Blackfin Pearlfish (*Austrolebias nigripinnis*)

Ecological Risk Screening Summary

U.S. Fish and Wildlife Service, April 2011
Revised, July 2017
Web Version, 7/5/2018

Photo: M. Loureiro. Licensed under CC-BY 3.0. Available: http://www.fishbase.se/photos/PicturesSummary.php?StartRow=0&ID=10951&what=species&TotRec=4. (July 2017).

1 Native Range and Status in the United States

Native Range

From Nico (2017):

"Tropical America. Lower Parana basin, around Rio de la Plata, in Argentina and Uruguay, and an area along the Rio Uruguay floodplains, South America (Costa, personal communication)."

Status in the United States

From Nico (2017):

"This pearlfish has been listed as a nonestablished species known from open waters in California (Courtenay et al. 1986, 1991; Williams and Jennings 1991). That listing likely is based on its introduction into experimental rice plots and ponds on lands of the Butte County Mosquito Abatement District in 1973 and 1974 (e.g., Shapovalov et al. 1981; Dill and Cordone 1997)."

"**Status:** Failed in California. Dill and Cordone (1997) concluded that there is no evidence that the species was ever an inhabitant of open waters […]"

Means of Introduction into the United States

From Nico (2017):

"Intentionally stocked to assess its ability as a mosquito control agent, especially in ricefields (Dill and Cordone 1997). These studies were with the approval of the Fish and Game Commission (Dill and Cordone 1997)."

Remarks

From Nico (2017):

"The literature is fragmentary and somewhat contradictory concerning the introduction of this species in open waters of California. Dill and Cordone (1997) provided details on the history of this fish in California. They related that the species was used for experimental purposes at the Agricultural Experiment Station at the University of California at Riverside, either carried out in the laboratory or in outdoor plots. These experiments were terminated in 1965 after one year because the species did not reproduce adequately, was prone to disease, and did not tolerate cold temperatures. Dill and Cordone also reported that the Butte County Mosquito Abatement District used the blackfin pearlfish in tests at the Biggs Rice Experiment Station in Butte County, California. As part of these tests, young blackfin pearlfish were introduced to ponds and rice paddies at the Station and in an adjacent temporary pool. None of the fish survived and tests were terminated. In contrast to other authors (e.g., Courtenay et al. 1986, 1991; Williams and Jennings 1991), Dill and Cordone (1997) did not consider these California sites to be open waters. Unfortunately, the literature does not provide details on the outflow connections, if any, of the experimental ponds or of the ricefield areas where this species was used. In addition, if these sites were subject to periodic flooding from adjacent areas, then the introductions may be considered open water."

From GBIF (2016):

"BASIONYM [i.e., original scientific name]
Cynolebias nigripinnis Regan, 1912"

The basionym was also used to search for information on impacts of this species.

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From ITIS (2017):

"Kingdom Animalia
Subkingdom Bilateria
Infrakingdom Deuterostomia
Phylum Chordata
Subphylum Vertebrata
Infraphylum Gnathostomata
Superclass Actinopterygii
Class Teleostei
Superorder Acanthopterygii
Order Cyprinodontiformes
Suborder Aplocheiloidei
Family Aplocheilidae
Subfamily Rivulinae
Genus *Austrolebias*
Species *Austrolebias nigripinnis* (Regan, 1912) – blackfin pearlfish"

"Current Standing: valid"

Size, Weight, and Age Range

From Froese and Pauly (2017):

"Max length : 7.0 cm TL male/unsexed; [Huber 1996]; common length : 4.5 cm TL male/unsexed; [Riehl and Baensch 1996]; max. reported age: 1 years [Hugg 1996]"

Environment

From Froese and Pauly (2017):

"Freshwater; benthopelagic; pH range: 6.0 - 7.0; dH range: 5 – 12 […]"

"[…] 18°C - 22°C [Schliewen 1992; assumed to represent recommended aquarium water temperature]"

Climate/Range

From Froese and Pauly (2017):

"Subtropical; […]"

Distribution Outside the United States

Native

From Nico (2017):

"Tropical America. Lower Parana basin, around Rio de la Plata, in Argentina and Uruguay, and an area along the Rio Uruguay floodplains, South America (Costa, personal communication)."

