

Aegopodium podagraria

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INTRODUCTORY

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Variegated goutweed.



All-green goutweed. Photos by John Randall, The Nature Conservancy, Bugwood.org

AUTHORSHIP AND CITATION:

Waggy, Melissa, A. 2010. *Aegopodium podagraria*. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: <http://www.fs.fed.us/database/feis/> [2010, January 21].

FEIS ABBREVIATION:
AEGPOD

NRCS PLANT CODE [87]:
AEPO

COMMON NAMES:
goutweed
bishop's goutweed
bishop's weed
bishopsweed
ground elder
herb Gerard

TAXONOMY:
The scientific name of goutweed is *Aegopodium podagraria* L. (Apiaceae) [40].

SYNONYMS:
Aegopodium podagraria var. *podagraria* [71]
Aegopodium podagraria var. *variegatum* Bailey [40,71]

LIFE FORM:
Forb

DISTRIBUTION AND OCCURRENCE

SPECIES: *Aegopodium podagraria*

- [GENERAL DISTRIBUTION](#)
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GENERAL DISTRIBUTION:

Goutweed was introduced in North America from Europe [82]. In the United States, goutweed occurs from Maine south to South Carolina and west to Minnesota and Missouri. It also occurs in the Pacific Northwest from Montana to Washington and Oregon. It occurs in all the Canadian provinces excepting Newfoundland and Labrador, and Alberta. [Plants Database](#) provides a distributional map of goutweed.

Globally, goutweed occurs primarily in the northern hemisphere, particularly in Europe, Asia Minor ([28,36,58,92], reviews by [14,27]), and Russia (review by [27,63]). Goutweed's native distribution is unclear. It may have been introduced in England (review by [2]) and is considered a "weed" in the former Soviet Union, Germany, Finland (Holm 1979 cited in [14]), and Poland [44]. It is nonnative in North America [82] and Australia including Tasmania (reviews by [2,14]).

Goutweed is grown as an ornamental (reviews by [13,72]) and occasionally escapes cultivation ([28,58,71], review by [95]). Little information has been published on its rate and direction of spread in North America. Darlington (1859 cited in [50]) considered goutweed invasive in the eastern United States by 1859, but goutweed was still considered uncommon in New England in the early 1980s [76]. Subsequent reviews on invasive species in New England indicate that goutweed may be becoming more widespread in Vermont [91] and Massachusetts [55]. A flora from Nova Scotia indicates that goutweed was locally abundant and becoming common in North America by the late 1960s [74]. In the early 1970's Swink [82] described goutweed as an "occasional weed" in northern Illinois, and an Illinois flora states goutweed is infrequent and rarely escapes cultivation [58].

HABITAT TYPES AND PLANT COMMUNITIES:

Little is known about goutweed's plant associates in North America, particularly where it may be most invasive. In Illinois [82] and the Northeast [28,76,91], goutweed occasionally occurs in wildlands. In Vermont, goutweed occurs in upland hardwood forests [91]. At one location in northern Illinois, goutweed occurred with boxelder (*Acer negundo*), slippery elm (*U. rubra*), black walnut (*Juglans nigra*), black raspberry (*Rubus occidentalis*), bristly greenbrier (*Smilax tamnoides*), great ragweed (*Ambrosia trifida*), eastern waterleaf (*Hydrophyllum virginianum*), and woodland lettuce (*Lactuca floridana*), and [82]. Based on its plant community associates in Europe, in North America goutweed may potentially occur in deciduous and coniferous woodland or forest communities and in plant communities with tall herbs.

Information from Europe indicates that goutweed most commonly occurs in deciduous woodlands and forests [21,24,53,67,101,102], especially in riparian areas [98]. It also occurs in shrublands, wetlands [46], and grasslands [26]. It typically occurs in plant communities characterized by tall herbs [83,84,98]. Goutweed sometimes dominates or codominates the herbaceous layer in plant communities and is a characteristic species for some plant communities outside of North America. In Sweden, it is a characteristic species for 2 plant community types, both dominated by buttercup (Ranunculaceae) species [67]. In Germany, there is a goutweed cover type that contains other tall herbs such as nettle (*Urtica* spp.) [83,84]. In the Czech Republic, goutweed dominated an abandoned grassland with tall grasses and forbs such as colonial bentgrass (*Agrostis capillaris*), meadow foxtail (*Alopecurus pratensis*), red fescue (*Festuca rubra*), and white bedstraw (*Galium album*) [26] and was codominant in a nitrophilous (species that prefer sites rich in nitrogen) plant community with stinging nettle (*U. dioica*) that occurs on anthropogenically altered sites (e.g., along roads, hedges, walls) [42]. In Estonia, goutweed dominates a wetland community type [46].

