

***Helicana japonica* (a crab, no common name)**

Ecological Risk Screening Summary

U.S. Fish & Wildlife Service, July 2020

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Organism Type: Crustacean

Overall Risk Assessment Category: Uncertain



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1 Native Range and Status in the United States

Native Range

From Shih and Suzuki (2008):

“K. Sakai et al. (2006) considered some specimens from Korea (of Deogjeog-do Island) and China (of Shandong Prov.) as *Helicana japonica*. [...] Otherwise, *H. japonica* is endemic to the southern part of main islands of Japan (the Pacific side of Shikoku and Kyushu) (K. Sakai et al. 2006).”

Status in the United States

Helicana japonica has not been reported or established in the United States. No information on trade of this species in the United States was found.

Means of Introductions in the United States

Helicana japonica has not been reported in the United States.

Remarks

Information for this assessment was searched for using the valid name *Helicana japonica* and the synonym *Helice japonica*.

From Shih and Suzuki (2008):

“Because *H. wuana* is the most common *Helicana* in the above area of the Yellow Sea (see Kamita 1941, K. Sakai et al. 2006), and *H. wuana* and *H. japonica* were confused by Dai et al. (1986) and Dai and Yang (1991), these materials should also be reexamined.”

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

According to WoRMS (2020), *Helicana japonica* K. Sakai & Yatsuzuka, 1980 is the current, valid name for this species. It was originally described as *Helice japonica* K. Sakai & Yatsuzuka, 1980.

From WoRMS (2020):

Animalia (Kingdom) > Arthropoda (Phylum) > Crustacea (Subphylum) > Multicrustacea (Superclass) > Malacostraca (Class) > Eumalacostraca (Subclass) > [...] Decapoda (Order) > Pleocyemata (Suborder) > Brachyura (Infraorder) > Eubrachyura (Section) > Thoracotremata (Subsection) > Grapsoidea (Superfamily) > Varunidae (Family) > Cyclograpsinae (Subfamily) > *Helicana* (Genus) > *Helicana japonica* (Species)

Size, Weight, and Age Range

According to Omori et al. (1998), *H. japonica* carapace width can be ≥ 20 mm.

Environment

From Omori et al. (1997):

“The closely related mud crabs, *Helice tridens* De Haan and *H. japonica* Sakai and Yatsuzuka occur sympatrically at high densities in estuaries and salt marshes throughout western Japan (Sakai, 1976; Sakai and Yatsuzuka, 1979).”

According to Omori et al. (1998), the temperature of the mud in which *H. japonica* can survive in ranged from 10 to 30°C.

From WoRMS (2020):

“marine, brackish”

Climate

No climate requirements were found for *H. japonica*. This species is native to a latitude range of 31 to 38°N.

Distribution Outside the United States

Native

From Shih and Suzuki (2008):

“K. Sakai et al. (2006) considered some specimens from Korea (of Deogjeog-do Island) and China (of Shandong Prov.) as *Helicana japonica*. [...] Otherwise, *H. japonica* is endemic to the southern part of main islands of Japan (the Pacific side of Shikoku and Kyushu) (K. Sakai et al. 2006).”

Introduced

No introductions known outside the United States.

Means of Introduction Outside the United States

Helicana japonica has not been reported or established outside of its native range.

Short Description

From Sakai (2020):

“Carapace punctate on its surface, and 1.2-1.3 times as broad as long; proto- and mesogastric regions noticeably concave; cardiac furrow and cervical groove present; lateral margins divergent posteriorly, tridentate behind external orbital tooth, posterior tooth scarcely developed; branchial region with three granulated lines. Suborbital ridge of male consisting of 11-12 protuberances, of which the innermost 1-2 ones a little elongate, striate vertically, and confluent; suborbital ridge of females consisting of 12-13 isomorphic granules. Chelipeds subequal, palm smooth, fingers gaping in proximal half, with teeth on cutting edges. Pleopod 1 elongate, terminal part curved dorsally, suture torded from ventromesial to dorsal surface at a small distance from tip; palp attached to stem. (Türkay 1995)”

Biology

From Shih and Suzuki (2008):

“Ecologically, most species of mudflat crabs seem to be more active during nighttime, although some species can be found during the day. In Japan, *Helice tridens* and *Helicana japonica* can be active in daytime (Henmi and Murai 1999), [...]”

According to Omori et al. (2006), *H. japonica* is a detritivore and carnivore.

From Omori et al. (1997):

“[...] *H. japonica* [...] have larval periods of one or two months, and the offspring [...] can potentially disperse widely (Baba and Moriyama, 1972).”

