

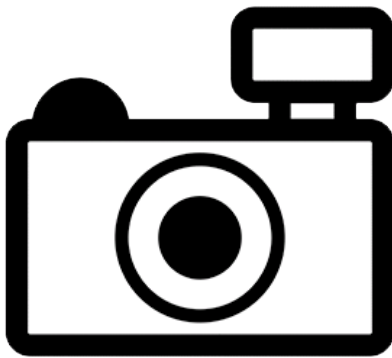
Maleny Crayfish (*Euastacus urospinosus*)

Ecological Risk Screening Summary

U.S. Fish and Wildlife Service, November 2011

Revised, May 2018

Web Version, 5/29/2018



No Photo Available

1 Native Range and Status in the United States

Native Range

From Coughran and Furse (2010):

“This species is endemic to Queensland, Australia. It is restricted to a tributary of Obi Obi Creek, between Maleny and Mapleton in the Blackall Ranges, and other sites in the Conondale Ranges (Morgan 1988, Borsboom 1998).”

From McCormack and Van der Werf (2013):

“The Maleny Crayfish *Euastacus urospinosus* has previously only been recorded from Booloumba and Obi Obi Creeks, Mary River, Queensland. Recent biological surveys of the region have extended its known distribution to include rainforested streams draining both sides of the Conondale Range into the Mary and Brisbane Rivers.”

Status in the United States

This species has not been reported as introduced or established in the United States. There is no indication that this species is in trade in the United States.

From Washington Department of Fish and Wildlife (2018):

“Prohibited aquatic animal species. RCW 77.12.020

These species are considered by the commission to have a high risk of becoming an invasive species and may not be possessed, imported, purchased, sold, propagated, transported, or released into state waters except as provided in RCW 77.15.253. [...] The following species are classified as prohibited animal species: [...] Family Parastacidae: Crayfish: All genera except *Engaeus*, and except the species *Cherax quadricarinatus* [sic], *Cherax papuanus*, and *Cherax tenuimanus*.”

Means of Introduction into the United States

This species has not been reported as introduced or established in the United States.

Remarks

From Coughran and Furse (2010):

“*Eu[a]stacus urospinosus* has been assessed as Endangered under [IUCN Red List] criterion B1ab(iii). This species has a severely fragmented distribution, is known from only two locations, and has an extent of occurrence of approximately 200 km². There has been a continuing decline in the quality of habitat due to the destructive nature of a number of exotic species in the area, some of which also predate upon this species. There is also destruction of suitable rainforest habitat in parts of its range. This species also faces the consequences of global temperature rise. As a restricted range species, dependent on cool, clear headwater streams, a slight increase in temperature could rapidly extirpate this species. This [sic] species is also thought to be subject to illegal fishing pressure, which is likely to drive significant declines in the population owing to its slow growth rate, coupled with fragmented distribution.”

From McCormack and Van der Werf (2013):

“The newly extended distribution, along with an assessment of current threats, suggests that the current IUCN listing of ‘Endangered’ could potentially be downgraded to ‘near threatened’, but only after a genetic analysis to assess the possible isolation of populations between catchments.”

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From WoRMS (2018):

“Biota > Animalia (Kingdom) > Arthropoda (Phylum) > Crustacea (Subphylum) > Multicrustacea (Superclass) > Malacostraca (Class) > Eumalacostraca (Subclass) > Eucarida (Superorder) > Decapoda (Order) > Pleocyemata (Suborder) > Astacidea (Infraorder) > Parastacoidea (Superfamily) > Parastacidae (Family) > *Euastacus* (Genus) > *Euastacus urospinosus* (Species)”

“Status accepted”

Size, Weight, and Age Range

From McCormack and Van der Werf (2013):

“Our *Euastacus urospinosus* specimens ranged in size from 11.6-43.5 mm OCL [occipital carapace length] [...]”

