

# Zebra Crayfish (*Cherax papuanus*)

## Ecological Risk Screening Summary

U.S. Fish and Wildlife Service, September 2011

Revised, September 2012, January 2018

Web Version, 5/17/2018



Photo: Vicard. Licensed under Creative Commons BY-SA 3.0. Available: <https://commons.wikimedia.org/w/index.php?curid=3573085>. (January 2018).

## 1 Native Range and Status in the United States

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### Native Range

From Austin (2010):

“This species is endemic to Lake Kutubu in Papua New Guinea.”

## Status in the United States

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

The Florida Fish and Wildlife Conservation Commission has listed the crayfish *Cherax papuanus* as a prohibited species. 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” (FFWCC 2018).

## Means of Introductions to the United States

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

## Remarks

Patoka et al. (2014) report that the scientific name of *Cherax papuanus* is sometimes misapplied to the species *Cherax peknyi*. The latter is in trade in the Czech Republic.

From Smith et al. (2016):

“[...] known as gari to the Foe [local indigenous people]”

## 2 Biology and Ecology

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### Taxonomic Hierarchy and Taxonomic Standing

From Crandall (2016):

“Classification: 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) > Cherax (Genus) > Cherax papuanus (Species)”

“Status: accepted”

### Size, Weight, and Age Range

Smith et al. (2016) report the size of *C. papuanus* as 80mm.

### Environment

From Austin (2010):

“Freshwater”

“The water of Lake Kutubu is clear, and the lake reaches a depth of 70 m. [...] the water quality within the lake is good (D’Cruz 2008).”

## **Climate/Range**

From Austin (2010):

“This species occurs in Lake Kutubu, which is located at an altitude of 850 m above sea level. The area of the lake is 49.24 km<sup>2</sup>. ”

## **Distribution Outside the United States**

Native

From Austin (2010):

“This species is endemic to Lake Kutubu in Papua New Guinea.”

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 Lukhaup and Herbert (2008):

“Rostral teeth [...] 2”

“Chelae [...] 2.5 x longer than broad; fingers 2.5 x longer than broad”

“Carapace [...] smooth and pitted, no cervical spines”

## **Biology**

From Smith et al. (2016):

“Crayfish, *C. papuanus*, were commonly observed on the sandy shallow banks around the south end of the lake, with a density of approximately 1 per 25m<sup>2</sup>. ”

## **Human Uses**

From Austin (2010):

“This species may be harvested as a food source (D'Cruz 2008).”

“In a programme monitoring the subsistence fishery on the lake, crayfish were found to comprise 35% of the total catch (approximately 5,800 individuals a day) (D'Cruz 2008).”

From Magalhães and de Andrade (2015):

“A literature review showed that the commercial offering of prohibited crayfish species occurs at least in the United Kingdom. For instance, the availability and ease of purchase of illegal crayfishes, such as [...] zebra crayfish *Cherax papuanus* Holthuis, 1949 [...] indicate that compliance of Prohibition Order of 1996 is not being respected (Clarke, 2007; Hill, 2012).”

## Diseases

From CABI (2018):

“Pathogens Carried  
*Aphanomyces astaci*”

From Smith et al. (2016):

“The fish kill, which began in January 2013 and lasted for 6 months, was characterized by fish pathologies consistent with epizootic ulcerative syndrome. [...] The endemic crayfish, *C. papuanus* [...] was plentiful in May-June and by its appearance and activity, was not adversely affected by the EUS-like outbreak.”

**Crayfish plague (for which *A. astaci* is the disease-causing agent) and epizootic ulcerative syndrome are OIE-reportable.**

## Threat to Humans

No information available.

