Neosiluroides cooperensis, Cooper Creek Catfish

Author

Arthington, Angela, Sternberg, D, Cockayne, B, Schmarr, D

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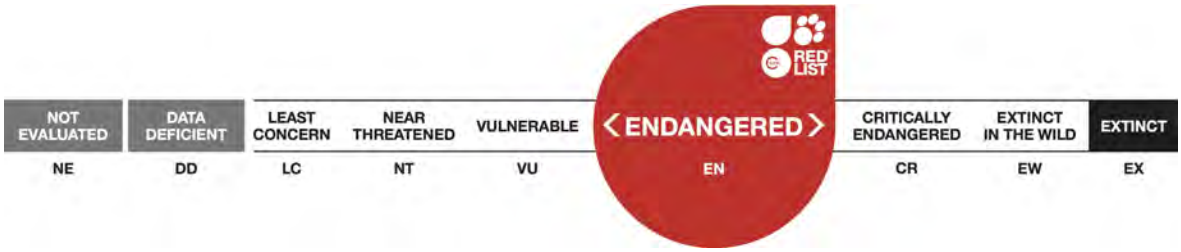
Neosiluroides cooperensis, Cooper Creek Catfish

Assessment by: Arthington, A., Sternberg, D., Cockayne, B. & Schmarr, D.



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Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Chordata	Actinopterygii	Siluriformes	Plotosidae

Taxon Name: *Neosiluroides cooperensis* Allen & Feinberg, 1998

Common Name(s):

- English: Cooper Creek Catfish

Taxonomic Source(s):

Eschmeyer, W.N., Fricke, R., and Ven der Laan, R. (eds.). 2017. Catalog of Fishes: genera, species, references. Updated 01 November 2017. Available at: http://researcharchive.calacademy.org/research/ichthyology/catelog/fishcatmain.asp.

Assessment Information

Red List Category & Criteria: Endangered B2ab(iii,v) ver 3.1

Year Published: 2019

Date Assessed: February 11, 2019

Justification:

Neosiluroides cooperensis is cryptic and naturally rare. It is endemic to the Cooper Creek system of the Lake Eyre Drainage Basin and is currently known from a total of 38 localities. This species occupies a total area (AOO) of approximately 128 km^2, nearly all of which is permanent riverine refugia (waterholes). Under a conservative climate scenario waterhole persistence is predicted to decrease by up to 30%. Furthermore, *N. cooperensis* is potentially threatened by the translocated predatory *Oxyeleotris lineolata* (Sleepy Cod), which has colonised many refugial waterholes of Cooper Creek. *Oxyeleotris lineolata* is considered to be a serious conservation risk outside of its natural range, and it is highly probable the two species interact during periods of extended waterhole drying. These risks will continue into the future given that eradication of *O. lineolata* from Cooper Creek is highly unlikely. The threat from *O. lineolata* is likely to spread across the whole distributional range of *N. cooperensis* following large flows, representing a single location for *N. cooperensis*. *Neosiluroides cooperensis* is therefore listed as Endangered.

Geographic Range

Range Description:

This species is endemic to the Cooper Creek system of the Lake Eyre Drainage basin, in south-west Queensland and north-east South Australia (Gomon and Bray 2018). It is currently known from a total of 38 localities: 31 in Queensland, and 7 in South Australia (DNRME 2018). Fish surveys, recorded in the primary and secondary literature, have occurred in the Cooper Creek system at various periods since 1987 (Sternberg and Cockayne 2018). Records were also sourced from the Atlas of Living Australia (ALA) (https://www.ala.org.au/). Records with no authority, collection date, collection locality, and an

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ambiguous GPS readings were removed. Further, records gained from the primary and secondary literature were prioritised over those from the ALA where overlap occurred. Multiple records exist for the three major river systems: Thomson River, Barcoo River and Cooper Creek, with additional scattered records from smaller tributaries including Darr River, Vergemont Creek, Wilson River, and Coongie Lakes. Sampling is typically conducted using a combination of fyke nets set overnight for 19 hrs (Sternberg and Cockayne 2018) and opportunistic seine netting. The monitoring sites are nearly all riverine waterholes, with a majority being long-term refugia in major watercourses. During extended periods of no or very low flow, Cooper Creek dries down to a mosaic of isolated, turbid waterholes that provide the only habitat for obligate aquatic species. Historical sampling has tended to occur close to populated places, which themselves are in limited number across the Cooper Creek system. Upstream records occur near the towns of Muttaburra on the Thomson River (201 m a.s.l.), and Blackall on the Barcoo River (254 m a.s.l.). The most downstream record occurs near Etadunna on the lower Cooper Creek (2 m a.s.l.), 167 km by river network upstream of Kati Thanda - Lake Eyre.

