

# Washington Invasive Ranking System

Washington Natural Heritage Program

## *Rubus bifrons* (Himalayan Blackberry)

Assessed by

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Ecological Impact Rank: **High** (80)

Confidence: **High** (75)

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Management Difficulty Rank: High (74)

Confidence: High (70)

Biological Characteristics of Invasiveness: High (77)

Confidence: High (79)

Concern Related to Distribution and Abundance: High (78)

Confidence: High (80)

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Photo Credit: Erin Burke, 2024. WNHP.

### Ranking Notes

*Rubus armeniacus* is a synonym for *Rubus bifrons* in the Washington Flora Checklist and Flora of North America (Weinmann et al., 2002; Alice et al., 2020). The Fire Effects Information System (Fryer, 2021) and USDA Plants database treat *R. bifrons* and *R. armeniacus* as different species. Washington Flora Checklist nomenclature is followed here and information documented for both *R. armeniacus* and *R. bifrons* in North America are used to inform this ranking document.

*Rubus bifrons* can hybridize with other species of *Rubus*, and hybrid swarms related to this species exist in the Pacific Northwest (Fryer, 2021).

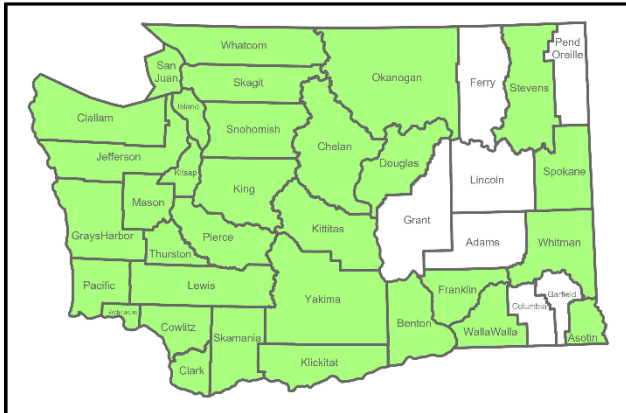
*Rubus bifrons* was assessed by multiple individuals. Range of assessor ratings is provided in parentheses following the final assigned rating.

### Legal Listings

[Washington State Weed Board](#): Class C

[Washington Invasive Species Council](#): No

## Section 1: Distribution and Abundance



**Figure 1.** Distribution of counties where *Rubus bifrons* has been documented in Washington State (CPNWH, 2023; EDDMapS, 2023; iNaturalist Contributors, 2023).

### Q1: Current Range Size in Washington

Rating: High

Confidence: High

*Rubus bifrons* has herbarium records from 32 of 39 counties in Washington state (82%) (CPNWH, 2023; iNaturalist Contributors, 2023). This species is also reported from Okanogan and Pend Oreille Counties (EDDMapS, 2023).

Source: Professional expertise, Herbarium records and other observations

### Q2: Current Trend in Total Range

Rating: Moderate

Confidence: Low

*Rubus bifrons* is reported most frequently in western Washington but is documented throughout the state. This species is least abundant in northeastern Washington (CPNWH, 2023; EDDMapS, 2023; iNaturalist Contributors, 2023). However, *R. bifrons* is increasing along the Snake River.

Source: Professional expertise, Herbarium records and other observations, Model predictions

### Q3: Proportion of Potential Range Currently Unoccupied

Rating: Low

Confidence: High (range Low - High)

*Rubus bifrons* is regarded as the most invasive shrub on the west coast (Fryer, 2021). This species is predicted to increase in abundance and expand its range to all counties in Washington (EDDMapS, 2023), but it is currently documented in only 82% of Washington counties (CPNWH, 2023; iNaturalist Contributors, 2023).

Source: Informal publication, Professional expertise, Herbarium records and other observations, Model predictions

### Q4: Local Range Expansion or Change in Abundance

Rating: Moderate

Confidence: High

*Rubus bifrons* observations have increased locally in the northern part of Puget Sound and are also reported to be increasing in the Snake River Canyon.

Source: Profession expertise

### Q5: Diversity of Ecosystems Invaded

Ecosystem Types: Forest & Woodland, Grassland & Shrubland, Marine Coastal Shore, Emergent Open Wetland, Forested Wetland

Rating: High

Confidence: High

*Rubus bifrons* is considered a facultative wetland species, capable of growing in both wetland and upland environments. While it prefers rich, loamy soils, The FEIS review for this species documented reports from a wide diversity of soil types and is capable of colonizing bare gravel (Fryer, 2021). *Rubus bifrons* is usually found in woodlands, forests, and riparian areas with moist, well-drained soils, in Mediterranean climates. It occurs in Willamette Prairies, where it can form extensive stands of encroaching shrubs along with *Rosa* spp. and *Toxicodendron diversilobum*. Other sources also note this species occurring in estuaries and coastal scrub (Cal-IPC, 2004; Stannard, 2014).

