

Seminole Killifish (*Fundulus seminolis*)

Ecological Risk Screening Summary

U.S. Fish and Wildlife Service, June 2017

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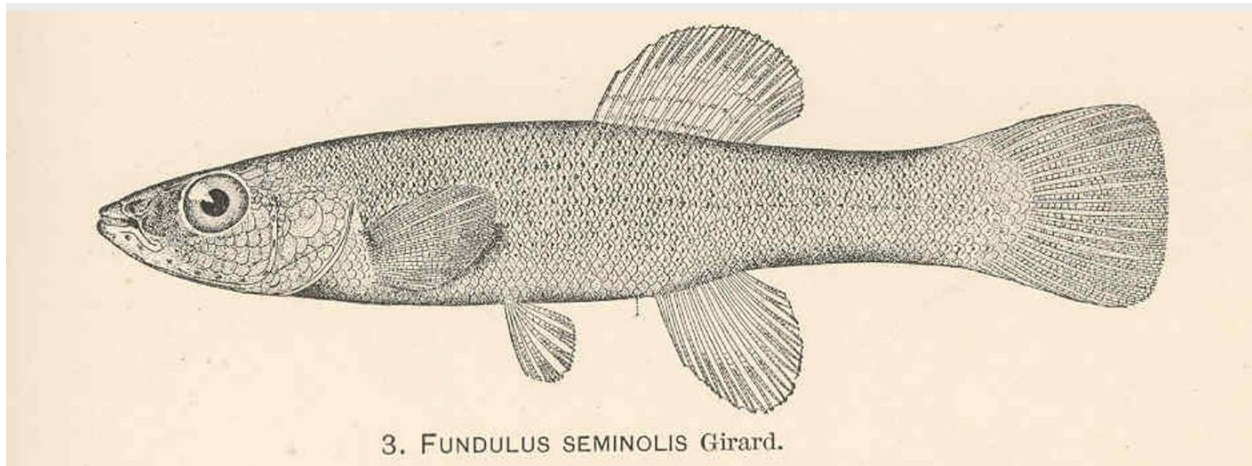


Illustration: *Fundulus seminolis*. Drawing by Albert J. Woolman. Source: Freshwater and Marine Image Bank.

1 Native Range and Status in the United States

Native Range

From Froese and Pauly (2017):

“North America: Peninsular Florida, USA from St. Johns (Atlantic) and New (Gulf) River drainages south to just below Lake Okeechobee.”

Status in the United States

From NatureServe (2013):

“Range encompasses peninsular Florida, from the St. Johns and New river drainages south to the Everglades (Page and Burr 2011).”

“This species is represented by a large number of occurrences (subpopulations) (Lee et al. 1980). Total adult population size is unknown but presumably exceeds 100,000. This fish is common (Page and Burr 2011).”

From Fuller and Neilson (2018):

“Nonindigenous Occurrences: A single individual was collected from North Bay in St. Andrew Bay, Bay County, Florida, in 1966 (Swift et al. 1986; museum specimen). First collected in Lake Marion, Santee River drainage, South Carolina (museum specimen), in 2009.”

“Status: Reported, but failed, in Florida. Established in South Carolina.”

Means of Introductions in the United States

From Fuller and Neilson (2018):

“Possible bait bucket release.”

Remarks

From NatureServe (2013):

“Currently, this species is of relatively low conservation concern and does not require significant additional protection or major management, monitoring, or research action.”

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 Osteichthyes
Class Actinopterygii
Subclass Neopterygii
Infraclass Teleostei
Superorder Ostariophysi
Order Cyprinodontiformes Berg, 1940
Suborder Cyprinodontoidei – cyprinodontoids
Family Fundulidae Jordan and Gilbert, 1882
Genus *Fundulus* Lacepède, 1803 – topminnows
Species *Fundulus seminolis* Girard, 1859 – Seminole killifish”

“Taxonomic Status: Valid.”

Size, Weight, and Age Range

From Froese and Pauly (2017):

“Maturity: Lm ? range ? - ? cm [...]
Max. reported age: 2 years [Hugg 1996].”

From DuRant et al. (1979):

“Seminole killifish in our study lakes reached maximum size of 160 mm, whereas the largest individuals recorded by McLane [1955] were 140 mm. Maximum growth takes approximately 14-18 months.”

Environment

From Froese and Pauly (2017):

“Freshwater; benthopelagic; non-migratory.”