Throughout its European range, goutweed occurs with a mix of deciduous trees that include ash (*Fraxinus* spp.) [53,67,84,102], oak (*Quercus* spp.) [21,24,53,67,101,102], beech (*Fagus* spp.) [24,33,49,67], maple (*Acer* spp.) [33,84,101], and elm (*Ulmus* spp.) [33]. It also occurs in coniferous forests. In Norway, goutweed occurred at the edge of a spruce (*Picea* spp.) forest bordered by a meadow [32] and in Russia, it occurred in a Norway spruce forest (*P. abies*) with either European aspen (*Populus tremula*) or littleleaf linden (*Tilia cordata*) [54]. In much of its northern European range, goutweed occurs in woodlands and shrublands characterized by willow (*Salix* spp.) [20,77], birch (*Betula* spp.) [20,77,101], common filbert (*Corylus avellana*) [33,53,101,102], and alder (*Alnus* spp.) [20,33,45]. In Europe, goutweed occurs with various forbs and grasses including stinging nettle [6,33,83], Canada thistle (*Cirsium arvense*) [6,60], bedstraw (*Galium* spp.) [26,84], and quackgrass (*Elymus repens*) [6,26,60].

BOTANICAL AND ECOLOGICAL CHARACTERISTICS

Aegopodium podagraria:



Photo by Leslie J. Merhoff, University of Connecticut, Bugwood.org

- [GENERAL BOTANICAL CHARACTERISTICS](#)
- [SEASONAL DEVELOPMENT](#)
- [REGENERATION PROCESSES](#)
- [SITE CHARACTERISTICS](#)
- [SUCCESSIONAL STATUS](#)

GENERAL BOTANICAL CHARACTERISTICS:

- [Botanical description](#)
- [Raunkiaer life form](#)

Botanical description: This description covers characteristics that may be relevant to fire ecology and is not meant for identification. Keys for identification are available (e.g., [[28,52,58,71,74,76,92](#)]).

Aboveground: Goutweed is a perennial ([[52,62](#)], review by [[15](#)]) herb [[52,56,59,79,92,95](#)] with erect, hollow stems (review by [[14](#)]). One review from the upper Great Lakes region indicated that goutweed grows from 4 to 12 inches (10-30 cm) tall [[15](#)], but it may grow to as tall as about 3 feet (1 m) in the northeastern United States [[28](#)]. In the Netherlands, goutweed grows from 1.5 feet (.47 m) [[39](#)] to 3 feet (1 m) tall ([[59](#)], review by [[14](#)]). Individual compound leaves are 1 to 3 inches (3-8 cm) long ([[28](#)], review by [[15](#)]). They are typically variegated but are occasionally all green [[79](#)], especially on plants established from seed [[92](#)]. Goutweed's inflorescence is a compound umbel [[71,76](#)] 2 to 4.7 inches (6-12 cm) wide [[28](#)]. Its seeds are about 1.4 mm wide [[31](#)].

Belowground: Information pertaining to goutweed's belowground morphology comes primarily from Europe. Goutweed has an extensive root system [[41](#)] that includes a main root and lateral roots. During early development, adventitious thick storage roots and thin feeding roots emerge from the [hypocotyl](#). Eventually, additional adventitious roots form at rhizome nodes (review by [[27](#)]).

Goutweed has horizontal rhizomes [[52,56,92](#)] that may transition to vertical shoots at the end of the growing season (review by [[27](#)]). Reports of goutweed's rhizome length vary from 2 to 118 inches (5-300 cm) ([[41,56](#)], review by [[27](#)]). One study indicated that rhizomes are about 2 mm in diameter [[56](#)]. Nothing specific had been reported on how deep goutweed's rhizomes are buried in the soil as of 2009, but one review indicated that goutweed has a "weak shallow rhizome system" [[34](#)]. "Total" rhizome length may shorten as connections between ramets decay (review by [[27](#)]).

