

# Conservation status of indigenous freshwater fish in the Wellington region

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## 1. Introduction

The New Zealand Threat Classification System (NZTCS) provides a tool for assigning a threat status to candidate taxa at the national scale. These threat rankings form the basis for prioritising conservation management actions, research and monitoring, and natural resource management decisions (Townsend et al, 2008). The NZTCS is effective at the national scale, but regional councils need local data for managing and protecting biodiversity within their regions. While the Department of Conservation (DOC) is tasked with managing indigenous species nationally, regional and district councils have a statutory obligation to manage the habitats of threatened species locally under the Resource Management Act, 1991.

A methodology to create regional threat lists was developed by a collaborative group comprising representatives from DOC, regional councils and a local authority. The resulting regional threat listing methodology leverages off the NZTCS, but applies a species population threshold adjusted to the regional land area under consideration (relative to the national land area) for species that are not nationally threatened. The assigned regional threat status cannot be lower than that of the national threat status, but can be higher, (e.g. a Nationally Vulnerable species could be assessed as being Regionally Critical). Other assessments made in the regional threat listing process include identifying populations that are national strongholds and the use of regional qualifiers, such as natural or historic range limits.

Biodiversity decline is occurring across New Zealand. One of the keys to halting/reversing that decline is knowing where those declines are occurring. A regional threat list will aid the identification of those losses at a local level, plus provide information that can be used for national conservation status assessments.

## 2. Methods

This report covers indigenous freshwater fish species in the Wellington region. The national conservation status was derived from Dunn et al 2017, while the regional status was determined by an expert panel comprised of Alton Perrie, Shyam Morar and Caleb Royal. This group assessed the status of the indigenous fish species in the Wellington region at a meeting held in October 2021.

Following the identification of all the indigenous freshwater fish species in the national fish species list that are present in the Wellington region, the NZTCS criteria were used to assign the regional threat status to Nationally Threatened and At Risk fish species in the region. For Nationally Not Threatened species, the regional population threshold was applied. In the Wellington region, the threshold was set at the presence of less than 1,000 mature individuals. If the population was not considered to be stable or increasing/decreasing by more than ten percent, the NZTCS criteria were used to determine the regional threat status. Regional qualifiers were also applied.

The process for determining the regional threat status of a species is shown in Appendix 1.

The regional threat listing process also provides for the identification of National Strongholds – this is where a regional population has more than 20% of the national population. No freshwater fish species in the Wellington region were considered to have met that threshold, but it was difficult to determine if that was the case without a clear understanding of the national context. The process for threat listing usually involves recording the basis of the decisions regarding population size and trend, i.e. whether it is based on the use of quantitative data or expert opinion. All designations for freshwater fish were made using expert opinion. It should be noted that the members of the expert panel all complete fishing in the Wellington region on a regular basis and their observations are based on their knowledge of both the presence of species and the changes over time in abundance of catches of those species, plus historical records.

An assessment of ‘regional significance’ was included in the threat listing process. This is based on expert knowledge of particular locations/sites that of regional importance for different species. This information is useful for regional policy planning processes.

### **3. Results**

Twenty-two indigenous freshwater fish species were identified as being present in the Wellington region. One species (shortjaw kokopu) was identified as being Nationally Vulnerable and Regionally Endangered (Appendix 2; Table 1), Three species were identified as being Regionally Vulnerable, one of which is Nationally Vulnerable, with the other two species being Nationally At Risk; Declining (Appendix 2; Table 2). Ten species were identified as being Regionally Declining (Appendix 2; Table 3). Nationally, six of these species are listed as Declining, with one being Naturally Uncommon and three listed as being Not Threatened. The trend for the populations sizes of all of these species were considered to be declining.

Seven species have been assessed as being Regionally Not Threatened (Appendix 2; Table 4), with one Coloniser shown in Appendix 2; Table 5. All of those species had population sizes of greater than 100,000 individuals and the populations were considered to be stable with the exception of redfin bully (*Gobiomorphus huttoni*), which was listed as showing a declining trend.

### **4. Discussion**

Seven freshwater fish species in the Wellington region were considered to have a higher threat ranking than that of the national threat list. The ranking of two of those species; shortjaw kokopu (*Galaxias postvectis*) and giant kokopu (*Galaxias argenteus*) was a result of low numbers of these fish being found in the region with a similar decline rate of that seen nationally. In the case of five other species; brown mudfish (*Neochanna apoda*), giant bully

(*Gobiomorphus gobioides*), grey mullet (*Mugil cephalus*), common smelt (*Retropinna retropinna*) and black flounder (*Rhombosolea retiaria*), the difference has largely been due to an increased population decline rate. Connectivity issues have been identified as causes of decline for the latter three species, while giant bully habitat is being impacted by introduced weeds on the Kapiti Coast. For brown mudfish, ongoing destruction of available habitat is a cause of concern.

It should be noted that a declining population trend is thought to be the case for 14 of the 22 freshwater fish species present in the region (64%). The causes of decline are varied, but habitat degradation and loss, water quality degradation, connectivity issues for migratory species, and impacts from introduced flora and fauna are all considered to be contributing to the ongoing decline of fish species.

## **5. Acknowledgements**

Jeremy Rolfe of the Department of Conservation (DOC) has led the development of this systematic approach to assessing the regional conservation status for indigenous species. His work has provided a nationally consistent methodology that can be used by regional councils. Roger Uys has provided invaluable assistance in developing this report.

## 6. References

Dunn NR, Allibone RM, Closs GP, Crow SK, David BO, Goodman JM, Griffiths M, Jack DC, Ling N, Waters JM and Rolfe JR, 2018. Conservation status of New Zealand freshwater fishes. *New Zealand Threat Classification Series 24*. 11 p.