Introduced

According to Froese and Pauly (2017), *A. nigripinnis* is probably established in the Philippines, where it was introduced in 1996.

According to Xiong et al. (2015), *A. nigripinnis* was introduced to China from South America. Its status is uncertain.

Means of Introduction Outside the United States

From Cagauan (2007):

"The blackfin pearlfish (*Austrolebias nigripinnis*) (Regan, 1912) introduced in 1996 has been used for research in mosquito control."

From Xiong et al. (2015):

"Aquarium"

Short Description

From Regan (1912):

"Depth of body 3¼ in the length, length of head 3¾. Caudal peduncle nearly as long as deep. Diameter of eye 3⅓ in the length of head. 28 scales in a longitudinal series. Dorsal 26; origin a little nearer to end of snout than to posterior end of its own base. Anal 25 ; origin a little behind that of dorsal. Dorsal and anal rays increasing in length posteriorly, the longest ¾ the length of head. Pectoral a little shorter than head, extending beyond origin of anal. Olivaceous ; a dark bar between and below eyes ; fins bluish black ; some small pale spots on body and fins."

Biology

From Froese and Pauly (2017):

"[…] non-migratory."

"Feeds on worms, crustaceans and insects [Mills and Vevers 1989]. Bottom spawner, 2-4 months incubation."

From Nico (2017):

"Like other annual killifishes, this species is capable of surviving in temporary pool habitats."

From Moshgani and Van Dooren (2011):

"Annual killifish occur in temporary environments in Africa and South America. The ephemeral ponds inhabited by annual killifish go through a dry season, killing adults and juveniles if present. Populations persist in such habitats due to the occurrence of eggs that are buried in the pond sediments and are able to endure the dry season in diapause (Wourms 1972). When the ponds refill, larvae hatch and continue the life cycle. During their life, annual fishes are exposed to variable environmental conditions with respect to temperature, oxygen level and food supply (Podrabsky et al. 1998; Errea and Danulat 2001). Adults generally reproduce a single season before the pond dries, and lay multiple batches of eggs."

Human Uses

From Froese and Pauly (2017):

"Aquarium: commercial."

Diseases

From Lom and Dyková (2005):

"A spontaneous infection of *G*[*lugea*] *anomala* in *Austrolebias nigripinnis*."

"One of the most interesting features of microsporidian biology is the capacity to stimulate hypertrophic growth of the invaded cell of the host animal. A symbiotic co-existence develops between the host cell and its microsporidian parasites and both partners turn into a well-organized xenoparasitic complex. It was Moniez (1887) describing what we know now as *Glugea anomala* (Moniez, 1887) Gurley, 1983 who clarified the parasitic nature of the *Glugea* 'tumours'."

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

Threat to Humans

From Froese and Pauly (2017):

"Harmless"

3 Impacts of Introductions

From Nico (2017):

"**Impact of Introduction:** Unknown."

4 Global Distribution

Figure 1. Known global distribution of *A. nigripinnis*, reported from southern South America. Map from GBIF (2016). Two points reported in GBIF (2016) in North America are not shown because they do not represent established populations of the species.