Stand structure: Goutweed exhibits clonal growth [59,62,74] and spreads by producing [ramets](#) ([59], review by [27]). In Massachusetts, goutweed forms dense mats (review by [95]). In Russia, goutweed's spatial distribution is nonrandom, and populations grow in clusters, presumably because of goutweed's rhizomatous nature [54].

Raunkiaer [73] life form:

[Geophyte](#)

SEASONAL DEVELOPMENT:

Literature pertaining to goutweed's phenology is sparse and comes primarily from locations outside North America. A few North American floras have reported flowering periods for goutweed. In Illinois, goutweed flowers from May to August [58], and a review from the Great Lakes region states that goutweed blooms in June [15]. In the northeastern United States, goutweed flowers from July to August [76]. In Nova Scotia, goutweed flowers and fruits from June through July [74].

The remainder of information, primarily from Europe, suggests a phenology that begins in early spring with seedling emergence, stem growth, and leaf development and culminates with plant senescence in fall after the first frost. In a garden in Belgium, goutweed seedlings emerged throughout the spring, but most emergence occurred in March and April [88]. In an outdoor experiment in Japan, cotyledons emerged by late April [68]. In Europe, goutweed seeds germinated in May or early June, and cotyledons photosynthesized for 1 to 2 months before dying. Primary rosette shoots develop soon after the cotyledons die (review by [27]). In Italy, optimal stem growth of goutweed occurred after mid-April [1]. In Germany, goutweed leaves begin to develop in early spring but are not fully expanded until May, when anthesis begins. Leaves stay green until August, when they begin to yellow, but they do not die until the first frost [56]. In Australia, goutweed's flowering stems emerge in midsummer [2].

REGENERATION PROCESSES:

- [Pollination and breeding system](#)
- [Seed production](#)
- [Seed dispersal](#)
- [Seed banking](#)
- [Germination](#)
- [Seedling establishment and plant growth](#)
- [Vegetative regeneration](#)

Although goutweed produces by seed and rhizomes (review by [15]), reproduction from seed may be rare [6,101], especially in wild populations [59].

Pollination and breeding system: In Switzerland [93], goutweed is insect pollinated, and it may be insect pollinated throughout its range. Goutweed emits a "strong" fragrance [9] and contains nectar on its nondeciduous floral parts (i.e., sepals, receptacle, gynoecium) [80]. It contains a number of volatile compounds that are suspected to influence insect-plant interactions [9,63], particularly those between bees and nectar-bearing plants [63]. In Sweden, pollinating beetles visited goutweed plants with fully developed flowers [19], although it is unclear whether beetles were acting as pollinators or just visiting the plants.

Goutweed has been described as both [monocarpic](#) [9] and [polycarpic](#) [8], but no details were given on how these determinations were made.

Seed production: As of this writing (2009), no information is available on seed production in goutweed, but anecdotal evidence suggests goutweed may not be a prolific seed producer. Smirnova (review by [27]) indicated that goutweed only flowers and fruits on sunny sites. The flora of Nova Scotia [74] indicated that variegated goutweed plants rarely produce fruit.

Seed dispersal: Goutweed seed is dispersed by gravity [31,101], and a few goutweed seeds may be dispersed short distances by wind. In an experiment in the Netherlands, 12% of goutweed seeds disseminated when a ripe umbel was held up to a fan at wind speeds lower than 10 m/second. This compares with dissemination rates of 40% to 89% for other Apiaceae species tested. On a platform, goutweed seeds were dispersed up to 1.9 feet (0.58 m) at a wind speed of 3.7 m/second [39]. As of this writing (2009), no information is available on how animals may aid in the dispersal of goutweed seeds, but its seeds are ribbed [52,76], suggesting they might adhere to animal coats.

Seed banking: Research pertaining to the longevity, density, and vertical distribution of goutweed seed in the soil seed bank is limited. Available evidence suggests that goutweed seeds form a seed bank, but seed longevity in the soil seed bank is unclear. In Denmark, 2 goutweed seedlings emerged from soil samples collected March to May at a depth of 3.9 inches (10 cm) [4]. In Poland, viable goutweed seed (collected to a 1.2-inch (3 cm) depth) occurred in an abandoned field, but goutweed did not occur in the aboveground vegetation until year 15 of the study [20]. Because goutweed does not likely have a long-range seed dispersal mechanism, it is possible goutweed established from soil-stored seed. In year 15, goutweed made up less than 10% of the aboveground vegetation cover [20]. Although goutweed's aboveground cover ranged from 11% to 50% over the next 5 years, no viable goutweed seeds were found in the soil seed bank after year 15 [20].