Country Occurrence:

Native: Australia (Queensland, South Australia)

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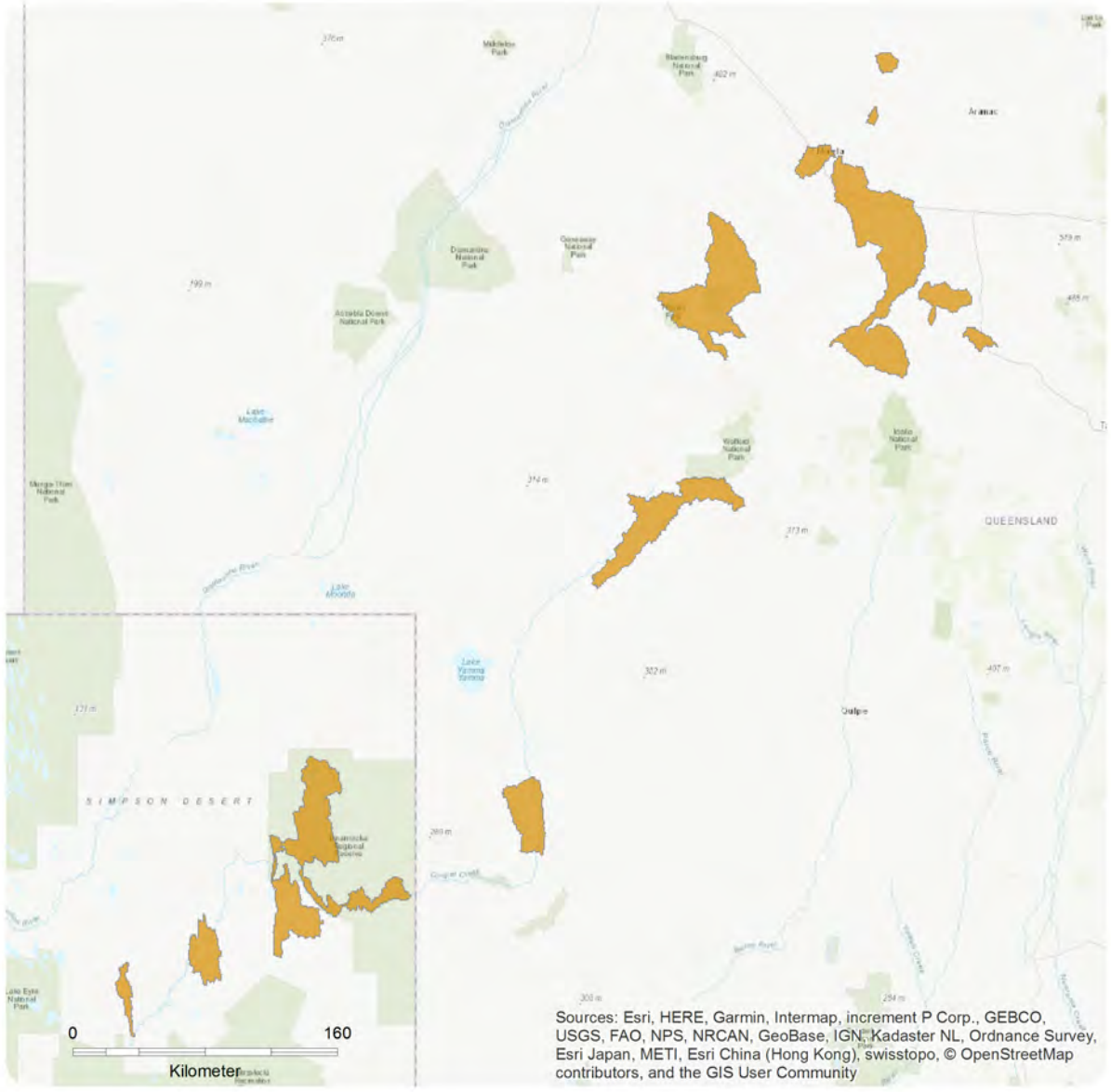
Distribution Map

Neosiluroides cooperensis



Range

Extant (resident)

Compiled by:

Lintermans, M. and colleagues 2019 IUCN Red List assessment for Australian freshwater fish.