“[...] 5°C - 24°C [Baensch and Riehl 1995; assumed to be recommended aquarium temperature range]”

From NatureServe (2013):

“Adults typically occur in open areas of streams and lakes and swim in small schools over sandy bottom; juveniles are more closely associated with floating or submergent vegetation; swims in mid-water or close to bottom (Gilbert in Lee et al. 1980, Page and Burr 2011).”

Climate/Range

From Froese and Pauly (2017):

“Temperate; [...] 31°N - 27°N”

From NatureServe (2013):

“Range encompasses peninsular Florida, from the St. Johns and New river drainages south to the Everglades (Page and Burr 2011).”

From Fuller and Neilson (2018):

“Established in South Carolina.”

Distribution Outside the United States

Native

The native range of *F. seminolis* is not known to extend outside of the United States.

Introduced

There are no known introductions of *F. seminolis* outside of the United States.

Means of Introduction Outside the United States

There are no known introductions of *F. seminolis* outside of the United States.

Short Description

From Fuller and Neilson (2018):

“The Seminole Killifish is one of the largest species of *Fundulus* in North America (to 16 cm TL). It can be distinguished from other large species of *Fundulus* (e.g., Gulf killifish *F. grandis*, banded killifish *F. diaphanus*, northern studfish *F. catenatus*) by a combination of color patterns and fin ray counts. Seminole Killifish are metallic green in color with several horizontal rows of small black spots. Females may have 15-20 dark green bars along side (often faint).”

Fuller and Neilson (2018) report 16-17 dorsal fin rays, 13 anal fin rays, and 50-55 lateral scales for *F. seminolis*.

Biology

From Froese and Pauly (2017):

“Inhabits open areas of lakes and quiet stream pools. Young are usually found in schools near vegetation. 16 cm max TL [Page and Burr 1991]. Not a seasonal killifish. Is very difficult to maintain in aquarium [Huber 1996].”

From NatureServe (2013):

“Adults typically occur in open areas of streams and lakes and swim in small schools over sandy bottom; juveniles are more closely associated with floating or submergent vegetation; swims in mid-water or close to bottom (Gilbert in Lee et al. 1980, Page and Burr 2011).”

From DuRant et al. (1979):

“Seminole killifish (*Fundulus seminolis*) were collected from Lake Wales, Florida, from October 1974 to June 1976 and from Star Lake during February and April 1976. Peak spawning was in April and May, but was prolonged and intermittent throughout the year. The highest gonadosomatic index for adult females (5.17) was in April, the lowest (0.01) in November. Probable spawning over *Vallisneria* sp. was seen in March 1976. Fish spawned in 1975 grew approximately 9 mm/month. Maximum size (160+ mm) was reached in 14-18 months. Chironomids were the principal food of adult fish; amphipods, fish eggs and plant seeds were of lesser importance. Fish under 45 mm TL ate mostly chironomids, cladocerans and ostracods.”

Human Uses

From DiMaggio et al. (2009):

“*Fundulus seminolis*, a freshwater killifish species endemic to Florida, has shown economic potential for use as a marine baitfish, with a small number of commercial operations currently in production.”

Diseases

None reported. No OIE-reportable diseases have been documented for this species.

Threat to Humans

From Froese and Pauly (2017):

“Harmless.”

3 Impacts of Introductions

There are no known studies of the impacts of introductions of this species.

4 Global Distribution



Figure 1. Known global distribution of *Fundulus seminolis*, reported from Florida, United States. Map from Fuller and Neilson (2018). The native range is shown in gold, and the established introduced population in South Carolina is shown as a yellow circle. The point in St. Andrew Bay, FL was removed because *F. seminolis* is not believed to be established there.

