

Cusped Crayfish (*Cherax cuspidatus*)

Ecological Risk Screening Summary

U.S. Fish and Wildlife Service, August 2011
Revised, September 2012 and November 2017
Web Version, 5/9/2018



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1 Native Range and Status in the United States

Native Range

From Austin (2010):

“This species is found only in coastal areas south of the Brunswick Heads, to Port Macquarie New South Wales, Australia. A subpopulation in Kingscliff is now thought to be extinct as repeated surveys have failed to find any individuals (C.M. Austin pers. comm. 2008). In a recent study this species was recorded from 26 sites, from the Brunswick, Clarence and Richmond River catchments, in addition to some minor coastal drainages (Coughran *et al.* 2008). It is further suggested this species may also be present within the Tweed River catchment where it was historically recorded (Coughran *et al.* 2008).”

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 U.S.

From FFWCC (2017):

“Prohibited nonnative species are considered to be dangerous to the ecology and/or the health and welfare of the people of Florida. These species are not allowed to be personally possessed or used for commercial activities. Very limited exceptions may be made by permit from the Executive Director [...] [The list of prohibited nonnative species includes] *Cherax cuspidatus*”

From Washington Department of Fish and Wildlife (2017):

“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 et al. (2008):

“[...] attempts to cross-breed *C. cuspidatus* with other similar yabby species were unsuccessful (Lawrence 1998).”

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From GBIF Secretariat (2017):

“Kingdom	Animalia
Phylum	Arthropoda
Class	Malacostraca
Order	Decapoda
Family	Parastacidae
Genus	<i>Cherax</i> Erichson, 1846
Species	<i>Cherax cuspidatus</i> Riek, 1969”

“SPECIES | ACCEPTED”

Size, Weight, and Age Range

No information available.

Environment

From Coughran et al. (2008):

“*Cherax cuspidatus* is a drought-tolerant species, having been found in some habitats that had been dry for over 12 months.”

“The highest densities observed were in heathland drains and swamps, where the pH was extremely acidic (overall range: 3.98 – 7.48) and the D.O. concentration was often well below 4.0 mg L⁻¹, and as low as 1.44 mg L⁻¹. Relatively high conductivities (overall range: 138 – 2980 μS cm⁻¹) were recorded at sites that were heavily affected by agriculture.”

Climate/Range

From Coughran et al. (2008):

“The water temperature of the habitats ranged from 15°C to 30°C.”

Distribution Outside the United States

Native

From Austin (2010):

“This species is found only in coastal areas south of the Brunswick Heads, to Port Macquarie New South Wales, Australia. A subpopulation in Kingscliff is now thought to be extinct as repeated surveys have failed to find any individuals (C.M. Austin pers. comm. 2008). In a recent study this species was recorded from 26 sites, from the Brunswick, Clarence and Richmond River catchments, in addition to some minor coastal drainages (Coughran *et al.* 2008). It is further suggested this species may also be present within the Tweed River catchment where it was historically recorded (Coughran *et al.* 2008).”

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

From Coughran et al. (2008):

“The morphological analyses revealed limited variation in *C. cuspidatus* from across its range, and the species is generally consistent with the most recent diagnosis (Austin 1986).”

From Coughran and Leckie (2007):

“We have known people to misidentify the native *C. cuspidatus*, which often develops an orange-red colour on the tips of the chelae and the ventral surface of the claw, as ‘red claw’.”

From Coughran (2005):

“Several useful features readily distinguish *Cherax leckii* from the only other *Cherax* in the coastal north of the state, *C. cuspidatus* [...]. In comparison to *C. cuspidatus*, *C. leckii* has: a more triangular and downturned rostrum, with weakly developed carinae that do not extend posteriorly as far as the postorbital ridges; very poorly developed (almost obsolete) postorbital ridges and spines; a sternal keel much sharper and higher in profile; a broader, more rotund body shape; and fewer mesial propodal tubercles.”

Biology

From Coughran et al. (2008):

“*Cherax cuspidatus* was recorded in a wide range of habitats, including heathland, sclerophyll forest and agricultural pasture. The species appears to be very tolerant to anthropogenic influences such as total clearing of vegetation, habitat disturbance and eutrophication caused by cattle grazing. The sites varied from dry gullies with subsurface moisture to swamps, lakes and streams.”

