Photo credit: Eric Coombs, Oregon Department of Agriculture, Bugwood.org

California Pest Rating Proposal for

Rubus bifrons Vest, Himalayan blackberry

Family: Rosaceae

Current Pest Rating: Q

Proposed Pest Rating: C

Synonym: *Rubus armeniacus* Focke

Comment Period: 04/28/2022 through 06/12/2022

Initiating Event:
Himalayan blackberry, assigned to *Rubus bifrons* in the Flora of North America, and often treated under the name *Rubus armeniacus*, has been widely naturalized in California for many years without formal rating from the CDFA. It has recently been assigned a rating of "Q" and a pest rating proposal is required to evaluate its current rating and status in California.

History & Status:

Background:

The "Himalayan blackberry" is believed to have originated in Eurasia (e.g. in the Caucasus Region) and was introduced into many temperate areas of the world in the 1800's as an edible fruit (see discussion in Gaire et al., 2015). This largely clonal group of blackberries has become naturalized in temperate areas of the world including many countries of Europe, New Zealand, Australia, North America, and South America (Chile). Because of widespread usage of the common name since its commercial distribution by Luther Burbank in the 1800's and the biological and taxonomic complexities in the blackberry and raspberry genus *Rubus* discussed below, the group of stout-prickled blackberries treated as *Rubus bifrons* in the Flora of North America (Alice et al., 2014) will be referred to below as the "Himalayan blackberry", although its original geographical origin is likely to be from other areas of Eurasia.

The Himalayan blackberry is a member of *Rubus* section *Rubus*, a group in which many taxa reproduce clonally both by rooting of the stems and by seeds, often apparently produced without genetic recombination in polyploid taxa comprising many of the named species in the group (Heslop-Harrison, 1968). Morphological variants can be maintained by clonal reproduction over a significant length of time, and there are many published scientific names in *Rubus* section *Rubus* representing largely asexual "microspecies". The Himalayan blackberry populations in California, Oregon, and Washington have been found in genetic studies by Clark et al. (2013) to most commonly be indistinguishable from *Rubus armeniacus* clones from Germany, and this species name has been widely applied to the Himalayan blackberry of western North America. In the Flora of North America treatment by Alice et al. (2014) the North American plants of Himalayan blackberry have been assigned to the slightly earlier published European species *Rubus bifrons* on the grounds that *R. armeniacus* and *R. bifrons* do not appear to be effectively distinguishable in morphology among or within plants in North America. Scientific names that have often been previously misapplied to the Himalayan blackberry include *Rubus discolor* Weihe and Nees, *R. procerus* P.J. Mueller (USDA GRIN database, 2022), and *R. vestitus* Weihe and Nees. A very broad grouping of species from *Rubus* section *Rubus* has sometimes been referred to as the "*Rubus fruticosus* L. species aggregate", which is listed as a U.S. Federal noxious "species". *Rubus fruticosus* was apparently originally described based on a mixture of the European species *R. plicatus* Weihe and Nees and *R. ulmifolius* Schott (Heslop-Harrison, 1968), and the Federal noxious weed taxon is now associated with the name *R. plicatus*, a species morphologically distinct from the Himalayan blackberry (Heslop-Harrison, 1968).

The Himalayan blackberry as seen in North America (following the treatment of Alice et al., 2014 as *R. bifrons* with *R. armeniacus* as a synonym) is a deciduous to semi-evergreen prickly shrub, commonly up to 3 (maximum of 5) m in height, with the arching biennial stems rooting at the tips. The stems are sparsely to densely hairy, usually not white-waxy or glandular-hairy, and are armed with many stout hooked prickles approximately 4-10 mm in length. The leaves are palmately compound with 3 to 5 leaflets that are whitened below, have a toothed margin and bear hooked prickles on the major veins. The inflorescences are terminal or axillary clusters each bearing from 10 to 100 or more flowers. The flowers have five white to pinkish petals approximately 10-15 mm in length. The mature fruit is a black, globose to cylindric aggregate berry approximately 1-2 cm in length, composed of 15 to 40 or more small fleshy drupelets that cohere together as a group. Each fruitlet contains a single seed enclosed in a hardened reticulate-sculptured endocarp that often emerges undamaged when

eaten and digested by birds or mammals. The endocarp seed units are light brown in color and approximately 3-4 mm long by 2-3 mm wide.

