CALIFORNIA DEPARTMENT OF FOOD & AGRICULTURE

California Pest Rating Proposal for

Koenigia polystachya (Wall. ex Meisn.) T. M. Schust. & Reveal, Himalayan knotweed

Family: Polygonaceae

Current Pest Rating: B

Proposed Pest Rating: A

Synonyms: *Polygonum polystachyum* Wall. ex Meisn.; *Persicaria wallichii* Greuter and Burdet; *Reynoutria polystachya* (Wall. ex Meisn.) Moldenke; *Rubrivena polystachya* (Wall. ex Meisn.) M. Král

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Comment Period: 04/27/2022 through 06/11/2022

Initiating Event:
Koenigia polystachya (as *Persicaria wallichii)* has previously been assigned a B-rating by the California Department of Food and Agriculture (CDFA), Plant Health and Pest Prevention Services, but has not previously gone through the current pest risk analysis procedure. *Koenigia polystachya (Persicaria wallichii)* 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:
Koenigia polystachya is perennial, rhizomatous subshrub up to 2 meters in height, with rhizomes that can spread several meters from the parent plant (Soll, 2004). Stems of *Koenigia polystachya* are erect and grow 80-100 centimeters (cm) in length. Stems are branching, angular and ribbed, hollow, and often swollen at the nodes (FOC, 2008; Hinds and Freeman, 2005). Leaves are lanceolate, five to 20 or more cm long, have pointed tips, and are often densely pubescent on the lower leaf surface and leaf margins. Knotweeds in general have a sheathing structure around the leaf nodes called an ocrea. *Koenigia polystachya* has dark or reddish-brown ocrea (FOC, 2008). The inflorescence is a dense, spreading panicle in shape, with pubescent to glabrous branches and clusters of small, white to pinkish, five-parted flowers (DiTomaso and Healy, 2013: Hinds and Freeman, 2005). The achenes are smooth, brown, triangular, approximately 2.5 mm long, and enclosed in a non-fleshy, persistent perianth (FOC, 2008). Above-ground plant parts die back in winter, but the brownish, somewhat woody stems persist (Soll, 2004).

<u>Worldwide Distribution</u>
Koenigia polystachya is native to temperate and tropical Asia including the countries of China, Afghanistan, India, Bhutan, Nepal, Pakistan, and Myanmar (CABI, 2022; USDA/GRIN, 2022). It is considered naturalized in Europe. In North America, it was introduced as an ornamental and has become naturalized in British Columbia and the states of Montana, Washington, Oregon, and California (USDA/NRCS, 2022).

Official Control:
Koenigia polystachya (as Persicaria wallichii) 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. *Koenigia polystachyum* (as *Persicaria wallichii*) is listed as a restricted noxious weed seed defined by California FAC Section 52258 and is subject to tolerances when found in agricultural seed shipments.

Koenigia polystachya (as *Persicaria wallichii*) is designated as a Class B noxious weed in the state of Washington and is subject to local eradication and control efforts. *Koenigia polystachya* (as *Polygonum polystachyum*) is designated as a B-rated noxious weed species in the state of Oregon and is subject to eradication and control efforts at the local level (NPB, 2022).

California Distribution:
The CalFlora Database contains 128 records of *Koenigia polystachya* (listed as *Polygonum polystachyum* and *Persicaria wallichii*) collected in California between 1940-2021. The number of collections per county are as follows: Humboldt (116); Del Norte (7); Mendocino (1); Placer (1); Santa Cruz(1). The CDFA Pest and Damage Record (PDR) database contains one additional record of *Koenigia polystachya* (as *Persicaria wallichii*) from Del Norte County in 2017 (CDFA/PDR database, 2022). The Consortium of California Herbaria database (CCH, 2022) has vouchered specimen records from the same five counties, with the earliest collections dating back to 1918 and 1925 in Humboldt County, and one additional collection from Golden Gate Park in San Francisco County in 1982, most likely representing a cultivated planting.

California Interceptions: There are no recorded interceptions of *Koenigia polystachya* in the CDFA PDR database.

Consequences of Introduction

1) **Climate/Host Interaction:** Score is **High (3)**
Koenigia polystachya can grow in a wide range of habitats with varying levels of soil moisture, nutrients, and light conditions. *Koenigia polystachya* can tolerate dry soils (CABI, 2019); however, establishment requires some soil moisture (DiTomaso and Healy, 2013). *Koenigia polystachya* can be found at elevations ranging from 0-4600 meters above sea level in waste areas, rocky slopes, meadows, wet forests, wetlands, valleys, riparian corridors, roadsides, ditches, irrigation canals, and other water drainage systems (CABI, 2019; DiTomaso and Healy, 2013).

   -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)**
Koenigia polystachyum 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)**
According to DiTomaso and Healy (2013) *Koenigia polystachya* can "spread primarily or perhaps exclusively, by woody rhizomes or fragmented stem sections that can root from the nodes." Root and stem fragments as small as 1 cm can form new plants (DiTomaso and Healy, 2013). *Koenigia polystachya* rhizome and stem fragments can be dispersed in waterways and by flooding (CABI, 2022), and moved by animals (beavers), on earth moving equipment, and in contaminated soil (Soll, 2004).

Seeds of *Koenigia polystachya* can be dispersed by wind and water; however, there is uncertainty regarding the ability of pure strains of *Koenigia polystachya* to reproduce sexually in North America (Soll, 2004).

- 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)**
Shipments of agricultural commodities, including agricultural seed, that are found to be infested with *Koenigia polystachya* are subject to quarantine and eradication measures if destined to a state where it is listed as a regulated noxious weed.

The large size and partially woody structure of the plant can be disruptive of rangeland and can interfere with agricultural equipment. The plants can also interfere with water transport when the plants become established along drainage canals or in riparian areas. Control and eradication of infestations for *Koenigia polystachya* are costly and time-consuming and must be carried out diligently for long periods of time in order to be successful (DiTomaso and Healy, 2013).

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)**
Perennial, rhizomatous growth and the numerous branching stems of *Koenigia polystachya* result in a clumping growth habit and the formation of dense colonies. *Koenigia polystachya* can create large stands that exclude native vegetation and impede seedling recruitment for woody species.

Loss of native plant species diversity can impact water quality, degrade habitats, and lead to disruptions throughout the ecosystem (King County Noxious Weed Control Program, 2022).

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 *Koenigia polystachya* **(High 15)**

Low = 5-8 points
Medium = 9-12 points
High = 13-15 points

1) **Post Entry Distribution and Survey Information**: Score is **Low (-1)**
Koenigia polystachya has been found in four northern California coastal counties (Del Norte, Humboldt, Mendocino, and Santa Cruz) and one county in the Sierra Nevada foothills (Placer).

-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 (15-1=14)**

Conclusion and Rating Justification:
Due to the High score of this analysis, and to help prevent the spread of *Koenigia polystachya* to new areas within California, an A-rating is recommended.

Uncertainty
It is unclear to what degree ornamental plantings of the Himalayan knotweed persist in California. The species has been present in north coastal counties of California for many decades, so there in little uncertainty about the risks to the environment posed by species. Himalayan knotweed has

been treated under scientific names in several different genera of Polygonaceae (e.g., as *Polygonum polystachyum*, *Rubrivena polystachya*, *Persicaria wallichii*, and currently as *Koenigia polystachya*) as generic concepts have changed with the use of molecular phylogenetic data to augment morphological systematics (Schuster et al., 2015), but the delimitation of the species has been stable.

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***Comment Period: 04/27/2022 through 06/11/2022**

***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.

Proposed Pest Rating: [A]