



Status: State endangered

Global and state rank: G5/S1

Other common names: round-leaved orchid

Synonyms: *Orchis rotundifolia* (Banks) Hultén

Family: Orchidaceae (orchids)

Taxonomy: American orchid taxonomists are now tending to follow the treatment proposed by Hultén (1968), who separated *O. rotundifolia* from the genus *Orchis* and placed it alone in the monotypic genus *Amerorchis* (Case 1987).

Total range: This predominantly boreal orchid ranges from Alaska to southern Greenland, extending south to Wyoming, the northern Great Lakes region, and northern New England. Though common in the western part of its range, it is one of the rarest orchids in eastern North America. Case (1987) notes that few naturalists have had the distinct pleasure of observing it in its natural habitat. Round-leaved orchis is considered rare in Maine, Montana, Wyoming, Wisconsin, and New Brunswick, and classified as extirpated in Vermont and New York.

State distribution: Michigan localities for this orchid are sparsely distributed from Isle Royale to the northern Lower Peninsula. The existence of this species has been confirmed since the 1980's from only five of the 12 known localities (Emmet, Chippewa, Schoolcraft, and Keweenaw counties), and it has apparently died out or been extirpated from at least

four former localities. Five records date from the turn of the century or before. Two the five recently-confirmed populations support hundreds or thousands of plants scattered over many acres; the others are not known to number more than a few plants. There is a reported extant locality for this species in the Les Cheneaux islands region, the site of a 1905 collection; however, no data have been received to date.

Recognition: Each plant of this orchid produces a single, **roundish to oval basal leaf** up to about 9 cm in length that is slightly yellowish-green in color. Stout, solitary robust stems reaching 9-25 cm in height are terminated by 10-15 or more small flowers in a loose raceme. The upper sepal and petals, which are 6-10 mm long, **converge to form a pale pink to white hood, above a spurred, flat, three-lobed lower lip that is typically spotted with dark purple.** The lateral lobes of the lip are relatively small, with the terminal lobe narrowed at the base but broadened toward the tip and often notched. Flowers measure about 1 cm from top to bottom.

The single leaf of non-flowering *O. rotundifolia* plants superficially resembles that of sterile *Smilacina trifoliata* (false Solomon-seal), a species with which it commonly occurs, but is usually distinguishable by its greater width-to-length ratio and by its three more or less prominent longitudinal veins.

Best survey time/phenology: According to Case (1987), there is considerable variation in blooming period, with this species flowering from late June through July throughout its range. There also may be



wide variation in blooming period among plants within colonies, as Case has observed at one Michigan locality.

Habitat: *Amerorchis rotundifolia* inhabits cold northern swamps or semi-open fens dominated by balsam fir, black spruce, and white cedar. An alkaline to circumneutral mineral soil or marl generally underlies the *Sphagnum* moss-dominated groundcover (Case 1987). Plants grow in full sun or semi-shade, and favor microsites where there is less competition from other herbaceous plants. They are often found in shaded, wet depressions and near tree bases, and tend to strongly favor sites where there is a persistent, cold, groundwater source. Typical associates include northern white cedar (*Thuja occidentalis*), saxifrage (*Saxifraga pensylvanica*), *Ledum groenlandicum* (Labrador tea), *Listera cordata* (heart-leaved tway-blade), *Malaxis unifolia* (green adder's-mouth), bulrush (*Scirpus hudsonianus*), alder-leaved buckthorn (*Rhamnus alnifolia*), yellow lady's-slipper orchid (*Cypripedium calceolus*), flat-topped aster (*Aster umbellatus*), *Platanthera obtusata* (blunt-leaf orchid), *Smilacina trifolia* (false Solomon-seal), and *Cypripedium reginae* (showy lady-slipper). To the north and far west where this species is more common, it inhabits a variety of habitats, including open tundra, montane conifer forests, dry spruce forests, and also limestone barrens.

Biology: Flowering in Michigan usually occurs from approximately mid-June into early July, depending upon microclimate. Round-leaved orchid is a stoloniferous, perennial species, though individual plants may be short-lived, and have been observed at different locations within a local area from year to year (Case 1987). Brief monitoring of one population by Michigan Natural Features Inventory (MNFI) indicated that individual plants/stems often die after flowering. If this orchid is monocarpic (i.e. dying following flowering and fruiting), seed set and dispersal is critical to the species' persistence. The demise of several southernmost populations for no apparent reason has led Case to suggest that the species may disperse from the north to cold Michigan bogs, where colonies eventually succumb to the warmer climate, particularly the relatively warm soils. A slow atmospheric warming trend would thus have adverse consequences for the viability of remaining Michigan populations.

Conservation/management: The observed decline of this species in Michigan may be partly attributable to natural extinctions of ephemeral populations as suggested above; factors such as warming trends and acid rain have also been suggested. One population was extirpated by a power line cut that removed forest cover, but no major human disturbances are apparent at other extirpated stations. Both large populations occur on U.S. Forest Service land.

Until the ecological requirements of this species in Michigan are better known, prudent management dictates insulation of ecosystems supporting healthy populations from human disturbances--particularly hydrologic alterations, since the flow of cool groundwater appears to play a critical role in maintaining suitable microsite conditions. Heavy cutting of overstory species, which probably occurred in the past in this species' habitats, is also risky, since it increases insolation and subsequent warming of the soil. Experimental habitat manipulations carried out very locally and carefully within such ecosystems might help elucidate the plant's response to various disturbances and suggest future management strategies.

The locations of populations should be kept highly confidential, as this species' typical habitat is highly vulnerable to overuse and trampling by orchid enthusiasts, photographers, curiosity-seekers, and plant poachers.

Comments: The lip of the flower may occasionally be entirely white. In the var. f. *lineata* (Mousely) Voss, it is characterized by two broad lines or irregular blotches of purple rather than being spotted.

Research needs: Inventory of Michigan's populations to determine their status is a principal need at present, particularly with regard to historical sites and occurrences for which there are few population data. Monitoring to determine population dynamics and trends would provide relevant information to guide management and stewardship.

Related abstracts: rich conifer swamp, Calypso orchid, ram's-head orchid

Selected references

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