

**WRITTEN FINDINGS OF THE  
DRAFT WASHINGTON STATE NOXIOUS WEED CONTROL BOARD  
Proposed noxious weed for 2016**

Scientific Name: *Crataegus monogyna* Jacq.

Synonyms: *Crataegus granatensis* Boiss.; *Crataegus oxyacantha* var. *praecox* hort.ex Loudon; *Crataegus apiifolia* Med.; *Crataegus curvisepala* auct. Non Lindm.; *Crataegus dissecta* Bork.; *Crataegus oxyacantha* auct.non L.; *Crataegus oxyacantha* L. var. *monogyna* (Jacq.) Wahlenb.; *Mespilus monogyna* (Jacq.) All.; *Oxyacantha apiifolia* (Med.) Roem.

Common Name: English hawthorn, common hawthorn, red hawthorn, one-seed hawthorn; Neapolitan medlar; whitethorn

Family: Rosaceae

Legal Status: proposed Class C noxious weed



Images: left, *Crataegus monogyna* in flower, image by Robert Vidéki, Doronicum Kft., Bugwood.org; center, lobed leaf with toothed edges; right, branches with leaves and mature fruit, center and right images by Robert Vidéki, Doronicum Kft., Bugwood.org.

Description and Variation:

Overall habit:

*Crataegus monogyna* is a long-lived, deciduous, small tree to large shrub. Its branches have sharp thorns and the leaves are deeply lobed. White flowers, which can have a pink tint, bloom in May and develop red fruits in the fall. *Crataegus monogyna* has no notable fall color like some eastern North American species (Jacobson 2008).

Roots:

*Crataegus monogyna* has deep and spreading roots, its crown and upper roots are able to sucker when trees are injured (DiTomaso and Healy 2007).

Stems:



Image: *Crataegus monogyna* stem in winter showing thorn-tipped branches, image by Ben Legler, 2006.

*Crataegus monogyna* grows as a large shrub to small tree, 6.6 to 32.8 feet (2 to 10m) tall (Phipps 1998). Generally, plants have a single trunk (Phipps 1998). The bark on older stems is plated while the younger stems have smooth, often reddish bark (Phipps 1998).

The twigs are glabrous or hairy and often thorn-tipped; thorns are straight, 0.4 to 1.0 inches (1 to 2.5 cm) long and at least some of them indeterminate, growing out into lateral twigs (DiTomaso and Healy 2007, Phipps 1998).

#### Leaves:

Leaves are deciduous, alternately arranged and closely clustered on short shoots that are 1.2 to 2.0 inches (3 to 5 cm) long (Phipps 2013). Leaf petioles are 0.4 to 1.6 inches (1 to 4 cm) long (Phipps 1998). Stipules are 1 to 16 mm long, hairy or glabrous, and have margins that are toothed or smooth (DiTomaso and Healy 2007). Leaves are variable in shape and are mostly ovate (egg-shaped) to triangular in outline (DiTomaso and Healy 2007). Pinnately-lobed with 3 to 7 deep, sharp, lobes, leaves are 0.4 to 2.6 inches (1 to 6.5 cm) long and wide, leathery in texture, and are glabrous or hairy (DiTomaso and Healy 2007). Leaf edges are toothed, mainly near lobe tips (Phipps 1998). Leaf veins extend to the sinuses (of the lobes) (Phipps 1998). The leaves that are on the short shoots where flowers occur are typically smaller than leaves on the longer, vegetative stems (DiTomaso and Healy 2007).

#### Flowers:

The inflorescence is a dense, flat-topped cluster (panicle) on a short, leafy shoot (Phipps 2013, DiTomaso and Healy 2007). Each inflorescence has 10 to 20 flowers on glabrous to pubescent pedicels (Phipps 1998). Flowers are 0.51 to 0.63 inches (13 to 16 mm) in diameter and have a glabrous to tomentose hypanthium (Phipps 1998). Flowers have 5 sepals that are triangular with smooth margins and 5 white petals that age to pinkish (DiTomaso and Healy 2007). Each flower has 5 to 25 stamens with pink-purple anthers, an inferior ovary, and 1 style (DiTomaso and Healy 2007).



