

***Metynnis lippincottianus* (a fish, no common name)**

Ecological Risk Screening Summary

U.S. Fish and Wildlife Service, February 2013
Revised, January 2018
Web Version, 8/23/2018



Photo: *Metynnis lippincottianus* by Lohanny Meira. Licensed under CC-BY 3.0. Available from: <http://www.fishbase.org/photos/UploadedBy.php?autoctr=30259&win=uploaded>. (January 2018).

1 Native Range and Status in the United States

Native Range

From Eschmeyer et al. (2018):

“Amazon River basin and northeastern Guiana Shield rivers: Brazil, Ecuador, Colombia, Bolivia and French Guiana.”

Status in the United States

From NatureServe (2017):

“Reported but not known to be established in Florida; *M. ROOSEVELTI* [*sic*; a synonym of *M. lippincottianus*, see Remarks] has been reported from Kentucky (Fuller et al. 1999).”

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 lippincottianus* 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 Halpatokee 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).”

Metynnis lippincottianus is advertised from an aquarium supplier in Lakeland, Florida (Imperial Tropicals 2015) as well as other online suppliers.

Means of Introductions in the United States

From Nico et al. (2018):

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

Remarks

There is no consensus on an English common name for *M. lippincottianus*. It is referred to as A Metynnis (NatureServe 2017), Silver Dollar (NatureServe 2017), and Spotted Silver Dollar (Imperial Tropicals 2015).

Eschmeyer et al. (2018) report the following synonyms for *M. lippincottianus*: *Metynnis anisurus*, *Metynnis dungerni*, *Metynnis goeldii*, *Metynnis heinrothi*, *Myletes lippincottianus*, *Myletes (Myleus) orbicularis*, *Metynnis roosevelti*, *Metynnis seitzii*, and *Metynnis snethlageae*.

All synonyms were used to search for information for this report, in addition to the accepted scientific name.

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*.”

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From ITIS (2018):

“Kingdom Animalia
Phylum Chordata
Subphylum Vertebrata
Superclass Osteichthyes
Class Actinopterygii
Subclass Neopterygii
Infraclass Teleostei
Superorder Ostariophysi
Order Characiformes
Family Characidae
Genus *Metynnis* Cope, 1878
Species *Metynnis lippincottianus* (Cope, 1870)”

“Taxonomic Status: valid”

Size, Weight, and Age Range

From Froese and Pauly (2017):

“Max length : 16.4 cm SL male/unsexed; [Cella-Ribeiro et al. 2015]; max. published weight: 205.37 g [Cella-Ribeiro et al. 2015]”

Environment

From Froese and Pauly (2017):

“Freshwater; pelagic; pH range: 5.5 - 7.5; dH range: ? – 22.”

“[...] 23°C - 27°C [Riehl and Baensch 1991; assumed to represent recommended aquarium water temperature]”

From NatureServe (2017):

“Riverine Habitat(s): Low gradient.”

Climate/Range

From Froese and Pauly (2017):

“Tropical [...]”

Distribution Outside the United States

Native

From Eschmeyer et al. (2018):

“Amazon River basin and northeastern Guiana Shield rivers: Brazil, Ecuador, Colombia, Bolivia and French Guiana.”

Introduced

From Beltrão et al. (2009):

“Gramame reservoir (located 7° 17' 40.42" S and 34° 57' 28.25" W, in the state of Paraíba, Brazil).”

From Assis et al. (2017):

“[...] downstream of the Xingó Dam, lower São Francisco River, Brazil.”

Garcia et al. (2018) report non-native occurrences of *Metynnis lippincottianus* in the Paranapanema River basin [southeastern Brazil], specifically in Rosana Reservoir, Taquaruçu Reservoir, Capivara Reservoir, Tibagi River, Canoas I Reservoir, Canoas II Reservoir, Salto Grande Reservoir, and Jurumirim Reservoir. It is not clear whether *M. lippincottianus* is established in these locations.

From Zeni et al. (2015):

“Four [*sic*] species are non-native to the Preto River and upper Paraná River basin [southeastern Brazil]: *Erythrinus erythrinus* (Block & Schneider, 1801), *Laetacara araguaiaae* Ottoni & Costa, 2009, *Leporinus microcephalus* Garavello & Britski, 1988, *Metynnis lippincottianus* (Cope, 1858), and *Poecilia reticulata* Peters, 1859.”

