

Silver Dollar (*Metynnis hypsauchen*)

Ecological Risk Screening Summary

U.S. Fish and Wildlife Service, February 2011

Revised, January 2016, March 2018

Web Version, 8/22/2018



Photo: Sesamehoneytart (2014). Licensed under Creative Commons (CC BY-SA 4.0). Available: https://commons.wikimedia.org/wiki/File:Metynnis_hypsauchen_small.jpg. (March 2018).

1 Native Range and Status in the United States

Native Range

From Eschmeyer et al. (2018):

“Amazon and Paraguay River basins and northern Guiana Shield rivers: Bolivia, Brazil, Colombia, Guyana, Peru and Venezuela.”

Status in the United States

From Nico et al. (2018):

“A member of this genus was collected in **Florida** from a lake on Marco Island, Collier County in January, 1980 (FSBC 19822; listed as *Metynnis lippincotianus* in Courtenay et al. 1984, and as *Metynnis* sp. in Courtenay and Stauffer 1990 and in Courtenay et al. 1991). A reproducing population was found in Halpatookee Regional Park Conservation Area in Martin County in 2005, with additional specimens taken in 2006 and 2007 (Shafland et al. 2008; Florida Fish and Wildlife Conservation Commission 2009). In **Kentucky**, a single fish (originally identified as a piranha and as *Metynnis roosevelti*) was taken by hook and line from Lighthouse Lake, Louisville, Jefferson County, in the summer of 1981 (Anonymous 1981; Fossett 1981).”

“There is considerable confusion surrounding the Kentucky record. In original published accounts, the fish was identified as a piranha, but the scientific name provided was *Metynnis roosevelti* (= *Metynnis maculatus*). However, in a photograph of the fish accompanying the newspaper article (Fossett 1981), the specimen actually appears to have a short adipose fin and is probably a pacu, possibly *Piaractus brachypomus*. The collectors gave the live fish to the Louisville Zoo, where it was kept in aquaria; when the fish later died, it was supposedly not preserved. The Kentucky specimen has been the basis for inclusion of the species in published lists of non-established foreign species, with earlier listings identifying it as *Metynnis roosevelti* (e.g., Courtenay et al. 1984) and later simply as *Metynnis* sp. (i.e., Courtenay and Stauffer 1990; Courtenay et al. 1991).”

From Froese and Pauly (2018):

“A popular aquarium fish, found in 75% of pet shops near Lakes Erie and Ontario [Rixon et al. 2005]”

Means of Introductions in the United States

From Nico et al. (2018):

“Records [for *Metynnis* sp.] mostly likely represent aquarium releases.”

Remarks

Eschmeyer et al. (2018) list *Metynnis calichromus*, *Metynnis ehrhardti*, *Myletes hypsauchen*, and *Metynnis calichromus schreitmuelleri* as synonyms for *Metynnis hypsauchen*. These synonyms were used in addition to the accepted scientific name to search for information for this report.

Froese and Pauly (2018) also list *Metynnis orinocensis*, *Myletes orinocensis*, and *Metynnis hypsauchen fasciatus* as misapplied synonyms for *Metynnis hypsauchen*.

From Ota et al. (2016):

“Taxonomic confusion is rife in the literature dealing with *Metynnis* species. There are 28 nominal species and only around half of them are recognized as valid. The elevated number of

synonyms is probably a consequence of the enormous variability of body shape and color pattern, which in turn are highly influenced by ontogeny and sexual dimorphism (Zarske & Géry, 1999; Jégu, 2003; Pavanelli et al., 2009; Ota et al., 2013). As a consequence, there is little information about the phylogenetic relationships among species of *Metynnis*.”

The common name “silver dollar” is applied to multiple species in the genus *Metynnis*.

