California Pest Rating Profile for

Prosopis strombulifera (Lam.) Benth., creeping mesquite, Argentine screwbean

Family: Fabaceae

Pest Rating: A

Synonyms: *Mimosa strombulifera* Lam. (basionym); *Acacia strombulifera* (Lam.) Willd.

Photo credit: Julia Scher, USDA APHIS PPQ, bugwood.org

Comment Period: 07/28/2022 through 09/11/2022

Initiating Event:
Prosopis strombulifera has previously been assigned an a A-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. *Prosopis strombulifera* is designated as a noxious weed as defined by the 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
Prosopis strombulifera is a spiny leguminous shrub that can grow to three meters in height, and spreads underground by extensive lateral roots, from which new shoots can develop to produce dense stands (Scher et al., 2015). The species has long, slender, downward sweeping branches and waxy, bipinnately compound leaves. Leaflets are widely spaced along the rachis and 2-9 millimeters (mm) long. Decurrent stipular spines are white, thin, 0.5-3 cm long and arise from the base of the leaf. The inflorescence is a spherical head (versus cylindrical and 4-8 cm long in the native California species *P. pubescens* Benth.), about 1.5 cm wide, with many, narrow, 1.5-2.2 mm long, tubular yellow flowers with exserted stamens and styles (Burkhart, 1976). Fruits (up to 20 or more per flower cluster) are bright yellow, tightly coiled legume pods, 1.8-5.2 cm long, and radiate straight out from the receptacle (Reginato et al., 2013). Seeds are approximately 5-10 per pod, ovate, grayish green, and 3.1-5.4 mm long (Burkhart, 1976; Scher et al., 2015).

Worldwide Distribution
Prosopis strombulifera is native to the South American countries of Argentina and Chile (USDA GRIN, 2022), and is also reported to be native in Peru (Scher et al., 2015).

Official Control:
Prosopis strombulifera 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. *Prosopis strombulifera* is listed as a restricted noxious weed seed defined by California FAC Section 52258. Any shipment of agricultural seed found to be infested with *Prosopis strombulifera* seeds is subject to quarantine and abatement.

Prosopis strombulifera is listed as a Federal noxious weed (Title 7 Code of Federal Regulations (CFR), Section 360.200) and a noxious weed seed under the Federal Seed Act (Title 7, CFR Section 201.16[b]. The species is prohibited from introduction into the United States and there is zero tolerance for propagative material in interstate shipments of agricultural commodities, including seed.

All plants in the genus *Prosopis* are designated as Harmful Organisms subject to phytosanitary restrictions for the countries of Australia and South Africa (USDA PExD, 2022).

California Distribution:
Between 1950-1965, *Prosopis strombulifera* was collected nine times from Imperial County (CalFlora Database, 2022). Wojciechowski and McClintock (2012) indicate that this species is not naturalized in California, and it represents a limited introduction in a single area under long-term official control. It was

likely cultivated around the abandoned United States Department of Agriculture experiment station near Bard, California, and has been reported as eradicated (DiTomaso and Healy, 2007).

California Interceptions: There are no recorded interceptions of *Prosopis strombulifera* in the CDFA Pest and Damage Record database (2022).

Consequences of Introduction

1) **Climate/Host Interaction:** Score is **High (3)**
Prosopis strombulifera grows in saline soils in arid and semi-arid regions below 50 m above sea level (Sher et al., 2015). It can grow in sandy, rocky soils and in disturbed areas. Picolli et al. (2011) confirmed through laboratory analysis of root tissue extracts taken from wild Argentinian plants that *Prosopis strombulifera* is associated with at least one nitrogen-fixing, growth hormone-producing bacteria, and suggest that the beneficial microorganism(s) enable the plant to grow in conditions of excess sodium chloride salts.

Many of California's most productive soils originate from ocean sediments that are naturally high in salts. Per CDWR (2016), sodium sulfate and sodium chloride are the dominant salt compositions in much of the San Joaquin Valley.

-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)**
Prosopis strombulifera 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 **Medium (2)**
Prosopis strombulifera spreads vegetatively on a local scale and by seed (Burkhart, 1976). It can form dense stands from new shoots that form on spreading rhizomes or lateral roots. In its native range, wildlife and livestock will eat the fruit of *Prosopis strombulifera* and disperse the seeds, which can also be spread by water or soil movement (EDDMapS, 2014). The species can produce as many as 21 seed pods per flower head, with 5 or more seeds per pod and numerous inflorescences per plant (Burkhart, 1976).

- 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)**

Due to its status as a Federal Noxious weed, any shipment of agricultural commodities, including agricultural seed, that are found to be infested with *Prosopis strombulifera* are subject to quarantine and eradication measures at the owner's expense.

Although livestock will consume the its seed pods, resource competition and crowding by *Prosopis strombulifera* thickets can reduce or eliminate the quantity and diversity of forage species available to livestock (FAO, 2000). The sharp stipular spines can also be injurious to livestock and humans.