From Borsboom (1998):

“The smallest free-living *E. urospinosus* had an OCL of 5.5 mm, the largest female recorded was 51.8 mm OCL (63.5 g) and the largest male was 54.1 mm OCL and 84.5 grams.”

Environment

From Coughran and Furse (2010):

“This species inhabits cool, clear fast flowing headwaters in rainforested areas. Like other species of *Euastacus*, this species prefers heavily shaded, well oxygenated waters where it can burrow under logs and rocks (Horwitz 1990).”

“Freshwater”

From Borsboom (1998):

“Creek water was below 20°C for most of the year and reached a maximum of 22.0-22.5°C. Minimum groundwater temperature (at burrow depth) in mid-winter was up to 4.5°C warmer than minimum water temperature in the creek riffle zones.”

Climate/Range

From McCormack and Van der Werf (2013):

“Our *Euastacus urospinosus* specimens [...] were found at elevations of 415-613 m.”

Distribution Outside the United States

Native

From Coughran and Furse (2010):

“This species is endemic to Queensland, Australia. It is restricted to a tributary of Obi Obi Creek, between Maleny and Mapleton in the Blackall Ranges, and other sites in the Conondale Ranges (Morgan 1988, Borsboom 1998).”

From McCormack and Van der Werf (2013):

“The Maleny Crayfish *Euastacus urospinosus* has previously only been recorded from Booloumba and Obi Obi Creeks, Mary River, Queensland. Recent biological surveys of the

region have extended its known distribution to include rainforested streams draining both sides of the Conondale Range into the Mary and Brisbane Rivers.”

Introduced

No introductions of this species have been reported.

Means of Introduction Outside the United States

No introductions of this species have been reported.

Short Description

Coughran (2002) describes the following as distinguishing morphological traits of *E. urospinosus*: small to medium suborbital spine; 1-3 small thoracic spines, ranging from blunt to moderately sharp; 2-3 Li spines on the second stomite on individuals of at least 20 mm OCL, ranging from blunt to moderately sharp; no dorsal apical propodal spines or spines above the propodal cutting edge; 5, or rarely 6, mesal propodal spines; usually one mesal apical dactylar spine; usually one apical spine above the dactylar cutting edge on individuals of at least 20 mm OCL; 4 mesal carpal spines; medium/large to small ventral spine size; usually 3-4 ventromesial spines; and 1-2 small dorsal carpal spines.

Biology

From Coughran and Furse (2010):

“Few specimens have been collected of this species from the Maleny and Mapleton localities, but in a more intensive, long-term study in the Conondale Ranges, Borsboom (1998) collected it in high numbers (J. Coughran and J.M Furse pers. comm. 2009).”

From McCormack and Van der Werf (2013):

“Berried females were observed only in May, and a female of 36 grams, and 43.5 mm OCL [occipital carapace length], had 67 eggs.”

“*Euastacus urospinosus* is a burrowing crayfish preferring cryptic habitat. It typically makes two types of burrows. Smaller crayfish less than 28 mm OCL [occipital carapace length] make relatively rudimentary burrows with only one or two entrances under rocks or other structures, and which usually extend no more than 300 mm into creek banks. They were always in wet areas, but burrows did not always reach water and many were just in wet sandy/rock areas along the stream edges or gravel bars. Larger adults, conversely, make deep burrows that are not connected to the creek and range deep into the rainforest adjacent to the creeks, or along ephemeral drainage gullies. Small drainage gullies through the rainforest that were dry on the surface during our survey, but would hold flowing water during rain events, were favoured areas. Burrows were also found in riparian rainforest that would only have water coverage during major flood events, and in such cases, burrows typically went down to the water table. These could be as deep as 1m or more, but where the water table was at as little as 300 mm depth, the burrows would still be long. Most of the smaller adult burrows we managed to excavate were generally 0.85-1.2 m in total depth with an average of three (occasionally 2-5) surface entrances, several

blind tunnels, and a chamber at the bottom. The lower tunnels and chamber were usually flooded. Most adult burrows were in the rainforest floor adjacent to small flowing streams, with a particular concentration of burrows around palm tree roots [...] It was common for the whole forest floor in palm valleys to be riddled with burrows (McCormack 2012).”

