

bishop's goutweed

Aegopodium podagraria L.

Synonym: *Aegopodium podagraria* var. *variegatum* Bailey

Other common name: ground-elder

Family: Apiaceae

Invasiveness Rank: 57 The invasiveness rank is calculated based on a species' ecological impacts, biological attributes, distribution, and response to control measures. The ranks are scaled from 0 to 100, with 0 representing a plant that poses no threat to native ecosystems and 100 representing a plant that poses a major threat to native ecosystems.

Description

Bishop's goutweed is a perennial herb that grows from 30 to 100 cm tall from long, white, branching rhizomes. Stems are hollow, grooved, and glabrous or covered with short-branched hairs. Leaves are one or two times pinnately compound. Leaflets are ovate, 4 to 8 cm long, and irregularly toothed with short petiolules and pointed tips. Basal leaves have long petioles and five or more leaflets. Upper leaves are reduced in size with three or more leaflets and petioles that are expanded at the sheath. Flowers are arranged in compound umbels at the ends of stems. Umbels are up to 9 cm in diameter. Petals are white or sometimes pink and 1.5 mm long. Seeds are ovate and 3 to 4 mm long (Luneva 2009, Klinkenberg 2010).



Stem and leaf of *Aegopodium podagraria* L. Photo by A. Winter.

Similar species: Several native members of the Apiaceae family can be confused with bishop's goutweed. Spotted water hemlock (*Cicuta maculata*) and western water hemlock (*Cicuta douglasiana*) can be distinguished from bishop's goutweed by the presence of a taproot or a cluster of thickened, tuberous roots and narrowly linear to narrowly oblong leaflets. Unlike bishop's goutweed, beach lovage (*Ligusticum scoticum*) has a thick taproot, stems that are red-purple at the

bases, purple-tinted leaf sheathes, and conspicuously three-ribbed seeds (Hultén 1968, Klinkenberg 2010, Ontarioweeds 2011).



Aegopodium podagraria L. growing on river bank. Photo by A. Winter.

Ecological Impact

Impact on community composition, structure, and interactions: Bishop's goutweed is highly shade tolerant and can form dense patches in closed-canopy forests, significantly increasing the density of herbaceous ground cover, inhibiting the germination and growth of trees and shrubs (Garske and Schimpf 2005), displacing native species, and reducing species diversity in ground layers (Klinkenberg 2010). Bishop's goutweed provides food and habitat for insects and mollusks (Waggy 2010). It is pollinated by a variety of beetles, bees, and small flies (Garske and Schimpf 2005, Waggy 2010); for this reason, its presence may alter native plant-pollinator interactions.

Impact on ecosystem processes: Bishop's goutweed is highly competitive in shaded areas (Garske and Schimpf 2005) and may decrease the nutrients and moisture available to native plant species. Its ability to inhibit the germination and growth of trees and shrubs (Garske and Schimpf 2005) in forests and woodlands suggests that

this species may significantly alter decomposition, nutrient cycling, and other ecological processes.

Biology and Invasive Potential

Reproductive potential: Bishop's goutweed reproduces sexually by seeds and vegetatively from rhizomes and root fragments (Klinkenberg 2010, Waggy 2010). The number of seeds produced per plant is unknown but probably low (Waggy 2010). Bishop's goutweed rarely produces seeds in shaded areas. In sunny areas, seedlings are rarely able to compete with mature plants, and most perish (Gatsuk et al. 1980). The amount of time seeds remain viable is unknown (Waggy 2010). Patches increase in size primarily through extension of the rhizome system (Garske and Schimpf 2005). New individuals are formed by vegetative separation when the rhizomes decay. Subdivision into two or several filial plants can occur, each consisting of partial shoots joined by rhizomes (Gatsuk et al. 1980).

Role of disturbance in establishment: Bishop's goutweed most often establishes under closed canopies where the ground layer vegetation has been disturbed or where the soil is bare (Waggy 2010). In North America, it commonly grows in anthropogenically disturbed sites, such as mesic roadsides and waste places (Klinkenberg 2010, Waggy 2010). However, it can also establish in naturally disturbed sites such as those disturbed by the digging of animals (Waggy 2010).

