

## California Pest Rating Proposal for

*Bassia scoparia* (L.) A. J. Scott, kochia, Mexican fireweed, burningbush, summer cypress

Family: Brassicaceae

Current Pest Rating: Q, Z

Proposed Pest Rating: C

Synonyms: *Kochia scoparia* (L.) Schrad., *Chenopodium scoparia* L.

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Comment Period: **04/29/2022 through 06/13/2022**

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### Initiating Event:

*Bassia scoparia* has been assigned a rating of Q by the CDFA Botany Laboratory and requires a pest rating proposal to evaluate its risk to the state.

### History & Status:

**Background:** *Bassia scoparia* is an erect annual herb, up to 1-2 meters in height. The root system can reach 2.4 m (8 feet) deep and a 2.4 m horizontal spread (Invasive Plant Atlas, 2021). The stems are usually much-branched above the base, and can be glabrous or with spreading hairs. The foliage is greenish to yellowish green, often becoming reddish at maturity. The leaves are alternate, commonly hairy, especially along the margins, narrowly lanceolate or linear in shape with an entire margin, 5-75 mm long, sessile or narrowing to a “pseudopetiole” at base, and usually 3-5 veined below the midpoint (Hrusa and Wilken, 2012; Mosyakin, 2003). The inconspicuous flowers (approximately 2-3 mm wide) are either pistillate or bisexual, borne in small spicate clusters in the axils of bracts. The immature flowers tend to be obscured by abundant hairs in the inflorescence. The flowers have five small sepeloid perianth parts, each typically with a short horizontal membranous wing in the bisexual flowers. The one-seeded utricle fruits are positioned horizontally, with the seed surrounded by the perianth parts and the papery fruit wall at maturity. The dull-brownish seeds are flattened and ovoid to wedge-shaped, approximately 1-2 mm in length, grooved on each face, and commonly are flecked with darker brown or black (DiTomaso and Healy, 2007; Mosyakin, 2003; USDA/PLANTS database, 2022).

The narrow-leaved form of the species, form *trichophylla* (hort. ex Voss) Schinz and Thell., known as “summer-cypress”, has been widely cultivated as a garden ornamental for its attractive bright red autumn foliage, but may also escape (Mosyakin, 2003).

**Worldwide Distribution:** *Bassia scoparia* is native to temperate and often arid regions of Asia from Japan, Korea, and eastern Russia and China west to the Caucasus region, Cyprus, and Turkey and adjacent areas of European Russia (Mosyakin, 2003; USDA/GRIN, 2022). It is a widespread weedy species, naturalized in many countries of Europe and the Middle East, in northern Africa (Morocco), Australia, New Zealand, southern South America (Argentina), and

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many areas of the United States and Canada. In the U. S., it has been reported from the majority of states, but is less commonly found in the southeastern states and has apparently not been found in Hawaii, Arkansas, Florida, or Georgia (Invasive Plant Atlas, 2022; Mosyakin, 2003; USDA Plants database, 2022). It has been found in each of the southern provinces of Canada from British Columbia to Quebec and New Brunswick (Mosyakin, 2003). The species is primarily a weed of temperate regions and can reach elevations of 2590 meters in the Rocky Mountains of the United States (Thornton et al., 1974).

**Official Control:** *Bassia scoparia* is listed as an invasive plant in Connecticut and as a noxious weed in the states of Arizona, Ohio, Oregon, and Washington (Center for Invasive Species and Ecosystem Health, 2022). It is listed as a prohibited noxious weed seed in the state of Ohio (USDA/AMS, 2022). It is a prohibited noxious weed in several provinces of Australia (Queensland Government, 2022). It is also listed as a harmful organism in phytosanitary requirements by the countries of Australia, Brazil, and Peru (USDA/PCIT database, 2022).

