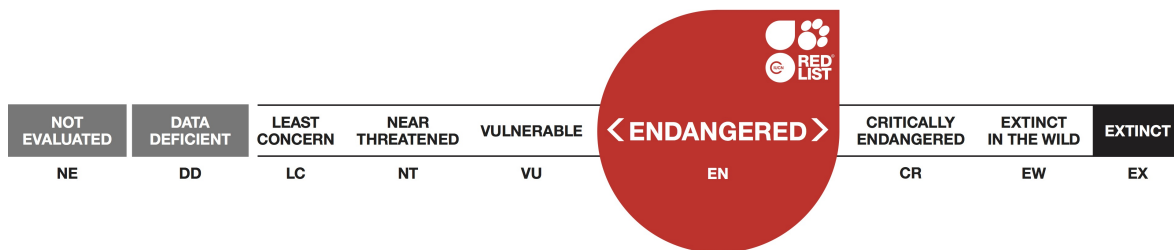


Nannoperca variegata, Variagated Pygmy Perch

Assessment by: Whiterod, N., Raadik, T. & Hammer, M.



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Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Chordata	Actinopterygii	Perciformes	Percichthyidae

Taxon Name: *Nannoperca variegata* Kuitert & Allen, 1986

Common Name(s):

- English: Variagated Pygmy Perch

Assessment Information

Red List Category & Criteria: Endangered B2ab(ii,iii) [ver 3.1](#)

Year Published: 2019

Date Assessed: February 12, 2019

Justification:

This species is assessed as Endangered based on its restricted distribution in Australia. It has an area of occupancy (AOO) of 204 km² and occurs at two locations based on the threat of drought. There have been continuing declines in AOO and habitat quality and quantity based on drought and agricultural activities.

Previously Published Red List Assessments

1996 – Vulnerable (VU)

<http://dx.doi.org/10.2305/IUCN.UK.1996.RLTS.T14322A4431489.en>

1994 – Vulnerable (V)

Geographic Range

Range Description:

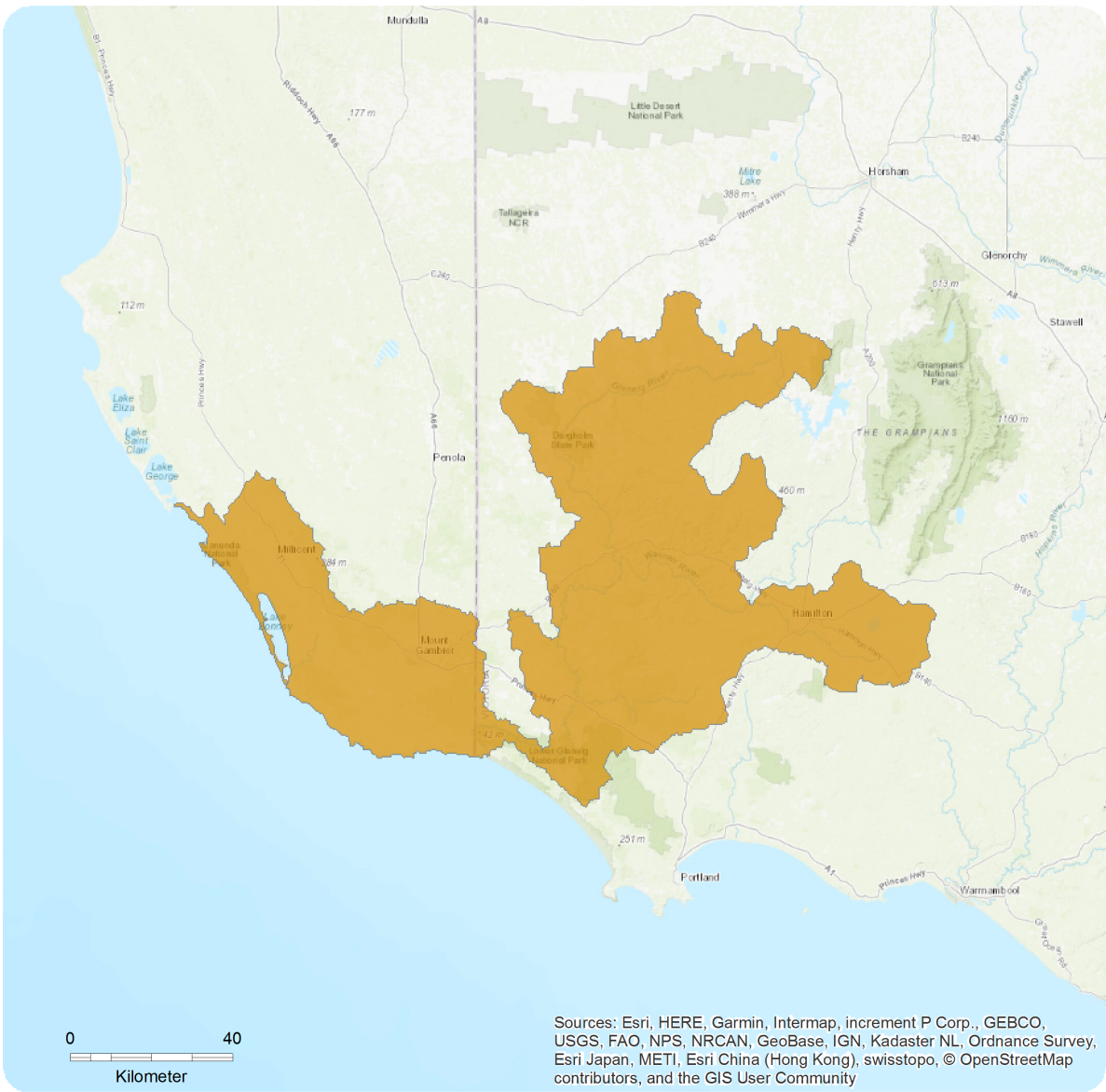
Variagated Pygmy Perch has a very limited distribution within south-eastern Australia, being restricted in Victoria to the Glenelg River Catchment in south-west Victoria and the restricted karst rising-spring habitats in south-east South Australia.