Germination: Seeds dispersed by goutweed plants in wildlands may have low germination rates [6], but in germination tests, goutweed seeds have shown moderate to high germination rates. In laboratory tests, 5% to 100% of goutweed seeds germinated after chilling at 41 °F (5 °C) [31,68,88].

At the time of seed dispersal, goutweed embryos are immature [25,68,88] and undergo a period of morphological and physiological dormancy before they germinate [68,88]. In Norway, 83% of goutweed seeds contained immature embryos, 15% contained endosperm but no embryos, and 2% were empty [25]. Before morphological dormancy can be broken, immature embryos must grow to full size; in the field, this process is triggered by cold temperatures in fall and early winter. An additional cold stratification period in the spring may be necessary to break physiological dormancy [88]. Several studies report that chilling of seeds induced goutweed germination. In the laboratory, exposure to temperatures of 41 °F (5 °C) for at least 16 weeks induced germination of goutweed seed [88]. In another study, no goutweed seeds germinated when fresh, but nearly all seeds germinated when exposed to 41 °F (5 °C) for 12 months [31]. A 3rd study [68] also induced goutweed germination at a temperature of 41 °F (5 °C) but obtained higher germination rates in a shorter time at 32 °F (0 °C). Vandeloos and others [88] found that, once dormancy was broken, seeds germinated at constant and alternating temperatures ranging from 50 to 73 °F (10-23 °C).

Seedling establishment and plant growth: Goutweed seedlings are most likely to establish and survive under the forest canopy on well-lit sites where ground disturbance has occurred (e.g., animal digging) and on sites void of other plants (review by [27]). Because recruitment from seed is seldom seen in wild populations [59], seedling establishment may be rare. Even seedlings establishing in sunlight may die the same year they emerge because they compete poorly for water and nutrients compared to surrounding mature plants (review by [27]).

Gastuk [27] provides a detailed review of the process of goutweed development. Experiments in Japan indicate that goutweed cotyledons emerge in early spring after snowmelt and quickly develop primary rosette shoots [68]. A review from Europe indicates that during the next 5 to 7 years, lateral roots sprout from the main root, and horizontal rhizomes develop from axillary buds on the primary rosette shoot. Plants may reach reproductive stage 5 to 7 years after germination (review by [27]). Growth may be more rapid for clones that maintain rhizome connections, because connections allow for resource sharing between ramets in the sun and ramets in the shade [59]. Mature plants grow "vigorously" but eventually show signs of senescence and transition to a "post reproductive period" (review by [27]).

Some [74,79] consider goutweed plants with all-green foliage more "vigorous", spreading more rapidly than the variegated type. Higher photosynthetic rates in all-green plants may account for differences in growth. In a nursery, photosynthetic rates for variegated and all-green goutweed plants were comparable in full sun. However, in shade, photosynthetic rates for the all-green type were more than 50% higher than rates for the variegated type [79].

Vegetative regeneration: Population expansion of goutweed likely occurs primarily by vegetative means [6,101]

from rhizomes (see [Botanical description](#)). Its vegetative reproduction has been described as "vigorous" [76]. It can produce new ramets from even small segments of rhizomes (review by [13]). Dense shading does not appear to restrict vegetative regeneration [101]. Two reviews recommend digging up goutweed's entire root system to control goutweed [3,15], but provided no details on the root sprouting capabilities of goutweed other than adding that the root system could be "rejuvenated" if not entirely removed [15].

SITE CHARACTERISTICS:

Information about site characteristics where goutweed is invasive in North America is limited (2009). Information on sites where goutweed occurs comes primarily from European studies.

Climate: Goutweed occurs in temperate climates (see [General Distribution](#)). In Europe, mean precipitation on sites where goutweed occurred ranged from 19.5 [70] to 32.8 [26] inches (495-832 mm). Mean annual temperature was typically around 44 °F (7 °C), except where goutweed occurred in central Sweden, where average annual temperatures were as low as 42 °F (5.6 °C) [59].

