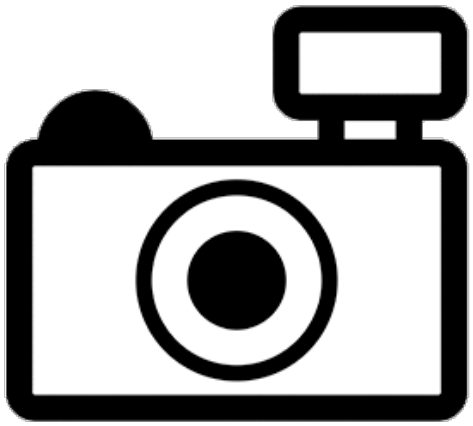
Silvinichthys bortayro (a catfish, no common name)
Ecological Risk Screening Summary

U.S. Fish & Wildlife Service, April 2012
Revised, December 2018
Web Version, 4/16/2021

Organism Type: Fish
Overall Risk Assessment Category: Uncertain



1 Native Range and Status in the United States

Native Range

From Froese and Pauly (2018):

"South America: artificial wells in western Argentina."

From Fernandez (2010):

"*Silvinichthys bortayro* (Ostariophysii: Siluriformes) is an endemic and endangered species from northwestern Argentina, South America."

From Fernández and de Pinna (2005):

"Distribution.-*Silvinichthys bortayro* is known only from artificial wells at San Luis, Departamento Capital, Provincia de Salta, western Argentina […]."

Status in the United States

No records of *Silvinichthys bortayro* in the wild or in trade in the United States were found.

From Arizona Office of the Secretary of State (2013):

"I. Fish listed below are considered restricted wildlife: […]
9. All species of the family Cetopsidae and Trichomycteridae. Common name: South American catfish."

From California Department of Fish and Wildlife (2019):

"It shall be unlawful to import, transport, or possess live animals restricted in subsection (c) below except under permit issued by the department. […] Family Trichomycteridae (Pygidiidae)-Parasitic Catfishes.: All species"

The Florida Fish and Wildlife Conservation Commission has listed the parasitic catfish *Silvinichthys bortayro* as a prohibited species. Prohibited nonnative species (FFWCC 2020), "are considered to be dangerous to the ecology and/or the health and welfare of the people of Florida. These species are not allowed to be personally possessed or used for commercial activities."

From Georgia DNR (2020):

"The exotic species listed below, except where otherwise noted, may not beheld as pets in Georgia. This list is not all inclusive. […]
Parasitic catfishes; all species"

From Louisiana State Legislature (2019):

"No person, firm, or corporation shall at any time possess, sell, or cause to be transported into this state by any other person, firm, or corporation, without first obtaining the written permission of the secretary of the Department of Wildlife and Fisheries, any of the following species of fish: freshwater electric eel (*Electrophorus* sp.); rudd (*Scardinius erythrophthalmus*); all members of the families *Synbranchidae* (Asian swamp eels); *Channidae* (snakeheads); *Clariidae* (walking catfishes); *Trichomycteridae* (pencil catfishes); all species of tilapia [*Sarotherodon caroli* is a species of tilapia], […]"

From Mississippi Secretary of State (2019):

"All species of the following animals and plants have been determined to be detrimental to the State's native resources and further sales or distribution are prohibited in Mississippi. No person shall import, sell, possess, transport, release or cause to be released into the waters of the state any of the following aquatic species or hybrids thereof. However, species listed as prohibited may be allowed under a permitting process where environmental impact has been assessed. […]
Pencil or parasitic catfishes Family Trichomycteridae **** [indicating all species within the family are included in the regulation]"

From State of Nevada (2018):

"Except as otherwise provided in this section and NAC 504.486, the importation, transportation or possession of the following species of live wildlife or hybrids thereof, including viable embryos or gametes, is prohibited: […]
South American Parasitic Catfish.....All species in the families Cetopsidae and Trichomycteridae"

From Oklahoma Secretary of State (2019):

"Until such time as is necessary for the Department of Wildlife Conservation to obtain adequate information for the determination of other harmful or potentially harmful exotic species, the importation into the State and/or the possession of the following exotic fish or their eggs is prohibited: […]
Parasitic South American Catfish group (Candiru), genera & species of the Trichomycteridae family. Vandellia spp., Tridens spp., and Pyqidium spp."

