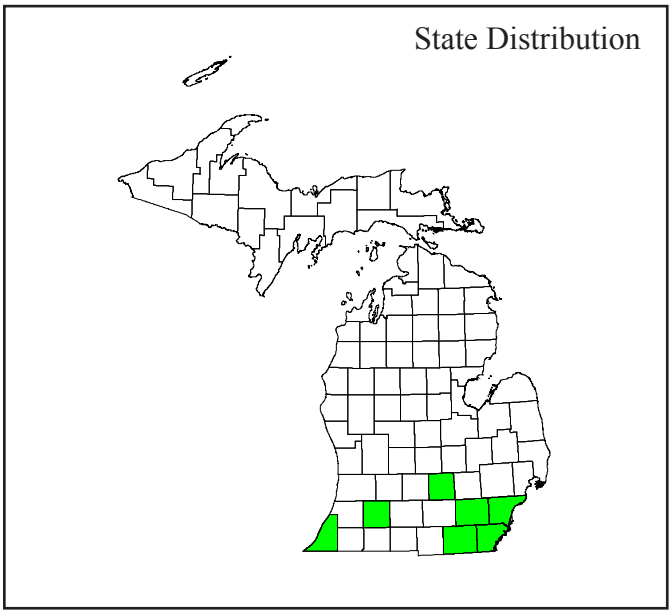
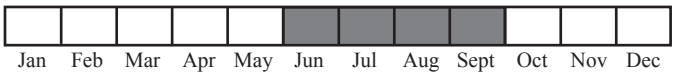
Silphium perfoliatum L. cup-plant

Photo by Ryan P. O'Connor



Best Survey Period



Status: Threatened

Global and state rank: G5/S2

Other common names: Indian-cup

Family: Asteraceae (aster or daisy family) also known as the Compositae

Taxonomy: The species is divided into two varieties, var. *connatum* (L.) Cronq., characterized by hairy stems with sessile leaves, which occurs in scattered stations in the mountains and the adjacent piedmont of Virginia, West Virginia, and North Carolina, and the more widespread typical variety, var. *perfoliatum*, which ranges largely north and west of var. *connatum* (Gleason and Cronquist 1991). A phylogenetic analysis of *Silphium* and the subtribe *Engelmanniinae* based on DNA sequence data was conducted by Clevinger and Panero (2000) to validate the circumscription of *Silphium* and its currently delineated sections.

Total range: Cup plant is primarily a prairie species, occurring in the eastern Great Plains from North Dakota to Kansas and Oklahoma, and ranging east to southern Ontario and south to North Carolina, Georgia, Arkansas, and Louisiana. It is considered rare in Louisiana, North Carolina, Ontario, Virginia, and West Virginia (NatureServe 2009).

State distribution: This species has been found in seven counties of extreme southeastern and southwestern Michigan; however, the Kalamazoo and Cass County records probably represent adventive colonies--chance introductions along weedy railroad rights-of-way. Native occurrences are all associated with rivers (especially the Huron, Raisin, and Galien rivers). Many colonies are rather small, consisting of just a few stems to approximately 100 in the largest. Several stations have been confirmed extant since 1980.

Recognition: *S. perfoliatum* is a **robust, tall, perennial plant, commonly reaching 1 to 2 m or more in height**. The stout, smooth to slightly hairy stem is **strongly 4-angled and square in cross-section**, bearing opposite, broadly ovate leaves with coarsely-toothed margins and roughened surfaces. The lower leaves may be as large as 3 dm long and 1.5 dm wide, their **bases uniting to form a distinctive cup encircling the stem**. Branching above, the stem terminates in an open inflorescence with numerous heads of yellow flowers, each head composed of about 20-30 rays that are 1.5-3.5 cm long and disks that are from 1.5-2.5 cm in diameter. All other species of *Silphium* in Michigan lack the fused leaf bases of cup plant. The related *S. integrilfolium*, (rosin-weed), a plant more typical of mesic prairies, bears similar flowers but is a much smaller plant with finely hairy, more roundish stems and ovate to lanceolate leaves that are not coarsely-toothed.

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P.O. Box 30444 - Lansing, MI 48909-7944
Phone: 517-373-1552

Best survey time/phenology: Cup plant is distinctive in vegetation condition and can be identified via its square stems and strongly fused (perfoliate) leaf bases, thus it can be sought as soon as plants have flushed and have well developed basal portions, approximately from June through September.

FQI Coefficient and Wetland Category: 10, FACW-

Habitat: Most of Michigan's cup plant colonies lie on river floodplains in forest openings, swales and sloughs along river margins, and other wet edges. The species is typically associated with a thick ground cover of *Ambrosia trifida* (great ragweed), *Laportea canadensis* (wood nettle), *Helianthus* spp. (sunflower), *Eupatorium* spp. (Joe-pye-weed), and goldenrods, such as *Solidago gigantea* (late goldenrod), and *S. canadensis* (Canada goldenrod). Other recorded associates include *Vernonia altissima* (ironweed), *Ratibida pinnata* (yellow coneflower), *Coreopsis tripteris* (tall coreopsis), *Asclepias incarnata* (swamp milkweed), *Helenium autumnale* (sneezeweed), *Laportea canadensis* (wood nettle), *Elymus virginicus* (Virginia rye), and *Rudbeckia laciniata* (coneflower). Overstory associates include such typical floodplain species as *Acer saccharinum* (silver maple), *Populus deltoides* (Eastern cottonwood), *Fraxinus pennsylvanica* (red ash), *Acer negundo* (boxelder), *Celtis occidentalis* (hackberry), *Platanus occidentalis* (Eastern sycamore), and *Ulmus americana* (American elm). In Ontario, cup plant inhabits wet prairies on river floodplains (Soper 1962). In the Chicago region, it is found on forested floodplains and in calcareous springy places (Swink and Wilhelm 1994). Cup plant grows in rich woods, thickets, prairies, and roadside ditches elsewhere in its range.

Biology: This persistent perennial plant is rhizomatous and has the ability to form dense clones. Flowering is initiated about mid-July and continues through August, with mature fruits produced by October.

Conservation/management: One very small, sterile colony of cup plant lies in a state dedicated natural area. Larger, more viable colonies exist in the University of Michigan's Dearborn's Fairlane Woods, Lower Huron MetroPark, and in River Rouge Park where appropriate management and stewardship is likely to take place. This species is vulnerable to hydrological disturbances of its moist riparian habitat, and probably also to overstory closure. Although forest openings are characteristic of floodplain habitats, small colonies and/or habitats deprived of a natural hydrologic regime which creates and maintains openings may benefit from human maintenance of openings.

Comments: Cup plant is considered to have a high value as a forage species, as discussed in an extensive overview provided by Stanford (1990).

Research needs: Status surveys are recommended, based on the many information gaps for several occurrences. Little is known about the specific dynamics of colonies, their population structure, and genetic diversity, and thus any studies that address these topics will assist agencies and others in prioritizing populations and directing management activities.

Related abstracts: Floodplain forest, Blanding's turtle, box turtle, cerulean warbler, red-shouldered hawk, smallmouth salamander, yellow-throated warbler, American beak grass, false hop sedge, heart-leaved plantain, pumpkin ash, purple turtlehead, red mulberry, snow trillium, Virginia bluebells, Virginia water-horehound.

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