Ribes glandulosum

Skunk Currant

Grossulariaceae

Ribes glandulosum by Peter M. Dziuk, 2012

***Ribes glandulosum* Rare Plant Profile**

New Jersey Department of Environmental Protection
State Parks, Forests & Historic Sites
State Forest Fire Service & Forestry
Office of Natural Lands Management
New Jersey Natural Heritage Program

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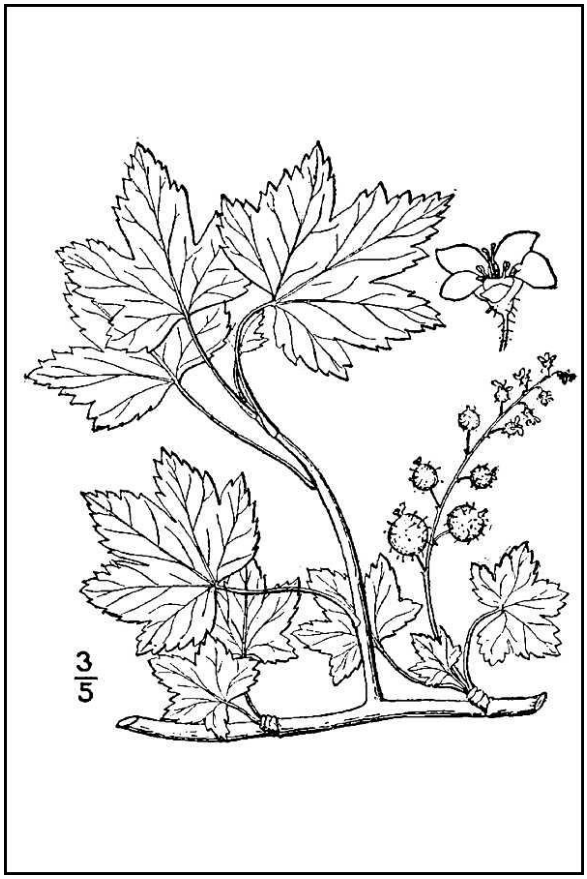
Life History

The genus *Ribes* is generally divided into two groups: Plants with spines on the branches (gooseberries) and those without (currants) (Gleason and Cronquist 1991). *Ribes glandulosum*, which belongs to the latter group, is commonly known as Skunk Currant due to the skunk-like odor the plants produce when the leaves or fruits are bruised (Fernald 1950, Morin 2020). Skunk Currant is a shrub with reclining or sprawling stems that sometimes grow upward at the tips (Britton and Brown 1913, Morin 2020). Stems may root where they touch the ground, spreading the plant vegetatively (Fern 2021, Les 2018, Minnesota Wildflowers undated). The alternate leaves are deeply 5–7 lobed with teeth along the margins and long, slender petioles (Britton and Brown 1913). The flowers of *Ribes glandulosum* are produced in axillary racemes and have five spreading whitish sepals that rise from a saucer-shaped base, surpassing the smaller pink petals (Morin 2020). The pedicels, ovaries and fruits feature dark pink glands on stalks up to one millimeter long (Gleason and Cronquist 1991, Morin 2020). The shrubs flower between May and June, and fruits are produced between May and September (Weakley 2015).

Of the ten other *Ribes* species that may be found in New Jersey, *Ribes glandulosum* is most likely to be confused with *R. lacustre* (Bristly Swamp Currant). *Ribes lacustre*, which also produces a disagreeable scent, is the exception to the gooseberry/currant rule cited above inasmuch as it has spiny stems (Fernald 1950, Gleason and Cronquist 1991). *Ribes glandulosum* may also be distinguished by its upright inflorescences and dark red berries, as the inflorescences of *R. lacustre* spread or droop and its berries are purple to black (GoBotany 2022).