From Texas Parks and Wildlife (2020):

"The organisms listed here are legally classified as exotic, harmful, or potentially harmful. No person may possess or place them into water of this state except as authorized by the department. Permits are required for any individual to possess, sell, import, export, transport or propagate listed species for zoological or research purposes; for aquaculture(allowed only for Blue, Nile, or Mozambique tilapia, Triploid Grass Carp, or Pacific White Shrimp); or for aquatic weed control (for example, Triploid Grass Carp in private ponds). […]
South American Parasitic Candiru Catfishes, Family Trichomycteridae All species"

From Utah Office of Administrative Rules (2019):

"All species of fish listed in Subsections (2) through (30) are classified as prohibited for collection, importation and possession, […] Parasitic catfish (candiru, carnero) family Trichomycteridae (All species)."

Means of Introductions in the United States

No records of *Silvinichthys bortayro* in the wild in the United States were found.

Remarks

From Fernandez (2010):

"Conservation status: Threatened (Fernandez 2005)."

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

According to Fricke et al. (2018), *Silvinichthys bortayro* Fernández & de Pinna, 2005 is the current valid and original name of this species.

From Bailly (2017):

"Biota > Animalia (Kingdom) > Chordata (Phylum) > Vertebrata (Subphylum) > Gnathostomata (Superclass) > […] Actinopterygii (Class) > Siluriformes (Order) > Trichomycteridae (Family) > Trichomycterinae (Subfamily) > *Silvinichthys* (Genus) > *Silvinichthys bortayro* (Species)"

Size, Weight, and Age Range

From Froese and Pauly (2018):

"Max length : 2.8 cm SL male/unsexed; [Fernández and de Pinna 2005]"

From Fernandez (2010):

"Maximum length: 30 mm SL."

Environment

From Froese and Pauly (2018):

"Freshwater; demersal."

Climate

From Froese and Pauly (2018):

"Tropical"

Distribution Outside the United States

Native

From Froese and Pauly (2018):

"South America: artificial wells in western Argentina."

From Fernandez (2010):

"*Silvinichthys bortayro* (Ostariophysii: Siluriformes) is an endemic and endangered species from northwestern Argentina, South America."

From Fernández and de Pinna (2005):

"Distribution.-*Silvinichthys bortayro* is known only from artificial wells at San Luis, Departamento Capital, Provincia de Salta, western Argentina […]."

Introduced

No records of introductions of *Silvinichthys bortayro* were found.

Means of Introduction Outside the United States

No records of introductions of *Silvinichthys bortayro* were found.

Short Description

From Froese and Pauly (2018):

"Dorsal soft rays (total): 9; Anal soft rays: 8 - 10. Differs from other species of the subfamily Trichomycterinae by the extreme elongation of the opercle and narrow odontode-bearing distal plate. Further differs by having elongated and curved coronoid process of the lower jaw. The lack of pelvic fin and girdle further differs this species from all other Trichomycterinae except *Eremophilus mutisii, E. candidus* and *Trichomycterus catamarcensis*, species that are readily distinguished from *Silvinichthys bortayro* by their coloration pattern. The pale integumentary pigmentation and reduction of the eyes are troglomorphic characters that are paralleled only in cave-dwelling species *Trichomycterus itacarambiensis* and *T. chaberti* among presently known trichomycterines. Can be easily distinguished from those two species by its proportionally much shorter body and fewer pectoral-fin rays (6 vs 7 and 10, respectively). Further differs except *Silvinichthys mendozensis* by the absece of a latero-sensory canal branch in the frontal and sphenotic; and also differs from S. mendozensis in having 6 versus 7 or 8 pectoral-fin rays and the absence versus presence of the pelvic fin and girdle [Fernández and de Pinna 2005]."

From Fernández and de Pinna (2005):

"Body round in cross-section at anterior part of trunk and gradually more compressed posteriorly, tapering to caudal fin. Dorsal trunk profile nearly straight from head to base of caudal fin. Ventral trunk profile gently convex from gular region to vent, somewhat distended in some specimens. Caudal peduncle expanding posteriorly toward caudal fin, because of diverging dorsal and ventral profiles. Body deepest at about midlength of trunk."