Country Occurrence:

Native: Australia (South Australia, Victoria)

Distribution Map

Nannoperca variegata

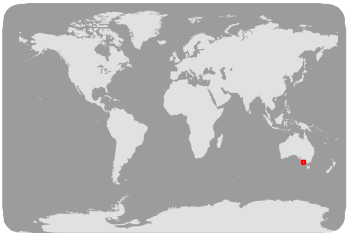


Range

Extant (resident)

Compiled by:

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



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



Population

The Variegated Pygmy Perch was only described in 1986 (Kuitert and Allen 1986), so there is no historical information on distribution or abundance. The species appears stable in South Australia's karst rising springs (Veale and Whiterod 2018) and main river channel habitats in Victoria, but tributary populations are likely to be experiencing declines due to reduced surface and groundwater flow and declining habitat quantity and quality resulting from agriculture and climate change.

Current Population Trend: Decreasing

Habitat and Ecology (see Appendix for additional information)

Variegated Pygmy Perch is a small (up to 6.5 cm) free-swimming species normally closely associated with submerged and emergent aquatic vegetation. The entire life cycle is completed in freshwater, although it can tolerate slightly brackish waters. Primarily carnivorous, aquatic insects and benthic microcrustaceans comprise the bulk of its diet (Allen 1989). Variegated Pygmy Perch spawn from spring to early summer, however very little else is known of the breeding biology of this species in the wild. It is assumed that breeding behaviour is similar to the Southern Pygmy Perch, which lays demersal, non-adhesive eggs over submerged aquatic vegetation and the substrate.

The preferred habitat of the Variegated Pygmy Perch includes relatively shallow freshwater streams with moderate to high water flow, in contrast to the other *Nannoperca* species that are often found in slow moving pools or lentic wetland environments. In the wild it can tolerate a temperature range of 14–26°C and a pH range of 6.8–7.5, with captive specimens surviving best in water temperatures of 18–27°C, a pH of 7.2 (Armstrong 1998) and well oxygenated water (Kuitert and Allen 1986). Limited knowledge exists on other aspects of the habitat and ecology of the species.