Means of Introduction Outside the United States

From Garcia et al. (2018):

“Nine South American freshwater ecoregions provided 38 of the 47 non-native fishes present in the [Paranapanema River] basin (83% of all introductions) [...]. The regions of native origin of

these species were primarily Paraguay and the Lower Paraná ecoregions, the Amazonas, Orinoco, Guianas, and Uruguay River basins. The importance of the Lower Paraná ecoregion as a donor region is reflected in the main introduction vector being the flooding of the Sete Quedas Falls via Itaipu Dam construction (24 of the 47 non-native fishes) [...]. The native origins of the introduced fishes from outside of South America were Africa, Asia, North America and Central America, with their vectors primarily mainly being aquaculture, fish stocking and the release of ornamental fish (via the aquarium trade).”

Short Description

No information available.

Biology

From Froese and Pauly (2017):

“Reproductive guild: nonguarders, open water/substratum egg scatterers.

Parental care: none.

Description of life cycle and mating behavior: Assumed to be like *Metynnis hypsauchen* (Riehl and Baensch 1991)”

From Beltrão et al. (2009):

“*Metynnis lippincottianus* and *Crenicichla menezesi* were more associated with the habitat in areas where riparian vegetation was removed [...]”

From Sá-Oliveira et al. (2013):

“Plant material was ingested by herbivorous species, such as *Metynnis lippincottianus*.”

Human Uses

From Froese and Pauly (2017):

“Aquarium: commercial.”

Metynnis lippincottianus is advertised from an aquarium supplier in Lakeland, Florida (Imperial Tropicals 2015) as well as other online suppliers.

Diseases

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

From Hoshino and Tavares-Dias (2014):

“The present study provides the first investigation on the ecological aspects of the parasites *M. lippincottianus* [sic] from the Amazonian basin, as well as the parasite-host relationship. 76 out of the examined fish (98.7%) were parasitized by at least one species of parasites. A total of 8,774 parasites were collected, being *Ichthyophthirius multifiliis*, *Anacanthorus jegui*,

Dadayius pacupeva, Digenea gen. sp. (metacercariae), *Procamallanus (Spirocamallanus) inopinatus*, *Procamallanus (Spirocamallanus) sp.*, *Spinoxyuris oxydoras*, *Contracaecum sp.* larvae, *Dolops longicauda* and Hirudinea gen. sp.”

From Moreira et al. (2009):

“We examined 44 specimens of *Metynnis lippincottianus* (Cope, 1870) (Characidae), collected in the Upper Paraná River floodplain, Brazil, from March 2006 to December 2007. Of the total number of fishes, 32 (72.7 %) were infected by at least one species of helminth (endoparasites). One digenean, *Dadayus pacupeva*, and four nematode species, *Spinoxyuris oxydoras*, *Contracaecum sp.* (larval stage), *Procamallanus (Spirocamallanus) inopinatus* and *Raphidascaris (Sprentascaris) mahnerti* were identified.”

Threat to Humans

From Froese and Pauly (2017):

“Harmless.”

3 Impacts of Introductions

From Beltrão et al. (2009):

“The present study reveals a depauperate fish fauna in the Gramame reservoir, when compared to the fauna before the impoundment (Torelli et al. 1997, Gomes-Filho and Rosa 2001), with only four species recorded and two of them introduced (non-native) [...] Furthermore, the introduction of exotic species such as the piscivorous *Cichla ocellaris* and the highly prolific *Metynnis lippincottianus* may have led to the loss of native species due to competition and predation, as mentioned for other reservoirs (Gurgel and Oliveira 1987, Godinho et al. 1994, Canan and Gurgel 1997).”

4 Global Distribution



Figure 1. Known global distribution of *Metynnis lippincottianus*, reported in South America. Map from GBIF Secretariat (2017). Points in the Orinoco River basin (Venezuela and eastern Colombia), east-central Brazil, and Upper Paraguay River basin (near the intersection of Bolivia, Brazil, and Paraguay) were excluded from the climate matching analysis because the establishment status of the species could not be confirmed for those areas.