"Head depressed, longer than broad and oval in dorsal view. Snout narrow, distinctly less broad than rest of head. Anterior profile of head semicircular. Mouth subterminal, profile of cleft paralleling profile of snout, its lateral rictae strongly directed posteriorly. Lower lip continuous, not constricted or divided medially. Lateral integumentary fold of lower lip large but not diverging markedly from remaining profile of lip. Upper lip wider than lower lip and dorsally continuous with remainder of head. Branchiostegal membranes narrowly attached to isthmus anteriorly at midline, with wide and almost free branchial openings.

Eyes small but not deeply sunk into integument, located dorsally on head, slightly anterior to midlength of HL. Skin covering to eyes thin and transparent. Lends of eye well differentiated; diameter about one-third that of orbit in largest specimen and slightly larger in small individuals. Orbital margin not free.

Opercular patch of odontodes small and elongate, located dorsolaterally on head, near dorsal head profile in lateral view and at approximately horizontal through eye. Four small opercular odontodes. Fold of integument underlying opercular odontode patch thin, forming delicate frame surrounding area of odontodes. Interopercular patch of odontodes elongate and weak, located laterally on ventral half of head, larger than opercular patch but very small compared to condition in other species of trichomycterine. Interopercular odontodes 9-12 and arranged in one or two irregular rows. Fold of integument surround interopercular odontode patch thin and inconspicuous."

"Pectoral fin small; with i + 5 rays, first unbranched ray of same approximate length as following ray, not prolonged as filament. Last ray markedly shorter than other rays. Pectoral-fin insertion approximately horizontally aligned with interopercular patch of odontodes. Dorsal-fin margin semicircular, with ii + 7 rays. Origin of dorsal-fin at vertical through anal opening. Anal fin semicircular in profile and slightly smaller than dorsal fin. Anal-fin origin located slightly posterior to vertical through dorsal fin origin. Anal-fin rays ii-iv + 6, with last ray atrophied in largest specimen. Caudal-fin margin almost round, with 5/6, 6/6, or 7/6 principal rays. Procurrent caudal-fin rays few, and almost vertically aligned, becoming gradually larger posteriorly and merging gradually into principal fin rays. Caudal peduncle markedly expanded in area of procurrent rays but never deeper than caudal-fin base."

"Color in life.-Body pinkish-yellow, slightly translucent, not opaque as in preserved specimens. Outline of vertebral column visible along postabdominal region. Gut contents evident as dark shadows along ventral translucent region of abdomen. Nearly entire lateral part of abdominal wall with dense, opaque, white covering of fat. Ventral surface of branchial region and pectoral girdle bright red, due to visible blood. Fin membranes transparent, with rays outlined in white."

Biology

From Fernandez (2010):

"*Habitat and ecology:* This small catfish is an invertivore, living in groundwater. It lives in artificial wells and clean undisturbed water. It is carnivorous generalist, preying mainly on insects and crustaceans. *Reproduction:* November through December."

Human Uses

No information on human uses of *Silvinichthys bortayro* was found.

Diseases

No information on diseases of *Silvinichthys bortayro* was found. **No records of OIE-reportable diseases (OIE 2021) were found for *S. bortayro.***

Threat to Humans

From Froese and Pauly (2018):

"Harmless"

3 Impacts of Introductions

No records of introductions of *Silvinichthys bortayro* were found.

4 History of Invasiveness

No records of introductions of *Silvinichthys bortayro* were found. Therefore, the history of invasiveness for *Silvinichthys bortayro* is classified as No Known Nonnative Population.

5 Global Distribution

Figure 1. Known distribution of *Silvinichthys bortayro.* Locations are in Argentina. Map from GBIF Secretariat (2018).

6 Distribution Within the United States

No records of *Silvinichthys bortayro* in the wild in the United States were found.

7 Climate Matching

Summary of Climate Matching Analysis

The climate match for *Silvinichthys bortayro* was low for the majority of the contiguous United States. There are small areas of medium match throughout the Midwest, California, and Texas. The Climate 6 score (Sanders et al. 2018; 16 climate variables; Euclidean distance) for the contiguous United States was 0.000, low (scores less than or equal to 0.005 are considered low) with all States having a low individual Climate 6 score.

