

**DRAFT: WRITTEN FINDINGS OF THE
WASHINGTON STATE NOXIOUS WEED CONTROL BOARD**

Scientific Name: *Rosa multiflora* Thunb.

Synonyms: *Rosa multiflora* var. *platyphylla* Thory, *Rosa polyantha* Siebold & Zucc., *Rosa quelpaertensis* H.L.v.

Common Name: multiflora rose, many-flower rose, baby rose, seven-sisters rose, Japanese rose, rambler rose

Family: Rosaceae

Legal Status: Not a listed noxious weed in Washington; on the monitor list.
<https://www.nwcb.wa.gov/noxious-weed-monitor-list>



Images: left, *Rosa multiflora* plant shrub habit; center, *Rosa multiflora* stems growing up tree, left and center images by Leslie J. Mehrhoff, University of Connecticut, Bugwood.org; right, roadside planting, image by Randy Westbrooks, Invasive Plant Control, Inc., Bugwood.org

Description and Variation:

Overall habit:

Multiflora rose is a spreading shrub that can form thickets of dense spiny growth. Plants have arching stems or stems that climb into tree canopies or sprawl along the ground. Leaves are alternate with typically 7 to 9 toothed leaflets and stipules that have fringed margins. Stems have pairs of prickles at leaf nodes that curve downward and various other prickles throughout or sometimes lacking. Plants have clusters of many sweet-scented white flowers, about 1 inch across, that form small reddish hips, about 1/4 inch in diameter.



Images: left, stems examples with prickles, image by James H. Miller, USDA Forest Service, Bugwood.org; center, stems sprouting from roots, image by John M. Randall, The Nature Conservancy, Bugwood.org; right, pair of recurved prickles at leaf nodes, image by Chris Evans, University of Illinois, Bugwood.org

Stems:

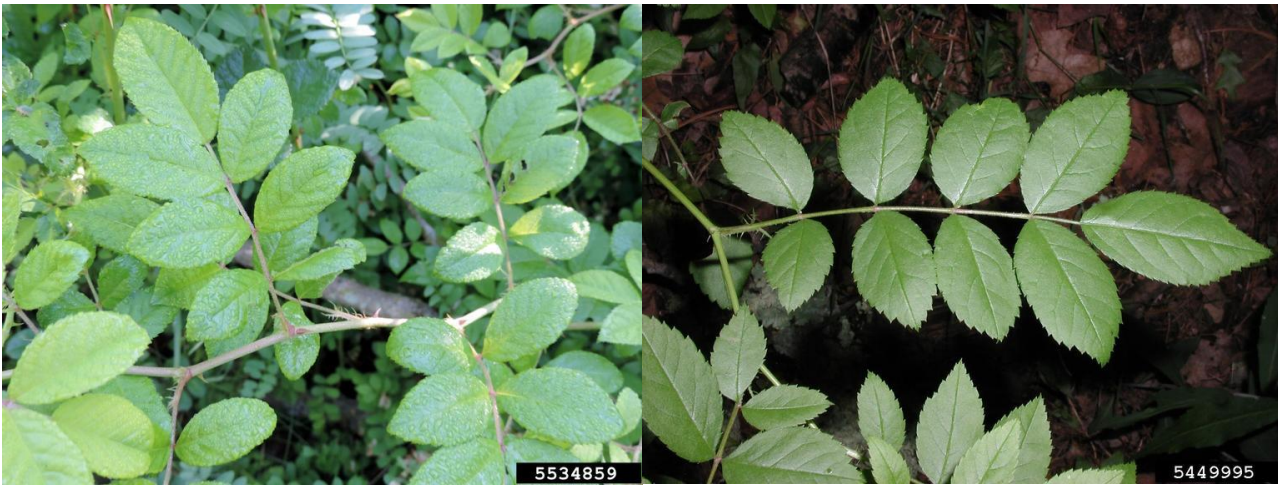
Stems, also called canes, are typically erect and arching, though they can also be climbing up into tree canopies or sprawling along the ground. The stems grow to around 10 to 15 feet tall, though climbing stems can grow 15 to 20 feet. The stems range in color from green to reddish to brown on mature stems. A pair of prickles (commonly called thorns) at the nodes are typically curved (back toward the base of the plant), or rarely straight, 0.16 to 0.24 inches (4 to 6 mm) long by 0.08 to 0.12 inches (2 to 3 mm) wide, often broader at the base and flattened (Yatskievych 2013). Prickles may also occur on the stems between the nodes, though may be few. Plants without prickles can also occur, though are infrequent (NYIS.info 2019).

