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for Bay of Plenty Regional Council

Mapping threatened and rare freshwater-dependent flora and fauna within the Bay of Plenty Region

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2 Executive summary

The National Policy Statement for Freshwater Management 2020 (NPSFM) and National Environment Standards for Freshwater 2020 (NESF) have been formulated by the New Zealand Government to assist regulatory authorities in managing the freshwater resource. The NPSFM sets out a National Objectives Framework (NOF) to support a nationally consistent approach to setting freshwater objectives. It is an obligation of regional councils under the NOF to identify the location of freshwater habitats relied on by threatened species in each Freshwater Management Unit (FMU) and to describe the extent to which each FMU has the critical habitats and conditions necessary to support the presence, abundance, survival, and recovery of the threatened species.

An exercise was conducted to extract the records of threatened species and species of other conservation interest that occur in the Bay of Plenty Region from a metadatset compiled from electronic biodiversity databases of locations of species of conservation interest nationally, and to assess whether these species are likely dependent on freshwater habitats, and to map the occurrences of these species. As part of this project, it is also considered prudent to identify localities and habitats occupied by species of other conservation interest. This information can be considered a 'watch list' as continued declines in populations of species of other conservation interest will, if unchecked, lead to their being listed as a Threatened species.

28,830 records of 842 species in the metadataset are mapped as occurring the in the Bay of Plenty Region, and 21,680 of these records are of 300 species assessed as likely dependent on freshwater habitat. This includes 6,079 records of 55 threatened species are that are likely to rely on freshwater habitats. These species are primarily reliant on water quality, water quantity (flow) and are mostly threatened by weed invasion of their habitat and by terrestrial pest animals.

Further work is required to critically examine the detail in the records of threatened species and investigation of species presence and habitat quality to determine which habitats qualify as critical habitats.

3 Introduction

New Zealand's freshwater is a scarce resource that is increasingly under pressure from surrounding land use, pests, waterway alteration, wetland drainage, water extraction, and climate change and as a result water quality and ecosystem health is declining in many places[1,2,3]. The loss of freshwater ecosystems and the species that inhabit them can lead to increased risk of flooding, reduced carbon sequestration, less māhinga kai, reduced ecosystem services, loss of social and cultural connection, and loss of water quality and quantity[1,3]. Another consequence of declining ecosystem health is that the species that rely on an ecosystem are also put under pressure, resulting in reduced fitness of individuals and declining populations and increased demand on conservation resources. Over 1,000 native species are known to occupy freshwater habitats[3] and many of the species occupying freshwater ecosystems are now categorised in the New Zealand Threat Classification System (NZTCS)[4] as Threatened; the highest level of conservation concern[1,3,5].

The National Policy Statement for Freshwater Management 2020[6] (NPSFM) and National Environment Standards for Freshwater 2020[7] (NESF) have been formulated by the New Zealand Government to assist regulatory authorities in managing the freshwater resource.

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1 Environment Aotearoa 2019. New Zealand's Environmental Reporting Series. Ministry for the Environment and Stats NZ.

2 Interim Regulatory Impact Analysis for Consultation: Essential Freshwater. Part 1: Summary and Overview.

3 Our fresh water 2017. New Zealand's Environmental Reporting Series. Ministry for the Environment and Stats NZ.

4 Townsend, A.J.; de Lange, P.J.; Duffy, C.A.J.; Miskelly, C.M.; Molloy, J.; Norton, D.A. 2007: New Zealand Threat Classification System manual. Department of Conservation, Wellington. 35p. and including the October 2019 Supplement.

5 Gerbeaux, P; Champion, P; Dunn, N. 2016. Conservation of freshwaters. Pp. 573-594 in Jellyman, P.G; Davie, T.J.A; Pearson, C.P; Harding, J.S. Advance in New Zealand Freshwater Science. NZ Freshwater Sciences Society and NZ Hydrological Society.

6 https://environment.govt.nz/assets/Publications/Files/national-policy-statement-for-freshwater-management-2020.pdf

7 https://www.legislation.govt.nz/regulation/public/2020/0174/latest/LMS364099.html

The fundamental concept of the NPSFM is Te Mana o Te Wai, which encompasses 6 principles relating to the roles of Tangata Whenua and other New Zealanders in the management of freshwater. The objective of the NPSFM is to ensure that natural and physical resources are managed in a way that prioritises:

(a) first, the health and well-being of water bodies and freshwater ecosystems

(b) second, the health needs of people (such as drinking water)

(c) third, the ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future.

The NPSFM sets out fifteen policies to support this objective. While all of the policies are relevant, those with direct and specific relevance to freshwater ecosystems and species, and this project, are:

Policy 6: There is no further loss of extent of natural inland wetlands, their values are protected, and their restoration is promoted.

Policy 7: The loss of river extent and values is avoided to the extent practicable.

Policy 8: The significant values of outstanding water bodies are protected.

Policy 9: The habitats of indigenous freshwater species are protected.

Policy 13: The condition of water bodies and freshwater ecosystems is systematically monitored over time, and action is taken where freshwater is degraded, and to reverse deteriorating trends.

Policy 14: Information (including monitoring data) about the state of water bodies and freshwater ecosystems, and the challenges to their health and well-being, is regularly reported on and published.

The NPSFM sets out a National Objectives Framework (NOF) to support a nationally consistent approach to setting freshwater objectives, with flexibility for recognising regional circumstances. It is an obligation of regional councils under the NOF to identify the location of freshwater habitats relied on by threatened species in each Freshwater Management Unit

(FMU) and to describe the extent to which each FMU (or part of an FMU) supporting a population of threatened species has the critical habitats and conditions necessary to support the presence, abundance, survival, and recovery of the threatened species. In practice this requires the identification of the presence of threatened species, as well as the location and condition of their habitats. As part of this project it is also considered prudent to identify localities and habitats occupied by species of other conservation interest (species that are assessed as At Risk, Data Deficient or Non-resident Native in the NZTCS or species that are considered of conservation interest for other reasons such as rarity within a region. This information can be considered a 'watch list' as continued declines in populations of species of other conservation interest will, if unchecked, lead to their being listed as a Threatened species.

The NPSFM also requires every regional council to map every natural inland wetland in its region that are known to contain threatened species[8].

This project works to identify the species of conservation interest inhabiting or using freshwater ecosystems and the locations at which they have been recorded within the Bay of Plenty Region. Species of conservation interest are those listed within the NZTCS as Threatened, At Risk or Data Deficient and species considered rare within the Bay of Plenty area for all taxonomic groups (birds, invertebrates, fish, bryophytes, plants, etc) that have both distribution data and that have had their conservation status assessed.

4 Methodological approach

In summary, this document outlines the process undertaken in identifying species of conservation interest that have been recorded from within the Bay of Plenty Region and summarises the results obtained. This information was sourced from a metadataset of 602,471 records of species of conservation interest (Threatened, At Risk, Data Deficient , or

[8] See Section 3.23(1)(b) of the NPSFM.

regionally important species) compiled from 36 electronic NZ biodiversity databases containing point location information. The locations where species have been recorded in freshwater areas are used to produce initial lists of both potentially freshwater-dependent threatened species and species of other conservation interest. Further investigation of the sites can then be carried out to assess if these habitats qualify as 'critical habitats and conditions that are necessary to support' threatened species as under the NPSFM compulsory value "threatened species".

To produce the initial list of indigenous species a map of the freshwater extent within the Bay of Plenty was developed (Section 6.7) and any species in the metadataset recorded as occurring within this area was added to the list of candidate species. These species were then assessed to see whether they qualified as freshwater-dependent species against the selection criteria in Section 6.2. Those species that qualified were then assigned to the most recent conservation status within the NZTCS[9], characterised (in Section 6.4) on their lifeform, hydrosystem (palustrine, lacustrine, riverine, geothermal or estuarine), nature of reliance on freshwater (dependence on water quantity, quality or passage), and the known threats (weed invasion, terrestrial pests, aquatic pests), based on ecological information in available data sources[10], discussions with experts, or species-specific web searches. Records of freshwater-dependent species were electronically tagged to a catchment unit (Section 6.6) and mapped using QGIS 3.16.5 GIS software.

Further work will be required (Section 9) to assess if the locations of these species are habitats qualify as 'critical habitats and conditions' as required under the NPSFM.

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[9] NZ Threat Classification System web database https://nztcs.org.nz/.

[10] For flora this includes the NZ Flora series and the NZ Plant Conservation Network website www.nzpcn.org.nz. For birds this includes NZ Birds Online website www.birdsonline.org.nz.

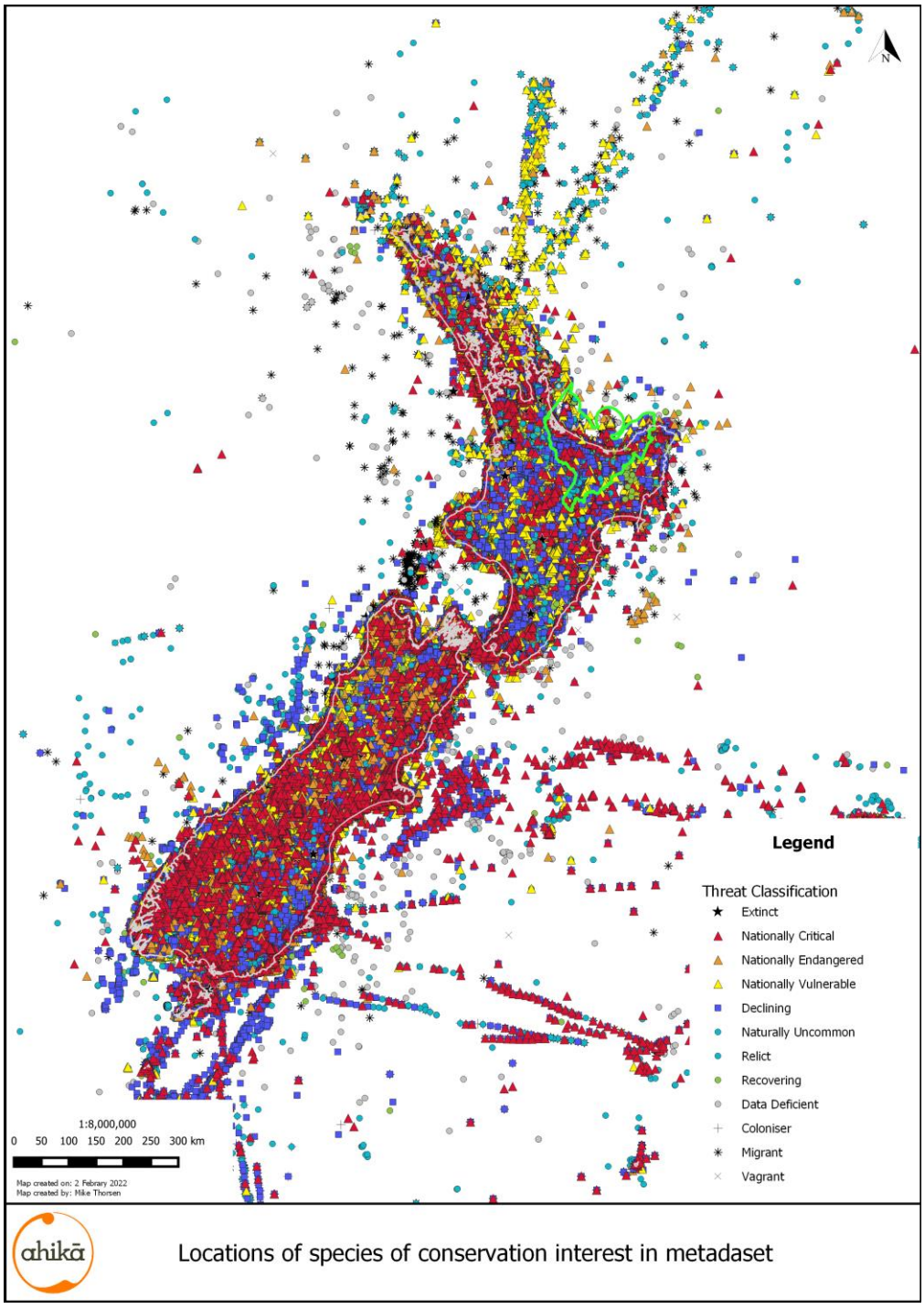

Figure 1. Locations of species of conservation interest within a metadataset compiled from electronic biodiversity databases. New Zealand coast outlined in grey and Bay of Plenty Region outlined in green. Note localities of Threatened species are mapped to show above records of At Risk and Data Deficient species which as a result are largely obscured in this map.

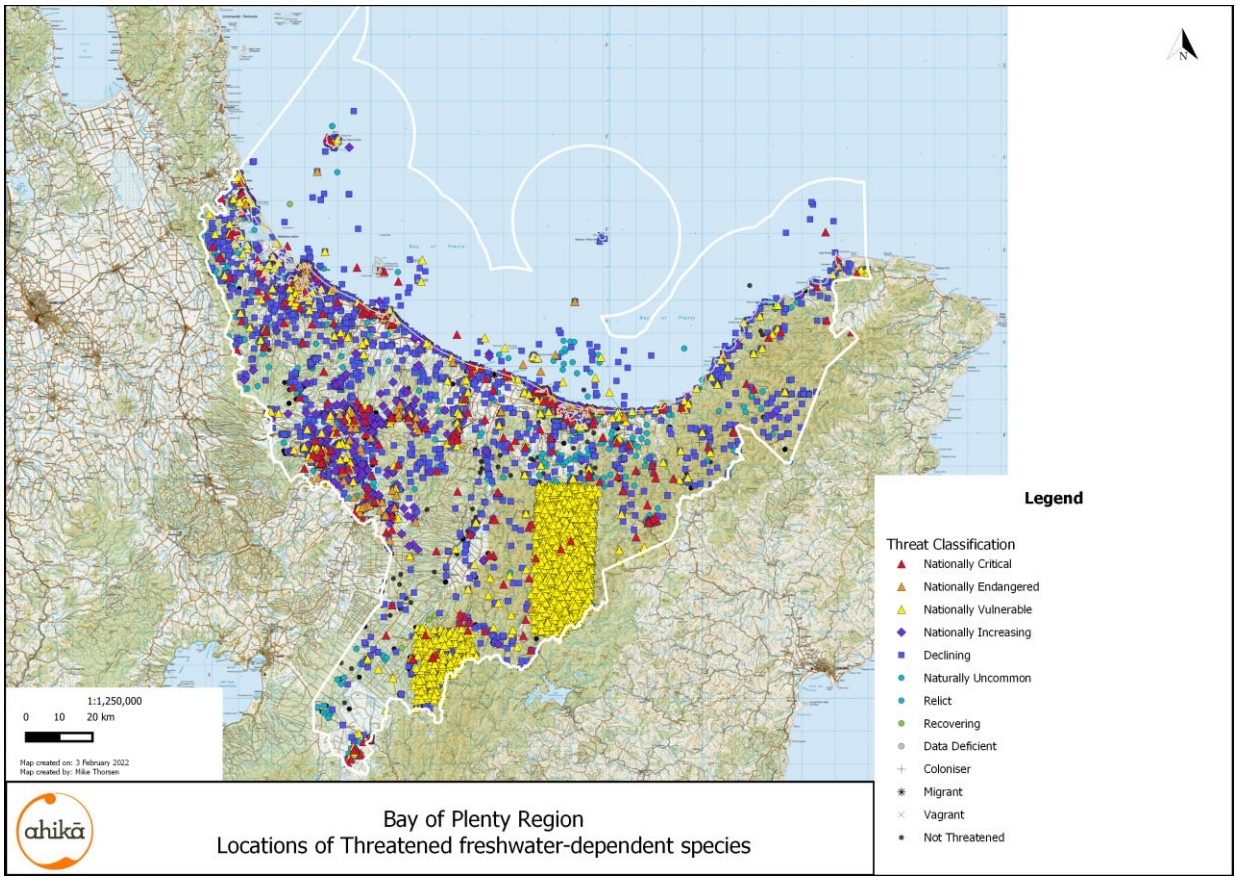

Figure 2. Locations within the Bay of Plenty Region (white line) of species of conservation interest held within a metadataset compiled from electronic biodiversity databases. Not Threatened species are those of local conservation interest.