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From ITIS (2018):

“Kingdom Animalia
Subkingdom Bilateria
Infrakingdom Deuterostomia
Phylum Chordata
Subphylum Vertebrata
Infraphylum Gnathostomata
Superclass Osteichthyes
Class Actinopterygii
Subclass Neopterygii
Infraclass Teleostei
Superorder Ostariophysi
Order Characiformes
Family Characidae
Genus *Metynnis*
Species *Metynnis hypsauchen* (Müller and Troschel, 1844)”

“Taxonomic Status: valid”

Size, Weight, and Age Range

From Froese and Pauly (2018):

“Max length : 18.0 cm SL male/unsexed; [Garcia-Ayala et al. 2014]”

Environment

From Froese and Pauly (2018):

“Freshwater; pelagic; pH range: 6.0 - 7.0”

“[...] 24°C - 28°C [Riehl and Baensch 1991; assumed to be recommended aquarium water temperatures]”

Climate/Range

From Froese and Pauly (2018):

“Tropical; [...]”

Distribution Outside the United States

Native

From Eschmeyer et al. (2018):

“Amazon and Paraguay River basins and northern Guiana Shield rivers: Bolivia, Brazil, Colombia, Guyana, Peru and Venezuela.”

Introduced

Froese and Pauly (2018) report introduction to Canada, but the source (Rixon et al. 2005) is a study of pet shop inventories and not introductions into natural habitats.

Means of Introduction Outside the United States

No introductions of this species have been confirmed beyond its native range.

Short Description

From Tropical Fish Keeping (2017):

“**Metynnus hypsauchen** is round and silvery; just as it’s [*sic*] name implies. It’s [*sic*] body is laterally compressed, almost round in appearance and colored silver with a hint of green and blue.”

“The anal fin of the male is edged in red which becomes more pronounced during breeding. Some [individuals] have a series of small dots on their sides.”

Biology

From Froese and Pauly (2018):

“Possesses powerful dentition that can cause serious bites.”

“Often spawns in schools, preferable [*sic*] near the surface. Does not eat its eggs, which hatch after 3 days.”

Human Uses

From Froese and Pauly (2018):

“Fisheries: minor commercial; aquarium: commercial”

From Kodisinghe and Jayamanne (2015):

“Production of ornamental fish is a rapidly growing sector of the aquaculture industry (Tlusty, 2001). Among the ornamental fish production in Sri Lanka, exotic ornamental fishes have a significant demand in the market. Silver Dollar (*Metynnis hypsauchen*) which was originated from South America is such kind of exotic ornamental fish in Sri Lanka that a higher demand has been achieved.”

Diseases

No OIE-listed diseases reported.

From Magalhães et al. (2018):

“[Cymothoid isopod] *Anphira xinguensis* Thatcher, 1995 [...] Specimens [...] found only in the lower Xingu Ria [...]; taken from the gill chambers of three species of *Metynnis* (Serrasalminidae): *M. lippincottianus*, *M. hypsauchen* and *M. altidorsalis*.”

Threat to Humans

Froese and Pauly (2018) makes contradictory statements on the threat posed to humans by *M. hypsauchen*.

From Froese and Pauly (2018):

“Harmless”

“Possesses powerful dentition that can cause serious bites.”

3 Impacts of Introductions

There are currently no recorded introductions or impacts of introductions of *M. hypsauchen*, however unidentified species of *Metynnis* are listed as locally established in Florida.

4 Global Distribution



Figure 1. Known global distribution of *Metynnis hypsauchen*, reported from South America (Bolivia, Brazil, Colombia, Guyana, Suriname, and Venezuela). Map from GBIF Secretariat (2018). Points in Hong Kong and India were not included in this map or the climate matching analysis because they do not represent established populations; one occurrence was reported in a marine location for this freshwater species and the other occurrence was reported in a city. Suriname was not included in Eschmeyer et al.'s (2018) list of countries where *M. hypsauchen* is native, but the location reported by GBIF Secretariat (2017) appears legitimate and is on a Guyana Shield river where *M. hypsauchen* is reported as native. No georeferenced occurrences were available for the portion of *M. hypsauchen*'s established range in Peru.

5 Distribution Within the United States

There is currently no known distribution of *Metynnis hypsauchen* within the United States; however, unidentified species of *Metynnis* are listed as locally established in Florida.

6 Climate Matching

Summary of Climate Matching Analysis

The climate match (Sanders et al. 2014; 16 climate variables; Euclidean Distance) was low across the contiguous United States for *Metynnis hypsauchen*, based on a Climate 6 score of 0.000. The range of proportions classified as low match is from 0 to 0.005, inclusive. Most of peninsular Florida and the southern Gulf coast of Texas have a medium climate match, while the rest of the contiguous United States have a low match.