“Two important factors governing the presence of *Euastacus urospinosus* became apparent during our work: 1) bangalow palm trees (*Archontophoenix cunninghamiana*) must be present; and 2) *Cherax* crayfish must be absent. Streams without palms scattered along the banks did not seem to support *E. urospinosus*, and even at over 500 m elevation invariably contained a *Cherax* species. [...] Conversely, when *Cherax* was absent but *E[euastacus] hystricosus* present, the two *Euastacus* species cohabited, with *E. hystricosus* in the large main streams, while *E. urospinosus* preferred the stream margins and banks as well as the smaller feeder streams that penetrate deep into the rainforest.”

“*Euastacus urospinosus*, like many species of its genus, are aggressive and will whip around to face any threat, raising their claws and snapping whilst rapidly retreating backwards, seeking to retreat under shelter or down their burrow. No crayfish were observed wandering the creeks or forest floor during the day, however, occasionally the tips of crayfish claws could be seen at the entrance to the burrow in the late afternoon.”

From Coughran (2013):

“Monroe (1977) and Borsboom (1998) observed a tendency for *Euastacus robertsi* and *E. urospinosus* to sit at burrow entrances at night, which is suggestive of a nocturnal nature.”

From Borsboom (1998):

“The data indicate that *E. urospinosus* is a winter brooder with a fixed annual cycle and a single synchronised release of juveniles in December, but the trigger for release is unknown. [...] Egg incubation is 4-5 months. [...] About one third of mature females recorded from late July to late November were not carrying eggs or juveniles.”

“It has been estimated that female *E. urospinosus* take approximately 6 years to reach reproductive maturity [...]”

Human Uses

From McCormack and Van der Werf (2013):

“All *Euastacus* species are classed as ‘no take’ and protected in Queensland. [...] From our own research in the area, and after consultation with other researchers, we believe *E. urospinosus* is not generally susceptible to illegal or recreational fishing.”

Diseases

From McCormack and Van der Werf (2013):

“Many specimens of *E. urospinosus* had abundant colonies of small white commensal temnocephalans (Platyhelminthes: Turbellaria) covering their bodies, and ectocommensal worms (Phreodrilid oligochaetes) were also observed on specimens from the Brisbane River drainage.”

No OIE-reportable diseases have been documented for this species.

Threat to Humans

No information available.

3 Impacts of Introductions

No information available. No introductions of this species have been reported. The Washington Department of Fish and Wildlife (2018) has listed the crayfish *Euastacus urospinosus* as a prohibited species.

4 Global Distribution



Figure 1. Known global distribution of *Euastacus urospinosus*, reported from Queensland, Australia. Map from GBIF Secretariat (2017). The location in western Queensland was excluded from the climate matching analysis because the coordinates do not match the verbal description of the location given in GBIF Secretariat (2017).

5 Distribution within the United States

This species has not been recorded in the U.S.

6 Climate Matching

Summary of Climate Matching Analysis

The climate match (Sanders et al. 2014; 16 climate variables; Euclidean Distance) for *Euastacus urospinosus* was high in parts of central and northern Florida and central coastal Texas. Medium match extended along the Atlantic and Gulf of Mexico coastlines from Maryland to Texas, and then north into the Southern Plains. There was also a patchy area of mostly medium match in the Southwest. The climate match was low for the remainder of the contiguous U.S. Climate 6 score indicated that the contiguous U.S. has a medium climate match overall. Scores between 0.005 and 0.103 are classified as medium match; Climate 6 score for *E. urospinosus* was 0.025.

