



Conservation Status of Freshwater Fishes in Otago

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Galaxias “species D”, Threatened – Regionally Vulnerable. Photograph by Angus McIntosh, ecologylive.nz

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Galaxias aff. *paucispondylus* “Manuherikia”, Threatened – Regionally Vulnerable. Photograph by Richard Allibone, Water Ways Consulting Inc.

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Executive Summary

This report provides the first assessment of the regional conservation status of freshwater fish taxa known to occur in the Otago Region since human arrival in Aotearoa New Zealand. A standardised methodology was used to assess the regional threat status of 41 freshwater fishes. Of these, 18 were assessed as Regionally Threatened (Regionally Critical = 2; Regionally Endangered = 4; Regionally Vulnerable = 12), four as Regionally At Risk (Regionally Declining = 2; Regionally Naturally Uncommon = 2), four as Regionally Not Threatened, seven as Regionally Data Deficient, seven as Regionally Introduced and Naturalised, and one as Regionally Extirpated. Otago serves as a national stronghold for 11 freshwater fish taxa, nine of which are endemic to the Region. Two additional taxa were identified as Regionally Introduced, Not Established.

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Introduction

Threat classifications play an important role in monitoring biodiversity and informing conservation actions. The New Zealand Threat Classification System (NZTCS) is used to assign threat statuses to candidate taxa (species, subspecies, varieties, and forma) in Aotearoa New Zealand (Townsend et al. 2008; Rolfe et al. 2022). Developed for terrestrial, freshwater, and marine biota (flora, fauna, and fungi), the NZTCS assesses taxa at the national scale using criteria based on population size, state, and trend, while also considering the impact of threats, recovery potential, and taxonomic certainty.

While the Department of Conservation – Te Papa Atawhai (DOC) holds national conservation functions through the Conservation Act 1987 and other legislation, regional and district councils have statutory obligations for indigenous biodiversity under the Resource Management Act 1991, and now under the Natural Environment Act 2026. The NZTCS is effective for informing conservation action, targeting resources, and monitoring biodiversity trends and conservation effectiveness at a national scale. However, national assessments can overlook situations where taxa are under greater pressure at regional or local scales.

The need for nationally consistent threat assessments at the regional scale led to the development of the Regional Threat Classification System (RTCS; Crisp et al. 2026). The RTCS extends the NZTCS by applying the same threat categories, status rankings, and criteria adjusted to regional scales, with additional qualifiers to capture attributes of regional importance. Regional assessments improve understanding of species' status across the landscape and help local government, iwi, and community groups prioritise complementary actions. Furthermore, they can strengthen regulatory protection for threatened species and contribute local knowledge to inform future national conservation assessments.

As of October 2026, regional conservation status assessments have already been completed in Otago for eight groups: amphibians (Jarvie 2025a), bats (Jarvie et al. 2023), birds (Jarvie et al. 2026b), indigenous vascular plants (Jarvie et al. 2026a), Onychophora (Jarvie 2025b), Orthoptera (Jarvie et al. 2026c), reptiles (Jarvie et al. 2025), and selected mushroom fungi (Jarvie & Cooper 2024). Specifically, for freshwater fishes, other councils have completed conservation status assessments in their Regions, including Greater Wellington Regional Council (Crisp et al. 2022), Auckland Council (Bloxham et al. 2023), and Horizons Regional Council (Hickey et al. 2025). This report provides a species list and the first conservation status for freshwater fishes in the Otago Region.

Methods

The threat status of freshwater fishes for Otago was assessed in March 2025 and updated in March 2026 by a panel of experts (Richard Allibone, Nicholas Dunn, Daniel Jack, Pete Ravenscroft, and Ciaran Campbell), with assistance from an Otago Regional Council (ORC) ecologist (Scott Jarvie), who has expertise in the RTCS process. This assessment covers freshwater fishes in the Region, following the Regional Threat Classification System manual (Crisp et al. 2026) as shown in Appendix 1, incorporating the list of regional qualifiers in Appendix 2, and the list of national qualifiers in Appendix 3. National threat statuses and national qualifiers from Dunn et al. (2018) were used to inform the regional assessment workshop and updated to be consistent with Dunn et al. (2025). Taxa are referred to by their scientific and common English names, consistent with the national assessment (Dunn et al. 2025). The use of te reo Māori and English in dual place names is based on the New Zealand Gazetteer (<https://gazetteer.linz.govt.nz>, administered by Toitū Te Whenua Land Information New Zealand), and guided by Kā Huru Manu – the Ngāi Tahu Atlas (<https://kahurumanu.co.nz/atlas/>).

Following Dunn et al. (2025), all taxa were classified as: 1) ‘taxonomically determinate’, i.e., legitimately and effectively published and generally accepted by relevant experts as distinct; or 2) ‘taxonomically unresolved’, i.e., used loosely to include both recognised but undescribed entities which still require formal taxonomic research to confirm their validity and provide them with a formal name and, occasionally, described species whose taxonomic validity is in question.

Using the standardised methodology, fish taxa not observed in Otago were first removed from consideration based on those recognised in the NZTCS list (Dunn et al. 2025). The next step was to identify Nationally Threatened and At Risk taxa that breed or are resident in the Region. For this assessment, all extant native freshwater fish taxa were confirmed as residents; no national or regional colonisers, migrants, or vagrants are present in the Otago Region. If more than 20% of the national population is breeding or resident for more than half their life cycle in the Region, taxa were assigned the National Stronghold qualifier and the NZTCS criteria applied. To ensure regional and national assessments do not conflict, the regional conservation status for taxa in the Threatened category must not be lower than the national status, for example, a Nationally Endangered taxon cannot be assessed as Regionally Vulnerable or lower but could be assessed as Regionally Critical (Crisp et al. 2026).

Regional thresholds were set at occupancy of more than 1,000 ha in accordance with standardised methodology (Crisp et al. 2026). If taxa did not meet the threshold, they were assigned a regional threat status by applying the NZTCS criteria to the regional

population. If taxa did meet the threshold and the population trend was $\pm 10\%$ stable or increasing, they were assigned the status Regionally Not Threatened.

For Nationally Not Threatened taxa, the regional population threshold was applied. If the population was not stable to increasing/decreasing by more than 10%, the NZTCS criteria were used to determine the regional threat status. Population trend criteria were applied based on current knowledge, projecting from recent past into the future over the next 10 years or three generations, whichever is the longer.

Freshwater fish taxa that have become established in Otago after deliberate or accidental introduction by humans are classified as Introduced and Naturalised. To be considered naturalised, taxa must have established a self-sustaining population in the wild over at least three generations and must have spread beyond the site of initial introduction. A category for Introduced, Not Established was used for freshwater fish taxa observed in Otago following Jarvie et al. (2026b), where: 1) a release is documented, but with no self-sustaining population in the wild; or 2) a deliberate introduction is documented, and published records indicate the species bred (or probably bred), but it is no longer extant.

To inform decisions on population numbers and distributions for the regional threat status of freshwater fish taxa, recent occurrence records (i.e., since 1940) were extracted and cleaned from the publicly accessible New Zealand Freshwater Fish Database (NZFFD, <https://nzffdms.niwa.co.nz/>, accessed February 2025) then taxonomically harmonised with the list of freshwater fish taxa in the NZTCS (Dunn et al. 2025) using expert knowledge of the names and distributions of freshwater fish taxa. The records were viewed in a locally operated dashboard using R v. 4.2.2 (R Core Team 2022) via the RStudio platform (Posit Team 2023). The main packages used were ‘shiny’ (Chang et al. 2021) and ‘flexdashboard’ (Iannone et al. 2020). The map layers used to view records were OpenStreetMap and Esri WorldImagery.

Further context was provided to the expert panel including published and unpublished reports such as the Climate Change Vulnerability Assessments for some taxa (Egan et al. 2020) and International Union for the Conservation of Nature (IUCN) Red List of Threatened Species assessment reports for taxa, where available (2025-2). For assessing non-diadromous galaxiid fishes, sub-population databases were used by the panel to inform area of occupancy (Dunn 2025b–p). These sub-population databases are outputs following methods devised by Dunn and O’Brien (2022) to integrate demographic and geospatial information to improve threat assessments and ultimately management of freshwater fishes. For all other taxa, the Otago area of occupancy was derived from Dunn (2025a) who sourced measured and modelled occupancies within freshwater and coastal hydrosystems (Snelder et al. 2004; Booker & Hicks 2013; Crow et al. 2014; Hume et al. 2016; White et al. 2022). Environmental DNA (eDNA) data, specifically publicly

available records from Wilderlab (<https://wilderlab.co.nz/explore>), were occasionally considered by the expert panel to support the distributional knowledge from known physical observations. The panel critically assessed available data and drew on their own expert knowledge to consider current and likely future threats to determine the status and qualifiers for each taxon.

In the tables with regional threat assessment information a notes column provides additional information where available. This may include the common name and threat status of indigenous taxa recorded in the IUCN Red List of Threatened Species status (2025-2; accessed, October 20, 2025), recorded distributions of regional endemic taxa (Appendix 4), locations of type localities (Appendix 5), the taxon's status from Climate Change Vulnerability Assessments (CCVA, Egan et al. 2020), relevant sub-population assessment data (Dunn 2025b–p), and fisheries stock status trend information for species in the quota management system (Fisheries New Zealand 2025).

Spatial identification of the habitats of freshwater fishes is useful for achieving environmental outcomes consistent with regional direction. Spatial presence in the Otago Region was determined using the taxonomically harmonised NZFFD records and further informed by sub-population assessments (Dunn 2025b–p). Information on the recent distribution of extant freshwater fish taxa in Otago is provided for each territorial authority (Table 2; Appendix 6), and for each Freshwater Management Unit (FMU), with the Clutha Mata-au FMU subdivided into five rohe (areas) (Table 3; Appendix 7).

Direction is given to regional councils in the National Policy Statement for Freshwater Management (NPS-FM 2020; Ministry for the Environment – Manatū Mō Te Taiao, 2025) to protect freshwater habitats, address fish passage issues, and provide habitats and conditions that support the recovery of threatened taxa. Further policy direction for taxa listed as Threatened by the IUCN is provided by the New Zealand Coastal Policy Statement 2010 (Department of Conservation – Te Papa Atawhai, 2025) and its accompanying Document for Policy 11(a) (Indigenous Biological Diversity – Biodiversity; Department of Conservation – Te Papa Atawhai, 2019). IUCN assessments are, therefore, considered particularly relevant for taxa found in the Coastal Environment, which includes the Coastal Marine Area (CMA, Appendix 6) and areas that influence and are influenced by coastal processes.

Many freshwater fish taxa assessed by Dunn et al. (2025) utilise habitats and conditions across the freshwater-marine continuum, either obligately or facultatively as part of their life history (McDowall 1990; Dunn et al. 2025). These habitats and conditions occur within and between the CMA and the wider Coastal Environment. While freshwater habitats in proximity to the coast are included within the Coastal Environment, this broader area has not yet been spatially delimited for the Otago Region (Otago Regional Council 2025a, 2025b). Consequently, spatial data or inferred presence based on life

history is provided for the Otago CMA (Appendix 6) but not yet determined for the broader Coastal Environment.

Results

A total of 41 freshwater fish taxa were assessed in the Otago Region since human arrival in Aotearoa New Zealand (Figure 1). Of these taxa, 18 are Regionally Threatened, four are Regionally At Risk, four are Regionally Not Threatened, seven are Regionally Data Deficient, seven are Regionally Introduced and Naturalised, and a single taxon is Regionally Extirpated. In addition to these 41 assessed fish taxa, two were Regionally Introduced, Not Established.

