Figure 1:*Cirsium japonicum* (Japanese thistle). Photo: CDFA

California Pest Rating Proposal for

Cirsium japonicum Fisch. ex DC.: Japanese thistle

Pest Rating: D

Comment Period: CLOSED

Initiating Event:

This plant has been included on the CDFA noxious weed list [3 CCR § 4500] for many years. However, Japanese thistle has not been reviewed under the current pest rating system. A pest rating proposal is required to evaluate the current rating and status of Japanese thistle in the state of California.

History & Status:

Background: This perennial herb grows up to 2 meters in height. The stems are grayish-white and covered with hairs, and the leaves, which measure up to 30 cm in length, have spine-bearing teeth on the margins. The flowers are red to purple in color (Owhi, 1965; Shi and Greuter, 2011). In its native habitat in Japan, it is reported to grow in a variety of open settings, including grasslands, wastelands, roadsides, and streams. This plant is apparently cultivated for its flowers, and grown as an ornamental in Japan, although the extent to which this is done outside of its native range is not known (Griffiths, 1994; Bailey and Bailey, 1976). Plants are not sold in California, but seed can be obtained from some seed sellers.

Worldwide Distribution: Japanese thistle is native to eastern Asia and is reported from China, Japan, Korea, eastern Russia, Taiwan, and Vietnam (Shi and Greuter, 2011). It is not known to be present anywhere else (including the United States), although it is apparently cultivated and seeds are available online.

Official Control: Japanese thistle has been listed on the CDFA noxious weed list. *Cirsium* spp. are listed as a primary noxious weed in Iowa (State of Iowa, 2018). Japanese thistle is a category 1b invasive in South Africa (ISSA, 2019).

California Distribution: Japanese thistle is not known to occur in California (CCH, 2019).

California Interceptions: Japanese thistle has not been intercepted in California.

The risk Japanese thistle would pose to California is evaluated below.

Consequences of Introduction:

1) **Climate/Host Interaction:** The areas in Asia where this plant occurs have a temperate climate, with moist to wet, warm summers. Due to water limitations, it would presumably not survive in a large portion of California. There are no known records of the successful introduction of this species to areas outside of its native distribution. Therefore, Japanese thistle receives a **Low (1)** in this category.

   Evaluate if the pest would have suitable hosts and climate to establish in California.
   Score: **1**
   - 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:** Risk is **High (3)** as weeds do not require any one host, but grow wherever ecological conditions are favorable.

Evaluate the host range of the pest.

Score: 3

- 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:** *Cirsium* species produce a medium number of seeds that are dispersed by wind and possibly by birds as well. Japanese thistle receives a Medium (2) in this category.

Evaluate the natural and artificial dispersal potential of the pest.

Score: 2

- 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:** Extracts from the leaves of Japanese thistle have been shown to have an allelopathic effect (in this case, inhibition of root growth) on alfalfa, and presumably this species could have a similar effect on other plants as well (Chon and Choi, 2003). Although it is listed by numerous organizations as a weed, there do not appear to be any reports of this plant being a serious problem to agriculture. Indeed, not a single report was found of it even having been successfully introduced outside of its native range. It is unlikely to have any economic impact in California. Japanese thistle receives a **Low (1)** in this category.

Evaluate the economic impact of the pest to California using the criteria below.

Economic Impact: None

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 Score: **1**

- **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:** Other *Cirsium* species have been shown to impact native ecosystems through displacing native plant species, but not this one. Japanese thistle is limited in its ability to spread, much like most native North American *Cirsium* spp. Therefore, it receives a **Low (1)** in this category.

Environmental Impact: None

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 Score: 1
- 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 Japanese thistle*:*

Add up the total score and include it here. **8**
-Low = 5-8 points
-Medium = 9-12 points
-High = 13-15 points

6) **Post Entry Distribution and Survey Information**: Japanese thistle is not known to be present in California. It receives a Not established (0) in this category.

Score: 0
-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) **The final score is** the consequences of introduction score minus the post entry distribution and survey information score:

Final Score: *Score of Consequences of Introduction – Score of Post Entry Distribution and Survey Information* ***= Low (8)***

Uncertainty:

Considering that this plant is widely distributed in Asia and is apparently cultivated to some extent, there is a surprising lack of evidence that it has become established anywhere outside of its native range. This is likely an indication that the plant has a limited ability to invade new areas.

Conclusion and Rating Justification:

Japanese thistle belongs to a genus that has a track record of invasiveness and economic and environmental impact, as well as including some of the rarest plants in the world. There is no available evidence that this particular species has had any negative impacts or even that it has been successfully introduced anywhere outside of its native range, but it presumably has limited potential to impact agriculture and/or the environment. In addition, Japanese thistle has the potential for use as an ornamental plant. Based on the evidence provided above **the proposed rating for Japanese thistle is a D.**

References:

Bailey, L.H. and Bailey, E.Z. 1976. Hortus Third: A Concise Dictionary of Plants Cultivated in the United States and Canada. A Simon & Schuster Macmillan Company, New York, NY.

Chon, S. -U. and Choi, S. -K. 2003. Assessment of allelopathic potential and antioxidant activity of leaf extracts from three Compositae plants. Korean Journal of Crop Science 48:303-307.

Consortium of California Herbaria (CCH). 2019. Data provided by the participants of the CCH. Regents of the University of California 2019. Accessed July 30, 2019:

http://ucjeps.berkeley.edu/consortium/

Griffiths, M. 1994. Index of Garden Plants: The New Royal Horticultural Society Dictionary. Timer Press, Portland, OR.

Invasive Species South Africa (ISSA). 2019. Accessed July 30, 2019:

http://www.invasives.org.za/

National Resources Conservation Service (NRCS). 2019. PLANTS Database. U.S. Department of Agriculture. Accessed July 30, 2019:

https://plants.usda.gov

Owhi, J. 1965. Flora of Japan. Smithsonian Institution, Washington, D.C.

Shi, Z. and Greuter, W. 2011. *Cirsium*. P. 160 *in* Wu, Z.Y., Raven, P.H. and Hong, D.Y., (eds.), Flora of China Volume 20-21 (Asteraceae). Science Press (Beijing) & Missouri Botanical Garden Press (St. Louis).Accessed July 30, 2019:

http://www.efloras.org/florataxon.aspx?flora_id=2&taxon_id=107139

State of Iowa. 2018. Title VIII. Transportation. Chapter 317.1A Noxious weeds. December 7, 2018.

U.S. National Plant Germplasm System (USNPGS). 2019. Accessed July 30, 2019:

https://npgsweb.ars-grin.gov

Wiersema, J. H. and León, B. 2016. World Economic Plants. CRC Press, New York, NY.

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***Comment Period: CLOSED**

***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 plant.health[@]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.

Pest Rating: D