## 3 Impacts of Introductions

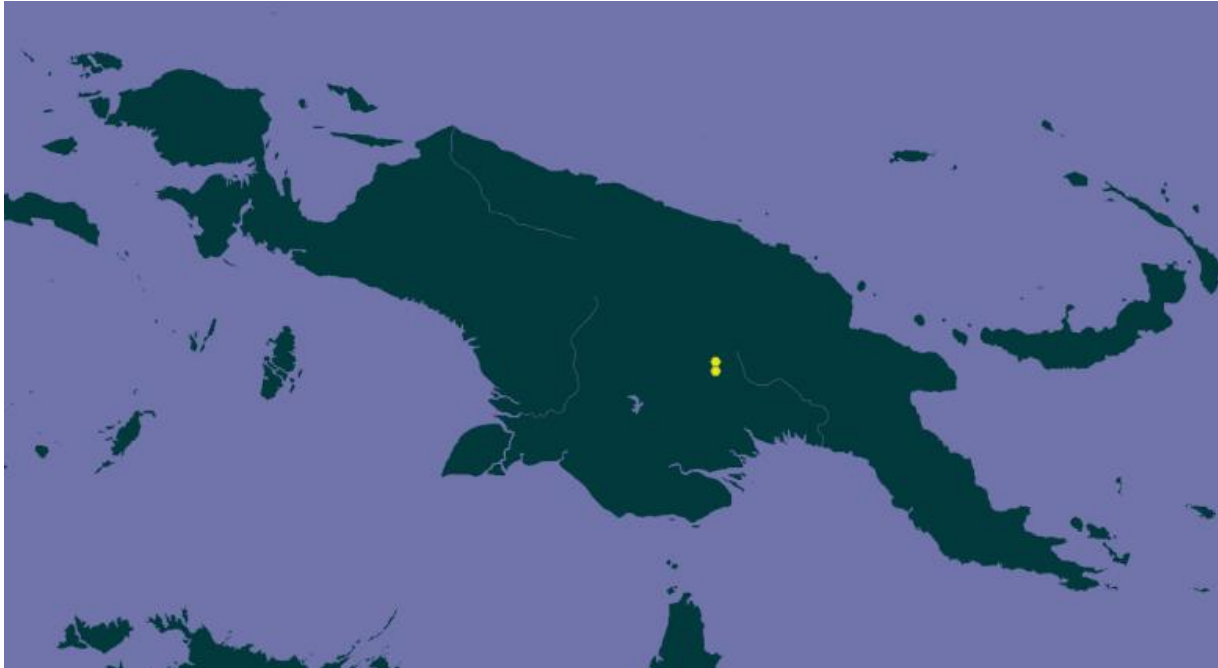
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No information available. No introductions of this species have been reported.

The Florida Fish and Wildlife Conservation Commission (FFWCC 2018) has listed the crayfish *Cherax papuanus* as a prohibited species.

## 4 Global Distribution

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**Figure 1.** Known global distribution of *Cherax papuanus*, with locations on the island of New Guinea. Map from GBIF Secretariat (2017).

## 5 Distribution Within the United States

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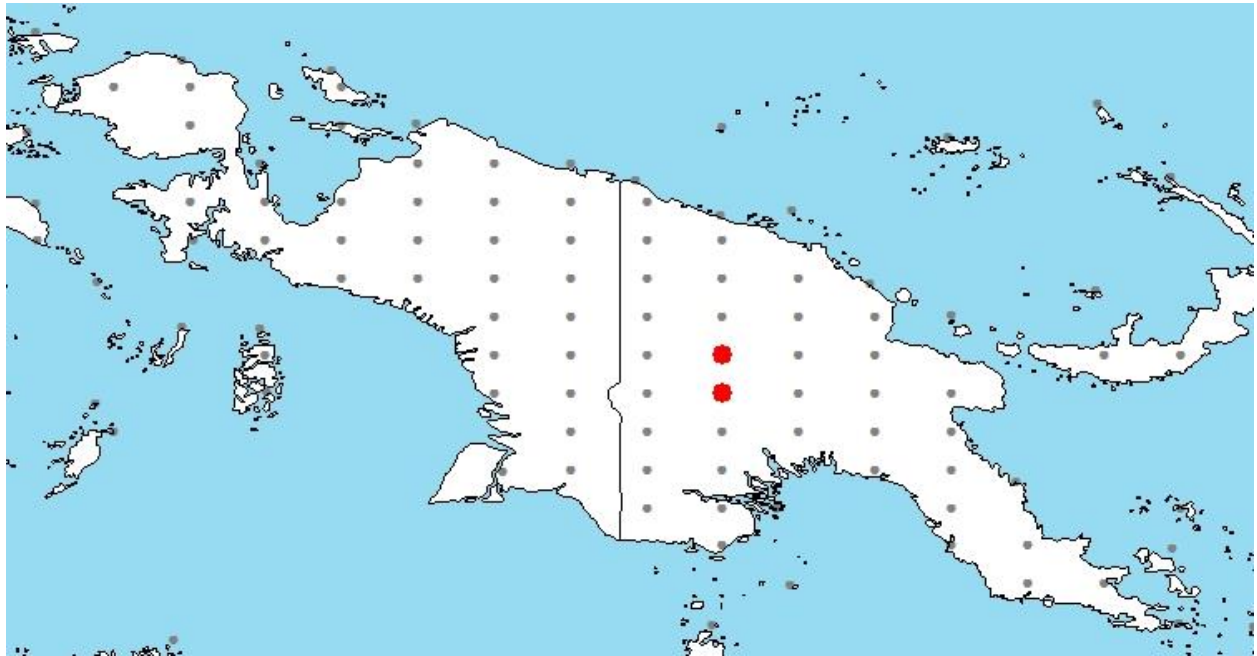
This species has not been reported as introduced or established in the United States.