Of the 18 Regionally Threatened taxa in Otago, two are Regionally Critical, four are Regionally Endangered, and 12 are Regionally Vulnerable. Of the four Regionally At Risk taxa, two are Regionally Declining and two are Regionally Naturally Uncommon. The Regionally Extirpated species is globally extinct.

The Region was identified as a National Stronghold for eleven freshwater fish taxa, meaning these taxa are expected to have > 20% of their national population in Otago (Appendix 4). Of those taxa with National Strongholds, nine are Regional Endemics, meaning they are native to the Region and do not breed elsewhere (Appendix 4; Jarvie 2025c). A total of seven taxa were at their natural range limit within the Region, excluding the regionally endemic taxa. There are five freshwater fish taxa with type localities in the Otago Region (Appendix 5, Jarvie 2025d).

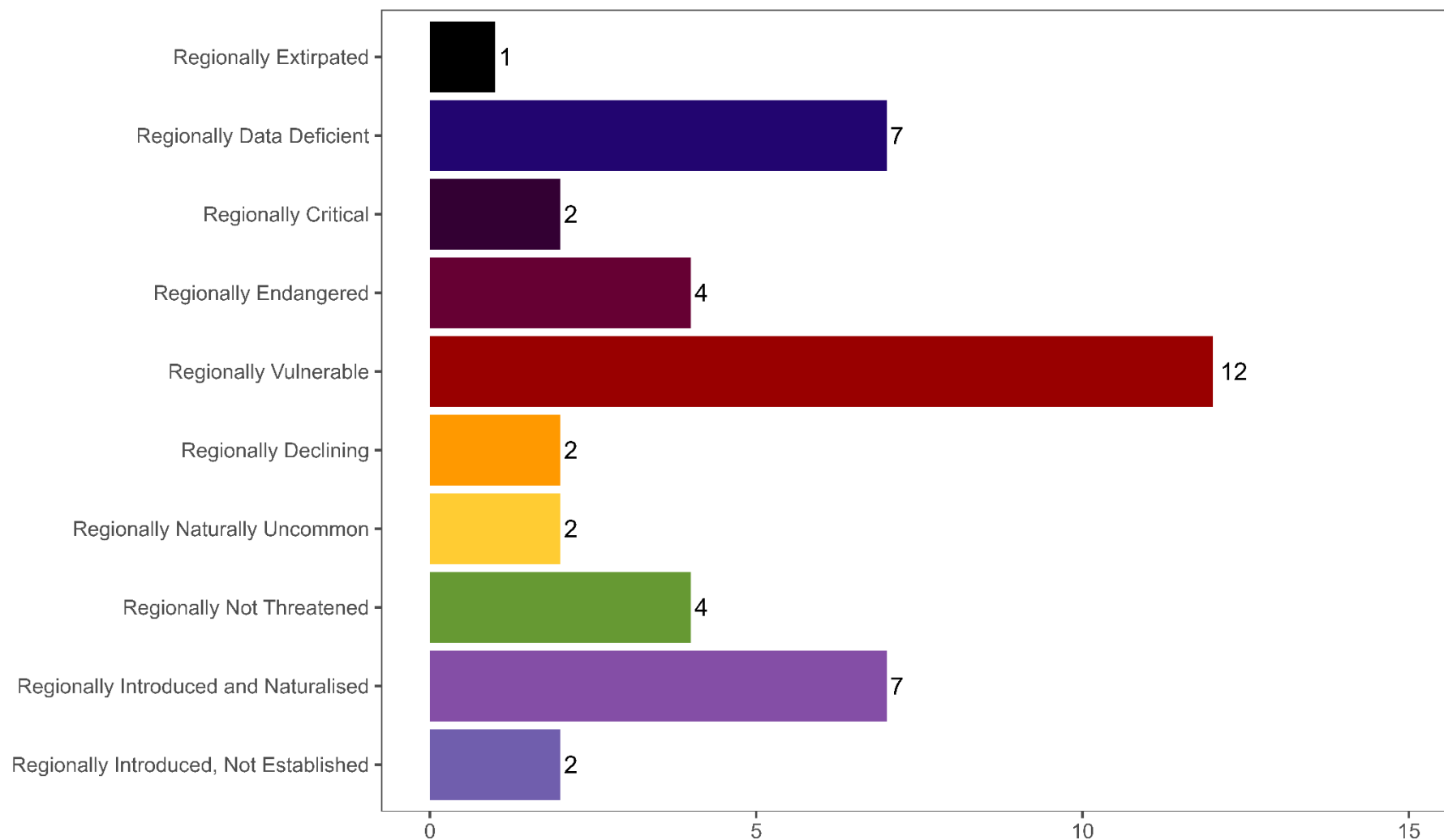


Figure 1. Conservation status of freshwater fishes in the Otago Region.

Table 1.1. Regional conservation status of freshwater fishes in Otago

Regional and national qualifiers are abbreviated as follows: CD = Conservation Dependent; CI = Climate Impact; CRN = Conservation Research Needed; DPR = Data Poor Recognition; DPS = Data Poor Size; DPT = Data Poor Trend; DE = Designated; FR = Former Range; INC = Increasing; NR = Natural Range Limit; NStr = National Stronghold; OL = One Location; PD = Partial Decline; PF = Population Fragmentation; RE = Regional Endemic; RR = Range Restricted; Sp = Biologically Sparse; TL = Type Locality; TO = Threatened Overseas. Other abbreviations are: DEC = declining; MATIND = mature individuals. National threat categories and criteria are summarised in Appendix 1 (see also Rolfe et al. 2022 and <https://nztcs.org.nz>). Qualifiers are defined in Appendices 2 (national qualifiers; Rolfe et al. 2022) and 3 (regional qualifiers; Crisp et al. 2026).

Common Name and Threat Status of indigenous taxa recorded in the IUCN Red List of Threatened Species (2025-2; accessed, October 20, 2025), recorded distributions of regional endemic taxa (Appendix 4), locations of type localities (Appendix 5), the taxon's status from Climate Change Vulnerability Assessments (CCVA, Egan et al. 2020), sub-population assessment data (Dunn 2025b–p), and fisheries stock status trend information for species in the quota management system (Fisheries New Zealand 2025) are noted where relevant.

Name and Authority	Common Name	National Conservation Status	Regional Criteria	National Stronghold	Regional Endemic	Regional Population	Regional Area	Regional Trend	Regional Confidence Population	Regional Confidence Trend	Regional Qualifiers	National Qualifiers	Notes
REGIONALLY EXTIRPATED (1)													
GLOBALLY EXTINCT (1)													
<i>Taxonomically determinate (1)</i>													
<i>Prototroctes oxyrhynchus</i> Günther 1870	grayling	Extinct											IUCN: Common Name and Threat Status: New Zealand Grayling, Extinct (West et al. 2014b).

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Conservation status of freshwater fishes in Otago

Conservation status continued

Name and Authority	Common Name	National Conservation Status	Regional Criteria	National Stronghold	Regional Endemic	Regional Population	Regional Area	Regional Trend	Regional Confidence Population	Regional Confidence Trend	Regional Qualifiers	National Qualifiers	Notes
REGIONALLY DATA DEFICIENT (7)													
<i>Taxonomically determinate (7)</i>													
<i>Anguilla australis</i> Richardson 1841	shortfin eel	Not Threatened									CD, CI, DPS, DPT, SO	CI, SO	<p>IUCN Threat Status: Near Threatened. The IUCN assessment applies to populations in Australia, New Caledonia, New Zealand, and Norfolk Island (Pike et al. 2019a).</p> <p>CCVA: High.</p> <p>Fisheries: Catches in the SFE 15 fish stock area have fluctuated without trend until 2015 and increased since. Low catches in 2022 and 2023 reduce certainty on catch per unit (Fisheries New Zealand 2025).</p> <p>Insufficient data was available to assess the predicted and ongoing trend for this taxon over three generations. Individuals caught or observed are often not differentiated from other eel taxa, which reduces the amount of reliable data available for this taxon.</p>

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Conservation status of freshwater fishes in Otago

Data Deficient continued

Name and Authority	Common Name	National Conservation Status	Regional Criteria	National Stronghold	Regional Endemic	Regional Population	Regional Area	Regional Trend	Regional Confidence Population	Regional Confidence Trend	Regional Qualifiers	National Qualifiers	Notes
<i>Anguilla dieffenbachii</i> Gray 1842	longfin eel	Declining									CD, CI, CR, DPS, DPT	CD, CI, DPT	<p>IUCN Threat Status: Endangered (Pike et al. 2019b).</p> <p>CCVA: Very high.</p> <p>Fisheries: Catches in the LFE 15 fish stock area have fluctuated without trend until 2015 and increased since. Low catches in 2022 and 2023 reduce certainty on catch per unit (Fisheries New Zealand 2025).</p> <p>Insufficient data was available to assess the predicted and ongoing trend for this taxon over three generations. Individuals caught or observed are often not differentiated from other eel taxa, reducing the amount of reliable data available for this taxon.</p>
<i>Forsterygion nigripenne</i> (Valenciennes 1836)	estuarine triplefin	Not Threatened											<p>IUCN Threat Status: Least Concern (Franklin & Clements 2014).</p> <p>Freshwater fish surveying and monitoring sites do not typically overlap with <i>F. nigripenne</i> habitat.</p>

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Conservation status of freshwater fishes in Otago

Data Deficient continued

Name and Authority	Common Name	National Conservation Status	Regional Criteria	National Stronghold	Regional Endemic	Regional Population	Regional Area	Regional Trend	Regional Confidence Population	Regional Confidence Trend	Regional Qualifiers	National Qualifiers	Notes
<i>Geotria australis</i> Gray 1851	lamprey	Nationally Vulnerable									CD, CI, CR, DPS, DPT, S?O, Sp, TO	CI, CR, DPS, DPT, S?O	IUCN Common Name and Threat Status: Pouched lamprey, Data Deficient. The IUCN assessment applies to populations in Australia, Chile, and Aotearoa New Zealand (Baker & Bice 2022). CCVA: Very high. Insufficient data to assess population trends and area of occupancy, partly due to unreliability in results from current sampling and monitoring methods, or biases towards particular life stages. Development of new protocols and emerging techniques and technologies may help in the future (Baker et al. 2024).
<i>Gobiomorphus gobioides</i> (Valenciennes 1837)	giant bully	Naturally Uncommon									CR, DPR, DPS, DPT, RR	DPT, RR	IUCN Threat Status: Least Concern (Ling et al. 2014b). Differentiation from other bully species in the field can be difficult or unreliable. Insufficient data exists to assess area of occupancy and predicted and ongoing population trend. Freshwater fish surveying and monitoring sites do not typically overlap with <i>G. gobioides</i> habitat.

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Conservation status of freshwater fishes in Otago

Data Deficient continued

Name and Authority	Common Name	National Conservation Status	Regional Criteria	National Stronghold	Regional Endemic	Regional Population	Regional Area	Regional Trend	Regional Confidence Population	Regional Confidence Trend	Regional Qualifiers	National Qualifiers	Notes
<i>Retropinna retropinna</i> (Richardson 1848)	common smelt	Declining									DPS, DPT	CI, CR, DPT, PD	IUCN Threat Status: Least Concern (Franklin et al. 2014). Insufficient data exists to assess population trend partly due to under-reporting in national databases, although juvenile common smelt have been observed at some river mouths in Otago during whitebait seasons (Campbell pers. obs., August – November 2013-2019). Freshwater fish surveying and monitoring sites do not typically overlap with <i>R. retropinna</i> habitat.
<i>Stokellia anisodon</i> (Stokell 1941)	Stokell's smelt	Nationally Critical									CI, CR, DPR, DPS, DPT, NR, OL	CI, CR, DPR, RR	IUCN Threat Status: Least Concern (David et al. 2014a). Unreliable differentiation of this from <i>R. retropinna</i> . Freshwater fish surveying and monitoring sites do not typically overlap with <i>S. anisodon</i> habitat.