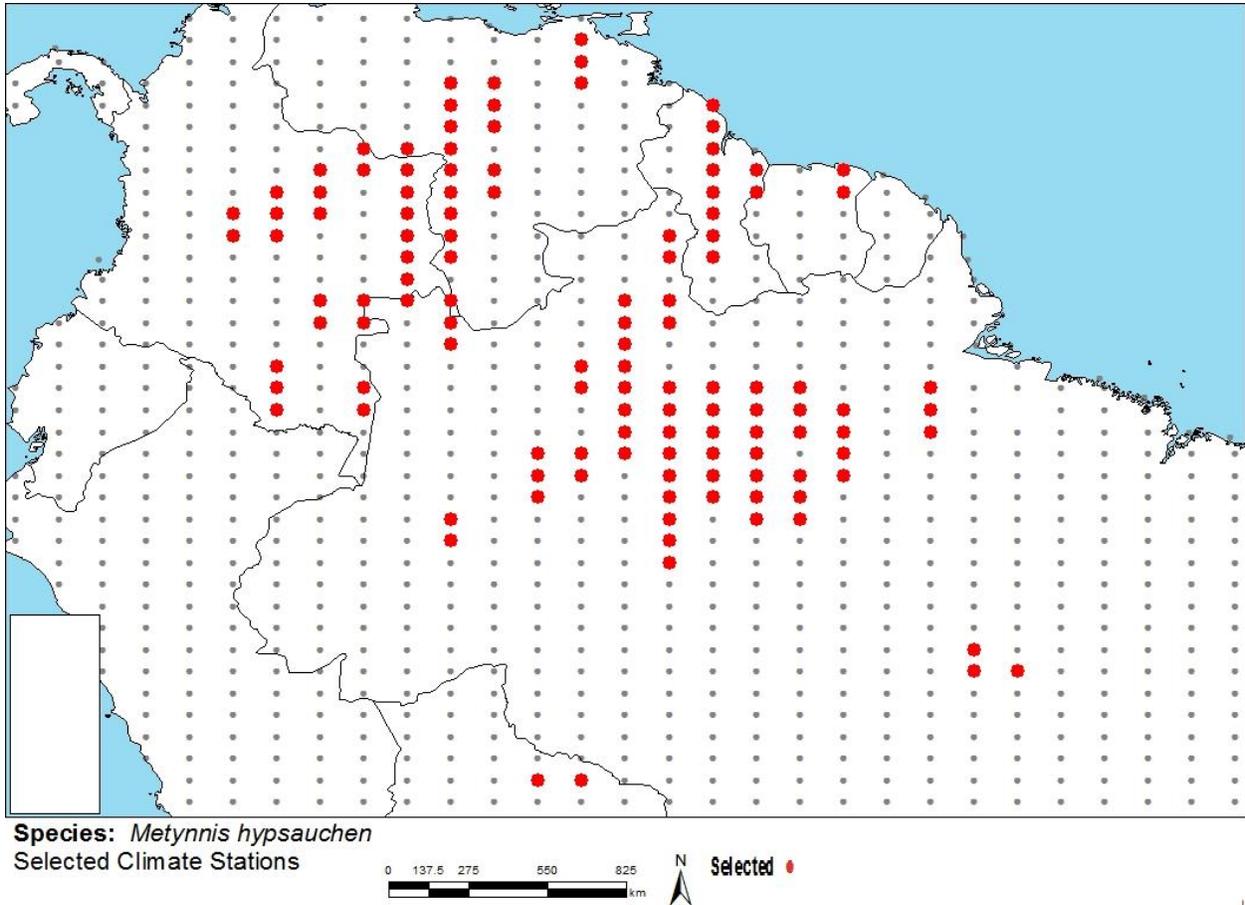


Figure 2. RAMP (Sanders et al. 2014) source map showing weather stations selected as source locations (red; Brazil, Bolivia, Colombia, Venezuela, Guyana, Suriname) and non-source locations (gray) for *Metynnis hypsauchen* climate matching. Source locations from GBIF Secretariat (2017).

