Figure 1: Wavy-leaved thistle (*Cirsium undulatum*); Photo: CDFA, 2001

California Pest Rating Proposal for

Cirsium undulatum (Nutt.) Spreng.: wavy-leaved thistle

Current Pest Rating: B

Proposed Pest Rating: D

Comment Period: 10/8/2019 through 11/22/2019

Initiating Event:

This plant has been included on the CDFA noxious weed list [3 CCR § 4500] as a B-rated plant pest. However, wavy-leaved thistle has not been reviewed under the current pest rating system. A pest

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rating proposal is required to evaluate the current rating and status of wavy-leaved thistle in the state of California.

History & Status:

Background: Wavy-leaved thistle is an erect, prickly plant that grows to over 2 meters tall and spreads via rhizomes and seeds. The stems and upper leaf surfaces are wooly, and the leaves can reach 10 centimeters wide and 40 centimeters long. New shoots are produced from deeply seated runner roots, but this species is not widely-spreading and clumps of plants are usually compact. Flowers are white, pink, or purple (Keil, 2006). Wavy-leaved thistle is found in disturbed areas, dry grassland and open scrubland (Keil, 2012).

Worldwide Distribution: Wavy-leaved thistle is native to western North America, including the Modoc Plateau of northeastern California and southern Canada (Keil, 2012). It has been introduced to various locations outside its historic range, including coastal California, probably through the distribution of hay produced in areas where it is native. It is found in throughout western United States, with occasional pockets east of the Mississippi in Michigan, Wisconsin, Pensylvannia and Missouri (NRCS, 2019).

Official Control: Wavy-leaved thistle is classified as a noxious weed in California. Iowa lists *Cirsium* spp. as a primary noxious weed (State of Iowa, 2018). It has been subject to eradication efforts in California (Siebe, 1976).

California Distribution: Wavy-leaved thistle is native to the Modoc Plateau of California; it has been reported in four counties in this region (Lassen, Modoc, Plumas, and Siskiyou) (Keil, 2012). It has been introduced to limited areas of central and southern California, where it has been reported from four coastal counties (Alameda, Los Angeles, San Diego, and San Luis Obispo) plus western San Bernardino County (CCH, 2019).

California Interceptions: Wavy-leafed thistle was intercepted at border stations on trucks from New Mexico and South Dakota and on bee colonies from Idaho (CDFA, 2019).

The risk wavy-leaved thistle would pose to California is evaluated below.

Consequences of Introduction:

1) **Climate/Host Interaction:** 1) Climate/Host Interaction: Between the native distribution in western North America (including northeast California) and the coastal localities in California to which it has been introduced, this species has been reported from a fairly wide geographic area. It is likely that it has been introduced to new areas via movement of hay or farm equipment and has been able to

persist through selective avoidance by livestock. Therefore, wavy-leaved thistle receives a **Medium (2)** in this category.

Evaluate if the pest would have suitable hosts and climate to establish in California.

Score: **2**

- 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:** Seeds of *Cirsium* species can be dispersed to some degree by wind, and they can be carried as a contaminant of seeds and hay. Wavy-leaved 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:** There is very little evidence available that this species is a problem weed in agricultural settings. Wavy-leaved 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:** There is very little evidence available that this species is invasive in natural settings. Therefore, it receives a **Low (1)** in this category.

Environmental Impact:
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:
- 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 wavy-leaved thistle*:* Medium (9)

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

6) **Post Entry Distribution and Survey Information**: : This plant has been reported from (and has presumably been introduced to) five counties that span much of coastal California. It receives a **Medium (-2)** in this category.

Score: -2
-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 (7)***

Uncertainty:

It is possible that some reports of this species are misidentifications of the similar species *Cirsium canescens* (Keil, 2006). If this is true, then the distribution of this species in the state may be more limited than the current data suggests. Many of the adventive populations have not been surveyed in many years, and some of these may be eradicated.

Conclusion and Rating Justification:

Wavy-leaved thistle is native to northeastern California. The reports of this species in coastal California are rather limited in scope and may represent rare but persistent establishment. There appears to have been ample opportunity for this species to spread and become established. Due to its spininess, it is unpalatable to livestock, but there is a lack of evidence that this plant has been a problem agriculturally or environmentally except very locally. For these reasons, a "D" rating is justified.

References:

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***Comment Period: 10/8/2019 through 11/22/2019**

***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.

Proposed Pest Rating: D
