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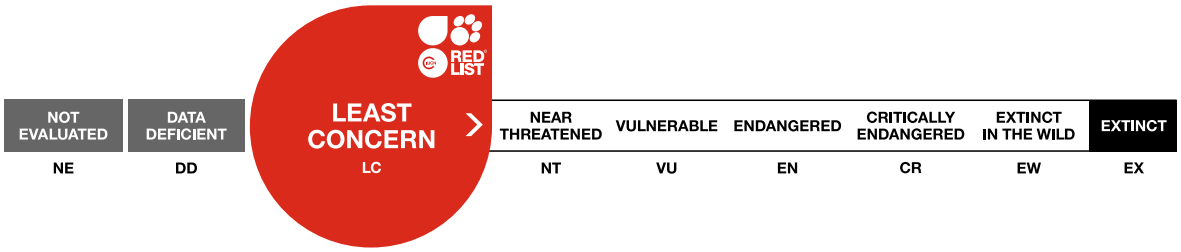
Hatcheria macraei

Assessment by: Cussac, V.



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Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Chordata	Actinopterygii	Siluriformes	Trichomycteridae

Scientific Name: *Hatcheria macraei* (Girard 1855)

Synonym(s):

- *Trichomycterus macraei* Girard, 1855

Taxonomic Source(s):

Fricke, R., Eschmeyer, W.N. and Van der Laan, R. (eds). 2020. Eschmeyer's Catalog of Fishes: genera, species, references. Updated 04 May 2020. Available at: http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp.

Taxonomic Notes:

The genus *Hatcheria* was created by Girard in 1855. Eigenmann (1910) placed *H. macraei* within the *Trichomycterus* genus and Tchernavin (1944) put *Hatcheria* in synonymy with *Trichomycterus*. In 1958, *Hatcheria* was proposed as a subgenus of *Trichomycterus* (De Buen 1958). Ringuelet *et al.* (1967) described five species of *Hatcheria* in Argentina, not considering *Trichomycterus*, then Arratia *et al.* (1978) separated the species within *Hatcheria*, and creating a new genus, *Bullockia* Arratia, Chang, Menu-Marque & Rojas, for Chilean waters. Finally, a study by Arratia and Menu-Marque (1981) found the *Hatcheria* species described by Ringuelet *et al.* (1967) indistinguishable and redescribed *H. macraei*, with clear intra-specific variation, leaving *Hatcheria* as a monotypic genus. The results of Unmack *et al.* (2009) have implications relative to the status of *Hatcheria*. There are at least two possible explanations for the placement of *H. macraei* within *T. areolatus*. It could be caused by introgressive hybridization of the mitochondrial genome of *T. areolatus* into *H. macraei* at different times in their history. An alternative hypothesis for the close relationship of *H. macraei* to *T. areolatus* is that the current taxonomy is incorrect, with *H. macraei* actually representing an individual lineage within *T. areolatus* that has morphologically diverged and specialized from other ancestral *T. areolatus* lineages.

Assessment Information

Red List Category & Criteria: Least Concern ver 3.1

Year Published: 2022

Date Assessed: May 6, 2022

Justification:

This species is native to Chile and Argentina. It is assessed as Least Concern given its widespread distribution.

Geographic Range

Range Description:

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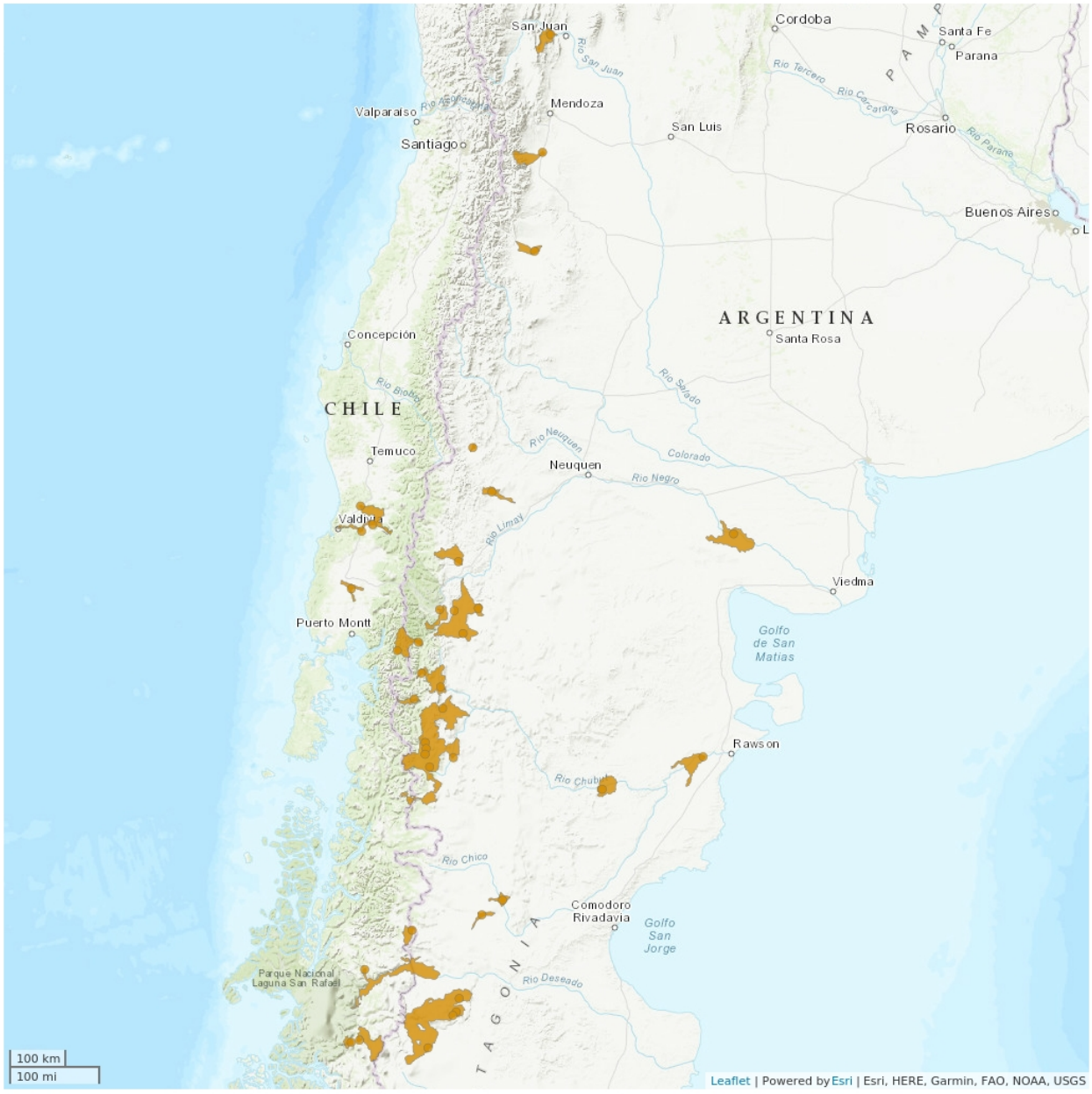
Hatcheria macraei is present at both sides of the Andes, ranging from 28°46' S in the Jagüé river, a tributary of the Desaguadero river (Fernández and Andreoli Bize 2015), to 47°7'S in the Ecker river, tributary of the Deseado river in Argentina, and from 38°43'S in the Imperial river to 47°34' S in the Baker river in Chile (Unmack *et al.* 2012). Together with *O. viedmensis* (Muñoz-Ramírez *et al.* 2014, Arratia and Quezada-Romegialli 2017), this species is the southernmost living ostariophysan fishes in the world. Complete records are detailed in Unmack *et al.* (2012).

Country Occurrence:

Native, Extant (resident): Argentina (Chubut, Mendoza, Neuquén, Rio Negro, San Juan, Santa Cruz); Chile (Aisén, Los Lagos)

Distribution Map



Legend

EXTANT (RESIDENT)

Compiled by:

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The boundaries and names shown and the designations used on this map do not imply any official endorsement, acceptance or opinion by IUCN.

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Population

Morphological variation among *H. macraei* subpopulations was consistent with great intra-specific variation as described in the studies by Arratia and Menu-Marque (1981) and Chiarello-Sosa *et al.* (2018). This was reflected mainly in the head size, trunk length, caudal peduncle height, and dorsal fin length, all attributes related to the ability to swim in rocky bottoms. Grouping morphometric data according to Cytb clades produced three well defined morphological groups within *H. macraei*. The first group extends southward from the Negro River Basin within the Atlantic-Pacific clade. The second one was restricted to two subpopulations separated by more than 5 latitudinal degrees within the Pacific clade (Lake Cholila in the head waters of the Yelcho River; and Blanco River - its southernmost record, presently a closed basin). The third group was formed by the northern Colorado River Basin, within the Atlantic clade (Becker *et al.* in prep).

