

# Argentinian Silverside (*Odontesthes bonariensis*)

## Ecological Risk Screening Summary

Web Version—07/14/2014

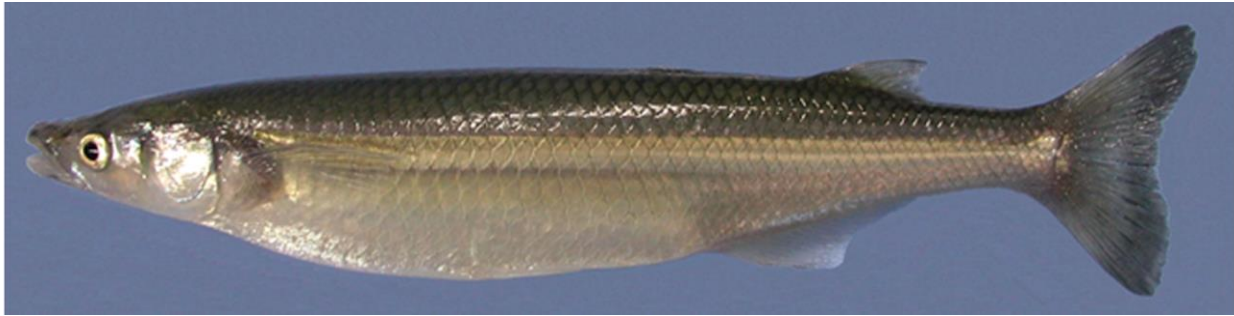


Photo (edited): ©S.K. Majhi from Majhi et al. (2009).

## 1 Native Range, and Status in the United States

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### Native Range

From Dyer (1998):

“South America: southern Argentina and Río de La Plata.”

### Status in the United States

This species has not been reported in the United States.

### Means of Introductions to the United States

This species has not been reported in the United States.

### Remarks

*Odontesthes bonariensis* is also known as the Pejerrey (Vila-Pinto 2011).

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## 2 Biology and Ecology

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### Taxonomic Hierarchy and Taxonomic Standing

From ITIS (2012):

“Kingdom Animalia  
Phylum Chordata  
Subphylum Vertebrata  
Superclass Osteichthyes  
Class Actinopterygii  
Subclass Neopterygii  
Infraclass Teleostei  
Superorder Acanthopterygii  
Order Atheriniformes  
Family Atherinopsidae  
Subfamily Atherinopsinae  
Genus *Odontesthes*  
Species *Odontesthes bonariensis* (Cuvier and Valenciennes, 1835)

Taxonomic Status: Valid.”

### Size, Weight, Age

From Dyer (1998):

“Maturity: Lm ? range ? - ? cm; Max length : 50.0 cm TL male/unsexed; (Devincenzi and Teague 1942); max. reported age: 4 years (Kottelat and Freyhof 2007).”

### Environment

From Dyer (1998):

“Marine; freshwater; brackish; pelagic-neritic; depth range 1 - ? m (Nakamura et al. 1986).”

### Climate/Range

From Dyer (1998):

“Subtropical; 11°C - 24°C (Grosman et al. 2004); 26°S - 41°S.”

### Distribution Outside the United States

Native

From Dyer (1998):

“South America: southern Argentina and Río de La Plata.”

## Introduced

From Dyer (1998):

Introduced to Morocco and Brazil but probably not established in those countries. Introduced and established in Chile, Bolivia, Peru, Japan, Israel, and Italy.

## Means of Introduction Outside the United States

From Dyer (1998):

Reasons listed for introduction include aquaculture (Chiba et al. 1989, Golani and Mires 2000, FAO 1997, Welcomme 1988), fisheries (Golani and Mires 2000, Welcomme 1988), and diffusion from other countries (FAO 1997, Welcomme 1988).

## Short description

From Dyer (1998):

“Dorsal spines (total): 6; Dorsal soft rays (total): 9; Anal spines: 1; Anal soft rays: 18 - 22. Body bluish brown dorsally, silvery ventrally. A broad silvery band with dark blue upper margin running from pectoral fin base to caudal fin base along midbody. Upper surface of head, pectoral and caudal fins blackish (Nakamura et al. 1986). Scales in the lateral line series above the lateral band 52-60; predorsal scales 28-35 (Malabarba and Dyer 2002).”