Leaves:

Leaves are alternately arranged on stems, 2 to 4.7 inches (5 to 12 cm) long, and compound, typically with 7 to 9 leaflets (full range 5 to 11) (Yatskievych 2013). The stipules at the base of the leaf, a key identification trait, are 0.3 to 0.5 inches (8-13 mm) long and have lacinate or fimbriate margins (fringe-like slender lobes on margins), often with gland-tipped teeth (Hitchcock and Cronquist 2018, Yatskievych 2013, Bean et al. 1981). The petiole and rachis have short hairs and/or longer woolly hairs, with or without stalked glands, and small prickles (Lewis et al. 2015, Yatskievych 2013). Leaflets are 0.4 to 1.8 inches (10-45 mm) long by 0.3 to 1 inch (8-25 mm) wide, obovate to elliptic with a cuneate base and an acute or acuminate tip (Yatskievych 2013, Bean et al. 1981). The terminal leaflet is on a stalk (petiolule) that is 0.3 to 0.5 inches (7-13 mm) long (Lewis et al. 2015). Leaf margins are serrated or sometimes doubly-serrated, 12-20 sharp teeth per side, and rarely gland-tipped (Lewis et al. 2015, Yatskievych 2013). The upper leaflet surface is shiny to dull with little to no hair, glabrous, while lower surface is glabrous to pubescent (Yatskievych 2013, DiTomaso and Healy 2007).



Images: leaf stipule examples. Images by left, Chris Evans, University of Illinois, Bugwood.org; right, Rich Old.



Images: multiflora rose compound leaf with stipules, images by: left, Richard Gardner, Bugwood.org; right, by Leslie J. Mehrhoff, University of Connecticut, Bugwood.org.

Flowers:

The inflorescence is a panicle, 4 to 6 inches long and wide, of many flowers, with ranges including 20-100, 5-45+, and 5 to 30+ (Hitchcock and Cronquist 2018, Lewis et al. 2015, Klinkenberg 2012). Panicles occur on lateral branches from second year's stems and at the tips of current year's growth (Yatskievych 2013). Flowers are on stalks that are 0.2 to 0.5 inches (5 to 12 mm) long, have hairs and stalked glands, no prickles, and several to many bracts that are similar to the stipules, but fall off before the hips form (Yatskievych 2013). Flowers are sweet scented and 0.6 to 1.2 inches (1.5 to 3 cm) across (Mathews 1995). The hypanthium is 0.08 to 0.12 inches (2 to 3 mm) long, hairless and sometimes having stalked glands (Yatskievych 2013). Flowers have five sepals, with their margins having slender lobes, becoming reflexed and falling off soon after flowering (Yatskievych 2013). Petals are typically white, though occasionally pink, five per flower, though there can be more in ornamental varieties. Each flower has many stamens and 6 to 11 pistils, with styles fused in a column, though sometimes separating toward the tips, glabrous and protruding (Yatskievych 2013, Bean et al. 1981).



Images: multiflora rose panicle, white flower close up and light pink flower examples; all three images: Leslie J. Mehrhoff, University of Connecticut, Bugwood.org.

Fruit:

Fruit is commonly called a hip and is orange-red to red to brownish red at maturity (Yatskievych 2013, DiTomaso and Healy 2007). Hips are typically 0.20 to 0.28 inches (5-7 mm) long and wide and ovoid to roundish in shape. Hips may or may not have a few stalked glands (Yatskievych 2013). Each hip contains 1 to 11 achenes, with an average of 7 per hip, which are noted as being viable for 10 to 20 years (Lingenfelter and

Curran 2013, Yatskievych 2013). Large plants are estimated to produce up to 500,000 or more seeds each year (Amrine 2002).



Image: left, immature green hips, image by Ohio State Weed Lab , The Ohio State University, Bugwood.org; center, mature hip and achenes, image by Leslie J. Mehrhoff, University of Connecticut, Bugwood.org; right, hip in panicle, image by Leslie J. Mehrhoff, University of Connecticut, Bugwood.org.

Similar species:

There are other native and non-native *Rosa* species growing in Washington State. In addition to multiflora rose, more common non-native species include dog rose (*Rosa canina*) and sweetbriar rose (*Rosa eglanteria*). Rugosa rose (*Rosa rugosa*) is a non-native species, growing outside of where it is planted in a few scattered locations in lowland western Washington (WTU Herbarium 2019). Pavék and Skinner (2013) note that multiflora rose is easily distinguished from the non-native sweetbriar rose (*Rosa eglanteria*), and other rose species here, by having clusters of 25 to 100 white flowers.

Table of select *Rosa* species in Washington:

Name	General	Prickles (thorns)	Leaves	Flowers	Fruit (hips)
multiflora rose, <i>Rosa multiflora</i> http://biology.burke.washington.edu/herbarium/imagecollection/taxon.php?Taxon=Rosa%20multiflora	Non-native; up to 10 to 15 feet tall and wide; stems can climb trees	Prickles typically curved back toward the base of the plant (recurved), or rarely straight, flattened; paired at nodes, variable distribution, some stems without	Stipule margins laciniate to fimbriate (fringe-like slender lobes on margins), often with gland-tipped teeth	Flowers in clusters (panicles), 5 to 45+ (up to 100) flowers; typically white petals, occasionally pink, lobed sepals; flowers 0.6 to 1.2 inches (1.5 to 3 cm) across; flowers sweet scented.	Around 0.25 inch (5 to 7 mm) diameter, red, orange-red; roundish; average of 7 achene per hip; may have a few stalked glands
dog rose, <i>Rosa canina</i> http://biology.burke.washington.edu/herbarium/imagecollection/taxon.php?Taxon=Rosa%20canina	Non-native, Eurasia and N. Africa; up to 9 feet tall	Prickles stout, strongly curved down, unequal in size, flattened	5 to 7 leaflets, serrated margins, no glands either side, smooth; fresh leaves without apple-scent; stipules 0.4 to 0.9 inches long by 0.1 to 0.2 inches wide (10–22 mm by 3–5 mm), stipule margins with gland-tipped hairs	Flowers are solitary or in small clusters, bloom in June to July; lower surface of sepals without glands; sepals often with slender lateral lobes, generally reflexed (curved outward) until shed; flowers pink to white , petals 0.8 to 1 inch	0.6 to 0.8 inch, bright red, elliptic to pear-shaped; ripen September to October, smooth and bright red; sepals eventually fall away; hips remain on plant for several months,

			or without glands	long	becoming black
sweetbriar rose, <i>Rosa rubiginosa</i> (syn. <i>Rosa eglanteria</i>) http://biology.burke.washington.edu/herbarium/imagecollection/taxon.php?Taxon=Rosa%20rubiginosa	Non-native; up to 10 feet tall	Prickles stout, strongly curved down, unequal, flattened	Fresh leaves sweet or apple-scented; leaf undersides with stalked glands, 5 to 7 leaflets having double-serrated margins with gland tipped teeth; underside of leaves with hairs and stalked glands	Flowers solitary or in small clusters; bloom June to July; Sepals with slender lateral lobes and stalked glands; lower surface of sepals glandular, sepals generally erect or spreading back (reflexed), curving backward, until shed; flowers pale to dark pink, 0.6 to 0.8 inches	Fruit 0.4 to 0.6 inches, elliptic to pear-shaped hip; ripen September to October, sepals eventually fall away; hips smooth, bright red; persistent on plant
baldhip rose, <i>Rosa gymnocarpa</i> , http://biology.burke.washington.edu/herbarium/imagecollection/taxon.php?Taxon=Rosa%20gymnocarpa	Native; up to 4 feet tall	Stems covered in straight, weak prickles; sometimes stems without prickles	Leaves of 5 to 9 leaflets; leaf stems and underside of leaf midrib have stalked glands	Flowers usually solitary and small. Petals 0.4 to 0.6 inches long, light to dark pink, broadly notched; pedicels and sepals have stalked glands, deciduous. Sepals unlobed, ascending to reflexed, fall off as fruit matures	Pear-shaped, 0.4 inches; ripens in August to September, bright red.
Nootka rose, <i>Rosa nutkana</i> http://biology.burke.washington.edu/herbarium/imagecollection/taxon.php?Taxon=Rosa%20nutkana	Native	Stout, straight, one pair at leaf base, other thorns absent or smaller	Leaflets 5-7; serrate or doubly serrated.	Flowers generally solitary (rarely 2 or more), flowers typically 1.8 to 2.8 inches (4.5-7 cm) in diameter	Fruit sepal tips often somewhat expanded and leafy; sepals persistent; red to purplish red hip, round to pear-shaped, 0.5 to 0.8 inches (1.2 to 2 cm)
Woods' rose, <i>Rosa woodsii</i> http://biology.burke.washington.edu/herbarium/imagecollection/taxon.php?Taxon=Rosa%20woodsii	Native; 3.3 to 9 feet tall;	Strait or sometimes curved, one or pair at leaf base	Leaflets often coarsely toothed; petioles and leaf rachis finely hairy, the hairs 0.2-0.5mm	Flowers in clusters of 3 to 12 (though can be single or more in clusters); pink to deep rose in color; flowers around 1.2 to 1.4 inches wide (sometimes smaller or up to 2 inches); sepals typically without glands, tapering to long narrow tips, 0.4 to 0.8 inches long by 0.08 0.14 inches wide (1-2 cm x 2-3.5mm)	Hips red, usually without hairs or glands, typically 0.24-0.5 inch by 0.20-0.47 inch (6-13 x 5-12 mm); sepals persistent.

rugosa rose, <i>Rosa rugosa</i> http://biology.burke.washington.edu/herbarium/imagecollection/taxon.php?Taxon=Rosa%20rugosa	Non-native; up to about 8.2 feet tall; young stems tomentose or minutely hairy	Prickles hairy at base; paired prickles at nodes, erect, stout, 0.4 inch long by 0.16 inch wide (10mm x 4mm); internodal prickles similar,	Leaves leathery, rugose, veins impressed on upper surface; stipules 0.8 to 1.2 inches by 0.16 to 0.3 inch wide (20–30 × 4–7 mm), auricles flared, margins entire or unevenly toothed, sessile-glandular	Flowers white or purplish-pink, 2.4 to 3.5 inches (6-9 cm) in diameter; 0.8 to 1.5 inches long by 0.16 to 0.23 inches wide (20–37 × 4–6 mm), margins smooth, rarely lobed	Hips scarlet, 0.7-0.8 inch by 0.8-1.0 inch in size (18-20 by 20-25 mm)
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Table references: (WTU Herbarium 2019, Hitchcock and Cronquist 2018, Pavek and Skinner 2013)