Source: Informal publication, Professional expertise

## Section 2: Biological Characteristics

### Q6: Aggressive Mode of Reproduction

Rating: Yes

Confidence: High

*Rubus bifrons* is a rhizomatous perennial shrub, with short-lived canes and long-lived roots and rhizomes. This species primarily reproduces vegetatively from rhizomes, root crown sprouts, and layering. This includes resprouting from cut stems after mechanical removal attempts. Rhizomes can grow at a depth of 0.5-2 meters and reach 10 meters long. This species grows more rapidly than co-occurring woody vegetation (Fryer, 2021).

*Rubus bifrons* has bisexual flowers and can seed through pollination and apomixis. This species has a mixed mating system, cross-pollination results in larger fruits and more seeds. Seeds are more commonly produced by apomixis and *Rubus bifrons* has relatively low genetic diversity. Pollination syndrome is generalist, but bees, particularly honeybees, are the most common floral visitors to this species. *Rubus bifrons* can produce between 7000 and 13,000 seeds per square meter (Fryer, 2021).

Source: Informal publication, Professional expertise

### Q7: Innate Potential for Long-Distance Dispersal

Rating: Yes

Confidence: High

*Rubus bifrons* seeds are distributed by animals, mammals and birds being the primary dispersal agents, though other animals, including slugs, are also capable of seed dispersal. Both seeds and plant fragments, which can also root and form new populations, are spread long distances by water (Fryer, 2021).

Source: Informal publication, Professional expertise

### Q8: Potential to be Spread by Human Activities

Rating: Yes

Confidence: High

*Rubus bifrons* is native to Eurasia but has established populations on all continents except Antarctica. This

species was introduced to North America for cultivation in the late 1800s; it is a major fruit crop in the Pacific Northwest and continued cultivation contributes to the spread of this species (Fryer, 2021). This species also readily invades areas after anthropogenic disturbances.

Source: Informal Publication, Professional Expertise

### Q9: Allelopathy

Rating: No

Confidence: Moderate

A literature search revealed no information about allelopathy in *Rubus bifrons*.

Source: Professional expertise

### Q10: Competitive for Limiting Abiotic Factors

Rating: Yes

Confidence: High

*Rubus bifrons* is especially competitive for water and nitrogen due to its extensive root system (Fryer, 2021). This species can also store water in its roots (Fryer, 2021). *Rubus bifrons* exhibits phenotypic plasticity: it can adapt leaf size to drought conditions, allowing it to be more water efficient than co-occurring species (Fryer, 2021).

The Fire Effects Information System account describes *R. bifrons* as “semievergreen” because leaves can stay green well into fall, with some green leaves remaining throughout the winter (Fryer, 2021). Cal-IPC refers to this species as “essentially evergreen” (Cal-IPC, 2024). Persistence of leaves is more likely in mild climates (Stannard, 2014), so this species may not be functionally evergreen throughout Washington.

Source: Informal publication, Professional expertise

### Q11: Growth Form

Rating: Yes

Confidence: High

*Rubus bifrons* forms dense stands or thickets, with up to 252 canes per square meter. These thickets crowd

out native vegetation and hinder wildlife movement (Fryer, 2021).

Source: Informal Publication, Professional Expertise

### **Q12: Germination Requirements**

Rating: No

Confidence: Low

*Rubus bifrons* seedlings establish best in open habitats and this species appears to prefer disturbed areas. Sources say it can establish in areas without disturbance, but did not specify what conditions promoted germination of this species in undisturbed habitats (Cal-IPC, 2004; Fryer, 2021).

Source: Informal publication, Professional expertise

### **Q13: Invasiveness of Other Plants in Genus**

Rating: Yes

Confidence: High

*Rubus bifrons* is part of the *Rubus fruticosus* complex of species. All species in this complex are classified as noxious weeds in the U.S. (Fryer, 2021).

Source: Informal Publication, Professional Expertise

### **Q14: Shade Tolerance**

Rating: Moderate

Confidence: Moderate

*Rubus bifrons* is frequently described as shade intolerant (Caplan & Yeakley, 2006). However, in the Pacific Northwest, *R. bifrons* is capable of growing and reproducing in woodland and forest understories.

Research does suggest that this species' growth can be limited in shaded conditions (Caplan & Yeakley, 2006). Seedlings establish best in open habitat, and plants grow more quickly and are better able to produce fruits in sun than in shade. A study in Australia found that this species required at least 45% sunlight for survival (Fryer, 2021).