5 Distribution Within the United States

There is currently no known distribution of *Metynnis lippincottianus* within the United States; however, unidentified species of *Metynnis* are listed as locally established in Florida. *Metynnis* in Florida were initially identified as *M. lippincottianus*, but that identification was later revised to an unidentified species from the genus *Metynnis* (see Status in the United States, above).

6 Climate Matching

Summary of Climate Matching Analysis

The Climate 6 score (Sanders et al. 2018; 16 climate variables; Euclidean distance) for the contiguous United States was 0.041, which is medium. The range for a medium climate match is between 0.005 and 0.103. East-central Florida had a high climate match, with medium match

throughout the southeastern United States from Maryland to coastal Texas and as far north as Kentucky. The remainder of the contiguous United States showed a low climate match.

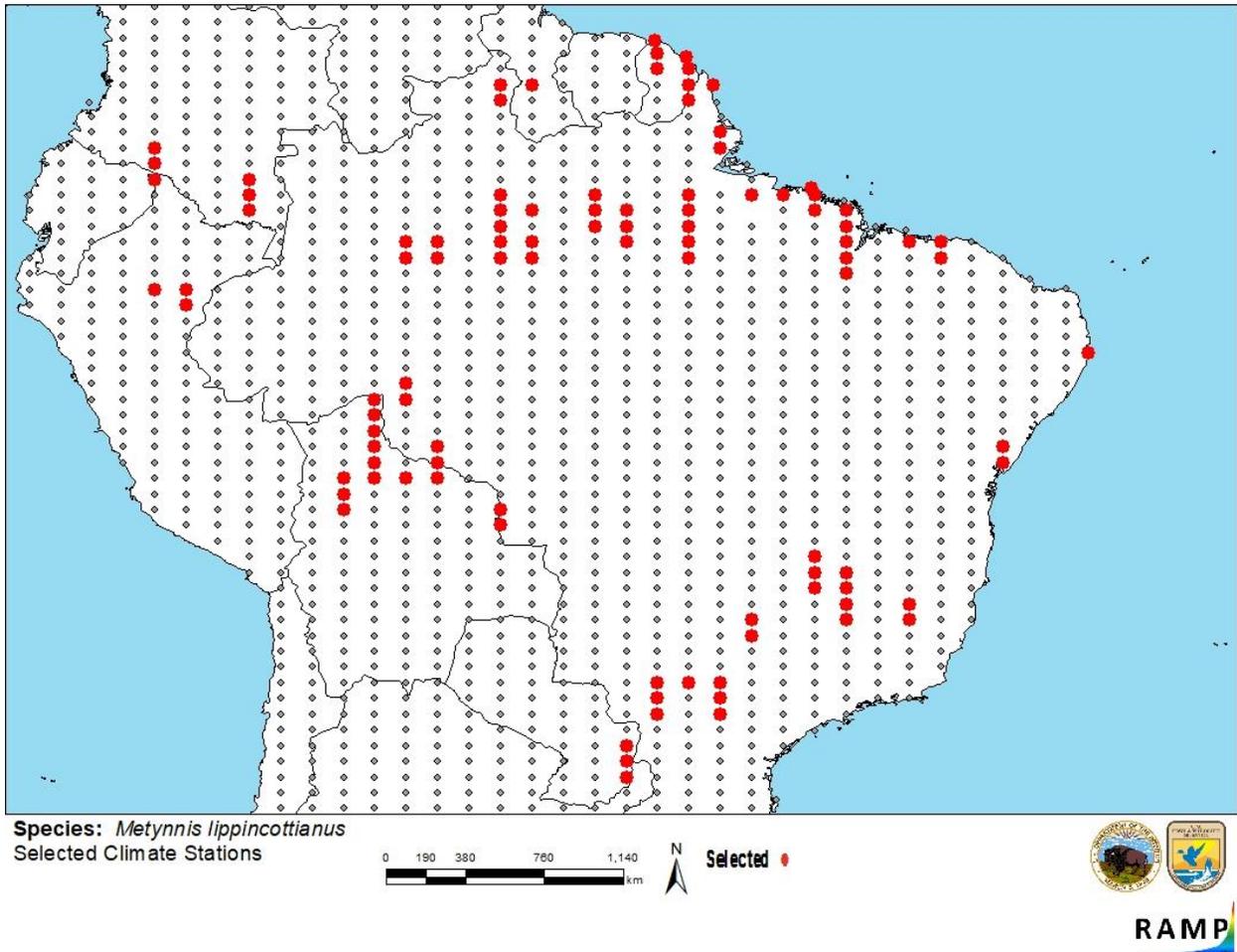


Figure 2. RAMP (Sanders et al. 2018) source map showing weather stations in South America selected as source locations (red; Brazil, French Guiana, Guyana, Colombia, Ecuador, Peru, Bolivia, Paraguay) and non-source locations (gray) for *Metynnis lippincottianus* climate matching. Source locations from GBIF Secretariat (2017). An additional location in eastern Brazil was added based on Assis et al. (2017).