Many species of *Ribes*—including *R. glandulosum*—serve as alternate hosts for the White Pine Blister Rust *Cronartium ribicola*, an introduced fungus that can cause long-term disruption to ecosystems by interfering with natural successional patterns (CABI 2022). The fungus has a two-part life cycle that requires both hosts: Spores produced on pines (*Pinus spp*.) in the spring are transmitted to an alternate host (e.g. *Ribes*). During the growing season, one type of spore develops that spreads the infection to other *Ribes* plants. Late in the season, a second spore type is produced that can infect pines and overwinter in the needles. While the damage to *Ribes* plants is usually considered to be relatively mild, an infection may be lethal to a pine tree if reaches the trunk (Snover-Clift and Jensen-Tracy 2010).

Unfortunately, much of the research that has been done concerning the ecology of *Ribes glandulosum* and other members of the genus was initiated out of a desire to eliminate *Ribes* in order to preserve pine trees (Spalding 1922, Fivaz 1931, Zambino 2010). The attitude that spawned broad eradication efforts during the early part of the twentieth century is best summed up by Fivaz (1931): "*The seeds of wild species of Ribes have escaped thorough investigation largely because these plants were unimportant shrubs of pasture, forest, and waste-land plant associations until their eradication became necessary as a means of preventing serious blister-rust damage to our valuable stands of white pine*." Skunk Currant was considered an important *Cronartium* host in eastern states and provinces, and was one of the earliest species targeted in the eradication program (Zambino 2010). The bias persists: Importation of *Ribes* plants to North America is currently banned, and the cultivation of *Ribes* is regulated in a number of states CABI 2022).



Left: Illustration by Britton and Brown 1913, courtesy USDA NRCS 2022a. Right: Fruits by Peter M. Dziuk (2013).

Floral glands by Peter M. Dziuk (2014).

Flowering plant by Katy Chayka (2014).

Pollinator Dynamics

Most species of *Ribes* are insect-pollinated, although a few species with tubular red flowers are pollinated by hummingbirds (Zambino 2010, Les 2017). Fertilization mechanisms have been best studied in currants that are grown commercially. McGregor (1976) noted the importance of bees to agricultural *Ribes* crops, remarking that inadequate insect pollination reduced the fruit yield. A California study of 14 *Ribes* species found that bees were the primary floral visitors, most species used multiple pollinators, and the primary pollinators of each species often varied between locations (Paget-Seekins 2012). One insect association reported for *Ribes glandulosum* was the Three-banded Lady Beetle (*Coccinella trifasciata*), although the beetle's activity on the plant was not specified (Hilty 2020). *C. trifasciata* is a native ladybug that is known to eat pollen (Shaw 2015). While pollen consumption is common in the Coccinellidae (Lundgren 2009), ladybugs are highly inefficient as pollinators (Bohart and Nye 1960). It seems likely that *Ribes glandulosum* utilizes multiple insects for pollination.

Seed Dispersal

The fruit of *Ribes glandulosum* is a berry that contains about 14 small seeds (Gould et al. 2013). *Ribes* berries are dispersed locally by gravity and over longer distances by frugivorous animals (Les 2017). Stiles (1980) included *Ribes* in a group of woody species with small-seeded summer fruits that typically have low lipid and high sugar content, have a short retention time on the plant, and are mainly dispersed by mammals and birds. The relatively early fruiting period of *Ribes* indicates that birds consuming the fruits are more likely to be residents than fall migrants, and key avian dispersers include Ruffed Grouse (*Bonasa umbellus*) and various thrushes (Turdidae). Seeds dispersed by resident birds are likely to be moved relatively short distances because they remain in the bird's digestive tract for only a brief time (Stiles 1980). Stiles also noted that sweetness in the fruits may have evolved to attract mammals, and that primary mammalian dispersers include the White-footed Mouse (*Peromyscus leucopus*), Red Fox (*Vulpes vulpes*) and Black Bear (*Ursus americana*). Hébert et al. (2008) reported that berries are a major summer food source for bears and that *Ribes spp.* are among their most frequently consumed fruits, and Zambino (2010) added hoofed animals to the list of potential dispersal agents for *Ribes*. Many of the aforementioned dispersers have been inferred from general information about the genus, and cannot be assumed to hold true for *R. glandulosum* as fruit palatability may come into play.