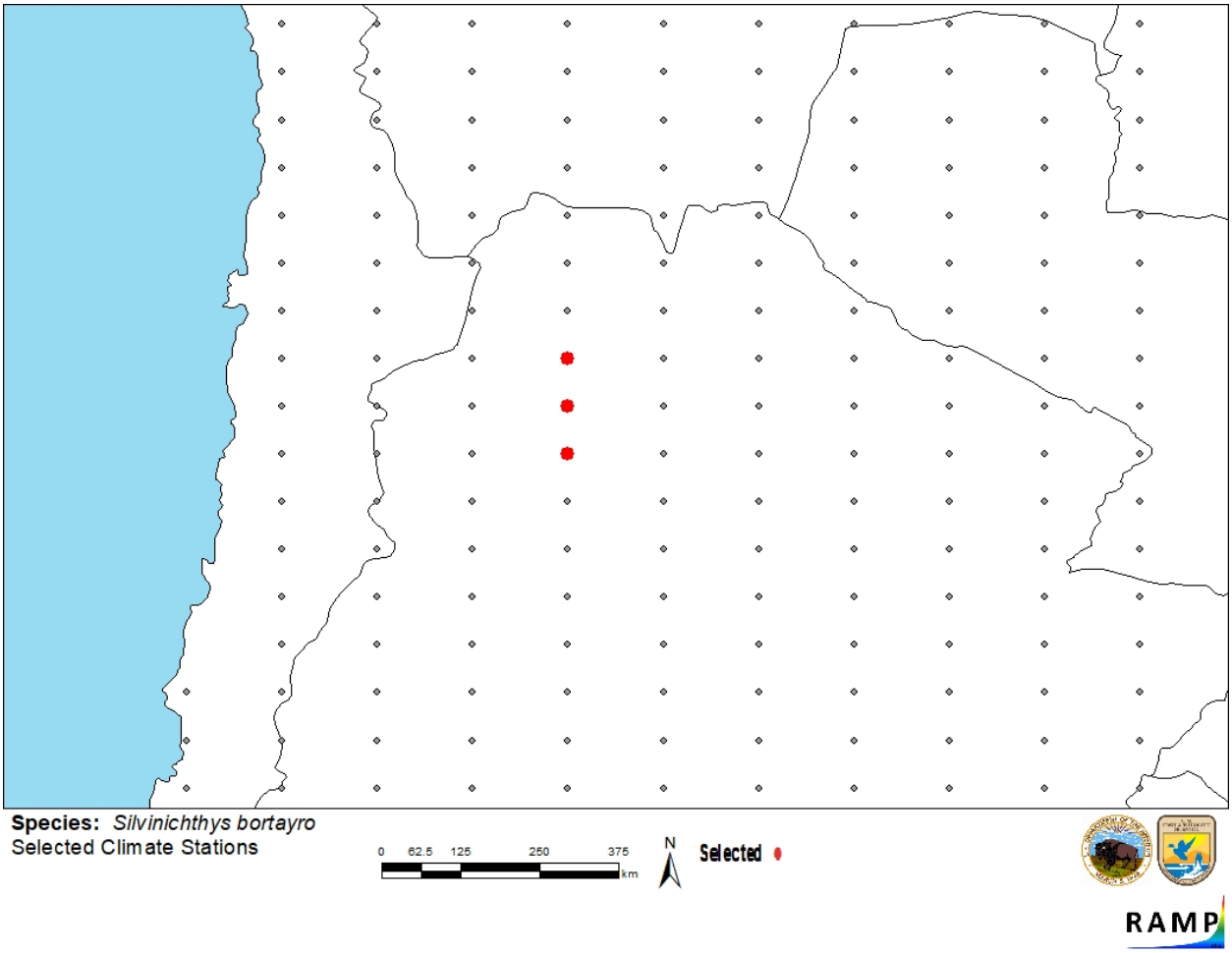


Figure 2. RAMP (Sanders et al. 2018) source map showing weather stations in South America selected as source locations (red; Argentina) and non-source locations (gray) for *Silvinichthys bortayro* climate matching. Source locations from GBIF Secretariat (2018). Selected source locations are within 100 km of one or more species occurrences, and do not necessarily represent the locations of occurrences themselves.