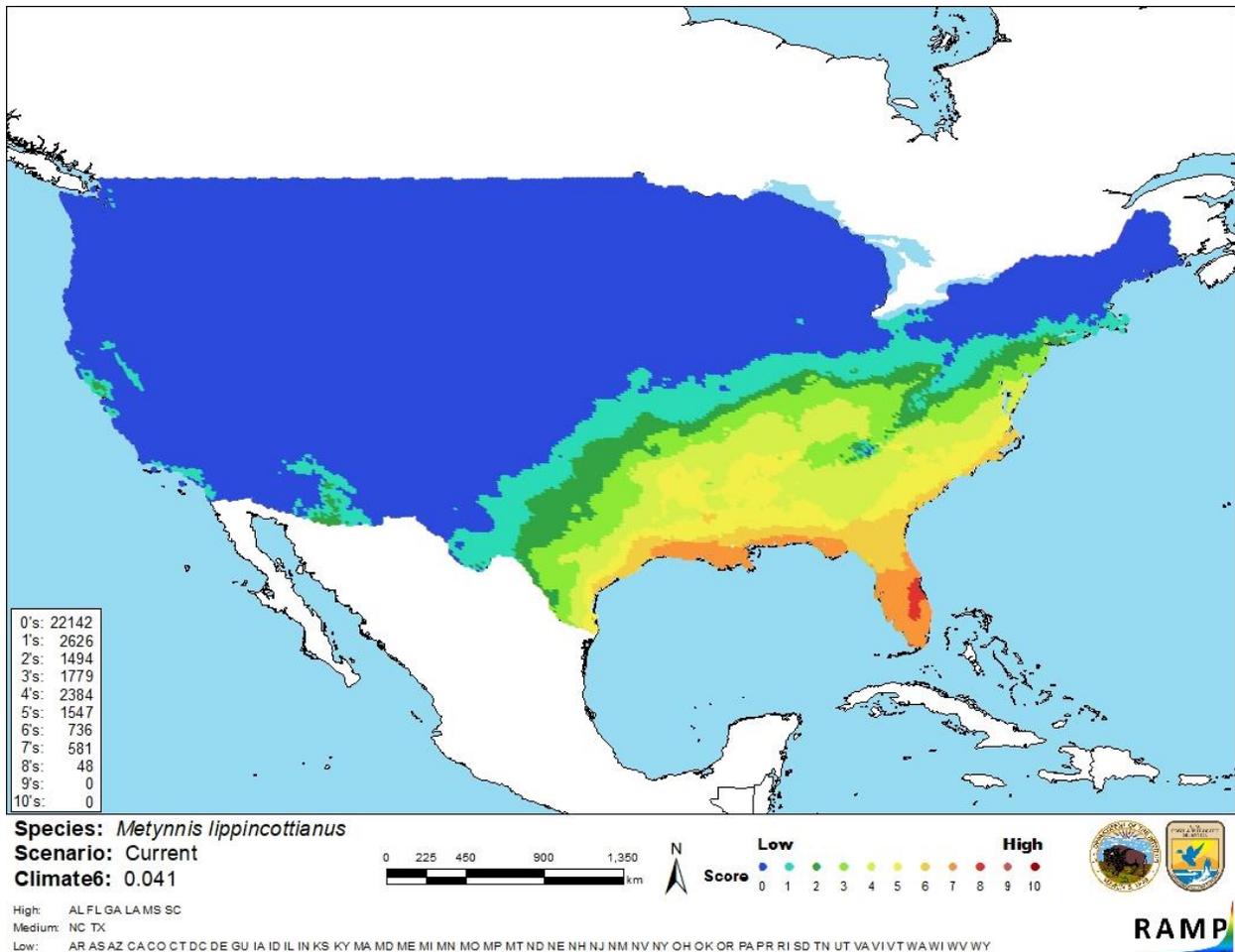


Figure 3. Map of RAMP (Sanders et al. 2018) climate matches for *Metynnis lippincottianus* in the contiguous United States based on source locations reported by GBIF Secretariat (2017) and Assis et al. (2017). 0=Lowest match, 10=Highest match.

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

Some peer-reviewed literature on the biology, distribution, and introductions of *Metynnis lippincottianus* is available. Information about possible impacts of *M. lippincottianus* is combined with another introduced species, making it impossible to know the individual contribution of each introduced species. Based on available data and taxonomic uncertainty, the certainty of this assessment is low.

8 Risk Assessment

Summary of Risk to the Contiguous United States

Metynnis lippincottianus is a freshwater fish native to the Amazon River basin and northeastern Guiana Shield rivers of South America. It has been introduced and appears to be established in other areas of Brazil. *M. lippincottianus* has also been observed in Florida, where it is currently in trade. It is not known whether this species has established in Florida. Impacts of this species have not been documented; the only information available is on the negative impacts of *M. lippincottianus* as part of a group of nonnative species, so it is unclear to what extent *M. lippincottianus* itself contributed to the negative impacts. The climate match with the contiguous United States is medium, with the highest matches in the Southeastern United States, especially in Florida and along the Atlantic and Gulf Coasts. Certainty of assessment is low. The overall risk assessment category for *Metynnis lippincottianus* is uncertain due to limited information about the impacts of this species.

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.

- Assis, D. A. S., V. A. Dias-Filho, A. L. Barroso Magalhães, and M. F. Guedes Brito. 2017. Establishment of the non-native fish *Metynnis lippincottianus* (Cope 1870) (Characiformes: Serrasalminidae) in lower São Francisco River, northeastern Brazil. *Studies on Neotropical Fauna and Environment* 52(3):228-238.
- Beltrão, G. B. M., E. S. F. Medeiros, and R. T. C. Ramos. 2009. Effects of riparian vegetation on the structure of the marginal aquatic habitat and the associated fish assemblage in a tropical Brazilian reservoir. *Biota Neotropica* 9(4):37-43.