5 Distribution within the United States

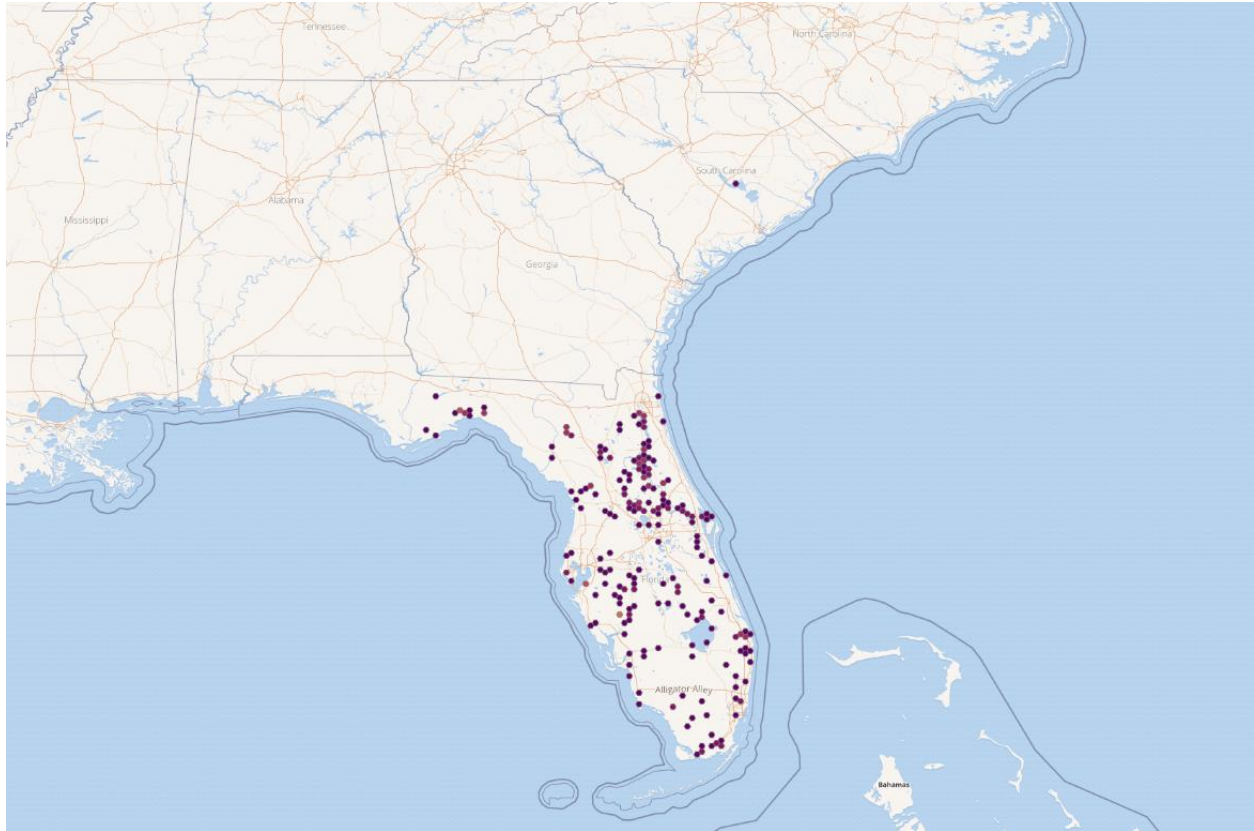


Figure 2. Known distribution of *Fundulus seminolis* in the contiguous United States. Map from GBIF (2017). A point in St. Andrew Bay, FL was removed because *F. seminolis* is not believed to be established there. A point in Key West, FL was removed because the location of the record was incorrect.

6 Climate Matching

Summary of Climate Matching Analysis

F. seminolis is native to peninsular Florida (Froese and Pauly 2017). This species has been introduced and established in South Carolina. The highest climate matches are along the coastline of the southeastern United States, and matches decrease with increasing distance from the currently established range.

The Climate 6 score (Sanders et al. 2014; 16 climate variables; Euclidean distance) for the contiguous U.S. was 0.095, which is classified as medium match.