Ribes seeds can remain viable for many years, waiting in the duff or soil for favorable germination conditions. *Ribes spp*., including *R. glandulosum*, may rapidly recolonize an area from banked seeds following a disturbance that opens the canopy (Fivaz 1931, Zambino 2010). Fivaz (1931) found that *Ribes glandulosum* seeds which had been buried beneath 35–70 year old trees germinated following a wind disturbance that tipped over the trees, disturbed the soil, and created a large canopy gap. It has also been reported that seeds of *R. glandulosum*, having been collected and dried for future cultivation, can be stored for long periods while retaining viability (Gould et al. 2013).

Habitat

Ribes glandulosum typically grows in fairly open moist places, often at high elevations. Reported habitats include conifer-dominated swamps, wet woods, spruce-fir forests, montane thickets, krummholz, seeps, boulder fields, clearings, and roadsides at elevations up to 2100 meters (Morin 2020). Fairbrothers and Hough (1973) noted that the species was common in the Allegheny Mountains. The New Jersey population is situated in a bowl-shaped depression on a talus slope (NJNHP 2022).

The shrub is non-mycorrhizal (Malloch and Malloch 1982) and is not associated with any particular forest type but shows a strong preference for a surface deposit of clay rather than till (Légaré et al. 2001). Humbert et al. (2007) studied shade tolerance in understory species and found that *Ribes glandulosum* was most likely to favor a partially open environment. The species is known to rapidly re-colonize openings following canopy disturbances (Fivaz 1931, Les 2017). Despite its affinity for wet places, *R. glandulosum* has a low tolerance for flooding (Tahvonen 2016).

Data from British Columbia was used to calculate the species' microsite preferences such as elevation (6–1890 meters, average = 1047m) and slope gradient (0–115 percent, average = 19%) (Klinkenberg 2020). Klinkenberg also quantified the most favorable moisture regime as 4 (mesic) on a scale of 0 (very xeric) to 8 (hydric) and identified the nutrient regime as C (medium). A more comprehensive description of the soil and moisture regimes is provided by the B. C. Ministry of Forests (1998). In a mesic water regime the primary water source is precipitation in moderate to fine-textured soils or limited seepage in coarse textured soils. Water is removed somewhat slowly relative to the supply, and moisture availability generally reflects climatic input. A medium nutrient regime, in which an average amount of nutrients are available, is associated with sites at which the water pH generally falls between 5.5 and 6.5.

Like many boreal species, *Ribes glandulosum* is fire-tolerant. Scotter (1960) listed the shrub as "*common on burnt areas*" in a report on the flora of northern Saskatchewan. Accounts of the species' response to variations in fire intensity were inconclusive. Ahlgren (1960) found that *R. glandulosum* had a positive response following hard or severe fires, and noted that the species may become dominant in wet areas following severe fire. Data reported by Wang and Kemball (2005) showed that *R. glandulosum* responded better in areas that were scorched or lightly burned than those that had experienced severe burns; however the species was not particularly abundant at any of their study sites. The frequency and cover of *Ribes glandulosum* plants markedly declines after an extended period (26+ years) without disturbance (Les 2017), so it appears that periodic canopy removal is beneficial for the species.

Wetland Indicator Status

Ribes glandulosum is a facultative wetland species, meaning that it usually occurs in wetlands but may occur in nonwetlands (U. S. Army Corps of Engineers 2020).

USDA Plants Code (USDA, NRCS 2022b)

RIGL

Coefficient of Conservatism (Walz et al., 2018)

CoC = 10. Criteria for a value of 9 to 10: Native with a narrow range of ecological tolerances, high fidelity to particular habitat conditions, and sensitive to anthropogenic disturbance (Faber-Langendoen 2018).

Distribution and Range

The global range of *Ribes glandulosum* is restricted to North America (POWO 2022). The map in Figure 1 depicts the extent of the species in the United States and Canada.