“Animals dig multi-chambered burrows, shallow enough that they can be caught by working the hand and two thirds of the forearm into the burrow chamber. Only one animal per burrow system was caught by this method during the study, and the much greater number of crayfish evident at some sites (via other capture methods or observation) than could be explained by the number of burrow systems would suggest that the majority of animals do not burrow. In other words, the finite amount of habitat available for burrows does not appear to be a major factor limiting the density of the population. At sites where the substratum is finer, the species also commonly occurs in very shallow depressions (not burrows) dug under rocks or woody debris. The species was frequently found in such depressions in clearly drought-stricken habitats, and although the shallow depressions hold no water, the moistness of the underlying clay presumably creates a sufficiently humid environment.

“Some *C. cuspidatus* collected from terrestrial burrows were torpid, others were active.”

“*C. cuspidatus* is a widespread species, and consideration of conservation status requires some measure of population sizes, or declines or fluctuations in population size or extent of occurrence. There are no data available to determine this as yet [...].”

“Crayfish associates of *C. cuspidatus* are; *E[uaustacus] valentulus* in sclerophyll forest and cleared pasture, *Tenuibranchiurus* sp. at both sites where the latter was recorded, and *E. gumar* at some sites that mark a transition between the lowland (*C. cuspidatus*) and highland (*E. gumar*) distributions of these species.”

From Coughran (2005):

“[...] undeveloped eggs of [...] *C. cuspidatus* are pale green.”

Human Uses

From Coughran et al. (2008):

“*Cherax cuspidatus* attains a suitable size, and occurs in easily accessible habitats, to constitute a recreational fishery. However, no specific guidelines are in place, and the species may be susceptible to localised exploitation.”

Diseases

From Coughran and Leckie (2007):

“[...] a low incidence of disease was recorded in a recent study of populations of crayfish endemic to northeastern New South Wales (Coughran 2005[b]).”

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

Threat to Humans

No information available.

3 Impacts of Introductions

No introductions of this species have been reported. The Florida Fish and Wildlife Conservation Commission (FFWCC 2017) and the Washington Department of Fish and Wildlife (2017) have listed the crayfish *Cherax cuspidatus* as a prohibited species.

4 Global Distribution



Figure 1. Known global distribution of *Cherax cuspidatus*, reported along the eastern coast of Australia. Map from GBIF Secretariat (2017).

5 Distribution Within the United States

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

6 Climate Matching

The climate match (Sanders et al. 2014; 16 climate variables; Euclidean Distance) was high in scattered locations in northern Florida and along the Atlantic coast from northern Florida through Georgia and South Carolina. It was medium in much of the remainder of the coastal states from the mid-Atlantic to a portion of Texas along the Gulf Coast and parts of the Midwest. The match was lowest in the Interior West, northern New England, and the North-Central region. Climate6 score indicated that the contiguous U.S. has a low climate match overall. The range of scores classified as low climate match is 0.000 to 0.005, inclusive; Climate6 score for *Cherax cuspidatus* was 0.004.