5 The datasets

Within the metadataset there are 602,471 records of species of conservation interest nationally (Figure 1). Of these, 28,830 records of 842 species from 24 data sources are mapped as occurring within the Bay of Plenty Region (Table 1) observed between 1901 and year 2021. Taxonomic representation and temporal distribution of observations within the metadataset is not even, with observations of some taxonomic groups, such as birds, being over-represented, and other taxonomic groups, such as lichens, being under-represented. The majority of the records are from observations post 2010, which reflects the rise of the use of electronic data capture, hand-held GPS use and the popularity of citizen science

biodiversity recording websites such as iNaturalist and eBird. The likely extent of this uneveness and its consequences are discussed in Section 8.

Note some of these databases are constantly updated and that mātauranga-a-iwi and mātauranga-a-hapu are not yet included in this report and that Mātauranga Māori is an important part of understanding historical and current distributions of indigenous species, their habitats and the special connections to Tangata Whenua and the wider environment in the Bay of Plenty.

Table 1. Sources of observations within the metadataset mapped as occurring within the Bay of Plenty Region.

Data source	Number of records
Auckland Museum	619
Auckland Museum Marine Collection	36
Auckland Museum Herbarium	430
Auckland Museum Land Vertebrate Collection	31
Auckland Museum Marine Collection	10
BOPRC EPT	76
BOPRC Key Biodiversity Flora Sites	904
BOPRC Marsh Bird	372
CHR Allan Herbarium	384
DOC BioWeb	2,683
DOC Bioweb Herpetofauna	17
DOC ECHB Plants	159
DOC Marine Mammal Database	185
DOC Regional Database 3953	900
DOC Bat Database	202
eBird	15,486
iNaturalist	4,215
MBIS Marine Fauna and Flora observations around New Zealand	3
MPI Protected species bycatch in New Zealand fisheries	38
National Vegetation Survey	138
NERMN	304
NIWA Invertebrate Type Collection	6
NIWA Freshwater Fish Database	1,625
NZ Arthropod Collection	9

Table 2. Taxonomic distribution of number of species and number of observations within the metadataset mapped as occurring within the Bay of Plenty Region

Taxonomic Group	Number of observations	Number of species observed
Algae	65	41
Bats	213	2
Birds	19,427	124
Fish (incl. marine fish)	1,741	14
Frogs	2	1
Hornworts and Liverworts	68	26
Invertebrates (incl. marine invertebrates)	195	42
Lichens	135	62
Mosses	40	10
Plants	6,599	487
Reptiles (incl. marine reptiles)	148	15
Seals and Sea lions	11	2
Whales, Dolphins and Porpoises	187	15

Permission for use of the information in the source datasets was granted under Creative Commons or was obtained from the hosting organisation. Ownership of data resides with the owner of the contributing dataset (See Appendix 6. Database use agreements for each source dataset usage provisions).

A requirement of database owners is that the actual location of each record within the metadataset is not passed onto any other party. For this reason, the outputs provided in this document are assigned to a catchment unit and grid references have been removed from publicly-available records.

5.1 Metadataset name validation

Each of the source datasets within the metadataset uses a unique name format and/or taxonomy as well as containing typographic differences. To establish relationships[11] between the names in the datasets a 'translation' spreadsheet was developed that converts names to the equivalent name as used in the NZTCS. Names that could not be automatically matched were examined, and if possible, converted to the correct NZTCS name. A performance standard was set of matching all names for plants, birds, reptiles, and bats. This standard was met for all records of these groups except where there was not an appropriate sub-specific assignation made in the source dataset. Corrections were not attempted for records where sub-specific assignation is not geographically based (i.e., *Mazus novaezeelandiae* which has two subspecies and two forma within one of these).

No attempt was made to check the accuracy of the identification made in the source dataset. Likewise, no attempt was made to check the accuracy of the grid reference of each record in the source dataset. However, any species that are considered erroneous records for the Bay of Plenty (see Section 8) were not included in mapping.

Duplicate records (arising from the same information being hosted in more than one dataset) were not removed from the metadataset to allow back-tracing of records and retrospective correction.

5.2 Site records

Some species records are recorded for a discrete area only (i.e., site plant species lists, or some site-based GIS layers). These records were not included in this mapping due to time

[11] Also called name harmonisation. See Grenié, M; et al. 2022. Harmonizing taxon names in biodiversity data: A review of tools, databases and best practices. Methods in Ecology and Evolution. DOI: 10.1111/2041-210X.13802.

constraints associated with obtaining the information, extracting data, and uncertainty about exact location of the record within the locality.

6 Species selection criteria, waterbody mapping, and definitions

6.1 Defining 'freshwater-dependent' species

The requirement within Section 3.8(3)(c) the NOF is to identify within each FMU "the location of habitats of threatened species" and in Appendix 1A – Compulsory values "(threatened species) refers to the extent to which an FMU or part of an FMU that supports a population of threatened species has the critical habitats and conditions necessary to support the presence, abundance, survival, and recovery of the threatened species. All the components of ecosystem health must be managed, as well as (if appropriate) specialised habitat or conditions needed for only part of the life cycle of the threatened species." Habitat is explained in NPSFM Appendix 1A (in compulsory value "Ecosystem Health") "as the physical form, structure, and extent of the water body, its bed, banks and margins; its riparian vegetation; and its connections to the floodplain and to groundwater."

Previous investigations[12, 13, 14] have identified habitat characteristics and species-specific attributes as important in identifying freshwater habitat of threatened species. However,

[12] Whatley, M. 2020. Identifying the location of Freshwater Habitats of Threatened Species in New Zealand: A Summary of Current Tools and Resources. Unpub. Adaptive Environmental Consulting Report to Ministry for the Environment.

[13] Champion, P; Elcock, S; Moss, M. 2021. Stocktake of nationally threatened freshwater dependent plants. Unpub. NIWA Report 2021186HN to Department of Conservation.

[14] Storey, R; Kilroy, C; Matheson, F; Neale, M; Crow, S, Whitehead, A. 2018. Scoping indicators for impacts on freshwater biodiversity and ecosystem processes of rivers and streams. NIWA client report 20118118HN to Ministry for the Environment.

there is frequently insufficient information (including mapping and site investigations) to allow defining important habitat characteristics. Also, the habitat characteristics and species attributes listed in previous studies are often more suited for assessing the importance of the habitat, its potential ability to support a population of a threatened species, or the conservation needs of freshwater habitats rather than with a conservation of a species perspective. Where species are listed in these previous studies, they are mainly based on expert opinion, and may cover only a portion of the biodiversity (i.e., includes plants only).

Further, under Section 3.7 of the NOF, it is a requirement to identify the 'values' present in each FMU and the locations of species of conservation interest (additional to Threatened species) is considered an FMU value.

The criteria by which a species can be considered dependent on freshwater is not considered in the NPSFM, but the interpretation for 'threatened species' (NPSFM1.4 (1)) is any indigenous species that:

(a) "relies on water bodies for at least part of its life cycle; and

(b) meets the criteria for nationally critical, nationally endangered, or nationally vulnerable species in the New Zealand Threat Classification System Manual" (see further below).

6.2 Species selection criteria used in this exercise

Selection criteria were used to decide if a species is likely to meet the requirements within the NOF. For the purposes of this exercise, the term 'relies on water bodies for at least part of its life cycle' is taken to mean that in the absence of freshwater individuals of that species would either 1) perish, 2) have a marked loss of vitality, or 3) have a marked reduction in their ability to reproduce. These definitions apply to the individuals of that species, not to the

population as a whole. In this report, the term 'freshwater-dependent'[15] is used to refer to species that are assessed as likely meeting the NOF specifications. An individual habitat or collection of connected habitats where water accumulates is here referred to as a waterbody.

The criteria used in this exercise to identify whether a species qualifies as 'freshwater-dependent' are, that it is an indigenous species, and it relies on water bodies for at least part of their life cycle, either as:

A) Most individuals of the species are recorded as permanently inhabiting freshwater habitats, or;
B) Most individuals of the species use freshwater habitats for a part of their lifecycle, such as for feeding or reproductive purposes, and display adaptions or lifestyles consistent with this, or;
C) Some individuals of a species have been recorded temporarily or occasionally using freshwater habitats for activities important in maintaining health and wellbeing such as feeding, drinking, or bathing, or;
D) The species is listed as a 'freshwater' species during NZ Threat Classification Assessments, in Clarkson et al. (2021) (plants only), Storey et al. (2018)[16] (birds only), or has been designated elsewhere as freshwater-dependent in a similar exercise to this, or;
E) The species is known to inhabit freshwater habitats in addition to other non-freshwater habitats[17].
F) Some individuals of the species are mapped as occurring in the mapped extent of freshwater (including the buffer, see Section 6.7), but their link to freshwater is not

[15] "freshwater-dependent" is introduced in Champion et al. 2021 (footnote 14 below) and it is a useful 'tag' to identify a group of species that likely meet the NOF requirements.

[16] Storey, R; Kilroy, C; Matheson, F; Neale, M; Crow, S, Whitehead, A. 2018. Scoping indicators for impacts on freshwater biodiversity and ecosystem processes of rivers and streams. NIWA client report 20118118HN to Ministry for the Environment.

[17] For plants see Champion, P; Elcock, S; Moss, M. 2021. Stocktake of nationally threatened freshwater dependent plants. NIWA unpub. report 2021186HN to the Department of Conservation.

known. These species are not categorised further on their hydrosystem or other characters.

These criteria are in broad accord to the wetland indicator status ratings of vascular plant taxa in Clarkson et al. (2021)[18], but redefines the Facultative definition to include motile species, and also includes species where this designation cannot be made on the basis of currently available information.

6.3 Categorising Threatened species and species of conservation interest.

Threatened species

A species is categorised as Threatened if it as listed as such in the NZTCS[19]. The Threatened category includes species listed as Nationally Critical, Nationally Endangered, Nationally Vulnerable or Nationally Increasing.

Species of other conservation interest

Species of other conservation interest are those listed within the NZTCS as At Risk or Data Deficient and species listed as Not Threatened in the NZTCS, but which are considered rare or regionally important within the Bay of Plenty.

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[18] Clarkson, B.R., Fitzgerald, N.B., Champion, P.D., Forester, L., Rance, B.D. (2021) New Zealand plant list 2021. Landcare Research Envirolink Report 2123-HBRC259, Hamilton. 58 pp.

19 Townsend, A.J.; de Lange, P.J.; Duffy, C.A.J.; Miskelly, C.M.; Molloy, J.; Norton, D.A. 2007: New Zealand Threat Classification System manual. Department of Conservation, Wellington. 35p. and including the October 2019 Supplement and 2021 Amendment.

Each species in the metadatabase is categorised on the basis of its current classification within the NZTCS.[20]

6.4 Characterisation of freshwater-dependent species

Nature of dependence on freshwater

The nature of the dependence on freshwater of each species was categorised into dependence classes: obligate, facultative, and unknown. Obligate species are those who spend their entire life cycle within a freshwater habitat. Facultative species are those who either: require a freshwater habitat for part of their lifecycle (i.e., black-billed gull that breed only on riverbeds but can forage in other habitats); some individuals of the species use the freshwater habitat as part of a range of habitats for a part of their lifecycle (i.e., long-tailed bats that forage along habitat margins, including wetland and river margins); or, part of the population occurs in wetland habitat (i.e., heart-leaved kohuhu plant *Pittosporum obcordatum* that occurs in riparian habitats, wetland margins but also on hillslope shrublands). Species categorised as 'Unknown' are species that are mapped as occurring in a freshwater area, but the nature of their relationship to freshwater habitats is not known.

Freshwater qualities

Species vary in their dependence on intrinsic values of the water body they inhabit, and this is influenced by the form that water takes in their habitat (i.e., ponded, flowing, still water), the flow regime (including ephemeral waterbodies and flooding of adjoining flood plain),

[20] Up to and including the 2021 reassessment of birds: Robertson, H.A.; Baird, K.A.; Elliott, G.P.; Hitchmough, R.A.; McArthur, N.J.; Makan, T.D.; Miskelly, C.M.; O'Donnell, C.F.J.; Sagar, P.M.; Scofield, R.P.; Taylor, G.A.; Michel, P. 2021: Conservation status of birds in Aotearoa New Zealand, 2021. New Zealand Threat Classification Series 36. Department of Conservation, Wellington. 43 p

the mineral turbidity, and the chemical quality of the water, or are dependent on a continuous connection to the sea to complete their lifecycle (fish passage).

Threatening processes

The persistence of a species within a freshwater habitat can be threatened by changed ecological process arising from weed invasion and proliferation of pests (both terrestrial and aquatic animal pests and weeds), changes to water qualities (described above) as well as extrinsic factors such as climate change, and probably a number of other factors (such as disease)[21,22]. The freshwater-dependent species in the Bay of Plenty Region have been categorised on the basis the processes which are known to frequently threaten their continued persistence at sites. Species have not been categorised on the basis of extrinsic factors (such as climate change) in this project because of a shortage of information on the identification and prevalence of these factors.

6.5 Habitat

In this exercise, the freshwater habitats used are broadly those described as the Wetland Classes and Wetland Forms in Johnson and Gerbeaux (2004)[23] within their Palustrine, Riverine, Lacustrine, Estuarine and Geothermal Hydrosystems[24]. This includes seasonal

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[21] Diaz, S; et al. 2019. Pervasive human-driven decline of life on Earth points to the need for transformative change. Science 366. DOI: 10.1126/science.aax3100.

[22] See Page 19 of Te Mana of te Taiao – Aotearoa NZ Biodiversity Strategy https://www.doc.govt.nz/globalassets/documents/conservation/biodiversity/anzbs-2020.pdf

[23] Johnson, P; Gerbeaux, P. 2004. Wetland types in New Zealand. Department of Conservation and Ministry for Environment, Wellington.

[24] The Nival and Inland Saline hydrosystem are not included as they do not occur in the Bay of Plenty. The Plutonic hydrosystem is not included as no information is available for this area. Habitats associated with aquifers are also not included are no information is available for this area.

freshwater habitats such as floodplains and ephemeral wetlands and habitats directly created by the actions of freshwater (i.e., bare flood zones, lake beaches). Hydrosystems can also transition between two types (such as a transition between palustrine and riverine hydrosystems in gully heads). In this exercise, the hydrosystem assignment is based primarily by the nature of their input water and by the substrate as described in Johnson and Gerbeaux (2004).

Each 'freshwater-dependent' species is categorised to the hydrosystem in which it occurs (a species can occur in one or multiple hydrosystems), and the boundaries of these hydrosystems are interpreted as that which the waterbody is primarily influenced by (i.e., the Lacustrine hydrosystem includes beach gravels, shallow water wetlands on the lake margin, and wetlands impounded by wave-formed levees). If there was doubt over the hydrosystems inhabited by a species, it was assigned to all candidate hydrosystems.

Further work will be required to describe and characterise the freshwater habitats occupied by freshwater-dependent species.

6.6 Freshwater Spatial Units

Each location of a freshwater-dependent species is assigned to the underlying spatial units: Bay of Plenty Regional Council draft Freshwater Management Unit (FMU), River Catchment, Water of National Importance (WONI) Unit, 5th and 4th Order Freshwater Environment of NZ (FWENZ) River Catchment Unit and River Environment Classification (REC) Hydro Unit (Figure 3). There are 29,175 REC hydro units within the Bay of Plenty Regional Council boundary. The REC hydro unit are used as the basis for aggregated mapping as they offer fine-scale detail throughout the region.

6.7 Mapping freshwater extent and extracting species.

The mapped extent of freshwater bodies within the Bay of Plenty Regional Council boundary (Figure 4) used mapped extent of lakes, geothermal, wetland, marshland and marshbird

provided by BOPRC together with 100 m either side of river centre lines from the FWENZ database and the lake outlines available through Land Information NZ[25]. Each water body was buffered by 100 m to account for uncertainties in boundary of waterbody and errors in mapped locations of species and to give a conservative picture. The buffer areas are included in the mapped extent of freshwater (Figure 4).

Any species mapped as occurring within the freshwater extent, including the buffer, and not already classified as a freshwater-dependent species, was considered for inclusion as a 'freshwater-dependent' species under Criteria F.