5 Distribution Within the United States

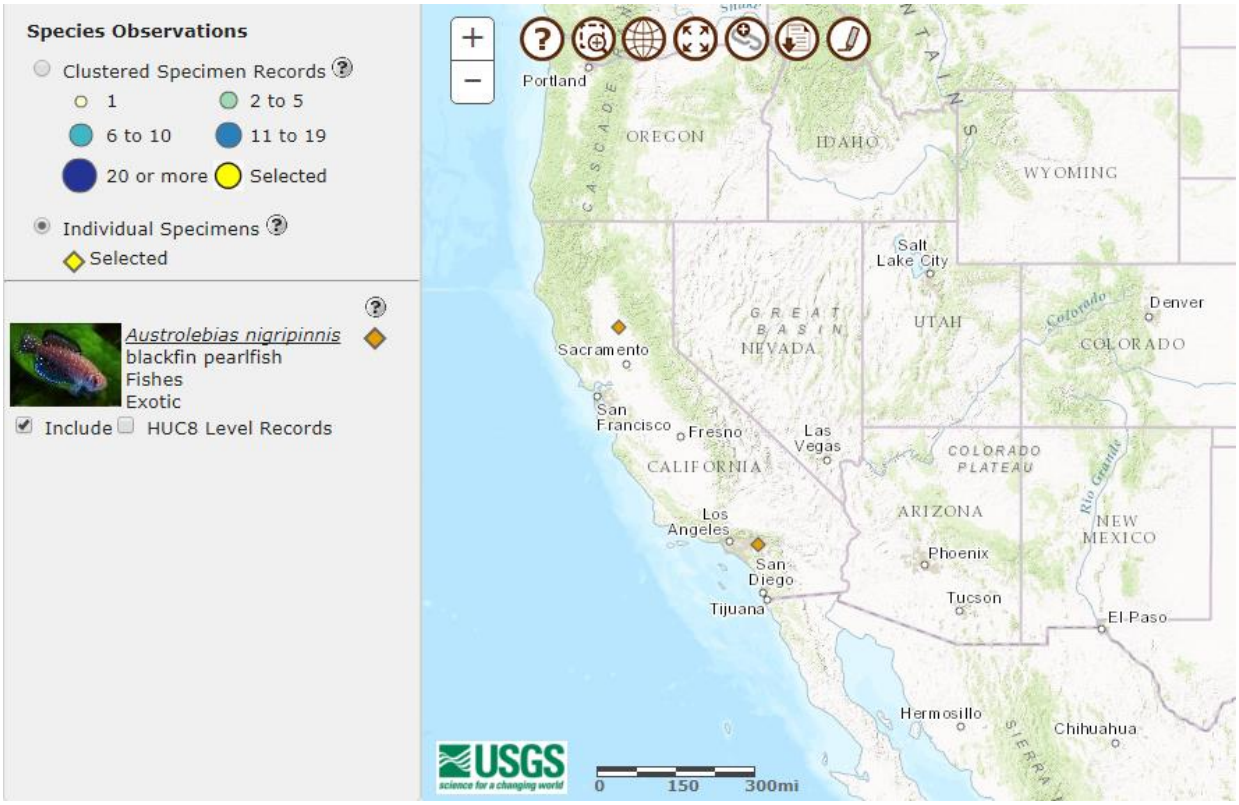

Figure 2. Known locations of introduction of *A. nigripinnis* in the United States. No established populations of *A. nigripinnis* are known from the United States Map from Nico (2017).

6 Climate Matching

Summary of Climate Matching Analysis

The climate match (Sanders et al. 2014; 16 climate variables; Euclidean Distance) was medium throughout the South, Southeast, and Mid-Atlantic. A small coastal area of Texas south of Houston showed high climate match. The climate match was low in the Northeast, much of the Great Lakes and North-Central regions, and in the West. Climate 6 score indicated that the U.S. has a medium climate match overall. The range of scores indicating a medium climate match is 0.005-0.103; Climate 6 score for *A. nigripinnis* was 0.065.