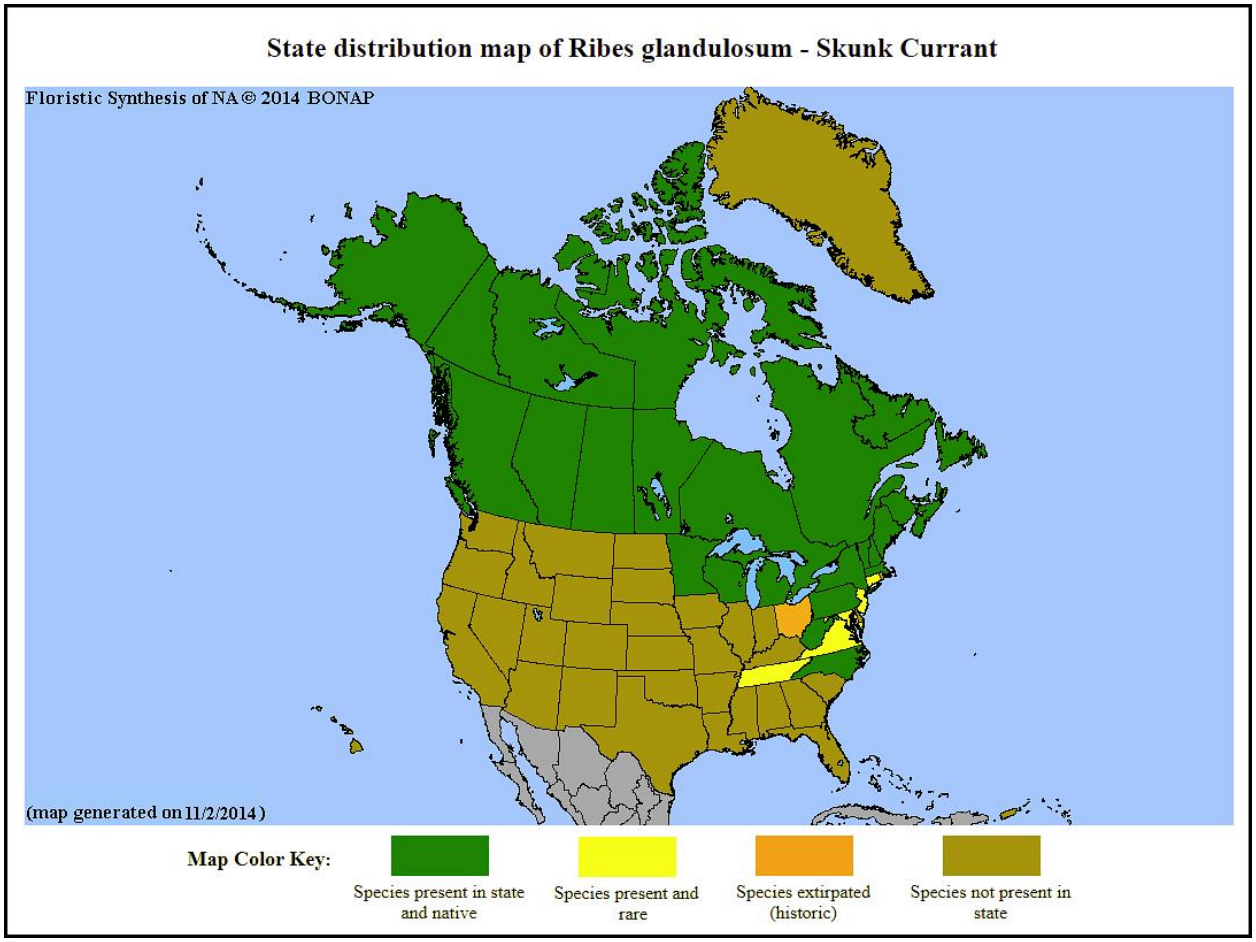


Figure 1. Distribution of R. glandulosum in North America, adapted from BONAP (Kartesz 2015).

The USDA PLANTS Database (2022b) shows records of *Ribes glandulosum* in two New Jersey counties: Bergen and Sussex (Figure 2). The data include historic observations and do not reflect the current distribution of the species.

