CALIFORNIA DEPARTMENT OF FOOD & AGRICULTURE

California Pest Rating Proposal for

Halogeton glomeratus (M. Bieb.) Ledeb., halogeton, saltlover

Family: Chenopodiaceae

Pest Rating: B

Synonyms: *Anabasis glomerata* M. Bieb.

Comment Period: 9/29/2020 through 11/13/2020

Initiating Event:

Halogeton glomeratus is designated as a noxious weed as defined by the California Food and Agriculture Code (FAC) Section 5004 and is listed in Title 3, California Code of Regulations, Section 4500. It has previously been rated by the Calfornia Department of Food and Agriculture, Plant Health and Pest Prevention Services, but has not previously undergone the current pest rating proposal process.

History & Status:

Background:

Halogeton glomeratus is an annual herbaceous plant that is adapted to growing in saline conditions. It has an initially decumbent growth habit, changing to erect through the growing season (Cronin and Williams, 1965). *Halogeton glomeratus* has a long taproot that can reach 1.3 meters deep and lateral roots can spread up to 45 centimeters (about 18 inches) in all directions (USDA/NRCS, 2020). Several main, branching stems can grow up to 1 meter in length, but the plant is usually smaller, typically less than 0.5 meters in height. Stems are fleshy and pink, red, or purple. Plant has small (0.4-2 cm long by 1-2 mm wide), greyish to bluish-green, narrowly cylindrical, somewhat succulent, sessile leaves, each with a stiff, bristle-like appendage at the tip. Flowers occur June through October and form in dense, axillary clusters including both bisexual and pistillate flowers. The five sepaloid parts of the perianth of the flower are dry and membranous and composed of a narrow claw at the base and a broadly fan-shaped, veined, apical winged portion approximately 2 to 4 mm long (Wetherwax and Wilken, 2012), which is cream-colored and often has red-violet areas. The winged perianth adheres to the small (approximately 1 to 2 mm) roundish single-seeded fruit and aids in dispersal by wind.

Worldwide Distribution: *Halogeton glomeratus* is native to arid and desert regions from northwest China and Mongolia to Central Asia and southeastern Russia (CABI, 2020). It was introduced to the Unites States, possibly as a seed contaminant, sometime before 1934 when it was first collected in

Wells (Elko County) in northeastern Nevada (Holmgren, 2003). By 1965 it had become established on over 10 million acres of western rangeland (Cronin and Williams, 1965). Currently it is known to be naturalized in Arizona, California, Colorado, Hawaii, Idaho, Montana, Nebraska, Nevada, New Mexico, Oregon, South Dakota, Utah, Washington, and Wyoming (USDA/NRCS, 2020).

Official Control: *Halogeton glomeratus* is a regulated noxious weed subject to quarantine and/or eradication in the states of Arizona, Hawaii, and Wyoming. It is listed as a class B weed subject to statewide biocontrol or other control measures in New Mexico and Oregon. It is listed a class C weed in Colorado subject to local control measures (NPB, 2020). *Halogeton glomeratus* does not appear on the United States Department of Agriculture, Federal Noxious Weed list.

Halogeton glomeratus is designated as a noxious weed species in the California Code of Regulations Title 3, Section 4500 and as a prohibited noxious weed seed in the California Seed Law (California Code of Regulations, Section 3854). Agricultural or vegetable seed lots contaminated with prohibited noxious weed seeds are considered a public nuisance in California and subject to seizure and abatement actions.

Halogeton glomeratus is designated as a prohibited noxious weed seed in Arizona, California, Colorado, Hawaii, Nevada, New Mexico, Oregon, and Wyoming and as a restricted noxious weed seed subject to labeling requirements in Idaho, Utah, and Washington (USDA/AMS, 2020).

California Distribution: *Halogeton glomeratus* is relatively widely distributed in sagebrush-scrub and desert scrub plant communities in Inyo, Kern, Lassen, Los Angeles, Modoc, Mono, and San Bernardino counties. It has been collected two times in both Nevada and Placer counties, and one time in Siskiyou, Sonoma, and Riverside counties (USDA,NRCS, 2020; CalFlora, 2020). The earliest vouchered California record in the Consortium of California Herbaria database (2020) is from 1948 in Lassen County along a railroad right of way.

