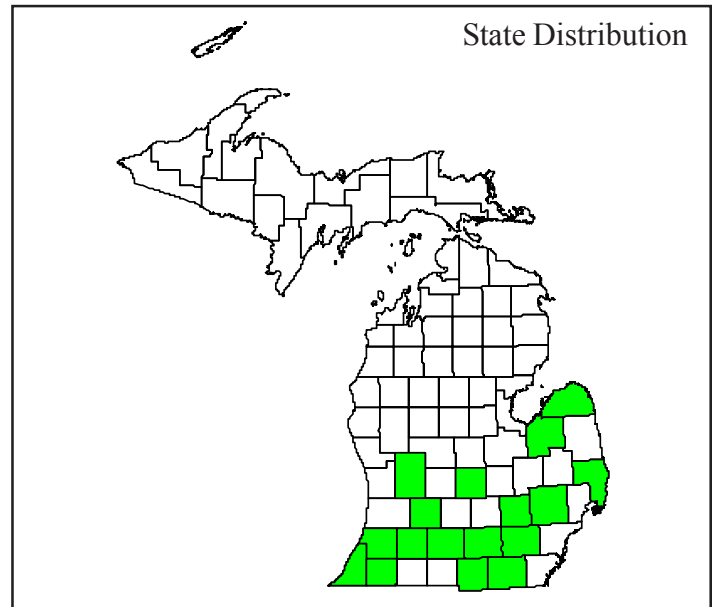
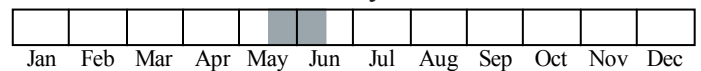


Photo by Susan R. Crispin



Best Survey Period



**Status:** State threatened

**Global and state rank:** G4/S2

**Other common names:** white lady-slipper

**Family:** Orchidaceae (orchid family)

**Total range:** This principally upper Midwestern species ranges eastward to New Jersey and New York, extending west through southern Michigan to Minnesota, the eastern Dakotas, and southern Manitoba and Saskatchewan. To the south it ranges to Nebraska, Missouri, and Kentucky. It is considered rare in Iowa (S1), Illinois (S3), Indiana (S2), Kentucky (S1), Michigan (S2), Minnesota (S3), North Dakota (S2S3), New York (S1), Ohio (S1), South Dakota (S1), Wisconsin, and Manitoba. In Pennsylvania and Saskatchewan, it is considered extirpated and is known only from historical records in Missouri and New Jersey.

**State distribution:** Small white lady's-slipper is restricted to southern Michigan, occurring primarily within a narrow band from Berrien and Kalamazoo counties in the southwest to southeastern Michigan, where it is concentrated in Livingston, Oakland, Washtenaw, and Jackson counties. Two localities in the thumb region constitute the northernmost occurrences in the state. About one-third of approx. 81 recorded occurrences have succumbed to ecological succession or loss of habitat due to development pressures. Of the remaining extant populations, several are quite large, consisting of over 100-200 individuals.

**Recognition:** Although *Cypripedium candidum* produces solitary stems, mature plants commonly form small, dense,

clonal clumps. This relatively small lady's-slipper averages about 20 cm in height, each stem producing several **strongly-ribbed, sheathing leaves that are densely short-hairy**. Stems are usually terminated by a **single flower (occasionally there may be two) characterized by its ivory-white pouch (the lip or lower petal) which may be faintly streaked with purple veins** toward the bottom and slightly purple-spotted around the pouch opening. The **lateral petals**, which are similar to the sepals, are **pale yellow-green and spirally twisted**. *Cypripedium candidum* is known to hybridize with two well-known varieties of yellow lady's-slipper, *C. calceolus* var. *pubescens* and *C. calceolus* var. *parviflora*, producing *C. Xfavillianum* and *C. Xandrewsii*, respectively. These hybrids are the only taxa that small white lady-slipper is likely to be confused with. However, *Cypripedium Xfavillianum* can be distinguished by its larger size and very pale yellow pouch, and *C. Xandrewsii*, which produces a white pouch like *C. candidum* can be distinguished by the dark, strongly spiralling petals and sepals more characteristic of var. *parviflorum*.

