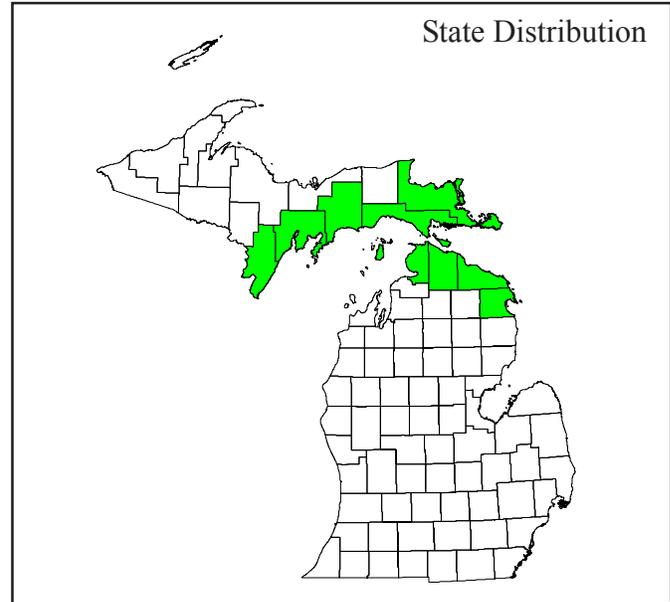
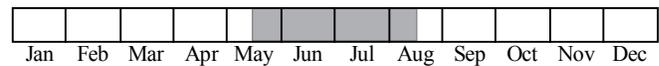




Photo by Thomas Arter



Best Survey Period



Legal status: State threatened, federal threatened

Global and state rank: G3/S3

Other common names: baby iris

Family: Iridaceae (iris family)

Synonyms: *Iris cristata* Ait. ssp. *lacustris* (Nutt.) Iltis; *Iris cristata* Ait. var. *lacustris* (Nutt.) Dykes.

Taxonomy: Though the dwarf lake iris was treated as a variety of the southern *Iris cristata* by Dykes in 1913 (see also Mason and Iltis 1965), it has since come to be widely recognized, including by Dykes (1924), as a distinct species based on consistent differences in morphology, habitat, range, and chromosome number and configuration (Foster 1937).

Total range: *Iris lacustris* is endemic to the northern shores of Lakes Michigan and Huron, growing nowhere else in the world. Its distribution centers around the Mackinac Straits region, with outliers extending to Wisconsin's Door Peninsula and Ontario's Bruce Peninsula. The distribution in the Great Lakes follows the geological feature known as the Niagara Escarpment, a limestone formation extending from the Door Peninsula through Michigan and Ontario to New York.

State distribution: The majority of the world's *Iris lacustris* population lies within Michigan's boundaries

where it is known from more than 80 locations. Its coastal range in Michigan extends from the Stonington Peninsula (Delta County) to Drummond Island (Chippewa County) and south to Wilderness State Park (Emmet County), Beaver Island (Charlevoix County), and Alpena (Alpena County). Atypical inland stations, which are probably relicts of former post-glacial lake stages, are known from Delta and Menominee counties. The abundance of dwarf lake iris is greatest in three general areas--the Garden Peninsula, southeastern Presque Isle and adjacent Alpena counties, and Cheboygan/Emmet counties--where it occurs almost continuously for many miles along the lakeshores and then densely to discontinuously over a few square miles inland. Colonies range in size from the extensive population clusters covering several hundred acres, such as in southern Presque Isle County, to those consisting of a few straggly stems persisting in isolated inland localities or forming small colonies on Great Lakes islands.

Recognition: This miniature iris is distinctive among the Michigan flora. Its **slender, yellowish, finely ribbed rhizomes have enlarged nodes** that give rise to fans of **flattened, slender leaves that range to ca. 15 cm in length and are about 1-2 cm wide**. The **showy, deep blue flowers** are of the typical iris type, with three arching, petal-like sepals (ca. 2 cm long) whose **orange crests lie partly beneath the smaller petal-like style branches**. The three petals are similar to the three sepals, and alternate with them. *Iris lacustris* can be recognized vegetatively by its



relatively diminutive leaves and slender rhizomes, the latter of which are useful in distinguishing dwarf lake iris from small individuals and juvenile plants of the widespread *Iris versicolor* (common blue-flag). *Iris lacustris* is notable for its somewhat sparse production of fruit, which when present consists of small, oblong, green capsules on short stalks. The seeds have been shown, in part, to be ant-dispersed (Planisek 1983).

Dwarf lake iris is most likely to be confused with *Tofieldia glutinosa* (false asphodel), a member of the lily family with extremely similar leaves that very commonly occurs in the same northern shoreline habitats. *Tofieldia*, which produces small **clusters of white flowers that develop clumps of reddish capsules**, can be distinguished from dwarf lake iris by its **much narrower, firmer-textured leaves and long, sticky flower stalks**. Moreover, quick observation will show that *Tofieldia* **lacks a rhizome and does not grow in dense clumps or patches** as dwarf lake iris does.

Best survey time/phenology: The leaves and rhizomes of dwarf lake iris can be identified throughout the growing season, and in combination with habitat information can be used fairly reliably to detect this species. It is easiest to detect, however, during the flowering period from mid-May through early June.