Habitat:

Multiflora rose grows in a wide range of conditions from full sun to partial shade and even in the shade of tree canopies, though it may flower and fruit less in shade (NYIS.info 2019). It grows in acidic soils, surviving in poor to fertile soil, dry to damp conditions, and from 0 to 5,577 feet (0 to 1700 meters) elevation (Lewis et al. 2015).

Multiflora rose occurs in fields, fallow fields, pastures, thickets, streambanks, edges of marshes, ponds and lakes, forest edges and understories, especially near gaps in the tree canopy, roadsides, fencerows, railroads, and other open disturbed areas. Herbarium specimens in Washington record multiflora rose growing in habitats and conditions such as disturbed shorelines, open fields, riparian areas, wet meadows, along trails and in thickets (WTU Herbarium 2019).

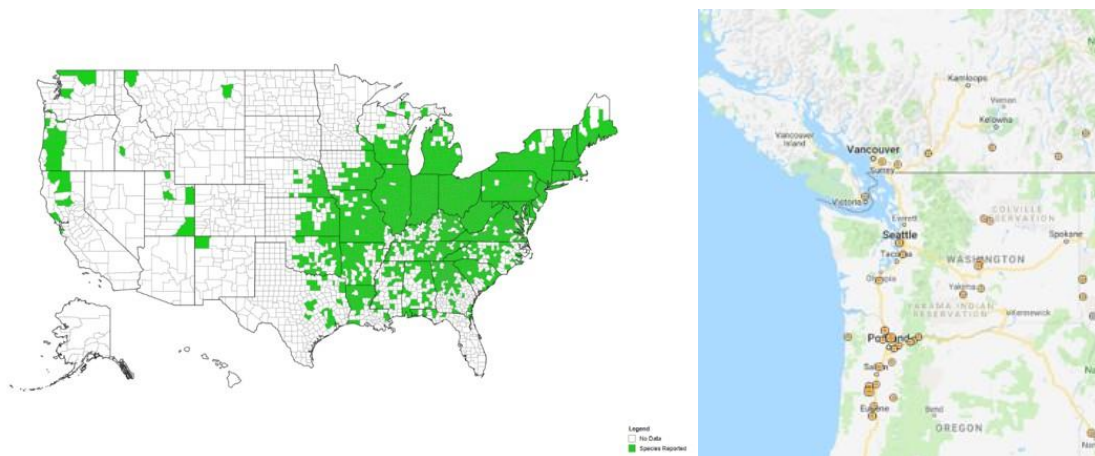
Geographic Distribution:

According to the USDA GRIN database (USDA ARS 2019), *Rosa multiflora* is native to parts of temperate Asia, specifically listing China, Japan, Korea, and Taiwan.

USDA GRIN database (USDA ARS 2019) lists *Rosa multiflora* naturalized in: South Africa, New Zealand, United Kingdom, Canada, and the United States.

In the United States, multiflora rose is abundant from the Great Plains to the east coast, where the species has been historically heavily planted (Amrine 2002). USDA PLANTS database (USDA NRCS 2019), USDA GRIN database (USDA ARS 2019), and EDDMapS (2019) currently document *Rosa multiflora* having a higher number of records in the east and northeast. Specifically records of *Rosa multiflora* in North America are documented in:

- United States: Washington, Oregon, California, Idaho, Montana, Utah, New Mexico, Nebraska, Kansas, Oklahoma, Texas, Louisiana, Arkansas, Missouri, Iowa, Minnesota, Wisconsin, Michigan, Illinois, Indiana, Ohio, Kentucky, Tennessee, Georgia, Alabama, Mississippi, Florida, South Carolina, North Carolina, Virginia, Maryland, Delaware, Pennsylvania, New York, New Jersey, Connecticut, Rhode Island, Massachusetts, Vermont, New Hampshire, and Maine.
- Canada: Ontario, Quebec, New Brunswick, Nova Scotia, and British Columbia.



Images: Left, EDDMapS (2019) county presence distribution data of *Rosa multiflora*; right, map of herbarium records of *Rosa multiflora* in Washington, Oregon, and southern British Columbia (Consortium of Pacific Northwest Herbaria 2019).