Elevation: As of this writing (2009) no information is available on goutweed's elevational distribution in North America. Publications from Europe indicate that goutweed occurs at altitudes from 31 feet (10 m) [90] to nearly 3,488 feet (1,063 m) [33,45]. In one study from Sweden, goutweed was most common at altitudes from 1,030 to 1,120 feet (315-340 m) [33].

General habitat and moisture: Available evidence suggests that goutweed prefers moist conditions and may tolerate saturated soils. In the northeastern United States, goutweed is associated with moist sites [28]. In the upper Great Lakes region goutweed occurs on moist, well-drained soils [15]. In Australia, goutweed growth is "most prolific" in moist conditions and semishade (review by [14]). One review indicated that goutweed survives "very wet" conditions [72], and in Sweden, goutweed occurred on a site that was regularly flooded by an adjacent stream [33].

Leuschner and Lenzion [49] investigated microhabitat conditions for various herbaceous species in a beech forest in Germany and speculated that goutweed's occurrence was most influenced by relatively low soil moisture. On sites where goutweed occurred (i.e., open and sheltered valley sites, shallow and steep north-facing slopes) moisture content ranged from 33.2% to 36.4%; moisture content ranged from 25.2% to 28.1% on sites where goutweed was absent (i.e., rapid drying south-facing slopes) [49].

Variable	Valley		North-facing slopes		South-facing slopes	
	open	sheltered	shallow	steep	shallow	steep
Goutweed cover (%)	15-25	15-25	3-5	1-3	0	0
Temperature (°C)	13.1	11.4	12.1	12.7	15.3	16.2
Relative humidity (%)	69.3	89.4	76.5	74.4	64	59.6
Vapor pressure deficit of air (Pa)	527	153	363	385	669	750
Photosynthetic active radiation (μmol/m ² /s)	451	434	305	339	470	508
Soil moisture (volume %)	34.7	36.4	36.1	33.2	28.1	25.2
pH	7.3	7.1	7.2	7.4	7.3	7.3

In North America, goutweed is associated with anthropogenically influenced habitats like roadsides and the sides of buildings [74,76]. In Canada, goutweed has escaped cultivation primarily to roadsides and "waste places" in southwestern British Columbia and from southern Manitoba to Nova Scotia [62,75]. Goutweed occurs in grasslands,

forests, roadsides, "waste places", and gardens in the upper Great Lakes region [15] and in Michigan, it occurs on forest borders [92]. On 1 site in Illinois, it occurred in a shaded ravine [82]. In Connecticut, goutweed occurs in floodplains and on the edges of wildlands (review by [13]). In Vermont it occurs in riparian and upland forests (review by [91]), and in Massachusetts it occurs on uplands, wetlands, and on floodplains (review by [95]). In North Carolina and South Carolina, the all-green type of goutweed occurs on the edges of bogs [71].

Goutweed occurs on similar sites throughout Europe. It occurs in managed or abandoned grasslands [83,84] or in fields where mowing or grazing has occurred [26,65,66]. Its occurrence has been associated with gardens [6]. It occurs in wildlands, especially in open forests, forest edges [39,67,83,88], and riparian areas [83,88].

Substrate: In regions outside North America, goutweed is considered a nitrophilous species ([42,53,83,88], Ellenberg 1979 cited in [22]). Soil pH, however, may influence goutweed's distribution more than nitrogen concentrations [23,90].

Available evidence from Europe indicates that goutweed occurs in soil pH ranging from 3.1 [24] to 9 [94], but several publications indicate it is most commonly found in weakly acidic [23,24,33,61,66] to weakly basic soils ([49,102], Ellenberg and others 1992 cited in [89]). In Sweden, goutweed occurred in a forest on sites with soil pH from 4.0 to 7.0. Over a 30- to 35-year period, goutweed cover increased more rapidly on sites where pH was >6.5 than in more acidic soils [22]. In a greenhouse, goutweed occurred in soil pH ranging from 3.17 to 4.5 but was most frequent on soils in the higher portion of that range (less acidic) [23]. In Britain, goutweed's nitrogen uptake was greatest in soils of pH 7 [3]. Two publications from Europe indicate that goutweed occurs on limestone [49,93].

Information on other substrate characteristics associated with goutweed is patchy. In Belgium, goutweed occurred in a flat, low-lying forest on sandy loam and silty loam. A layer of sandy clay occurred at approximately a 3-foot (1 m) depth and impeded drainage [90]. In Sweden, goutweed occurred in soils covered with a thin layer of litter that persisted from autumn to spring and decomposed by summer. There was no or only a thin layer of humus below the litter layer [21].

