CALIFORNIA DEPARTMENT OF FOOD & AGRICULTURE

California Pest Rating Proposal

Lissachatina fulica (Bowdich): giant African snail

Gastropoda: Achatinidae

Current Rating: Q

Proposed Rating: A

Comment Period: 06/07/2022 – 07/22/2022

Initiating Event:

One live *Lissachatina fulica* was surrendered by a Sonoma County resident in April 2022. This snail has not yet been rated. A pest rating proposal is needed.

History & Status:

Background: *Lissachatina fulica* is a large (the shell can reach 200 mm in length), nocturnal snail that is native to eastern Africa and has been introduced to many (mostly tropical) parts of the world (Terrestrial mollusc tool). It has broad feeding habits and reported foods include live and dead plants as well as livestock feces (Albuquerque et al., 2008). Among the wide variety of living plants it consumes (over 500 species) are many crops, including citrus, eggplant, tomato (fruit), lettuce, broccoli, cabbage, and peppers (Raut and Barker, 2002; Stronge, 2016; Thiengo et al., 2007). Reports suggest young plants, including seedlings, may be most vulnerable (Bhagat and Subba, 2013; Raut and Barker, 2002).

The greatest reported impacts are in small farms and vegetable gardens. Stronge (2016) reported significant impacts (including changes in practices, such as hand removal of snails and modification of surrounding habitat to limit snail infestations) in the Solomon Islands. Losses of up to 30% on small

farms in Brazil have been reported (Thiengo et al., 2007). There is also a nuisance impact of the presence of large numbers of large snails in populated areas.

It is commonly reported that populations of *L*. *fulica* drop off from initially high levels. The cause for this is not known (Raut and Barker, 2002). It has also been suggested that the impacts to agriculture and environment are exaggerated. Regarding environmental impacts, an experiment on Christmas Island found no impact of GAS to leaf litter or seedling mortality. The snail mostly fed on leaf litter and (to a much lesser degree) fruit (O'Loughlin and Green, 2017).

Lissachatina fulica vectors the rat lungworm, *Angiostrongylus cantonensis*, which causes eosinophilic meningitis in humans and livestock (Giant African snail). This snail leaves slime trails and feces wherever it travels, and people who come into contact with this material could become infected with lungworms (Budha and Naggs, 2008). Rat lungworms were found in *L*. *fulica* in southern Florida when that area was infested (Iwanowicz et al., 2015). Other species of lungworms affecting humans and domestic animals were found in this snail in Colombia by Penagos-Tabares et al. (2019).

In accordance with its apparent preference for tropical or subtropical areas, activity of *L*. *fulica* appears to be limited by humidity (it appears to require at least 50% relative humidity) (Raut and Barker, 2002). The snail goes into a dormant state during periods of low humidity.

Lissachatina fulica is eaten by people in some parts of the world. In addition, its slime has been used as a skin treatment (Borrero et al., 2009). Both of these uses have probably caused its introduction to new areas.

Most or all of the potential biological control agents that have been introduced around the world to control *L*. *achatina* are generalist predators, and this strategy has usually not resulted in control and has sometimes had environmental impacts, on native snails, for example (Cowie; Raut and Barker, 2002).

Worldwide Distribution: *Lissachatina fulica* is native to eastern Africa. It has been introduced to southeastern Asia (including India), Oceania (including Christmas Island, Hawaii, and the Solomon Islands), and South America (including Brazil and Ecuador) (Borrero et al., 2009; Sajan et al., 2019). It was introduced to and eradicated from Florida twice. The second eradication was declared in 2021 (Giant African snail).

Official Control: *Lissachatia fulica* is considered reportable by the United States Department of Agriculture (U.S. regulated plant pest table). It is a quarantine pest in Canada, Mexico, and Israel and on the "A1 list" for Chile (EPPO global database).

California Distribution: *Lissachatina fulica* is not known to occur in California (California Department of Food and Agriculture).

California Interceptions: *Lissachatina fulica* has been intercepted on ornamental plants and vegetables from Hawaii (California Department of Food and Agriculture).

The risk *Lissachatina fulica* poses to California is evaluated below.

Consequences of Introduction:

1) **Climate/Host Interaction:** This snail feeds on a wide variety of plant (living and dead) and non-plant (feces) materials, and food is not likely to be a limiting factor in its potential distribution in California. Climate, on the other hand, is likely to be a significant limiting factor. Most of the known areas of the world where this snail is established have a tropical or subtropical climate. It is not known to be established in areas with a Mediterranean or temperate climate. Humidity is reported to be a significant limiting factor of the activity of this snail. It seems likely that if *L. fulica* can establish in California at all, it would be limited to a small area of coastal California. It may be able to persist in areas with artificially high humidity (residential areas, for example), but

this has not been reported in other parts of the world with climate comparable to California. Therefore, it receives a **Low (1)** 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:** *Lissachatina fulica* feeds on a wide variety of plants and other organic matter. 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:** *Lissachatina fulica* could be moved with infested plant material. In addition, it might be moved by people for use as a pet. 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:** *Lissachatina fulica* clearly causes impacts to agriculture, although these impacts appear to be limited to certain environments (small farms in tropical and subtropical areas) and, at least in some cases, appear to diminish over time. If it was able to become established in California, it could decrease yield and increase production costs. Hand removal and other labor-intensive techniques of control may be required. A variety of lungworms are known to be carried by this snail; some of them could affect not only farmworkers but livestock as well. As this snail is a regulated pest in other countries (including Canada and Mexico), its presence in California could result in the loss of markets. Therefore, it receives a **High (3)** in this category.

Economic Impact: A, B, C, D, E, 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: High

– 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:** *Lissachatina fulica* is unlikely to become established in a large portion of California. Climate is likely to limit it to perhaps parts of coastal southern California and possibly residential and agricultural areas in other parts of the state. This snail is a generalist feeder. It therefore seems unlikely that it will have significant impacts on native habitats or species in California if it was established here. It is a well-known pest of small farms and gardens, and it could impact gardens and ornamental plantings in California. Infestations could trigger treatments. Therefore, *L. fulica* receives a **Medium (2)** in this category.

Environmental Impact: D, E

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: High (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 *Lissachatina fulica*: Medium (12)

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:** *Lissachatina fulica* is not known to be established in California. It receives a **Not established (0)** 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 (12)

Uncertainty:

Lissachatina fulica may not be capable of establishing anywhere in California for climate reasons. There is low uncertainty regarding its presence in the state; a snail this large and with a clear preference for human-inhabited areas is unlikely to go unnoticed.

Conclusion and Rating Justification:

Lissachatina fulica is a snail that is not known to be established in California. It appears unlikely to be capable of establishing in more than perhaps a small fraction of the state. However, it poses a risk to agriculture and gardens in residential areas. For these reasons, an "A" rating is justified.

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Responsible Party:

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***Comment Period: 06/07/2022 – 07/22/2022**

***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