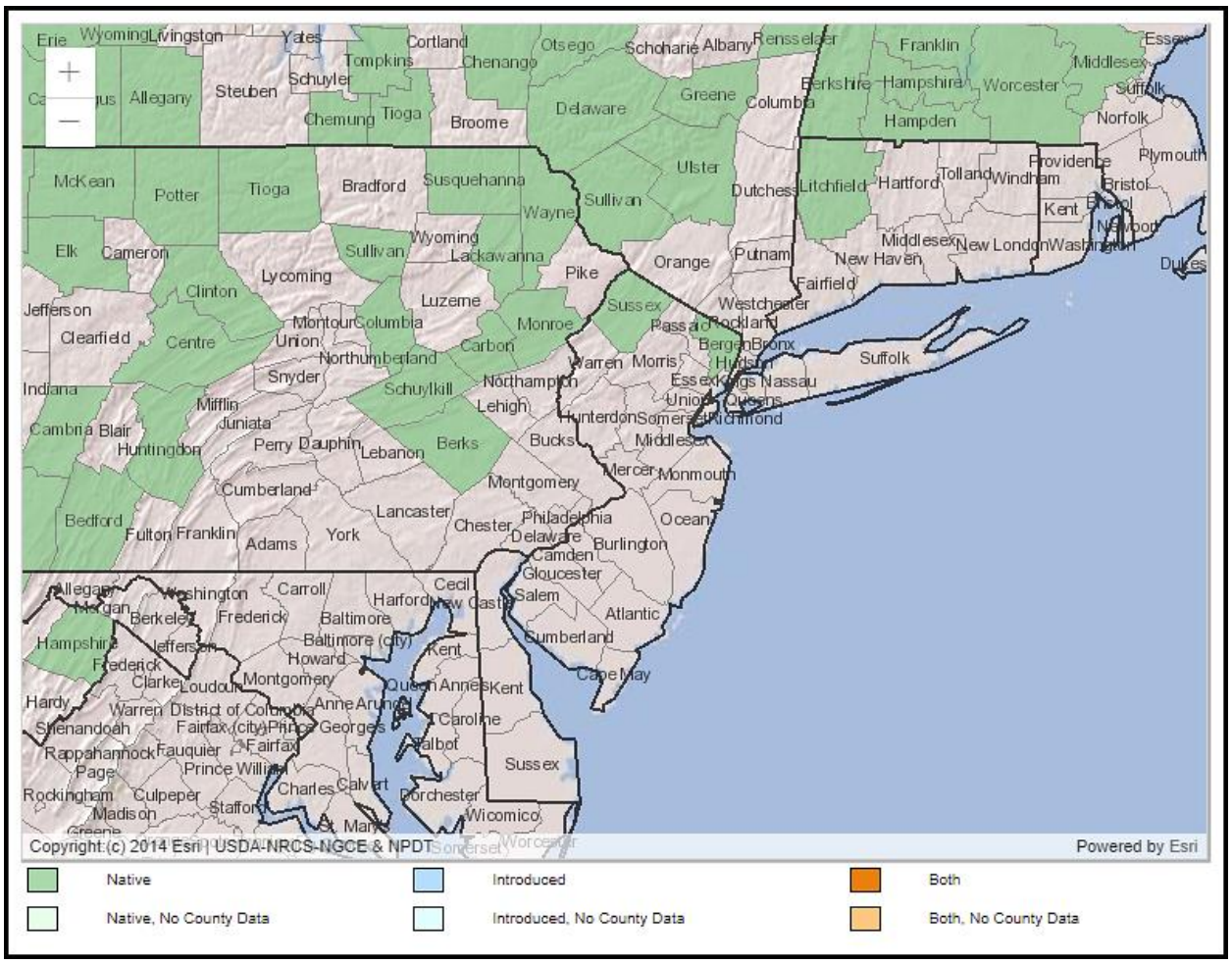


Figure 2. County records of R. glandulosum in New Jersey and vicinity (USDA NRCS 2022b).