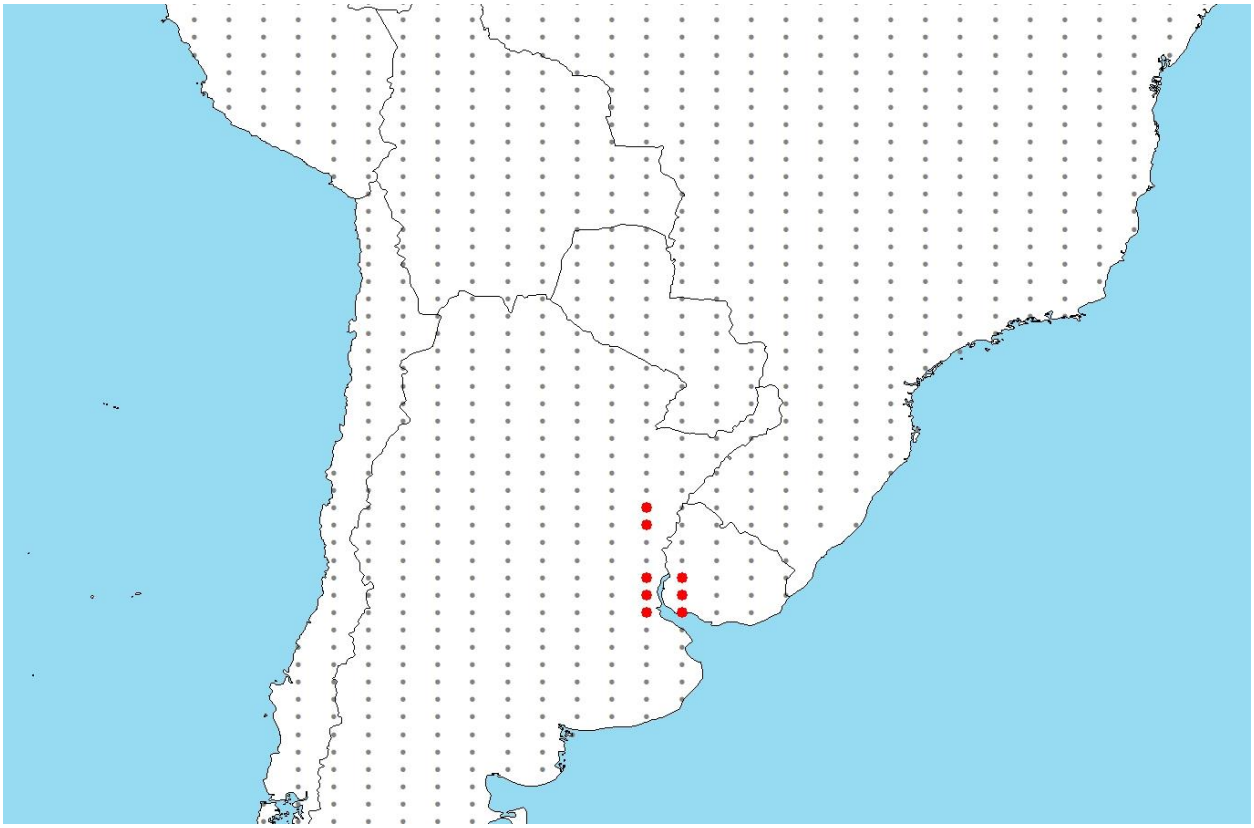

Figure 3. RAMP (Sanders et al. 2014) source map showing weather stations along the border of Uruguay and Argentina selected as source locations (red) and non-source locations (gray) for *A. nigripinnis* climate matching. Source locations from GBIF (2016). Only established locations were used.