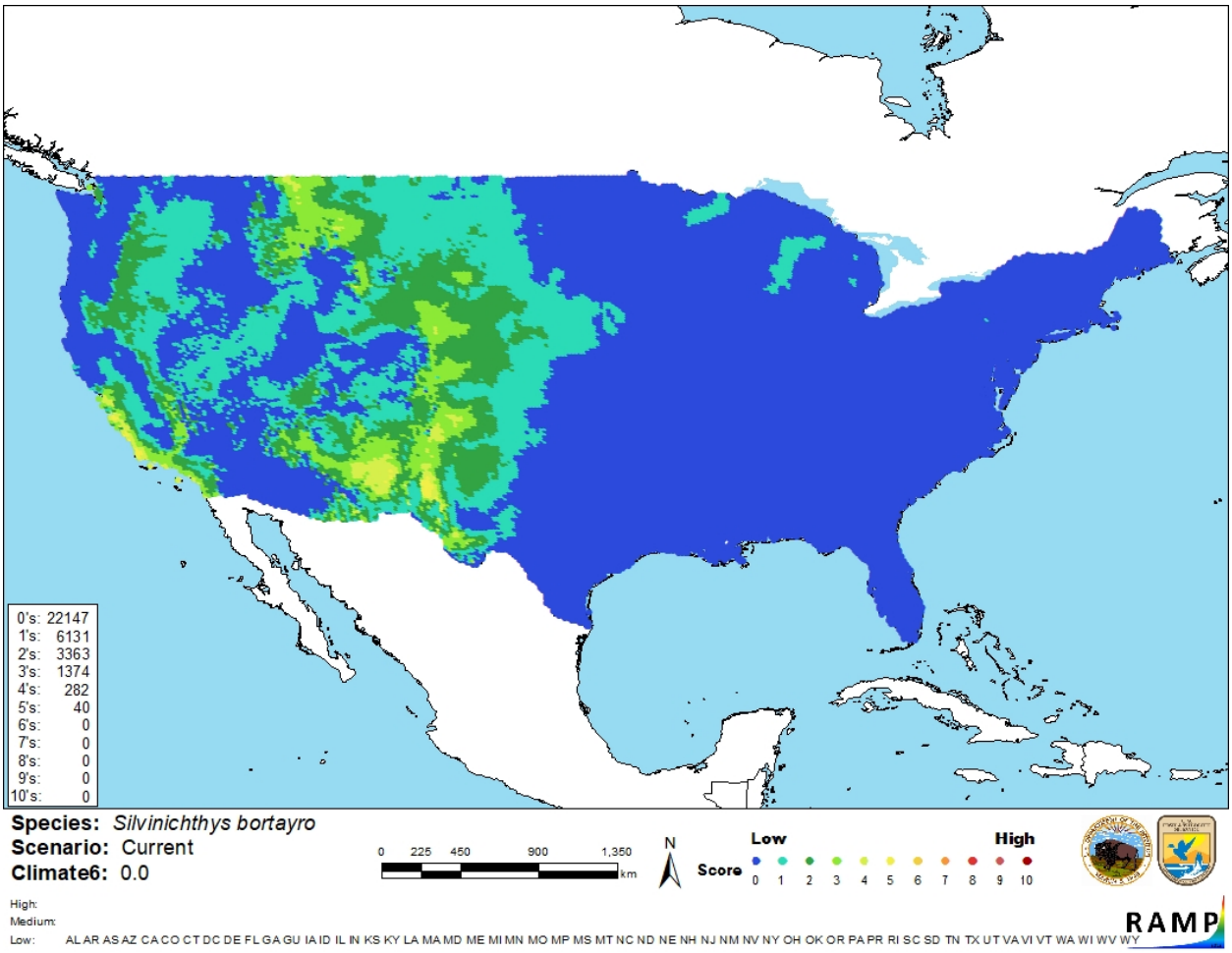


Figure 3. Map of RAMP (Sanders et al. 2018) climate matches for *Silvinichthys bortayro* in the contiguous United States based on source locations reported from GBIF Secretariat (2018). Counts of climate match scores are tabulated on the left. 0/Blue = Lowest match, 10/Red = Highest match.

