

## California Pest Rating Proposal for

*Cenchrus echinatus* L. (southern sandbur), *C. spinifex* Cav. (coast sandbur; field sandbur), *C. longispinus* (Hack.) Fernald (mat sandbur; longspine sandbur)

Poales; Poaceae tribe Paniceae

Pest Rating: *C. echinatus* – B; *C. spinifex* – B; *C. longispinus* – B

Synonym for *C. spinifex*: *C. incertus* M. A. Curtis

---

Comment Period: **10/09/2020 through 11/23/2020**

---

### Initiating Event:

Three sandbur species in the genus *Cenchrus* have been designated as noxious weeds as defined by the California Food and Agriculture Code Section 5004 and are listed in Title 3, California Code of Regulations, Section 4500. A pest rating proposal is required to evaluate the current rating and status of these species in the state of California.

### History & Status:

**Background:** Sandburs are panicoid grasses in the genus *Cenchrus* L. that are often designated as noxious weeds due to their prominent spiny fruiting burs. They usually grow in open or disturbed habitats and generally prefer sandy soils (Stieber and Wipff, 2003). In California, they usually are summer annuals to 0.6 m tall, and can grow to 1 m tall under favorable conditions (DiTomaso and Healy, 2007; Smith, 2012). Coast sandbur behaves as an annual in California, but can be biennial or a short-lived perennial elsewhere under different climate regimes (DiTomaso and Healy, 2007). The sandburs are characterized by an inflorescence of dense spikelike panicles of spiny burs. Each bur containing a group of 2 to 4 one-seeded spikelets surrounded by an involucre of flattened and spiny bristles. The plants can provide good forage for livestock before the burs develop. However, the bur spines are stiff and can injure the mouths and feet of animals and the hands and feet of people working in infested fields, orchards, or vineyards. Southern sandbur has a single whorl of flattened, fused inner bracts subtended by smaller finer bristles, while the other two species have several whorls of flattened spines (Smith, 2012). Coast sandbur differs from the rather similar mat sandbur in having smaller numbers of

---

bristles in the fruiting bur (8-40 bristles with a broader base 1-3 mm wide in *C. spinifex* versus 45-75 bristles less than 1 mm wide in *C. longispinus*; Smith, 2012). Southern sandbur and coast sandbur are primarily distributed across the southern U.S. and south to South America, while mat sandbur also occurs in most states of the U. S. and north to British Columbia, Ontario, and Quebec (Stieber and Wipff, 2003; USDA/GRIN, 2020; USDA PLANTS database). Although believed introduced in California (Calflora, 2020), the original native range of sandburs in pre-Columbian times is unclear, so it is possible that some populations in southeastern California may be native (USDA/GRIN, 2020).

**Worldwide Distribution:** These three species of sandburs are native to North America and southward to the Caribbean and South America (USDA/GRIN, 2020). Southern sandbur is also naturalized in parts of Asia and Australasia, and mat sandbur has been introduced into Eurasia and Australasia.

**Official Control:** These three species of sandburs have been designated as noxious weeds by California [3 CCR § 4500] and are listed as prohibited noxious weed seeds by the state [3 CCR § 3854]. Coast and southern sandburs are also listed as noxious weeds and prohibited noxious weed seeds in Arizona. Mat sandbur is listed as a prohibited noxious weed seed in Wyoming and a restricted noxious weed seed in Colorado and North Carolina, and coast sandbur is listed as a prohibited noxious weed seed in Wyoming and as a restricted noxious weed seed in Georgia, North Carolina, and Washington (USDA/AMS, 2020). All spiny-burred *Cenchrus* species are designated as harmful organisms in international commerce by Australia, and coast and southern sandburs are designated as harmful organisms by New Zealand. Coast sandbur and mat sandbur are also designated as harmful organisms by the Russian Federation and the neighboring countries in the Eurasian Customs Union (USDA/PCIT database, 2020).

**California Distribution:** Each of the three sandbur species has been collected in all counties in southern California. Mat sandbur has been collected northwards in scattered locations in Fresno, Merced, Stanislaus, San Joaquin, Tuolumne, El Dorado, Yolo, Solano, Contra Costa, Glenn, and Lassen counties and coast sandbur occurs in occasional locations in San Luis Obispo, Monterey, Merced, Stanislaus, Solano, Sacramento, El Dorado, and Glenn counties. Southern sandbur has also been collected in Solano County (Calflora database, 2020; CDFA PDR database; Consortium of California Herbaria, 2020).

**California Interceptions:** Sandburs have been intercepted approximately 20 times at California border inspection stations on vehicles entering California from Arizona, Florida, Minnesota, Missouri, New Mexico, Oklahoma, and Texas, in alfalfa hay from Nevada, and in feed seed shipments from Argentina and Colorado. The majority of the intercepts that were able to be identified to species represent the coast sandbur, *C. spinifex* (CDFA PDR database, 2020).

The risk **sandburs** pose to California is evaluated below.

## **Consequences of Introduction:**

- 1) Climate/Host Interaction:** Risk is **Medium (2)**, as the plants are naturalized in California. Each of the species occurs in patchy areas in coastal and desert portions of southern California, while the more
-

cold-tolerant mat sandbur and coast sandbur also occur sporadically northwards in coastal counties and the Central Valley.