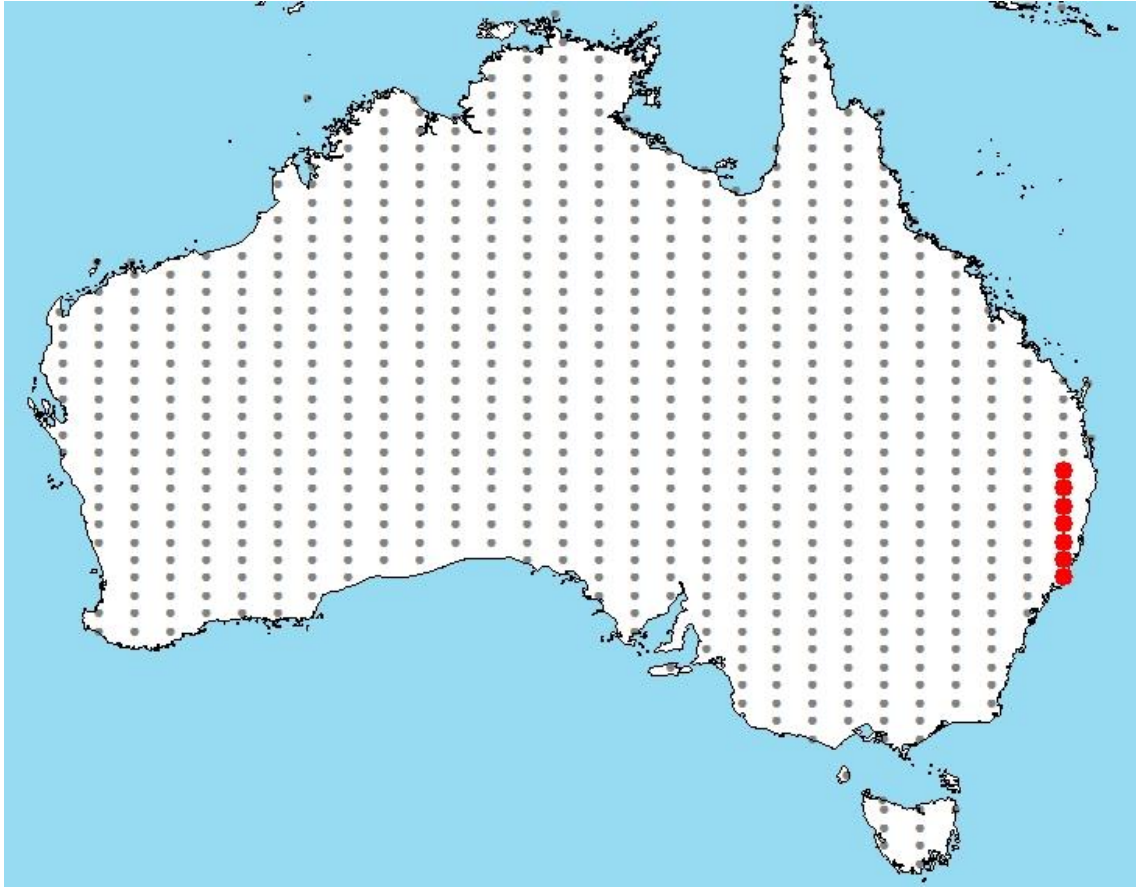


Figure 2. RAMP (Sanders et al. 2014) source map showing weather stations in Australia selected as source locations (red) and non-source locations (gray) for *Cherax cuspidatus* climate matching. Source locations from GBIF Secretariat (2017).