Worldwide Distribution: *Rubus bifrons* is a plant of open or disturbed habitats and woodland edges, considered to be native to southeastern to north-central Europe from Italy and Croatia north to France, Belgium, the Netherlands, Germany, and Poland (USDA GRIN, 2022). *Rubus armeniacus* Focke is a species native to the Caucasus Region, although the name has been widely applied to plants naturalized elsewhere in the world. The "Himalayan blackberry" was widely introduced into temperate areas of the world as a fruit crop in the 1800s and has naturalized in Europe, North America, South America (Chile), New Zealand, Australia, and South Africa (CABI, 2022), although the microspecies involved may vary among these different areas.

In the United States, the Himalayan blackberry has been reported (under *R. bifrons* with *R. armeniacus* as a synonym) from Alaska, Arizona, California, Oregon, Washington, Idaho, Montana, Nevada, Utah, Colorado, New Mexico, Texas, Kansas, Oklahoma, Arkansas, Missouri, Illinois, Kentucky, Tennessee, Louisiana, Mississippi, Alabama, Georgia, South Carolina, North Carolina, Virginia, Maryland, Pennsylvania, Ohio, New Jersey, New York, Connecticut, Massachusetts, and Rhode Island (Alice et al., 2014; Invasive Plants Atlas, 2022), and the Canadian provinces of British Columbia and Ontario, with greatest abundance from northern California north to British Columbia.

Official Control: The Himalayan blackberry (under *R. armeniacus*) is listed as a Class B noxious weed in Oregon and a Class C noxious weed subject to local control measures in Washington state. The broad portion of *Rubus* section *Rubus* included in the *Rubus fruticosus* L. aggregate is listed as a U. S. Federal noxious weed, although the species name now associated with this listing is *Rubus plicatus* (USDA APHIS, 2022). The *Rubus fruticosus* aggregate is listed as a category 2 invasive plant in South Africa, a noxious weed in New Zealand, and a harmful plant by Mexico (USDA PCIT database, 2022). The *R. fruticosus* aggregate is listed as a U. S. Federal noxious weed seed prohibited from entry into the country and interstate sale or transport (USDA AMS, 2022).

California Distribution: The Himalayan blackberry has been reported from vouchered collections in at least 44 counties in California, including all coastal counties and the great majority of the counties on the western slope of the Sierra Nevada and Cascade Ranges and the adjoining Central Valley, mostly under the name *Rubus armeniacus*, and has been present in many counties dating back to the 1950's or earlier (Consortium of California Herbaria, 2022). The group (under *Rubus armeniacus*) has multiple mapped localities in the Calflora database (2022) in all counties of California except Mono and Imperial on the eastern border and is generally absent from very dry areas such as the Mojave Desert and areas east of the Sierra Nevada or Cascade crests.

California Interceptions: No interceptions at border inspection stations have been recorded in the CDFA PDR database (2022).

Consequences of Introduction

1) **Climate/Host Interaction:** Score is **High (3)**

The Himalayan blackberry has established a wide distribution in California (Alice, 2012; Consortium of California Herbaria, 2022). It is particularly widespread in foothill and lower mountain areas along roadsides, rivers, and woodland edges.

- Low (1) Not likely to establish in California; or likely to establish in very limited areas
- Medium (2) may be able to establish in a larger but limited part of California
- **High (3) likely to establish a widespread distribution in California**

2) **Known Pest Host Range:** Score is **High (3)**

The Himalayan blackberry can occur wherever general ecological conditions exist that are conducive to its survival.

- Low (1) has a very limited host range
- Medium (2) has a moderate host range
- **High (3) has a wide host range**

3) **Pest Dispersal Potential: Score is High (3)**

The Himalayan blackberry reproduces by seed, commonly producing 30 or more seeds per fruit, and under favorable conditions can produce thousands of seeds per plant (Alice et al., 2014). The succulent aggregate fruits or their fruitlets are attractive to birds and mammals and the hard-coated endocarps ("seeds") within the fruitlets can be easily and widely dispersed after having been eaten by birds and small mammals. The seeds can persist in a dormant state in soil for several years and can be dispersed when soil is moved. The plants also spread locally by rooting of the canes or stem fragments.

Evaluate the natural and artificial dispersal potential of the pest.