REGIONALLY THREATENED (18)

REGIONALLY CRITICAL (2)

Taxonomically determinate (1)

<i>Neochanna burrowsius</i> (Phillipps 1926)	Canterbury mudfish	Nationally Critical	A (3)				≤ 1 ha		Low	Low	CD, CR, DPS, DPT, EF, NR, OL, PF	CD, CI, EF, PF, RR, Sp	IUCN Threat Status: Critically Endangered (West et al. 2014f). Sub-population assessment: Dunn (2025p). Experiencing significant declines in the Canterbury Region, where this taxon is almost exclusively found (Dunn et al. 2025).
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Conservation status of freshwater fishes in Otago

Regionally Critical continued

Name and Authority	Common Name	National Conservation Status	Regional Criteria	National Stronghold	Regional Endemic	Regional Population	Regional Area	Regional Trend	Regional Confidence Population	Regional Confidence Trend	Regional Qualifiers	National Qualifiers	Notes
Taxonomically unresolved (1)													
<i>Galaxias</i> "Teviot"	Teviot flathead galaxias (Teviot River)	Nationally Critical	A (3)	Yes	Yes		≤ 1 ha		Medium	Medium	CD, CI, CR, DPR, NR, NStr, OL, PF, RE, Rel	CD, CI, PF, RR	Endemic to Otago. Restricted to ten tributaries of the Te Awa Makarara/Teviot River. An outlying record exists in Red Swamp Creek, a tributary of the upper Taieri / Taieri River. Sub-population assessment: Dunn (2025f).
REGIONALLY ENDANGERED (4)													
Taxonomically determinate (1)													
<i>Galaxias cobitinis</i> McDowall & Waters 2002	lowland longjaw galaxias (Kakanui River)	Nationally Endangered	B (1)	Yes	Yes	250–1000 MATIND		STABLE ±10%	Medium	Medium	CD, CI, CR, EF, NR, NStr, OL, RE, TL, TLH	CD, CI, EF, OL	IUCN Threat Status: Critically Endangered (Allibone et al. 2014g). The IUCN assessment includes lowland longjaw galaxias in the Waitaki catchment, now recognised as a separate entity, namely <i>Galaxias</i> aff. <i>cobitinis</i> "Waitaki" (Dunn et al. 2025). Sub-population assessment: Dunn (2025j). Endemic to Otago. Found only within its natural range in the Kākaunui / Kakanui River. A conservation translocation into Waianakarua River is now believed to have failed (Dunn et al. 2025). Type locality: Kauru River. Population size for this taxon was assessed using the number of mature individuals, consistent with Dunn et al. (2025).

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Conservation status of freshwater fishes in Otago

Regionally Endangered continued

Name and Authority	Common Name	National Conservation Status	Regional Criteria	National Stronghold	Regional Endemic	Regional Population	Regional Area	Regional Trend	Regional Confidence Population	Regional Confidence Trend	Regional Qualifiers	National Qualifiers	Notes
<i>Taxonomically unresolved (3)</i>													
<i>Galaxias</i> "Nevis"	Nevis galaxias (Nevis River)	Nationally Endangered	A (3)	Yes	Yes		≤ 10 ha	DEC: 30-50%	Low	Low	CD, CI, CR, DPS, DPT, NR, NStr, OL, PF, RE	CD, CI, EF, OL	IUCN Threat Status: Not Assessed, although noted and excluded from the assessment for <i>Galaxias gollumoides</i> , as they have previously been recognised as conspecifics. Sub-population assessment: Dunn (2025b). Endemic to Otago. Recorded only in the Nevis River / Te Papapuni catchment. It has been lost from historic mainstem sites and is now only found in tributaries above waterfall barriers.
<i>Galaxias</i> "southern"	southern flathead galaxias (Otago, Southland)	Declining	A (3)				≤ 10 ha	DEC: 10-30%	Low	Low	CD, CR, DPS, DPT, NR, PF, RR	CI, CR, DPT, EF, PF, RR, Sp	Sub-population assessment: Dunn (2025d).
<i>Galaxias</i> aff. <i>paucispondylus</i> "Manuherikia"	alpine galaxias (Manuherikia River)	Nationally Endangered	B (3)	Yes	Yes		≤ 10 ha	STABLE ±10%	Medium	Medium	CR, NR, NStr, OL, RE	CI, DPT, EF, OL	IUCN Threat Status: Not Assessed, although included in the assessment for <i>Galaxias paucispondylus</i> . This taxon has since been split from the parent taxon along with another recognised entity. Sub-population assessment: Dunn (2025g), noting recent survey work (Allibone 2025) and difficulty with estimating area of occupancy in braided river habitats. Endemic to Otago. Only known from upstream of Falls Dam in the Manuherikia / Manuherikia River.

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Conservation status of freshwater fishes in Otago

Conservation status continued

Name and Authority	Common Name	National Conservation Status	Regional Criteria	National Stronghold	Regional Endemic	Regional Population	Regional Area	Regional Trend	Regional Confidence Population	Regional Confidence Trend	Regional Qualifiers	National Qualifiers	Notes
REGIONALLY VULNERABLE (12)													
<i>Taxonomically determinate (9)</i>													
<i>Cheimarrichthys fosteri</i> Haast 1874	torrentfish	Naturally Uncommon	C (3)				≤ 100 ha	DEC: 10-30%	Low	Low	CI, CR, DPS, DPT	DPS, RR	IUCN Threat Status: Vulnerable (Allibone et al. 2014c).
<i>Galaxias anomalus</i> Stokell 1959	central Otago roundhead galaxias	Nationally Vulnerable	C (3)	Yes	Yes		≤ 100 ha	DEC: 10-30%	Medium	Low	CD, CI, CR, DPT, EF, NR, NStr, PF, RE, RR, TL, TLH	CD, CI, EF, PF, RR	IUCN Threat Status: Critically Endangered (Allibone et al. 2014f) Sub-population assessment: Dunn (2025i). Endemic to Otago. Recorded in Taieri / Taieri River catchment and the Manuharekia / Manuharekia River within the Clutha River / Mata-Au. Type locality: Ophir Spring.
<i>Galaxias argenteus</i> (Gmelin 1789)	giant kokopu	Declining	B (3)				≤ 100 ha	STABLE ±10%	Low	Low	CD, CI, CR, DPS, DPT, RF, RR	CI, DPT, PD	IUCN Threat Status: Vulnerable (West et al. 2014e). CCVA: Moderate.
<i>Galaxias eldoni</i> McDowall 1997	Eldon's galaxias	Nationally Vulnerable	C (3)	Yes	Yes		≤ 100 ha	DEC: 10-30%	Medium	Low	CD, CR, DPT, NR, NStr, PD, PF, RE, RR, TL, TLH	CD, CI, PD, PF, RR	IUCN Threat Status: Critically Endangered (Allibone et al. 2014a). Sub-population assessment: Dunn (2025l). Endemic to Otago. Recorded in the Taieri / Taieri River and Tokomairaro River catchments. Type locality: Smugglers Creek.
<i>Galaxias fasciatus</i> Gray 1842	banded kokopu	Naturally Uncommon	B (3)				≤ 100 ha	STABLE ±10%	Low	Medium	CD, CI, CR, DPS, RR		IUCN Threat Status: Least Concern (West et al. 2014a). CCVA: High.
<i>Galaxias gollumoides</i> McDowall & Chadderton 1999	Gollum galaxias	Declining	B (3)				≤ 100 ha	STABLE ±10%	Low	Low	CI, DPR, DPS, DPT, NR, PF, RR	CI, DPT, PF, RR, Sp	IUCN Threat Status: Critically Endangered (Allibone et al. 2014e). Sub-population assessment: Dunn (2025m).

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Conservation status of freshwater fishes in Otago

Regionally Vulnerable continued

Name and Authority	Common Name	National Conservation Status	Regional Criteria	National Stronghold	Regional Endemic	Regional Population	Regional Area	Regional Trend	Regional Confidence Population	Regional Confidence Trend	Regional Qualifiers	National Qualifiers	Notes
<i>Galaxias maculatus</i> (Jenyns 1842)	inanga	Nationally Vulnerable					> 1000 ha	STABLE ±10%	Medium	Low	CD, CI, CR, DPT, T?O	CD, DPS, RR, SO?	IUCN Common Name and Threat Status: Common galaxias, Least Concern, noting the IUCN assessment applies to populations in Argentina, Australia, Chile, Falkland Islands, and Aotearoa New Zealand (Bice et al. 2019). CCVA: High. This taxon was assessed as Regionally Vulnerable, consistent with the national assessment (Dunn et al. 2025) and the standardised protocol (Crisp et al. 2026).
<i>Galaxias pullus</i> McDowall 1997	dusky galaxias	Nationally Vulnerable	C (3)	Yes	Yes		≤ 100 ha	DEC: 10-30%	Medium	Medium	CD, CI, CR, NR, NStr, PD, PF, RE, RR, TL, TLH	CD, CI DPT, PD, PF, RR	IUCN Threat Status: Critically Endangered (Allibone et al. 2014d). Sub-population assessment: Dunn (2025n). Endemic to Otago. Recorded in the Taiari / Taieri and Clutha River / Mata-Au catchments. Type locality: Stream draining Munro Dam.
<i>Galaxias vulgaris</i> Stokell 1949	Canterbury galaxias	Naturally Uncommon	B (3)				≤ 100 ha	STABLE ±10%	Medium	Low	CD, CI, DPT, NR, RR	CI, DPT, PF	IUCN Threat Status: Least Concern (Allibone et al. 2014h).
Taxonomically unresolved (3)													
<i>Galaxias</i> "Pomahaka"	Pomahaka galaxias (Pomahaka River)	Nationally Vulnerable	C (3)	Yes			≤ 100 ha	DEC: 10-30%	Medium	Low	CD, CI, CR, DPR, DPT, NR, NStr, PF, RR	CD, CI, DPT, PF, RR	Sub-population assessment: Dunn (2025c). This lineage currently includes some sub-populations previously assigned to <i>Galaxias</i> "lower Clutha" and <i>Galaxias</i> "species D" (Dunn et al. 2025).

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Conservation status of freshwater fishes in Otago

Regionally Vulnerable continued

Name and Authority	Common Name	National Conservation Status	Regional Criteria	National Stronghold	Regional Endemic	Regional Population	Regional Area	Regional Trend	Regional Confidence Population	Regional Confidence Trend	Regional Qualifiers	National Qualifiers	Notes
<i>Galaxias</i> "species D"	Clutha flathead galaxias (Clutha River)	Nationally Vulnerable	C (3)	Yes	Yes		≤ 100 ha	DEC: 10-30%	Medium	Low	CD, CI, CR, DPR, DPT, NR, NStr, PD, PF, RE	CD, CI, DPT, PF, RR	Sub-population assessment: Dunn (2025e). Endemic to Otago. Mostly confined to tributaries of the Clutha River/Mata-Au catchment, and also in some rivers in The Catlins area. This lineage includes sub-populations previously assigned to <i>Galaxias</i> "lower Clutha" and <i>Galaxias</i> "Pomahaka" (Dunn et al. 2025).
<i>Galaxias</i> aff. <i>paucispandylus</i> "Southland"	alpine galaxias (Southland)	Declining	B (3)				≤ 100 ha	STABLE ±10%	Low	Low	CR, DPS, DPT, NR, RR	CI, DPT, EF, PF, RR, Sp	IUCN Threat Status: Not Assessed, although included in the assessment for <i>G. paucispandylus</i> . This taxon is recognised outside of the IUCN process as split from the parent taxon along with another recognised affinis. Sub-population assessment: Dunn (2025h).