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:** The plants produce burs that are able to spread effectively on animals, motor vehicles, and equipment. They also sometimes occur as contaminants in shipments of hay or grain for animal feed. They are restricted by ecological preferences (e.g., disturbed, sandy soils). Sandburs receive 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:** Sandburs are injurious to livestock, can prompt new control activities, and could trigger quarantines with other states and countries. Sandburs receive a **High (3)** in this category.

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

**Economic Impact: C, D, F**

- 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: 3**

- 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:** The spiny fruits could adversely impact rare wildlife, such as the San Joaquin kit fox and the desert tortoise, by physically wounding them. Because of their potential to cause injuries to people and animals, additional treatment programs to control these species would be needed. Therefore, it receives a **High (3)** in this category.

**Environmental Impact: B, D**

- 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: 3**

- 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 sandburs: High (13)**

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:** Sandburs have been found to be established in several counties and at least two areas of 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 = **Medium (13–2=11)**

### Uncertainty:

Sandburs have been in California dating back to at least the 1800s, so uncertainty is low.

### Conclusion and Rating Justification:

Sandburs are invasive under suitable conditions and the spiny burs can move on livestock and vehicles. Although distributed in many suitable habitats in parts of southern California, all three species of sandbur have the potential to spread further in California and present an increased hazard to livestock in the state. Therefore, a rating of **B** for all three species of sandbur is recommended.

### References:

Calflora. 2020. Information on California plants for education, research and conservation, with data contributed by public and private institutions and individuals. Accessed: March 24, 2020:

[https://www.calflora.org/cgi-bin/species\\_query.cgi?where-calrecnum=1840](https://www.calflora.org/cgi-bin/species_query.cgi?where-calrecnum=1840)

[https://www.calflora.org/cgi-bin/species\\_query.cgi?where-calrecnum=1841](https://www.calflora.org/cgi-bin/species_query.cgi?where-calrecnum=1841)

[https://www.calflora.org/cgi-bin/species\\_query.cgi?where-calrecnum=1842](https://www.calflora.org/cgi-bin/species_query.cgi?where-calrecnum=1842)

California Department of Food and Agriculture (CDFA). 2020. Pest and damage record (PDR) database. Accessed March 25, 2020:

<https://pdr.cdfa.ca.gov/PDR/pdrmainmenu.aspx>

California Invasive Plant Council (Cal-IPC). 2007. Plant Assessment Form: *Cenchrus echinatus* and *C. longispinus*. Accessed: April 9, 2020

<https://www.cal-ipc.org/plants/risk/cenchrus-echinatus-risk/>

<https://www.cal-ipc.org/plants/risk/cenchrus-longispinus-risk/>

Consortium of California Herbaria (CCH). 2020. Data provided by the participants of the CCH. Regents of the University of California 2020. Accessed March 24, 2020:

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

DiTomaso, J. M. and Healy, E. A. 2007. Weeds of California and other Western States. University of California Agriculture and Natural Resources Publication 3488, pp. 1078-1082.

Firestone, J., 2014. Global Invasive Species Team. Bugwood Wiki. Accessed March 24, 2020:

[https://wiki.bugwood.org/Cenchrus\\_spp.](https://wiki.bugwood.org/Cenchrus_spp.)

---

Smith, J. P. 2012. *Cenchrus*. Pp. 1433-1434 in Baldwin, B. G., Goldman, D. H., Keil, D.J., Patterson, R., Rosatti, T.J., and Wilken, D.H., editors. The Jepson manual: Vascular Plants of California, second edition. University of California Press, Berkeley.

Stieber, M. T. and Wipff, J. K. 2003. *Cenchrus* L. Pp. 529-536 in Flora of North America Editorial Committee, editors. Flora of North America North of Mexico, vol. 25, Magnoliophyta: Commelinidae (in part): Poaceae, part 2. Oxford University Press, New York and Oxford.

United States Department of Agriculture (USDA), Agricultural Marketing Service (AMS). 2020. State Noxious Weed Seed Requirements Recognized in the Administration of the Federal Seed Act. Accessed September 2, 2020:

<https://www.ams.usda.gov/sites/default/files/media/StateNoxiousWeedsSeedList.pdf>

United States Department of Agriculture (USDA), Agricultural Research Service, National Plant Germplasm System. 2020. Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. Accessed September 2, 2020.

<https://npgsweb.ars-grin.gov/gringlobal/taxon/taxonomysimple>

United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS). 2020. Phytosanitary Certificate Issuance and Tracking System (PCIT). Accessed September 2, 2020.

<https://pcit.aphis.usda.gov/PEXD/faces/ViewPEXD.jsp>

United States Department of Agriculture (USDA), Natural Resource Conservation Service. 2020. The PLANTS database. Accessed September 2, 2020.

<https://plants.usda.gov/core/profile?symbol=CENCH>

## Author:

Dean G. Kelch, Environmental Program Manager; CDFA/PHPPS Permits and Regulation/Environmental Compliance/ PDAS; 2800 Gateway Oaks, Suite 200, Sacramento, CA 95833; Tel. (916) 403-6650; permits[@]cdfa.ca.gov.

## Responsible Party:

Robert Price, Primary State Botanist; California Department of Food & Agriculture; Seed Laboratory and Herbarium; 3294 Meadowview Road, Sacramento, CA 95832; Tel. (916) 738-6700;

---

permits[@]cdfa.ca.gov

---

**\*Comment Period: 10/09/2020 through 11/23/2020**

**\*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](mailto: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: B**

---