Current Population Trend: Unknown

Habitat and Ecology **(see Appendix for additional information)**

The relic condition of *H. macraei* has been confirmed by physiological studies. In Lake Buenos Aires (46° 32' S, mean annual air temperature <8°C), *H. macraei* shows an upper death temperature (31°C) similar to that of a warm water fish, but an upper loss of equilibrium temperature (LOE) equal to 22°C, suggesting that its high death temperature is a 'physiological relic' related to previous warm water adaptation and the low LOE temperature a product of the present thermal condition (Gómez 1990). The species occurs in the rithronic zone of streams and rivers in areas with loose pebbles, gravel or sandy bottoms, substrates that allow individuals to bury themselves and avoid predators (Arratia 1983). *Hatcheria macraei* prefers dark substrates (Arratia 1983). It has broad environmental tolerances with a widespread presence in small headwater streams to low elevation rivers on a variety of substrates, especially gravel and rocks (Arratia *et al.* 1983; Unmack *et al.* 2009, 2012). Moreover, it appears that habitat preference changes with age and can be somewhat flexible, allowing individuals to respond to seasonal river flow fluctuations. This may in part explain their widespread distribution (Arratia 1983). Adults inhabit the benthic part of the rhitronal region of rivers and streams (Arratia 1983) and have been described as negatively phototactic and orienting themselves against the current (Ringuelet *et al.* 1967, 1975; Arratia 1976; Arratia and Menu-Marque 1981; Habit *et al.* 2005; Barriga *et al.* 2013). An important size-related habitat shift has been reported for *H. macraei* with positive allometric larval growth affecting mainly the head region, locomotion structures, the trunk region, and body robustness. Changes from positive allometric to isometric growth in *H. macraei* reflect the larva–juvenile transition (Barriga and Battini 2009, Becker *et al.* in prep).

Systems: Freshwater (=Inland waters)

Use and Trade **(see Appendix for additional information)**

There is no use or trade information for this species.

Threats **(see Appendix for additional information)**

Invasive alien species are a potential threat. However, nocturnal activity and negative phototactic behaviour appear to be important mechanisms which have enabled *H. macraei* to withstand the effects of salmonid introduction in lotic environments where other native fishes have suffered negative effects

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(Barriga *et al.* 2016). Mining and water abstraction are other potential threats.

Conservation Actions **(see Appendix for additional information)**

Capture is forbidden in national parks of Argentina.

Credits

Assessor(s): Cussac, V.

Reviewer(s): Lyons, T.J.

Partner(s) and Institution(s): ABQ BioPark

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Bibliography

Arratia, G. 1976. Variaciones de las hipurapófisis en algunos peces siluriformes (Familia Trichomycteridae). *An. Mus. Hist. Natur., Valparaiso, Chile* 9: 105-114.

Arratia, G. 1983. Preferencias de habitat de peces siluriformes de aguas continentales de Chile (Fam. Diplomystidae y Trichomycteridae). *Studies on Neotropical Fauna and Environment* 18(4): 217-237.

Arratia, G. and Menu-Marque, S. 1981. Revision of the freshwater catfishes of the genus *Hatcheria* (Siluriformes, Trichomycteridae) with comentaries on ecology and biogeography. *Zool. Anz.* 206: 88-111.

Arratia, G. and Quezada-Romegialli, C. 2017. Understanding morphological variability in a taxonomic context in Chilean diplomystids (Teleostei: Siluriformes), including the description of a new species. *PeerJ* 5: e2991.

Arratia, G.F., Chang, A.G., Menu-Marque, S. and Rojas, G.M. 1978. About *Bullockia* gen. nov., *Trichomycterus mendozensis* n. sp. and Revision of the Family Trichomycteridae (Pisces, Siluriformes). *Studies on Neotropical Fauna and Environment* 13: 157-194.

Arratia, G., Peñafort, M.B and Menú Marque, S. 1983. Peces de la región sureste de Los Andes y sus probables relaciones biogeográficas actuales. *Deserta* 7: 48-107.

Barriga, J.P. and Battini, M.A. 2009. Ecological significances of ontogenetic shifts in the stream-dwelling catfish, *Hatcheria macraei* (Siluriformes, Trichomycteridae), in a Patagonian river. *Ecology of Freshwater Fish* 18(3): 395-405.

