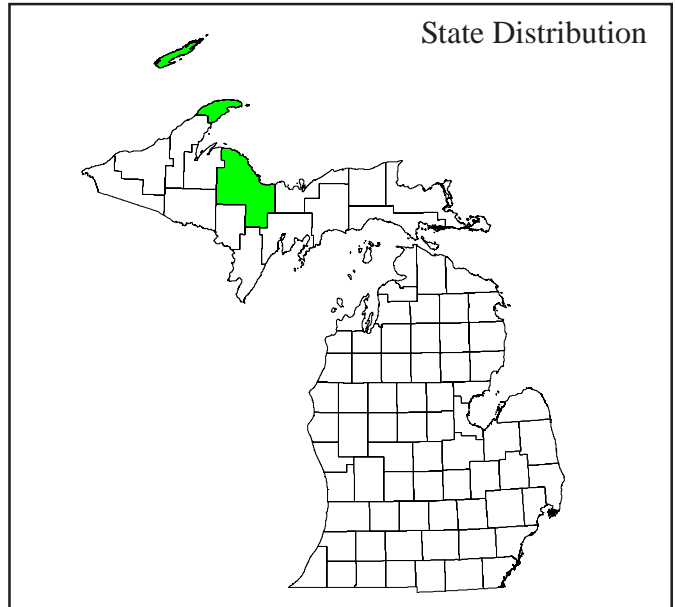
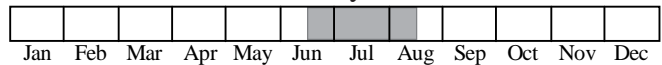




Photo by Susan R. Crispin



Best Survey Period



Status: State threatened

Global and state rank: G5/S2

Other common names: black sedge

Family: Cyperaceae (sedge family)

Synonyms: *Carex ovata* Rudge; *C. atrata* L. subsp. *atratiformis* (Britton) Kükenthal; *C. atratiformis* subsp. *raymondii* (Calder) A.E. Porsild; *C. raymondii* Calder (Flora of North America 2002).

Taxonomy: This taxon includes a minor variant that was formerly referred to *C. raymondii* based on small pigmentation differences in the perigynia and scales; *C. atratiformis* is also known to hybridize with the related *C. norvegica* Retzius where their ranges overlap in Newfoundland and Quebec, forming the hybrid *C. ×quirponensis* Fernald (Flora of North America 2002).

Range: *C. atratiformis* is transcontinental in boreal North America, occurring in the Northwest from Alaska and the Yukon Territories through British Columbia to Idaho, and in the Northeast reaching its southern extent in montane New England and also ranging to Lake Superior. It is considered rare in Labrador, Maine, New Brunswick, Newfoundland, Nova Scotia, New York,

Ontario, and Vermont, and is known only from historical records in New Hampshire (NatureServe 2007).

State distribution: This rare sedge is known from 13 sites, with all but two occurring in Isle Royale National Park. The two mainland localities, both of which are historical records, are comprised of an 1863 collection in Keweenaw County, and a 1914 collection in Marquette County. Within the Isle Royale archipelago, *C. atratiformis* occurs from the main island to Passage Island, where it is often frequent over relatively large areas, including the coasts of several near-shore, small island chains and along significant portions of several of the many protected bays, coves, and harbors of the main island.

Recognition: *C. atratiformis* is a loosely tufted sedge ranging up to ca. 70 dm in height, with strongly reddish stem bases and clumps of 2-5 mm-wide leaves that tend to be much shorter than the fertile stems. The **stalked, cylindric, 1-2 cm long spikelets are dark-brown**, and borne terminally on slender, somewhat wiry stems that are finely scabrous (rough) just under the inflorescence. **The lowermost spikelets are upright to drooping on thin stalks and are pistillate (female), though these sometimes bear a few male flowers at the base. The terminal spikelet is erect and mostly pistillate, bearing male flowers over a portion of the base. The**



dark pistillate scales are acute, sometimes ending in a small, sharp, tip, and equal the perigynia in size, whereas the perigynia are strongly flattened and elliptic to oval, with a short, abrupt, two-toothed beak ca. 0.5 mm long. *C. atratiformis* is mostly likely to be confused with *Carex media*, a related sedge that has similarly dark brown scales and perigynia and occurs mostly within the same range and coastal habitats in Michigan. In contrast to *C. atratiformis*, *C. media* has much shorter spikelets (0.5-1.2mm long) that are all erect and stalkless. The common and widespread *C. buxbaumii*, a related species of *Carex* sect. *Atratae*, is superficially similar but has much more elongate, stalkless spikelets, with strongly awned pistillate scales and bright green perigynia that are not flattened.

Best survey time/phenology: This sedge has been observed in identifiable (fertile) condition primarily from mid-June to mid-August.

FQI Coefficient and Wetland Category: 10, FACW-

Habitat: In Michigan *C. atratiformis* occurs primarily along the rock and cobble shores and boulder beaches of Lake Superior, typically in moist, mossy, rock crevices in areas largely sheltered or protected from severe wave action. Plants may be near or within the edge of the splash zone, and often occur in filtered light, in partial to heavy shade. On Isle Royale, colonies have been observed growing under *Alnus incana* ssp. *rugosa* (tag alder), *Viburnum edule* (squashberry), *Thuja occidentalis* (northern white cedar), *Abies balsamea* (balsam fir), and *Betula papyrifera* (paper birch), with such herbaceous associates as *Primula mistassinica* (bird's-eye primrose), *Selaginella selaginoides* (spikemoss), and the mosses *Polytrichum*, *Aulacomnium*, and *Tortella*. One Isle Royale collection came from a wet forest border adjacent to swamp land, and it has also been found locally in semi-open low, swampy areas along foot trails that parallel Isle Royale's shores. Throughout its boreal range, this species occurs on moist rock outcrops, calcareous ledges and cliffs, along streams, on damp slopes, and in open meadows and other moist places (Flora of North America 2002, Hultén 1968).

Biology: *C. atratiformis* is a perennial with deep rhizomes. In Michigan, it is fertile from approximately mid-June to mid-August. In an extensive study of North American rusts documented as occurring on *Carex*, Kern

(1917) isolated and described *Puccinia lysimachiata* (Link) Kern, for which *C. atratiformis* was an identified host.

Conservation/management: Excessive recreational activities, such as heavy foot traffic via trails, should be avoided in this sedge's rocky shoreline habitat, where natural disturbances can be expected to maintain optimal habitat. Leung and Marion (2000) cite the extirpation of *C. atratiformis*, *C. scirpoidea* (bulrush sedge, also a rare boreal species listed as threatened in Michigan), and other alpine plants in New England as being attributed to human trampling. This particular susceptibility suggests that occasional monitoring on Isle Royale may be warranted. Although mainland occurrences have not been observed for many years, potential habitat appears to persist and thus status surveys of the two historical localities – and elsewhere within the western Upper Peninsula region – has merit.

Research needs: In addition to status surveys, genetic research and other basic biological investigations (e.g. life history, population structure) are desirable for assisting in future management activities.

Related abstracts: Volcanic bedrock lakeshore, volcanic cobble shore, downy oatgrass, alpine bluegrass, alpine bistort

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