History:

Multiflora rose was introduced to North America as an ornamental species and as root stock for ornamental roses in the 1800's, with the exact date varying among sources (for example Lewis et al. 2015, Wyman 1969). Later in the 1930s to 1960s, multiflora rose was widely promoted and provided by the U.S. Soil Conservation Service in the central and eastern U.S. to landowners to grow as a living fence or hedge to protect wildlife areas and farm woodlands from livestock (Lewis et al. 2015, Doll 2006, Steavenson 1946). Multiflora rose was also promoted as a means to prevent soil erosion, to provide wildlife habitat, and even as a roadside crash barrier and to reduce headlight glare, with game districts and conservation departments providing inexpensive or even free root cuttings (Schery 1977, Wyman 1969). Due to its ability to reproduce and spread successfully beyond where it was planted, multiflora rose became a management concern and now infests more than an estimated 45 million acres in the eastern United States (Banasiak and Meiners 2009, Loux et al. 2005).

Listings:

Rosa multiflora is listed as a noxious weed or as a regulated plant in the following states: noxious weed and prohibited invasive plant in Iowa; noxious weed in Missouri; county-option noxious weed in Kansas; nuisance weed under state or local authority and a restricted plant in Wisconsin; prohibited noxious weed in Maine; noxious weed in West Virginia; regulated noxious weed in Alabama; regulated noxious weed in New Hampshire; prohibited invasive plant in Ohio; noxious weed in Pennsylvania; a prohibited noxious weed in Illinois; prohibited noxious weed in Connecticut; regulated in Indiana; prohibited plant in Tennessee; restricted noxious weed in Minnesota; regulated in South Dakota (National Plant Board 2019, South Dakota Legislative Research Council n.d.).

Nearby to Washington:

The Illustrated Flora of British Columbia (Klinkenberg 2012) notes multiflora rose is documented, but rare, in southwestern British Columbia, and at that time was only known on Sapperton Island, growing on mesic slopes in the lowland zone. In 2012, an update to the E-Flora of BC added multiflora rose to its 'Invasive, Noxious and Problem Plants of British Columbia List', as a minor upland invasive species (Klinkenberg 2012). Herbarium records in British Columbia now document escaped plants in at the southern end of Vancouver Island, Mission, west of Hope in the Fraser Valley, Penticton, Castlegar, and Riondel (Consortium of Pacific Northwest Herbaria 2019).

In Oregon, 24 herbarium specimens document escaped plants in the western side of the state with Benton County having the most collections at 8 (Consortium of Pacific Northwest Herbaria 2019). Other Oregon counties with herbarium records of multiflora rose are: Clackamas County: 1 specimen; Columbia County: 2

herbarium specimens; Lane County: 3 herbarium specimens; Linn County: 2 herbarium specimens; Marion County: 3 herbarium specimens; Multnomah County: 3 herbarium specimens; Tillamook County: 1 herbarium specimen (Consortium of PNW Herbaria 2019). Multiflora rose is noted as an invasive species in parts of the state. In Eugene, multiflora rose has been added to its lists of invasive plants that may not be planted or utilized on city property or projects as it is a problem in wetlands of west Eugene and the Fern Ridge Wildlife Area (City of Eugene n.d.). The Native Plant Society of Oregon includes multiflora rose on its Invasive Ornamentals List with the rankings of high and moderate impact. The list notes it was planted widely by the Oregon Department of Transportation and in addition to the Eugene locations, it is also a major problem at the E.E. Wilson Wildlife Area in Benton County (Emerald Chapter NPSO 2008). Multiflora rose is also on Portland's Nuisance Plant List, which prohibits its planting in certain zones of the city and in landscaping areas (City of Portland 2016). It is ranked with a C classification, which is for plants that are known to be invasive, widely distributed and difficult to control once widespread.

California herbaria records document plants in disturbed open sites in primarily northern California, and they are found in the geographic regions of the outer North Coast Ranges, Cascade Range foothills, and high Cascade Range and the Sacramento Valley (Ertter 2014).

Washington:

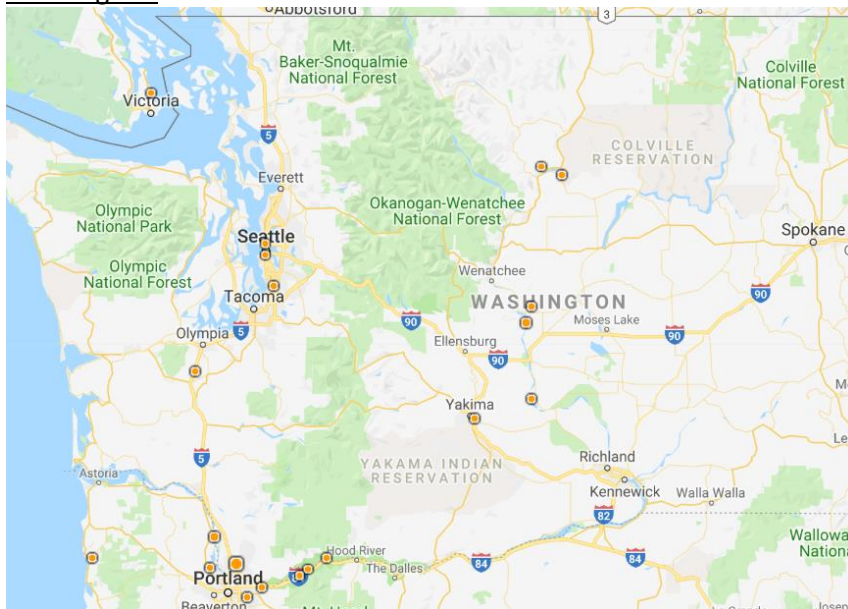


Image: Herbarium records (orange dots) of multiflora rose in Washington State, map by Consortium of PNW Herbaria, 2019.