Systems: Freshwater

Use and Trade

While no direct evidence exists for the collection of Variegated Pygmy Perch, notes on the husbandry of this species in aquaria are readily available in web based publications, suggesting that collection to some degree may be occurring (Saddler and Hammer 2010).

Threats (see Appendix for additional information)

The nature of the lowland, shallow freshwater habitat of Variegated Pygmy Perch means it is especially susceptible to a range of practices that result in habitat degradation and loss, especially where this habitat occurs on private land. The extraction of groundwater, particularly in the south-east South Australia, is a clear threat to the ecological sustainability of the significant habitats and species of coastal springs in these areas (Hammer 2002), as well as in Victoria. Apart from the direct loss of habitat, lateral connectivity to wetlands is also reduced.

Many sites on private property are threatened by damage from unrestricted stock access. Stock access and trampling has a major impact on waters where Variegated Pygmy Perch is found through disturbance and removal of instream and riparian habitat. Physical damage to instream vegetation directly removes a key habitat component. A reduction in riparian vegetation quality generally results in

a decrease in water quality through increased nutrient run-off and a reduction in bank stability which leads to increased erosion and sedimentation. Sedimentation has direct effects on fish including asphyxiation, the smothering of eggs, a reduced ability to find food and the smothering of stream beds which leads to a reduction in habitat and flows. Additionally, sedimentation reduces the level and diversity of aquatic macroinvertebrates and plants, factors considered critical components of Variegated Pygmy Perch habitat. Degraded riparian vegetation also leads to a decrease in organic input. Macroinvertebrates (a major dietary component of Variegated Pygmy Perch) require this organic input as a nutrient source. Decreased overhanging vegetation also leads to increased summer water temperatures which in turn may lead (particularly when combined with increased nutrient input) to algal blooms. Further physical disturbance of smaller waters may also occur through practices such as drainage and ploughing after water levels are reduced.

Apart from the direct effects of groundwater extraction, alteration of natural flood and drying cycles, particularly in shallow creeks — through activities such as catchment clearing, establishing extensive plantations or construction of dams — pose threats to Variegated Pygmy Perch habitat. These activities may alter natural seasonal water levels at critical times of the year or may result in complete loss or permanent alteration of more shallow habitats. Populations occurring in smaller creeks on land where grazing is practised (constituting the majority of known sites) are particularly susceptible to water abstraction for stock watering. Extensive plantations of eucalypts and pines in south-eastern South Australia and south-western Victoria pose a major threat to habitat through lowering ground water levels and decreasing runoff.

Predation by Redfin Perch *Perca fluviatilis*, Brown Trout *Salmo trutta* and Rainbow Trout *Oncorhynchus mykiss* may be a factor in the decline of this species (Wager and Jackson 1993). Habitat destruction (namely aquatic vegetation) by Common Carp (*Cyprinus carpio*) may also impact on habitat critical to the survival of this species, while competition/aggressive behaviour (particularly from Eastern Gambusia *Gambusia holbrooki*) are also implicated in the decline of this species (Wager and Jackson 1993).

This species is particularly vulnerable to climate change (Chessman 2013). A predicted major impact of climate change in south-eastern Australia will be a decline in overall rainfall, increasing temperatures, and increasing evaporation, with subsequent reductions in water availability and streamflow (Hughes 2003). Under these conditions, it is anticipated that the availability of habitat and its suitability will decline for many subpopulations, which will contribute to localised extinctions and further fragmentation and isolation of remaining subpopulations.

Conservation Actions (see Appendix for additional information)

This species is listed as Vulnerable under the Australian EPBC Act. A recovery plan articulates a long-term objective to minimise the probability of extinction and ensure long-term survival of Variegated Pygmy Perch in the wild and to increase the probability of important populations becoming self-sustaining in the long term (Saddler and Hammer 2010). Under the recovery plan, 27 conservation actions are set out, including:

- Determine the distribution and abundance,
- Determine the genetic and taxonomic status of populations,
- Determine habitat characteristics and requirements,
- Identify and manage potentially threatening processes impacting on Variegated Pygmy Perch conservation,

- Protect key populations across the range,
 - Determine population trends at key sites
 - Investigate key aspects of biology and ecology,
 - Establish a captive breeding capacity and undertake translocations to establish new populations, and
 - Undertake community education and communication to increase awareness and involvement.
- Progress toward the conservation actions was assessed by Saddler *et al.* (2013), indicating more than half of the actions have not commenced or are only partially completed.