**Best survey time/phenology:** Surveys for this species should be conducted from late May to early June, when it typically flowers. It is fairly difficult to confirm the identity of non-flowering specimens.

**Habitat:** In Michigan, small white lady's-slipper occurs primarily in prairie fens and other marly, alkaline sites with groundwater seepage. These graminoid-dominated peatlands are commonly found adjacent to lake and stream systems. It also occurs in wet prairie communities of the clay lakeplain regions of southwestern Michigan and the



thumb. These wet prairies are similar to tallgrass prairies, the typical habitat of this species outside of Michigan. Case (1987) also reports that it has been found in damp depressions in limestone barrens in Kentucky. Typical prairie fen soils in Michigan are Houghton mucks, often forming deep organic deposits. Common associates of white lady's-slipper include *Andropogon gerardii* (big bluestem), *Sorghastrum nutans* (Indian grass), *Potentilla fruticosa* (shrubby cinquefoil), *Carex stricta* (sedge), *Betula pumila* (bog birch), *Thelypteris palustris* (marsh fern), *Valeriana uliginosa* (valerian) and *V. edulis* var. *ciliata* (edible valerian, state threatened), *Sporobolus heterolepis* (prairie dropseed, state special concern), *Muhlenbergia richardsonis* (mat muhly, state threatened), *Solidago ohioensis* (Ohio goldenrod), *S. riddellii* (Riddell's goldenrod), *Pycnanthemum virginianum* (mountain mint), *Rhamnus alnifolia* (alder-leaved buckthorn), *Hierochloa odorata* (sweet grass), and numerous other species typical of southern Michigan fens, including several additional listed taxa.

**Biology:** Flowering occurs in late May to early June. Case (1987) and Luer (1975) both report that this perennial species develops rapidly, often blooming before the leaves have fully flushed and unwrapped the stems. Curtis (1943) estimated that at least 12 years or more are necessary for maturation following germination, and observed that clones are formed through the production of small plants from adventitious buds on 2 to 3-year-old roots. Curtis (1954) also documented the marked variation in flower and fruit production from year to year, and found no correlation between avg. flower and fruit production and the relative abundance of this species in the vegetation in comparison to other lady-slipper species. In a pollination study in southern Ontario, Catling and Knerer (1980) found small halictine and andrenid bees to be the principal pollinators. These bees were dependent on the availability of nectar from a variety of other flowering species whose blooming period coincided with *C. candidum*.

**Conservation/management:** Exemplary occurrences are protected and managed by several conservation organizations, including The Nature Conservancy and the Michigan Nature Association. However, many sites have been severely disturbed or destroyed through agricultural activities, peat or marl mining, land drainage, and other human activities. Others have succumbed to the invasion of woody shrubs due to ecological succession, while still others are threatened by the invasion of exotic species, the most notable pests being *Rhamnus frangula* (glossy-leaved buckthorn) and *Lythrum salicaria* (purple loosestrife). Prevention of hydrological changes and maintenance of a fairly open condition are necessary for maintaining viable fen habitat. Careful fire management has been recommended for both shrub control and the healthy maintenance of populations (Bowles 1983). Kohring (1981) observed the favorable response of a population following a planned burn in a railroad right-of-way, noting that the number of blooming plants tripled and plant vigor

increased. The use of prescribed burns should be carefully studied before, during and after their use in order to determine if and how burning can best be employed to maintain and/or enhance small white lady's-slipper populations. Since at least one Federal and State threatened insect species, (Mitchell's satyr), is known to inhabit prairie fens in southwest Michigan, any burn strategy employed should consider the presence of rare insects, mollusks, and herptiles.

**Research needs:** Due to the significant development pressure in southern Michigan where this species is most common, research regarding compatible development activities is of highest priority. Specific precautions that must be taken in order to maintain fen hydrology should be determined and proposed as policy. The role of fire as a management tool to minimize succession or the invasion of exotic species should also be investigated. Research on the breeding biology and genetic diversity of this species will provide a sounder basis for making management decisions.

**Related abstracts:** prairie fen, lakeplain wet prairie, lakeplain wet-mesic prairie, edible valerian, English sundew, mat muhly, prairie dropseed, prairie Indian-plantain, eastern massasauga, Mitchell's satyr

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