**California Distribution:** *Bassia scoparia* has been reported from 35 or more counties along the entire length of California, with the greatest number of known localities found in northern and eastern California in the Modoc Plateau and Sierra Nevada and White Mountain regions and in southern California. In vouchered records from the Consortium of California Herbaria (CCH, 2022) and records from the CDFA PDR database (2022) *Bassia scoparia* has been collected from Humboldt, Modoc, Siskiyou, Trinity, and Lassen counties in far northern California, and Nevada, Placer, El Dorado, Alpine, Mariposa, Mono, and Inyo counties in the Sierra Nevada and White Mountain regions. It has been collected in scattered locations in the Sacramento and San Joaquin Valleys in Butte, Colusa, Yolo, Madera, Merced, Stanislaus, and Fresno counties, and in the coast ranges and San Francisco Bay area in Solano, Sonoma, Marin, San Francisco, Santa Cruz, Kings, and San Luis Obispo counties, and in coastal, montane, or desert areas of southern California in Santa Barbara, Ventura, Los Angeles, Orange, Kern, San Bernardino, Riverside, San Diego and Imperial counties. The Calflora database (2022) also indicates reported occurrences in Mendocino, Sacramento, San Joaquin, and Monterey counties. The earliest collection documented in the Consortium database was made in the 1948 in Santa Barbara County, and by the 1960's the species had been collected in scattered locations in an additional 14 counties from Humboldt, Siskiyou and Modoc counties in far northern California to Ventura, Los Angeles, Orange, and San Diego counties in southern California.

**California Interceptions:** Over 150 interceptions of *Bassia scoparia* have been submitted for identification to the CDFA Plant Pest Diagnostics Branch from 2003 to 2022, most commonly as a seed contaminant in grain or other agricultural seed shipped into the state and sampled for feed mill certification, or as a plant contaminant in alfalfa or straw hay being trucked into the state. It has also been found relatively frequently on grilles or beds of vehicles entering the state and several times on bee boxes (CDFA PDR database, 2022).

## Consequences of Introduction

### 1) Climate/Host Interaction: Score is **Medium (2)**

*Bassia scoparia* occurs in arid steppe and desert regions in its native area in Asia (Mosyakin, 2003). The species can tolerate a wide variety of soils, temperatures, and moisture conditions (Invasive Plant Atlas, 2022). It is found at elevations below 2300 meters (6562 feet) in California, where it has been collected in a variety of open or disturbed habitats including fields, roadsides, ditch margins, and seasonal wetlands as well as being grown as a garden ornamental (CCH, 2022; DiTomaso and Healy, 2007; Hrusa and Wilken, 2012).

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

- Low (1) Not likely to establish in California; or likely to establish in very limited areas.

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- **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)**

*Bassia scoparia* can occur wherever 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)**

*Bassia scoparia* reproduces only by seed. Seeds are small (approximately 1-2 mm long) and one per fruit, but numerous fruits are produced on each stem, and individual plants have been reported to produce up to 25,000 seeds under extremely favorable conditions (Friesen et al., 2009). The seeds can be dispersed locally by wind or water or by farm equipment or the feet or fur of animals, and the entire plant dries up at maturity and can be dispersed by wind as a tumbleweed (DiTomaso and Healy, 2007; Queensland Government, 2022). The species is dispersed over longer distances as a frequent seed contaminant in shipments of hay, grain or other crop seeds (CDFA PDR database, 2022), as well as being sold as an ornamental species.

Evaluate the natural and artificial dispersal potential of the pest.

- 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).**

*Bassia scoparia* was introduced into North America in the 1800's as an ornamental plant (Friesen et al., 2009), with the "summer cypress" form being especially attractive for its red mature foliage, but is problematic as an ornamental because of its weediness and high reproductive capacity. The plant is reported to have significant nutritional value as a forage plant for cattle when eaten in moderate quantities, but can be toxic to livestock when eaten as a substantial part of the diet due to the presence of saponins, alkaloids, oxalates, and nitrates, and can cause photosensitization in cattle, sheep, and horses (Friesen et al., 2009; Kingsbury, 1964).

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

- 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.**
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**5) Environmental Impact: Score is Medium (2)**

*Bassia scoparia* is a weed of agricultural land and disturbed or open habitats in its native range (Clapham, 1964) and as a naturalized species in Australia and North America (Queensland Government, 2021; Mosyakin, 2003).