Source: Published research, Informal publication, Professional expertise

### **Q15: Disturbance Tolerance**

Rating: Yes

Confidence: High

*Rubus bifrons* occurs across successional stages but is most successful in early seral communities and is frequently found on disturbed sites. Fire does not have a negative effect on this species—it may even break seed dormancy and eliminates cover of competing plants, allowing for seedling growth. Roots and rhizomes can be very deep in the soil, potentially insulating this species from even severe fires (Wiggers et al., 2013). *Rubus bifrons* frequently increases in both density and reproduction after fire and other disturbances (Fryer, 2021).

Source: Published Research, Informal Publication, Professional Expertise

### **Q16: Propagule Persistence**

Rating: >5 years

Confidence: Moderate

*Rubus bifrons* seeds exhibit both mechanical and chemical dormancy and usually take two to three years to germinate. Both fire and digestion can break seed dormancy. Freeze-thaw cycles, wet-dry cycles, or scarification by insect or fungi damage can also break dormancy and induce germination for *Rubus bifrons* seeds. This species develops a seed bank, but information on seed longevity in the seed bank is currently lacking (Fryer, 2021).

Source: Informal Publication

### **Q17: Palatability**

Rating: Yes, plant is unpalatable

Confidence: High

Ungulates sometimes browse *Rubus bifrons* leaves, but they do not prefer them, likely due to the large spines. Insects and other invertebrates, including several leafhopper species, do eat the leaves. *Rubus bifrons* is the preferred host for *Dikrella californica* (blackberry leafhopper), which is also an agricultural pest on grapes and roses. (Fryer, 2021). Young shoots of *Rubus bifrons* apparently contain a chemical that



deters *Ariolimax columbianus* from feeding (Wood, 2012).

Source: Published research, Informal publication, Professional expertise

### Section 3: Ecological Impact

#### Q18: Impact on Ecosystem Abiotic Processes

Abiotic Processes: Light availability, Hydrology, Fire, Nutrient dynamics

Rating: Moderate (range Moderate - High)

Confidence: Moderate (range Moderate - High)

Dense thickets and tall canes limit light availability for co-occurring species (Fryer, 2021). Large amounts of leaf litter are found under *Rubus bifrons* thickets, affecting how much bare soil is available for seeds to germinate in, and potentially also changing nutrient dynamics in invaded systems (Caplan & Yeakley, 2006). *Rubus bifrons* litter and plants may not burn well in moist sites, but it is flammable where fuels are sufficient (Fryer, 2021), and it seems likely that high densities of this species could change fire dynamics and post-fire recovery in grasslands, woodlands, and forests. No specific information was found on how long-term or reversible these impacts might be.

Source: Published research, Informal publications, Professional expertise

#### Q19: Impact on Ecosystem Structure

Rating: High (range Moderate - High)

Confidence: High

This species can prevent species like *Pinus ponderosa* or *Quercus garryana* from establishing, potentially preventing succession to woodland or forested ecosystems. Replacement of native species leads to permanent monocultural thickets of *R. bifrons* that can prevent animal movement and reduce the habitat value of meadows and forest openings (Fryer, 2021). In Willamette Prairie habitats, *R. bifrons* is part of a suite of species that convert existing grasslands into shrublands.

Source: Informal publication, Professional expertise

#### Q20: Impact on Ecosystem Composition

Rating: High

Confidence: High

*Rubus bifrons* can alter community structure by replacing native riparian shrubs and thickets, including native *Rubus* species. *Rubus bifrons* forms thick, monotypic stands of impenetrable brush that can reduce species diversity and significantly change the community composition of ecosystems it occurs in (Fryer, 2021). In Willamette Prairie habitats it reduces native species diversity and frequently occurs with other introduced species (including *Jacobaea vulgaris*, *Cytisus scoparius*, and numerous pasture grasses). Where forest understories have been disturbed, monocultural stands of *R. bifrons* can also outcompete diagnostic understory species like *Polystichum munitum*.

Source: Informal publication, Professional expertise

#### Q21: Impact on Particular Native Species

Rating: Low

Confidence: Moderate

*Rubus bifrons* is part of a suite of invasive species that threaten rare butterflies such as the Taylor's Checkerspot that depend on open prairie-oak grasslands and savannas for habitat. *Rubus bifrons* converts grasslands to shrublands and can smother host species important for butterfly larvae (Schultz et al., 2011).