REGIONALLY AT RISK (4)

REGIONALLY DECLINING (2)

Taxonomically determinate (2)

<i>Galaxias brevipinnis</i> Günther 1866	koaro	Declining	C (2)	Yes			> 10,000 ha	DEC: 10-30%	Low	Low	CR, DPS, DPT, NStr, S?O	CI, DPT, PD	IUCN Common Name and Threat Status: Climbing galaxias, Least Concern, noting the IUCN assessment applies to populations in Australia and Aotearoa New Zealand (Raadik et al. 2019). CCVA: High.
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Conservation status of freshwater fishes in Otago

Regionally Declining continued

Name and Authority	Common Name	National Conservation Status	Regional Criteria	National Stronghold	Regional Endemic	Regional Population	Regional Area	Regional Trend	Regional Confidence Population	Regional Confidence Trend	Regional Qualifiers	National Qualifiers	Notes
<i>Galaxias depressiceps</i> McDowall & Wallis 1996	Taieri flathead galaxias	Declining	A (2)	Yes	Yes		≤ 1,000 ha	DEC: 10-30%	Medium	Low	CD, CI, CR, DPT, NR, NStr, PD, PF, RE, RR, TL	Sp, CI, CD, DPT, PF, RR	IUCN Threat Status: Vulnerable (Allibone et al. 2020). Sub-population assessment: Dunn (2025k). Type locality: Healy Creek. Endemic to Otago. Recorded in the Taieri / Taieri River, Waihemo / Shag River, Waikōuaiti / Waikouaiti River, Akatore Creek, and Tokomairaro River catchments.
REGIONALLY NATURALLY UNCOMMON (2)													
<i>Taxonomically determinate (2)</i>													
<i>Gobiomorphus hubbsi</i> (Stokell 1959)	bluegill bully	Naturally Uncommon					< 100,000 ha	STABLE ±10%	Medium	Low	CI, CR, DPT		IUCN Threat Status: Vulnerable (Allibone et al. 2014b).
<i>Gobiomorphus huttoni</i> (Ogilby 1894)	redfin bully	Naturally Uncommon					< 100,000 ha	STABLE ±10%	Medium	Low	CI, CR, DPT, PD		IUCN Threat Status: Near Threatened (Ling et al. 2014a).

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Conservation status of freshwater fishes in Otago

Conservation status continued

Name and Authority	Common Name	National Conservation Status	Regional Criteria	National Stronghold	Regional Endemic	Regional Population	Regional Area	Regional Trend	Regional Confidence Population	Regional Confidence Trend	Regional Qualifiers	National Qualifiers	Notes
REGIONALLY NOT THREATENED (4)													
<i>Taxonomically determinate (4)</i>													
<i>Aldrichetta forsteri</i> (Valenciennes 1836)	yellow-eye mullet	Not Threatened					> 1000 ha	STABLE ±10%	Medium	Low	DPT, SO	DPT, SO	IUCN Common Name and Threat Status: yelloweye mullet, Least Concern, noting the IUCN assessment applies to populations in Australia and Aotearoa New Zealand (David et al. 2014b). CCVA: Low. Fisheries: There is insufficient information to estimate stocks of yellow-eye mullet in the “YEM 3” fish stock area (Fisheries New Zealand 2025).
<i>Gobiomorphus breviceps</i> (Stokell 1939)	upland bully	Naturally Uncommon					> 1000 ha	STABLE ±10%	High	High			IUCN: Threat Status: Least Concern (West et al. 2014c), although includes the recently described sister lineage (<i>Gobiomorphus mataraerore</i> , Thacker et al. 2023).
<i>Gobiomorphus cotidianus</i> McDowall 1975	common bully	Not Threatened					> 1000 ha	STABLE ±10%	Medium	Medium			IUCN Threat Status: Least Concern (West et al. 2014d).
<i>Rhombosolea retiaria</i> Hutton 1874	black flounder	Not Threatened					> 1000 ha	STABLE ±10%	Medium	Low	CR, DPT	CI, CR, DPT	IUCN Threat Status: Data Deficient (David et al. 2014c). Fisheries: The lack of species-specific reporting limits the ability to assess long-term trends in stocks of black flounder (BFL) within the “FLA 3” flatfish stock area (Fisheries New Zealand 2025).

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Conservation status of freshwater fishes in Otago

Conservation status continued

Name and Authority	Common Name	National Conservation Status	Regional Criteria	National Stronghold	Regional Endemic	Regional Population	Regional Area	Regional Trend	Regional Confidence Population	Regional Confidence Trend	Regional Qualifiers	National Qualifiers	Notes
REGIONALLY INTRODUCED AND NATURALISED (7)													
<i>Taxonomically determinate (7)</i>													
<i>Carassius auratus</i> (Linnaeus 1758)	goldfish	Introduced and Naturalised										Inc	
<i>Oncorhynchus mykiss</i> (Walbaum 1792)	rainbow trout	Introduced and Naturalised											
<i>Oncorhynchus tshawytscha</i> (Walbaum 1792)	Chinook salmon	Introduced and Naturalised											
<i>Perca fluviatilis</i> Linnaeus 1758	perch	Introduced and Naturalised										Inc	
<i>Salmo trutta</i> Linnaeus 1758	brown trout	Introduced and Naturalised											
<i>Salvelinus fontinalis</i> (Mitchill 1814)	brook char	Introduced and Naturalised											
<i>Tinca tinca</i> (Linnaeus 1758)	tench	Introduced and Naturalised										Inc	

Two taxa in the Otago Region have been identified as Regionally Introduced, Not Established, where either a release has been documented with no record of self-sustaining population in the wild, or a deliberate introduction is documented, published records indicate the species bred (or probably bred), but it is no longer extant (Table 1.2).

Table 1.2. Regionally Introduced, Not Established freshwater fishes in Otago.

Name and Authority	Common Name	National Conservation Status	Notes
REGIONALLY INTRODUCED, NOT ESTABLISHED (2)			
<i>Taxonomically determinate (2)</i>			
<i>Ctenopharyngodon idella</i> (Valenciennes 1844)	grass carp		Not assessed by Dunn et al. (2025), as this taxon does not fit the New Zealand Threat Classification System criteria.
<i>Salmo salar</i> Linnaeus 1758	Atlantic salmon	Introduced and Naturalised	While its national status is uncertain, this taxon is highly likely extinct in the Otago Region (J. Couper pers. comm. 2026, Fish and Game; Dunn et al. 2025; Stokell 1955).

Presence of 41 extant freshwater fish taxa were assessed for the Coastal Marine Area, each Territorial Authority, and each Freshwater Management Unit or rohe in the Otago Region and summarised in Tables 2 and 3.

Table 2. Presence of extant freshwater fish taxa by territorial authority and Coastal Marine Area in the Otago Region.

Territorial authorities and a provisional Coastal Marine Area (CMA) are mapped in Appendix 6. *P* indicates a taxon was recently recorded (since 1940) in the New Zealand Freshwater Fish Database or in sub-population assessments (Dunn 2025b–p) to be present in a territorial authority or the CMA, except for grass carp which was inferred from unpublished observations; *LP* indicates a taxon has not been recorded present in the CMA but is inferred by life history.

Name and Authority	Common Name	Central Otago District Council	Clutha District Council	Dunedin City Council	Queenstown Lakes District Council	Waitaki District Council (Otago part only)	Coastal Marine Area
REGIONALLY THREATENED							
REGIONALLY CRITICAL							
<i>Galaxias</i> "Teviot"	Teviot flathead galaxias (Teviot River)	<i>P</i>					
<i>Neochanna burrowsius</i> (Phillipps 1926)	Canterbury mudfish					<i>P</i>	
REGIONALLY ENDANGERED							
<i>Galaxias cobitinis</i> McDowall & Waters 2002	lowland longjaw galaxias (Kakanui River)					<i>P</i>	
<i>Galaxias</i> "Nevis"	Nevis galaxias (Nevis River)	<i>P</i>					
<i>Galaxias</i> "southern"	southern flathead galaxias (Otago, Southland)		<i>P</i>		<i>P</i>		
<i>Galaxias</i> aff. <i>paucispondylus</i> "Manuherikia"	alpine galaxias (Manuherikia River)	<i>P</i>					
REGIONALLY VULNERABLE							
<i>Cheimarrichthys fosteri</i> Haast 1874	torrentfish	<i>P</i>	<i>P</i>	<i>P</i>		<i>P</i>	<i>LP</i>
<i>Galaxias</i> "Pomahaka"	Pomahaka galaxias (Pomahaka River)	<i>P</i>	<i>P</i>				
<i>Galaxias</i> "species D"	Clutha flathead galaxias (Clutha River)	<i>P</i>	<i>P</i>		<i>P</i>		
<i>Galaxias</i> aff. <i>paucispondylus</i> "Southland"	alpine galaxias (Southland)				<i>P</i>		
<i>Galaxias anomalus</i> Stokell 1959	central Otago roundhead galaxias	<i>P</i>		<i>P</i>			
<i>Galaxias argenteus</i> (Gmelin 1789)	giant kokopu		<i>P</i>	<i>P</i>		<i>P</i>	<i>LP</i>
<i>Galaxias eldoni</i> McDowall 1997	Eldon's galaxias		<i>P</i>	<i>P</i>			
<i>Galaxias fasciatus</i> Gray 1842	banded kokopu		<i>P</i>	<i>P</i>		<i>P</i>	<i>LP</i>
<i>Galaxias gollumoides</i> McDowall & Chadderton 1999	Gollum galaxias		<i>P</i>		<i>P</i>		
<i>Galaxias maculatus</i> (Jenyns 1842)	inanga	<i>P</i>	<i>P</i>	<i>P</i>		<i>P</i>	<i>LP</i>
<i>Galaxias pullus</i> McDowall 1997	dusky galaxias	<i>P</i>	<i>P</i>	<i>P</i>			
<i>Galaxias vulgaris</i> Stokell 1949	Canterbury galaxias					<i>P</i>	

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Conservation status of freshwater fishes in Otago

