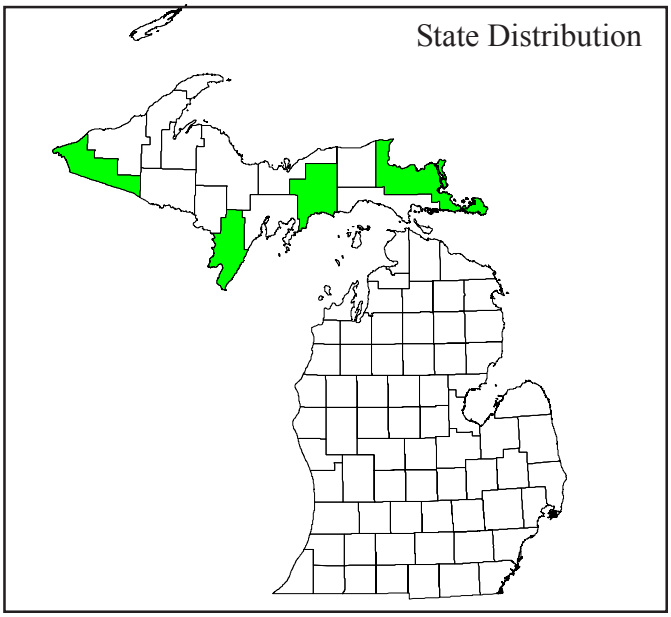
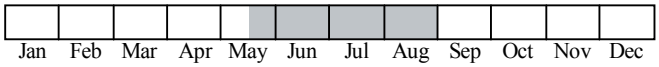
Petasites sagittatus (Pursh.) A. Gray — arrowhead sweet-coltsfoot

Photo by Emmet J. Judziewicz, Wisconsin State Herbarium



Best Survey Period



Legal status: State threatened

Global and state rank: G4/S1S2

Family: Asteraceae (Aster family)

Other common names: (arrow-leaved) butterbur

Total range: *Petasites sagittatus* ranges across the North American arctic, reaching its southern limit in Washington, Colorado, the northern Great Lakes region, Quebec, and Labrador. It is considered rare in Wisconsin, Idaho, Wyoming, and South Dakota.

State distribution: The first Michigan locality for this species was discovered in Schoolcraft County in 1981 by Don Henson. It is now known from four additional sites in Schoolcraft County and one locality each in northern Menominee, Gogebic, Chippewa, and Alger counties. Most known localities support one or a few very localized clonal patches which may be dense and contain up to several hundred stems. When first documented, the largest colony extended over several acres in Schoolcraft County, but was seriously damaged in the early 1980's by hydrologic impoundment due to construction of a logging road.

Recognition: Arrow-leaved sweet-coltsfoot is a perennial, with aerial shoots arising from a creeping rhizome. The large, 30 cm long basal leaves have long, hairy stalks and **arrowhead-shaped (sagittate), coarsely-toothed blades that are densely white-hairy beneath.** The single **hairy flowering stem** (1-5 dm), which **emerges in early spring** before the leaves develop, bears reduced, sheathing, **bract-like leaves and terminates in a thick cylindrical cluster of whitish flower heads** reported to be fragrant. Although rayless, **the flowers have copious, silky, white hairs**, which elongate when in fruit (see photo.) The mature fruits are ribbed achenes 3-3.5 mm long, each with a tuft of bristle-like hairs at their summit to aid in wind dispersal. *P. frigidus* (=*P. palmatus*; northern sweet-coltsfoot), a closely related and more common species that may occur with *P. sagittatus*, is distinguished by its much smaller, deeply palmate-lobed leaves.

Best survey time/phenology: It is best to survey for this species during the latter part of its flowering period in early spring or when in fruit from late spring to early summer. However, the large, distinctively arrowhead-shaped leaves, distinguishing it from the more common, *P. frigidus*, can be seen throughout the growing season. Observers are often stumped when they see sweet coltsfoot species during the early flowering period

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since the leaves are not yet flushed and most members of the aster family tend to flower much later in the growing season.

Habitat: At one Schoolcraft County site, *P. sagittatus* grows with *Carex lasiocarpa*, *C. lacustris* and *C. lanuginosa* (sedges), *Salix petiolaris* (willow), *Betula pumila* (bog birch), and *Alnus rugosa* (speckled alder) in wet, open peaty swales between ancient dune formations. At another Schoolcraft County site, it inhabits a weakly patterned peatland (pH 5.9) dominated by *Carex lasiocarpa* (sedge). Associates there include *Calamagrostis canadensis* (bluejoint), *Muhlenbergia glomerata* (marsh wild-timothy), *Salix* sp., *Solidago uliginosa* (bog goldenrod), *Caltha palustris* (marsh-marigold), and *Iris versicolor* (blue-flag.) The habitats at other Michigan localities have been described as sedge fen, marsh, and wet swales. In its more boreal main range, this species inhabits wet meadows, bogs, and tundra habitats (Scoggan 1978.)

Biology: *Petasites sagittatus* is a perennial that forms vegetative clones by means of rhizomes. Therefore, apparent "colonies" may actually consist of only one or a few genetically distinct individuals. The species flowers in May (though Michigan plants appear seldom to flower) and releases plumed, wind-borne seeds in early summer. Like most members of this genus, it is functionally dioecious, i.e. with male and female flowers borne, for the most part, on separate plants.

Conservation/management: The majority of Michigan occurrences of this species are on state and national forest lands. Of the two colonies known in Hiawatha National Forest, one appears to be suffering from inundation brought about by construction of a logging road. This underscores the importance of avoiding hydrologic disturbances to this species' habitat. An attempt is being made to mitigate potentially damaging effects of road reconstruction through the Menominee County population by the Michigan Department of Transportation. Infrequent flowering and the production of male and female flowers on separate plants may impede sexual reproduction of this species in Michigan, lowering the chances for the establishment of new colonies, as well as its ability to survive environmental changes and disturbances.

Comments: Since the habitat of this species does not appear to be unique or even especially rare in Michigan's Upper Peninsula, its distribution may be limited to relict colonies established during post-glacial times under very different climatic conditions. *P. sagittatus* occasionally hybridizes with the much more common *P. frigidus* to produce *P.* X*vitifolius* (grape-leaved butterbur.) This hybrid occurs among one of the populations of *P. sagittatus* on national forest land and possibly also at an Alger County location.

Research needs: Studies to determine the specific hydrologic requirements of this species are of primary importance in order to gain a better understanding of potential impacts of hydrologic disturbance brought about by activities such as road construction and timber removal. Further research regarding the genetics and breeding biology of this species would shed light on the reproductive potential of Michigan populations as well as help determine their structure and genetic diversity. In addition, dedicated surveys for arrow-leaved sweet-coltsfoot in Michigan would be useful to determine more precisely the extent of this species in the state.

Related abstracts: northern blue butterfly

Selected references:

Henson D. 1983. Survey of threatened and endangered vascular plants within and adjacent to proposed Banksiana timber sale. Unpubl. report prepared for Hiawatha National Forest

Polunin, N. 1959. Circumpolar arctic flora. Clarendon Press, Oxford.

Scoggan, H.J. 1979. The flora of Canada. Nat. Mus. Natural Sci. Publ. Bot. No 7(4) pp. 1583-1584.

Abstract citation:

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