Images: left, *Crataegus monogyna* flower clusters in bloom, image by Robert Vidéki, Doronicum Kft., Bugwood.org; right, close-up of blooming flowers with pink-purple anthers, image by Sander van der Wel, licensed under the Creative Commons Attribution-Share Alike 2.0 Generic license.



Image: left, *Crataegus monogyna* mature fruit clusters, image by Ben Legler, 2006; right, nutlet (pyrene) of *C. monogyna*, image by Steve Hurst, hosted by the USDA-NRCS PLANTS Database.

#### Fruit:

The fruit is a drupe-like pome, elliptic to spherical in shape, 0.24 to 0.47 inches (6 to 12 mm) long by 0.20 to 0.39 inches (5 to 10 mm) in diameter (Phipps 2013, DiTomaso and Healy 2007). Fruits are bright to deep red and have persistent reflexed sepals on their tips (DiTomaso and Healy 2007). A distinctive feature for this



species is the 1 nutlet (sometimes 2) that is typically found in each fruit. The brown nutlet is a stony layer (endocarp) encapsulating one seed each, typically 0.16 to 0.35 inches (4 to 9 mm) long (DiTomaso and Healy 2007).

#### Similar species:

The native black hawthorn (Douglas's hawthorn), *Crataegus douglasii*, is in the same genus but has characteristics to distinguish it from *Crataegus monogyna*. *Crataegus douglasii*, which occurs all over Washington, has weakly lobed leaves (not prominently lobed), flowers with 5 styles (not 1 style), and blackish fruits (not bright red).



Images: left maturing and mature fruit of *Crataegus douglasii*, image by Ben Legler 2004; right, *Crataegus monogyna* 'Crimson Cloud', example of another cultivar of *C. monogyna*, image by Famartin [Creative Commons Attribution-Share Alike 3.0 Unported](#) license

*Crataegus monogyna* and *Crataegus douglasii* are able to hybridize, which was first documented in western Oregon by Love and Feigen (1978). Hybridizing populations tend to have characteristics that are similar to or are intermediate between the parent plants including purple-black fruit, flowers with 2 to 3 styles, and a wide range of leaf blade shapes (Love and Feigen 1978).

A few cultivars have been available in the trade besides the species, but generally their growth forms or flower colors distinguish it from the species. These cultivars include *Crataegus monogyna* 'Flexulosa' (syn. 'Tortuosa'), cultivar of *C. monogyna* that has twisted, corkscrew branches and white flowers; and *Crataegus monogyna* 'Stricta' a form that has upright growth, a narrow habit, and is without thorns (Oregon State University n.d.).

#### Habitat:

*Crataegus monogyna* grows in full sun but can also tolerate shade. It grows in lowland areas on many soil types, growing best in moist soil or in areas that receive over 60 cm of precipitation (DiTomaso and Healy 2007, GOERT 2002). Established trees are able to survive moderate drought conditions (DiTomaso and Healy 2007). It grows in a variety of habitats including disturbed areas, gardens, forest and woodland understories, riparian areas, grassland, abandoned fields, pastures, oak woodlands, forest clearings and edges (DiTomaso and Healy 2007, Sigg and Alverson 2000).

#### Geographic Distribution:

According to the USDA GRIN database, (USDA ARS 2015), *Crataegus monogyna* is native to parts of Asia, Europe, and northern Africa specifically:

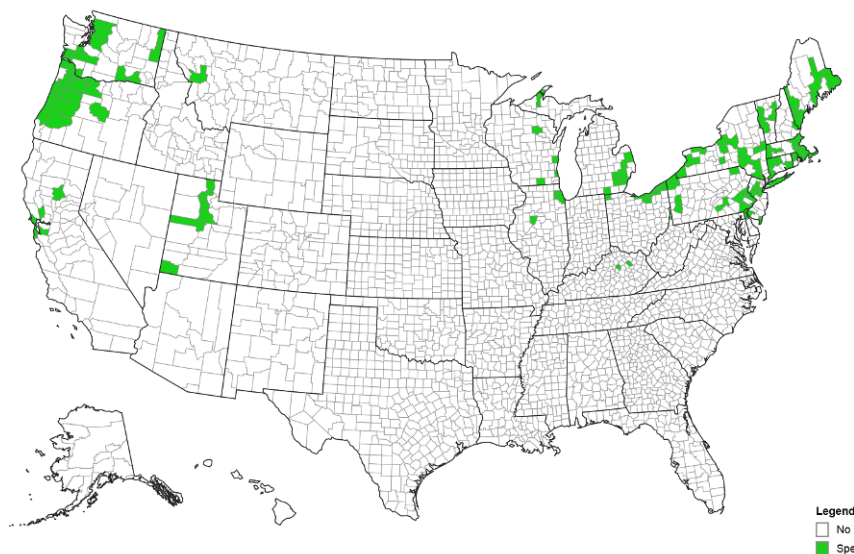
- Northern Africa: Algeria, Morocco, Tunisia
- Asia: Cyprus, Egypt, Iran, Iraq, Israel, Lebanon, Syria, Turkey, Georgia, Russian Federation (Ciscaucasia)

- Europe: Denmark, Finland, Ireland, Norway, Sweden, United Kingdom, Austria, Belgium, Czech Republic, Germany, Hungary, Netherlands, Poland, Slovakia, Switzerland, Belarus, Estonia, Lithuania, Ukraine, Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Greece, Italy, Montenegro, Romania, Slovenia, France, Portugal, Spain

Currently, USDA GRIN database (USDA ARS 2015) lists *Crataegus monogyna* naturalized in:

- Africa: South Africa
- Australia
- New Zealand
- North America: western North America

*Crataegus monogyna* was introduced here in the 1800s as a garden ornamental (Sigg and Alverson 2000). In the Pacific Northwest, it is commonly found west of the Cascade Mountains in Washington and Oregon, less commonly in southeastern Washington, and scattered locations in other parts of the U.S. with wider distribution in eastern North America (WTU 2015). In Oregon, it is an invader on prairies and deciduous woodlands in the Willamette Valley, known there for over 100 years (Sigg and Alverson 2000). It also may have been introduced and survived as root stock for scion types that died (Oregon State University n.d.).



Map: County presence/absence map of *Crataegus monogyna* in the United States, map by EDDMapS 2015.

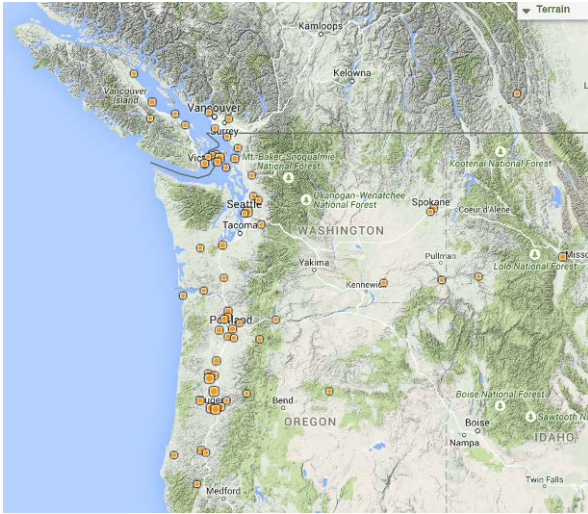
#### Listings:

*Crataegus monogyna* is listed as 'limited' by the California Invasive Plant Council and is not listed as a noxious weed in any state (National Plant Board 2015).

#### Washington:

The first *Crataegus monogyna* herbarium specimen in Washington is from Wahkiakum County, along roadsides by the Alohachan River in 1927 (WS 69043) (WTU 2015). Other early herbarium records in Washington State include a collection in Spokane County on gravelly soil in 1932 (WTU 23057), a collection from Thurston County in 1936 (WTU 82120), a collection from Clallam County on Tivoli Island in 1951 (PSM03421), a collection from San Juan County on San Juan Island in 1975 (WTU 263251), a collection from King County in 1975 (WTU 328460), a collection from Chelan County on a gravelly flat in 1977 (WWB 20238), a collection from King County in 1977 (WTU 381721) in 1981 (SRP 14545), a collection from Snohomish County in 1986 where it was suspected of horse toxicity (WS 301166), and a collection from Benton County in 1991 (WS 316745). There are

collections from eastern and western Washington but there is a larger number of collections from western Washington (Consortium of PNW Herbaria 2015).