Conservation Status

G5 *Ribes glandulosum* is considered globally secure. The G5 rank means the species has a very low risk of extinction or collapse due to a very extensive range, abundant populations or occurrences, and little to no concern from declines or threats (NatureServe 2022). The map below (Figure 3) illustrates the range-wide conservation status of Skunk Currant. In the northern portion of its U. S. range and throughout Canada the species is considered secure or apparently so or is unranked. Toward the southeastern end of its range, *R. glandulosum* is listed as critically imperiled (very high risk of extinction) in one state, imperiled (high risk of extinction) in one state, vulnerable (moderate risk of extinction) in four states, and possibly extirpated in Ohio.

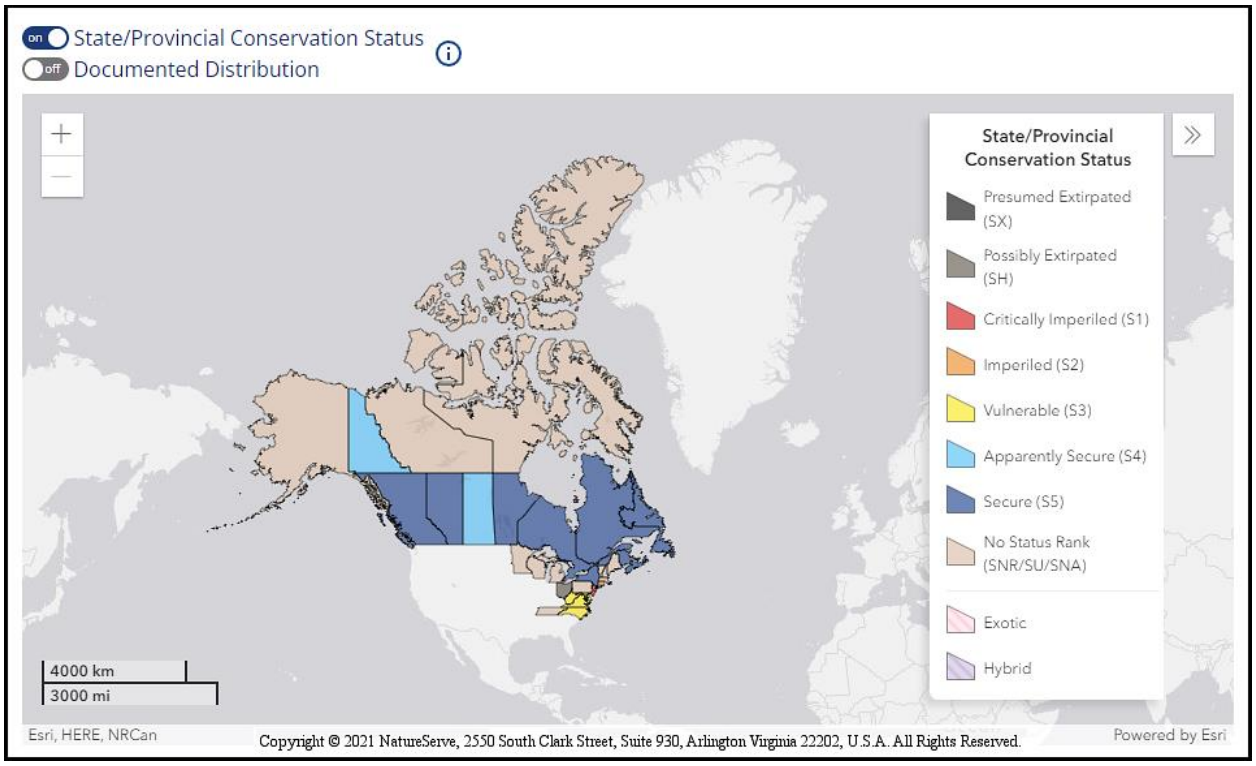


Figure 3. Conservation status of R. glandulosum in North America (NatureServe 2021).