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 **High (3)**
Per Llanes et al (2012), the morphological and physiological characteristics of *Prosopis strombulifera* enable it to tolerate salt stress and to efficiently use water in saline soil conditions better than most other halophytes. Although wildlife will consume the its seed pods (EDDMapS, 2014), resource competition and crowding by *Prosopis strombulifera* can reduce or eliminate the quantity and diversity native forage species available wildlife (FAO, 2000).

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 *Prosopis strombulifera*: **High (14)**

Low = 5-8 points
Medium = 9-12 points

High = 13-15 points

1) **Post Entry Distribution and Survey Information**: Score is **Not Established (0)**
Prosopis strombulifera has been reported from only one location of Imperial County as an abandoned experimental planting, which is under official control as a noxious weed and has been reported to be eradicated (DiTomaso and Healy, 2007).

-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: High (14-0=14)**

Conclusion and Rating Justification:
Due to the High score of this analysis, and the economic impact of *Prosopis strombulifera* infestations or infested shipments, an A-rating is recommended.

Uncertainty: Because of the spiny, thicket-forming nature of the plant there is little uncertainty concerning the risks posed to the environment or agriculture of the state of California.

References

Burkart, A., 1976. A monograph of the genus *Prosopis* (Leguminosae subfam. Mimosoideae). Journal of the Arnold Arboretum, 57:219-249, 450-525. https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=Burkart%2C+A.+1976.+A+monograph+of+the+genus+Prosopis+%28Leguminosae+subfam.+Mimosoideae%29.+J.+Arnold+Arbor.+57%3A457.&btnG= Accessed March 18, 2022.

Calflora: Information on California plants for education, research, and conservation, with data contributed by public and private institutions and individuals, including the Consortium of California Herbaria. 2022. Berkeley, California. https://www.calflora.org/ Accessed March 18, 2022

California Department of Food and Agriculture (CDFA), Plant Pest Diagnostics Branch, Pest and Damage Record (PDR) Database. Accessed March 15, 2022.

California Department of Water Resources (CDWR). Salt and Salinity Management. A Resource Management Strategy of the California Water Plan. July 29, 2016 https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/California-Water-Plan/Docs/RMS/2016/18_Salt_Salininty_Mgt_July2016.pdf Accessed March 18, 2022

DiTomaso, J.M., and Healy, E.A. 2007. Weeds of California and Other Western States. University of California Agriculture and Natural Resources Publication 3488.

Food and Agriculture Organization (FAO) of the of the United Nations. "The genus *Prosopis* "Algarrobos" in Latin America and the Caribbean. Distribution, Bioecology, Uses and Management. October 2000 by Francisca María Galera." https://www.fao.org/3/ad314s/AD314S00.htm#TOC Accessed March 18, 2022 (translated)

Llanes, A., Bertazza, G., Palacio, G. and Luna, V., 2013. Different sodium salts cause different solute accumulation in the halophyte *Prosopis strombulifera*. Plant Biology, 15, pp.118-125. https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=prosopis+strombulifera&oq=prosopis+str Accessed March 18, 2022

Piccoli, P., Travaglia, C., Cohen, A., Sosa, L., Cornejo, P., Masuelli, R., and Bottini, R. (2011). An endophytic bacterium isolated from roots of the halophyte *Prosopis strombulifera* produces ABA, IAA, gibberellins A1 and A3 and jasmonic acid in chemically-defined culture medium. Plant Growth Regulation. 64(2):207-210. https://www.researchgate.net/publication/251302542 Accessed March 18, 2022

Reginato, M.A., Reinoso, H., Llanes, A.S., and Luna, M.V. 2013. Stomatal abundance and distribution in *Prosopis strombulifera* plants growing under different iso-osmotic salt treatments. American Journal of Plant Sciences 4, number 12C:80-90. doi: 10.4236/ajps.2013.412A3010. Accessed March 18, 2022

Scher, J. L., D. S. Walters, and A.J. Redford. 2015. Federal noxious weed disseminules of the U.S., Edition 2.2. California Department of Food and Agriculture, and USDA APHIS Identification Technology Program. Fort Collins, CO. http://idtools.org/id/fnw> Accessed March 18, 2022

United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Phytosanitary Export Database (PExD). 2022. https://pcit.aphis.usda.gov/PExD Accessed April 13, 2022

United States Department of Agriculture (USDA), Agricultural Research Service, National Plant Germplasm System. 2022. Germplasm Resources Information Network (GRIN Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/gringlobal/taxon/taxonomydetail?id=29773 Accessed March 18, 2022.

University of Georgia, Center for Invasive Species and Ecosystem Health, Bugwood Network, Early Detection and Distribution Mapping System (EDDMapS). 2014. https://wiki.bugwood.org/Prosopis_strombulifera/EDDMapSWest Accessed March 18, 2022.

Wojciechowski, M.F. and McClintock, E. 2012. *Prosopis strombulifera*, in Jepson Flora Project (eds.) Jepson eFlora, https://ucjeps.berkeley.edu/eflora/eflora_display.php?tid=39957 Accessed on March 18, 2022.

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***Comment Period:** **07/28/2022 through 09/11/2022**

***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: A