Presence continued

Name and Authority	Common Name	Central Otago District Council	Clutha District Council	Dunedin City Council	Queenstown Lakes District Council	Waitaki District Council (Otago part only)	Coastal Marine Area
REGIONALLY AT RISK							
REGIONALLY DECLINING							
<i>Galaxias brevipinnis</i> Günther 1866	koaro	P	P	P	P	P	LP
<i>Galaxias depressiceps</i> McDowall & Wallis 1996	Taieri flathead galaxias	P	P	P		P	
REGIONALLY NATURALLY UNCOMMON							
<i>Gobiomorphus hubbsi</i> (Stokell 1959)	bluegill bully		P	P		P	LP
<i>Gobiomorphus huttoni</i> (Ogilby 1894)	redfin bully		P	P		P	LP
REGIONALLY NOT THREATENED							
<i>Aldrichetta forsteri</i> (Valenciennes 1836)	yellow-eye mullet		P	P		P	LP
<i>Gobiomorphus breviceps</i> (Stokell 1939)	upland bully	P	P	P	P	P	
<i>Gobiomorphus cotidianus</i> McDowall 1975	common bully	P	P	P	P	P	P
<i>Rhombosolea retiaria</i> Hutton 1874	black flounder		P	P		P	P
REGIONALLY DATA DEFICIENT							
<i>Anguilla australis</i> Richardson 1841	shortfin eel	P	P	P		P	LP
<i>Anguilla dieffenbachii</i> Gray 1842	longfin eel	P	P	P	P	P	LP
<i>Forsterygion nigripenne</i> (Valenciennes 1836)	estuarine triplefin		P	P			LP
<i>Geotria australis</i> Gray 1851	lamprey	P	P	P		P	LP
<i>Gobiomorphus gobioides</i> (Valenciennes 1837)	giant bully		P	P		P	LP
<i>Retropinna retropinna</i> (Richardson 1848)	common smelt	P	P	P		P	P
<i>Stokellia anisodon</i> (Stokell 1941)	Stokell's smelt					P	P
REGIONALLY INTRODUCED AND NATURALISED							
<i>Carassius auratus</i> (Linnaeus 1758)	goldfish	P	P	P	P		
<i>Oncorhynchus mykiss</i> (Walbaum 1792)	rainbow trout	P	P	P	P		
<i>Oncorhynchus tshawytscha</i> (Walbaum 1792)	Chinook salmon	P	P	P	P	P	P
<i>Perca fluviatilis</i> Linnaeus 1758	perch	P	P	P	P	P	
<i>Salmo trutta</i> Linnaeus 1758	brown trout	P	P	P	P	P	LP
<i>Salvelinus fontinalis</i> (Mitchill 1814)	brook char	P	P	P	P	P	
<i>Tinca tinca</i> (Linnaeus 1758)	tench					P	
REGIONALLY INTRODUCED, NOT ESTABLISHED							
<i>Ctenopharyngodon idella</i> (Valenciennes 1844)	grass carp				P		

Table 3. Presence of extant freshwater fish taxa in Freshwater Management Units (FMU) in the Otago Region. The Clutha Mata-au FMU has been further subdivided into five rohe (areas).

Freshwater management units and rohe are mapped in Appendix 7. *P* indicates a taxon was recently recorded (since 1940) in the New Zealand Freshwater Fish Database or in sub-population assessments (Dunn 2025b–p) to be present in a FMU or rohe, except for grass carp which was inferred from unpublished observations.

Name and Authority	Common Name	North Otago FMU	Dunedin & Coast FMU	Taiari FMU	Cattlins FMU	Clutha Mata-au FMU				
						Upper Lakes Rohe	Dunstan Rohe	Roxburgh Rohe	Manuherikia Rohe	Lower Clutha Rohe
REGIONALLY THREATENED										
REGIONALLY CRITICAL										
Galaxias "Teviot"	Teviot flathead galaxias (Teviot River)			P				P		
Neochanna burrowsius (Phillipps 1926)	Canterbury mudfish	P								
REGIONALLY ENDANGERED										
Galaxias cobitinis McDowall & Waters 2002	lowland longjaw galaxias (Kakanui River)	P								
Galaxias "Nevis"	Nevis galaxias (Nevis River)						P			
Galaxias "southern"	southern flathead galaxias (Otago, Southland)				P	P				
Galaxias aff. paucispondylus "Manuherikia"	alpine galaxias (Manuherikia River)								P	
REGIONALLY VULNERABLE										
Cheimarrichthys fosteri Haast 1874	torrentfish	P			P			P		P
Galaxias "Pomahaka"	Pomahaka galaxias (Pomahaka River)		P					P		P
Galaxias "species D"	Clutha flathead galaxias (Clutha River)			P	P		P	P	P	P
Galaxias aff. paucispondylus "Southland"	alpine galaxias (Southland)					P				
Galaxias anomalus Stokell 1959	central Otago roundhead galaxias			P					P	
Galaxias argenteus (Gmelin 1789)	giant kokopu	P	P	P	P					P
Galaxias eldoni McDowall 1997	Eldon’s galaxias		P	P						
Galaxias fasciatus Gray 1842	banded kokopu	P	P	P	P					
Galaxias gollumoides McDowall & Chadderton 1999	Gollum galaxias				P	P				P
Galaxias maculatus (Jenyns 1842)	inanga	P	P	P	P			P		P
Galaxias pullus McDowall 1997	dusky galaxias			P				P		P
Galaxias vulgaris Stokell 1949	Canterbury galaxias	P								

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Conservation status of freshwater fishes in Otago

Presence continued

Name and Authority	Common Name	North Otago FMU	Dunedin & Coast FMU	Taiari FMU	Catlins FMU	Clutha Mata-au FMU				
						Upper Lakes Rohe	Dunstan Rohe	Roxburgh Rohe	Manuherekia Rohe	Lower Clutha Rohe
REGIONALLY AT RISK										
REGIONALLY DECLINING										
Galaxias brevipinnis Günther 1866	koaro	P	P	P	P	P	P	P	P	P
Galaxias depressiceps McDowall & Wallis 1996	Taieri flathead galaxias	P	P	P						
REGIONALLY NATURALLY UNCOMMON										
Gobiomorphus hubbsi (Stokell 1959)	bluegill bully	P	P		P					
Gobiomorphus huttoni (Ogilby 1894)	redfin bully	P	P	P	P					P
REGIONALLY NOT THREATENED										
Aldrichetta forsteri (Valenciennes 1836)	yellow-eye mullet	P	P	P						P
Gobiomorphus breviceps (Stokell 1939)	upland bully	P	P	P	P	P	P	P	P	P
Gobiomorphus cotidianus McDowall 1975	common bully	P	P	P	P	P	P	P	P	P
Rhombosolea retiaria Hutton 1874	black flounder	P	P	P	P					P
REGIONALLY DATA DEFICIENT										
Anguilla australis Richardson 1841	shortfin eel	P	P	P	P			P		P
Anguilla dieffenbachii Gray 1842	longfin eel	P	P	P	P	P	P	P	P	P
Forsterygion nigripenne (Valenciennes 1836)	estuarine triplefin		P		P					
Geotria australis Gray 1851	lamprey	P	P	P	P			P		P
Gobiomorphus gobioides (Valenciennes 1837)	giant bully	P	P		P					P
Retropinna retropinna (Richardson 1848)	common smelt	P	P	P	P			P		P
Stokellia anisodon (Stokell 1941)	Stokell’s smelt	P								
REGIONALLY INTRODUCED AND NATURALISED										
Carassius auratus (Linnaeus 1758)	goldfish		P			P	P		P	P
Oncorhynchus mykiss (Walbaum 1792)	rainbow trout		P	P		P	P	P	P	P
Oncorhynchus tshawytscha (Walbaum 1792)	Chinook salmon	P	P	P		P	P	P		P
Perca fluviatilis Linnaeus 1758	perch	P	P	P	P		P	P	P	P
Salmo trutta Linnaeus 1758	brown trout	P	P	P	P	P	P	P	P	P
Salvelinus fontinalis (Mitchill 1814)	brook char	P	P	P		P	P		P	P
Tinca tinca (Linnaeus 1758)	tench	P								
REGIONALLY INTRODUCED, NOT ESTABLISHED										
Ctenopharyngodon idella (Valenciennes 1844)	grass carp					P	P			

Discussion

This report is the first regional conservation status for freshwater fish in the Otago Region. A total of 43 freshwater fish taxa were identified in the Otago Region since human arrival in Aotearoa New Zealand (Figure 1). Of the 41 taxa assessed using the standardised methodology, 18 are Regionally Threatened, four are Regionally At Risk, four are Regionally Not Threatened, seven are Regionally Data Deficient, seven taxa were Regionally Introduced and Naturalised, and a single taxon was identified as Regionally Extirpated. In addition to these assessed taxa, two taxa were identified as Regionally Introduced, Not Established.

Regionally Extirpated freshwater fish

Prototroctes oxyrhynchus was last observed in the early 1930s and is now confirmed as globally extinct (West et al. 2014b). Formerly widespread in lowland rivers and streams throughout the North Island/Te Ika-a-Māui and South Island/Te Waipounamu and previously known from Otago rivers (Lee & Perry 2019). In Tūhura Otago Museum, a specimen is stored with the collection site noted as Molyneux (Clutha) River.

Regionally Data Deficient freshwater fish taxa

The Otago Region has seven Regionally Data Deficient freshwater fish species (Table 1.1), which were assigned to this category for three main reasons. First, for five species (*Forsterygion nigripenne*, *Geotria australis*, *Gobiomorphus gobioides*, *Retropinna retropinna*, and *Stokellia anisodon*), information is mostly available from incidental captures and a limited number of species-specific or habitat-specific targeted surveys or monitoring programmes, limiting data available to confidently assess population size or trend. Additionally, for *S. anisodon*, their range has a very narrow known overlap with the Otago Region at the Waitaki River mouth, an artifact of the mid-river border with the Canterbury Region. For *G. australis*, their habitats may overlap with sampling effort but the methods until recently have either not targeted *G. australis* or have been ineffective at detecting them (Baker & Bice 2022; Baker et al. 2024).

Second, predicted and ongoing population trends for three generations of *Anguilla australis*, and *A. dieffenbachii* were unable to be determined during this assessment. Generation times are 20 years for *A. australis* (Pike et al. 2019a) and 30 years for *A. dieffenbachii* (Pike et al. 2019b). Area of occupancy was ascertained for these taxa (Dunn 2025a), but population trends held such uncertainty across three generations.

Third, identification of some taxa in freshwater fish monitoring or surveying is unreliable, either because differentiation is not attempted or recorded (e.g., *A. dieffenbachii*, *A. australis*, *G. gobioides*, *S. anisodon*), or because differentiation is difficult (e.g., *G. gobioides*, *S. anisodon*).

Regionally Threatened freshwater fish taxa

In the Otago Region, there were 18 Regionally Threatened freshwater fish taxa (Table 1.1). These include two Regionally Critical, four Regionally Endangered, and 12 Regionally Vulnerable taxa. Both *Neochanna burrowsius* and *Galaxias* “Teviot” are Regionally Critical and Nationally Critical, sharing the most severe regional and national threat statuses, respectively (Table 1.1).

The four Regionally Endangered taxa were *G. cobitinis*, *Galaxias* “Nevis”, *Galaxias* “southern”, and *Galaxias* aff. *paucispondylus* “Manuherikia” (Table 1.1). Of the four Regionally Endangered freshwater fish taxa, three had the Nationally Endangered status and the other had the At Risk – Declining status; this latter taxon has a more elevated conservation status regionally than nationally, reflecting greater conservation concern within the Region. Specifically, *Galaxias* “southern” occupies less than 10 ha in Otago, although it is more widespread in the Southland Region. *Galaxias* “southern” are only known in the Otago Region from several tributary streams of the Von River South Branch, and detectability has declined over the last two decades (Jack 2015).

Of the 12 Regionally Vulnerable freshwater fish taxa, six taxa share an equivalent Nationally Vulnerable status, while six taxa were assessed nationally as At Risk (Table 1.1). The six Regionally Vulnerable taxa with equivalent national status were *G. anomalus*, *G. eldoni*, *G. maculatus*, *G. pullus*, *Galaxias* “Pomahaka”, and *Galaxias* “species D”. In contrast, the other six Regionally Vulnerable taxa – *Cheimarrichthys fosteri*, *G. argenteus*, *G. fasciatus*, *G. gollumoides*, *G. vulgaris*, and *Galaxias* aff. *paucispondylus* “Southland” – hold a more elevated conservation status regionally than nationally, reflecting their greater conservation concern within the Region.