All mapping was undertaken in the QGIS 3.16.5 GIS software.

[25] https://data.linz.govt.nz/data/.

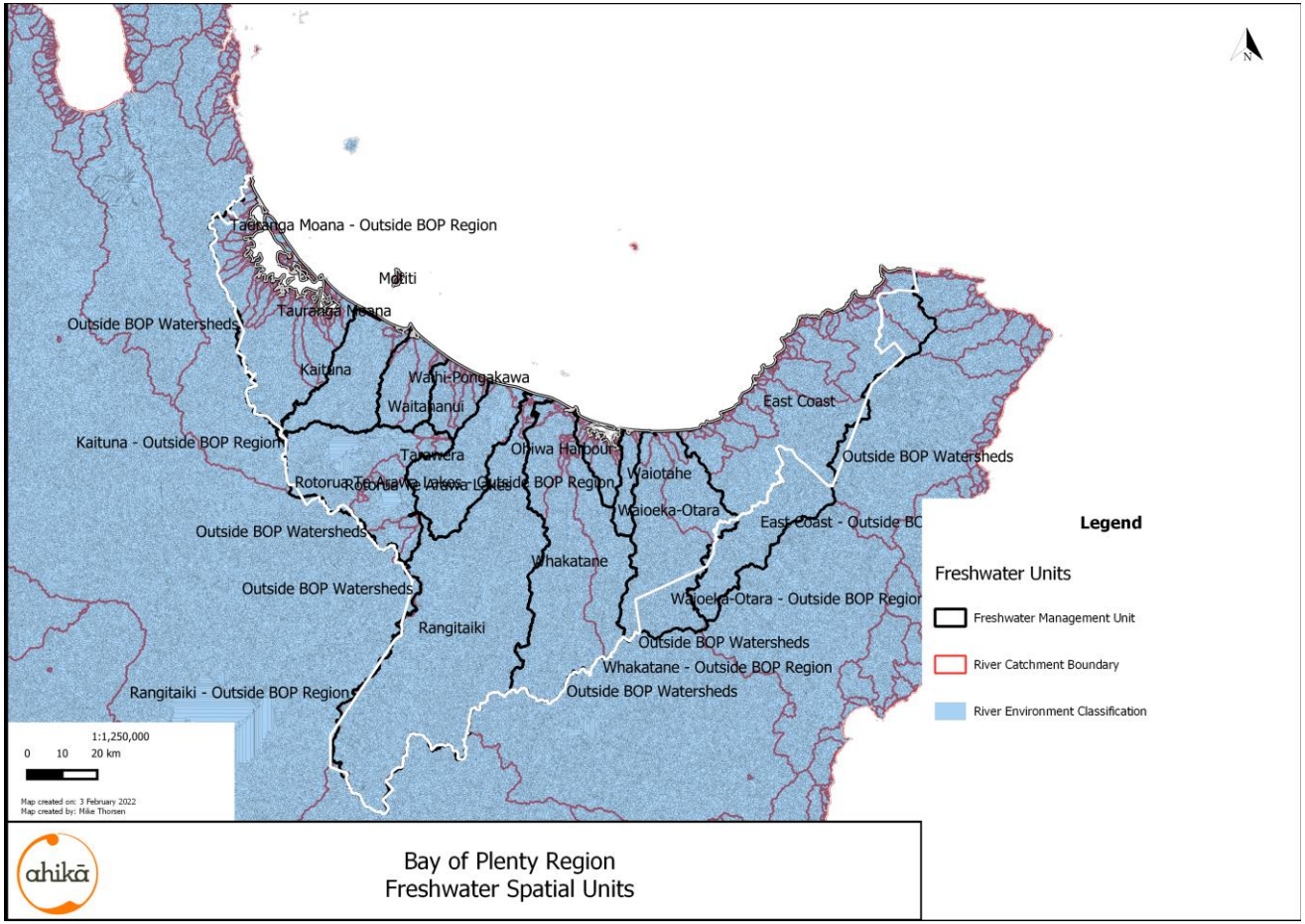

Figure 3. Freshwater spatial units of the Bay of Plenty. Bay of Plenty Regional Council boundary outlined. Freshwater Management Units named. Water of National Importance (WONI) Units and 5th and 4th Order Freshwater Environment of NZ (FWENZ) Units not shown for clarity.

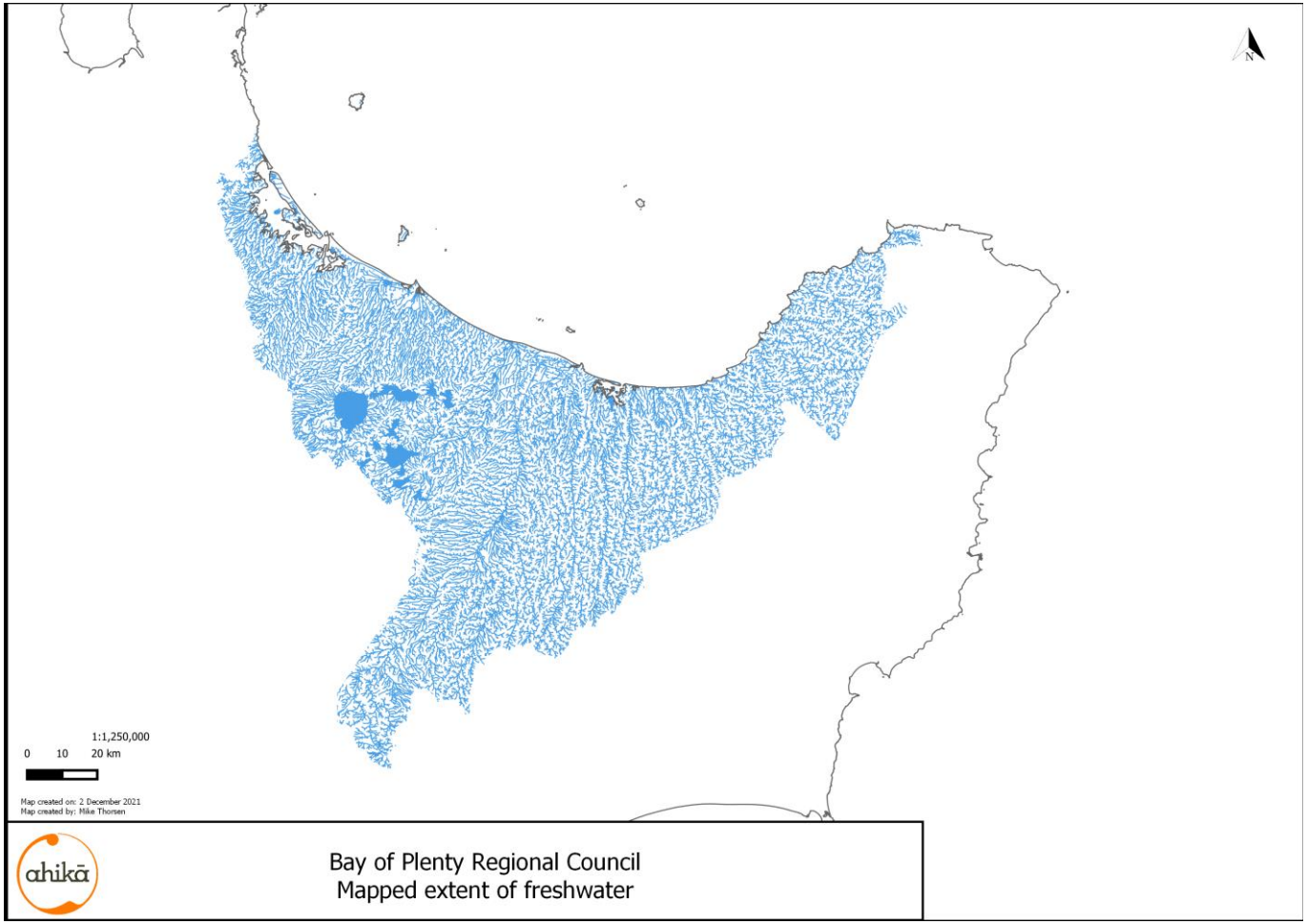

Figure 4. Mapped extent of freshwater within Bay of Plenty Regional Council boundary.

7 The freshwater-dependent species in the Bay of Plenty

300 of the 842 Threatened species or species of other conservation interest mapped in the metadataset as occurring within the boundaries of the Bay of Plenty Region are identified as freshwater-dependent species using the criteria in Section 6.2. There are 21,680 records of these 300 species (Appendix 3. Observations of freshwater-dependent species in the Bay of Plenty Region.).

7.1 Threatened freshwater-dependent species

Fifty-five species are identified as Threatened freshwater-dependent species within the Bay of Plenty Region (Table 4, Appendix 1. List of Threatened Freshwater-Dependent Species). Most of these species are located in lacustrine, palustrine or riverine hydrosystems (Table 3). Twenty are currently[26] categorised as Nationally Critical, nine as Nationally Endangered, 20 as Nationally Vulnerable and Six as Nationally Increasing. All Threatened species are dependent on flow quantity, and most are also dependent on flow quality (Table 3). Only two Threatened fish species are dependent also on fish passage. The majority of species are threatened by weeds or terrestrial pest animals (Table 3).

There are 6,079 records of these species (Table 3) within the Bay of Plenty Region (Figure 5) located within 1,208 REC Units (Figure 7). 366 records are situated outside the mapped extent of freshwater (Figure 6). 507 records are of a Nationally Critical species, 327 records are of a Nationally Endangered species, 3,441 records are of a Nationally Vulnerable species, and 1,804 records of a Nationally Increasing species.

[26] Threat status is reassessed on a roughly 5-yearly interval.

Table 3. Count of species and number of records for those species in each categorisation into life form, hydrosystem, freshwater reliance, flow reliance and threatening processes of Threatened freshwater-dependent species.

Feature	Number of Species	Number of Records
Life Form		
Bats	1	11
Birds	15	4,996
Fish	2	97
Invertebrates	1	1
Plants	36	974
Hydrosystem		
Lacustrine	29	2,652
Palustrine	22	654
Riverine	33	4,592
Geothermal	8	580
Estuarine	10	1,288
Reliance		
Obligate	29	3,873
Facultative - Lifecycle	3	221
Facultative - Occasional	4	746
Facultative - Distribution	20	1,800
Flow		
Quantity	55	6,079
Quality	48	5,928
Passage	2	97
Threatened by		
Weeds	43	5,450
Pests - terrestrial	38	5,350
Pests - aquatic	7	3,116
TOTAL in metadatabase	**55**	**6,079**

Table 4. List of Threatened freshwater-dependent species mapped as occurring within the Bay of Plenty Region

Name	Common Name	Taxonomic Group	Life Form	Threat Status	Threat Criteria [27]
Ardea modesta J.E. Gray, 1831	White Heron, great egret, great white heron, kotuku, kotuku, great white egret, eastern great egret	Fauna	Birds	Nationally Critical	A(1)
Botaurus poiciloptilus Wagler, 1827	Australasian Bittern, matuku hurepo, matuku hurepo	Fauna	Birds	Nationally Critical	B(1)
Caleana minor R.Br.	Flying Duck Orchid	Flora	Plants	Nationally Critical	A(1)
Chalinolobus tuberculatus Forster, 1844	Long-tailed bat	Fauna	Bats	Nationally Critical	C
Hypericum minutiflorum Heenan		Flora	Plants	Nationally Critical	B(2)
Isolepis lenticularis R.Br.		Flora	Plants	Nationally Critical	A(3)
Juncus holoschoenus R.Br.		Flora	Plants	Nationally Critical	A(3)
Korthalsella salicornioides (A.Cunn.) Tiegh.	Mistletoe, dwarf mistletoe, leafless mistletoe	Flora	Plants	Nationally Critical	C
Lagenophora montana Hook.f.	papataniwha	Flora	Plants	Nationally Critical	A(3)
Leptospermum repo de Lange & L.M.H.Schmid	Peat bog manuka	Flora	Plants	Nationally Critical	C
Libertia cranwelliae Blanchon, B.G.Murray & Braggins	Cranwells Iris, Cranwells Mikoikoi, ,	Flora	Plants	Nationally Critical	A(1)
Lophomyrtus bullata Burret	Ramarama, bubble leaf	Flora	Plants	Nationally Critical	C
Lophomyrtus obcordata (Raoul) Burret	Rohutu, New Zealand myrtle	Flora	Plants	Nationally Critical	C
Mazus novaezeelandiae subsp. impolitus f. hirtus Heenan	dwarf musk, swamp musk	Flora	Plants	Nationally Critical	A(3)
Myosotis pottsiana (L.B.Moore) Meudt, Prebble, R.J.Stanley & Thorsen		Flora	Plants	Nationally Critical	B(2)

[27] Refer NZTCS.

Name	Common Name	Taxonomic Group	Life Form	Threat Status	Threat Criteria [27]
Neomyrtus pedunculata (Hook.f.) Allan	Rohutu, myrtle	Flora	Plants	Nationally Critical	C
Ophioglossum petiolatum Hook.	Stalked adderâ€™s tongue fern	Flora	Plants	Nationally Critical	A(3)
Schoenus carsei Cheeseman	Carse's Schoenus	Flora	Plants	Nationally Critical	A(3)
Syzygium maire (A.Cunn.) Sykes & Garn.-Jones	swamp maire, maire tawake, waiwaka	Flora	Plants	Nationally Critical	C
Utricularia australis R.Br.	yellow bladderwort	Flora	Plants	Nationally Critical	C
Carex cirrhosa Berggr.	Curly Sedge	Flora	Plants	Nationally Endangered	A(3)
Centipeda minima (L.) A.Braun & Asch. subsp. minima	sneezeweed, centipeda	Flora	Plants	Nationally Endangered	B(3)
Chlidonias albostriatus (G.R. Gray, 1845)	Black-fronted tern, tarapirohe, tarapiroe, blackfronted tern, black fronted tern	Fauna	Birds	Nationally Endangered	C(1)
Dicranopteris linearis (Burm.f.) Underw.	tangle fern	Flora	Plants	Nationally Endangered	B(3)
Egretta sacra sacra Gmelin, 1789	Reef Heron, matuku moana, eastern reef egret	Fauna	Birds	Nationally Endangered	A(1)
Hypericum rubicundulum Heenan		Flora	Plants	Nationally Endangered	A(3)
Kunzea tenuicaulis de Lange	Geothermal kanuka, Geothermal kunzea, Prostrate kanuka	Flora	Plants	Nationally Endangered	C(3)
Mazus novaezeelandiae subsp. impolitus Heenan f. impolitus	dwarf musk/matt leaved mazus	Flora	Plants	Nationally Endangered	A(3)
Pterostylis micromega Hook.f.	Swamp Greenhood	Flora	Plants	Nationally Endangered	A(3)
Anarhynchus frontalis Quoy & Gaimard, 1830	Wrybill, ngutu-pare	Fauna	Birds	Nationally Increasing	
Anas chlorotis G.R. Gray, 1845	Brown Teal, brown duck, Pateke, pateke	Fauna	Birds	Nationally Increasing	
Callaeas wilsoni (Bonaparte, 1851)	North Island Kokako, blue-wattled crow, kokako, hokako, honga, onga, honge, onge, pakara, werewere	Fauna	Birds	Nationally Increasing	
Charadrius obscurus aquilonius Gmelin, 1789	Northern New Zealand Dotterel	Fauna	Birds	Nationally Increasing	
***Falco novaeseelandiae ferox* (Trewick & Olley 2016)**	Bush falcon, Karearea	Fauna	Birds	Nationally Increasing	