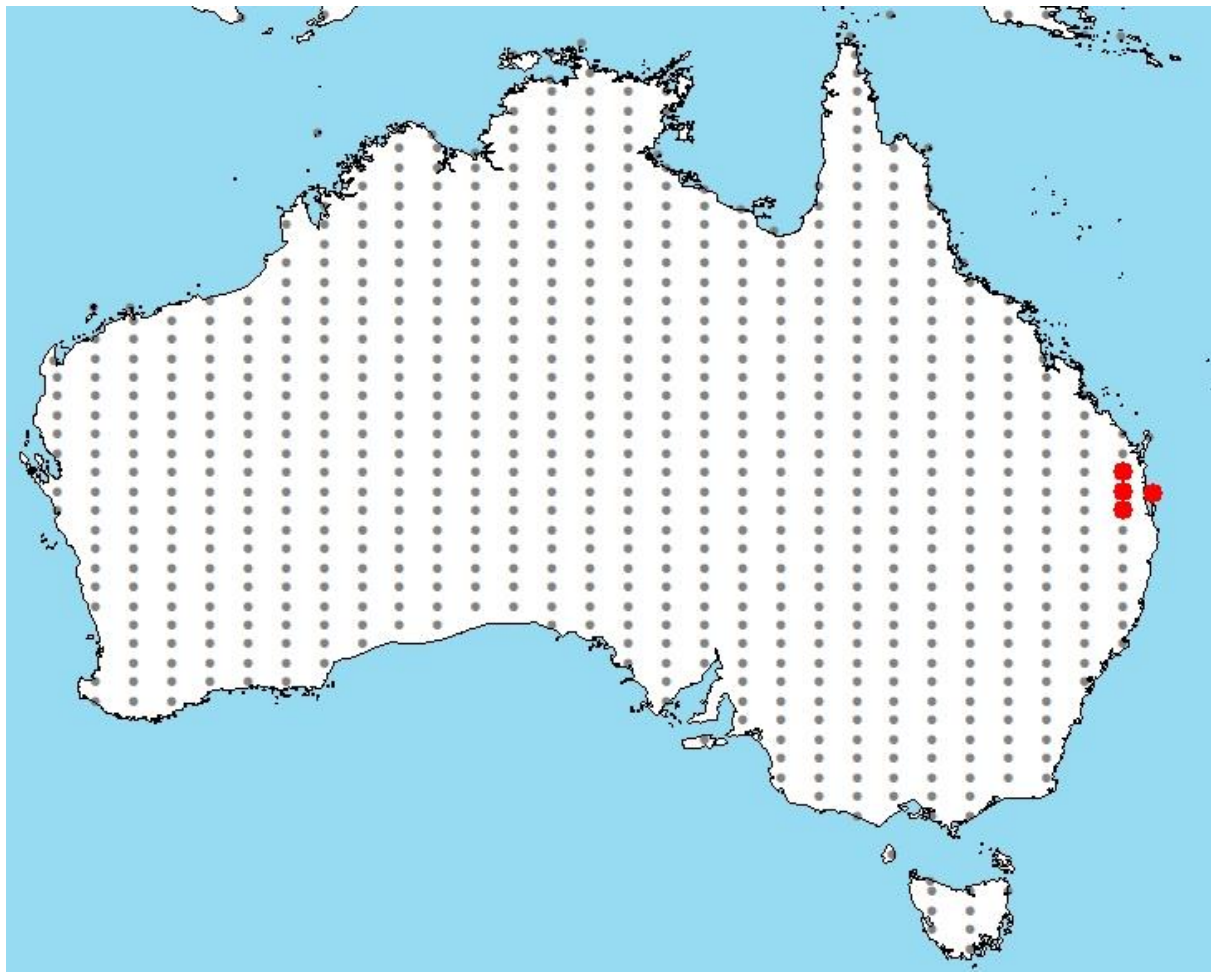


Figure 2. RAMP (Sanders et al. 2014) source map showing weather stations in Australia selected as source locations (red) and non-source locations (gray) for *Cherax urospinosus* climate matching. Source locations from GBIF Secretariat (2017).