SUCCESSIONAL STATUS:

Throughout its range, goutweed prefers partial shade ([18,28,79,88], reviews by [14,15]) but tolerates deep shade ([18,49,76,82], review by [55]) with up to 90% canopy cover [33].

Although goutweed has some attributes of early successional species (e.g., establishes on disturbed sites), available evidence suggests it is not typically associated with early succession. Goutweed has limited regeneration from seed and its [seed dispersal](#) may limit its ability to establish on new sites. In Canada, goutweed does not normally grow in full sun. Photosynthetic tissue of the all-green type may be harmed if exposed to full sunlight; however, tissue on variegated plants may not be affected [79]. One review from Massachusetts indicated that goutweed grows in full sunlight [55] but provided no further details on its growth potential on such sites. In a previously mowed meadow in Poland, goutweed did not establish until year 15 of a 20-year-study even though viable seeds were collected from the soil during previous years of the study. Goutweed established only after the meadow had transitioned to a willow scrub community with a high proportion of sedges (*Carex* spp.) [20]. In Germany, goutweed occurred only on the floor of a deciduous forest and not in a newly vegetated patch of ground with pioneer species [17].

Outside of North America, goutweed occurs in mid- [90,101] to late-successional stages ([77,101], De Keersmaeker and Muys 1995 cited in [89], Pysek 1977 cited in [70]), and based on its affinity for shade, it may occur in similar successional stages in North America. Goutweed's abundance tends to increase over time ([20,24,53], Pysek 1977 cited in [70]), and it may become more abundant in late succession. For example, goutweed was common in a 100- to 130-year-old German beech forest [49] and in Poland, it attained greatest cover on woodland sites in late succession [100].

Verheyen and Hermy [89] speculated that goutweed's occurrence may only be moderately correlated with forest age ($r^2=0.51$). Other factors, such as habitat quality, pH [89], nitrogen availability [24], and distance to an undisturbed population of goutweed [89], may influence the distribution of goutweed more than forest age.

FIRE EFFECTS AND MANAGEMENT

SPECIES: [Aegopodium podagraria](#)

- [FIRE EFFECTS](#)
- [FUELS AND FIRE REGIMES](#)
- [FIRE MANAGEMENT CONSIDERATIONS](#)

FIRE EFFECTS:

- [Immediate fire effect on plant](#)
- [Postfire regeneration strategy](#)
- [Fire adaptations and plant response to fire](#)

Immediate fire effect on plant: As of this writing (2009), no information was available on the immediate effects of fire on goutweed. Goutweed is likely top-killed by fire and it is unknown whether it can sprout from the root crown. Because it is rhizomatous, goutweed may survive fire if its rhizomes and roots are buried deep enough to be protected from lethal heating (see [Botanical description](#) and [Vegetative regeneration](#)). Plants with perennating tissue that is protected below the soil surface may survive fire ([[12](#)], reviews by [[57,96](#)]).

Postfire regeneration strategy [[81](#)]:

Rhizomatous herb, [rhizome](#) in soil
[Secondary colonizer](#) (on- or off-site seed sources)

Fire adaptations and plant response to fire:

- [Fire adaptations](#)
- [Plant response to fire](#)

Fire adaptations: As of this writing (2009), information pertaining to goutweed's fire adaptations was limited to assumptions based on its known biological attributes. Based on its ability to [reproduce vegetatively](#), goutweed may sprout after fire if its rhizomes and roots remain undamaged. Because goutweed does not often reproduce from seed in the wild and its seed is primarily gravity-dispersed (see [Seed dispersal](#)), it is unlikely goutweed would establish on newly burned sites from off-site seed sources. A persistent [seed bank](#) may provide a means for postfire establishment of goutweed; however, goutweed does not tend to establish during early succession (see [Successional Status](#)).

Plant response to fire: As of this writing (2009) no information was available on goutweed's response to fire.

FUELS AND FIRE REGIMES:

- [Fuels](#)
- [Fire regimes](#)

Fuels: As of this writing (2009) no information was available on goutweed's fuel characteristics.