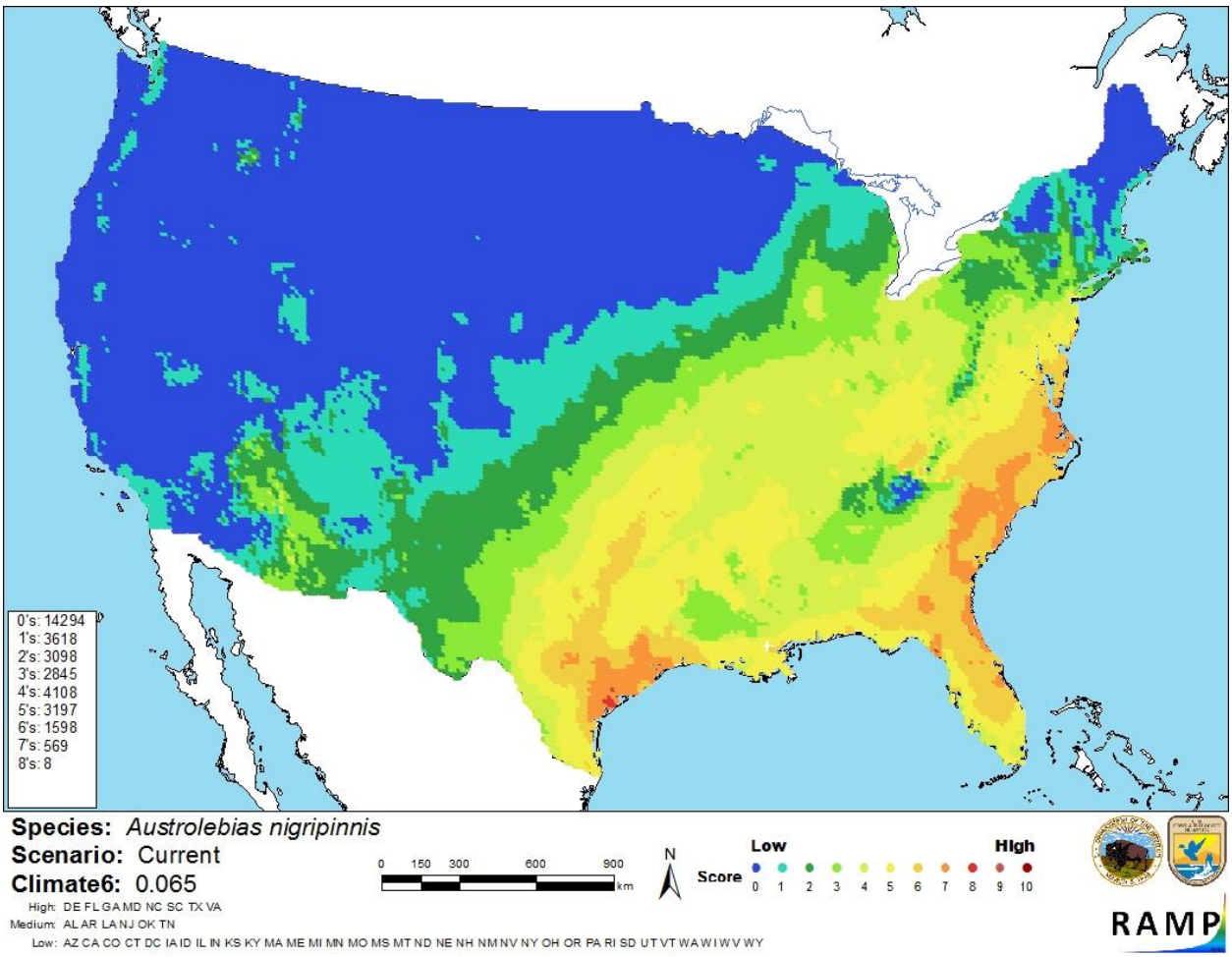

Figure 4. Map of RAMP (Sanders et al. 2014) climate matches for *A. nigripinnis* in the contiguous United States based on source locations reported by GBIF (2016). 0=Lowest match, 10=Highest match. Counts of climate match scores are tabulated on the left.

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≤X≤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 *A. nigripinnis*, but no information is available on any potential impacts of introduction of this species. Further research is needed into establishment status in the Philippines and China, and any impacts of these introductions. Certainty of this assessment is low.

8 Risk Assessment

Summary of Risk to the Contiguous United States

Austrolebias nigripinnis is an annual killifish native to Uruguay and Argentina. The species was introduced into agricultural areas in California as a potential mosquito control species. Due to issues with survival and reproduction of the species, this experiment was eventually terminated and none of the introduced specimens are believed to have survived. *A. nigripinnis* has also been introduced to the Philippines and China for mosquito control and aquarium use, respectively. Impacts of introduction are unknown, as is the establishment status of introduced populations in Asia. Climate match to the contiguous U.S. was medium. Overall risk posed by *A. nigripinnis* is uncertain.

Assessment Elements

- **History of Invasiveness:** None Documented
- **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.

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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.

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