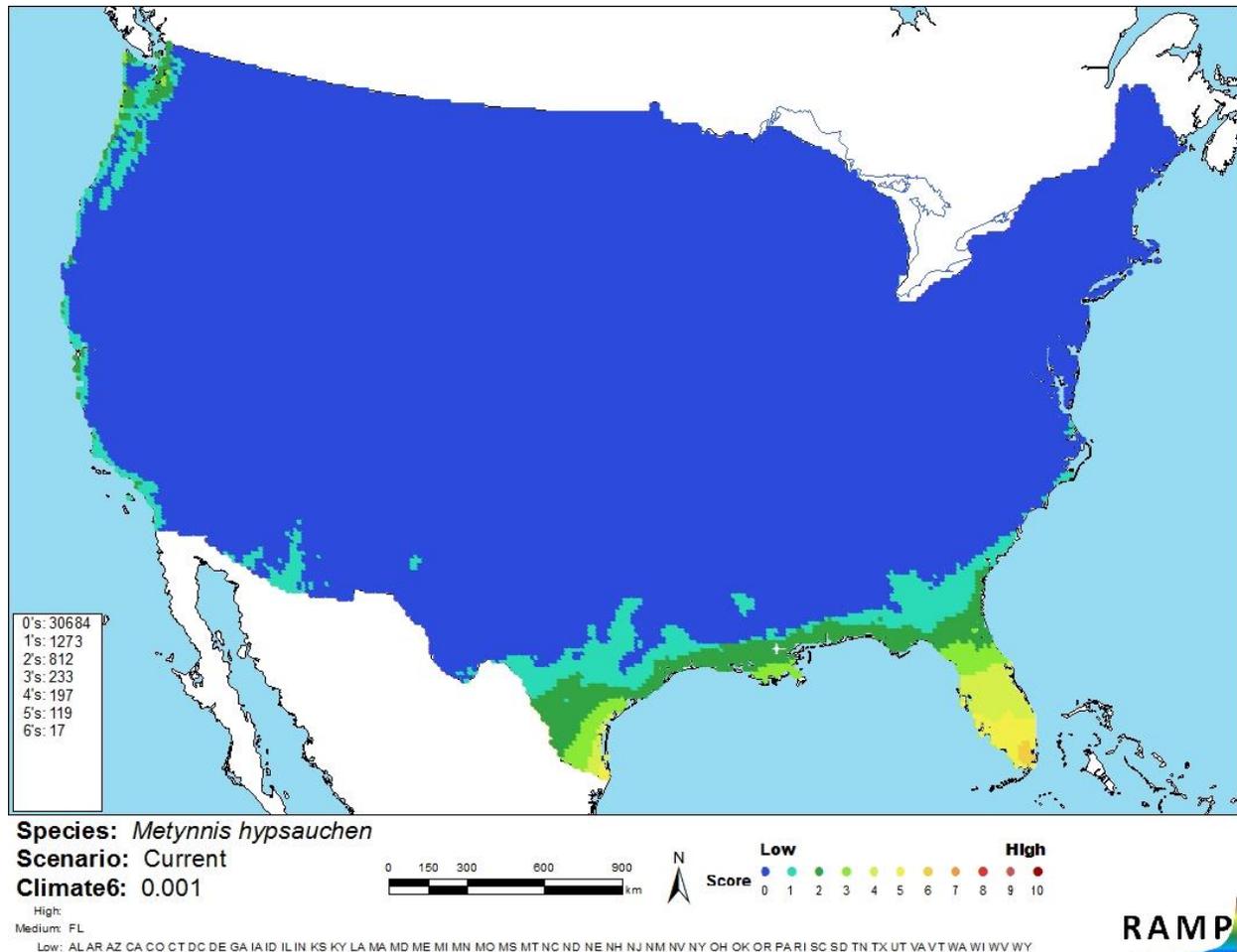


Figure 3. Map of RAMP (Sanders et al. 2014) climate matches for *M. hypsauchen* in the contiguous United States based on source locations reported by GBIF Secretariat (2017). 0=Lowest match, 10=Highest match.