Name	Common Name	Taxonomic Group	Life Form	Threat Status	Threat Criteria [27]
Poliocephalus rufopectus (G.R. Gray, 1843)	New Zealand Dabchick, Weweia, totokipio, taihoropi (Hokianga), taratimoho (Waikato), New Zealand gre	Fauna	Birds	Nationally Increasing	
Althenia bilocularis (Kirk) Cockayne		Flora	Plants	Nationally Vulnerable	B(3)
Amphibromus fluitans Kirk	Water brome	Flora	Plants	Nationally Vulnerable	C(3)
Anas superciliosa Gmelin, 1789	Grey Duck, Pacific black duck, parera, gray duck, black duck	Fauna	Birds	Nationally Vulnerable	C(1)
Carex rubicunda Petrie	Sedge	Flora	Plants	Nationally Vulnerable	C(3)
Coprosma obconica Kirk		Flora	Plants	Nationally Vulnerable	C(1)
Edpercivalia borealis (McFarlane, 1951)		Fauna	Invertebrates	Nationally Vulnerable	
Galaxias postvectis Clarke, 1899	Shortjaw kokopu	Fauna	Fish	Nationally Vulnerable	
Geotria australis Gray, 1851	Lamprey	Fauna	Fish	Nationally Vulnerable	C(3)
Hydroprogne caspia Pallas, 1770	Caspian Tern, Taranui	Fauna	Birds	Nationally Vulnerable	B(1)
Hymenolaimus malacorhynchos Gmelin, 1789	Blue duck, Whio, mountain duck, blue mountain duck	Fauna	Birds	Nationally Vulnerable	C(1)
Juncus pauciflorus R.Br.	leafless rush	Flora	Plants	Nationally Vulnerable	C(3)
Kunzea salterae de Lange		Flora	Plants	Nationally Vulnerable	D(3)
Leptospermum scoparium J.R.Forst. & G.Forst. var. scoparium	manuka, tea tree, kahikatoa	Flora	Plants	Nationally Vulnerable	
Libertia peregrinans Cockayne & Allan	New Zealand iris, mikoikoi, ,	Flora	Plants	Nationally Vulnerable	D(3)
Lycopodiella serpentina (Kunze) B.Ollg.	bog clubmoss	Flora	Plants	Nationally Vulnerable	C(3)
Melicytus flexuosus Molloy & A.P.Druce		Flora	Plants	Nationally Vulnerable	D(1)
Notiomystis cincta (Du Bus de Gisignies, 1839)	Hihi, Stitchbird	Fauna	Birds	Nationally Vulnerable	
Pittosporum obcordatum Raoul	Heart-leaved kohuhu	Flora	Plants	Nationally Vulnerable	B(1)
Pittosporum turneri Petrie	Turner's kohuhu, tent pole tree	Flora	Plants	Nationally Vulnerable	B(1)
Podiceps cristatus australis Gould, 1844	Southern Crested Grebe, great crested grebe, puteketeke, puteketeke, kamana, kamana	Fauna	Birds	Nationally Vulnerable	A(1)

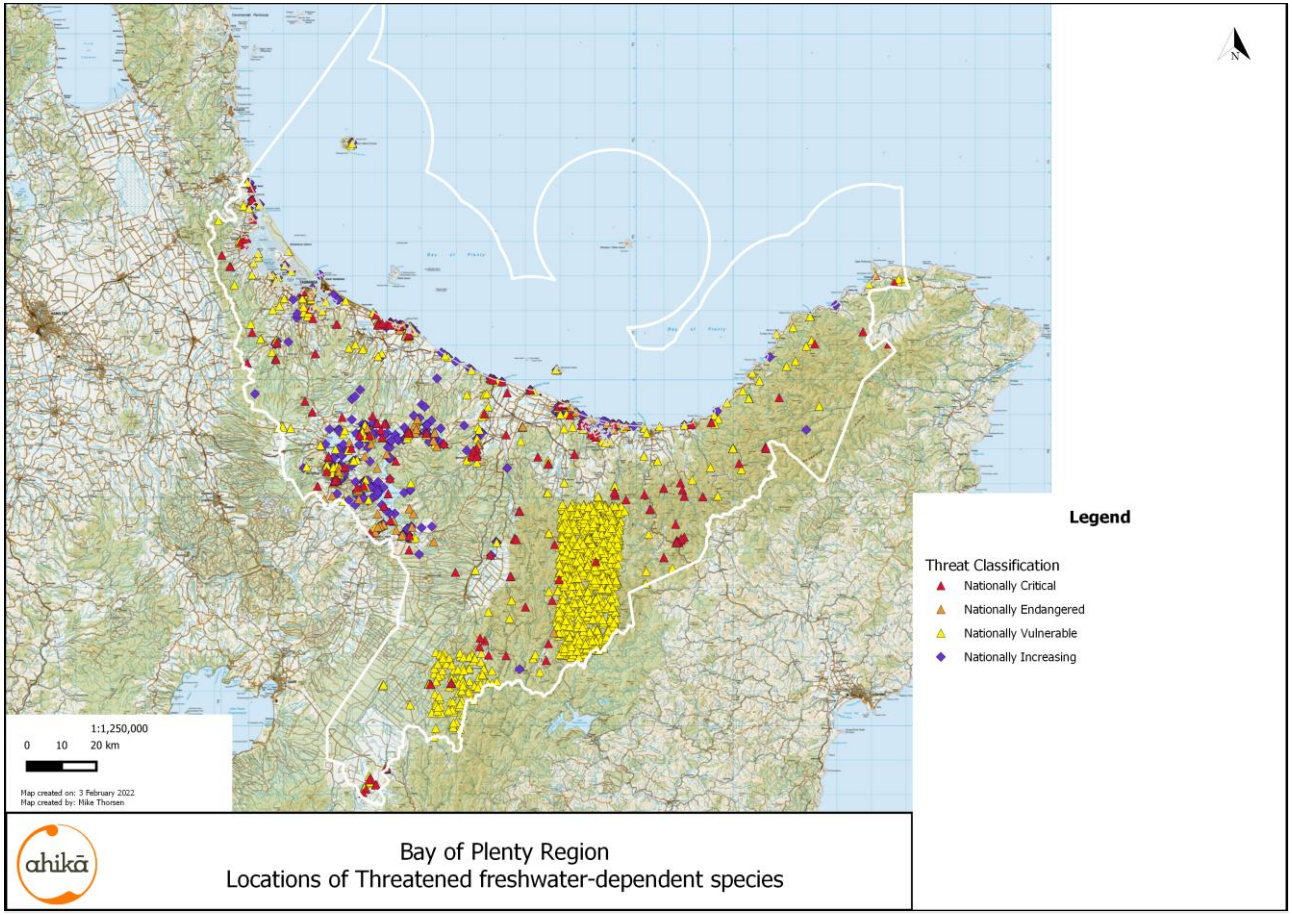

Figure 5. Locations of Threatened freshwater-dependent species recorded from freshwater within the boundary of the Bay of Plenty Region (white outline).

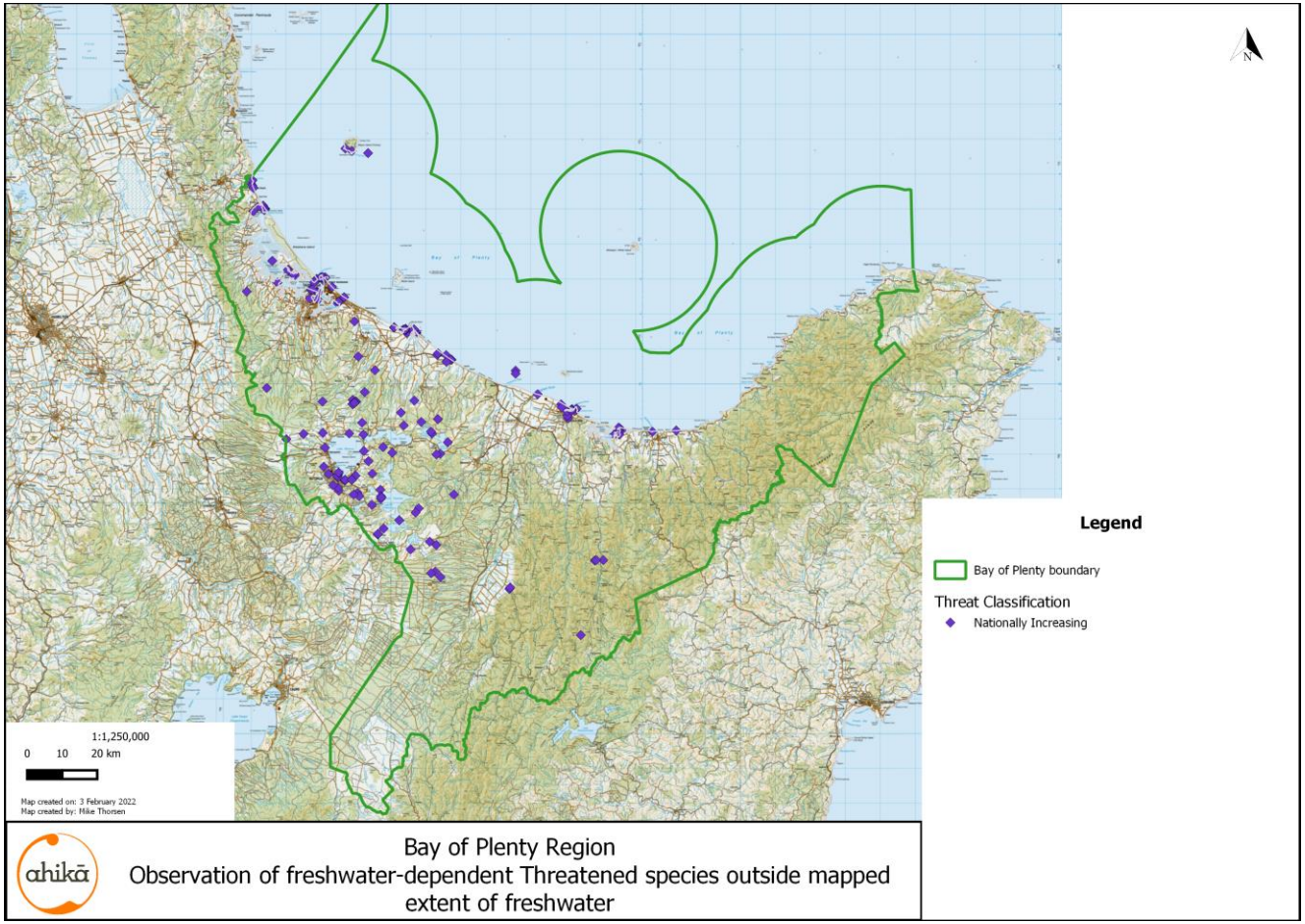

Figure 6. Locations of freshwater-dependent Threatened species outside mapped extent of freshwater in the Bay of Plenty Region.

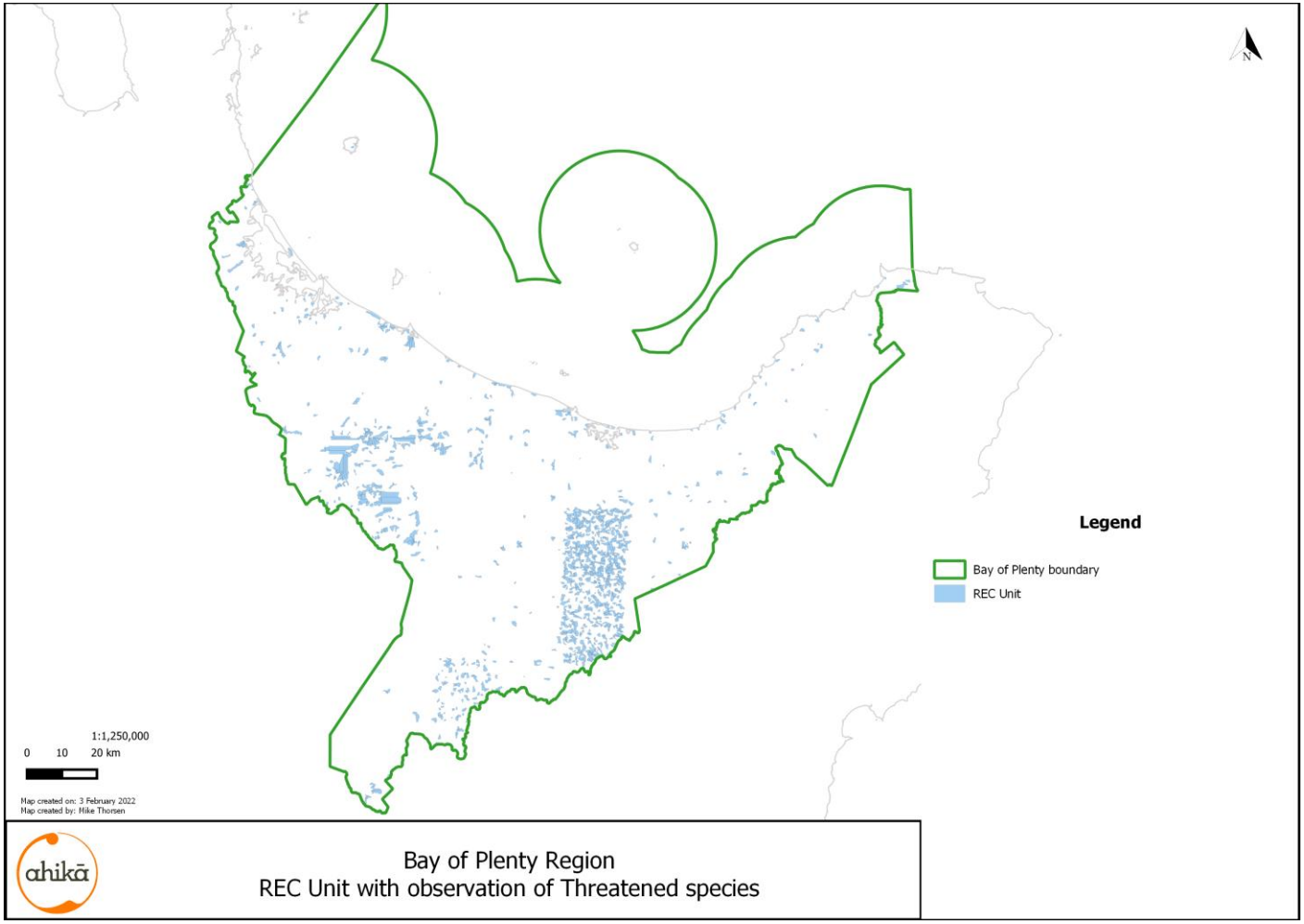

Figure 7. River Environment Classification (REC) units within the Bay of Plenty Region where Threatened freshwater-dependent species have been mapped.

7.2 Freshwater-dependent species of other conservation interest

Two hundred and forty-five species are identified as freshwater-dependent species of other conservation interest within the Bay of Plenty Region (Appendix 2. List of freshwater-dependent species of conservation interest Appendix 1. List of Threatened Freshwater-Dependent Species). Most of these species are located in either lacustrine, palustrine or riverine hydrosystems, and are mostly of Not Threatened but potentially of regional importance conservation status (Table 5). All species of conservation interest are dependent on flow quantity, and most are also dependent on flow quality (Table 5). The majority of the species are potentially threatened by weeds or terrestrial pests (Table 5).

There are 15,601 records of these species within the Bay of Plenty Region (Figure 8) located within 1,586 REC Units (Figure 10). 5,118 records are situated outside of the mapped extent of freshwater (Figure 9) indicating either other habitats occupied by these species, currently unknown freshwater bodies, or errors in location.

Table 5. Count of species and number of records in the Bay of Plenty region for those species in each categorisation of each species into life form, hydrosystem, freshwater reliance, flow reliance, threatening processes, and conservation status of freshwater-dependent species of conservation interest.