From Omori et al. (1998):

“Therefore, these environmental stresses may have an important effect on the distribution of estuary benthos such as *H. tridens* and *H. japonica* than do the particle size of the sediment and other characteristics. From the tolerance experiments, it is obvious that *H. tridens* and *H. japonica* have different abilities to tolerate various physico-chemical stresses. [...] The distribution of *H. japonica* is limited to the lower part of the estuary, and this restricted distribution may be due to its lower tolerance of salinity stress. *Helice japonica* could not survive even for two days at 0‰ in the laboratory, and the salinity at the upper stations decreased to about 0‰ in the rainy season in June and early July [...]. During a riverine flood, the water level of the estuary is always higher than usual level at the extreme low water of spring tide, and these high levels are maintained for several days after a flood. Therefore, almost all of the crab burrow openings are entirely covered by low salinity water for several days, and the low salinity stress may be serious for crab species, particularly for *Helice japonica* in the upper part of the estuary.”

Human Uses

The following section pertains to mudflat crabs in general, not necessarily *H. japonica*.

From Shih and Suzuki (2008):

“In parts of Taiwan, Korea, and China, these crabs are eaten by local people (Maki and Tsuchiya 1923, Kamita 1941, Dai et al. 1984, Wei and Chen 1991), [...]”

Diseases

There are no known OIE-reportable diseases (OIE 2020) for *Helicana japonica*.

No other information on diseases were found.

Threat to Humans

No threats to humans were found for *H. japonica*.

3 Impacts of Introductions

Helicana japonica has not been reported or established outside of its native range.

4 History of Invasiveness

There are no known introductions or nonnative populations of *Helicana japonica* reported in the literature; therefore there is no information on impacts of introduction. The history of invasiveness is classified as No Known Nonnative Population.

5 Global Distribution



Figure 1. Known global distribution of *Helicana japonica*. Observations are reported from southern Japan. Map from GBIF Secretariat (2020).

Additional observations in China and South Korea were provided in Shih and Suzuki (2008).

6 Distribution Within the United States

No records of *Helicana japonica* in the wild in the United States were found.

7 Climate Matching

Summary of Climate Matching Analysis

The overall climate match for the contiguous United States was medium. The Gulf Coast (except southern Florida), coastal areas of the Mid-Atlantic States, southern central Plains and small patches of the eastern Southwest had medium matches. There was one area of high match in coastal North Carolina. Everywhere else had a low match. The overall Climate 6 score (Sanders et al. 2018; 16 climate variables; Euclidean distance) for the contiguous United States was 0.036, medium (scores between 0.005 and 0.103, exclusive, are classified as medium). The following States had high individual Climate 6 scores: Florida, Kansas, Missouri, North Carolina, Oklahoma, and South Carolina. Alabama, Arkansas, Georgia, New Mexico, Texas, and Virginia all had medium individual scores. All other States had low individual scores. The climate match does not account for salinity tolerance. Species establishment will require both a suitable climate and the availability of aquatic habitat with appropriate salinity (see Environment, above).