Regionally At Risk freshwater fish taxa

In the Otago Region four freshwater fish species were assigned a Regionally At Risk category (Table 1.1). Two were Regionally Declining and two were Regionally Naturally Uncommon. The Regionally Declining taxa in Otago were *G. brevipinnis* and *G. depressiceps*. For *G. brevipinnis* in Otago, the potential for different population trends were noted for diadromous and potadromous (i.e., migratory freshwater-resident) populations. This taxon meets the Partial Decline Qualifier as it is considered to be declining over most of its range, including diadromous populations within the Otago Region and beyond, but different population trends are likely in Otago’s lakes and surrounding tributaries (e.g., Lake Mahinerangi, Whakatipu Waimāori/Lake Wakatipu, Lake Wānaka, Te Wairere/Lake Dunstan, Lake Roxburgh). Since 2017, the known area of occupancy for *G. depressiceps* increased from ≤ 100 ha to 100–1000ha (Dunn 2025a; Dunn 2025k; Dunn & O’Brien 2022). Additionally, restoration efforts for *G. depressiceps* in Akatore Creek (Jack et al. 2023), and tributaries of Waihemo / Shag River (Otago Regional Council 2025c) were being initiated or taking effect during this time.

The Regionally Naturally Uncommon taxa were *Gobiomorphus hubbsi* and *G. huttoni*. In Otago, these fishes had area of occupancy of $\leq 1,000$ ha and population trends that were Stable $\pm 10\%$.

Regionally Not Threatened freshwater fish taxa

Four freshwater fish taxa in Otago were Regionally Not Threatened: *G. breviceps*, *G. cotidianus*, *R. retiaria*, and *A. forsteri* (Table 1.1). Of the Regionally Not Threatened taxa only *G. breviceps* had a lower conservation status regionally than nationally, reflecting greater conservation concern elsewhere, i.e., Regionally Not Threatened cf. to Nationally Naturally Uncommon. In Otago, this taxon has a stable population and exceeds the regional scaling threshold for area of occupancy (i.e., > 1,000 ha, Dunn 2025a). There is no evidence for predicted or ongoing decline for the Otago population, and *G. breviceps* are well-distributed in suitable habitat types in the Region. All other Regionally Not Threatened taxa had the equivalent national status.

Regionally Introduced and Naturalised freshwater fish taxa

In Otago, seven freshwater fish species were identified as Regionally Introduced and Naturalised (Table 1.1). These are taxa that have become naturalised in the wild after being deliberately or accidentally introduced in Aotearoa New Zealand by human agency. Introductions of exotic fish have occurred in Otago since the late 1860s, including for sports fish. All seven Regionally Introduced and Naturalised taxa in Otago have secure populations overseas. While some of these taxa are recorded in discrete catchments or sub-catchments in the Otago Region (e.g., *Tinca tinca*), others are widespread in Otago's freshwater environment (e.g., *Salmo trutta*).

Regionally Introduced, Not Established freshwater fish taxa

This category includes freshwater fish taxa observed where: 1) a release is documented, but a self-sustaining population has not yet established in the wild; or 2) where a deliberate introduction is documented and published records indicate the species bred (or probably bred), but it is no longer extant. *Ctenopharyngodon idella* and *Salmo salar* were identified as Regionally Introduced, Not Established (Table 1.2).

Ctenopharyngodon idella have been documented as deliberately introduced into the wild in Otago for aquatic weed control, but there is no evidence of a self-sustaining population establishing. The Ministry for Primary Industries – Manatū Ahu Matua (MPI) and Department of Conservation – Te Papa Atawhai (DOC) both have statutory roles for approving the release of *C. idella*; DOC for releases to new locations and MPI for locations where *C. idella* already exist. *Ctenopharyngodon idella* release has been permitted in an artificial pond by DOC near Lake Hayes/Waiwhakaata although subsequent unauthorised releases in the Otago Region and more broadly across the country are being investigated (Phoenix Hale pers. comm. 2025, DOC). Although Otago is unlikely to currently have the environmental conditions necessary for *C. idella* to successfully breed in the wild, this likelihood is not impossible and ecological consequences are potentially dire (Hofstra et al. 2014).

Although *S. salar* are not recorded in the Otago Region in the New Zealand Freshwater Fish Database, deliberate introductions and established wild populations are documented in the Otago Region from 1868 onwards. Establishment was not successful, with the taxon now considered extirpated from the Otago Region and nationally either extinct or declining towards extinction while restricted to the Waiau catchment in the Southland Region (Jayde Couper, pers. comm. 2026, Fish and Game; Dunn et al. 2025; Stokell 1955).

Select Regional Qualifiers discussion

Qualifiers can provide additional information on a taxon's threat status. Below are explanations of why some regional qualifiers were used for freshwater fish taxa in Otago.

Regional Endemics and National Strongholds

The Otago Region has 11 species assigned the qualifier National Stronghold (Appendix 4), meaning they have > 20% of the national population in Otago. Nine of these taxa are regional endemics, i.e., known to be native and only breed in Otago. The regional endemics are *Galaxias* “Nevis”, *Galaxias* “species D”, *Galaxias* “Teviot”, *Galaxias* aff. *paucispondylus* “Manuherikia”, *G. anomalus*, *G. cobitinis*, *G. depressiceps*, *G. eldoni*, and *G. pullus*. Two taxa, *Galaxias* “Pomahaka” and *G. brevipinnis*, have Otago national strongholds and are also found elsewhere. *Galaxias* “Pomahaka” are almost exclusively recorded in the Otago Region but also found in the Southland Region near to the regional boundary shared with Otago. Although *G. brevipinnis* are widely distributed throughout Australia (Victoria, Tasmania, South Australia, New South Wales), and Aotearoa New Zealand (Te Waipounamu / South Island, Te Ika-a-Māui / North Island, Chatham Island / Rēkohu, and sub-Antarctic islands), the Otago Region is a stronghold for the national population. Of the taxa that have National Strongholds in Otago, nine were Regionally Threatened (Regionally Critical = 1; Regionally Endangered = 3; Regionally Vulnerable = 5), and two were Regionally At Risk (Regionally Declining).

Type Locality

The type locality of a nominal taxon refers to the geographical place of capture, collection, or observation on the name-bearing type or specimen. The five taxa with Otago type localities are *G. anomalus*, *G. cobitinis*, *G. depressiceps*, *G. eldoni*, and *G. pullus* (Appendix 5).

Conservation Dependent

Conservation Dependent taxa are those likely to move to a worse conservation status if current management ceases. The term ‘management’ can include indirect actions that benefit taxa,

such as protection and restoration of spawning habitats, or legislation that controls harvest, or elimination of invasive predator species from targeted river reaches. Of the 17 freshwater fish taxa identified with the Conservation Dependent qualifier in Otago, two were Regionally Data Deficient, 14 were Regionally Threatened, and one was Regionally At Risk. Of the 12 taxa in the Regionally Threatened category with the Conservation Dependent qualifier, two had the Regionally Critical status, three had the Regionally Endangered status, and nine had the Regionally Vulnerable status. For diadromous galaxias fishes (*G. maculatus*, *G. fasciatus*, and *G. argenteus*), the Conservation Dependent qualifier generally related to the protection of their freshwater spawning habitats and regulation of the whitebait fishery (Department of Conservation 2005). For *A. dieffenbachii* and *A. australis*, the Conservation Dependent qualifier related to the management of eel fisheries, including through commercial and amateur fishing regulations. The Conservation Dependent Qualifier was also identified for *G. australis* and eleven freshwater-resident galaxiid species which are benefitting from habitat protection and restoration, and, for some, the removal of invasive predatory fish (Department of Conservation 2003, 2004; Jack 2023; Jack et al. 2023; Otago Regional Council 2025c).

One Location

Six taxa were assigned the qualifier One Location for Otago: *Galaxias* aff. *paucispondylus* “Manuherikia”, *Galaxias* “Teviot”, *G. cobitinis*, *Galaxias* “Nevis”, *N. burrowsius*, and *S. anisodon*. Four of these are endemic to Otago and the One Location qualifier refers to their entire global population existing in one place. *Galaxias* aff. *paucispondylus* “Manuherikia” is recorded only in the Manuherikia / Manuherikia River catchment, upstream from Falls Dam. *Galaxias* “Teviot” is in tributaries of Lake Onslow, tributaries of the Teviot River catchment, and nearby in the very headwaters of the Taiari / Taieri River catchment. *Galaxias* “Nevis” is recorded only in the Nevis River/ Te Papapuni catchment, and *G. cobitinis* is only present in the Kauru River and Kākaunui / Kakanui River catchment. *N. burrowsius* and *S. anisodon* have been assigned the One Location qualifier as in Otago they are only found near the Waitaki River mouth, although their range is mostly in the Canterbury Region.

Summary

This report identifies the freshwater fish species recorded in the Otago Region since human arrival. An expert panel then applied a consistent framework to assign the conservation status, trends, and qualifiers to these taxa at the regional scale.

Information on regional freshwater fish populations is crucial for management. It allows regional councils and others to implement national legislation and direction, identify important habitats, inform consenting processes, prioritise targeted restoration efforts, and monitor the long-term effectiveness of conservation interventions. Benefits gained by assessing risk of extinction at the regional scale, complementary to national assessments, include:

- improved knowledge of the status of taxa across the region;
- direction for local government and community groups to prioritise conservation actions that can work in synergy with or provide additionality to the work of DOC;
- an improved ability to protect taxa through regulatory processes; and
- improved national conservation assessments of species through greater local input.

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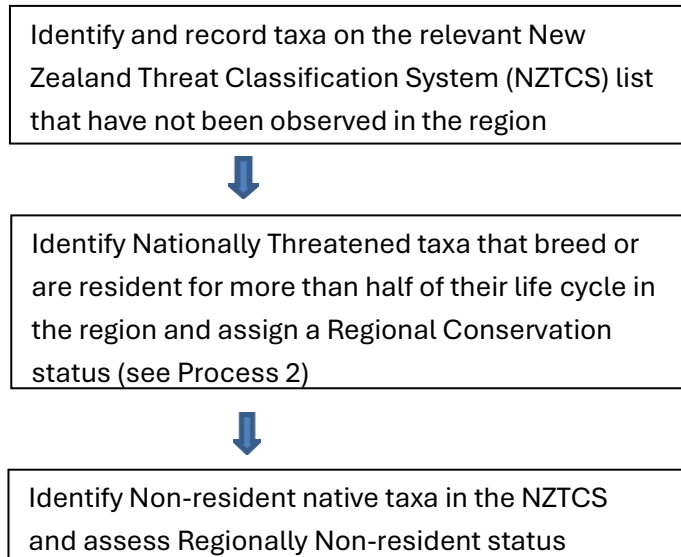
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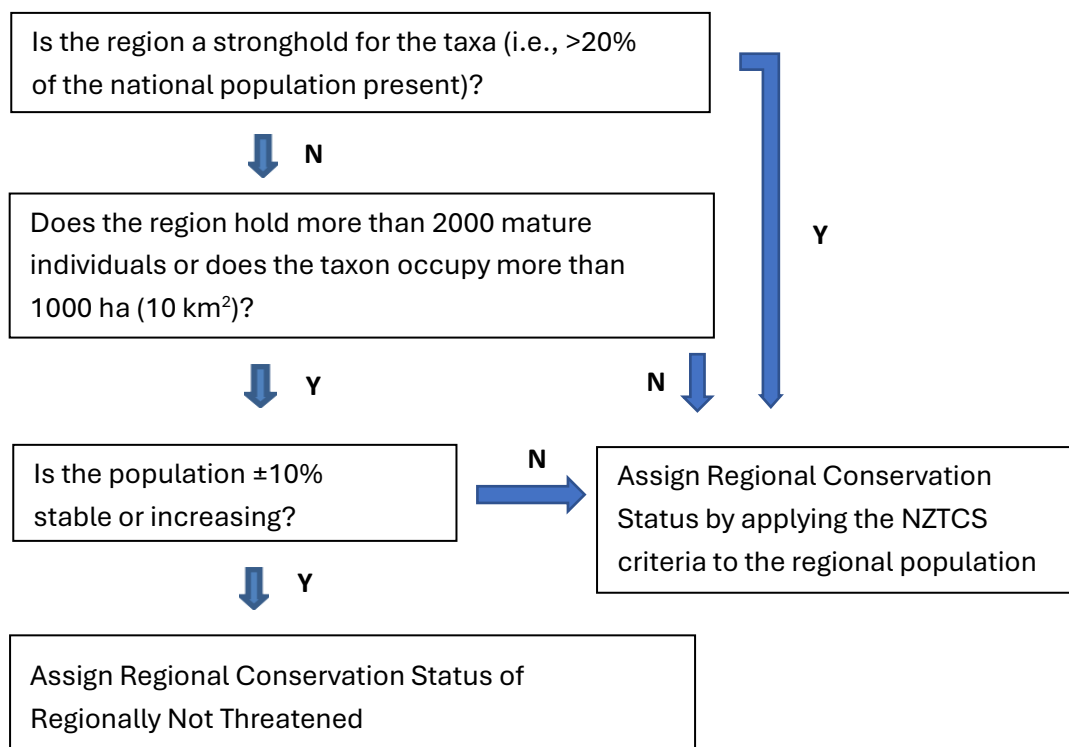
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Appendix 1: Process for determining the regional threat status of taxa