Ribes glandulosum is ranked S1.1 in New Jersey (NJNHP 2022), meaning that it is critically imperiled due to extreme rarity. A species with an S1.1 rank has only ever been documented at a single location in the state. Skunk Currant is also listed as an endangered species (E) in New Jersey, meaning that without intervention it has a high likelihood of extinction in the state. Although the presence of endangered flora may restrict development in certain communities such as wetlands or coastal habitats, being listed does not currently provide broad statewide protection for the plants. Additional regional status codes assigned to the shrub signify that the species is eligible for protection under the jurisdictions of the Highlands Preservation Area (HL) and in the New Jersey Pinelands (LP) (NJNHP 2010).

New Jersey's sole confirmed occurrence of *Ribes glandulosum* is in Sussex County, where it was first collected by J. A. Davis in 1955 and subsequently relocated by Vincent Abraitys in 1964 (Snyder 1984, NJNHP 2022). Viability of the population is presently ranked as 'Good'. The Bergen County report of the species apparently originated with the collector William H. Leggett, who noted that it was a fugitive from Europe sparingly escaped from cultivation (Britton 1889). The record is questionable, as *R. glandulosum* is strictly a North American species (POWO 2022, Morin 2020).

Threats

Although *Ribes glandulosum* plants may decrease in number as the canopy develops, natural successional processes do not appear to threaten the species due to its ability to persist for lengthy periods of time in the seed bank. Individual occurrences could be threatened by

elimination of habitat for development, or by direct damage to plants resulting from other human activities such as understory clearing and off-road vehicle traffic. No specific threats to the New Jersey population have been reported (NJNHP 2022).

While the relationship between Skunk Currant and the White Pine Blister Rust is most often discussed in terms of the shrub's role as an alternate host to a species that threatens trees, *Ribes* may also be a victim. During the growing season, spores from an infected *Ribes* plant may be transported to nearby plants via wind or insects, spreading the fungus throughout a population. The *Cronartium* colonizes the leaves and petioles of *R. glandulosum*, resulting in patches of dead tissue, and heavy infections may lead to premature defoliation (Spalding 1922). Two consecutive years of rust infection has caused the complete loss of plants in several other species of *Ribes* (Zambino 2010). Consequently, an intense *Cronartium* outbreak could pose a significant threat to a small or isolated *Ribes* population.

White Pine Blister Rust on a *Ribes* leaf, courtesy of Robert L. Anderson, USDA Forest Service, Bugwood.org.

Management Summary and Recommendations

Ribes glandulosum is a fairly common boreal species that is less abundant and mainly restricted to cooler mountainous areas at the southern end of its range. The Skunk Currant seems to be somewhat flexible regarding its light, water, and nutrient requirements so it is unclear what has inhibited its success at lower latitudes. A better understanding of the factors that define *R. glandulosum*'s southern boundary (e.g. limited temperature tolerances or a particular faunal association) would aid in predicting the species response to changing climate conditions and in conservation planning for vulnerable populations.

In areas where *R. glandulosum* is at risk, management efforts should focus on the conservation of extant occurrences. Considerations might include land preservation, protection from direct human disturbances, and monitoring of populations for rust impacts.

At sites where *R. glandulosum* is declining due to canopy closure, maintaining patches of open habitat could help the shrub to persist. Use of herbicides to hinder succession should be avoided, however, as the species is particularly sensitive. Sullivan et al. (1998) found that the crown volume of *Ribes glandulosum* plants treated with glyphosate was significantly reduced, and the loss was sustained for the duration of the five-year study. If fire is utilized for *R. glandulosum* habitat maintenance, the burn should be moderated in order to preserve rootstock and buried seed and allow rapid rejuvenation of the target species. At some locations, creation of small gaps by hand thinning may be sufficient to promote regeneration from the seed bank.

Synonyms

The accepted botanical name of the species is *Ribes glandulosum* Grauer. Orthographic variants, synonyms, and common names are listed below (ITIS 2021, USDA 2022b, Hébert et al. 2008, Gould et al. 2013).

Botanical Synonyms	Common Names
Ribes prostratum L'Hér.	Skunk Currant
Ribes resinosum Pursh	Mountain Currant
	Fetid Currant
	Skunk Red Currant
	Skunkberry

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