Multiflora rose is on the Washington State Noxious Weed Control Board's monitor list, which is a non-regulatory list that serves to gather information about a plant's distribution, impacts, or other information that could eventually be used to justify its listing as a future noxious weed. The Flora of the Pacific Northwest (Hitchcock and Cronquist 2018) notes that multiflora rose is increasing on both sides of the Cascade Mountains. At this time, multiflora rose appears to have scattered populations throughout the state, but distribution data may be lacking. Herbarium and database records document *Rosa multiflora* occurring at:

- Clark County: 3 herbarium specimens, 2 are from same location (WTU: 363544, WTU: 368942)
- Douglas County: 2 herbarium specimens (WTU: 368677, WTU: 374951)
- Grant County: 5 herbarium specimens, 2 are from same location (WTU: 176344, WTU: 397810, ID: 137974, WTU: 409667)

- King County: 3 herbarium specimens (WTU: 340052, WTU: 350388, WTU: 417811) and 1 record (WA State Weed Data Viewer)
- Okanogan County: 1 herbarium specimen (WTU: 420890), 3 records of same location over 3 years (EDDMapS 3192290)
- Skamania County: 3 herbarium specimens (WTU: 404626, WTU: 420234, WTU: 420629)
- Thurston County: 1 herbarium specimen (WTU: 408097)
- Wahkiakum County 2 records of possibly same location (EDDMapS 989660)
- Walla Walla: 2 herbarium specimens of same location (ID: 148682)
- Whatcom County 1 record (EDDMapS 7219492)
- Yakima County: 1 herbarium specimen (WTU: 368950)

(Consortium of Pacific Northwest Herbaria 2019, EDDMapS 2019, WSDA 2019).

In an informal survey of county noxious weed board coordinators, where 37 of 39 counties responded:

- 12 counties have multiflora rose
- 13 counties do not have multiflora rose
- 12 were not sure if they have multiflora rose.

Informal survey comments about known populations included:

- Benton County: Most of the populations are in native settings. Plants are more concentrated in areas of additional moisture as annual rainfall is typically too low.
- Kittitas County: Multiflora rose is in quite a few places, escaped into pastures, but it is not really viewed as a concern.
- Pend Oreille County: Two primary infestations, one is roadside revegetation project and the other is in a rural housing development, from multiple plantings with plants slowly spreading.
- Stevens County: has escaped populations scattered in several different areas. They have not found any heavy or dense infestations.
- Thurston County: almost all known plants are escaped, with the exception being old farmsteads. Multiflora rose is fairly common in drier, hotter parts of the county and is estimated to occur in 100 or more isolated patches, primarily near fence rows, right-of-way. It is not currently displacing a significant amount of native or other plants.
- Walla Walla County: multiflora rose may be in several locations in the foothills of the Blue Mountains.
- Island County: there are some escaped plants taking up approximately 200 square feet on a private property that were discovered in 2017.

King County:

King County Noxious Weed Control Board's Education Specialist Sasha Shaw reported that most of the multiflora rose she has observed has been either planted or spreading from existing plants, with some plants potentially introduced by birds. Plants are known to occur in patches along Issaquah Creek, near residences in the Maple Valley area and along Highway 169, and on the Soos Creek Trail. The main impact areas seem to be riparian edges, roadsides, and trails (Sasha Shaw, pers. comm. 2019). Other reports from the King County Noxious Weed Board where multiflora rose has been found include Discovery Park (Seattle) and the Green River Natural Resources Area (Karen Peterson and Tom Erler, pers. comm. 2019).

Nelson Salisbury of EarthCorps reports it being documented by EarthCorps in twelve parks: Cheasty Greenbelt, Woodland Park, Pigeon Point, and West Duwamish/Soundway), Beaver Pond NA, Burk-Gilman Trail, Discovery

Park (2 sites), East Duwamish: south Chicago Street, Littlebrook NA (2 sites), Puget Creek Natural Area, West Duwamish: Riverview (2 sites), and West Seattle Golf Course (2 Sites). He notes it may be more prevalent than what is documented, as there are at least a few other parks that have it, including Ravenna Park, Golden Gardens, and along Thorton Creek (Nelson Salisbury, pers. comm. 2019).

Other observations in King County include:

- About 3-5 sites on private properties, mainly farms (Jacobus Saperstein, King Conservation District, pers. comm. 2019)
- Scattered plants in the Little Si, Mount Si Natural Resource Conservation Area (Henry Mustin, pers. comm. 2019)
- In Kent on the Green River Natural Resources Area, Riverview park, and a few along Military Road, roughly between 200th and 228th (Taj Schade pers. comm. 2019).
- In Issaquah, with removal of one plant near Pickering Barn and one at Lake Sammamish State Park that was removed, though another is still present and beginning to climb a tree (Janet Wall, pers. comm. 2019).
- Multiflora rose has been found growing along Cottage Lake Creek (local landowner, pers. comm. 2019).