Habitat: Dwarf lake iris usually occurs in close proximity to Great Lakes shores on sand or in thin soils over calcareous gravel or bedrock (alvar). It tolerates full sun to nearly complete shade, but appears to flower best in semi-open edge or ecotonal habitats, typically amongst scattered trees or on shoreline forest margins where it usually occurs with northern white cedar (*Thuja occidentalis*) and balsam fir (*Abies balsamea*). Dwarf lake iris is almost invariably associated with northern white cedar, though spruce (principally *Picea glauca*), balsam fir, and trembling aspen (*Populus tremuloides*) are also frequently present in the overstory. Groundcover associates commonly include *Arctostaphylos uva-ursi* (bearberry), *Primula mistassinica* (bird's-eye primrose), *Cypripedium calceolus* (yellow lady-slipper), *Polygala paucifolia* (gay-wings), *Smilacina stellata* (false Solomon-seal), *Castilleja coccinea* (Indian paintbrush), *Tofieldia glutinosa* (false asphodel), *Carex capillaris* (sedge), *C. castanea* (sedge), and especially *C. eburnea* (sedge). Frequent shrub associates are *Shepherdia canadensis* (soapberry), *Juniperus communis* (common juniper), *J. horizontalis* (ground juniper), *Cornus stolonifera* (red-osier dogwood), and *Potentilla fruticosa* (shrubby cinquefoil).

Other rarities that may be found in association with dwarf lake iris include state and federal threatened

Solidago houghtonii (Houghton's goldenrod), state threatened *Calypso bulbosa* (calypso orchid), *Carex scirpoides* (bulrush sedge), and *Pterospora andromedea* (pine-drops), and state special concern *Cypripedium arietinum* (ram's-head orchid), *Pinguicula vulgaris* (butterwort), and *Carex richardsonii* (Richardson's sedge). Occasionally, this species extends out into open dune ridges in association with state and federal threatened *Cirsium pitcheri* (Pitcher's thistle) and state threatened *Tanacetum huronense* (Lake Huron tansy). On Drummond Island it is found in alvar habitat associated with state special concern *Sporobolus heterolepis* (prairie dropseed).

In many instances, the historical distribution of this iris seems to be as important as habitat in determining where it now grows. For example, many stations, likely consisting of relict colonies, lie along abandoned shores, especially former beach ridges of the ancient Great Lakes, sometimes in habitats that are now obviously unfavorable due to succession and other factors. This species has demonstrated that under certain conditions it can readily spread into artificially cleared areas with dryish, calcareous substrates, where it may advance aggressively.

Biology: Dwarf lake iris usually flowers from about mid-May through early June, depending on site exposure and annual weather variations. Each flower remains open about three days (Planisek 1983). Fruiting capsules ripen from mid-July to mid-August and release seeds that bear a white accessory appendage attractive to ants, which appear to play a role in dispersal (Planisek 1983). Observations show that fertility in this species is low due to: 1) sparse flower production, 2) low fruit-set (only 3% of growing tips develop fruits), and 3) low seed-set (an average of 21 seeds per capsule) (Planisek 1983). The flowers are self-compatible. No pollen vectors have been observed, though other irises are known to be bee- or fly-pollinated. Plants of *Iris lacustris* reproduce readily by rhizome forking and elongation, and plants can be aged by counting the enlarged nodes which mark the locations of past years' growing tips. Extensive clones often form, with tens or possibly hundreds of shoots possibly representing only one or a few genetically distinct individuals. Isozyme analysis of nine populations of dwarf lake iris found this species to be genetically depauperate as a whole (Hannan 2000.) There was a lack of detectable isozyme variation at any locus, and all isozymes found exhibited electrophoretic mobilities similar to those of *I.*

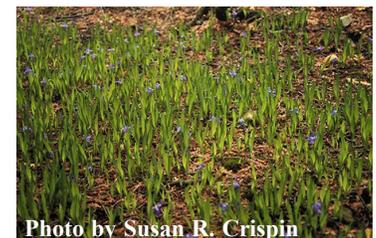


Photo by Susan R. Crispin



cristata, a similar species found south of the Wisconsinian glacial maximum. These findings support the hypothesis that dwarf lake iris is of geologically recent origin from a single, genetically depauperate *I. cristata* gene pool.

Conservation/management: Since *Iris lacustris* is largely restricted to the Great Lakes shores, it is highly vulnerable to ongoing shoreline development and intensive recreation. Fortunately, this species is a persistent and rather ecologically resilient plant, and can often withstand less-than-catastrophic disturbances (e.g. overstory removal, occasional trampling, shading). It is clearly sensitive to mechanical disturbance or removal of its substrate, but can often recolonize small disturbed areas if it flourishes nearby. At least seven large, thriving colonies of iris lie partly or wholly on state lands, as do numerous other healthy but smaller ones. The Nature Conservancy and Michigan Nature Association each have good colonies of this iris within their preserve systems. Thriving colonies are probably best maintained without active management, though experimental techniques to determine the effects of disturbance, such as the removal of maturing canopy trees, are desirable to learn if this type of management may be necessary to perpetuate dwarf lake iris in some habitats. Colonies which appear to be suffering from shading might be rejuvenated by removing some canopy trees, which is likely to stimulate flowering. Historically, fire may have played a role locally by reducing canopy closure.



Comments: Form *albiflora*, bearing white flowers, occurs sporadically among the typical blue-flowered plants at several locations in Emmet, Presque Isle, and Schoolcraft counties, and perhaps elsewhere. Dwarf lake iris was designated Michigan's state wildflower in 1998.

Research needs: Breeding system studies, including investigations of pollination biology, are desirable for this species. Due to the increasing amount of development occurring where the iris occurs, research on experimental management techniques such as canopy removal, to determine the role of disturbance in the natural history of this species, is of high priority.

Related abstracts: Limestone pavement lakeshore, wooded dune and swale, American dune wild-rye, butterwort, calypso orchid, fasciated broom-rape, Houghton's goldenrod, Lake Huron tansy, pine-drops, Pitcher's thistle, prairie dropseed, Pumpelly's brome grass, ram's-head orchid, black tern, Caspian tern, common tern, Hine's emerald, Lake Huron locust, massasauga, piping plover.

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