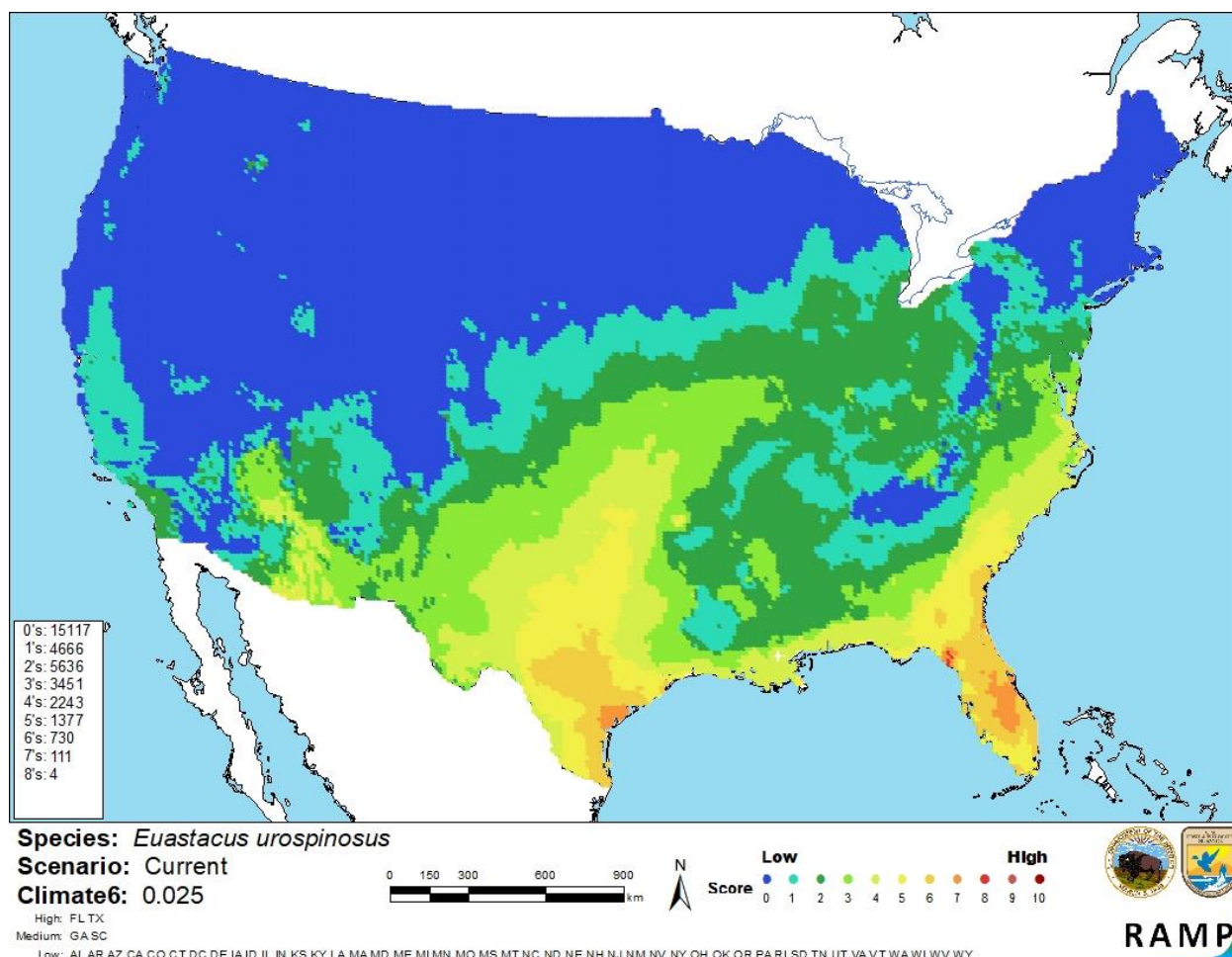


Figure 3. Map of RAMP (Sanders et al. 2014) climate matches for *Cherax urospinosus* in the contiguous United States based on source locations reported by GBIF Secretariat (2017). 0=Lowest match, 10=Highest match. Counts of climate match scores are tabulated on the left.