Townsend AJ, de Lange PJ, Duffy CAJ, Miskelly CM, Molloy, J and Norton DA. 2008. *New Zealand Threat Classification System Manual*. Department of Conservation, Wellington.

## Appendix 1: Process for determining the regional threat status of a species

### Process 1: Determination of regional threat status

Identify and record taxa on the relevant NZTCS list that have been observed in the region



Identify Nationally Threatened taxa that breed or are resident for more than half of their life cycle in the region and assign a Regional Conservation status (see Process 2)



Identify Non-resident native taxa in the NZTCS and assess regional Non-resident status

### Process 2: Determination of strongholds and Regionally Not Threatened species

Is the region a stronghold for the taxa (i.e. >20% of the national population present)



N

Y



Does the region hold more than 500, 1000, 200 or 3000 mature individuals or does the taxon occupy more than 250, 500, 1000 or 1500ha (2.5, 5, 10 or 15km<sup>2</sup>)?



Y

N



Assign Regional Conservation Status by applying the NZTCS criteria to the regional population

Is the population  $\pm 10\%$  stable or increasing?



Y

N



Assign Regional Conservation Status of Regionally Not Threatened

## Appendix 2: Regional conservation status of indigenous freshwater fish species of the Wellington region

**Table 1: Regionally Endangered freshwater fish species**

Name and Authority	Common Name	National Conservation Status	Regional Population Size	Regional Population Trend	Qualifiers	Regional Significance
<i>Galaxias postvectis</i> Clarke 1899	Shortjaw kokopu	Vulnerable	250-1000	Declining 10-50%	Data Poor	Yes

**Table 2: Regionally Vulnerable freshwater fish species**

Name and Authority	Common Name	National Conservation Status	Regional Population Size	Regional Population Trend	Qualifiers	Regional Significance
<i>Galaxias argenteus</i> (Gmelin 1789)	Giant kokopu	Declining	1000-5000	Declining 30-70%	Partial Decline	Yes
<i>Geotria australis</i> Gray 1851	Lamprey	Vulnerable	1000-5000	Declining 10-50%	Data Poor, Secure Overseas	Yes
<i>Neochanna apoda</i> Gunther 1867	Brown mudfish	Declining	20,000-100,000	Declining 10-50%	Partial Decline, Designated	Yes

**Table 3: Regionally Declining freshwater fish species**

Name and Authority	Common Name	National Conservation Status	Regional Population Size	Regional Population Trend	Qualifiers	Regional Significance
<i>Anguilla dieffenbachii</i> Gray 1842	Longfin eel	Declining	>100,000	Declining 10-70%	Conservation Dependent, Data Poor	No
<i>Cheimarrichthys fosteri</i> Haast 1974	Torrentfish	Declining	>100,000	Declining 10-70%		Steeper reaches Ruamahanga rivers
<i>Galaxias aff. divergens</i> 'northern'	Dwarf galaxias	Declining	>100,000	Declining 10-70%	Data Poor	Yes
<i>Galaxias brevipinnis</i> Gunther 1866	Koaro	Declining	>100,000	Declining 10-70%	Partial Decline	Yes (Upper Ruamahanga)
<i>Galaxias maculatus</i> (Jenyns 1842)	Inanga	Declining	>100,000	Declining 10-70%	Conservation Dependent, Secure Overseas	No?
<i>Gobiomorphus gobioides</i> (Valenciennes 1837)	Giant bully	Naturally Uncommon	20,000-100,000	Declining 10-70%	Data Poor, Range Restricted	No
<i>Gobiomorphus hubbsi</i> (Stokell 1959)	Bluegill bully	Declining	>100,000	Declining 10-70%	Data Poor	Yes (Hutt River)
<i>Mugil cephalus</i> Linnaeus 1758	Grey mullet	Not Threatened	5000-20,000	Declining 10-30%	Secure Overseas	No
<i>Retropinna retropinna</i> (Richardson 1848)	Common smelt	Not Threatened	>100,000	Declining 10-30%		No
<i>Rhombosolea retiaria</i> (Richardson 1848)	Black flounder	Not Threatened	5000-20,000	Declining 10-30%	Data Poor	Yes (Lake Wairarapa)

**Table 4: Regionally Not Threatened freshwater fish species**

Name and Authority	Common Name	National Conservation Status	Regional Population Size	Regional Population Trend	Qualifiers	Regional Significance
<i>Aldrichetta forsteri</i> (Valenciennes 1836)	Yelloweye mullet	Not Threatened	>100,000	Stable	Data Poor, Secure Overseas	No
<i>Anguila australis</i> Richardson 1841	Shortfin eel	Not threatened	>100,000	Stable		No
<i>Galaxias fasciatus</i> Gray 1842	Banded kokopu	Not Threatened	>100,000	Stable		Yes (Upper Ruamahanga)
<i>Gobiomorphus aff. breviceps</i>	Upland bully	Not Threatened	>100,000	Stable		No
<i>Gobiomorphus basalis</i> Gray 1942	Cran's bully	Not Threatened	>100,000	Stable		No
<i>Gobiomorphus cotidianus</i> McDowall 1975	Common bully	Not Threatened	>100,000	Stable	Data Poor	No
<i>Gobiomorphus huttoni</i> (Ogilby 1894)	Redfin bully	Not threatened	>100,000	Declining 10-30%	Partial Decline	No

**Table 5: Regional Coloniser**

Name and Authority	Common Name	National Conservation Status	Regional Population Size	Regional Population Trend	Qualifiers	Regional Significance
<i>Anguilla reinhardtii</i> Steindachner 1867	Australian longfin	Coloniser/Non-resident Native	<250	Stable to Increasing	Secure Overseas	No