Feature	***Number of Species***	***Number of Records***
Life Form		
Birds	36	11,326
Fish	8	1,634
Frogs	1	2
Hornworts and Liverworts	5	24
Invertebrates	14	77
Lichens	2	5
Mosses	1	2
Plants	179	2,529
Hydrosystem		
Lacustrine	*110*	*14,011*
Palustrine	*105*	*2,441*
Riverine	*131*	*13,663*
Geothermal	*8*	*194*
Estuarine	*29*	*9,337*
Reliance		

Obligate	*119*	*6,545*
Facultative - Lifecycle	*10*	*5,575*
Facultative - Occasional	*7*	*1,616*
Facultative - Distribution	*103*	*4,956*
Flow		
Quantity	*246*	*15,599*
Quality	*227*	*11,828*
Passage	*8*	*1,634*
Threatened by		
Weeds	*201*	*6,822*
Pests - terrestrial	*123*	*12,362*
Pests - aquatic	*25*	*2,516*
Conservation Status		
Coloniser	4	46
Data Deficient	9	53
Declining	51	9586
Migrant	3	162
Naturally Uncommon	51	2358
Not Threatened	115	1042
Recovering	2	1446
Relict	4	891
Vagrant	6	13
TOTAL in metadataset	**245**	**15,601**

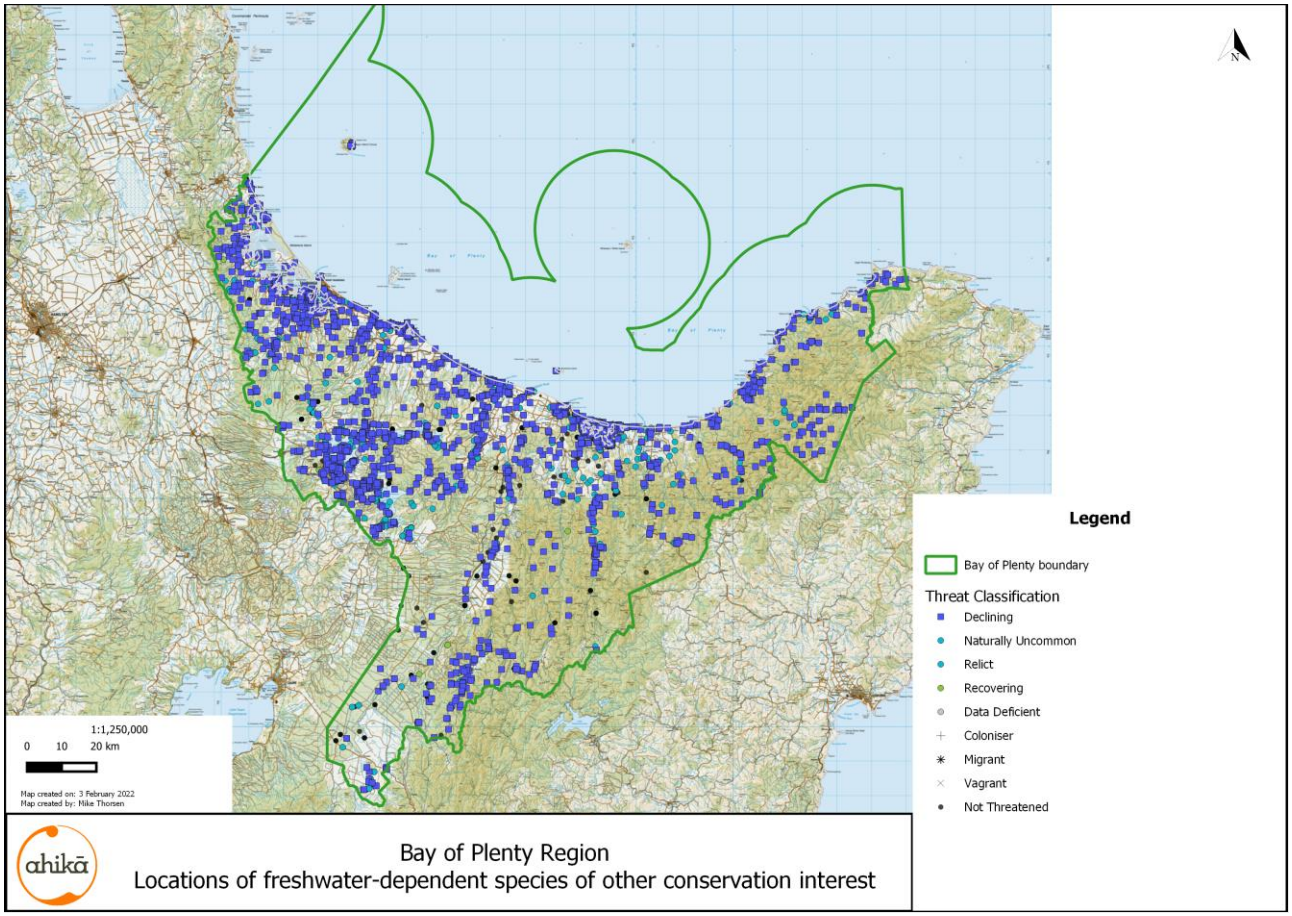

Figure 8. Locations of freshwater-dependent species of other conservation interest recorded from freshwater within the Bay of Plenty Region (green outline).

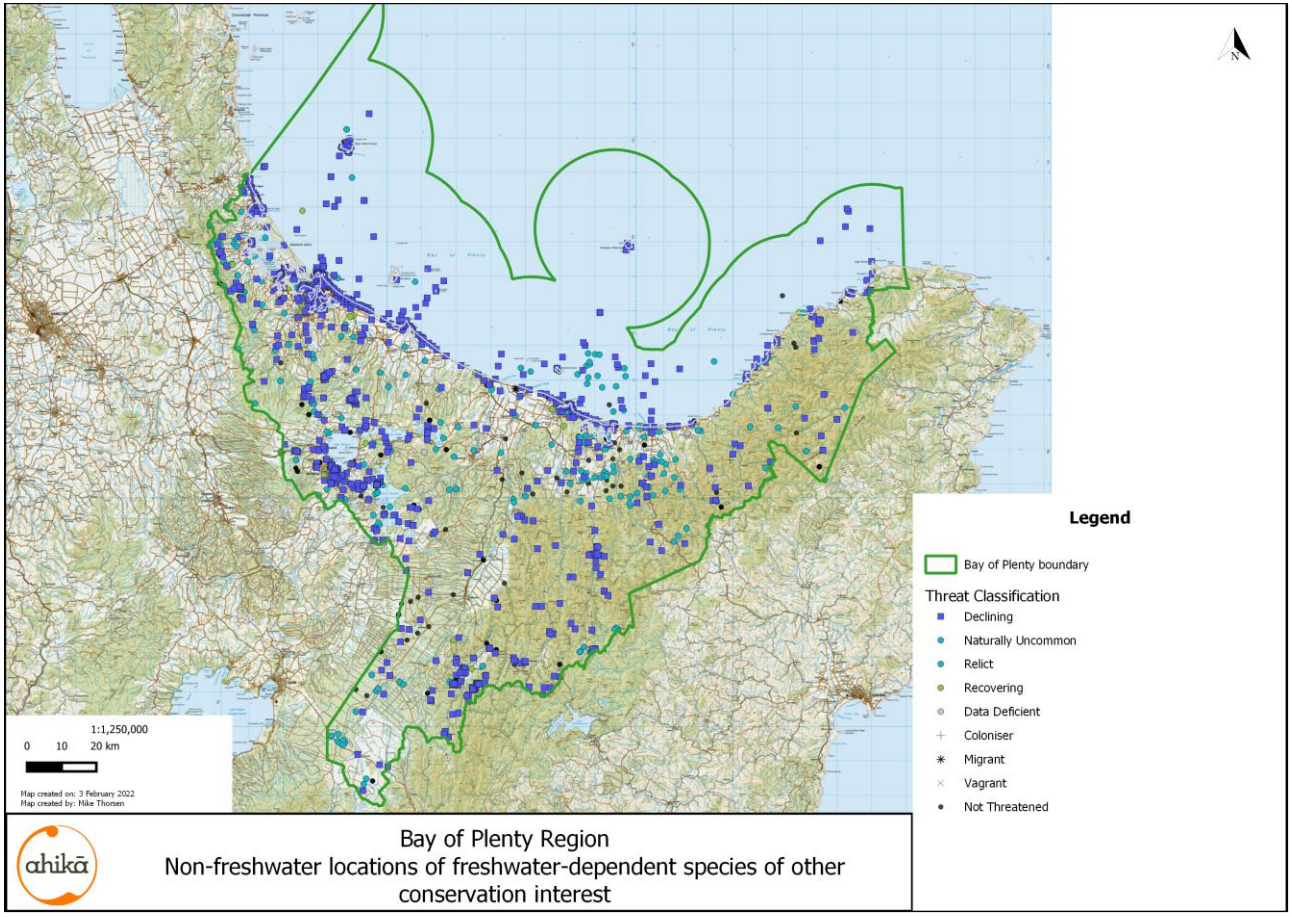

Figure 9. Locations outside of freshwater extent where freshwater-dependent species of other conservation interest have been recorded from within the boundary of the Bay of Plenty Region (green outline).

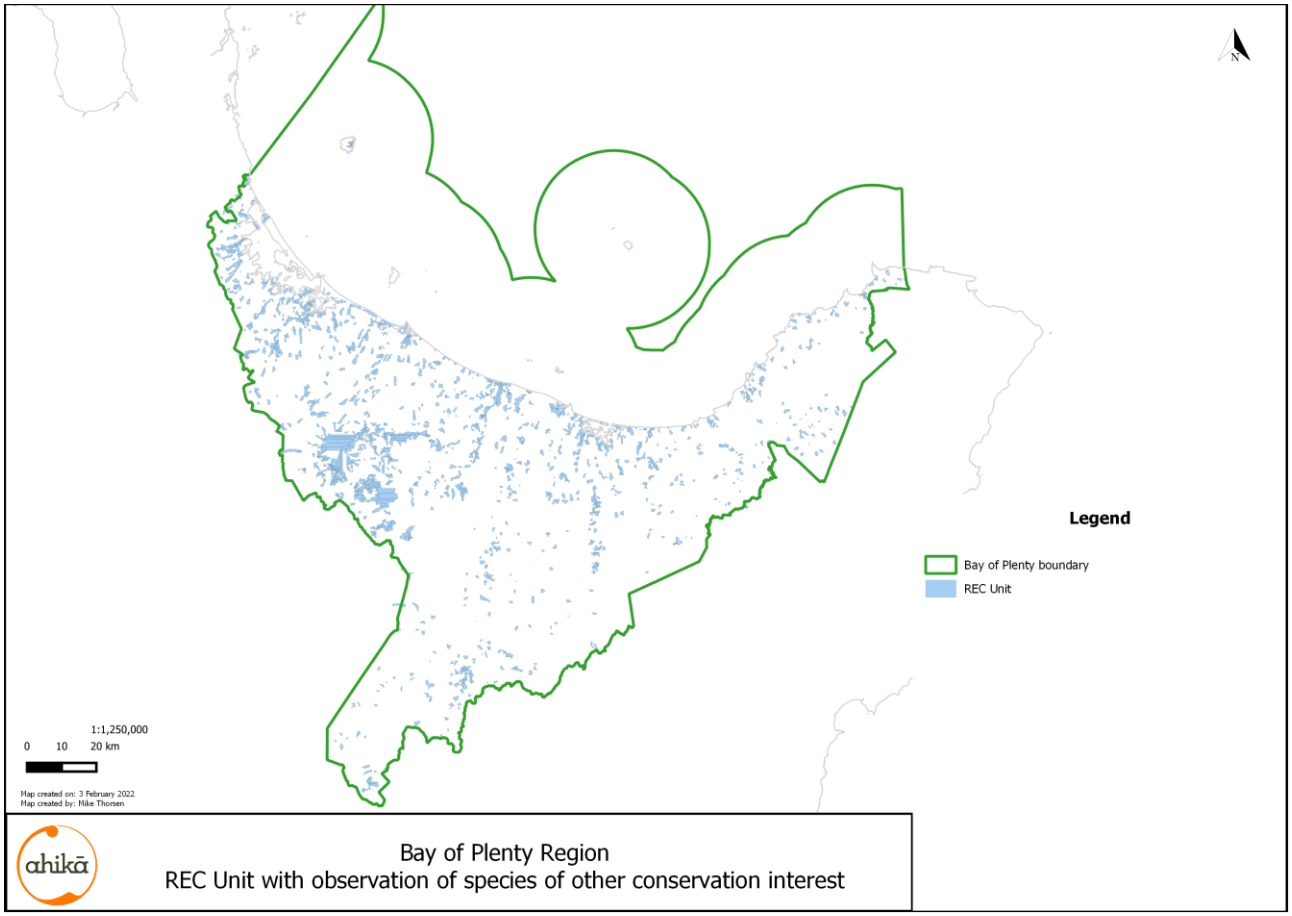

Figure 10. River Environment Classification (REC) units within the Bay of Plenty Region where freshwater-dependent species of other conservation interest have been mapped.

7.3 Excluded species

Records of seven species are suspected to rely on freshwater for part of their life cycle, but are of uncertain freshwater assignation, mainly as a result of insufficient information to determine whether they inhabit freshwater habitats (Table 6). Records of nine species that are considered to not be present within the Bay of Plenty (Table 7) are excluded from this exercise. Records of a further 242 species that are mapped as occurring within the freshwater extent were also excluded on the basis that there was no information to link them to freshwater habitats (Table 8).

Table 6. Species suspected of relying on freshwater for part of their lifecycle, but that could not be determined to qualify as freshwater-dependent because of insufficient information available for the species.

Name	Common Name	Taxonomic Group	Life Form	Threat Category	Threat Status
Charadrius leschenaultii leschenaultii Lesson, 1826	Large sand dotterel	Fauna	Birds	Non-resident Native	Vagrant
Charadrius mongolus Pallas, 1776	Mongolian dotterel	Fauna	Birds	Non-resident Native	Vagrant
Charadrius veredus Gould, 1848	Oriental dotterel	Fauna	Birds	Non-resident Native	Vagrant
Pluvialis dominicus Statius Muller, 1776	American golden plover	Fauna	Birds	Non-resident Native	Vagrant
Cololejeunea inflexifolia R.M.Schust.	liverwort	Flora	Hornworts and Liverworts	At Risk	Naturally Uncommon
Gyalolechia flavovirescens (Wulfen) Søchting, Frödén & Arup	lichen	Flora	Lichens	Data Deficient	Data Deficient
Thyridia repens (R.Br.) W.R.Barker & Beardsley	Native musk, Native monkey flower	Flora	Plants	At Risk	Naturally Uncommon

Table 7. Species which identification is considered incorrect, or probably represents a cultivated individual.

Name	Common Name	Taxonomic Group	Life Form	Threat Category	Threat Status	Reason for exclusion
Cyanoramphus malherbi Souancé, 1857	Malherb's parakeet, kakariki, kakariki, kakariki karaka, kakariki karaka, orangefronted parakeet, or	Fauna	Birds	Threatened	Nationally Critical	Exclude as probably a misidentification for another Cyanoramphus species
Nestor notabilis Gould, 1856	Kea	Fauna	Birds	Threatened	Nationally Endangered	Exclude as not known to occur naturally in this area
Strigops habroptila Gray, 1845	Kakapo, kakapo, owl-parrot, tarapo, tarepo, night parrot	Fauna	Birds	Threatened	Nationally Critical	No natural population known in area
Carex tenuiculmis (Petrie) Heenan & de Lange	slender wine sedge	Flora	Plants	At Risk	Declining	South Island species
Carmichaelia petriei Kirk	desert broom	Flora	Plants	At Risk	Declining	Misidentification of another species?
Kunzea ericoides (A.Rich.) Joy Thomps.	Manuoea, Titira, Atitira, Kanuka	Flora	Plants	Threatened	Nationally Vulnerable	Not known to occur naturally in this region
Leucopogon parviflorus (Andrews) Lindl.	Chatham Island Mingimingi	Flora	Plants	At Risk	Naturally Uncommon	Misidentification of another species?
Veronica dieffenbachii Benth.	Dieffenbach's koromiko	Flora	Plants	At Risk	Naturally Uncommon	No natural population known in area
Xeronema callistemon W.R.B.Oliv. f. callistemon	Poor Knights Lily, Raupo-Taranga	Flora	Plants	At Risk	Naturally Uncommon	No natural population known in area

Table 8. Species mapped as occurring in freshwater, but for which no information was available to link them to freshwater.