## 6 Climate Matching

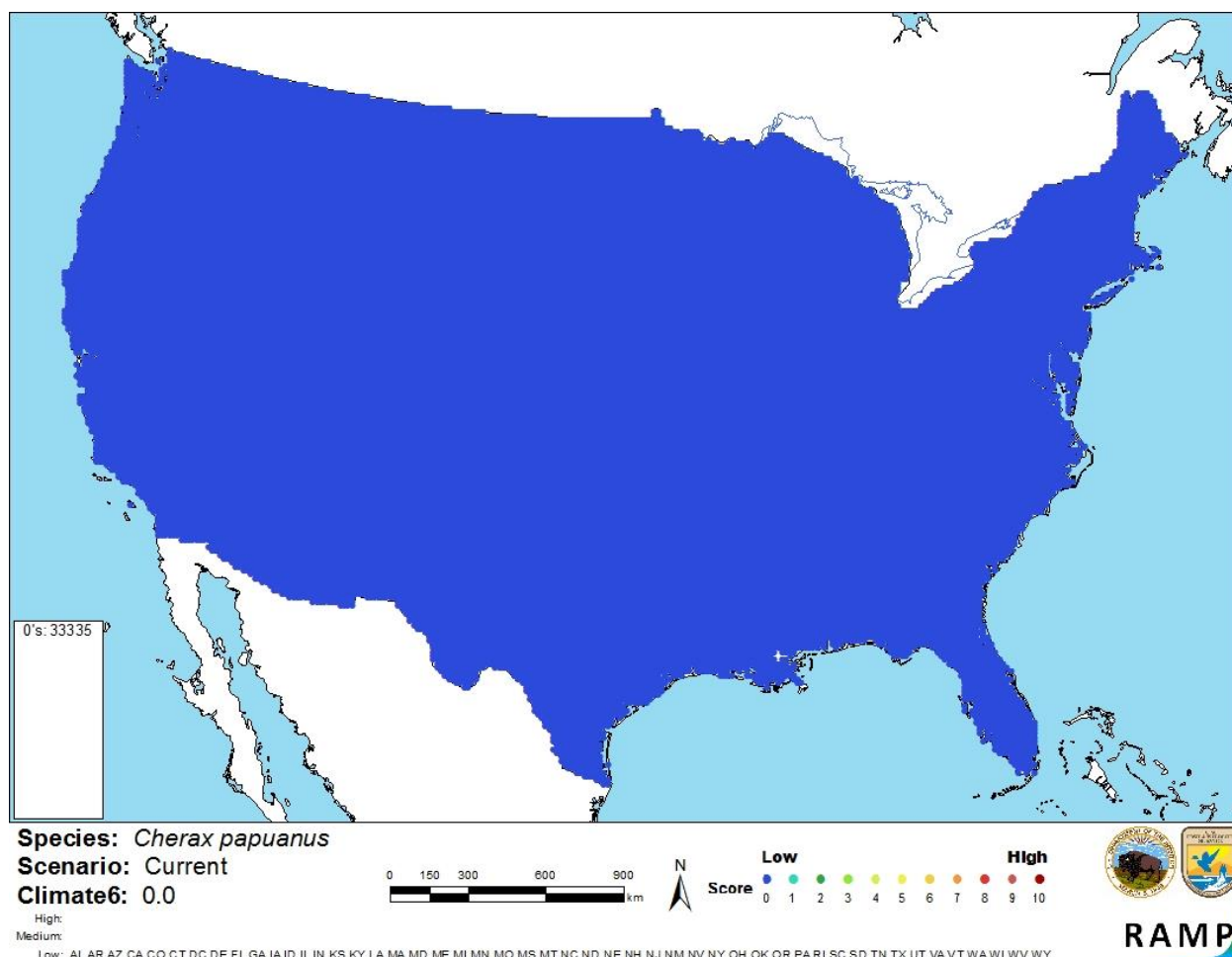
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### Summary of Climate Matching Analysis