The “High”, “Medium”, and “Low” climate match categories are based on the following table:

Climate 6: Proportion of (Sum of Climate Scores 6-10) / (Sum of total Climate Scores)	Climate Match Category
$0.000 \leq X \leq 0.005$	Low
$0.005 < X < 0.103$	Medium
≥ 0.103	High

7 Certainty of Assessment

The biology and ecology for *Metynnis hypsauchen* are documented, however robust data is lacking for this species. Assessment of this species is complicated due to uncertain identification of *Metynnis* spp. captured and established in the United States, and the need for systematic revision of the genus. No confirmed introductions or established populations of this species

currently exist, so impacts of introduction are unknown. Based on the available data, certainty of assessment is low.

8 Risk Assessment

Summary of Risk to the Contiguous United States

Silver dollar (*Metynnis hypsauchen*) is a fish species native to the Amazon and Paraguay River basins, and north Guiana Shield rivers in South America. It is used in aquariums and has a minor value for human consumption. *Metynnis hypsauchen* is currently available for trade within the United States and requires careful handling due to powerful dentition that can cause serious bites. History of introductions and distribution is unclear based on review of existing literature. Members of the *Metynnis* genus (species uncertain) have been collected beyond their native range in Florida, where their status is listed as locally established. No confirmed introductions of *Metynnis hypsauchen* have been reported. The climate match with the contiguous United States is low, with a medium match only in peninsular Florida and the southern Gulf Coast of Texas. The certainty of assessment is low. Given the lack of introductions, the overall risk for *Metynnis hypsauchen* is uncertain.

Assessment Elements

- **History of Invasiveness (Sec. 3): Uncertain**
- **Climate Match (Sec. 6): Low**
- **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.

- Eschmeyer, W. N., R. Fricke, and R. van der Laan, editors. 2018. Catalog of fishes: genera, species, references. Available: <http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatget.asp?spid=4062>. (March 2018).
- Froese, R., and D. Pauly, editors. 2018. *Metynnis hypsauchen* (Müller & Troschel, 1844). FishBase. Available: <https://www.fishbase.de/summary/Metynnis-hypsauchen.html>. (March 2018, August 2018).
- GBIF Secretariat. 2018. GBIF backbone taxonomy *Metynnis hypsauchen* (Müller and Troschel, 1844). Global Biodiversity Information Facility, Copenhagen. Available: <https://www.gbif.org/species/2353434>. (March 2018).

- ITIS (Integrated Taxonomic Information System). 2018. *Metynnis hypsauchen* Müller and Troschel, 1844. Integrated Taxonomic Information System, Reston, Virginia. Available: https://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=163249#null. (March 2018).
- Kodisinghe, K. A. J. L., S. C. Jayamanne, and A. H. M. S. S. K. Abeysinghe. 2015. Induced breeding of Silver Dollar (*Metynnis hypsauchen*) using ovaprim. Pages 24-26 in Technical Session-Aquatic Resources Technology. Proceedings of the Research Symposium of Uva Wellassa University, January 29-30, 2015.
- Magalhães, C., R. Robles, E. A. Souza-Carvalho, F. L. Carvalho, J. C. O. Malta, and F. L. Mantelatto. 2018. Annotated checklist of parasitic and decapod crustaceans from the middle and lower Xingu (Amazon Basin) above and below the Belo Monte dam complex, Pará State, Brazil. Proceedings of the Academy of Natural Sciences of Philadelphia 166(1):1-34.
- Nico, L., P. Fuller, and M. Neilson. 2018. *Metynnis* sp. Cope, 1878. U.S. Geological Survey, Nonindigenous Aquatic Species Database, Gainesville, Florida. Available: <https://nas.er.usgs.gov/queries/FactSheet.aspx?SpeciesID=423>. (February 2018).
- Ota, R. P., L. H. R. Py-Daniel, and M. Jégu. 2016. A new Silver Dollar species of *Metynnis* Cope, 1878 (Characiformes: Serrasalminae) from Northwestern Brazil and Southern Venezuela. Neotropical Ichthyology 14(4):e160023.
- Sanders, S., C. Castiglione, and M. H. Hoff. 2014. Risk Assessment Mapping Program: RAMP. U.S. Fish and Wildlife Service.
- Tropical Fish Keeping. 2017. Silver dollar (*Metynnis hypsauchen*). Available: <http://www.tropical-fish-keeping.com/silver-dollar-metynnis-hypsauchen.html#sthash.3hY9C3NA.dpbs>. (August 2018).

