Natural Heritage & Endangered Species Program
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Ram's Head Lady's-slipper

Cypripedium arietinum Ait. F.

State Status: **Endangered**
Federal Status: **None**

Ram's Head Lady's-slipper showing stem leaves and flower at end of stem with hairs on the lip around the opening. Photo: Jennifer Garrett, NHESP.

Description: Ram's Head Lady's-slipper is a small but striking purplish orchid (family Orchidaceae) that is quite rare throughout its range (i.e., globally rare). Plants grow singly or in loose clusters from short rhizomes with long fibrous roots. This slender lady's-slipper varies in height from 5 to 30 cm. Plants bear 3 to 5 bluish green, elliptic-lance shaped leaves growing along the stem in a spiral arrangement. A small solitary flower is borne at the tip of the stem – plants very rarely bear two flowers. The sac-like lip petal of the flower is white above and streaked below with a net-like pattern of purple, crimson, and sometimes green. The lip petal resembles a miniature charging ram's head due to its downward-pointing conical shape. The opening of the lip petal is densely covered with long silky hairs. The flower has three distinct brownish purple and green streaked sepals. The dorsal sepal forms an arching hood above the inflated lip. The two lateral petals and sepals twist and spiral downward and away from the inflated lip.

Ram's Head Lady's-slipper often reproduces vegetatively by offshoots from parent plants. Sexual reproduction is less common. Plants are obligate out-breeders and require pollination by small bees to accomplish cross-pollination. Although this plant is not a nectar producer, bees are attracted by the sweet smelling vanilla-like odor and the venation pattern on the flower. Upon successful pollination, many microscopic seeds are produced and contained within a linear-ellipsoid shaped fruiting capsule.

Aids to identification: The height of Ram's Head Lady's-slipper is variable; flowering plants are usually 10 to 15 cm taller than vegetative plants. The stem is covered by tiny glandular hairs and the leaves are smooth with fine short hairs along their wavy margins. Leaves are 5 to 10 cm long, 1.5 to 3.5 cm wide, and sometimes folded lengthwise. The lip petal or flower sac is 1.3 to 2.5 cm long and 1 to 2 cm wide. Sepals are distinctly free to their base. The dorsal sepal is 1.5 to 2.5 cm long and 1 to 2 cm wide and forms a hood over the lip; upon pollination, it will droop, covering the opening to the lip petal. Sepals and petals are linear-lanceolate and similar in appearance. The two lateral sepals are 1.5 to 2 cm long and 0.2 to 0.5 cm wide. The lateral petals are the same length but 0.1 to 0.2 cm wide.

Similar species: Ram's Head Lady's-slipper is easily distinguished from other Lady's-slippers when in flower. Vegetative plants are sometimes confused with Yellow Lady's-slipper (*Cypripedium parviflorum*) or Helleborine Orchid (*Epipactis helleborine*).

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Habitat in Massachusetts: Though known in other regions from coniferous swamps and limey coniferous woodlands, Ram's Head Lady's-slipper in Massachusetts inhabits somewhat rich, partially shaded conifer and mixed hardwood forests. It prefers seasonally moist circumneutral soils and requires a specialized mycelia fungal structure in the soil for successful germination and uptake of nutrients in the proto-corm and rhizomatous stages of growth. It is often found in microhabitats with little competition from other understory plants.

Sugar Maple (*Acer saccharum*), White Ash (*Fraxinus americana*), Basswood (*Tilia americana*), Black Birch (*Betula lenta*), Eastern Hemlock (*Tsuga canadensis*) and White Oak (*Quercus alba*) are characteristic trees in the forest canopy. Witch Hazel (*Hamamelis virginiana*) is often scattered in the shrub layer. Herbaceous cover is sparse and may include Christmas Fern (*Polystichum acrostichoides*), Bashful Bulrush (*Trichophorum planifolium*), White Wood Aster (*Eurybia divaricata*), Blunt-lobed Hepatica (*Anemone americana)*, Canada Mayflower (*Maianthemum canadense*), and Solomon's Seal (*Polygonatum pubescens*). The introduced Helleborine Orchid is sometimes found nearby.

Phenology in Massachusetts: Ram's Head Lady's-slipper flowers in mid-spring; fruit matures mid summer and seed dispersal may occur in autumn, and continue in the spring and summer of the following year.

Range: Ram's Head Lady's-slipper is native to east central North America. Its range extends from Nova Scotia, Southern Quebec, Maine west to Saskatchewan, and south to New England, New York, Michigan, Wisconsin, and Minnesota.

Population status in Massachusetts: Ram's Head Lady's-slipper is listed under the Massachusetts Endangered Species Act as Endangered. All species listed are protected from killing, collecting, possessing, or sale and from activities that would destroy habitat and thus directly or indirectly cause mortality or disrupt critical behaviors. This species is currently reported as extant from Berkshire and Franklin Counties and historic from Hampden and Hampshire Counties.

Threats: Ram's Head Lady's-slipper is an exceptionally rare and striking orchid, making it vulnerable to illegal collection by orchid enthusiasts, or picking by the unaware and curious observer. It is also vulnerable to White-tailed Deer browse, especially in areas with an over abundance of deer. This species has a very long life cycle, taking many years to grow from seed to mature fruiting plant. Therefore, the impacts of collection or over-browsing by White-tailed Deer have the potential to decimate small populations. Known habitats are susceptible to invasions by non-native plants such as Japanese Barberry (*Berberis thunbergii*) that compete with native plants for space, light, and nutrients. Large scale land clearing is unlikely at known sites, but this orchid may be sensitive to low levels of habitat and land use change partly due to the specialized relationship it has with soil mycorrhizae. Changes in forestry practices, hydrology, colluvial soil building processes, and fire regimes all have the potential to adversely impact environmental conditions necessary to sustain Ram's Head Lady's-slipper.

Management recommendations: Monitor known populations of Ram's Head Lady's-slipper to gain a better understanding of population dynamics, environmental processes necessary to sustain populations, and current threats. Minimize White-tailed Deer browse by managing local deer populations, and erecting deer enclosures as needed. Monitor and control invasive species such as Japanese Barberry. Consider selective tree removal to maintain or create small canopy gaps. Avoid trampling and prohibit use of off-road vehicles at sites. Conduct research aimed at understanding the factors necessary to maintain the presence and vitality of beneficial mycorrhizae in the soil.

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Flowering Time in Massachusetts

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

For more information:

Blaney, S. and D. Mazerolle. 2007. Nova Scotia Provincial Status Report on Ram's Head Lady's-slipper (*Cypripedium arietinum* R.Br.). Prepared for the Nova Scotia Species at Risk Working Group. 31 pp.

Brzeskiewicz, M. 2000. Conservation assessment for *cypripedium arietinum* (Ram's Head Lady's-slipper). USDA Forest Service, Eastern Region. Chequamegon-Nicolet National Forest. 20 pp.

Sheviak, C.J. 2003. *Cypripedium arietinum* in Flora of North America. Vol.26 (Flora of North America Editorial Committee, eds.). Oxford University Press, New York, New York.

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