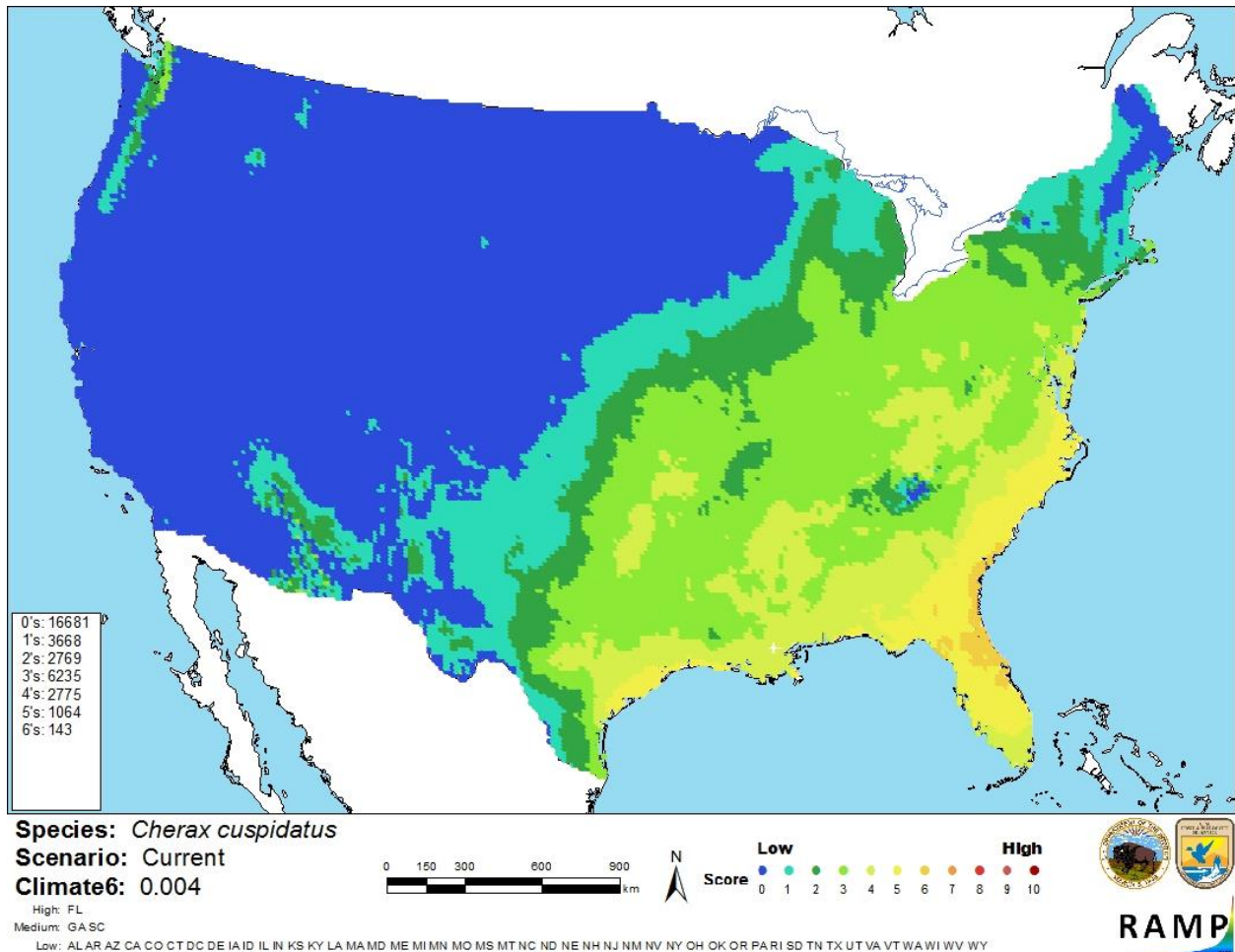


Figure 3. Map of RAMP (Sanders et al. 2014) climate matches for *Cherax cuspidatus* in the contiguous United States based on source locations reported by GBIF Secretariat (2017). 0=Lowest match, 10=Highest match.

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
$0.000 < X < 0.005$	Low
$0.005 < X < 0.103$	Medium
≥ 0.103	High

7 Certainty of Assessment

Some information is available on the biology, ecology, and distribution of *Cherax cuspidatus*. However, no introductions of this species have been reported, so impacts of introduction remain unknown. Because of the lack of introduction history, the certainty of this assessment is low.

8 Risk Assessment

Summary of Risk to the Contiguous United States

Cherax cuspidatus is a crayfish native to northeastern coastal New South Wales, Australia. The species may be exploited through recreational fishing in its native range, but no formal fishery exists. No introductions of this species have been reported. The Florida Fish and Wildlife Conservation Commission and the Washington Department of Fish and Wildlife have listed the crayfish *C. cuspidatus* as a prohibited species. Climate match is low overall for the contiguous U.S., with the highest climate matches occurring in the southeastern U.S. Without a history of introduction, the overall risk posed by *C. cuspidatus* to the contiguous U.S. is uncertain.

Assessment Elements

- **History of Invasiveness (Sec. 3): Uncertain**
- **Climate Match (Sec. 6): Low**
- **Certainty of Assessment (Sec. 7): 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.

Austin, C. M. 2010. *Cherax cuspidatus*. The IUCN Red List of Threatened Species 2010: e.T153642A4525660. Available: <http://www.iucnredlist.org/details/full/153642/0>. (November 2017).

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Coughran, J., and S. Leckie. 2007. Invasion of a New South Wales stream by the tropical crayfish, *Cherax quadricarinatus* (von Martens). Pages 40-46 in D. Lunney, P. Eby, P. Hutchings, and S. Burgin. *Pest or guest: the zoology of overabundance*. Royal Zoological Society of New South Wales, Mosman, Australia.

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FFWCC (Florida Fish and Wildlife Conservation Commission). 2017. Prohibited species list. Florida Fish and Wildlife Conservation Commission, Tallahassee, Florida. Available: <http://myfwc.com/wildlifehabitats/nonnatives/regulations/prohibited/>. (November 2017).

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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. 2017. WAC 220-12-090 classification – nonnative aquatic animal species. Washington Department of Fish and Wildlife, Olympia, Washington. Available: <http://wdfw.wa.gov/ais/wac.html>. (November 2017).

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.

Austin, C. M. 1986. Electrophoretic and morphological systematic studies of the genus *Cherax* (Decapoda: Parastacidae) in Australia. Doctoral dissertation. Department of Zoology, University of Western Australia, Perth, Australia.

Coughran, J. 2005b. Biology of the freshwater crayfishes of northeastern New South Wales, Australia. Doctoral thesis. School of Environmental Science & Management, Southern Cross University, Lismore, Australia.

Lawrence, C. 1998. Enhancement of yabby production from Western Australian farm dams. Final report, FRDC Project 94/075. Fisheries Research Report no. 112. Fisheries Research and Development Corporation, Fisheries Western Australia, Perth, Australia.