The “High”, “Medium”, and “Low” climate match categories are based on the following table:

Climate 6: Proportion of (Sum of Climate Scores 6-10) / (Sum of total Climate Scores)	Climate Match Category
$0.000 \leq X \leq 0.005$	Low
$0.005 < X < 0.103$	Medium
≥ 0.103	High

7 Certainty of Assessment

Information is available on the biology, ecology, and distribution of *Euastacus urospinosus* from a couple of detailed studies of the species. Impacts of introduction are unknown because there have been no introductions reported. Without further information about impacts of introduction, certainty of this assessment is low.

8 Risk Assessment

Summary of Risk to the Contiguous United States

Euastacus urospinosus is an Australian crayfish native to high-elevation rainforest surrounding headwater streams. The known native distribution of *E. urospinosus* has expanded over the past ten years as more research has been done on this species. *E. urospinosus* has not been reported as introduced outside its native range, so any impacts of introduction remain unknown. Climate match to the contiguous U.S. is medium, with the highest matches occurring in Florida and Texas. Overall risk to the contiguous U.S. is uncertain.

Assessment Elements

- **History of Invasiveness: Uncertain**
- **Climate Match: Medium**
- **Certainty of Assessment: Low**
- **Overall Risk Assessment Category: Uncertain**

9 References

Note: The following references were accessed for this ERSS. References cited within quoted text but not accessed are included below in Section 10.

- Borsboom, A. 1998. Aspects of the biology and ecology of the Australian freshwater crayfish, *Euastacus urospinosus* (Decapoda: Parastacidae). Proceedings of The Linnean Society of New South Wales 119:87-100.
- Coughran, J. 2002. A new species of the freshwater crayfish genus *Euastacus* (Decapoda: Parastacidae) from northeastern New South Wales, Australia. Records of the Australian Museum 54:25-30.
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Sanders, S., C. Castiglione, and M. Hoff. 2014. Risk Assessment Mapping Program: RAMP. U.S. Fish and Wildlife Service.

Washington Department of Fish and Wildlife. 2018. WAC 220-12-090 classification - nonnative aquatic animal species. Washington Department of Fish and Wildlife, Olympia, Washington. Available: <https://wdfw.wa.gov/ais/wac.html>. (May 2018).

WoRMS. 2018. *Euastacus urospinosus* (Riek, 1956). In World Register of Marine Species. Available: <http://www.marinespecies.org/aphia.php?p=taxdetails&id=885670>. (May 2018).

10 References Quoted But Not Accessed

Note: The following references are cited within quoted text within this ERSS, but were not accessed for its preparation. They are included here to provide the reader with more information.

Horwitz, P. 1990. The conservation status of Australian freshwater crustacea with a provisional list of threatened species, habitats and potentially threatening processes. Report number 14. Australian National Parks and Wildlife Service, Canberra.

McCormack, R. B. 2012. The spiny freshwater crayfish of Australia - a guide to the *Euastacus* freshwater crayfish of Australia. CSIRO Publishing, Melbourne, Australia.

Monroe, R. 1977. A new species of *Euastacus* (Decapoda: Parastacidae) from north Queensland. *Memoirs of the Queensland Museum* 18(1):65–67, plate 19.

Morgan, G. J. 1988. Freshwater crayfish of the genus *Euastacus* Clark (Decapoda: Parastacidae) from Queensland. *Memoirs of The Museum of Victoria* 49: 1-49.