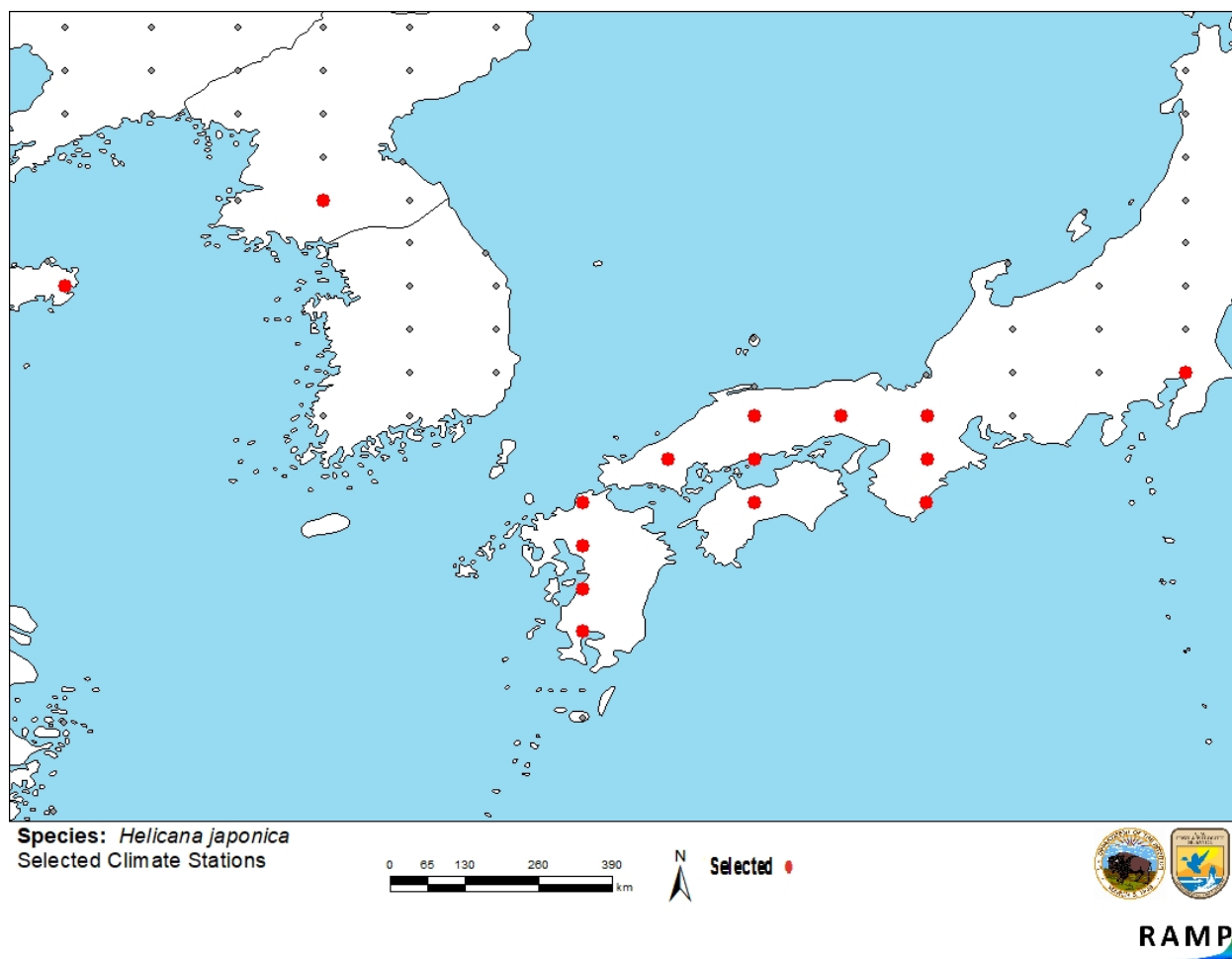


Figure 2. RAMP (Sanders et al. 2018) source map showing weather stations in Japan, Korea and China selected as source locations (red) and non-source locations (gray) for *Helicana japonica* climate matching. Source locations from GBIF Secretariat (2020) and Shih and Suzuki (2008). Selected source locations are within 100 km of one or more species occurrences, and do not necessarily represent the locations of occurrences themselves.