- 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/fishcatmain.asp>. (August 2018).
- Froese, R., and D. Pauly, editors. 2017. *Metynnis lippincottianus* (Cope, 1870). FishBase. Available: <http://www.fishbase.org/summary/Metynnis-lippincottianus.html>. (January 2018).

- Garcia, D. A. Z., Britton, J. R., Vidotto-Magnoni, A. P., and M. L. Orsi. 2018. Introductions of non-native fishes into a heavily modified river: rates, patterns and management issues in the Paranapanema River (Upper Paraná ecoregion, Brazil). *Biological Invasions* 20(5):1229-1241.
- GBIF Secretariat. 2017. GBIF backbone taxonomy: *Metynnis lippincottianus* (Cope, 1870). Global Biodiversity Information Facility, Copenhagen. Available: <https://www.gbif.org/species/2353419>. (August 2018).
- Imperial Tropicals. 2015. Spotted Silver Dollars (*Metynnis lippincottianus*). Imperial Tropicals. Available: <https://imperialtropicals.com/products/silver-dollar-tank-raised-size-1>. (January 2018).
- Hoshino, M. D. F. G., and M. Tavares-Dias. 2014. Ecology of parasites of *Metynnis lippincottianus* (Characiformes: Serrasalminidae) from the eastern Amazon region, Macapá, State of Amapá, Brazil. *Maringá* 36(2): 249-255.
- ITIS (Integrated Taxonomic Information System). 2018. *Metynnis lippincottianus*. Integrated Taxonomic Information System, Reston, Virginia. Available: http://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=163251. (January 2018).
- Moreira, L. H. A., R. M. Takemoto, F. H. Yamada, T. L. Ceschini, and G. C. Pavanelli. 2009. Ecological aspects of metazoan endoparasites of *Metynnis lippincottianus* (Cope, 1870) (Characidae) from Upper Paraná River floodplain, Brazil. *Helminthologia* 46:214.
- NatureServe. 2017. NatureServe Explorer: an online encyclopedia of life, version 7.1. NatureServe, Arlington, Virginia. Available <http://explorer.natureserve.org>. (January 2018).
- 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: Serrasalminidae) from Northwestern Brazil and Southern Venezuela. *Neotropical Ichthyology* 14(4):e160023.
- Sa-Oliveira, J. C., Angelini, R., and V. J. Isaac-Nahum. 2014. Diet and niche breadth and overlap in fish communities within the area affected by an Amazonian reservoir (Amapá, Brazil). *Anais da Academia Brasileira de Ciências* 86(1):383-406.
- Sanders, S., C. Castiglione, and M. H. Hoff. 2018. Risk Assessment Mapping Program: RAMP, version 3.1. U.S. Fish and Wildlife Service.