Barriga, J.P., Espinós, N.A., Chiarello-Sosa, J.M. and Battini, M.A. 2013. The importance of substrate size and interstitial space in the microhabitat selection by the stream-dwelling catfish *Hatcheria macraei* (Actinopterygii, Trichomycteridae). *Hydrobiology* 705(1): 191-206.

Barriga, J.P., Espinós, N.A., Torres, W.D.C. and Battini, M.A. 2016. Diel locomotor activity and shelter use in the Patagonian catfish *Hatcheria macraei* under experimental conditions. *J Ethol* 34: 53-58.

Becker, L.A., Battini, M.A., Unmack, P.J., Barriga, J.P., Azpelicueta, M.M., Johnson, J.B. and Cussac, V.E. in prep. Morphologic and genetic variation within a relict Andean catfish, *Hatcheria macraei*, and its relationship with *Trichomycterus areolatus* and *Bullockia maldonadoi* (Siluriformes: Trichomycteridae). *Annals of the Brazilian Academy of Sciences*.

Chiarello-Sosa, J.M., Battini, M.Á. and Barriga, J.P. 2018. Latitudinal phenotypic variation in the southernmost trichomycterid, the catfish *Hatcheria macraei*: an amalgam of population divergence and environmental factors. *Biological Journal of the Linnean Society* 124: 718-731.

De Buen, F. 1957-1958. Ictiología. La familia Ictaluridae nueva para la fauna aclimatada de Chile y algunas consideraciones sobre los Siluroidei indígenas. *Inv. Zool. Chilenas* 4: 146-158.

Eigenmann, C. 1910. Catalogue of the freshwater fishes of tropical and south temperate America. Reports, Princeton University Expeditions to Patagonia.. Princeton.

Fernández, L. and Andreoli Bize., J. 2015. *Hatcheria macraei* (Girard, 1855) (Siluriformes, Trichomycteridae): new record from northwestern Argentina. *Check List* 11(4): 1672.

Gómez, S.E. 1990. Some thermal ecophysiological observation on the catfish *Hatcheria macraei* (Girard, 1855) (Pisces, Trichomycteridae). *Biota, Osorno, Chile* 6: 89-95.

IUCN. 2022. The IUCN Red List of Threatened Species. Version 2022-2. Available at: www.iucnredlist.org. (Accessed: 08 December 2022).

Muñoz-Ramírez, C.P., Unmack, P.J., Habit, E., Johnson, J.B., Cussac, V.E. and Victoriano, P. 2014. Phylogeography of the ancient catfish family Diplomystidae: Biogeographic, systematic, and conservation implications. *Molecular Phylogenetics and Evolution* 73: 146-160.

Ringuelet, R.A. 1975. Zoogeografía y ecología de los peces de aguas continentales de la Argentina y consideraciones sobre las áreas ictiológicas de América del Sur. *Ecosur* 2(3): 1-122.

Ringuelet, R.A., Arámburu, R.H. and Arámburu, A.A. 1967. *Los peces argentinos de agua dulce*. Comisión de Investigaciones Científicas, Gobernación de la Provincia de Buenos Aires.

Tchernavin, V. 1944. A revision of some Trichomycterinae based on material preserved in the British Museum (Natural History). *Proc. Zool. Soc. London* 114: 234-275.

Unmack. P.J., Barriga, J.P., Battini, M.A., Habit, E.M. and Johnson, J.B. 2012. Phylogeography of the catfish *Hatcheria macraei* reveals a negligible role of drainage divides in structuring populations. *Mol. Ecol.* 21(4): 942-959.

Unmack, P.J., Bennin, A.P., Habit, E.M., Victoriano, P.F. and Johnson, J.B. 2009. Impact of ocean barriers, topography, and glaciation onthe phylogeography of the catfish *Trichomycterus areolatus* (Teleostei: Trichomycteridae) in Chile. *Biological Journal of the Linnean Society* 97: 876-892.

Unmack, P.J., Habit, E.M. and Johnson, J.B. 2009. New records of *Hatcheria macraei* (Siluriformes, Trichomycteridae) from Chilean province. *Gayana* 73: 102-110.

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Disclaimer

External Resources

For Supplementary Material, and for Images and External Links to Additional Information, please see the Red List website.

