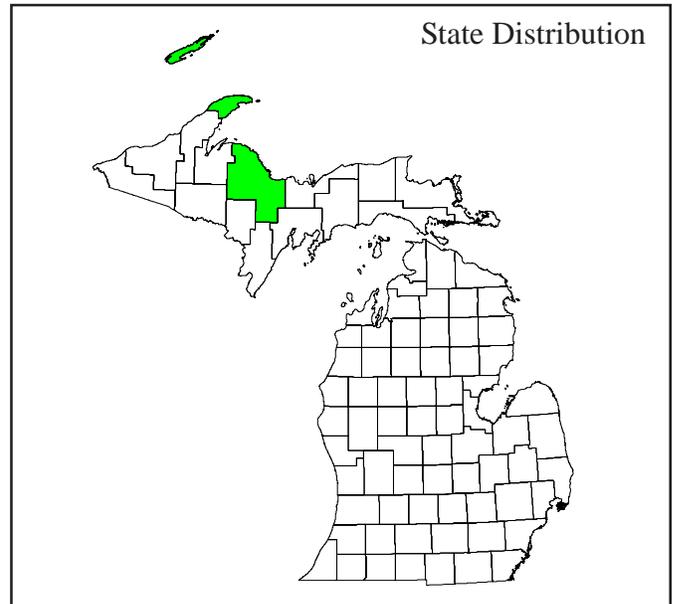
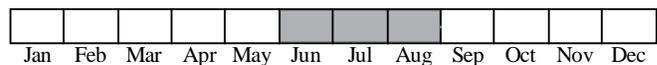




Photo by Susan R. Crispin



Best Survey Period



**Status:** State threatened

**Global and state rank:** G5/S2

**Other common names:** knotted pearlwort

**Family:** Caryophyllaceae (pink family)

**Synonyms:** *Spergula nodosa* L., *Sagina nodosa* var. *borealis* (G.E. Crow) Cronquist

**Taxonomy:** The species has been divided into two subspecies, of which plants found in Michigan are referred to subsp. *borealis* Crow, a taxon that occurs in the American subarctic and ranges to New England and the Lake Superior region (Given and Soper 1981). The typical subspecies, *S. nodosa* subsp. *nodosa*, occurs in Europe and northeast North America from New England to Labrador (Flora of North America 2005). Crow (1979) used scanning electron microscopy (SEM) to study the usefulness of seed morphology in determining taxonomic relationships in *Sagina*. Crow found a high level of variation and overlap among certain groups of the genus but also the occurrence of surface patterns found to be very useful in determining systematic relationships for some of the species groups.

**Range:** This nearly circumboreal plant grows in North America from the Canadian arctic south to Massachusetts, the Lake Superior region, and in Canada from Alberta through New Brunswick and Nova Scotia. It is considered rare in Alberta, New Brunswick, Nova Scotia, and Prince Edward Island (NatureServe 2007).

**State distribution:** Of the 19 occurrences, all but one Michigan locality for pearlwort has been documented in Keweenaw County, with nine sites on the mainland (including three historical records) and 10 sites known in Isle Royale National Park. Elsewhere, a single small colony was discovered in 1984 at a waterfall in southern Marquette County.

**Recognition:** Pearlwort is a low, diminutive plant that grows in loose to dense clumps with **tufts of narrow, linear leaves at the base**. The clumps produce several upright to reclining stems that range from ca. 5-15 cm in height and bear opposite leaves, **the lower leaves linear to awl-shaped, the upper leaves very reduced, bearing tiny sterile shoots composed of fleshy, short-triangular leaves that are borne in axillary clusters, thus giving the stems their “knotted” appearance**. Small, white, four- or five-petaled flowers are borne on the upper portion of the stems and are largely terminal, but may also be borne on slender pedicels in branching inflorescences. **The 3-4.5 mm long petals distinctly**



**exceed the sepals in length and have styles that are from 1-1.5 mm in length.** This species is most likely to be confused with the introduced *Sagina procumbens*, an introduced Eurasian pearlwort found occasionally in lawns, along sidewalks, and meadows (Voss 1985) and also in seeps and on moist rocks in regions where *S. nodosa* is known. The introduced pearlwort can be distinguished by its petals, which are markedly shorter than the sepals, and smaller styles that are less than 0.5 mm.

**Best survey time/phenology:** Although this species has been observed as early as late April and mid-May, most observations and collections have occurred from June through August, which should be considered the optimal survey period.

**FQI Coefficient and Wetland Category:** 10, FACU+

**Habitat:** In Michigan pearlwort commonly inhabits rock crevices and sheltered bedrock areas along the Lake Superior shore, usually growing within or near the splash zone. There the sparse vegetation includes such characteristic associates as *Primula mistassinica* (bird's-eye primrose), *Trisetum spicatum* (downy oatgrass), *Deschampsia cespitosa* (hair grass), *Hieracium canadense* (hawkweed), *Campanula rotundifolia* (harebell), and mosses. On the north shore of Lake Superior, pearlwort characterizes two "rock herb field" communities described by Given and Soper (1981). Its microhabitat there is described as very moist and cool with northern and northwestern exposures (Soper and Maycock 1963), where the species include such associates as *Pinguicula vulgaris* (butterwort), *Trisetum spicatum*, *Woodsia alpina* (alpine woodsia), *Poa glauca* (bluegrass), *Potentilla tridentata* (three-toothed cinquefoil), and *Festuca saximontana* (fescue).

**Biology:** *S. nodosa* is a perennial that blooms principally in mid-summer from July and August. It is a protandrous species, i.e. producing and dispersing pollen before the stigmas of flowers of the same plant become receptive to pollen, thus promoting outcrossing. In a study of the seed production in 49 species, Salisbury (1976) compared the average seed output for each species within the same region to the individuals of each species exhibiting the highest seed production. For *S. nodosa*, the average seed output was 1,200 seeds per individual, whereas exceptionally fruitful individuals could produce nearly 7,000 seeds per plant. Among the

49 species examined in the study, those that had individuals with a markedly higher seed output did not show a pattern of comprising either annual or perennial species but did tend to consist of species characteristic of open habitats.

**Conservation/management:** This species' rocky shoreline habitat can be damaged or destroyed by intensive foot traffic and by residential or recreational development. No known mainland localities are protected, and two occurrences known only from historical records in Keweenaw County have not been relocated since 1926 and may now possibly be destroyed. Isle Royale populations, which constitute approximately half of those known in Michigan, are subject to little human disturbance and have few if any threats, but occasional monitoring may be warranted.

**Research needs:** The paucity of literature on this species demonstrates that considerable life history, genetic, and other relevant information needs to be acquired in order to know how to best conserve and manage pearlwort and its habitat.

**Related abstracts:** Volcanic bedrock lakeshore, encrusted saxifrage, prickly saxifrage

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