## Biology

From Dyer (1998):

“Adults inhabit coastal lagoons and near estuaries, usually in freshwater (Nakamura et al. 1986, Kottelat and Freyhof 2007). Gregarious. Adults feed on zooplankton. Mature adults spawn for the first time at 1-2 years. Eggs are deposited among aquatic vegetation (Kottelat and Freyhof 2007). Maximum length estimated from the fact that the congeneric *Odontesthes incisa* has a common length of 10 cm TL. This species is a cool water predator that has affected the abundance of other species native to the lakes (Welcomme 1988). The fisheries [sic] has now flourished especially in lakes and reservoirs, in Peru, Argentina, southern Brazil and Chile.”

## Human uses

From Dyer (1998):

“Fisheries: minor commercial; aquaculture: commercial; gamefish: yes.”

From Vila-Pinto (2011):

“*O. bonariensis* has had a positive economic impact in places where it has been introduced as is the case with Bolivia and Peru where it is today the principal fish in artisan fisheries producing 1700 tons a year (Loubens and Osorio 1991); similarly in Italy (Sola et al. 1988). It is economically important throughout its native range of distribution (Reartes 1995).”

“*O. bonariensis* is an important sport fish and has had a positive impact on tourism in all places where it has been introduced.”

## Diseases

There are no known OIE-reportable diseases for this species.

## Threat to humans

Potential pest.

## 3 Impacts of Introductions

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From Dyer (1998):

“Established [in Chile] and contributes to fishery but may have eliminated the local *Orestias* and *Trichomycterus* species. Has created adverse situation for native species (Perez et al. 2003).”

“Reintroduced [to Bolivia] in 1962. Damaged native *Orestias* populations [...] In 1955 it established itself in the lake Titicaca where according to the study of electroacoustic evaluation (1986) reached a biomass of 20,000 tons. The biologists from Peru considered that this species is displacing the native species in the marshy (lacustrine) littoral zone [...] The production of [*Odontesthes bonariensis*] in the Peruvian sector of the lake in 1992 was of 2,807 tons, whereas the statistics of commercialization of the fish in La Paz-Bolivia (92-93) record 150 tons. The 70% of the species commercialized come from the Titicaca. The production of [*Odontesthes bonariensis*] in the Poopo lake reached in 1991 a production of 2,205 TM, in 1992, of 543 tons and in 1993 was reduced to zero due to the total disappearance of this water body (FAO 1997).”

“Has damaged populations of local *Orestias* species [in Peru] (Welcomme 1988).”

From Gabriela et al. (2013):

“Many [zooplankton communities in Argentina] have suffered alterations due to the human activities developed in their watersheds, such as piping, animal husbandry, cultivation of grains and oilseeds, and urbanizations, or due to the introduction of fish, particularly the zooplanktivorous *Odontesthes bonariensis* Cuvier y Valenciennes, 1835 due to its sport and economic value (Echaniz et al. 2008, Echaniz et al. 2009, Echaniz et al. 2010, Rosso 2007).”

“Lake 4, which had very low transparency, showed the presence of *Daphnia spinulata*, a cladoceran of considerable size, which is relatively common when there are no predators (Echaniz et al. 2010, Muylaert et al. 2006). This was the case of this lake because *O. bonariensis*, the main zooplanktivorous fish, was absent. Most of the remaining lakes showed higher water transparency and presence of *O. bonariensis*, and the crustaceans recorded were of small size.”

From Vila-Pinto (2011):

“Up to now *O. bonariensis* has not been considered an invasive species in any of the places of introduction. On the contrary, this species has been selected in European and Asian countries for acclimation in temperate systems due to the quality of its meat, its rapid growth early fecundity and for being an excellent sport fish.”

“*O. bonariensis* is not listed as a quarantine pest in any of the places where it has been introduced. The only risk cited in the literature is about the feeding habits of the adults introduced into Lake Titicaca where they predominantly consume the native killifish *Orestias ispi* and the small catfishes of the genus *Trichomycterus*.”