Fire regimes: With one exception, no published information was available at this time (2009) on North American plant communities where goutweed occurs, making it difficult to infer what fire regimes may be associated with

goutweed. On one site in Illinois, goutweed occurred in a shaded ravine with box elder and slippery elm. Fire regimes on this site may be similar to those described for wooded draws and ravines of the Great Plains. Surface or replacement fires may occur every 40 to 95 years, depending on moisture patterns and on the fire regimes of adjacent mixed-grass prairie and shrubland. Because native ungulates tend to concentrate in woody draws and ravines for food and cover, grazing may influence fire regimes and stand regeneration in these communities [48].

FIRE MANAGEMENT CONSIDERATIONS:

Preventing postfire establishment and spread: Although there may be potential for goutweed to establish either vegetatively or by seed after fire (see [Fire adaptations](#)), as of this writing specific information on preventing its postfire establishment and spread was lacking. In general, however, the best way to prevent the spread and establishment of invasive species is through early detection and eradication, careful monitoring and follow-up, and limiting dispersal of invasive plant seed into burned areas. General recommendations for preventing postfire establishment and spread of invasive plants include:

- Incorporate cost of weed prevention and management into fire rehabilitation plans
- Acquire restoration funding
- Include weed prevention education in fire training
- Minimize soil disturbance and vegetation removal during fire suppression and rehabilitation activities
- Minimize the use of retardants that may alter soil nutrient availability, such as those containing nitrogen and phosphorus
- Avoid areas dominated by high priority invasive plants when locating firelines, monitoring camps, staging areas, and helibases
- Clean equipment and vehicles prior to entering burned areas
- Regulate or prevent human and livestock entry into burned areas until desirable site vegetation has recovered sufficiently to resist invasion by undesirable vegetation
- Monitor burned areas and areas of significant disturbance or traffic from management activity
- Detect weeds early and eradicate before vegetative spread and/or seed dispersal
- Eradicate small patches and contain or control large infestations within or adjacent to the burned area
- Reestablish vegetation on bare ground as soon as possible
- Avoid use of fertilizers in postfire rehabilitation and restoration
- Use only certified weed-free seed mixes when revegetation is necessary

For more detailed information on these topics see the following publications: [[5,10,29,86](#)].

Use of prescribed fire as a control agent: As of this writing, no information was available on the use of prescribed fire to manage goutweed.

MANAGEMENT CONSIDERATIONS

SPECIES: [Aegopodium podagraria](#)

- [FEDERAL LEGAL STATUS](#)
- [OTHER STATUS](#)
- [IMPORTANCE TO WILDLIFE AND LIVESTOCK](#)
- [OTHER USES](#)
- [IMPACTS AND CONTROL](#)

FEDERAL LEGAL STATUS:

None

OTHER STATUS:

Information on state-level noxious weed status of plants in the United States is available at [Plants Database](#).

IMPORTANCE TO WILDLIFE AND LIVESTOCK:

As of this writing (2009), little was known about goutweed's importance to wildlife and livestock in North America. The flowers of the Apiaceae family as a whole attract numerous insects with their nectar ([9], review by [103]). In Russia, goutweed is one of the most common plants and a "basic" source of nectar (review by [63]). In Switzerland, goutweed was 1 of only 2 plants out of 11 tested that were considered an "optimal" food source for parasitic wasps that have an important agricultural role [93]. In Sweden, 2 beetle species known to pollinate other plants were found on goutweed during anthesis [19]. In Poland, a patch of goutweed was completely eaten by a slug (*Arion lusitanicus*) [44].

Palatability and/or nutritional value: No information is available on this topic.

Cover value: In the Netherlands, a snail (*Cepaea nemoralis*) was found on goutweed leaves but did not eat them [99].

OTHER USES:

In North America, goutweed has been used as a ground cover (reviews by [13,95]).

Extracts from goutweed's roots have been used worldwide for their purifying and antiinflammatory properties [7]. There is evidence it has been used for treatment of gout in the past [69].

IMPACTS AND CONTROL:

Impacts: Reports on goutweed's impacts in North America are limited and anecdotal in nature. Reviews have described goutweed as an "aggressive" invader in the upper Great Lakes region [15], Vermont [91], and Massachusetts [55]. In New England, goutweed persists in wildlands and is locally abundant (review by [13]). It is considered invasive in northern Illinois [37] and Massachusetts [95]. The most detailed information comes from Vermont, where goutweed threatens forested and open areas and dominates the ground layer in some areas. It is a particular threat to native vegetation in floodplain forests (review by [91]). Reports on goutweed's impacts in Canada vary. Catling [11] considers goutweed to be a high-priority nonnative species in need of control because of its "major impacts" to wildlands in Canada. Others [62,97] consider goutweed a minor threat to native plant communities in Canada; however, White [97] cautioned that it may become locally abundant.