Potential for long-distance dispersal: Seeds have no specific adaptations for dispersal (Garske and Schimpf 2005), but can be transported short distances by wind (Waggy 2010). In Gustavus, Alaska, bishop's goutweed appears to primarily reproduce vegetatively (Rapp 2006).

Potential to be spread by human activity: Bishop's goutweed is grown in gardens as an ornamental plant, a medicinal herb, or a vegetable. Most infestations originate from intentional plantings that have spread to natural areas (Garske and Schimpf 2005, Plants for a Future 2010, Waggy 2010). This species can spread from root fragments in dumped garden debris (Klinkenberg 2010). The variegated variety has been planted in Gustavus as a ground cover and was observed spreading beyond maintained plantings and displacing native species (Rapp 2006).

Germination requirements: Seeds have both morphological and physiological dormancy and require a long period of cold stratification before they can germinate. Temperatures of 0°C to 5°C are required to break seed dormancy (Phartyal et al 2009). Bishop's goutweed usually germinates in May or early June (Gatsuk et al 1980).

Growth requirements: Bishop's goutweed grows in temperate climates on most soil types with pH between 3.1 and 9 but grows best in moist, nitrogen-rich soils with high calcium carbonate (CaCO₃) contents (Luneva and Budrevskaya 2007, Klinkenberg 2010, Waggy

2010).

Congeneric weeds: No other *Aegopodium* species are known to occur as non-native weeds in North America (ITIS 2011, USDA 2011).

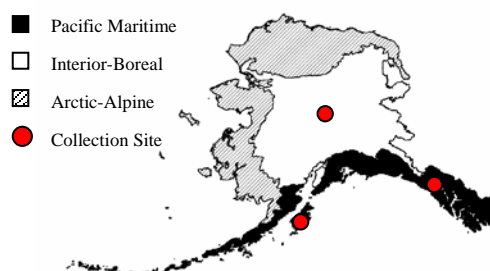
Legal Listings

- Has not been declared noxious
- Listed noxious in Alaska
- Listed noxious by other states (VT; considered invasive and banned in CT and prohibited in MA)
- Federal noxious weed
- Listed noxious in Canada or other countries

Distribution and Abundance

Bishop's goutweed is cultivated as an ornamental plant (Plants for a Future 2010, Waggy 2010). It has also been planted as a low-maintenance ground cover (Garske and Schimpf 2005). Although the less vigorous variegated variety is often cultivated, 'normal' non-variegated plants, which are more vigorous and rapidly spreading, can arise from variegated populations (Small 1973). In North America, this species grows in grasslands, forests, gardens, logged areas, abandoned fields, pastures, roadsides, and disturbed areas (Garske and Schimpf 2005, Klinkenberg 2010, Waggy 2010). In Europe and Vermont, bishop's goutweed grows in riparian areas in deciduous woodlands and forests. In Massachusetts, it grows in wetland communities. In North and South Carolina, it grows on the edges of bogs (Waggy 2010).

Native and current distribution: Bishop's goutweed is common in Europe, Asia Minor, and Central Asia, but its native range is unclear (Luneva and Budrevskaya 2007, Waggy 2010). It has been introduced to North America, Australia, New Zealand, and Japan (Mito and Uesugi 2004, Waggy 2010, Landcare Research 2011). In Norway, Bishop's goutweed grows as far north as 71.042°N (Vascular Plant Herbarium Trondheim 2010). This species has been documented in the Pacific Maritime and Interior-Boreal ecogeographic regions of Alaska (AKEPIC 2011).



Distribution of bishop's goutweed in Alaska

Management

Small patches can be dug by hand. All underground parts must be removed to prevent plants from regenerating from rhizome fragments. Plant material

should be bagged to prevent the dispersal of rhizome fragments. Large infestations can be controlled with herbicides, such as glyphosate. Frequent mowing to prevent seed set can contain populations. Mowing populations in the spring or early summer followed by

covering them with black plastic sheeting can effectively control bishop's goutweed. Controlled areas should be monitored for several years following treatment. No biological control agents are available in North America (Garske and Schimpf 2005).

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