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.

- Anonymous. 1981. Piranha caught in Kentucky. Pet Business 7(11):33.
- Courtenay, W. R., Jr., D. A. Hensley, J. N. Taylor, and J. A. McCann. 1984. Distribution of exotic fishes in the continental United States. Pages 41-77 in W. R. Courtenay, Jr., and J. R. Stauffer, Jr, editors. Distribution, biology, and management of exotic fishes. John Hopkins University Press, Baltimore, Maryland.
- Courtenay, W. R., Jr., D. P. Jennings, and J. D. Williams. 1991. Appendix 2: exotic fishes. Pages 97-107 in C. R. Robins, R. M. Bailey, C. E. Bond, J. R. Brooker, E. A. Lachner, R. N. Lea, and W. B. Scott. Common and scientific names of fishes from the United States and

- Canada, 5th edition. American Fisheries Society Special Publication 20. American Fisheries Society, Bethesda, Maryland.
- Courtenay, W. R., Jr., and J. R. Stauffer, Jr. 1990. The introduced fish problem and the aquarium fish industry. *Journal of the World Aquaculture Society* 21(3):145-159.
- Florida Fish and Wildlife Conservation Commission. 2009. Florida FWC exotic database. Florida Fish and Wildlife Conservation Commission, Tallahassee, Florida.
- Fossett, J. 1981. Here's one that didn't get away. *The Courier-Journal*, Louisville, Kentucky (June 19).
- Garcia-Ayala, J. R., E. M. Brambilla, F. A. Travassos, E. D. Carvalho, and G. S. David. 2014. Length-weight relationships of 29 fish species from the Tucuruí Reservoir (Tocantins/Araguaia Basin, Brazil). *Journal of Applied Ichthyology* 30:1092-1095.
- Jégu, M. 2003. Subfamily Serrasalminae (Pacus and piranhas). Pages 182-196 *in* R. E. Reis, S. O. Kullander, and C. J. Ferraris Jr., editors. Check list of the freshwater fishes of South and Central America. Edipucrs, Porto Alegre, Brazil.
- Ota, R. P., C. P. Röpke, J. Zuanon, and M. Jégu. 2013. Serrasalminidae. Pages 15-47 *in* L. J. Queiroz, G. Torrente-Vilara, W. M. Ohara, T. H. S. Pires, J. Zuanon, and C. R. C. Dória, organizers. Peixes do rio Madeira, volume II. Santo Antônio Energia, São Paulo, Brazil.
- Pavanelli, C. S., R. P. Ota, and P. Petry. 2009. New species of *Metynnis* Cope, 1878 (Characiformes: Characidae) from the rio Paraguay basin, Mato Grosso State, Brazil. *Neotropical Ichthyology* 7:141-146.
- Riehl, R., and H. A. Baensch, 1991. *Aquarien Atlas*, volume 1. Mergus, Verlag für Natur-und Heimtierkunde, Melle, Germany.
- Rixon, C. A. M., I. C. Duggan, N. M. N. Bergeron, A. Ricciardi, and H. J. Macisaac. 2005. Invasion risks posed by the aquarium trade and live fish markets on the Laurentian Great Lakes. *Biodiversity and Conservation* 14:1365-1381.
- Shafland, P. L., K. B. Gestring, and M. S. Stanford. 2008. Florida's exotic freshwater fishes - 2007. *Florida Scientist* 71(3):220-245.
- Tlustý, M. 2002. The benefits and risks of aquacultural production for the aquarium trade. *Aquaculture* 205:203-219.
- Zarske, A., and J. Géry. 1999. Revision der neotropischen Gattung *Metynnis* Cope, 1878. 1. Evaluation der Typusexemplare der nominellen Arten (Teleostei: Characiformes: Serrasalminidae). *Zoologische Abhandlungen Staatliches Museum für Tierkunde Dresden* 50:169-216.