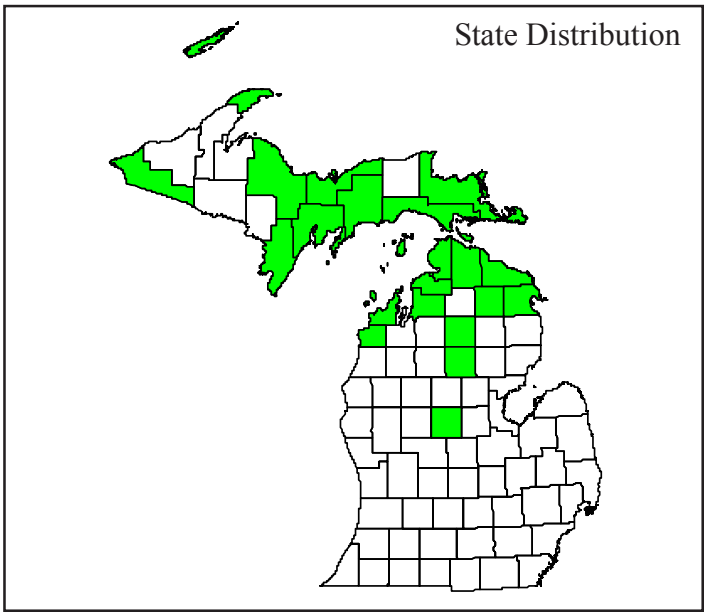
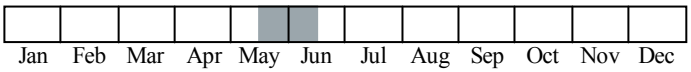
Calypso bulbosa (L.) Oakes — calypso orchid



Best Survey Period



Status: State threatened

Global and state rank: G5/S2

Other common names: fairy slipper, deer's head orchid

Family: Orchidaceae (orchid family)

Synonyms: *Cytherea bulbosa* House, *Calypso borealis* Salisb.

Taxonomy: This is the only species in the genus *Calypso*. North American plants are sometimes considered var. *americana* (R. Brown) Luer and at least one form, occurring in the Pacific Northwest, differs in proportions, markings, and physiology (Case 1987).

Total range: This widespread species nearly circles the globe in the northern hemisphere, ranging throughout North America, Europe, and Asia. In North America, calypso is found from Labrador to Alaska, south to New England, Minnesota, the Great Plains, Arizona, and along the west coast to California. It is considered rare in Maine (S2 rank), Vermont (S2), and Wisconsin (S2-3), South Dakota (S3), and in New Hampshire and New York where it is known only from historical records.

State distribution: Calypso is widely distributed in the northern Lower Peninsula and the Upper Peninsula of Michigan, with 85 locational records from 23 counties. At least eight counties have records dating since 1980. Most mainland - especially more southerly - colonies consist of few plants, but large colonies with hundreds of plants occur occasionally to the north, especially on Isle Royale.

Recognition: At flowering time the visible portion of this plant consists of a **single pleated oval, basal leaf**, and a leafless stalk 1-2 dm tall, topped by a **tiny solitary flower**. The nodding blossom has **five purple to magenta petals** (1-2 cm long) and a **sac-like lip about 2 cm long**. The **back of the lip** is translucent white and **spotted with purple**, while **the front** is crested with **three rows of yellow hairs**. The lowermost saccate portion is whitish with red-brown to purple markings within and has two conspicuous horns at the base. The seldom seen capsule is erect, elliptical, and about 2.5 cm in length.

Best survey time/phenology: Due to its rarity and extremely small size, calypso orchid is notoriously difficult to find. Although its tiny, basal evergreen leaf could potentially be recognized and found with extremely diligent searching, this would be highly ineffective survey strategy. In all practicality one is limited to surveying when the showy flower is present. This survey window varies depending upon the location and specific weather conditions, but in Michigan is usually from late May through early June, varying according to locality and latitude.

Habitat: Calypso is an inhabitant of moist coniferous forests with cool soils. In Michigan, it is found in spruce-balsam-cedar swamps, and also in drier cedar-fir thickets along the shores of the upper Great Lakes, especially on calcareous substrates. When found in boggy areas, it inhabits drier hummocks or the bases of old trees or stumps. It is nearly always in the shade (Case 1964). Caljouw (1981) found it under canopy covers of no less than 60% and in soils no warmer than 15° C. Common

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

associates include *Trientalis borealis* (twinflower), *Goodyera repens* (lesser rattlesnake plantain), and *Corallorhiza striata* (striped coral-root) (Case 1964).

Biology: In Michigan, Calypso plants flower from May to July depending on location, but are always among the first plants to bloom (Case 1964). After flowering, the single leaf fades and the corm produces a new bud on one side. From this bud a new leaf emerges in late summer, surviving the winter until the next flowering season. The corm is globose or ellipsoid and may have a coralloid rhizome attached (Mousley 1924; Correll 1950). Bumblebees of several species pollinate the flowers, but receive no reward since nectar is not produced. Plants are self-compatible, but require the mechanical action of a bumblebee to effect pollination (Mosquin 1970). Fruiting capsules develop in June and July, though they are rarely found, as are seedlings (Case 1964). Mousely (1924) reported rhizomatous roots at the base of the tuber to be a major means of reproduction. Dormancy, commonly of one to two years, has also been reported (Vickery 1984). The whole plant is frequently attacked by rodents, slugs, and fungi, particularly in the eastern U.S. (Correll 1950). Our plants tend to grow in scattered, sparse populations and have not been successfully cultured. The western form seems to be more "aggressive," growing in denser colonies, and has been successfully cultivated for one to two years when carefully tended (Case 1964).

Conservation/management: Calypso is protected in at least three Michigan Nature Association sanctuaries, three Nature Conservancy preserves, three state natural areas, two national parks, and in the Sylvania Recreation Area. At any site with considerable public recreation use, this species is vulnerable to trampling by wildflower enthusiasts. Corms are dug in western states for commercial export (Wiley 1968). In the East, logging and drainage of its habitat contribute to calypso's increasing rarity. In Maine, studies suggest that spruce budworm infestations may have damaged calypso populations by reducing shade (Vickery 1984). Publicizing the location of calypso colonies, especially readily accessible ones, should be avoided. Conservation of nearby bee populations could promote fertilization and seed-set.

Comments: This species has nutritional, as well as aesthetic value, as the mucilagenous corms were eaten by native Americans in British Columbia (Correll 1950). The name "calypso" comes from Homer's sea-nymph in the Odyssey who kept Odysseus concealed seven years on her island. Both the beauty and rarity of calypso, as well as the seclusion of its habitats, make this a fitting name (Correll 1950).

Research needs: Relatively little is known of the natural history of this diminutive orchid, and thus virtually any life history study would aid greatly in management and conservation. Of primary interest would be investigations of this species' breeding system, especially pollination biology and studies leading to a better understanding of the requirements for germination and establishment. Demographic monitoring would also enhance our knowledge of the population dynamics of this species.

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

Selected references

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Abstract citation

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