Name	Common Name	Taxonomic Group	Life Form	Species Type	Threat Category	Threat Status	Reason for exclusion
Acrosymphyton firmum M.W.Hawkes	red seaweed	Flora	Algae	Seaweeds	Data Deficient	Data Deficient	Marine
Amalthea freemaniae D'Archino & W.A.Nelson	red seaweed	Flora	Algae	Seaweeds	At Risk	Naturally Uncommon	Marine
Bostrychia gracilis (R.J.King & Puttock) Zuccarello & J.A.West	red seaweed	Flora	Algae	Seaweeds	Data Deficient	Data Deficient	Marine
Bostrychia harveyi Mont.	red seaweed	Flora	Algae	Seaweeds	Data Deficient	Data Deficient	Marine
Bostrychia moritziana (Sond. ex Kütz.) J.Agardh	red seaweed	Flora	Algae	Seaweeds	Data Deficient	Data Deficient	Marine
Catenella nipae Zanardini	red seaweed	Flora	Algae	Seaweeds	Data Deficient	Data Deficient	Marine
Ceramium tasmanicum (Kütz.) Womersley	red seaweed	Flora	Algae	Seaweeds	Data Deficient	Data Deficient	Marine
Cladhymenia lyallii Harv.	red seaweed	Flora	Algae	Seaweeds	Data Deficient	Data Deficient	Marine
Cladophora daviesii Harv.	green seaweed	Flora	Algae	Seaweeds	Data Deficient	Data Deficient	Marine
Grateloupia urvilleana (Mont.) Parkinson	red seaweed	Flora	Algae	Seaweeds	At Risk	Naturally Uncommon	Marine
Microcladia pinnata J.Agardh	red seaweed	Flora	Algae	Seaweeds	Data Deficient	Data Deficient	Marine
Notheia anomala Harv. & Bailey	brown seaweed	Flora	Algae	Seaweeds	At Risk	Naturally Uncommon	Marine
Perithalia capillaris J.Agardh	brown seaweed	Flora	Algae	Seaweeds	At Risk	Naturally Uncommon	Marine
Rhodymenia leptophylla J.Agardh	red seaweed	Flora	Algae	Seaweeds	Data Deficient	Data Deficient	Marine

Spyridia filamentosa (Wulfen) Harv.	red seaweed	Flora	Algae	Seaweeds	Data Deficient	Data Deficient	Marine
Ulva ralfsii (Harv.) Le Jol.	green seaweed	Flora	Algae	Seaweeds	Data Deficient	Data Deficient	Marine
Ulva rigida C.Agardh	green seaweed	Flora	Algae	Seaweeds	Data Deficient	Data Deficient	Marine
Mystacina tuberculata rhyacobia Hill & Daniel, 1985	Central lesser short-tailed bat	Fauna	Bats	Bats	At Risk	Declining	No direct link to freshwater bodies
Arenaria interpres (Linnaeus, 1758)	Ruddy turnstone	Fauna	Birds	Birds	Non-resident Native	Migrant	Coastal
Calidris acuminata (Horsfield, 1821)	Sharp-tailed sandpiper	Fauna	Birds	Birds	Non-resident Native	Migrant	Coastal
Calidris alba (Pallas, 1764)	Sanderling	Fauna	Birds	Birds	Non-resident Native	Vagrant	Coastal
Calidris canutus rogersi (Mathews)	Lesser knot	Fauna	Birds	Birds	Threatened	Nationally Vulnerable	Coastal
Calidris ferruginea (Pontoppidan, 1763)	Curlew Sandpiper	Fauna	Birds	Birds	Non-resident Native	Vagrant	Coastal
Calidris melanotos (Vieillot, 1819)	Pectoral sandpiper	Fauna	Birds	Birds	Non-resident Native	Vagrant	Coastal
Calidris ruficollis (Pallas, 1776)	Red-necked Stint, Rufous-necked Stint	Fauna	Birds	Birds	Non-resident Native	Migrant	Coastal
Calidris tenuirostris (Horsfield, 1821)	Great Knot	Fauna	Birds	Birds	Non-resident Native	Vagrant	Coastal
Coprotheres pomarinus (Temminck, 1815)	Pomarine skua	Fauna	Birds	Birds	Non-resident Native	Migrant	Marine
Eudynamys taitensis (Sparrman)	Long-tailed Cuckoo, Koekoea, koekoea, kohoperoa, long-tailed koel, longtailed cuckoo, long tailed cu	Fauna	Birds	Birds	At Risk	Naturally Uncommon	No direct link to freshwater bodies
Eudyptula minor minor J.R. Forster, 1781	little blue penguin, little penguin, southern blue penguin, blue penguin, korora	Fauna	Birds	Birds	At Risk	Declining	Marine

Haematopus unicolor J.R. Forster, 1844	Variable Oystercatcher, black oystercatcher, Torea pango, torea pango, torea tai, torea tai, torea,	Fauna	Birds	Birds	At Risk	Recovering	Coastal
Halobaena caerulea (Gmelin, 1789)	Blue Petrel	Fauna	Birds	Birds	Non-resident Native	Migrant	Marine
Limosa haemastica (Linnaeus, 1758)	American black-tailed (Hudsonian) godwit	Fauna	Birds	Birds	Non-resident Native	Vagrant	Coastal
Limosa lapponica Naumann, 1836	Kuaka, Eastern bar-tailed godwit, bar tailed godwit	Fauna	Birds	Birds	At Risk	Declining	Coastal
Limosa limosa melanuroides Gould, 1846	Black-tailed Godwit	Fauna	Birds	Birds	Non-resident Native	Vagrant	Coastal
Milvus migrans (Boddaert, 1783)	Black kite	Fauna	Birds	Birds	Non-resident Native	Vagrant	No direct link to freshwater bodies
Numenius madagascariensis (Linnaeus, 1776)	Far Eastern Curlew, Eastern Curlew	Fauna	Birds	Birds	Non-resident Native	Vagrant	Coastal
Numenius minutus Gould, 1840	Little Whimbrel	Fauna	Birds	Birds	Non-resident Native	Vagrant	Coastal
Numenius phaeopus variegatus (Scopoli, 1786)	Asiatic Whimbrel	Fauna	Birds	Birds	Non-resident Native	Migrant	Coastal
Pachyptila turtur (Kuhl, 1820)	Fairy Prion, Titi wainui, titi wainui, dove prion	Fauna	Birds	Birds	At Risk	Relict	Marine
Pelecanoides urinatrix ((Gmelin), 1789) urinatrix	Northern Diving Petrel, Kuaka	Fauna	Birds	Birds	At Risk	Relict	Marine
Pterodroma cookii (G.R. Gray, 1843)	Cook's Petrel, Titi, titi, blue-footed petrel, Cooks petrel	Fauna	Birds	Birds	At Risk	Relict	Marine
Puffinus bulleri Salvin, 1888	Buller's Shearwater	Fauna	Birds	Birds	At Risk	Naturally Uncommon	Marine
Puffinus carneipes Gould, 1844	Flesh-footed Shearwater, Toanui, tuanui, pale-footed shearwater, fleshfooted shearwater, flesh foote	Fauna	Birds	Birds	Threatened	Nationally Vulnerable	Marine

Puffinus gavia (Forster, 1844)	Fluttering Shearwater, Pakaha, pakaha, Forster's shearwater, flutterer, brown-backed shearwater	Fauna	Birds	Birds	At Risk	Relict	Marine
Stercorarius parasiticus (Linnaeus, 1758)	Arctic Skua	Fauna	Birds	Birds	Non-resident Native	Migrant	Marine
Sterna bergii cristata Stephens, 1826	Greater crested tern	Fauna	Birds	Birds	Non-resident Native	Vagrant	Coastal
Sterna hirundo longipennis Nordmann, 1835	Common tern	Fauna	Birds	Birds	Non-resident Native	Vagrant	Coastal
Sterna paradisaea Pontoppidan, 1763	Arctic Tern	Fauna	Birds	Birds	Non-resident Native	Migrant	Marine
Sternula albifrons sinensis Pallas, 1764	Little tern	Fauna	Birds	Birds	Non-resident Native	Migrant	Coastal
Sternula nereis davisae Mathews & Iredale, 1913	New Zealand Fairy Tern, tara iti	Fauna	Birds	Birds	Threatened	Nationally Critical	Coastal
Thalassarche cauta cauta Gould, 1841	Tasmanian Albatross, White-capped mollymawk	Fauna	Birds	Birds	Non-resident Native	Vagrant	Marine
Tringa brevipes (Vieillot, 1816)	Grey-tailed Tattler, Gray-tailed Tattler, Siberian (Grey-tailed) Tattler	Fauna	Birds	Birds	Non-resident Native	Vagrant	Coastal
Tringa cinerea Guldenstaedt, 1774	Terek Sandpiper	Fauna	Birds	Birds	Non-resident Native	Vagrant	Coastal
Tringa hypoleucos Linnaeus, 1758	Common Sandpiper	Fauna	Birds	Birds	Non-resident Native	Vagrant	Coastal
Tringa incana (Gmelin, 1789)	Wandering Tattler	Fauna	Birds	Birds	Non-resident Native	Vagrant	Coastal
Tringa stagnatilis (Bechstein, 1803)	Marsh Sandpiper	Fauna	Birds	Birds	Non-resident Native	Vagrant	Coastal
Carcharodon carcharias (Linnaeus, 1758)	Great white shark/white pointer	Fauna	Fish	Sharks and Rays	Threatened	Nationally Endangered	Marine
Cephaloziella invisa R.M.Schust.	liverwort	Flora	Hornworts and Liverworts	Hornworts and Liverworts	Data Deficient	Data Deficient	No direct link to freshwater bodies

Cephaloziella muelleriana R.M.Schust.	liverwort	Flora	Hornworts and Liverworts	Hornworts and Liverworts	Data Deficient	Data Deficient	No direct link to freshwater bodies
Chiloscyphus erosus J.J. Engel	liverwort	Flora	Hornworts and Liverworts	Hornworts and Liverworts	At Risk	Naturally Uncommon	No direct link to freshwater bodies
Herzogianthus vaginatus (Herzog) R.M.Schust.	liverwort	Flora	Hornworts and Liverworts	Hornworts and Liverworts	At Risk	Naturally Uncommon	No direct link to freshwater bodies
Lejeunea helmsiana Steph.	liverwort	Flora	Hornworts and Liverworts	Hornworts and Liverworts	At Risk	Naturally Uncommon	No direct link to freshwater bodies
Metzgeria crassipilis (Lindb.) A.Evans	liverwort	Flora	Hornworts and Liverworts	Hornworts and Liverworts	At Risk	Naturally Uncommon	No direct link to freshwater bodies
Microlejeunea filicuspis (Steph.) Heinrichs, Schäf.-Verw., Pócs & S.Dong	liverwort	Flora	Hornworts and Liverworts	Hornworts and Liverworts	At Risk	Naturally Uncommon	No direct link to freshwater bodies
Phaeomegaceros aff. hirticalyx (a) (CHR 689565; Whanganui River)	hornwort	Flora	Hornworts and Liverworts	Hornworts and Liverworts	At Risk	Naturally Uncommon	No direct link to freshwater bodies
Riccia bullosa Link	liverwort	Flora	Hornworts and Liverworts	Hornworts and Liverworts	Data Deficient	Data Deficient	Exotic
Calliphora hilli Patton, 1925		Fauna	Invertebrates	Flies	At Risk	Naturally Uncommon	No direct link to freshwater bodies
Celaenia olivacea (Urquhart, 1885)	orbweaver spider	Fauna	Invertebrates	Spiders and Harvestmen	Data Deficient	Data Deficient	No direct link to freshwater bodies
Cermatulus nasalis	Pentatomidae	Fauna	Invertebrates	Bugs	At Risk	Naturally Uncommon	No direct link to freshwater bodies
Chorebus thorpei Berry, 2007		Fauna	Invertebrates	Wasps, bees and ants	Data Deficient	Data Deficient	No direct link to freshwater bodies
Latrodectus katipo Powell, 1871	katipō, katipō, katipo	Fauna	Invertebrates	Spiders and Harvestmen	At Risk	Declining	No direct link to freshwater bodies
Neoscona orientalis (Urquhart, 1887)	orbweaver spider	Fauna	Invertebrates	Spiders and Harvestmen	Data Deficient	Data Deficient	No direct link to freshwater bodies
Orthodera novaezealandiae (Colenso, 1882)		Fauna	Invertebrates	Other	At Risk	Declining	No direct link to freshwater bodies

Schizoglossa worthyae Powell, 1949	Snail	Fauna	Invertebrates	Snails and Limpets	Threatened	Nationally Vulnerable	No direct link to freshwater bodies
Chaenotheca degelii Tibell		Flora	Lichens	Lichens	At Risk	Naturally Uncommon	No direct link to freshwater bodies
Cladia inflata (F.Wilson) D.J.Galloway		Flora	Lichens	Lichens	At Risk	Declining	No direct link to freshwater bodies
Crocodia poculifera (Müll.Arg.) D.J.Galloway & Elix	lichen	Flora	Lichens	Lichens	At Risk	Naturally Uncommon	No direct link to freshwater bodies
Leptogium coralloideum (Meyen & Flot.) Vain.		Flora	Lichens	Lichens	At Risk	Naturally Uncommon	No direct link to freshwater bodies
Multiclavula mucida (Pers.) R.H. Petersen		Flora	Lichens	Lichens	Data Deficient	Data Deficient	No direct link to freshwater bodies
Pannaria subcrustacea (Räsänen) P.M.Jørg.		Flora	Lichens	Lichens	Data Deficient	Data Deficient	No direct link to freshwater bodies
Parmotrema cristiferum (Taylor) Hale		Flora	Lichens	Lichens	Data Deficient	Data Deficient	No direct link to freshwater bodies
Parmotrema robustum (Degel.) Hale		Flora	Lichens	Lichens	At Risk	Naturally Uncommon	No direct link to freshwater bodies
Pseudocyphellaria intricata (Delise) Vain.	lichen	Flora	Lichens	Lichens	At Risk	Naturally Uncommon	No direct link to freshwater bodies
Punctelia perreticulata (Räsänen) G.Wilh. & Ladd		Flora	Lichens	Lichens	At Risk	Naturally Uncommon	No direct link to freshwater bodies
Sticta babingtonii D.J.Galloway	lichen	Flora	Lichens	Lichens	At Risk	Declining	No direct link to freshwater bodies
Sticta caliginosa D.J.Galloway	lichen	Flora	Lichens	Lichens	At Risk	Naturally Uncommon	No direct link to freshwater bodies
Teloschistes sieberianus (Laurer) Hillmann		Flora	Lichens	Lichens	At Risk	Naturally Uncommon	No direct link to freshwater bodies
Usnea nidifica Taylor		Flora	Lichens	Lichens	At Risk	Naturally Uncommon	No direct link to freshwater bodies
Usnea trichodeoides Motyka		Flora	Lichens	Lichens	Data Deficient	Data Deficient	No direct link to freshwater bodies

Fissidens hylogenes Dixon		Flora	Mosses	Mosses	At Risk	Naturally Uncommon	No direct link to freshwater bodies
Fissidens hyophilus Mitt.		Flora	Mosses	Mosses	At Risk	Naturally Uncommon	No direct link to freshwater bodies
Aciphylla aff. squarrosa (a) (AK 44773; Volcanic Plateau)	Flora	Plants		Plants	At Risk	Declining	No direct link to freshwater bodies
Agathis australis (D.Don) Lindl. ex Loudon	kauri, kauri pine	Flora	Plants	Plants	Threatened	Nationally Vulnerable	No direct link to freshwater bodies
Alseuosmia pusilla Colenso		Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Anaphalioides subrigida (Colenso) Anderb.		Flora	Plants	Plants	At Risk	Naturally Uncommon	No direct link to freshwater bodies
Anthosachne kingiana subsp. multiflora (Banks & Sol. ex Hook.f.) Govaerts	blue grass, blue wheat grass	Flora	Plants	Plants	At Risk	Declining	No direct link to freshwater bodies
Anthosachne solandri (Steud.) Barkworth & S.W.L.Jacobs	native wheatgrass, blue wheatgrass	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Archeria racemosa Hook.f.		Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Ascarina lucida Hook.f. var. lucida	Hutu	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Asplenium cimmeriorum Brownsey & de Lange	cave spleenwort	Flora	Plants	Plants	At Risk	Naturally Uncommon	No direct link to freshwater bodies
Asplenium lamprophyllum Carse		Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Austroblechnum norfolkianum (Heward) Gasper & V.A.O.Dittrich		Flora	Plants	Plants	At Risk	Naturally Uncommon	No direct link to freshwater bodies

