California Pest Rating Profile for

Salsola paulsenii Litv., barbwire Russian-thistle

Family: Chenopodiaceae

Pest Rating: C

Synonym: *Kali paulsenii* (Litv.) Akhani and E. H. Roalson

Photo credit: S. Matson

Comment Period: 07/27/2022 through 09/10/2022

Initiating Event:

Salsola paulsenii has been previously assigned a C-rating by the California Department of Food and Agriculture (CDFA), Plant Health and Pest Prevention Services, but has not gone through the current pest risk analysis procedure. *Salsola paulsenii* is designated as a noxious weed as defined by the

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California Food and Agricultural Code (FAC) Section 5004 and is listed in Title 3, California Code of Regulations (CCR), Section 4500.

History & Status:

General Description

Salsola paulsenii is an annual spiny herb. Young plants have four lateral, nearly prostrate branches that ascend with maturity. Mature plants have erect stems that profusely branch from the base and can reach lengths of over 1 meter. Plants form a distinctly rounded shape. Stems of *Salsola paulsenii* are ribbed and sometimes red-striped, and can be straight or shallowly curved like a bow. Leaves are alternate, narrowly linear to thread-like (up to 30 millimeters (mm) long and usually less than one mm wide) and spine-tipped. Flowers are bisexual, five-parted, and usually arising singly from the axils of elongated, spiny, recurved bracts. The utricle fruit contains a single seed with coiled embryo, and is enveloped by a membranous, colorless or pale pink, conspicuously veined perianth. This persistent perianth, 7 to 12 mm in diameter, forms a winged, circular appendage around the mature fruit, with a central beak formed by the tips of the sepal lobes (Beatley, 1973; Mosyakin, 2003; Pasiecznik, 2015).

Worldwide Distribution

Salsola paulsenii is native to dry temperate to subtropical regions of central Asia and eastern Europe, including portions of Afghanistan, Iran, Azerbaijan, Russian Federation, Kazakhstan, Kyrgyzstan, Turkmenistan, Uzbekistan, Mongolia, western China, and southwestern Pakistan (USDA GRIN, 2022). It is considered naturalized in the southwestern region of the United States of America. *Salsola paulsenii* has been collected from the states of Arizona, California, Nevada, Colorado, New Mexico, Oregon, Texas, and Utah (EDDMapS, 2022; Mosyakin, 2003)

Official Control:

Salsola paulsenii is listed on CCR Section 4500 as a noxious weed defined by California FAC Section 5004. The Department is mandated by California FAC, Division 1, Chapter 3, Section 403 to prevent the introduction and spread of noxious weeds. *Salsola paulsenii* is listed as a restricted noxious weed seed in California defined by California FAC Section 52258 and subject to stringent tolerances in agricultural seed offered for sale in California.

California Distribution:

Since 1930, *Salsola paulsenii* has been collected approximately 300 times from 16 California counties in the eastern and southern areas of the state. The number of collections per county include Inyo (149), Ventura (25), San Bernardino (23), Kern (22), Mono (19), Riverside (19), Los Angeles (14), Plumas (7), Sierra (6), Imperial (3), San Diego (3), San Luis Obispo (3), Santa Barbara (3), Alpine (2), Lassen (2), Modoc (1) (CalFlora Database, 2022).

California Interceptions:

Salsola paulsenii was intercepted as a hitchhiking weed by California Border Inspection Stations in 2011 and 2012, once on a commercial car hauler from Arizona and once on a passenger vehicle from Texas. (CDFA PDR database, 2022).

Consequences of Introduction

1) **Climate/Host Interaction:** Score is **Medium (2)**
In its native range, *Salsola paulsenii* grows in sandy, highly permeable soils, and prefers to grow under woody trees and shrubs, benefitting from the "bioconcentrates in leaves and fruits that accumulate in the sub-canopy" (Kostivkovsky and Young, 2000). Where introduced, *Salsola paulsenii* and can be found in desert scrub, on sand dunes and eroded sandy slopes, and in disturbed areas such as roadsides, railways, and edges of cultivated fields (Pasiecznik, 2015; Mosyakin, 1996). According to Mosyakin (1996), *Salsola paulsenii* is "confined mostly to open sands, and rarely to saline sandy habitats."

Salsola paulsenii is considered low-water tolerant and occurs at elevations between 0-2,090 meters above sea level and up to eight meters below sea level (CalFlora database, 2022). *Salsola paulsenii* can tolerate a wide range of temperatures from 0 to above 40 degrees Celsius (Pasiecznik, 2015).

-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)**
Salsola paulsenii 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)**
Evans and Young (1980) found that individual plants of *Salsola paulsenii* usually produce fewer than 1,000 seeds. Seeds drop beneath the parent plant and can survive for up to two years in the soil. Seeds of *Salsola paulsenii* require thorough wetting of the soil in order to geminate (Pasiecznik, 2015).

The cutting and transportation of hay from infested rangelands and pastures can result in the spread of *Salsola paulsenii* seeds (Pasiecznik, 2015). Kostivkovsky and Young (2000) suggest that *Salsola paulsenii* seed could have been brought to America as a contaminant of cotton from India or in wool from anywhere within its natural range. Evans and Young (1980) demonstrated that seeds of *Salsola paulsenii* can be moved by small mammals. Mosyakin (1996) describes the winged perianth surrounding the fruit as an adaptation for wind dispersal.

- 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 **Low (1)**
Kostivkovsky and Young (2000) state that in its native range, the long growing season of *Salsola paulsenii* (from May to late autumn) results in its being considered "good fodder for sheep and camels", and the abundant seeds that cover it in September and October are considered nutritious

for cattle. The plants are reported to provide forage for livestock and native mammals and birds in arid to semiarid areas of North America.

Agricultural shipments (including seed) that are infested with *Salsola paulsenii* that are shipped into or within California are subject to regulatory actions, including reconditioning, typically at the owner's expense.

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:
- 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 **Medium (2)**

Salsola paulsenii begins growth early in the spring and grows rapidly, resulting in localized competition for resources with native species (Pasiecznik, 2015). Germination of seeds below parent plants results in the formation of dense, monoclonal patches and localized reduction in native biodiversity.

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:
- 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 *Salsola paulsenii*: **Medium (11)**

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: Low (11-3=8)

Conclusion and Rating Justification:
Due to the economic impacts of *Salsola paulsenii* on infested agricultural shipments, a C-rating is recommended.

Uncertainty: *Salsola paulsenii* is long established in arid to semiarid portions of eastern and southern California, so there is limited uncertainty about the risks that it can pose. The species is reported to form intermediates with the widespread common Russian-thistle, *S. tragus*, also a C-rated pest species.

References

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***Comment Period: 07/27/2022 through 09/10/2022**

***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.

Pest Rating: C