The Washington State Department of Transportation planted multiflora rose along some of Washington's roadways in the 1970s and 1980s. It was planted along I-5 south of downtown Seattle (1970s), along I-5 at the main entrance to Fort Lewis, and on I-5/205 in Vancouver (Ray Willard, pers. comm. 2019). Multiflora rose is also present in the I-90 corridor between Bellevue and Issaquah and is escaping into the adjacent open spaces on both sides of the highway, growing up into the trees (David Giblin, pers. comm. 2014).

Growth and Development:

Achenes germinate in the early spring after cold stratification, within two months of soil temperatures being above freezing (SE-EPPC n.d.). In their first one to two years, plants slowly establish, with the following year's growth being rapid (SE-EPPC n.d.). Plants develop numerous stems (canes) that are either sprawling, upright and arching, or climbing into tree canopies. Large plants have living stems on their edges, while the interior stems may be shaded out and die (Schery 1977). It is unknown how long plants may live, but it is thought to be for a long period of time unless killed by people or animals (Doll 1996).

Plants can produce canes with up to as many as 40 to 50 panicles of flowers (Amrine 2002). Flowers typically bloom from April to June and are pollinated by a variety of generalist insects. A study in Iowa observed the most common pollinators visiting flowers were Syrphidae (syrphid flies), *Apis mellifera* (European honey bees), and *Bombus* (bumblebee) species along with a lesser number of other insects (Jesse et al. 2006). Flowers develop into fruits - hips - that mature in color from green to red. Hips are fully mature in the fall and can remain on plants into the winter, with a number being eaten by birds and sometimes animals. Hips that remain unconsumed turn leathery and will eventually drop to the ground (DiTomaso et al. 2013).

Reproduction:

Multiflora rose reproduces by seed as well as vegetatively by layering (Jesse et al. 2010, Szafoni 1991). Seeds are dispersed by birds and other animals such as deer and rodents (Jesse et al. 2010, Loux et al. 2005). Seeds commonly germinate near and under established plants as well as under trees and other locations where birds perch (Schery 1977). A variety of bird species have been observed feeding on multiflora rose hips including robins, starlings and red-winged blackbirds (Amrine 2002). Seeds can pass rapidly through digestive tracts of birds, and its thought this may increase the germination rate, along with the bird feces also acting as a fertilizer to seedlings (Lincoln 1978 and Scott 1965 in Amrine 2002). Seeds can be up to 90% viable when they are not experiencing drought conditions or seed predation (Amrine 2002). Large canes with many panicles can

produce up to 17,500 seeds, with estimates of large shrubs producing 500,000 plus seeds annually. With seeds estimated to be able to survive in the soil for 10 to 20 years, a substantial seedbank develops around mature plants (Loux et al. 2005).

Vegetatively, plants can form dense thickets by spreading roots and layering. Layering occurs when arching stem tips touch the ground and form a shallow root system and then grow new stems (Lingenfelter and Curran 2013).

Economic and Ecological Importance:

Detrimental:

Multiflora rose is an invasive shrub that has infested over 45 million acres in the central and eastern United States (Loux et al. 2005). Due to its extensive range and spread, many states have listed it as a noxious weed and prohibit its sale (see 'Legal Listings section'). Plants are able to rapidly invade and form dense thickets in just a few years (Lingenfelter and Curran 2013). Impenetrable thickets are created by the prickly stems that can exclude native plant species and quality forage plants (Jesse et al. 2010). These thickets can also prevent the passage of wildlife, livestock, and people. Agricultural fields next to hedgerows can also be negatively impacted. One study found corn yields were reduced in rows adjacent to hedges of multiflora rose by as much as 25% (Labisky and Anderson 1965).

Multiflora rose is able to establish and aggressively spread in a wide variety of habitats, including croplands, pastures and native plant communities (Yatskievych 2013). Infestations have been able to take over entire pastures (Barbour and Meade 1980 and Doudrick 1987 in Eckardt and Martin 2001). Yurkonis et al. (2005) studied multiflora rose in abandoned agricultural fields and found it was associated with a decline in species richness as well as colonization rates.

Control costs of multiflora rose can be high for land managers. Costs were estimated to exceed \$40 million dollars for multiflora rose control by West Virginia farmers from 1981 to 1982, and similar costs were projected for many eastern states that have large infestations (Williams and Hacker 1982 in Amrine 2002). In the central and eastern US where multiflora rose has become a problem on agricultural lands, a number of states have established cost-share programs to help with the financial burden of controlling infestations (Eckardt and Martin 2001). Mature plants can create a substantial seedbank resulting in the need for long-term control and monitoring.