NE DD LC NT VU EN ENDANGERED CR EW EX

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

The Cooper Creek Catfish is the sole member of a genus that is a distinct genetic lineage among the Plotosidae (i.e. monophyletic) (Unmack 2013). This species is usually not abundant (Unmack 2003). In South Australia, it is considered rare, where it is deemed 'protected at all times' by fisheries legislation (Hammer *et al.* 2009, Fisheries Management Act 2007). However, in Queensland the Cooper Creek Catfish is a regulated species, with a take or possession limit of five individuals allowed at any one time (Fisheries Act 1994). Survey information confirms that this species is naturally rare. In South Australian fisheries surveys between 2012-2016, only fourteen individuals of this species were caught out of over 96,000 fish (0.15%) (Fisheries and Aquaculture PIRSA 2016). In Queensland, 230 fish sampling events (a total of two large, and six small fyke nets per sampling event) were conducted between 2011 and 2018 in permanent and semi-permanent waterholes (DNRME 2018). This sampling program captured a total of 276,963 fish, which included just 196 Cooper Creek Catfish (0.07%) (DNRME 2018). The proportion of sites with Cooper Creek Catfish present (i.e. the number of sites present, divided by the total number of sites sampled in each year) varied between 9% and 22% for the same time period.

Current Population Trend: Stable

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

The Cooper Creek Catfish has no known congeners, is cryptic and naturally rare. Very little is known of its biology and ecology (Wager and Unmack 2000). This species has the largest eggs (3-4 mm) and lowest fecundity (1000 eggs per spawning) of the Australian plotosid catfish (Allen *et al*. 2002). This species commonly grows to 450 mm (AQIES) but may grow up to 600 mm, suggesting that it has a relatively long lifespan (Arthington and Balcombe 2011). It appears to be sedentary and unlikely to migrate long distances, but has been recorded moving <10 km (Arthington and Balcombe 2011). This species typically occurs in larger, more permanent waterholes of intermittent streams, over clay and earth substrates and in turbid waters (Allen *et al*. 2002). Extensive sampling of the wetted floodplains surrounding Windorah (central Cooper Creek basin) in January 2004 revealed that the Cooper Creek Catfish was the only native species not found in floodplain fyke net samples, although it is known to be present in the waterholes of central Cooper Creek study area (Balcombe *et al*. 2007).

Systems: Freshwater

Use and Trade

This species is occasionally angled for recreation and is considered good eating (Unmack and Wager 2018). Cooper Creek Catfish are rarely kept in aquaria.

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

The Cooper Creek Catfish has a limited distribution and is potentially threatened by the introduction of alien and translocated species (Unmack and Wager 2018). Prior to 2008, *Oxyeleotris lineolata* (Sleepy Cod) was not recorded from the Cooper Creek system, however, present-day distribution records show that this species is found throughout the main channel of the Cooper Creek catchment, occupying many of the permanent waterholes inhabited by Cooper Creek Catfish (Sternberg and Cockayne 2018). The first known record of *O. lineolata* in the LEB exists for 'Waterloo' waterhole at the confluence of Vergemont Creek and the Thomson River in 2008 (Kerezsy 2010). The combined relative biomass of *O.*

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lineolata (the percent contribution of *O. lineolata* biomass to the total fish biomass) in four permanent waterholes shows an increasing trend over time, with early years (2011, 2012, 2013) remaining below 10%, followed by a rapid increase in later years (Sternberg and Cockayne 2018). By 2016, *O. lineolata* relative biomass had increased to an average of 30% across the four waterholes and, in some cases, comprised as much as 45% of the total fish biomass (Sternberg and Cockayne 2018). This increase in biomass implies that local populations had become self-sustaining through reproduction and recruitment processes, irrespective of new arrivals, and follows the establishment phase of a typical species invasion process (Sternberg and Cockayne 2018). All reaches of the Cooper catchment (upper, central, lower) contain large, mid-sized and small *O. lineolata* individuals; however, there is a decreasing trend in both size and abundance of individuals from the headwaters to the lower reaches (Sternberg and Cockayne 2018). Populations in waterholes in the upper catchment are composed of larger individuals and higher total abundances, while mid-catchment waterholes are mainly composed of mid-sized individuals and moderate abundances (Sternberg and Cockayne 2018). Waterholes in the lower reaches are dominated by juveniles and considerably lower total abundances (Sternberg and Cockayne 2018). When viewed in its entirety, the abundance and length distribution of sleepy cod throughout the Cooper is indicative of a 'colonising front' (sensu Pusey *et al.* 2006) moving downstream (south-west), with a potential origin probably in the region south of Longreach (Sternberg and Cockayne 2018). When introduced to new habitats outside its natural range, this species is considered to be a serious conservation risk to native fish species (Pusey *et al.* 2004, Pusey *et al.* 2006). With a derived longevity in excess of 15 years, a life-history strategy that combines batch spawning, high fecundity and parental care (i.e. high juvenile survivorship), there is real potential for *O. lineolata* to dominate fish assemblages in refugial waterholes in the upper, central and lower Cooper Creek system (Sternberg and Cockayne 2018). The full extent of the integration of *O. lineolata* with native fish assemblages in the Cooper Creek system is however, currently unknown (Sternberg and Cockayne, 2018).