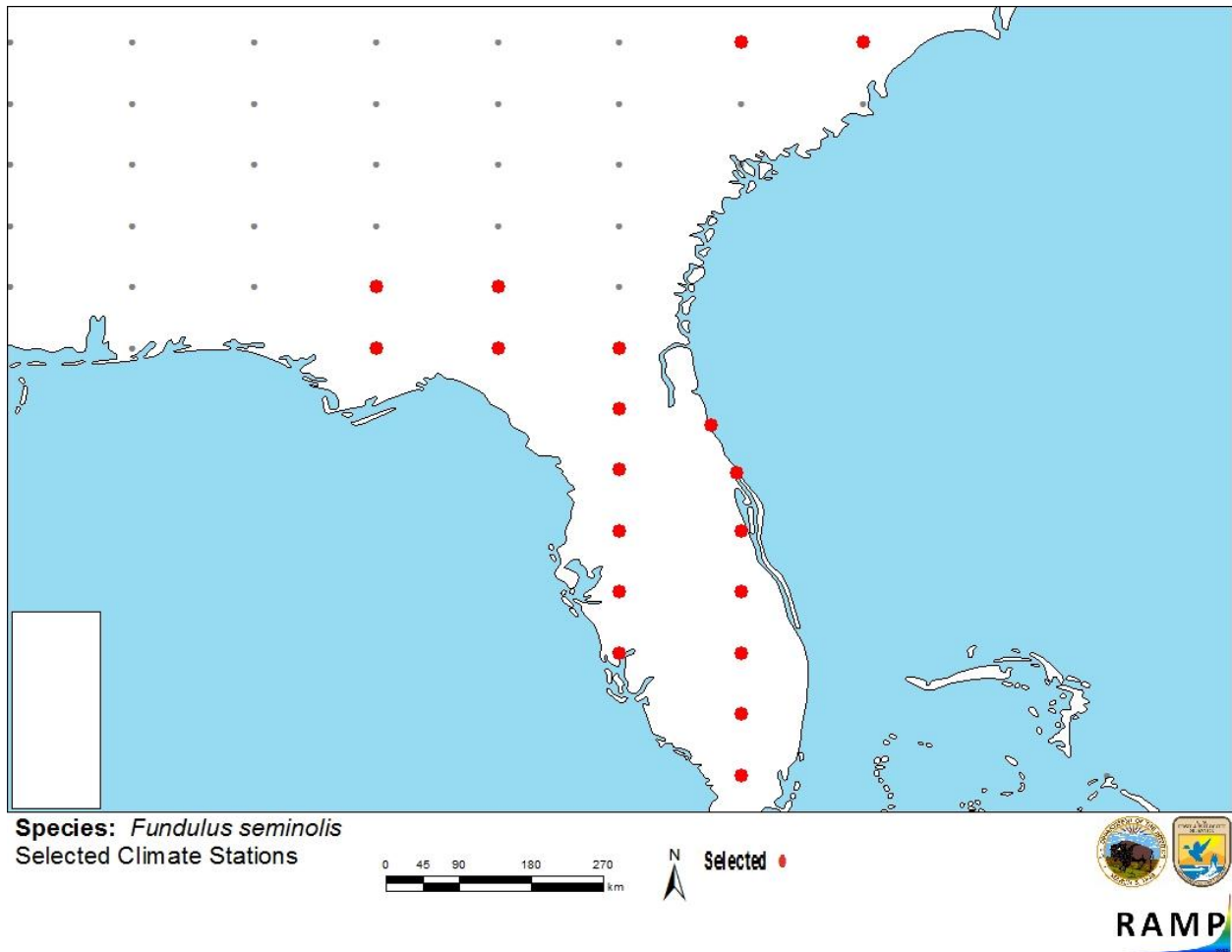


Figure 2. RAMP (Sanders et al. 2014) source map showing weather stations selected as source locations (red) and non-source locations (gray) for *Fundulus seminolis* climate matching. Source locations from GBIF (2017). A point in Key West, FL was removed because the location of the record was incorrect.