Zeni, J. O., A. C. Santos, and F. R. Carvalho. 2015. Contribution of different mesohabitats to the maintenance of fish richness and diversity in the lower Preto River. *Acta Scientiarum Biological Sciences* 37(3):301-308.

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.

Canan, B., and H. D. C. B. Gurgel. 1997. Estrutura populacional de *Metynnis roosevelti* Eigenmann, 1915 (Characidae, Myleinae) da lagoa do Jiqui, Parnamirim, Rio Grande do Norte. *Rev. UNIMAR* 19(2):479-491.

Cella-Ribeiro, A., M. Hauser, L. D. Nogueira, C. R. C. Doria, and G. Torrente-Vilara. 2015. Length-weight relationships of fish from Madeira River, Brazilian Amazon, before the construction of hydropower plants. *Journal of Applied Ichthyology* 31:939-945.

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).

Fuller, P. L., L. G. Nico, and J. D. Williams. 1999. Nonindigenous fishes introduced into inland waters of the United States. American Fisheries Society, Special Publication 27.

Godinho, A. L., M. T. D. Fonesca, and L. M. D. Araújo. 1994. The ecology of predator fish introductions: the case of rio Doce Valley lakes. Pages 77-83 in R. M. Pinto-Coelho, A. Giani, and E. Von Sperling, editors. *Ecology and human impact on lakes and*

- reservoirs in Minas Gerais with special reference to future development and management strategies. SEGRAC, Belo Horizonte, Brazil.
- Gomes-Filho, G., and R. S. Rosa. 2001. Inventário da ictiofauna da bacia do rio Gramame, Paraíba, Brasil. Pages 167-173 in T. Watanabe, editor. *A bacia do Rio Gramame: biodiversidade, uso e conservação*. PRODEMA, João Pessoa, Brazil.
- Gurgel, J. J. S., and A. G. Oliveira. 1987. Efeitos da introdução de peixes e crustáceos no semi-árido do Nordeste brasileiro. *Coleção Mossoroense, Série B* 453:7-32.
- 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. Serrasalmidae. 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.
- Pelicice, F. M., and A. A. Agostinho. 2009. Fish fauna destruction after the introduction of a non-native predator (*Cichla kelberi*) in a Neotropical reservoir. *Biological Invasions* 11(8):1789-1801.
- Riehl, R., and H. A. Baensch. 1991. *Aquarien Atlas, volume 1*. Mergus, Verlag für Natur-und Heimtierkunde, Melle, Germany.
- Shafland, P. L., K. B. Gestring, and M. S. Stanford. 2008. Florida's exotic freshwater fishes - 2007. *Florida Scientist* 71(3):220-245.
- Torelli, J., I. L. Rosa, and T. Watanabe. 1997. Ictiofauna do rio Gramame, Paraíba, Brasil. *Iheringia, Série Zoologia* 82(1):67-73.
- Zarske, A., and J. Géry. 1999. Revision der neotropischen Gattung *Metynnis* Cope, 1878. 1. Evaluation der Typusexemplare der nominellen Arten (Teleostei: Characiformes: Serrasalmidae). *Zoologische Abhandlungen Staatliches Museum für Tierkunde Dresden* 50:169-216.