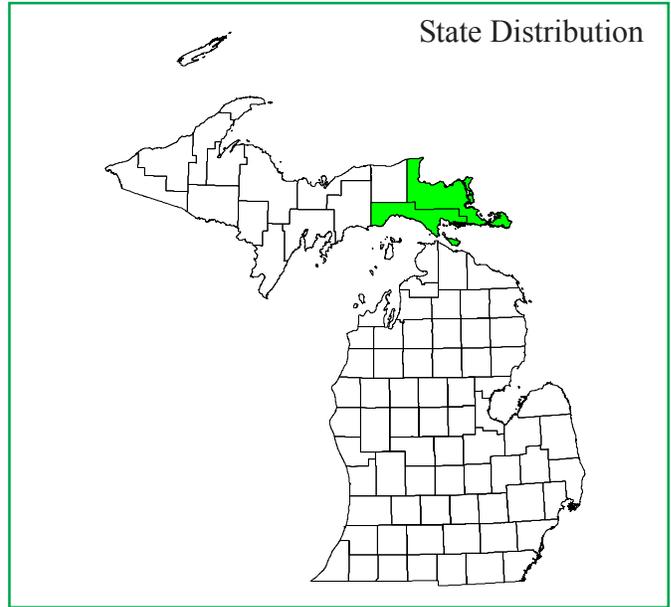
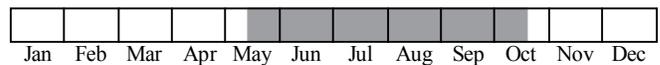




Photo by Michael R. Penskar



Best Survey Period



**Legal status:** State endangered, federal threatened

**Global and state rank:** G4T3/S1

**Family:** Aspleniaceae (spleenwort family)

**Synonyms:** *Phyllitis japonica* Komarov var. (or ssp.) *americana* (Fern) A. & D. Löve; *Asplenium scolopendrium* L.; *Scolopendrium vulgare* J. E. Smith.

**Taxonomy:** This tetraploid New World variety of *P. scolopendrium* was proposed as a separate species by Löve (1954) on the basis of its distinct cytology, morphology, and ecology. That treatment was immediately refuted by Wagner (1955) and has not been followed by subsequent authors. There has been a trend toward recognizing *Asplenium* as a broad genus, subsuming *Phyllitis* as well as several other small, related genera. However, Löve (1973), argues for the maintenance of those groups as valid genera, citing *Phyllitis* as the prime example.

**Total range:** In North America, Hart's-tongue fern is locally abundant only on the Bruce Peninsula of Ontario. Isolated colonies occur in Alabama, New York, Tennessee, and northern Michigan. It is considered rare in these states. Other varieties of this species occur in Europe, where it is widespread, and in Japan.

**State distribution:** Hart's-tongue is currently known from seven stations in eastern Mackinac County, supporting from about 25 to several hundred plants each. An eighth station in south-central Chippewa

County has been vandalized nearly to extirpation, with only two plants reported remaining in 1982. Four localities have been documented within the Hiawatha National Forest.

**Recognition:** Hart's-tongue fern has unusual **elongate, untoothed evergreen fronds** that are shaped-as the name suggests-somewhat like deer tongues. The blade reaches 20-40 cm in length, tapers to a pointed tip, and is **strongly lobed (auricled) at the base**. **Sori** (spore-bearing organs) **appear as linear brown stripes along the veins on the leaf underside**. The fronds, which grow from a scaly rhizome, may number over 100 per rootstock in Ontario, but are usually limited to 10-40 on Michigan plants. The only fern with which this species might be confused is walking fern (*Asplenium rhizophyllum*), which usually occurs with hart's-tongue. Walking fern differs by its much smaller (10-25 cm) fronds which have very long-tapering tips.

**Habitat:** In Michigan, this fern occurs on north or east-facing topographic slopes on shaded, moist boulders and ledges of Niagaran Dolomite. All sites lie on prominent highlands of the Niagara escarpment (rising 30-100 m above the surrounding lowlands) which were islands in Glacial Lake Algonquin approximately 10,500 years ago. In fact, the plants at one Mackinac County station are growing on boulders uncovered by the wave action of Lake Algonquin (Futyma 1980). All sites are dominated by relatively young hardwood forests of sugar maple. Common associates are *Polystichum lonchitis* (northern holly fern), *P. virginianum* (common polypody), *Asplenium*



*trichomanes* (maidenhair spleetwort), *Cystopteris fragilis* (fragile fern), and *Geranium robertianum* (herb-robert).

**Biology:** Fronds of Hart's-tongue fern remain green throughout the winter, with new fronds are produced at the start of each growing season. *Asplenium scolopendrium* reproduces only by spores. Although the effects of forest cutting on this fern have not been well documented, it has been able to colonize young aspen forests in Ontario, presumably becoming established from nearby spore sources (Futyma 1980). Extensive defoliation of the maple overstory by leaf-miners in two successive years has caused some dessication-especially of plants on south-facing exposures-but no observed mortality in a Mackinac County population being monitored by the Michigan Natural Features Inventory (pers. comm.). The predilection of this species for low boulders and crevices suggests that moist, sheltered conditions are required for sporeling establishment.

**Conservation/management:** Preservation of this extremely rare fern will depend, in the short term, on protection of its habitat from major disturbances and from unscrupulous collectors. To discourage collecting, locations of colonies should remain confidential. Before long-term management can be undertaken, much more needs to be learned about this fern's life history and its response to habitat changes. Attempts to establish new colonies through transplanting have met with little success in New York (Faust 1969). Close monitoring of Michigan's hart's-tongue colonies should be an essential component of any future management.

**Comments:** A sudden increase in a Hart's-tongue population in New York has been ascribed to an increase in shade and humidity provided by a blown-down tree.

**Research needs:** Investigation of nearly all aspects of the biology and ecology of Hart's-tongue fern, including demography, reproductive biology, genetic variability, and basic life-history strategies is desirable. Determination of the impact of overstory reduction vs. shading is particularly important, since reduction of overstory is the most immediate threat to this species.

**Related abstracts:** Mesic northern forest, Assiniboia sedge, fairy-bells, gensing, goblin moonwort, walking fern, northern goshawk, red shouldered hawk, rapids clubtail, woodland vole.

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#### Abstract citation:

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