Process 1: Determination of regional threat status



Process 2: Determination of strongholds and Regionally Not Threatened species



Appendix 2: List of Regional Qualifiers for Regional Conservation Threat Assessments

Qualifiers from Crisp et al. (2026) provide context to the threat category and status of taxa.

Code	Qualifier	Description
BNS	Benchmarked Against National Status	The regional data for population size / area of occupancy and trend indicate that the taxon has a less threatened conservation status than its national status.
Clnt	Conservation Introduction	Establishment of a taxon for the purposes of conservation outside its recorded distribution but within an appropriate habitat and ecogeographical area. Two types of Conservation Introductions are recognised: a) Assisted migration is the intentional movement and release of an organism outside its indigenous range to avoid extinction of populations of the focal species, and b) Ecological replacement is the intentional movement and release of organism outside its indigenous range to perform a specific ecological function.
FR	Former Resident	Breeding population (existed for more than 50 years) extirpated from the region but continues to arrive as a regional vagrant or migrant.
IN	Introduced Native	The taxon was introduced to the region, though is not known to have previously occurred in it.
IR	Indigenous Range Limit	The inferred range (extending in any direction) of the taxon in pre-human times meets its natural limit in the region. The range limit can be north/south and/or east/west, depending on the regional council boundaries.
NR	Natural Range	The known range (extending in any direction) of the taxon meets its natural limit in the region. The range limit can be north/south and/or east/west, depending on the regional council boundaries.
NStr	National Stronghold	More than 20% of the national population breeds or is resident for more than half the taxon's life cycle in the region.
PR	Population Reinforcement	Translocations from other regions have been carried out to boost the population numbers of the taxon.
RC	Regional Coloniser	Taxa that have arrived in the region without human assistance and have been successfully breeding in the wild since 1950.
RE	Regional Endemic	Taxa known to breed only in the region.
RM	Regional Migrant	A minimum of 15 individuals of a New Zealand native taxon are known to visit the region as part of their normal life cycle, but do not breed in the region.
RN	Reintroduction	Taxa that have been reintroduced to the region after having previously gone extinct there.
RR	Range Restricted	To be Range Restricted, a taxon must be naturally confined to a specific substrate, habitat, or geographical area less than the regional threshold areas (e.g., 1000 ha for the Otago Region), see Table 2.1 Crisp et al. (2022).
RV	Regional Vagrant	Aotearoa New Zealand native taxa that have sporadic or transitory occurrences in the region with fewer than 15 individuals visiting per annum.
TL	Type Localities	The type locality of the taxon is within the region (ignore if the taxon is or has ever been regionally extinct).

Continued next page

Regional qualifiers continued

Code	Qualifier	Description
TLH	Holotype	A holotype is the one specimen on which a species name is based.
TLI	Isotype	An isotype is a duplicate specimen of the holotype.
TLL	Lectotype	A lectotype is a specimen later selected to serve as the single type specimen for species originally described from a set of syntypes. In zoology, a lectotype is a kind of name-bearing type.
TLN	Neotype	A neotype is a specimen later selected to serve as the single type specimen when an original holotype has been lost or destroyed or where the original author never cited a specimen.
TLS	Syntype	A syntype is any one of two or more specimens that is listed in a species description where no holotype was designated.

Appendix 3: List of National Qualifiers from the New Zealand Threat Classification System

National qualifiers from Rolfe et al. (2022) provide context to the threat category and status of taxa.

Code	Qualifier	Description
<i>Assessment Process Qualifier</i>		
DPR	Data Poor: Recognition	A taxon is given the Data Poor: Recognition qualifier when confidence in the assessment is low because of difficulties in determining the identity of the taxon in the field and/or laboratory. Taxa with this qualifier will also often be given the qualifiers Data Poor: Size and Data Poor: Trend, in which case they are most likely to be Data Deficient.
DPS	Data Poor: Size	The Data Poor: Size qualifier indicates that confidence in the assessment is low because of a lack of data on population size.
DPT	Data Poor: Trend	The Data Poor: Trend qualifier indicates that confidence in the assessment is low because of a lack of data on population trend.
DE	Designated	A taxon is given the Designated qualifier when the expert panel has assigned it to what they consider to be the most appropriate status without full application of the criteria. For example, a commercial fish stock that is being fished down to the biomass maximum sustainable yield (BMSY) may meet the criteria for Declining but could be designated as Not Threatened if the expert panel believes that this better describes its risk of extinction.
<i>Biological Attribute Qualifier</i>		
IE	Island Endemic	The Island Endemic qualifier is given to a taxon whose natural distribution is restricted to one island archipelago (e.g., the Auckland Islands) and is not found on the North or South Islands of New Zealand or Stewart Island/Rakiura. A taxon cannot be given this qualifier if it is Secure Overseas (SO, SO? or S?O) or Threatened Overseas (TO, TO? or T?O).
NS	Natural State	A taxon is given the Natural State qualifier if it has a stable or increasing population that is presumed to be in a natural condition (i.e., it has not experienced a historical human-induced decline). This qualifier is equivalent to the 'natural' population state value in the NZTCS database.
RR	Range Restricted	A taxon that is naturally confined to a specific substrate or habitat or a geographic area of less than 100,000 ha (1000 km ²) is given the Range Restricted qualifier. This is assessed by taking into account the area of habitat that is occupied by each sub-population and summing these areas where there is more than one sub-population. Examples of such taxa include Chatham Island forget-me-not (<i>Myosotidium hortensia</i>) and Auckland Island snipe (<i>Coenocorypha aucklandica aucklandica</i>). This qualifier can apply to any Threatened or At Risk taxon. However, it is redundant if a taxon is confined to one location.
Sp	Biologically Sparse	The Biologically Sparse qualifier is used when a taxon naturally consists of small and widely scattered sub-populations. It can apply to any Threatened or At Risk taxon.

Continued next page

National qualifiers continued

Code	Qualifier	Description
<i>Pressure Management Qualifier</i>		
CD	Conservation Dependent	A taxon that is likely to move to a worse conservation status over the longer of the next 10 years or three generations (maximum 100 years) if current management ceases is given the Conservation Dependent qualifier. The term 'management' can include indirect actions that benefit taxa, such as island biosecurity. A taxon is only considered conservation dependent if cessation of the management would result in a worse conservation status, and the influence of the benefits of management on the total population must be considered before using this qualifier. The benefit of managing a single sub-population may not be adequate to trigger this qualifier but may trigger Partial Decline. Furthermore, taxa that are qualified as Conservation Dependent may also be given the Partial Decline qualifier if only one or a few sub-populations have benefitted from management.
CI	Climate Impact	<p>The taxon is adversely affected by long-term climate trends and/or extreme climatic events.</p> <p>The following questions provide a guide to using the CI Qualifier:</p> <p>Is the taxon adversely affected by long-term changes in the climate, such as an increase in average temperature or sea-level rise?</p> <p>If NO = no Qualifier but needs monitoring and periodic re-evaluation because projected changes to the average climate and sea-level rise may adversely impact the taxon (including via changes to the distribution and prevalence of pests, weeds, and predators) in the future.</p> <p>If YES = CI Qualifier</p> <p>Is the taxon adversely affected by extreme climate events, such as a drought, storm, or heatwave?</p> <p>If No = no Qualifier but needs monitoring and periodic re-evaluation because projected changes to the climate are likely to increase the frequency and/or severity of these events in the future.</p> <p>If YES = CI Qualifier</p> <p>Use of the Climate Impact Qualifier would indicate the need for more in-depth research, ongoing monitoring of climate impacts, and potentially a climate change adaptation plan for the taxon.</p> <p>See NZTCS manual 2022 Appendix 2 for additional questions that can be used to analyse climate impacts (Rolfe et al. 2022)</p>
CR	Conservation Research Needed	A taxon is given the Conservation Research Needed qualifier if the causes of its decline and/or solutions for its recovery are poorly understood and research is required

Continued next page

National qualifiers continued

Code	Qualifier	Description
PF	Population Fragmentation	The Population Fragmentation qualifier is used where gene flow between sub-populations is hampered as a direct or indirect result of human activity. It should be noted that naturally disjunct populations are not considered to be fragmented
RF	Recruitment Failure	The Recruitment Failure qualifier is used where the age structure of the current population of a taxon is such that a catastrophic decline is likely in the future. It should be noted that a failure to produce new progeny or the failure of progeny to reach maturity can be masked by apparently healthy populations of mature specimens.
<i>Population Trend Qualifier</i>		
EF	Extreme Fluctuations	A taxon that has an increased threat of extinction due to extreme unnatural population fluctuations or natural fluctuations overlaying human-induced declines is given the Extreme Fluctuations qualifier. When ranking taxa with extreme fluctuations, the lowest estimated number of mature individuals should be used for determining population size, as a precautionary measure. However, annual population fluctuations that are a natural function of a taxon's life cycle should not be considered.
EW	Extinct in the Wild	A taxon that is known only in captivity or cultivation or has been reintroduced to the wild but is not self-sustaining is given the Extinct in the Wild qualifier. Assessment of a reintroduced population should be considered only when it is self-sustaining, which requires both of the following criteria to have been fulfilled: It is expanding or has reached a stable state through natural replenishment and at least half the breeding adults are products of the natural replenishment; and it has been at least 10 years since reintroduction.
Inc	Increasing	The Increasing qualifier is used when a taxon has an ongoing or forecast increase of > 10% in the total population, taken over the longer of the next 10 years or three generations (maximum 100 years). Note that this qualifier is redundant for taxa ranked as Recovering
PD	Partial Decline	A taxon that is declining over most of its range but has one or more secure populations (such as on offshore islands) is given the Partial Decline qualifier. An example of a Partial Decline taxon is North Island kākā (<i>Nestor meridionalis septentrionalis</i>), which is declining towards a small, stable population. The Relict qualifier may be appropriate when the population has stabilised.
PE	Possibly Extinct	A taxon that has not been observed for more than 50 years but for which there is insufficient evidence to support declaring it extinct is given the Possibly Extinct qualifier. This qualifier may apply to several Data Deficient and Nationally Critical taxa.