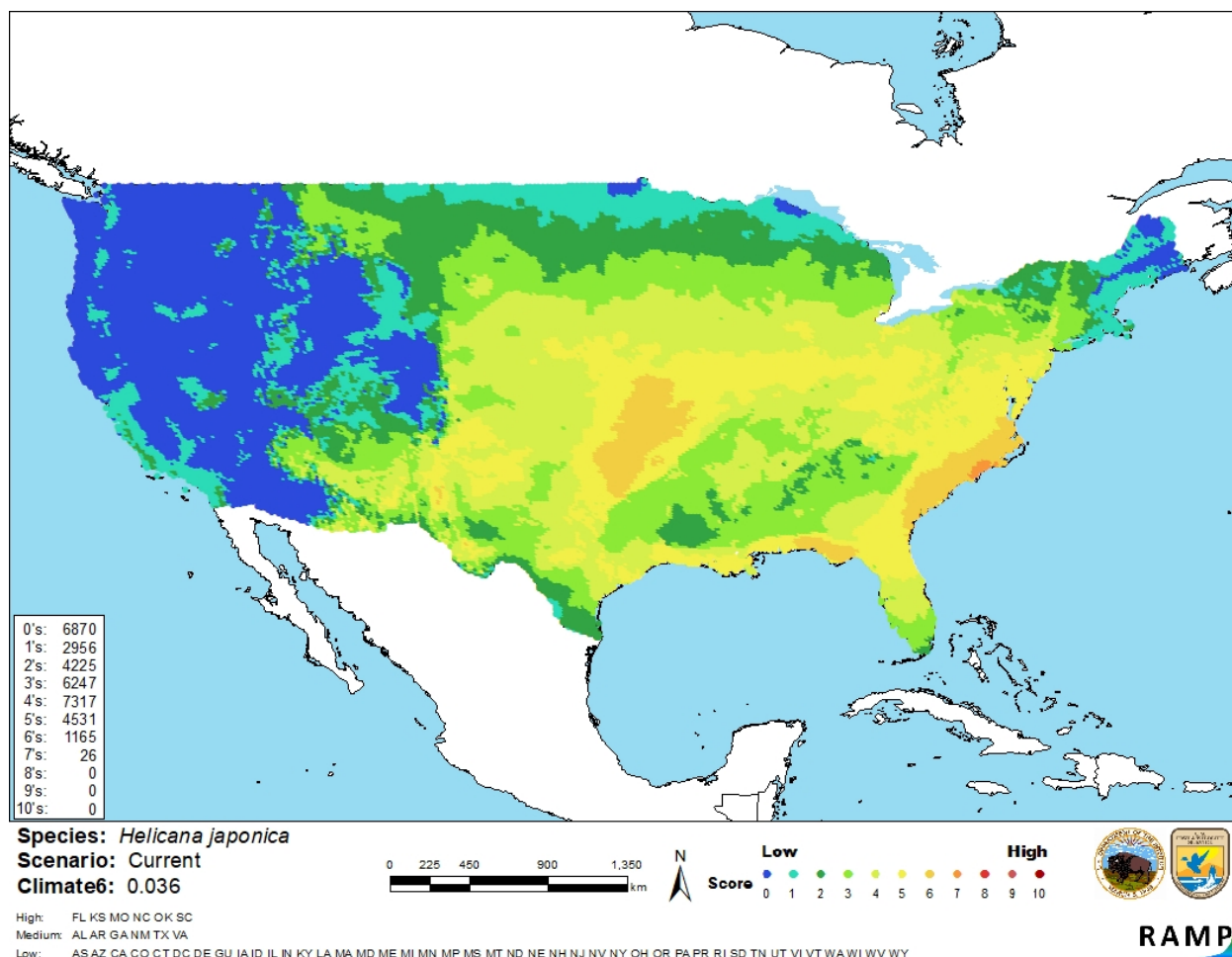


Figure 3. Map of RAMP (Sanders et al. 2018) climate matches for *Helicana japonica* in the contiguous United States based on source locations reported by GBIF Secretariat (2020) and Shih and Suzuki (2008). Counts of climate match scores are tabulated on the left. 0/Blue = Lowest match, 10/Red = Highest match.

The High, Medium, and Low Climate match Categories are based on the following table:

Climate 6: (Count of target points with climate scores 6-10)/ (Count of all target points)	Overall Climate Match Category
$0.000 \leq X \leq 0.005$	Low
$0.005 < X < 0.103$	Medium
≥ 0.103	High

8 Certainty of Assessment

The certainty of assessment is low. There is quality information available about the biology and ecology of *Helicana japonica*. There were no records of introductions found, so impacts of introduction are unknown. The climate match does not account for salinity tolerance. Species

establishment will require both a suitable climate and the availability of aquatic habitat with appropriate salinity, reducing certainty. There has been misidentification of this species in some studies, further reducing the certainty of assessment.

9 Risk Assessment

Summary of Risk to the Contiguous United States

Helicana japonica is crab that is native to estuaries in East Asia (Korea, Japan, and China). This crab may be used for human consumption. *H. japonica* has not been reported outside of its native range. The History of Invasiveness is classified as No Known Nonnative Populations. The overall climate match for the contiguous United States was Medium. Areas of medium to high match were found throughout much of the east and into part of the Southwest. The climate match does not account for salinity tolerance. Species establishment will require both a suitable climate and the availability of aquatic habitat with appropriate salinity. The certainty of assessment is Low because of a lack of information and salinity requirements. The overall risk assessment category is Uncertain.

Assessment Elements

- **History of Invasiveness (Sec. 4): No Known Nonnative Population**
- **Overall Climate Match Category (Sec. 7): Medium**
- **Certainty of Assessment (Sec. 8): Low**
- **Remarks, Important additional information: No additional information**
- **Overall Risk Assessment Category: Uncertain**

10 Literature Cited

Note: The following references were accessed for this ERSS. References cited within quoted text but not accessed are included below in Section 11.

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Omori K, Irawan B, Kikutani Y. 1998. Studies on the salinity and desiccation tolerances of *Helice tridens* and *Helice japonica* (Decapoda: Grapsidae). *Hydrobiologia* 386:27–36.

Omori K, Kikutani Y, Irawan B, Goda Y. 2006. Size-dependent intraguild reciprocal predation between *Helice tridens* De Haan and *H. japonica* Sakai and Yatsuzuka (Decapoda: Grapsidae) as analyzed in field experiments. *Journal of Crustacean Biology* 26:148–153.

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- [WoRMS] World Register of Marine Species. 2020. *Helicana japonica* K. Sakai & Yatsuzuka, 1980. World Register of Marine Species. Available: <http://www.marinespecies.org/aphia.php?p=taxdetails&id=444723> (December 2020).

11 Literature Cited in Quoted Material

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.

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