Multiflora rose can also cause physical injury. The prickles on the stems can be hazardous to people as well as animals, tearing skin and clothing (Kurtz and Hansen 2013).

While plants can provide wildlife habitat, they also provide a home for pests such as rats (Popay 2013).

Beneficial:

Multiflora rose was introduced and promoted throughout much of the United States as a soil stabilizer, a living fence or natural hedgerow, and as habitat for wildlife. It was also planted along roadsides and in highway medians to serve as a crash barrier and to prevent headlight glare from oncoming cars (Schery 1977). Multiflora rose is generally not promoted or planted anymore for these purposes due to how readily it spreads. Though once used as an ornamental plant and rootstock, multiflora rose is typically no longer sold or used as a rootstock in favor of other species (Doudrick et al. 1986 in Eckardt and Martin 2001).

Multiflora rose hips provide a food source for birds and wildlife, especially in winter months when food sources may be scarce. Animals such as rabbits, deer, mice, chipmunks; and birds such as cedar waxwings, robins, mockingbirds, grouse and pheasants feed on the rose hips (Doll 2006, Schery 1977).

The hips are also used for tea as a source of vitamin C. Be aware however that there is a layer of hairs around the achenes that need to be cleaned off, otherwise they can cause mouth and digestive tract irritation (Amrine 2002, Plants for a Future n.d.). Beside other medicinal uses, the achenes are also used as a purgative in traditional Japanese medicine (Lewis et al. 2015).

Control:

Loux et al. (2005) point out that there are two important parts of multiflora rose control: the destruction of the existing plants, and the annual monitoring and control of seedlings as they germinate.

Make sure to wear protective clothing and thick gloves when working with multiflora rose to avoid injury from the prickles as much as possible.

When possible, carry out control methods when pollinators are not active on plants. Also, make sure to clean shoes, clothing, and equipment when leaving infestations to prevent spreading seeds to new locations.

Manual and Mechanical Control:

Seedlings and young plants can be hand-pulled or dug out. Note that after the first one or two years, plants will have to be dug out as roots will be established and pulling may just break off the stems, leaving the roots in the soil to resprout. Smaller plants may also be removed from the soil with a 'weed wrench' type tool when the soil is moist. Make sure to dig up roots that break off and are left in the soil to prevent resprouting.

If conditions allow, repeated mowing of plants, 3 to 6 times per season, for typically 2 to 4 years can provide successful control (Lingenfelter and Curran 2013, Szafoni 1991). This method will eventually drain the plant of its resources and kill the plant. This repeated mowing method can be time consuming and may not be possible to employ on steep hillsides or other types of terrain. A single cutting or mowing will not kill multiflora rose, as it is able to resprout from the roots. Repeated cutting of the plants, with loppers, saws or other tools, is preferred over mowing in high quality habitats to reduce damage to native plant communities (Szafoni 1991).

Digging or excavating plants from the soil is also an effective way to control plants. Hand digging with a shovel or Pulaski may only be possible in controlling small plants. For larger plants use a tractor with a chain, a front-end loader, a backhoe, or a bulldozer, making sure to remove the roots (Lingenfelter and Curran 2013). If all the roots with shoot buds aren't removed, make sure to follow up with further control work and continue to monitor the area for resprouts and seedlings.

Where topography allows, repeated cultivated will also control multiflora rose (DiTomaso et al. 2013).

Cultural Control:

Burning alone is not thought to be an effective control option for multiflora rose, and the roots will likely resprout (DiTomaso et al. 2013). Burning may be used for removing dead brush; just make sure to follow up with additional management as roots left in the ground can resprout (Loux et al. 2005). Before burning plants, make sure to check for any local fire regulations or restrictions.

DiTomaso et al. (2013) also note that planting competitive grasses and other plants may slow the establishment of new plants but will not likely effect established shrubs and their spread.

Biological Control:

There are no approved biological control agents for multiflora rose in Washington State.



Image: Multiflora rose foliar herbicide application. Image by Nancy Dagley, USDI National Park Service, Bugwood.org.

Chemical Control:

There are many herbicide options that can be used to control multiflora rose, typically applied as a foliar spray, cut stem treatment, or a basal bark treatment. Currently, multiflora rose is not included in The Pacific Northwest Weed Management Handbook, but check back as this resource is continually updated:

<https://pnwhandbooks.org/>. For questions about specific herbicide use, please contact your county noxious weed control board.

Weed Control in Natural Areas in the Western United States (DiTomaso et al. 2013) provides helpful herbicide recommends and advice. Remember to carefully read and follow the herbicide label. In general, use herbicide control in combination with other control methods to reduce usage when possible. When using herbicide, treat plants when pollinators are not present or are the least active.

Monitor plants to make sure all have been killed, and follow up with additional control methods where plants are still living. After plants have died, mow down or burn the remaining dead stems to provide access to the site for wildlife or livestock (DiTomaso et al. 2013). This will also allow better access to control any seedlings that come up the following years. Make sure to check local restrictions and regulations before burning.

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