*Rubus bifrons* has many flowers and can flower for several months, potentially competing with native species for pollinators (Shelby & Peterson, 2015). In a study from Ferndale, Washington, *R. bifrons* pollen was the most common heterospecific pollen found on *Sidalcea hendersonii* stigma. Receiving *R. bifrons* pollen did not apparently limit seed set in this species, but this may not be the case for other species (Shelby & Peterson, 2015). *Rubus bifrons* was most commonly visited by honeybees, potentially disrupting or displacing native pollinators, which could also have additional adverse effects on native plant communities (Shelby & Peterson, 2015). On the



other hand, *Rubus bifrons*' showy flowers, generalist pollinator syndrome, and persistence in disturbed areas could potentially be beneficial to native pollinators and increase pollinator visits to neighboring native plants.

Information from California suggests that *R. bifrons* can provide cover for many native animal species, but was also found to be preferred shelter for the invasive black rat, which can have a significant impact on native bird populations (Cal-IPC, 2004; Fryer, 2021).

Source: Published research, Informal publication, Professional expertise

#### **Q22: Observed Ability to Invade Undisturbed Ecosystems**

Rating: Moderate (range Moderate - High)

Confidence: Moderate

*Rubus bifrons* is an aggressive invader, and can establish in late successional habitats, though usually by taking advantage of natural disturbances within those habitats.

Source: Professional expertise

#### **Q23: Observed Ability to Invade Naturally Disturbed Ecosystems**

Rating: Yes

Confidence: High

*Rubus bifrons* is a common invader in naturally disturbed ecosystems like riparian areas, Willamette Prairie, and oak woodlands. This species is also resilient to fire and is capable of increasing in abundance post-fire (Fryer, 2021).

Source: Informal publication, Professional expertise

### **Section 4: Management Difficulty**

#### **Q24: General Management Difficulty**

Rating: Moderate (range Moderate - High)

Confidence: High

The major difficulty in managing *Rubus bifrons* is maintaining control efforts through a long enough

cycle. Management requires a long-term, ecosystem-wide control effort using integrated management techniques. Herbicide and other treatments need to be on a long enough cycle to address the lifespan of the seedbank and other propagules in the soil (R. Johnson, pers. comm. 2024). The most effective control method in non-forested ecosystems is mowing (Fryer, 2021). Rhizomes and root crowns can continue sprouting after several years of treatment, but repeated mowing can eventually exhaust root reserves (Fryer, 2021). Grazing by goats or other animals following mowing may also be helpful (Fryer, 2021). Prescribed fire, alone or accompanied with mowing, does not reduce *Rubus bifrons* abundance, and may increase this species (Fryer, 2021). Mechanical treatment alone may also increase abundance of this species if efforts are not maintained long-term (Fryer, 2021). Herbicides are only effective when combined with other techniques and require multiple follow up treatments (Fryer, 2021). Seed dispersal can result in new populations in treated areas, increasing management difficulty (Fryer, 2021). Climate change is likely to have a positive effect on *Rubus bifrons*, increasing management difficulty.

Source: Informal publication, Professional expertise

#### **Q25: Minimum Time Commitment**

Rating: Moderate

Confidence: High

*Rubus bifrons* occurrences are likely to require long term management, unless they are caught early in their invasion (Fryer, 2021).

Source: Informal publication, Professional expertise

#### **Q26: Impacts of Management on Native Species**

Rating: High (range Low - High)

Confidence: Moderate (range Moderate - High)

Timing of management efforts could potentially affect birds using *Rubus bifrons* as nesting habitat (Astley, 2011). Initial treatments for this species can include mowing, tilling, broadscale herbicide applications or other techniques that have significant collateral damage to co-occurring native species.



*Rubus bifrons* can overtop trees and other plants, and there are no treatments that won't also negatively affect the co-occurring species (R. Johnson, pers. comm. 2024).

Source: Professional expertise, Thesis

### **Q27: Inaccessibility of Invaded Areas**

Rating: Moderate

Confidence: Moderate

*Rubus bifrons* can be found in steep or otherwise difficult to access areas, particularly east of the Cascades.

Source: Professional expertise

### **Q28: Sociopolitical Implications of Management**

Rating: Moderate/Low (range Insignificant-Moderate/Low)

Confidence: Moderate (range Moderate - High)

*Rubus bifrons* is a major crop in the Pacific Northwest and feral fruits are widely used. There may be public objection to herbicide application in some locations. However, this species is also an alternative host for pests and diseases that affect grapevines, and is a significant weed in grass production fields in Oregon (Fryer, 2021).

Source: Informal publication, Professional expertise

### **Additional Comments**

For a more detailed overview of *Rubus bifrons* characteristics, ecology, and management, see the Fire Effects Information System report on *Rubus armeniacus* and *R. bifrons* (Fryer, 2021).

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