Appendix

Habitats

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Habitat	Season	Suitability	Major Importance?
5. Wetlands (inland) -> 5.1. Wetlands (inland) - Permanent Rivers/Streams/Creeks (includes waterfalls)	Resident	Suitable	Yes
5. Wetlands (inland) -> 5.5. Wetlands (inland) - Permanent Freshwater Lakes (over 8ha)	Resident	Suitable	Yes

Threats

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Threat	Timing	Scope	Severity	Impact Score
3. Energy production & mining -> 3.2. Mining & quarrying	Ongoing	Minority (<50%)	Unknown	Unknown
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.2. Species disturbance 2. Species Stresses -> 2.3. Indirect species effects -> 2.3.7. Reduced reproductive success		
7. Natural system modifications -> 7.2. Dams & water management/use -> 7.2.3. Abstraction of surface water (agricultural use)	Ongoing	Minority (<50%)	Unknown	Unknown
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.2. Species disturbance 2. Species Stresses -> 2.3. Indirect species effects -> 2.3.7. Reduced reproductive success		
8. Invasive and other problematic species, genes & diseases -> 8.1. Invasive non-native/alien species/diseases -> 8.1.2. Named species (Oncorhynchus mykiss)	Ongoing	-	-	Low impact: 3
8. Invasive and other problematic species, genes & diseases -> 8.1. Invasive non-native/alien species/diseases -> 8.1.2. Named species (Cyprinus carpio)	Ongoing	Majority (50-90%)	Unknown	Unknown
	Stresses:	1. Ecosystem stresses -> 1.3. Indirect ecosystem effects 2. Species Stresses -> 2.2. Species disturbance 2. Species Stresses -> 2.3. Indirect species effects -> 2.3.7. Reduced reproductive success		
8. Invasive and other problematic species, genes & diseases -> 8.1. Invasive non-native/alien species/diseases -> 8.1.2. Named species (Odontesthes bonariensis)	Ongoing	Majority (50-90%)	Unknown	Unknown
	Stresses:	1. Ecosystem stresses -> 1.3. Indirect ecosystem effects 2. Species Stresses -> 2.2. Species disturbance		

		2. Species Stresses -> 2.3. Indirect species effects -> 2.3.7. Reduced reproductive success		
8. Invasive and other problematic species, genes & diseases -> 8.4. Problematic species/disease of unknown origin -> 8.4.2. Named species (Salvelinus fontinalis)	Ongoing	-	-	Low impact: 3
8. Invasive and other problematic species, genes & diseases -> 8.4. Problematic species/disease of unknown origin -> 8.4.2. Named species (Salmo trutta)	Ongoing	-	-	Low impact: 3
8. Invasive and other problematic species, genes & diseases -> 8.4. Problematic species/disease of unknown origin -> 8.4.2. Named species (Salvelinus namaycush)	Ongoing	-	-	Low impact: 3

Conservation Actions in Place

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Conservation Action in Place
In-place research and monitoring
Action Recovery Plan: No
Systematic monitoring scheme: No
In-place land/water protection
Conservation sites identified: No
Occurs in at least one protected area: Yes
Invasive species control or prevention: No
In-place species management
Harvest management plan: No
Successfully reintroduced or introduced benignly: No
Subject to ex-situ conservation: No
In-place education
Subject to recent education and awareness programmes: No
Included in international legislation: No
Subject to any international management / trade controls: No

Conservation Actions Needed

(http://www.iucnredlist.org/technical-documents/classification-schemes)

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Conservation Action Needed
1. Land/water protection -> 1.2. Resource & habitat protection
2. Land/water management -> 2.2. Invasive/problematic species control

Additional Data Fields

Distribution
Continuing decline in area of occupancy (AOO): Unknown
Estimated extent of occurrence (EOO) (km²): 810789
Continuing decline in extent of occurrence (EOO): Unknown
Number of Locations: 24
Continuing decline in number of locations: Unknown
Lower elevation limit (m): 100
Upper elevation limit (m): 1,000
Habitats and Ecology
Movement patterns: Unknown

The IUCN Red List Partnership

The IUCN Red List of Threatened Species™ is produced and managed by the IUCN Global Species Programme, the IUCN Species Survival Commission (SSC) and The IUCN Red List Partnership.

The IUCN Red List Partners are: ABQ BioPark; Arizona State University; BirdLife International; Botanic Gardens Conservation International; Conservation International; Missouri Botanical Garden; NatureServe; Re:wild; Royal Botanic Gardens, Kew; Sapienza University of Rome; Texas A&M University; and Zoological Society of London.