So far as it has been recorded, the largest *Crataegus monogyna*, measuring 69 feet in 2005, is planted in Volunteer Park in Seattle, Washington (Jacobson 2008).

San Juan Noxious Weed Control Board (2015) reports that in San Juan County, *Crataegus monogyna* infests large areas of prime agricultural land on the major islands, and is especially problematic on the south side of San Juan Island. There, local farmers and ranchers have been asking to have this species listed since the inception of the county's noxious weed control program in 1996.

Maps: WTU map of counties with orange circles indicating collections of *Crataegus monogyna* (Consortium of PNW Herbaria 2015).

#### Growth and Development:

*Crataegus monogyna* grows from seed, germinating in the spring, and has rapid development its first 15 years (GOERT 2012). Seedlings have oblong-elliptic cotyledons that are 0.4 to 0.6 inches (1 to 1.5 cm) long, with a rounded tip and wedge-shaped base (DiTomaso and Healy 2007). Most of the plant's vegetative growth occurs in the spring and early summer, with an average of 1 to 2 feet (Sigg and Alverson 2000). Leaves are deciduous and typically emerge in March or April (GOERT 2012). Plants growing in shade (understories) will lose lower branches and be tree-like in habit, and those growing in the open will have branches to the ground (Sigg and Alverson 2000). Flowers bloom in the spring, generally April to June (WTU). The flowers are self-incompatible and are pollinated by insects to form fruit (DiTomaso and Healy 2007). Fruits ripen in the fall (September and October) and typically remain on the plant into the winter if uneaten (Sallabanks 1992). Fruit production begins when plants are around 10 years old (DiTomaso and Healy 2007). Plants have long lives, living 70 up to 250 years (DiTomaso and Healy 2007, GOERT 2002).





Image: *Crataegus monogyna* fall color, image by Tom DeGomez, University of Arizona, Bugwood.org; right, *C. monogyna* growing in a grassland with branches extending to the ground, image by Sannse, file is licensed under the Creative Commons Attribution-Share Alike 3.0 Unported license.

#### Reproduction:

*Crataegus monogyna* reproduces by seed. Plants produce many fruits, with one estimate from an Oregon study of 2,721 fruits per plant in one season (Sigg and Alverson 2000). Fruit drops to the soil beneath the tree and it also dispersed by animals, primarily by fruit-eating birds (Sallabanks 1993, DiTomaso and Healy 2007). Sallabanks (1992) found the American robin (*Turdus migratorius*) to be the only bird dispersal agent in a western Oregon study. Over the two years of the study, the American robin consumed 24% to 48% of *C. monogyna*'s fruit and actually flew away with around 14% to 29% of the fruit crop (Sallabanks 1992). Also, the American robin has been found to prefer *C. monogyna* fruit over native *Crataegus* species when they are growing together (Sallabanks 1992 in Sallabanks 1992). Seeds that are ingested and pass through birds have an increased probability of seed germination, though ingestion is not required for germination (DiTomaso and Healy 2007). Seedlings are often found under where birds perch such as under trees, fence posts, forest understories (Sigg and Alverson 2000). Seeds are also dispersed with water, soil movement, and human activities (DiTomaso and Healy 2007).

#### Economic Importance:

##### Detrimental:

Hybridization can occur between *Crataegus monogyna* and the native hawthorn, *Crataegus douglasii*, altering the gene pool of the native species and creating competition for resources and pollinators. When growing with *C. douglasii*, the American robin was found to prefer *C. monogyna*'s seed to the native species, thus competing with the native for seed dispersers (Sallabanks 1992 in Sallabanks 1992). The robin's preference for *C. monogyna* over the native *C. douglasii* was determined by three traits that favored *C. monogyna*--fruit crop size, mean fruit size, and mean fruit pulp to nutlet (pyrene) ratio (Sallabanks 1993).