The information on the impacts of introduced *Odontesthes bonariensis* is somewhat conflicting. It has been used successfully as an aquaculture fish. However, there are also documented effects on some native fish populations and plankton communities. Due to these negative effects, the history of invasiveness for this species is high.

## 4 Global Distribution

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**Figure 1.** Known global established locations of *Odontesthes bonariensis*. Map from GBIF (2014).

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## 5 Distribution within the United States

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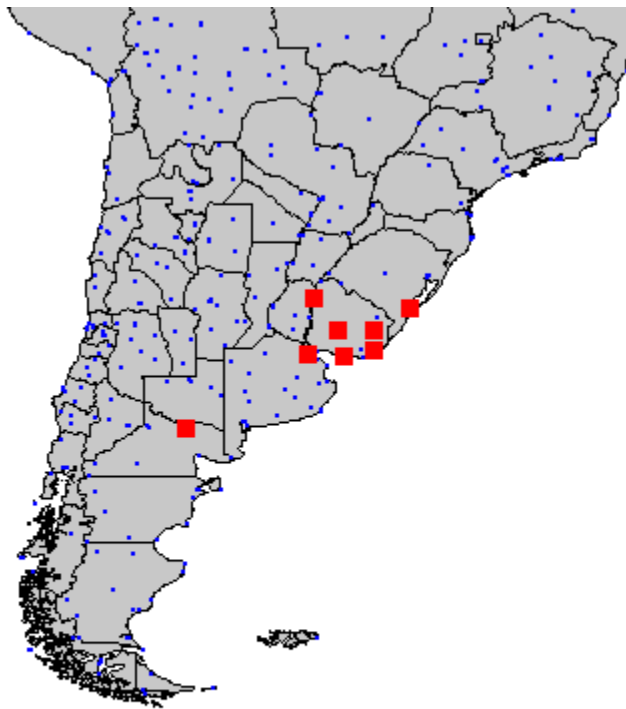
This species has not been reported in the United States.

## 6 CLIMATCH

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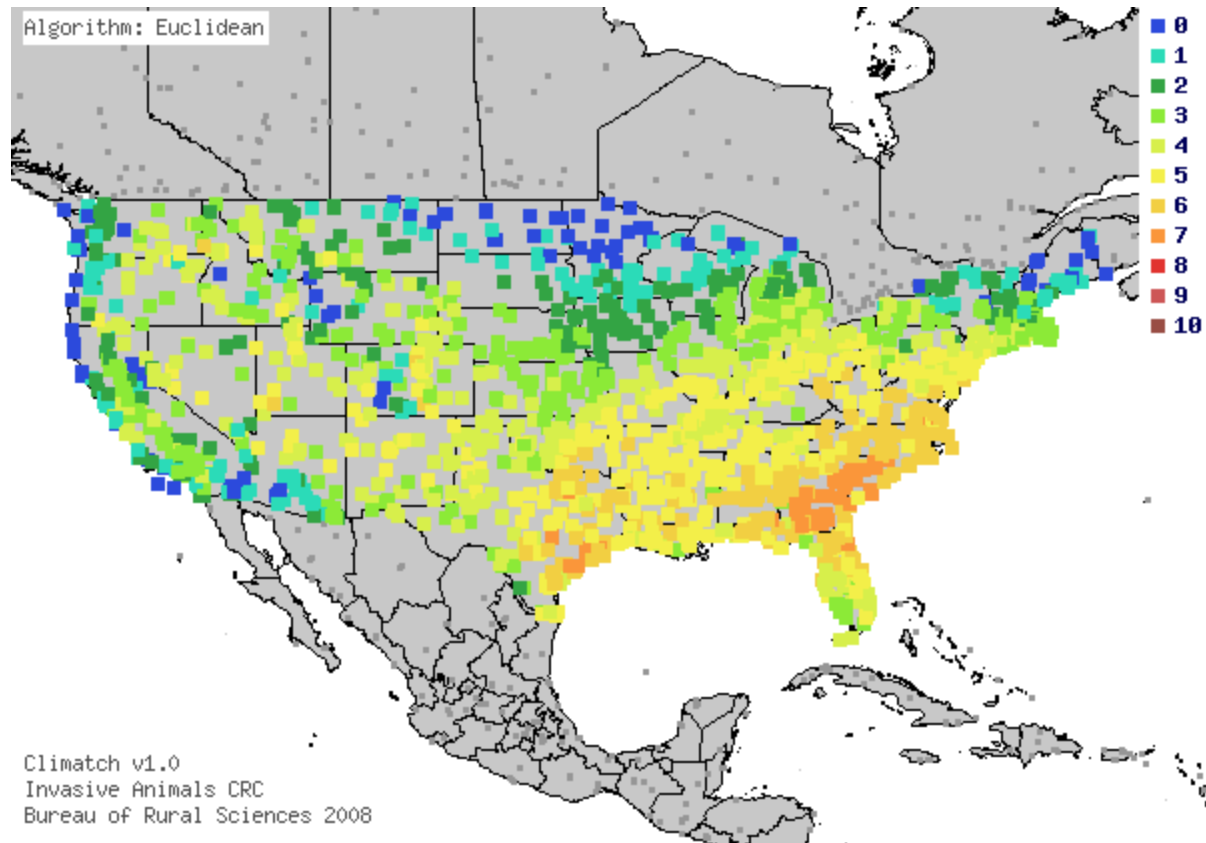
### Summary of Climate Matching Analysis