Austrostipa stipoides (Hook.f.) S.W.L.Jacobs & J.Everett	coastal immorality grass, buggar grass	Flora	Plants	Plants	Not Threatened	Not Threatened	Coastal
Azorella allanii (Cheeseman) G.M.Plunkett & A.N.Nicolas		Flora	Plants	Plants	At Risk	Naturally Uncommon	No direct link to freshwater bodies
Beilschmiedia tarairi (A.Cunn.) Benth. & Hook.f. ex Kirk	Taraire	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Brachyglottis elaeagnifolia (Hook.f.) B.Nord.		Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Brachyglottis kirkii (Hook.f. ex Kirk) C.J.Webb var. kirkii	Kohurangi, Kirk's daisy	Flora	Plants	Plants	Threatened	Nationally Vulnerable	No direct link to freshwater bodies
Brachyglottis perdicioides (Hook.f.) B.Nord.	Raukumara	Flora	Plants	Plants	Threatened	Nationally Critical	No direct link to freshwater bodies
Bulbophyllum tuberculatum Colenso		Flora	Plants	Plants	At Risk	Naturally Uncommon	No direct link to freshwater bodies
Caladenia bartlettii (Hatch) D.L.Jones, Molloy & M.A.Clem.		Flora	Plants	Plants	At Risk	Naturally Uncommon	No direct link to freshwater bodies
Caladenia minor Hook.f.	Caladenia	Flora	Plants	Plants	Data Deficient	Data Deficient	No direct link to freshwater bodies
Caladenia variegata Colenso		Flora	Plants	Plants	At Risk	Naturally Uncommon	No direct link to freshwater bodies
Carex inversa R.Br.	creeping lawn sedge	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Carex raoulii Boott	Coastal forest sedge, Raoul's sedge	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Carmichaelia williamsii Kirk	William's Broom, Giant-flowered broom	Flora	Plants	Plants	At Risk	Relict	No direct link to freshwater bodies
Cheilanthes sieberi Kunze	rock fern	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies

Chiloglottis valida D.L.Jones	Bird Orchid, Ant Orchid	Flora	Plants	Plants	Non-resident Native	Vagrant	No direct link to freshwater bodies
Chionochloa flavicans Zotov f. flavicans	snow tussock	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Christella aff. dentata (b) (AK 126902; "thermal")		Flora	Plants	Plants	Threatened	Nationally Endangered	No direct link to freshwater bodies
Clematis quadribracteolata Colenso		Flora	Plants	Plants	At Risk	Naturally Uncommon	No direct link to freshwater bodies
Clianthus maximus Colenso	kakabeak, kowhai ngutu-kaka, kaka beak	Flora	Plants	Plants	Threatened	Nationally Critical	No direct link to freshwater bodies
Clianthus puniceus (G.Don) Sol. ex Lindl.	Kakabeak, kowhai ngutu kaka, kaka beak	Flora	Plants	Plants	Threatened	Nationally Critical	No direct link to freshwater bodies
Colobanthus affinis (Hook.) Hook.f.		Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Connorochloa tenuis (Buchanan) Barkworth, S.W.L.Jacobs & H.Q.Zhang	prostrate bluegrass	Flora	Plants	Plants	Data Deficient	Data Deficient	No direct link to freshwater bodies
Coprosma acerosa A.Cunn.	sand Coprosma	Flora	Plants	Plants	At Risk	Declining	No direct link to freshwater bodies
Coprosma aff. acerosa (a) (AK 158739; Central North Island)		Flora	Plants	Plants	At Risk	Declining	No direct link to freshwater bodies
Coprosma arborea Kirk	mamangi, tree Coprosma	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Coprosma areolata Cheeseman	thin-leaved Coprosma	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Coprosma brunnea (Kirk) Cockayne ex Cheeseman		Flora	Plants	Plants	At Risk	Declining	No direct link to freshwater bodies
Coprosma crassifolia Colenso		Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Coprosma dodonaeifolia W.R.B.Oliv.		Flora	Plants	Plants	At Risk	Naturally Uncommon	No direct link to freshwater bodies

Coprosma macrocarpa subsp. minor A.P.Druce ex R.O.Gardner & Heads		Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Cordyline pumilio Hook.f.	dwarf cabbage tree, ti koraha, ti rauriki	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Coriaria pottsiana W.R.B.Oliv.		Flora	Plants	Plants	At Risk	Naturally Uncommon	No direct link to freshwater bodies
Corokia buddleioides A.Cunn. var. buddleioides	korokio	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Corybas cheesemanii (Hook.f. ex Kirk) Kuntze	Helmet Orchid, Cheesemans Spider Orchid	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Crassula colligata Toelken subsp. colligata		Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Dactylanthus taylorii Hook.f.	Wood rose, pua o te reinga, flower of Hades	Flora	Plants	Plants	Threatened	Nationally Vulnerable	No direct link to freshwater bodies
Daucus glochidiatus (Labill.) Fisch., C.A.Mey. & Avé-Lall.	native carrot, New Zealand carrot	Flora	Plants	Plants	At Risk	Declining	No direct link to freshwater bodies
Deyeuxia quadriseta (Labill.) Benth.		Flora	Plants	Plants	At Risk	Declining	No direct link to freshwater bodies
Dichelachne inaequiglumis (Hack.) Edgar & Connor	short-hair plume grass	Flora	Plants	Plants	At Risk	Naturally Uncommon	No direct link to freshwater bodies
Doodia squarrosa Colenso		Flora	Plants	Plants	At Risk	Naturally Uncommon	No direct link to freshwater bodies
Drymoanthus flavus St George & Molloy	Little spotted moa	Flora	Plants	Plants	At Risk	Declining	No direct link to freshwater bodies
Epilobium astonii (Allan) P.H.Raven & Engelhorn	Aston's willowherb	Flora	Plants	Plants	At Risk	Naturally Uncommon	No direct link to freshwater bodies
Epilobium glabellum G.Forst.	willowherb	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Epilobium gracilipes Kirk	willowherb	Flora	Plants	Plants	At Risk	Naturally Uncommon	No direct link to freshwater bodies

Epilobium hectorii Hausskn.	willowherb	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Epilobium hirtigerum A.Cunn.	hairy willowherb	Flora	Plants	Plants	At Risk	Recovering	No direct link to freshwater bodies
Festuca luciarum Connor	Fescue	Flora	Plants	Plants	At Risk	Naturally Uncommon	No direct link to freshwater bodies
Ficinia spiralis (A.Rich.) Muasya & de Lange	pingao, golden sand sedge, pikao	Flora	Plants	Plants	At Risk	Declining	No direct link to freshwater bodies
Fuchsia procumbens A.Cunn.	creeping fuchsia, climbing or trailing fuchsia	Flora	Plants	Plants	At Risk	Naturally Uncommon	No direct link to freshwater bodies
Gahnia lacera (A.Rich.) Steud.	cutty grass	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Geranium solanderi Carolin	Solanders geranium	Flora	Plants	Plants	At Risk	Declining	No direct link to freshwater bodies
Gonocarpus aggregatus (Buchanan) Orchard		Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Hymenophyllum armstrongii (Baker) Kirk	Filmy fern	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Hymenophyllum lyallii Hook.f.	Filmy fern	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Hymenophyllum malingii (Hook.) Mett.	Filmy fern	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Hymenophyllum minimum A.Rich.	Filmy fern	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Hymenophyllum revolutum Colenso	Filmy fern	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Hymenophyllum villosum Colenso	Hairy filmy fern	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Ipomoea cairica (L.) Sweet	pouwhiwhi, coastal morning glory, railway creeper	Flora	Plants	Plants	At Risk	Naturally Uncommon	No direct link to freshwater bodies
Kunzea linearis (Kirk) de Lange & Toelken	rawiri manuka	Flora	Plants	Plants	Threatened	Nationally Vulnerable	No direct link to freshwater bodies
Kunzea robusta de Lange & Toelken	manuka, kanuka, kopuka, rawirinui, maru, manuka rauriki	Flora	Plants	Plants	Threatened	Nationally Vulnerable	No direct link to freshwater bodies
Kunzea serotina de Lange & Toelken	makahikatoa	Flora	Plants	Plants	Threatened	Nationally Vulnerable	No direct link to freshwater bodies

Kunzea toelkenii de Lange		Flora	Plants	Plants	Threatened	Nationally Critical	No direct link to freshwater bodies
Lachnagrostis pilosa (Buchanan) Edgar subsp. pilosa	robust wind grass	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Lagenophora cuneata Petrie		Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Leionema nudum (Hook.) Paul G.Wilson	Mairehau	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Lepidium oleraceum G.Forst. ex Sparrm.	Nau, Cooks scurvy grass	Flora	Plants	Plants	Threatened	Nationally Endangered	No direct link to freshwater bodies
Libertia ixioides (G.Forst.) Spreng.	Mikoikoi, NZ iris	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Luzula banksiana E.Mey. var. banksiana	Coastal woodrush	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Luzula banksiana var. migrata (Buchenau) Edgar	woodrush	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Melicope ternata J.R.Forst. & G.Forst.	Wharangi	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Meryta sinclairii (Hook.f.) Seem.	Pukanui, Puka	Flora	Plants	Plants	At Risk	Naturally Uncommon	No direct link to freshwater bodies
Metrosideros albiflora Sol. ex Gaertn.	white rata, akatea	Flora	Plants	Plants	Threatened	Nationally Vulnerable	No direct link to freshwater bodies
Metrosideros carminea W.R.B.Oliv.	Crimson rata, Carmine rata	Flora	Plants	Plants	Threatened	Nationally Vulnerable	No direct link to freshwater bodies
Metrosideros colensoi Hook.f.	Rata	Flora	Plants	Plants	Threatened	Nationally Vulnerable	No direct link to freshwater bodies
Metrosideros diffusa (G.Forst.) Sm.	white rata	Flora	Plants	Plants	Threatened	Nationally Vulnerable	No direct link to freshwater bodies
Metrosideros excelsa Sol. ex Gaertn.	Pohutukawa, New Zealand Christmas tree	Flora	Plants	Plants	Threatened	Nationally Vulnerable	No direct link to freshwater bodies
Metrosideros fulgens Sol. ex Gaertn.	rata, akatawhiwhi	Flora	Plants	Plants	Threatened	Nationally Vulnerable	No direct link to freshwater bodies
Metrosideros kermadecensis W.R.B.Oliv.	Kermadec pohutukawa	Flora	Plants	Plants	Threatened	Nationally Critical	No direct link to freshwater bodies

Metrosideros perforata (J.R.Forst. & G.Forst.) A.Rich.	white rata, akatorotoro, akatea	Flora	Plants	Plants	Threatened	Nationally Vulnerable	No direct link to freshwater bodies
Metrosideros robusta A.Cunn.	Northern rata	Flora	Plants	Plants	Threatened	Nationally Vulnerable	No direct link to freshwater bodies
Metrosideros umbellata Cav.	Southern rata	Flora	Plants	Plants	Threatened	Nationally Vulnerable	No direct link to freshwater bodies
Muehlenbeckia ephedroides Hook.f.	Leafless pohuehue, leafless muehlenbeckia, Twigs	Flora	Plants	Plants	Threatened	Nationally Vulnerable	No direct link to freshwater bodies
Myosotis saxosa Hook.f.		Flora	Plants	Plants	Threatened	Nationally Critical	No direct link to freshwater bodies
Nestegis montana (Hook.f.) L.A.S.Johnson	Narrow-leaved maire	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Olearia albida (Hook.f.) Hook.f.		Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Olearia ilicifolia Hook.f.	mountain holly	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Olearia pachyphylla Cheeseman	thick-leaved tree daisy	Flora	Plants	Plants	Threatened	Nationally Critical	No direct link to freshwater bodies
Olearia paniculata (J.R.Forst. & G.Forst.) Druce	Akiraho, golden akeake	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Olearia solandri (Hook.f.) Hook.f.	Coastal tree daisy	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Oxalis rubens Haw.		Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Oxybasis ambigua (R.Br.) de Lange et Mosyakin		Flora	Plants	Plants	At Risk	Declining	No direct link to freshwater bodies
Pelargonium inodorum Willd.	kopata	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Pellaea aff. falcata (b) (AK 330788; "Auckland volcanoes")		Flora	Plants	Plants	Threatened	Nationally Critical	No direct link to freshwater bodies
Picris burbidgeae S.Holzapfel	Native Oxtongue	Flora	Plants	Plants	Threatened	Nationally Vulnerable	No direct link to freshwater bodies

Pimelea longifolia Sol. ex Wikstr.	Long-leaved pimelea	Flora	Plants	Plants	At Risk	Declining	No direct link to freshwater bodies
Pimelea orthia C.J.Burrows & Thorsen subsp. orthia	Pimelea	Flora	Plants	Plants	Threatened	Nationally Critical	No direct link to freshwater bodies
Pimelea tomentosa (J.R.Forst. & G.Forst.) Druce		Flora	Plants	Plants	Threatened	Nationally Vulnerable	No direct link to freshwater bodies
Pimelea villosa Sol. ex Sm.	sand daphne, autetaranga, toroheke, sand pimelea	Flora	Plants	Plants	At Risk	Declining	No direct link to freshwater bodies
Piper excelsum subsp. peltatum (R.O.Gardner) de Lange	kawakawa, pepper tree	Flora	Plants	Plants	At Risk	Naturally Uncommon	No direct link to freshwater bodies
Pittosporum ellipticum Kirk		Flora	Plants	Plants	At Risk	Naturally Uncommon	No direct link to freshwater bodies
Pittosporum kirkii Hook.f. ex Kirk	Kirkâ€™s kohuhu, thick-leaved kohukohu	Flora	Plants	Plants	At Risk	Declining	No direct link to freshwater bodies
Pittosporum ralphii Kirk	Karo	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Plectranthus parviflorus Willd.	Cockspur Flower	Flora	Plants	Plants	Non-resident Native	Coloniser	No direct link to freshwater bodies
Poa billardierei (Spreng.) St.-Yves	Sand tussock, hinarepe	Flora	Plants	Plants	At Risk	Declining	Coastal
Pomaderris apetala subsp. maritima N.G.Walsh & F.Coates	Tainui, New Zealand hazel	Flora	Plants	Plants	Threatened	Nationally Critical	No direct link to freshwater bodies
Pomaderris phylicifolia Lodd. ex Link subsp. phylicifolia	Tauhinu	Flora	Plants	Plants	Threatened	Nationally Critical	No direct link to freshwater bodies
Pseudopanax laetus (Kirk) Philipson		Flora	Plants	Plants	At Risk	Declining	No direct link to freshwater bodies
Psilotum nudum (L.) P.Beauv.	whisk fern, skeleton fork fern	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Pteris saxatilis (Carse) Carse		Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies

Pterostylis agathicola D.L.Jones, Molloy & M.A.Clem.	Kauri greenhood	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Pterostylis porrecta D.L.Jones, Molloy & M.A.Clem.	Shrimp-flowered Greenhood	Flora	Plants	Plants	At Risk	Naturally Uncommon	No direct link to freshwater bodies
Ranunculus acaulis Banks & Sol. ex DC.	sand buttercup, shore buttercup	Flora	Plants	Plants	Not Threatened	Not Threatened	Coastal
Raoulia australis Hook.f. ex Raoul	Common mat daisy	Flora	Plants	Plants	At Risk	Declining	No direct link to freshwater bodies
Raukaua edgerleyi (Hook.f.) Seem.	raukawa	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Rorippa divaricata (Hook.f.) Garn.-Jones & Jonsell	New Zealand water cress, Matangaoa	Flora	Plants	Plants	Threatened	Nationally Vulnerable	No direct link to freshwater bodies
Rubus squarrosus Fritsch	Leafless lawyer, yellow-prickled lawyer	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Rytidosperma biannulare (Zotov) Connor & Edgar	gumland bristle grass	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Rytidosperma merum Connor & Edgar	Slender bristle grass	Flora	Plants	Plants	At Risk	Declining	No direct link to freshwater bodies
Rytidosperma viride (Zotov) Connor & Edgar		Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Scandia aff. rosifolia (AK 344466; "inland")		Flora	Plants	Plants	At Risk	Declining	No direct link to freshwater bodies
Scandia rosifolia (Hook.f.) J.W.Dawson	Koheriki	Flora	Plants	Plants	Threatened	Nationally Critical	No direct link to freshwater bodies
Scleranthus biflorus (J.R.Forst. & G.Forst.) Hook.f.	Canberra grass	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Scleranthus uniflorus P.A.Will.		Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Senecio banksii Hook.f.		Flora	Plants	Plants	At Risk	Naturally Uncommon	No direct link to freshwater bodies
Senecio biserratus Belcher	fireweed	Flora	Plants	Plants	At Risk	Declining	No direct link to freshwater bodies