The climate match (Sanders et al. 2014; 16 climate variables; Euclidean Distance) for *Cherax papuanus* is low for all of the contiguous United States, reflected in a Climate 6 score of 0.000. The scores classified as low match are 0.005 or less. The low climate match is likely due to the limited, tropical range of the species.



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



**Figure 3.** Map of RAMP (Sanders et al. 2014) climate matches for *Cherax papuanus* 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<br>(Sum of Climate Scores 6-10) / (Sum of total Climate Scores) | Climate Match<br>Category |
|------------------------------------------------------------------------------------------|---------------------------|
| $0.000 \leq X \leq 0.005$                                                                | Low                       |
| $0.005 < X < 0.103$                                                                      | Medium                    |
| $\geq 0.103$                                                                             | High                      |

## 7 Certainty of Assessment

Limited information is available on the biology, ecology, and distribution of *Cherax papuanus*. Furthermore, no introductions of this species have been reported, so any impacts of introduction remain unknown. Certainty of this assessment is low.

## 8 Risk Assessment

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### Summary of Risk to the Contiguous United States

*Cherax papuanus* is a crayfish native to a lake in central Papua New Guinea. The species is present in the aquarium trade in the United Kingdom, but has not been reported elsewhere outside its native range except as a misnomer for another species of crayfish in the Czech pet trade. Florida prohibits possession or trade of *C. papuanus*. *C. papuanus* has an overall low climate match with the contiguous U.S. and impacts of introduction remain unknown. The overall risk assessment is uncertain.

### Assessment Elements

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

## 9 References

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**Note: The following references were accessed for this ERSS. References cited within quoted text but not accessed are included below in Section 9.**

- Austin, C. M. 2010. *Cherax papuanus*. The IUCN Red List of Threatened Species 2010: e.T153660A4528294. Available: <http://dx.doi.org/10.2305/IUCN.UK.2010-3.RLTS.T153660A4528294.en>. (January 2018).
- CABI. 2018. *Cherax papuanus*. Invasive Species Compendium. CAB International, Wallingford, U.K. Available: <https://www.cabi.org/isc/datasheet/110065>. (January 2018).
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- Magalhães, A. L. B., and R. F. de Andrade. 2015. Has the import ban on non-native red swamp crayfish (Crustacea: Cambaridae) been effective in Brazil? *Neotropical Biology and Conservation* 10(1):48-52.
- Patoka, J., L. Kalous, and O. Kopecký. 2014. Risk assessment of the crayfish pet trade based on data from the Czech Republic. *Biological Invasions* 16:2489-2494.
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- Smith, P. T., B. Y. Imbun, and F. P. Duarte. 2016. Impacts of a fish kill at Lake Kutubu, Papua New Guinea. *Pacific Science* 70(1):21-33.
- Washington Department of Fish & Wildlife. 2018. WAC 220-12-090 Classification - Nonnative aquatic animal species. Washington Department of Fish & Wildlife, Olympia, Washington. Available: <https://wdfw.wa.gov/ais/wac.html>. (January 2018).

## 10 References Quoted But Not Accessed

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**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.**

- Clarke, M. 2007. Shops selling illegal tropical crayfish. Available: <http://www.practicalfishkeeping.co.uk/content.php?sid=1425>. (October 2014).
- D'Cruz, R. 2008. Lake Kutubu catchment management plan. WWF Kikori River Programme. Aonyx Environmental, Kuching, Malaysia.
- Hill, N. 2012. Illegal fish still on sale in the UK. Available: <http://www.practicalfishkeeping.co.uk/content.php?sid=4920>. (February 2014).