- Low (1) does not have high reproductive or dispersal potential
- Medium (2) has either high reproductive or dispersal potential
- **High (3) has both high reproduction and dispersal potential**

4) **Economic Impact:** Score is **High (3)**

The Himalayan blackberry forms dense stands along roadsides and woodland edges in well-watered areas of California. The fruits are attractive to birds and other wildlife and are eaten or gathered as food by people. The dense prickly clumps of the blackberry are hard to completely remove, although goats can be helpful in reducing the volume of the plants, and the stout prickles can be injurious to humans and livestock. Himalayan blackberry has been reported (along with other native and introduced *Fragaria* and *Rubus* species) as a host in for the strawberry blossom weevil *Anthonomus rubi* (Canadian Food Inspection Agency, 2022), which attacks flowers and fruits of commercial strawberries, raspberries, and blackberries in western Canada, but is not yet reported from California. The Himalayan blackberry is reported as a host for a variety of pathogenic fungi, bacteria, and viruses. The Himalayan blackberry (and the widespread native California grape) can act as host reservoirs for the Pierce's disease agent

Xylella fastidiosa, an important pathogen of cultivated grape vines in California (Baumgartner and Warren, 2007).

A. The pest could lower crop yield.
B. The pest could lower crop value (includes increasing crop production costs).
C. The pest could trigger the loss of markets (includes quarantines).
D. The pest could negatively change normal cultural practices.
E. The pest can vector, or is vectored, by another pestiferous organism.
F. The organism is injurious or poisonous to agriculturally important animals.
G. The organism can interfere with the delivery or supply of water for agricultural uses.

Economic Impact A, D, E, F:
- Low (1) causes 0 or 1 of these impacts
- Medium (2) causes 2 of these impacts
- High (3) causes 3 or more of these impacts

5) Environmental Impact: Score is **High (3)**

The Himalayan blackberry can form dense clumps in open habitats if enough water is available to the plants, potentially changing the makeup of environmental communities. Because of the dense growth of the blackberry, other species can be shaded out or physically excluded.

A. The pest could have a significant environmental impact such as lowering biodiversity, disrupting natural communities, or changing ecosystem processes.
B. The pest could directly affect threatened or endangered species.
C. The pest could impact threatened or endangered species by disrupting critical habitats.
D. The pest could trigger additional official or private treatment programs.
E. The pest significantly impacts cultural practices, home/urban gardening or ornamental plantings.

Environmental Impact A, D, E:
- Low (1) causes none of the above to occur
- Medium (2) causes one of the above to occur
- **High (3) causes two or more of the above to occur**

Consequences of introduction to California for the Himalayan blackberry group: **High (15)**

Low = 5-8 points
Medium = 9-12 points
High = 13-15 points

1) Post Entry Distribution and Survey Information: Score is **High (3)**

-Not established (0) Pest never detected in California or known only from incursions.
-Low (-1) Pest has a localized distribution in California or is established in one suitable climate/host area (region).

-Medium (-2) Pest is widespread in California but not fully established in the endangered area, or pest established in two contiguous suitable climate/host areas.
-**High (-3) Pest has fully established in the endangered area, or pest is reported in more than two contiguous or non-contiguous suitable climate/host areas.**

7) Final Score: Medium 12 (15-3=12)

Uncertainty: Since the Himalayan blackberry is already widely established in California there is little uncertainty about the impact of the plant. The taxonomy of the group at the species level has been subject to considerable uncertainty as evidenced by the multiple species names that have been used for the plants occurring as introduced taxa in North America.

Conclusion and Rating Justification: The Himalayan blackberry is a serious environmental weed in the Pacific coastal states of the U.S. that has been widely distributed in California for many decades as an escape from cultivation. A "C" rating is recommended under CCR section 3162 because of the very widespread distribution of the group within the state. Local control should be instituted to help mitigate potential risks to fruit crop plantings of grapes, raspberries and strawberries.

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***Comment Period: 04/28/2022 through 06/12/2022**

***NOTE:**

You must be registered and logged in to post a comment. If you have registered and have not received the registration confirmation, please contact us at permits[@]cdfa.ca.gov.

Comment Format:

- Comments should refer to the appropriate California Pest Rating Proposal Form subsection(s) being commented on, as shown below.

  Example Comment:

  Consequences of Introduction: 1. Climate/Host Interaction: [Your comment that relates to "Climate/Host Interaction" here.]

- Posted comments will not be able to be viewed immediately.

- Comments may not be posted if they:

  Contain inappropriate language which is not germane to the pest rating proposal;

  Contains defamatory, false, inaccurate, abusive, obscene, pornographic, sexually oriented, threatening, racially offensive, discriminatory or illegal material;

  Violates agency regulations prohibiting sexual harassment or other forms of discrimination;

  Violates agency regulations prohibiting workplace violence, including threats.

- Comments may be edited prior to posting to ensure they are entirely germane.
- Posted comments shall be those which have been approved in content and posted to the website to be viewed, not just submitted.

Proposed Pest Rating: [C]