California Interceptions: Since 2007, *Halogeton glomeratus* plant material, including seeds, has been collected 55 times in private vehicles, campers, moving and storage trucks, and honeybee shipments inspected at the California Border Protection Stations. Most of the vehicles entered the state from Nevada. Eight of the vehicles originated in either Utah, Colorado, Arizona, Florida, or Wyoming. Los Angeles County agricultural inspectors intercepted this species one time on a honeybee shipment from Nevada (CDFA/PDR database, 2020).

Consequences of Introduction

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

   Halogeton glomeratus is adapted to basic and saline soils where the pH ranges from 8-9 and the sodium chloride levels are at least 5,800 parts per million (CABI, 2020). It occurs on soils made up primarily of clay, loams, and sand (not silt) at elevations from 760-2100 meters (2,500 to 7,000 ft) above sea level, where the annual precipitation ranges from five to 13 inches per year (Cronin and Williams, 1965; USDA/NRCS, 2020). It is found in disturbed sites such as overgrazed pastures, roadsides, and railroad corridors with other plants including *Artemisia* spp. (sagebrush) and *Atriplex confertiflora* (shadscale).

Halogeton glomeratus is not well adapted to the California Floristic Province, which has a Mediterranean-type climate characterized by winter rainfall and summer drought.

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
- **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)**

Halogeton glomeratus 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)**.

Halogeton glomeratus reproduces entirely by seed. It is a prolific seed producer, with about 30 seeds produced per centimeter of stem and as many as 25,000 seeds per large plant (CABI, 2020). Seeds produced early in the season germinate soon after ripening. Seeds produced late in the season can remain viable in the soil for several years (Pavek, 1992).

Seeds can be dispersed by wind, water, animals, and human activity (CABI, 2020). Seeds can be spread along roads by road equipment, on vehicles, and in the movement of contaminated soil and seeds. Dried *Halogeton glomeratus* plants with attached seeds can tumble and spread seed several miles (Pavek, 1992). Seeds will remain viable after passing through the digestive tract of animals such as sheep and rabbits.

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)**

Halogeton glomeratus can have large economic impacts on the ranching industry in (USDA-GRIN, 2015). Although unpalatable and avoided where more desirable forage is available, *Halogeton glomeratus* has been shown to be poisonous to sheep and cattle (Pavek, 1992). Numerous cases of sheep poisoning, and death occurred in the 1940's and 1950's, and cases of cattle poisoning, and death have been reported, including one in 2006 and one in 2012 (Rood et al., 2014).

Economic impacts of *Halogeton glomeratus* infestation on pastureland can include the loss of cattle and sheep due to poisoning, the lowering of grazing potential on infested pastureland, the loss or reduced value of infested agricultural seed lots, and higher costs associated with care of animals when they graze on infested areas (Rood et al., 2014).

Recommendations for livestock management in areas infested with *Halogeton glomeratus* include the use of dietary supplements to counter the negative metabolic effects of *Halogeton glomeratus*, ensuring the availability of water and more desirable forage, and moving or excluding animals from heavily infested sites (Rood et al., 2014).

California has approximately 63 million areas of rangelands, including approximately 22 million acres classified as desert-scrub or sagebrush habitat (UC Rangelands, 2020). Average pasture or grazing land value in California is $10,000 per acre (USDA/NASS, 2020).

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)**

Halogeton glomeratus can impact the environment by altering chemical composition of the soil and reducing biodiversity (Pavek, 1992). Plant tissues of *Halogeton glomeratus* accumulate salts from the lower soil layers. The salts leach out as the plant deteriorates and increase the salinity of the soil surface, creating a condition that favors germination of salt-adapted *Halogeton glomeratus* seeds over non-halophytic plants (DiTomasso and Kyser, 2013). Crusts of accumulated salt can reduce water infiltration.

Species impacted by the presence of *Halogeton glomeratus* include the critically endangered cacti, *Sclerocactus brevispinus* and *S. wetlandicus* and *Astragalus anserinus* (a milkvetch that is a candidate species under the Endangered Species Act) (CABI, 2020).

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 *Halogeton glomeratus:* **High (14)**

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

1) 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 (12) 14-2=12

Uncertainty: The rate of spread of halogeton will be affected by ongoing control efforts and future environmental changes in the state.

Conclusion and Rating Justification: Halogeton is an introduced species that is toxic to livestock in rangeland habitats in California. Because it is established in multiple counties in more than one region of California, but has the potential to continue to expand its distribution in the state, a B-rating is recommended.

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***Comment Period:** **9/29/2020 through 11/13/2020**

***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.

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