

## California Pest Rating Proposal

### *Pyrrhocoris apterus* (L.): European firebug

Hemiptera: Pyrrhocoridae

Current Rating: Q

Proposed Rating: C

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Comment Period: **05/07/2024 – 06/21/2024**

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#### Initiating Event:

*Pyrrhocoris apterus* was found in the environment in California. It has not yet been through the pest rating process. Therefore, a pest rating proposal is needed.

#### History & Status:

**Background:** *Pyrrhocoris apterus* is red and black and somewhat similar in appearance to another pyrrhocorid common in California, *Scantius aegyptius*. Most adults have short wings, but a small proportion have fully developed wings; it is not clear if the long-winged form can fly. There is one generation per year. Adult females lay eggs in soil in the spring.

This bug feeds on seeds of a variety of plants, especially in the Malvaceae, but also Asparagaceae, Asteraceae, Betulaceae, Boraginaceae, Cornaceae, Cupressaceae, Fabaceae, Fagaceae, Lamiaceae, Rosaceae, Sapindaceae, and Ulmaceae. In the case of linden trees (*Tilia* spp.), fallen seeds are fed upon. Photographs posted on the citizen science web site iNaturalist suggest that *P. apterus* also feeds on seeds of various plants that have not fallen. In the Czech Republic, this bug was reported to primarily feed on seeds of Malvaceae and *Robinia pseudacacia* (Fabaceae). It is also reported to feed on dead and living insects. They may enter buildings in the fall to overwinter and are reported to release foul-smelling fluid if disturbed (Kristenová et al., 2011; Stokes and Wenninger, 2022).

**Worldwide Distribution:** *Pyrrhocoris apterus* is native to Europe and parts of Asia and it has been introduced elsewhere, including North America, where it is reported from Canada (Ontario) and the United States (California, Idaho, Utah). It occurs in northern Africa, Asia (including China), Europe (widespread, including the Mediterranean), and Oceania (Australia) (Mata et al., 2024; Forthman, 2024; iNaturalist; Oviedo Rojas and Jackson, 2018; Stokes and Wenninger, 2022; Thompson, 2017).

**Official Control:** *Pyrrhocoris apterus* is not known to be under official control anywhere.

**California Distribution:** *Pyrrhocoris apterus* was found on *Cotoneaster* sp. landscaping plants in San Bruno, San Mateo County, California in November 2023 (California Department of Food and Agriculture). There are several reports of this bug on the citizen science web site iNaturalist from the same general location in San Bruno and from another location in San Mateo County, suggesting it is well-established in that county (iNaturalist; Forthman, 2024).

**California Interceptions:** *Pyrrhocoris apterus* was intercepted on firewood from Utah in 2015 at a border station (California Department of Food and Agriculture).

The risk *Pyrrhocoris apterus* poses to California is evaluated below.

### **Consequences of Introduction:**

- 1) **Climate/Host Interaction:** *Pyrrhocoris apterus* is polyphagous and there are likely food plants present over much of California. It appears to be tolerant of a wide variety of climates, including Mediterranean. Therefore, it receives a **High (3)** in this category.
  - 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:** *Pyrrhocoris apterus* is polyphagous. Therefore, it receives a **High (3)** in this category.

– Low (1) has a very limited host range.

– Medium (2) has a moderate host range.

– **High (3) has a wide host range.**

3) **Pest Reproductive and Dispersal Potential:** The form of *P. apterus* with fully-developed wings may be able to fly. Therefore, it receives a **Medium (2)** in this category.

– 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:** The lack of reported impacts caused by *P. apterus*, considered along with its broad distribution (including in the Mediterranean region, where many important California crops are grown), suggests that economic impacts in California are highly unlikely. Therefore, it receives a **Low (1)** in this category.

**Economic Impact:**

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: Low**

- **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:** *Pyrrhocoris apterus* is expected to establish a widespread distribution in California and it feeds on seeds of a wide variety of plants. It is possible, though there is no evidence to support it, that feeding by this bug could impact native plants by reducing the number of viable seeds. Therefore, *P. apterus* receives a **Medium (2)** in this category.

**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 Score: Medium (2)**

- 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 *Pyrrhocoris apterus*: Medium (11)**

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:** *Pyrrhocoris apterus* was found in the environment in San Mateo County and is considered established there. It receives a **Low (-1)** in this category.

–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.

### **Final Score:**

7) The final score is the consequences of introduction score minus the post entry distribution and survey information score: Medium (10)

### **Uncertainty:**

This bug may have a strong preference for seeds of one or more California plants, though there is nothing to support this.

### **Conclusion and Rating Justification:**

*Pyrrhocoris apterus* appears to pose a very low risk to California. If it had potential to be a significant agricultural pest in California, this would likely be reflected in the literature. There may be a small risk of environmental impacts, however, such impacts are not seen in the literature. It is considered to be established in California. For these reasons, a “C” rating is justified.

## References:

California Department of Food and Agriculture. Pest and damage record database. Accessed December 4, 2023:

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

Forthman, M. 2024. First record of *Pyrrhocoris apterus* (Linnaeus, 1758) (Hemiptera: Heteroptera: Pyrrhocoridae) in California, U.S.A. *The Pan-Pacific Entomologist* 100:75-78.

iNaturalist. Accessed April 19, 2024:

<https://www.inaturalist.org/>

Kristenová, M., Exnerová, A., and Štys, P. 2011. Seed preferences of *Pyrrhocoris apterus* (Heteroptera: Pyrrhocoridae): Are there specialized trophic populations? *European Journal of Entomology* 108:581-586.

Mata, L., Vogel, B., Palma, E., and Malipatil, M. The arrival and spread of the European firebug *Pyrrhocoris apterus* in Australia as documented by citizen scientists. Accessed April 19, 2024: <https://ecoevorxiv.org/repository/view/3983/>

Oviedo Rojas, P. J. and Jackson, M. D. 2018. *Pyrrhocoris apteris* L. (Hemiptera: Pyrrhocoridae), a newly introduced family, genus, and species to Ontario and Canada. *Journal of the Entomological Society of Ontario* 149:27-32.

Stokes, B. S. and Wenninger, E. J. 2022. Red fire bug – A new Idaho invader? Accessed January 2, 2024:

<https://www.uidaho.edu/extension/publications/bul/bul1019>

Thompson, L. 2017. European firebug spreads in Utah. Accessed December 4, 2023:

<https://nhmu.utah.edu/articles/2023/05/european-firebug-spreads-utah>

## Responsible Party:

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**\*Comment Period: 05/07/2024 – 06/21/2024**

### **\*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.

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**Proposed Pest Rating: C**