The climate match (Australian Bureau of Rural Sciences 2008, 16 climate variables; Euclidean Distance) was high in the Southeast to Texas; medium across much of the Northeast, lower Midwest, Great Plains, and Southwest, and low elsewhere. Climate 6 match indicated that the contiguous U.S. has a high climate match. The range for a high climate match is 0.103 and greater; climate match of *Odontesthes bonariensis* is 0.144.



Climatch v1.0  
Invasive Animals CRC  
Bureau of Rural Sciences 2008

**Figure 2.** CLIMATCH (Australian Bureau of Rural Sciences 2008) source map showing weather stations selected as source locations (red) and non-source locations (blue) for *Odontesthes bonariensis* climate matching. Source locations from GBIF (2014).



**Figure 3.** Map of CLIMATCH (Australian Bureau of Rural Sciences 2008) climate matches for *Odontesthes bonariensis* in the contiguous United States based on source locations reported by GBIF (2014) 0= Lowest match, 10=Highest match.

**Table 1.** CLIMATCH (Australian Bureau of Rural Sciences 2008) climate match scores.

| CLIMATCH Score         | 0   | 1     | 2   | 3   | 4   | 5   | 6   | 7  | 8 | 9 | 10 |
|------------------------|-----|-------|-----|-----|-----|-----|-----|----|---|---|----|
| Count                  | 100 | 167   | 228 | 352 | 420 | 422 | 229 | 56 | 0 | 0 | 0  |
| Climate 6 Proportion = |     | 0.144 |     |     |     |     |     |    |   |   |    |

## 7 Certainty of Assessment

Information on the biology of *Odontesthes bonariensis* is readily available. There is some information documenting locations of introductions but it is somewhat incomplete and, in some cases, specific locations cannot be determined. Reports on the impacts associated with the introduction of this species are conflicting, and need more documentation. Therefore the certainty of assessment is medium.

## 8 Risk Assessment

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### Summary of Risk to the Contiguous United States

*Odontesthes bonariensis* is native to South America and has been implicated in the displacement of native fish species in areas outside of its native range. This species has been introduced to other areas of South America, as well as Italy, Israel, and Japan for aquaculture purposes. Though negative impacts from introductions have been reported, this species has had a positive impact on aquaculture and tourism in many places. It is unknown whether *Odontesthes bonariensis* would impact native fish if established in the United States; at this time negative impacts on fish have been limited to two genera in Lake Titicaca. This species is also known to alter plankton communities and water clarity. There are no reports of this species in the U.S. Climate match with the continental U.S. is high. The overall risk for this species is high.

### Assessment Elements

- **History of Invasiveness(See Section 3):** High
- **Climate Match (See Section 6):** High
- **Certainty of Assessment (See Section 7):** Medium
- **Remarks/Important additional information** Potential Pest
- **Overall Risk Assessment Category:** High



## 9 References

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## 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.**

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