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:

- 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 *Bassia scoparia*: **High (13)**

Low = 5-8 points

Medium = 9-12 points

High = 13-15 points

**6) Post Entry Distribution and Survey Information: Score is Medium (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) Final Score: Medium 11 (13-2=11)**

**Conclusion and Rating Justification:**

*Bassia scoparia* has been known from the state of California for over 70 years and continues to be introduced into the state relatively frequently as a contaminant of hay and commercial grain or other agricultural or vegetable seeds. The species occurs most commonly in open or disturbed arid or semiarid habitats, and some forms have been widely grown as ornamentals for their attractive mature foliage. The species is relatively widespread but of sporadic distribution in California and has been reported from at least 35 counties along the length of the state. The species has value as an ornamental but must be grown in a well-controlled manner to mitigate its spread as a weed. A rating of "C" is recommended under CCR 3162 because of the widespread distribution of the species within the state.

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### Uncertainty:

The species is a widespread weed in temperate areas of the world, and has been present in California for many years, so there is little uncertainty.

### References:

CalFlora. 2022. 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. Accessed: April 27, 2022. <https://www.calflora.org/>

CDFA Pest and Damage Record (PDR) Database. 2021. *Bassia scoparia*. Plant Health and Pest Prevention Services. California Department of Food and Agriculture. Accessed April 27, 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.

Friesen, L.F., Beckie, H.J., Warwick, S.I., and Acker, R.C. van. 2009. The biology of Canadian weeds. 138. *Kochia scoparia* (L.) Schrad. Canadian Journal of Plant Science 89: 141-167.

Fuller, T.C., and McClintock, E. 1986. Poisonous Plants of California. University of California Press, Berkeley.

Holm, L.G., Doll, J., Holm, E., Pancho, J.V., and Herberger, J.P. 1997. World Weeds: Natural Histories and Distribution. John Wiley and Sons, New York.

Hrusa, G.F., and Wilken, D.H. 2012. *Kochia scoparia* subsp. *scoparia*. In Jepson Flora Project (eds.). Jepson eflora. [https://ucjeps.berkeley.edu/eflora/eflora\\_display.php?tid=91769](https://ucjeps.berkeley.edu/eflora/eflora_display.php?tid=91769) Accessed April 27, 2022

Invasive Plant Atlas. 2022. Mexican fireweed, *Bassia scoparia* (L.) A. J. Scott in Invasive Plant Atlas of the United States. <https://www.invasiveplantatlas.org/subject.html?sub=19886> Accessed April 27, 2022

Kingsbury, J.M. 1964. Poisonous Plants of the United States and Canada. Prentice-Hall, Englewood Cliffs, N.J.

Mosyakin, S.L. 2003. *Kochia* Roth. Pp. 310-312 in Flora of North America Editorial Committee (eds.), Flora of North America North of Mexico. Volume 4, Magnoliophyta: Caryophyllidae, Part 1. Oxford University Press, New York and Oxford.

National Plant Board. 2021. <https://nationalplantboard.org/laws-and-regulations/> Accessed January 7, 2021

Queensland Government. 2022. Weeds of Australia Fact Sheet, *Bassia scoparia*. [https://keyserver.lucidcentral.org/weeds/data/media/Html/bassia\\_scoparia.htm](https://keyserver.lucidcentral.org/weeds/data/media/Html/bassia_scoparia.htm) Accessed April 27, 2022

Thornton, B.J., Harrington, H.D., and Zimdahl, R.L. 1974. Weeds of Colorado. Colorado State University Experiment Station Bulletin 514-S, Revised edition.

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United States Department of Agriculture (USDA), Agriculture Marketing Service (AMS). 2022. State Noxious-Weed Seed Requirements Recognized in the Administration of the Federal Seed Act.

<https://www.ams.usda.gov/sites/default/files/media/StateNoxiousWeedsSeedList.pdf> Accessed April 27, 2022.

United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS). 2022. PLANTS Database. <https://plants.usda.gov/core/profile?symbol=BASC5> Accessed April 27, 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/taxonomydetail.aspx> Accessed April 27, 2022.

United States Department of Agriculture (USDA), Phytosanitary Certificate Issuance and Tracking System (PCIT). 2022. Phytosanitary Export Database. <https://pcit.aphis.usda.gov/PEXD/faces/ViewHarmfulOrgs.jsp> Accessed April 27, 2022.

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**\*Comment Period:** 04/29/2022 through 06/13/2022

**\*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](mailto:permits[@]cdfa.ca.gov).

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**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;
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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.

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**Proposed Pest Rating: [C]**

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