Goutweed invades native ecosystems outside North America (review by [72]). In the United Kingdom, it is considered a nuisance species [16]. A review from Australia describes goutweed as the "worst" of garden weeds. It spreads rapidly under favorable growing conditions; a single plant can cover an area of 10 feet² (3 m²) in 1 year [2].

Control: Regardless of what control method is employed, control of goutweed may be complicated by its rhizomatous nature. Reviews indicate that sprouting occurs if any rhizomes remain [95].

All-green goutweed may be more persistent [74] and spread more rapidly than variegated goutweed (see [Seedling establishment and plant growth](#)), making the all-green type particularly difficult to control [79].

Fire: As of this writing (2009), no information was available on the use of prescribed fire to control this species.

Prevention: It is commonly argued that the most cost-efficient and effective method of managing invasive species is to prevent their establishment and spread by maintaining "healthy" natural communities [51,78] (e.g., avoid road building in wildlands [85]) and by monitoring several times each year [38]. Preventing the establishment and spread of goutweed may be facilitated by preventing its escape from cultivation. One review from the upper Great Lakes region recommended planting goutweed only on sites not adjacent to wildlands and in gardens where root spread can be restricted (e.g., between a sidewalk and a house) (review by [15]).

Cultural control: No information was available as of this writing (2009).

Physical or mechanical control: A couple of reviews recommend hand pulling, raking, and digging followed up by monitoring to control goutweed [2,95]; however, caution must be taken to remove the entire rhizome and root system (reviews by [2,15,95]). Removing flowers before seed set may help control goutweed (reviews by [2,15]). Because goutweed's starch reserves are typically depleted by spring, Meyer [56] speculated that goutweed might be killed if it was prevented from photosynthesizing in the spring. Tree and shrub cutting, root trenching [102], hay making [26], and cattle grazing [65,66] may also reduce goutweed cover, but these methods have been developed for agricultural fields and may not be applicable to wildlands.

Biological control: No information was available as of this writing (2009).

Chemical control: One review from the Great Lakes region indicated that glyphosate could be applied to goutweed's foliage in spring or summer [15], but details on its effectiveness were not provided.

Integrated management: Attempts to combine herbicide with landscape cloth, bark mulch, and hand weeding to control goutweed in a garden were unsuccessful because sprouting occurred from either rhizomes or root fragments left in the soil (review by [13]).

APPENDIX: FIRE REGIME TABLE

SPECIES: *Aegopodium podagraria*

The following table provides fire regime information for the one known plant community in which goutweed may occur. At the time of this writing (2009), no additional information had been reported on goutweed's plant associates in North America, so no further inferences could be made about the types of fire regimes goutweed may tolerate.

Fire regime information on a vegetation community in which goutweed may occur. This information is taken from the [LANDFIRE Rapid Assessment Vegetation Model](#) [48], which was developed by local experts using available literature, local data, and expert opinion. The PDF file linked from the plant community name describes the model and synthesizes the knowledge available on vegetation composition, structure, and dynamics in that community. Cells are blank where information is not available in the Rapid Assessment Vegetation Model.

Northern Great Plains

Vegetation Community (Potential Natural Vegetation Group)	Fire severity*	Fire regime characteristics			
		Percent of fires	Mean interval (years)	Minimum interval (years)	Maximum interval (years)

Northern Plains Woodland

Northern Great Plains wooded draws and ravines	Replacement	38%	45	30	100
	Mixed	18%	94		
	Surface or low	43%	40	10	

*Fire Severities—

Replacement: Any fire that causes greater than 75% top removal of a vegetation-fuel type, resulting in general replacement of existing vegetation; may or may not cause a lethal effect on the plants.

Mixed: Any fire burning more than 5% of an area that does not qualify as a replacement, surface, or low-severity fire; includes mosaic and other fires that are intermediate in effects.

Surface or low: Any fire that causes less than 25% upper layer replacement and/or removal in a vegetation-fuel class but burns 5% or more of the area [35,47].

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