

## HUDSONIA HARLEM VALLEY BIODIVERSITY MANUAL SUPPLEMENT

### Devil's bit (*Chamaelirium luteum*)

A dioecious perennial of the lily family (*Liliaceae*), devil's bit reaches the northern limit of its range in the Harlem Valley. With 11 extant and over 60 historical occurrences in the state (Utter and Hurst 1990) it is ranked S1 (NYS Endangered) by the New York Natural Heritage Program.

Male and female flowers are borne on separate plants, at the top of a single stalk from a basal rosette of dark green, entire and somewhat fleshy leaves. Blooming occurs in the latitude of the study area in June or early July, with male and female plants flowering in synchrony (Allard 2003).

### Habitats in the Study Area

Moist woodlands of no special character support occurrences of this plant in New England (Allard 2003). It occurs both in acidic oak-hemlock-white pine growth and in sugar maple-white ash woodland on limestone (Massachusetts Natural Heritage Program 1988). Less frequently, devil's bit occurs in wet meadows (Allard 2003). With more occurrences documented, the habitat requirements of this species might be better revealed.

### Study Area Distribution

Presently known only from two locations in the study area: Pawling Nature Reserve (The Nature Conservancy) in the Town of Pawling, Dutchess County, and private land in the Town of Dover, Dutchess County. Both are in wetlands (Kiviat, personal communication). An occurrence in western Columbia County, and four extant occurrences in southeastern Massachusetts (Massachusetts Natural Heritage Program 1988) suggest there may be undiscovered locations in the study area.

### Other Relevant Aspects of Ecological Niche and Behavior

In most occurrences of devil's bit in the Northeast very few plants are observed to bloom in any one year (Allard 2003). It is possible that blooming is stimulated by increased light, and that habitats with stands of this plant have become increasingly shaded as trees and shrubs matured. The species is not typically found in natural open habitats, but rather blooms opportunistically when blowdowns or tree-cutting allow light into the forest. Meagher (1978) reported Devil's bit as occurring on moderately unstable slopes where trees fall relatively frequently. The Dutchess County occurrences are not on steep slopes. Baskin et al. (2001) reported that direct sunlight was required for seed germination in this species. Blau and Venezia (1983; cited in Allard 2003) found that plants in an open meadow in Dutchess County produced more flowers annually than those in a nearby woodland.

### Description and Identification

A perennial herb of the lily family (*Liliaceae*), devil's bit is unusual among herbs in having male and female flowers on separate plants, and male flowers that are showier than the female flowers. Occasionally a plant is found with flowers of both sexes (Allard 2003). In late spring or early summer both male and female plants raise a single flowering stalk with 2-4 leaves from a basal

rosette of simple, lanceolate leaves. Shorter (ca 30 cm) stalks of male plants bear a raceme of small, cream-colored flowers. Taller (50-80 cm) stalks of female plants bear inconspicuous greenish flowers. Female stalks with seed capsules may persist through winter. There is evidence that in northern populations; a smaller percentage of plants flower per year than in southern populations (Meagher 1978).

## **Threats and Conservation**

As with any rare plant, habitat loss is probably a factor in any decline of this species. Evidence suggests that in the last 50 years, devil's bit has declined throughout New York and New England (Massachusetts Natural Heritage Program 1988, Allard 2003). The plant has been found recently in only one of 4 documented Massachusetts locations, but the low number of total sites is inconclusive, and apparently the habitats have not changed significantly in the last several decades.

Deer browse the flowering stalks (Blau and Venezia 1983, Allard 2003), but the long-term effect of this on reproduction has not been well studied. Habitat damage, especially to soils, is a potential threat. At least one New England population was decimated by logging (Allard 2003). Occasionally rare plants, including devil's bit, have been locally extirpated by landowners or developers to remove a potential constraint to development.

## **Survey Technique Constraints**

Flowering so rarely, the only evidence of devil's bit is often the basal rosettes of non-blooming plants. These resemble rosettes of other lilies (e.g. bluebead lily [*Clintonia borealis*]), and superficially a number of composites and other woodland plants. Mixed with other basal rosettes, those of devil's bit would be very hard to detect without close examination of all the rosettes in a surveyed patch of a woodland herb community. The difficulty of habitat characterization further confounds the study of this species.

## **References to Identification Literature**

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