Plants can form thickets and block animal movement (Sigg and Alverson 2000). In fact, this plant was used historically used in hedgerows to contain livestock. Its dense growth can alter the structure of forest understories (Sigg and Alverson 2000). In Oregon's Willamette Valley, a nature preserve was abandoned because the *Crataegus monogyna* infestation was beyond control with available resources (Sigg and Alverson 2000). *Crataegus monogyna* can alter open grasslands by creating shrub and tree layers (GOERT 2002). It is invading pastures and prime agronomic areas in San Juan County (San Juan County NWCB 2015). In the Garry oak ecosystems on Vancouver Island, it is invasive and is replacing open areas with dense shrub growth

(GOERT 2002). Its dense growth can that excludes understory plants by greatly reducing the light that reaches the ground (Richardson 2004).

In Europe and New Zealand, *Crataegus monogyna* is a host of fire blight bacterium (*Erwinia amylovora*) which also affects pears and apples (Sigg and Alverson 2000).

#### Beneficial:

*Crataegus monogyna* was originally brought to the United States as an ornamental plant. Historically, parts of the plant (berries, flowers and leaves) have been used medicinally in Europe for treating disorders of the heart and circulation system (DiTomaso and Healy 2007, Plants for a Future n.d.). Both the flowers and fruits have a history in folk medicine for a variety of uses and have been well known for their use as a heart tonic (Plants for a Future n.d.).

The wood of *Crataegus monogyna* is very hard, and while it can be difficult to work with, has been used for purposes such as tool handles (Plants for a Future n.d.).

#### Control:

Due to *Crataegus monogyna*'s thorns, make sure to wear gloves and other protective clothing when working with plants.

Make sure to monitor for seedlings as birds can disperse seeds far from plants. Frequently monitor habitats where *C. monogyna* may grow to find and control plants when they are small.

#### Mechanical Control:

Manual removal of seedlings and small plants is possible and is easier to accomplish when the soil is moist. Seedlings can be hand-pulled, but small plants will need to be dug out including all the roots or at least the crown and upper portions of the roots to prevent resprouts (DiTomaso and Healy 2007). Plants can be cut back with the best time being in early summer as the plant is putting most of its energy into aboveground growth (Sigg and Alverson 2000). Larger shrubs and trees can be cut to the base with chain saws or hand saws (GOERT 2002). Avoid cutting the plants when they are full of ripe fruit as they will be dispersed when moving and disposing of plant material (GOERT 2002). Remove the cut material from site as *C. monogyna* can regenerate from cutting (GOERT 2002). Plants will resprout unless the roots are removed or the cut surface is treated with herbicide (Sigg and Alverson 2000). Burning the cut surface with a torch may also reduce sprouting (GOERT 2002).



Image: Cut stem of *Crataegus monogyna* with sprouts growing from the base, image by San Juan County Noxious Weed Control Board

#### Cultural Control:

It is unknown how effective fire may be at controlling *Crataegus monogyna*. A study cited in Zouhar (1998) by Pendergrass et al. (1998) reported that on the wet prairies of Oregon's Willamette Valley, the density of nonnative, invasive shrubs which included *C. monogyna*, was not significantly altered by either a single fall



burn or two consecutive fall burns. It was pointed out though that repeated burning over time may gradually reduce the density and slow the expansion of the invaders (Zouhar 1998).

#### Biocontrol Control:

There are not any approved biological control agents for *Crataegus monogyna*.

The spines of *Crataegus monogyna* typically deters grazing by animals so is not a viable control option (Sigg and Alverson 2000).

#### Herbicide Control:

Currently there isn't information on *Crataegus monogyna* control in the Pacific Northwest Weed Management Handbook, but check back for information as it is continually being updated.

<http://pnwhandbooks.org/weed/control-problem-weeds>

Using a cut stem treatment on *Crataegus monogyna* has shown success. Freshly cut stems, cutting as close to the ground as possible, can be painted with triclopyr (25% and 75% cottonseed oil or other as surfactant) and glyphosate (Sigg and Alverson 2000). Foliar sprays have not been as reliable for control and there is more risk of damage to non-target plant (Sigg and Alverson 2000).

Always read and follow the herbicide label instructions. Check with your local county noxious weed control board to discuss treatment options.

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