Continued next page

National qualifiers continued

Code	Qualifier	Description
<i>Population State Qualifier</i>		
NO	Naturalised Overseas	A taxon that is endemic to New Zealand but has been introduced (deliberately or accidentally) by human agency to another country and has naturalised there is given the Naturalised Overseas qualifier. An example of such a taxon is <i>Olearia traversiorum</i> in the Republic of Ireland.
OL	One Location	The One Location qualifier is used where a taxon is found at one location (geographically or ecologically distinct area) in New Zealand that is less than 100 000 ha (1000 km ²), so a single event (e.g., a predator irruption or fire) could easily affect all individuals of the taxon. Examples of such taxa include L'Esperance Rock groundsel (<i>Senecio esperensis</i>) and Open Bay Island leech (<i>Hirudobdella antipodum</i>). This qualifier can apply to all Threatened, At Risk, Non-resident Native – Coloniser and Non-resident Native – Migrant taxa, regardless of whether their restricted distributions in New Zealand are natural or human induced. Resident native taxa that have restricted distributions but for which it is unlikely that all sub-populations would be threatened by a single event (e.g., because water channels within an archipelago are larger than known terrestrial predator swimming distances) should be qualified as Range Restricted.
Rel	Relict	The Relict qualifier is given to a taxon whose population has declined since human arrival to less than 10% of its former range but has stabilised. The range of a relictual taxon takes into account the area currently occupied as a ratio of the taxon's former extent. Reintroduced and self-sustaining populations within or outside the former known range of a taxon should be considered when determining whether a taxon is relictual. This definition is modified from the definition of the At Risk – Relict category provided in Townsend et al. (2008). The main difference is that trend is no longer included in the qualifier definition, allowing the qualifier to be applied to any taxon that has experienced severe range contraction, regardless of whether that contraction continues or has been arrested. This qualifier may replace the Partial Decline qualifier once a taxon's population has stabilised within a reduced area.
SO	Secure Overseas	The Secure Overseas qualifier is used when a taxon is secure in the parts of its natural range outside New Zealand.
SO?	Secure Overseas?	Use of the Secure Overseas? qualifier indicates that it is uncertain whether a taxon of the same name that is secure in the parts of its natural range outside New Zealand is conspecific with the New Zealand taxon. An example of such a taxon is the bidibidi <i>Acaena minor</i> var. <i>antarctica</i>
S?O	Secure? Overseas	Use of the Secure? Overseas qualifier indicates that it is uncertain whether the taxon is secure in the parts of its natural range outside New Zealand. An example of such a taxon is the New Zealand bull kelp <i>Durvillaea antarctica</i> .
TO	Threatened Overseas	The Threatened Overseas qualifier is used when the taxon is threatened in the parts of its natural range outside New Zealand.
TO?	Threatened Overseas?	Use of the Threatened Overseas? qualifier indicates that it is uncertain whether a taxon of the same name that is threatened in the parts of its natural range outside New Zealand is conspecific with the New Zealand taxon.

Continued next page

National qualifiers continued

Code	Qualifier	Description
T?O	Threatened? Overseas	Use of the Threatened? Overseas qualifier indicates that it is uncertain whether the taxon is threatened in the parts of its natural range outside New Zealand. An example of such a taxon is the aquatic beetle <i>Gyrinus convexusculus</i> .

Appendix 4: Freshwater fishes that are Regional Endemics or have National Strongholds in the Otago Region

Name and Authority	Common Name	Regional Endemic	National Stronghold
<i>Galaxias</i> "Nevis"	Nevis galaxias (Nevis River)	Regional Endemic	National Stronghold
<i>Galaxias</i> "Pomahaka"	Pomahaka galaxias (Pomahaka River)		National Stronghold
<i>Galaxias</i> "species D"	Clutha flathead galaxias (Clutha River)	Regional Endemic	National Stronghold
<i>Galaxias</i> "Teviot"	Teviot flathead galaxias (Teviot River)	Regional Endemic	National Stronghold
<i>Galaxias</i> aff. <i>paucispondylus</i> "Manuherikia"	alpine galaxias (Manuherikia River)	Regional Endemic	National Stronghold
<i>Galaxias anomalus</i> Stokell, 1959	central Otago roundhead galaxias	Regional Endemic	National Stronghold
<i>Galaxias brevipinnis</i> Günther, 1866	koaro		National Stronghold
<i>Galaxias cobitinis</i> McDowall & Waters, 2002	lowland longjaw galaxias (Kakanui River)	Regional Endemic	National Stronghold
<i>Galaxias depressiceps</i> McDowall & Wallis, 1996	Taieri flathead galaxias	Regional Endemic	National Stronghold
<i>Galaxias eldoni</i> McDowall, 1997	Eldon's galaxias	Regional Endemic	National Stronghold
<i>Galaxias pullus</i> McDowall, 1997	dusky galaxias	Regional Endemic	National Stronghold

Appendix 5: Freshwater fish species with type localities in the Otago Region

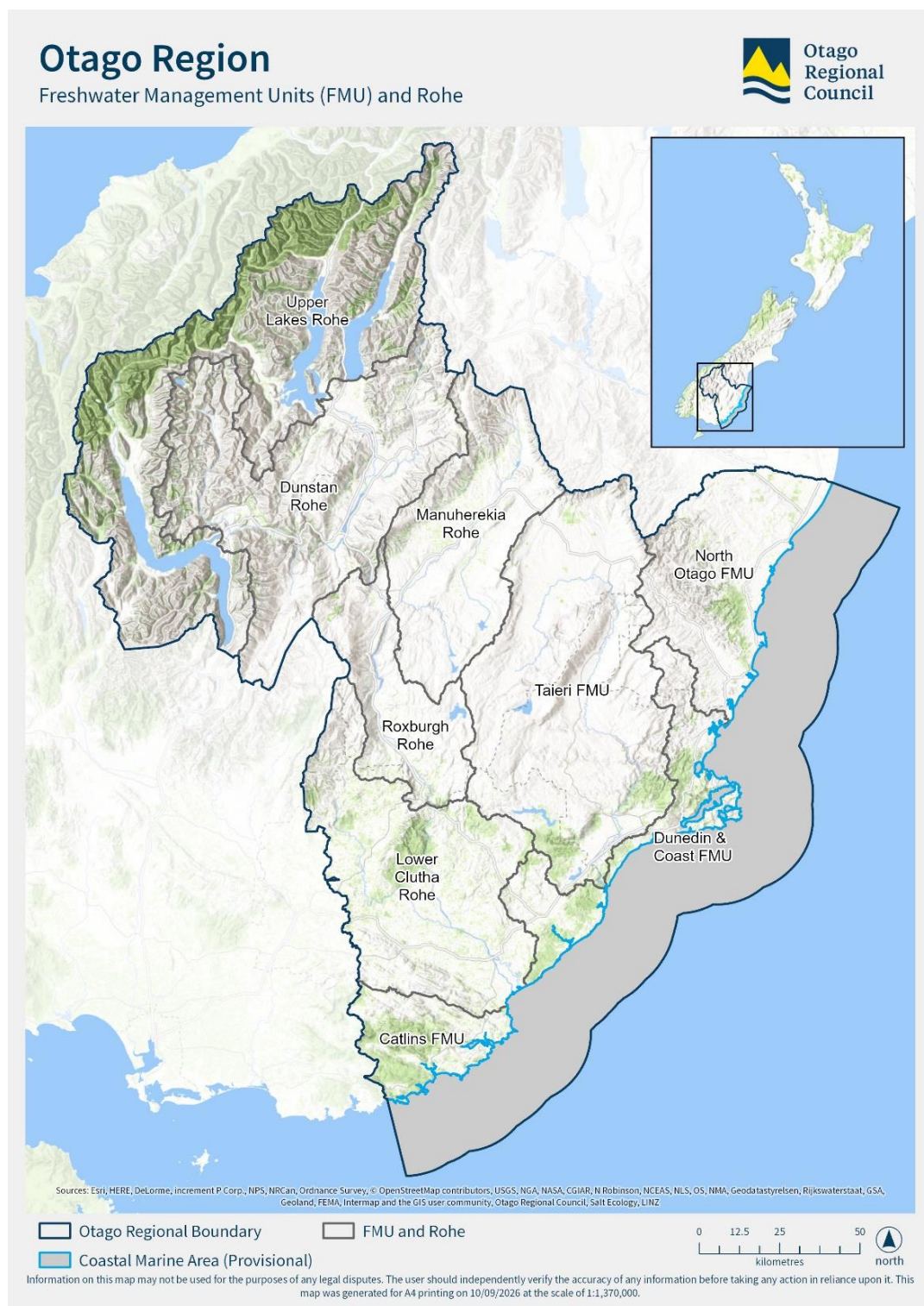
Type localities as described by Roberts et al. 2015.

Name and Authority	Common Name	Locations
<i>Galaxias anomalus</i> Stokell, 1959	central Otago roundhead galaxias	Holotype: NMNZ P.002776. The outlet of a spring which is drained by a ditch crossing the Ophir-Omakau Road a few chains northwest of the Ophir Hotel, central Otago, New Zealand (45°06.13' S, 169°36.30' E). Type locality redefined by McDowall & Wallis (1996).
<i>Galaxias cobitinis</i> McDowall & Waters, 2002	lowland longjaw galaxias (Kakanui River)	Holotype: NMNZ P.037567. Kauru River, tributary of the Kakanui River at road bridge, North Otago, New Zealand [45°04.80' S, 170°47.68' E].
<i>Galaxias depressiceps</i> McDowall & Wallis, 1996	Taieri flathead galaxias	Holotype: NMNZ P.031802. Healy Creek, where it crosses Danseys Pass Road, tributary of Kye Burn, Taieri River system, Otago, New Zealand (44°58.12' S, 170°19.60' E).
<i>Galaxias eldoni</i> McDowall, 1997	Eldon's galaxias	Holotype: NMNZ P.033177. Smugglers Creek, tributary of Traquair Burn, Taieri River system, South Island, New Zealand (45°49.62' S, 170°12.917' E).
<i>Galaxias pullus</i> McDowall, 1997	dusky galaxias	Holotype: NMNZ P.033175. Stream draining Munro Dam, tributary of Waipori River, Taieri River system, South Island, New Zealand (45°53.7' S, 170°00.47' E).



Appendix 6: Map of Territorial Authorities and Coastal Marine Area in the Otago Region.

Otago has five Territorial Authorities: Central Otago District, Clutha District, Dunedin City, Queenstown Lakes District and Waitaki District (Otago part only). A provisional Coastal Marine Area is also shown. See Appendix 7 for map of Freshwater Management Units in Otago.



Appendix 7: Map of Freshwater Management Units in the Otago Region.

The inland area of the Otago Region has been divided into five Freshwater Management Units (FMUs): Clutha Mata-au, Catlins, Dunedin & Coast, North Otago, and Taieri. The Clutha Mata-au FMU has been further subdivided into five rohe (areas): Upper Lakes, Dunstan, Manuherekia, Roxburgh and Lower Clutha. A provisional Coastal Marine Area is also shown. See Appendix 6 for map of Territorial Authorities and Coastal Marine Area in Otago.



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