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

The Cooper Creek Catfish does not have a specific action recovery plan. This species occurs in Malkumba-Coongie Lakes National Park in South Australia, and in Welford National Park and other parks in Queensland. Sternberg and Cockayne (2018) recommend research into the basic biology, life-history and trophic dynamics of this catfish species, and research on interactions with Sleepy Cod.

Credits

Assessor(s): Arthington, A., Sternberg, D., Cockayne, B. & Schmarr, D.

Reviewer(s): Kerezsy, A., Unmack, P. & Brown, C.

Facilitators(s) and Compiler(s): Chanson, J.S.

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External Resources

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Appendix

Habitats

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

Habitat	Season	Suitability	Major Importance?
5. Wetlands (inland) -> 5.2. Wetlands (inland) - Seasonal/Intermittent/Irregular Rivers/Streams/Creeks	Resident	Suitable	Yes
5. Wetlands (inland) -> 5.6. Wetlands (inland) - Seasonal/Intermittent Freshwater Lakes (over 8ha)	Seasonal occurrence unknown	Suitable	No
5. Wetlands (inland) -> 5.8. Wetlands (inland) - Seasonal/Intermittent Freshwater Marshes/Pools (under 8ha)	Seasonal occurrence unknown	Suitable	No
5. Wetlands (inland) -> 5.15. Wetlands (inland) - Seasonal/Intermittent Saline, Brackish or Alkaline Lakes and Flats	Seasonal occurrence unknown	Suitable	No

Threats

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

Threat	Timing	Scope	Severity	Impact Score
8. Invasive and other problematic species, genes & diseases -> 8.1. Invasive non-native/alien species/diseases -> 8.1.2. Named species (Oxyeleotris lineolata)	Ongoing	Whole (>90%)	Slow, significant declines	Medium impact: 7
	Stresses:	2. Species Stresses -> 2.2. Species disturbance 2. Species Stresses -> 2.3. Indirect species effects -> 2.3.2. Competition 2. Species Stresses -> 2.3. Indirect species effects -> 2.3.7. Reduced reproductive success		

Conservation Actions in Place

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

Conservation Actions in Place
In-Place Research, Monitoring and Planning
Action Recovery plan: No
Systematic monitoring scheme: Yes
In-Place Land/Water Protection and Management
Conservation sites identified: Yes, over part of range

Conservation Actions in Place
Occur in at least one PA: Yes
Percentage of population protected by PAs (0-100): 1-10
Area based regional management plan: Yes
Invasive species control or prevention: No
In-Place Species Management
Harvest management plan: Yes
Successfully reintroduced or introduced beningly: 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

Research Needed

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

Research Needed
1. Research -> 1.2. Population size, distribution & trends
1. Research -> 1.3. Life history & ecology
1. Research -> 1.5. Threats
3. Monitoring -> 3.1. Population trends
3. Monitoring -> 3.4. Habitat trends

Additional Data Fields

Distribution
Estimated area of occupancy (AOO) (km²): 128
Continuing decline in area of occupancy (AOO): Yes
Extreme fluctuations in area of occupancy (AOO): No
Estimated extent of occurrence (EOO) (km²): 140994.89
Continuing decline in extent of occurrence (EOO): No
Extreme fluctuations in extent of occurrence (EOO): Custom (0-1)
Number of Locations: 1
Continuing decline in number of locations: No

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Distribution
Extreme fluctuations in the number of locations: No
Lower elevation limit (m): 2
Upper elevation limit (m): 254
Population
Population severely fragmented: No
Habitats and Ecology
Continuing decline in area, extent and/or quality of habitat: Yes
Movement patterns: Not a Migrant

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