The High, Medium, and Low Climate match Categories are based on the following table:

Climate 6: (Count of target points with climate scores 6-10)/ (Count of all target points)	Overall Climate Match Category
0.000≤X≤0.005	Low
0.005<X<0.103	Medium
≥0.103	High

8 Certainty of Assessment

The certainty of assessment for *Silvinichthys bortayro* is low. There is minimal information available for this species. No information on introductions of *Silvinichthys bortayro* was found.

9 Risk Assessment

Summary of Risk to the Contiguous United States

Silvinichthys bortayro is a South American catfish native to Brazil. The history of invasiveness is no known nonnative populations. It has not been reported as introduced or established anywhere in the world. The climate match for the contiguous United States was low with all States having an individually low climate match. The certainty of assessment is low. The overall risk assessment category is uncertain.

Assessment Elements

- **History of Invasiveness (Sec. 3): No Known Nonnative Populations**
- **Climate Match (Sec. 6): Low**
- **Certainty of Assessment (Sec. 7): Low**
- **Remarks/Important additional information:** No additional information.
- **Overall Risk Assessment Category: Uncertain**

10 Literature Cited

Note: The following references were accessed for this ERSS. References cited within quoted text but not accessed are included below in Section 11.

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California Department of Fish and Wildlife. 2019. Restricted species laws and regulations manual. Available: https://wildlife.ca.gov/Conservation/Invasives/Regulations (November 2020).

Fernandez L. 2010. Threatened fishes of the world: *Silvinichthys bortayro* (Fernandez and de Pinna, 2005) (Trichomycteridae). Environmental Biology of Fishes 87:195.

Fernández L, de Pinna MCC. 2005. Phreatic catfish of the genus *Silvinichthys* from southern South America (Teleostei, Siluriformes, Trichomycteridae). Copeia 2005:100–108.

[FFWCC] Florida Fish and Wildlife Conservation Commission. 2020. Prohibited species list. Tallahassee: Florida Fish and Wildlife Conservation Commission. Available: http://myfwc.com/wildlifehabitats/nonnatives/regulations/prohibited/ (October 2020).

Fricke R, Eschmeyer WN, van der Laan R, editors. 2018. Catalog of fishes: genera, species, references. California Academy of Science. Available: http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp (December 2018).

Froese R, Pauly D, editors. 2018. *Silvinichthys bortayro* Fernández & de Pinna, 2005. FishBase. Available: https://www.fishbase.de/summary/Silvinichthys-bortayro.html (December 2018).

GBIF Secretariat. 2018. GBIF backbone taxonomy: *Silvinichthys bortayro* Fernández & de Pinna, 2005. Copenhagen: Global Biodiversity Information Facility. Available: https://www.gbif.org/species/2343287 (Decemeber 2018).

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Mississippi Secretary of State. 2019. Guidelines for aquaculture activities. Mississippi Administrative Code, Title 2, Part 1, Subpart 4, Chapter 11. Jackson, Mississippi: Regulatory and Enforcement Division, Office of the Mississippi Secretary of State.

[OIE] World Organisation for Animal Health. 2021. OIE-listed diseases, infections and infestations in force in 2021. Available: http://www.oie.int/animal-health-in-the-world/oie-listed-diseases-2021/ (April 2021).

Oklahoma Secretary of State. 2019. List of restricted exotic species. Oklahoma Administrative Code, Title 800, Chapter 20-1-2.

Sanders S, Castiglione C, Hoff M. 2018. Risk Assessment Mapping Program: RAMP. Version 3.1. U.S. Fish and Wildlife Service.

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Texas Parks and Wildlife. 2020. Invasive, prohibited and exotic species. Austin, Texas: Texas Parks and Wildlife. Available: https://tpwd.texas.gov/huntwild/wild/species/exotic/prohibited_aquatic.phtml (November 2020).

Utah Office of Administrative Rules. 2019. Classification and specific rules for fish. Utah Administrative Code, Rule R657-3-23.

11 Literature Cited in Quoted Material

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.

Fernandez L. 2005. Risk of extinction of a rare catfish of Andean groundwater and its priority for conservation. AMBIO 34:269–270.