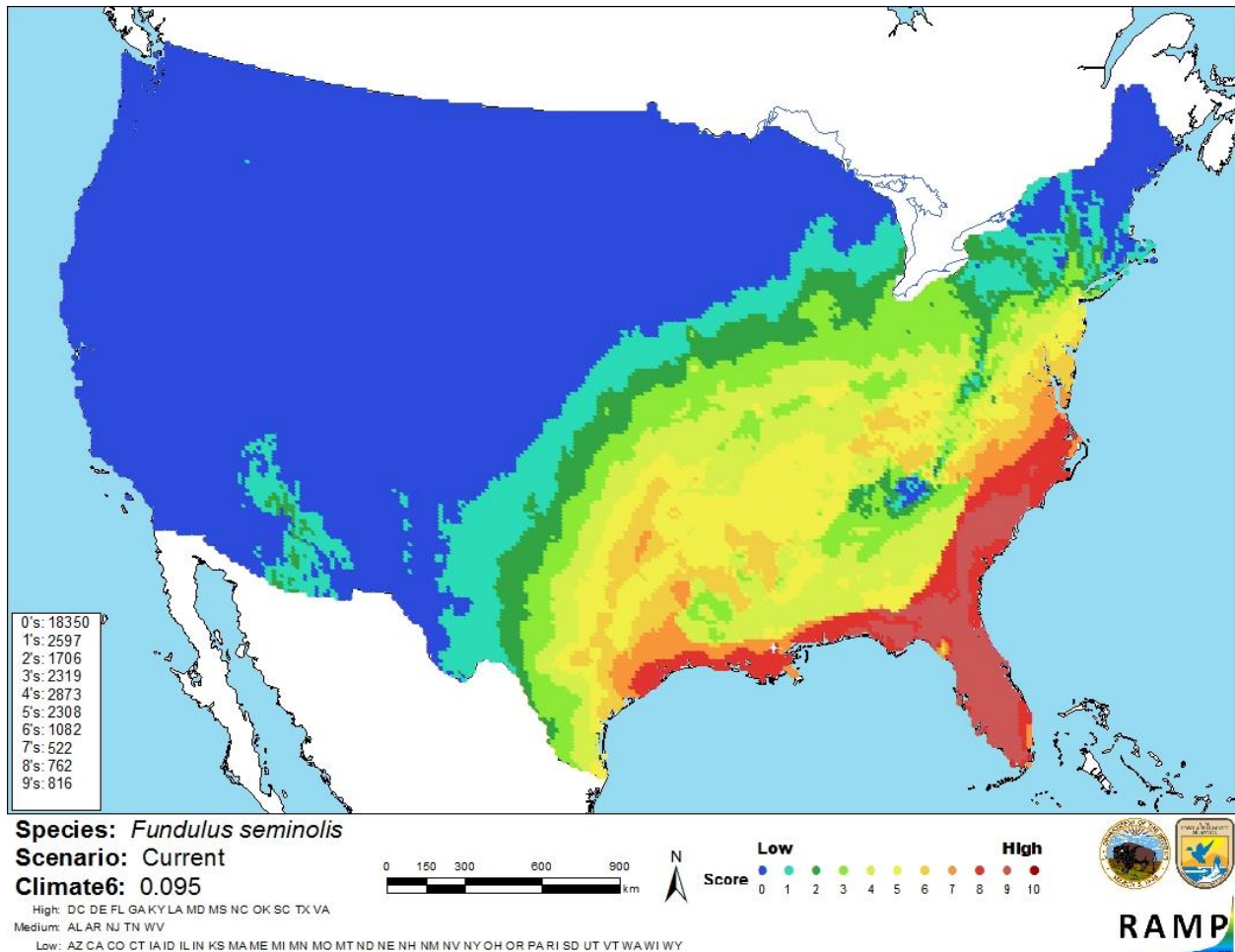


Figure 3. Map of RAMP (Sanders et al. 2014) climate matches for *Fundulus seminolis* in the contiguous United States based on source locations reported by GBIF (2017). 0= Lowest match, 10=Highest match. Counts of climate match scores are tabulated on the left.

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 on the biology and distribution of this species is readily available. There is enough data to be confident in the distribution of this species and the climate match. However, no studies have been conducted on the impacts of introduced populations. Certainty of assessment for this species is low.

8 Risk Assessment

Summary of Risk to the Contiguous United States

Fundulus seminolis is a large freshwater topminnow native to peninsular Florida. *F. seminolis* has been introduced and established in Lake Marion, South Carolina. It was also introduced to St. Andrew Bay, Florida, but did not establish there. There are no studies on the impacts of the introduced population, resulting in a low certainty for this assessment. The overall risk for this species is uncertain.

Assessment Elements

- **History of Invasiveness (Sec. 3): None Documented**
- **Climate Match (Sec.6): Medium**
- **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.

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- DuRant, D.F., J.V. Shireman, and R.D. Gasaway. 1979. Reproduction, growth and food habits of seminole killifish, *Fundulus seminolis*, from two central Florida Lakes. *American Midland Naturalist* 102(1): 127-133.
- Froese, R., and D. Pauly. Editors. 2017. *Fundulus seminolis*. FishBase. Available: <http://fishbase.org/summary/Fundulus-seminolis.html> (December 2017).
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- GBIF (Global Biodiversity Information Facility). 2017. GBIF Backbone Taxonomy: *Fundulus seminolis*. GBIF Secretariat, Copenhagen. Available: <https://demo.gbif.org/species/5203702>. (January 2018).
- Integrated Taxonomic Information System (ITIS). 2017. *Fundulus seminolis* Girard, 1859. Integrated Taxonomic Information System, Reston, Virginia. Available: https://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=165656#null. (June 2017).

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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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Page, L.M., and B.M. Burr. 1991. A field guide to freshwater fishes of North America north of Mexico. Houghton Mifflin Company, Boston, Massachusetts.

Page, L.M., and B.M. Burr. 2011. Peterson field guide to freshwater fishes of North America north of Mexico. Houghton Mifflin Harcourt, Boston, Massachusetts.

Swift, C.C., C.R. Gilbert, S.A. Bortone, G.H. Burgess, and R.W. Yerger. 1986. Zoogeography of the fishes of the southeastern United States: Savannah River to Lake Pontchartrain. 213-266 in C.H. Hocutt and E.O. Wiley, eds. The zoogeography of North American freshwater fishes. John Wiley and Sons, New York, New York.