Credits

Assessor(s): Whiterod, N., Raadik, T. & Hammer, M.

Reviewer(s): Bice, C., Bruce, A., Coleman, R., Freeman, R., Koehn, J., Lintermans, M., Pearce, L., Scott, K. & Tims, A.

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External Resources

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) -> 5.9. Wetlands (inland) - Freshwater Springs and Oases	Resident	Suitable	Yes

Threats

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

Threat	Timing	Scope	Severity	Impact Score
11. Climate change & severe weather -> 11.1. Habitat shifting & alteration	Ongoing	-	-	-
11. Climate change & severe weather -> 11.2. Droughts	Ongoing	-	-	-
2. Agriculture & aquaculture -> 2.2. Wood & pulp plantations -> 2.2.2. Agro-industry plantations	Ongoing	-	-	-
2. Agriculture & aquaculture -> 2.3. Livestock farming & ranching -> 2.3.3. Agro-industry grazing, ranching or farming	Ongoing	-	-	-
7. Natural system modifications -> 7.2. Dams & water management/use -> 7.2.11. Dams (size unknown)	Ongoing	-	-	-
7. Natural system modifications -> 7.2. Dams & water management/use -> 7.2.3. Abstraction of surface water (agricultural use)	Ongoing	-	-	-
7. Natural system modifications -> 7.2. Dams & water management/use -> 7.2.7. Abstraction of ground water (agricultural use)	Ongoing	-	-	-
8. Invasive and other problematic species, genes & diseases -> 8.1. Invasive non-native/alien species/diseases -> 8.1.2. Named species (<i>Salmo trutta</i>)	Ongoing	-	-	-
8. Invasive and other problematic species, genes & diseases -> 8.1. Invasive non-native/alien species/diseases -> 8.1.2. Named species (<i>Oncorhynchus mykiss</i>)	Ongoing	-	-	-

8. Invasive and other problematic species, genes & diseases -> 8.1. Invasive non-native/alien species/diseases -> 8.1.2. Named species (<i>Gambusia holbrooki</i>)	Ongoing	-	-	-
8. Invasive and other problematic species, genes & diseases -> 8.1. Invasive non-native/alien species/diseases -> 8.1.2. Named species (<i>Cyprinus carpio</i>)	Ongoing	-	-	-
8. Invasive and other problematic species, genes & diseases -> 8.1. Invasive non-native/alien species/diseases -> 8.1.2. Named species (<i>Perca fluviatilis</i>)	Ongoing	-	-	-

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: Yes
Systematic monitoring scheme: No
In-Place Land/Water Protection and Management
Occur in at least one PA: Yes

Conservation Actions Needed

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

Conservation Actions Needed
1. Land/water protection -> 1.2. Resource & habitat protection
2. Land/water management -> 2.2. Invasive/problematic species control
3. Species management -> 3.3. Species re-introduction -> 3.3.1. Reintroduction
3. Species management -> 3.3. Species re-introduction -> 3.3.2. Benign introduction
3. Species management -> 3.4. Ex-situ conservation -> 3.4.1. Captive breeding/artificial propagation
3. Species management -> 3.4. Ex-situ conservation -> 3.4.2. Genome resource bank
4. Education & awareness -> 4.3. Awareness & communications

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
2. Conservation Planning -> 2.1. Species Action/Recovery Plan
3. Monitoring -> 3.1. Population trends

Additional Data Fields

Distribution
Estimated area of occupancy (AOO) (km ²): 204
Continuing decline in area of occupancy (AOO): Yes
Estimated extent of occurrence (EOO) (km ²): 6332
Continuing decline in extent of occurrence (EOO): No
Number of Locations: 2
Population
Population severely fragmented: No
Habitats and Ecology
Continuing decline in area, extent and/or quality of habitat: Yes
Movement patterns: Unknown

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