Senecio esleri C.J.Webb	Esler's fireweed	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Senecio glomeratus Poir. subsp. glomeratus	fireweed	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Senecio hispidulus A.Rich.	fireweed	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Senecio rufiglandulosus Colenso		Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Senecio scaberulus (Hook.f.) D.G.Drury	fireweed	Flora	Plants	Plants	Threatened	Nationally Critical	No direct link to freshwater bodies
Senecio wairauensis Belcher	Mountain fireweed	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Sicyos australis Endl.	ambush vine	Flora	Plants	Plants	At Risk	Naturally Uncommon	No direct link to freshwater bodies
Sicyos mawhai I.Telford & P.Sebastian	mawhai, ambush vine	Flora	Plants	Plants	At Risk	Relict	No direct link to freshwater bodies
Solanum aviculare G.Forst. var. aviculare	poroporo	Flora	Plants	Plants	Threatened	Nationally Vulnerable	No direct link to freshwater bodies
Solanum laciniatum Aiton	poroporo, bullibulli	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Solanum opacum A.Braun & Bouché	small-flowered nightshade	Flora	Plants	Plants	Data Deficient	Data Deficient	No direct link to freshwater bodies
Sonchus kirkii Hamlin	Puha, shore puha, New Zealand sow thistle	Flora	Plants	Plants	At Risk	Declining	Coastal
Sophora fulvida (Allan) Heenan & de Lange	kowhai	Flora	Plants	Plants	At Risk	Naturally Uncommon	No direct link to freshwater bodies
Spergularia tasmanica (Kindb.) L.G.Adams	New Zealand sea spurrey, native sea spurrey	Flora	Plants	Plants	Not Threatened	Not Threatened	Coastal
Stackhousia minima Hook.f.		Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Suaeda novae-zelandiae Allan	Sea blite	Flora	Plants	Plants	Not Threatened	Not Threatened	Coastal
Tetragonia tetragonoides (Pall.) Kuntze	kokihi, New Zealand spinach, tutae-ikamoana	Flora	Plants	Plants	At Risk	Naturally Uncommon	Coastal

Thelymitra colensoi Hook.f.	Colenso's sun orchid	Flora	Plants	Plants	Data Deficient	Data Deficient	No direct link to freshwater bodies
Thelymitra nervosa Colenso	Spotted sun orchid, sun orchid	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Thelymitra tholiformis Molloy & Hatch	Domed Sun Orchid	Flora	Plants	Plants	At Risk	Naturally Uncommon	No direct link to freshwater bodies
Trisetum arduanum Edgar & A.P.Druce		Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Veronica corriganii (Carse) Garn.-Jones	Hebe	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Veronica hookeriana Walp.	Hooker's speedwell, Hooker's parahebe	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Veronica plebeia R.Br.		Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Veronica speciosa R.Cunn. ex A.Cunn.	Napuka, Titirangi	Flora	Plants	Plants	At Risk	Declining	No direct link to freshwater bodies
Veronica tairawhiti (B.D.Clarkson & Garn.-Jones) Garn.-Jones	Wairoa koromiko	Flora	Plants	Plants	At Risk	Naturally Uncommon	No direct link to freshwater bodies
Viola lyallii Hook.f.	Haaka, New Zealand native violet	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Vittadinia australis A.Rich.	white fuzzweed	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Wahlenbergia pygmaea subsp. pygmaea Colenso	North Island harebell	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Zostera muelleri subsp. novazelandica (Setch.) S.W.L.Jacobs	seagrass, eelgrass, nana, Zostera	Flora	Plants	Plants	At Risk	Declining	Coastal
Zoysia pauciflora Mez	zoysia	Flora	Plants	Plants	Not Threatened	Not Threatened	No direct link to freshwater bodies
Dactylocnemis pacificus (Gray, 1842)	Pacific Gecko	Fauna	Reptiles	Geckos	At Risk	Relict	No direct link to freshwater bodies
Dermochelys coriacea (Vandelli, 1761)	Leatherback, Coffin-back, Leatherback Sea Turtle, Leathery Turtle, Luth, Trunkback Turtle, Trunk Turtle	Fauna	Reptiles	Turtles & Tortoises	Non-resident Native	Migrant	Marine

Hoplodactylus duvaucelii (Dumeril & Bibron, 1836)	Duvaucel's Gecko	Fauna	Reptiles	Geckos	At Risk	Relict	No direct link to freshwater bodies
Mokopirirakau granulatus (Gray, 1845)	Forest Gecko	Fauna	Reptiles	Geckos	At Risk	Declining	No direct link to freshwater bodies
Naultinus elegans Gray, 1842	Auckland Green Gecko	Fauna	Reptiles	Geckos	At Risk	Declining	No direct link to freshwater bodies
Naultinus punctatus Gray, 1842	Wellington Green gecko	Fauna	Reptiles	Geckos	At Risk	Declining	No direct link to freshwater bodies
Oligosoma "Whirinaki"	Whirinaki Skink	Fauna	Reptiles	Skinks	Threatened	Nationally Critical	No direct link to freshwater bodies
Oligosoma infrapunctatum (Boulenger, 1887)	Speckled Skink	Fauna	Reptiles	Skinks	At Risk	Declining	No direct link to freshwater bodies
Oligosoma ornatum (Gray, 1843)	Ornate Skink	Fauna	Reptiles	Skinks	At Risk	Declining	No direct link to freshwater bodies
Oligosoma smithi (Gray, 1845)	Shore Skink	Fauna	Reptiles	Skinks	At Risk	Naturally Uncommon	No direct link to freshwater bodies
Oligosoma striatum (Buller, 1871)	Striped Skink	Fauna	Reptiles	Skinks	At Risk	Declining	No direct link to freshwater bodies
Mirounga leonina (Linnaeus, 1758)	southern elephant seal	Fauna	Seals and Sea lions	Seals and Sea lions	Threatened	Nationally Critical	Marine
Orcinus orca (Linnaeus, 1758)	orca	Fauna	Whales, Dolphins and Porpoises	Dolphins	Threatened	Nationally Critical	Marine
Philanisus mataua Ward, 1995	Fauna	Invertebrates			At Risk	Naturally Uncommon	Marine
Euphorbia glauca G.Forst.	shore spurge, sea spurge, waiu-atua, sand milkweed	Flora	Plants	Plants	At Risk	Declining	Coastal

8 Knowledge gaps, identifying data poor areas and metadataset errors

The list and map of candidate freshwater-dependent species in the Bay of Plenty Region contains bias. There is considerable taxonomic bias in which species are recorded (Table 9), an effect partly compounded by the lack of people with sufficient experience to accurately identify less-represented taxonomic groups, or difficult to identify life forms (such as grasses). A temporal bias towards more recent observations is also present due to an increase in the ease of recording biodiversity observations resulting from the development of electronic databasing and data capture tools and the rise in usage of citizen science biodiversity recording systems such as eBird and iNaturalist.

Table 9. Taxonomic bias in observations of freshwater-dependent species in the Bay of Plenty Region.

Taxonomic Group	***Number of Species***	***Number of Observations***
Bats	1	11
Birds	52	16,324
Fish	10	1,731
Frogs	1	2
Hornworts and Liverworts	5	24
Invertebrates	15	78
Lichens	2	5
Mosses	1	2
Plants	214	3,503

There are several potential other sources of error in the metadataset that this analysis uses. The analysis is dependent on accurate identification of species identity and correctly recorded locations in the source datasets. Obvious errors in identity were removed from analysis, but it is not possible to confirm the identity of each species record without querying the original data record and probably the original observer.

The metadataset is based on datasets that mainly contain 'incidental' records in that someone observed something that they thought was worthy of recording. For this reason, the datasets contain

inherent bias towards recording 'notable' species and the composition of records in the dataset indicate that birds over-recorded and invertebrates under-recorded. There is also probable spatial bias in that remote areas are under-sampled and 'popular' biodiversity areas, particularly those near towns and cities, are over-sampled.

Blank areas in the map may mean that the area has not been examined.

Matauranga Maori which could provide valuable observations over extended period of time, are not generally included in these records. This can be considered as a gap in the accessible data.

9 Next steps

The recommended next steps in the process of fulfilling the requirements in the NOF is to critically evaluate the detail (possibly involving examining the original record or querying the original recorder) in the dataset generated in this exercise to select locality records of Threatened species where there is higher probability of persistence of the population at the site. A field examination will then be required to both assess the status (including trend) of the threatened species at the site and to assess the quality of its habitat and the processes that are threatening that habitat. An assessment on whether the habitat qualifies as 'critical habitat' can be undertaken based on the field examinations performed throughout New Zealand. An Action Plan will be required that covers each species or site identified as containing critical habitat. The Action Plan may take the form of a site management plan, species management plan or habitat management plan (or other plan). This plan will require full description of the management actions and resources required to safeguard (and ideally improve) the critical habitat.

Appendix 1. List of Threatened Freshwater-Dependent Species

See file: BOPRC_ThreatenedFreshwaterDependentSpeciesList.xlsx

Appendix 2. List of freshwater-dependent species of conservation interest

See file: BOPRC_ConservationInterestFreshwaterDependentSpeciesList.xlsx

Appendix 3. Observations of freshwater-dependent species in the Bay of Plenty Region.

See spreadsheet and GIS files: BOP_FWD_SpeciesObservations_20220202.

Appendix 4. Descriptions of spreadsheet column headers

9.1 Description of column information in spreadhseet files: BOPRC_ThreatenedFreshwaterDependentSpeciesList.xlsx & BOPRC_ConservationInterestFreshwaterDependentSpeciesList.xlsx

Column Header	Description of column information
NameCurren	The current taxonomic name and naming authority as used in the NZTCS.
NameSimple	The current taxonomic name excluding naming authority as used in the NZTCS.
NameCommon	Common name(s) of the species (if any)
Environment	The predominant environment inhabited by the species (Marine, Terrestrial or Freshwater)
Taxonomic_	The higher-order taxonomic grouping of the species (Flora, Fauna)
Taxonomi_1	The main taxonomic grouping of the species (Bats, Birds, Fish, Invertebrates, Plants)
Taxonomi_2	A finer-scale taxonomic grouping of the species for large groups (such as invertebrates) in Taxonomic_1 if needed (otherwise inherits value of Taxonomic_1).
BioStatus_	Whether the species is Indigenous (also found outside of NZ, or Endemic), if known.
ThreatCate	The NZTCS Threat Category (Threatened, At Risk, Data Deficient, Non-resident Native, Not Threatened) of the species.
ThreatStat	The NZTCS Threat Status of the species.
ThreatCrit	The Criteria for which the species qualifies for Threat Status in the NZTCS (refer to NZTCS manual and updates for descriptors of these criteria).
ObligateFW	If this species is considered to qualify as an obligate freshwater inhabitant in Criteria A of Section 6.2.
FAC_LifeCycle	If this species is considered to inhabit freshwater habitats for part of its life cycle in Criteria B of Section 6.2.
FAC_Occ	Some individuals of this species have been recorded temporarily or occasionally using freshwater habitats for activities important in maintaining health and wellbeing such as feeding, drinking, or bathing in Criteria C of Section 6.2.
FAC_Distribution	The species is known to inhabit freshwater habitats in addition to other non-freshwater habitats in Criteria E of Section 6.2.
NZTCS_FW	The species is listed as a 'freshwater' species during NZ Threat Classification Assessments as in Criteria D of Section 6.2.
Mapped_FW	Some individuals of this species are mapped as occurring within the mapped extent of freshwater, but their link to freshwater is not known as in Criteria F of Section 6.2.
FW_Buffer	Some individuals of this species are mapped as occurring within the buffer of the mapped extent of freshwater, but their link to freshwater is not known as in Criteria F of Section 6.2.
FW_Sp	Whether the species qualifies as a freshwater-dependent species by meeting one or more of Criteria A-F of Section 6.2.
Clarkson	The Wetland Indicator Status of the species as listed in Clarkson et al. (2021), New Zealand Plant List 2021 (Plants only). see: https://datastore.landcareresearch.co.nz/dataset/nz-wetland-plant-indicator-status-ratings-2021
Lacustrine	Whether the species occupies wetland habitats within the Lacustrine hydrosystem.
Palustrine	Whether the species occupies wetland habitats within the Palustrine hydrosystem.
Riverine	Whether the species occupies wetland habitats within the Riverine hydrosystem.
Geothermal	Whether the species occupies wetland habitats within the Geothermal hydrosystem.
Estuarine	Whether the species occupies wetland habitats within the Estuarine hydrosystem.

Notes	Notes and links to information supporting categorisation(s) of the species.
Excluded	Whether the species has been excluded from the list of freshwater-dependent species.
ExclNote	The reason why the species has been excluded from the list of freshwater-dependent species.
Quantity	Whether the species, or the habitat it occupies, is reliant on the quantity of water (including dependence on seasonal variation in water quantity) at the sites it inhabits.
UpQuality	Whether the species, or the habitat it occupies, is reliant on the quality of water arriving from upstream at the sites it inhabits.
Passage	Whether the species, or the habitat it occupies, is reliant on a continuous water passage to the sites it inhabits.
Weeds	Whether the continued presence of a species at sites is often threatened by terrestrial weeds.
PestsLand	Whether the continued presence of a species at sites is often threatened by terrestrial pest animals such as possums, rodents, rabbits, etc.
PestAquatic	Whether the continued presence of a species at sites is often threatened by aquatic weeds or aquatic pest animals.
NumRecords	The number of observations within the Bay of Plenty of this species in the metadataset.

9.2 Description of column information in spreadsheet and GIS files: BOP_FWD_SpeciesObservations_20220202.

Column Header	Description of column information
DatabaseNu	A unique identifier code within the metadatase.
DatabaseSc	The scale of the source dataset (region or national).
Source	The source dataset of the observation.
Accessed	Date observation obtained from the source dataset
NZTM E	Coordinate of observation (obscured for species and landowner security reasons).
NZTM S	Coordinate of observation (obscured for species and landowner security reasons).
ID	The ID number used in the source dataset of observation.
NameOrigin	The name of the species as used in the source dataset.
NameCurren	The current taxonomic name and naming authority as used in the NZTCS.
NameSimple	The current taxonomic name excluding naming authority as used in the NZTCS.
NameCommon	Common name(s) of the species (if any)
Date	The date on which the observation was made.
Year	The year on which the observation was made.
Locality	The locality where the observation was made (if given).
Observer	The name of user code of the person(s) who made the observation.
Notes	Notes provided as part of the observation.
Count	A count of the number of individuals observed (if given).
Environmen	The predominant environment inhabited by the species (Marine, Terrestrial or Freshwater)
Taxonomic_	The higher-order taxonomic grouping of the species (Flora, Fauna)
Taxonomi_1	The main taxonomic grouping of the species (Bats, Birds, Fish, Invertebrates, Plants)
Taxonomi_2	A finer-scale taxonomic grouping of the species for large groups (such as invertebrates) in Taxonomic_1 if needed (otherwise inherits value of Taxonomic_1).
BioStatus_	Whether species is Indigenous (also found outside of NZ, or Endemic), if known.
ThreatCate	The NZTCS Threat Category (Threatened, At Risk, Data Deficient, Non-resident Native, Not Threatened) of the species.
ThreatStat	The NZTCS Threat Status of the species.
ThreatCrit	The Criteria for which the species qualifies for Threat Status in the NZTCS (refer to NZTCS manual and updates for descriptors of these criteria).
FW_Sp	Whether the species qualifies as a freshwater-dependent species by meeting one or more of Criteria A-F of Section 6.2.
Map_FW	Whether the observation is located within the mapped extent of freshwater.
Map_FWB	Whether the observation is located within the buffer to the mapped extent of freshwater.
Map_FWFWB	Whether the observation is located within the buffer or the mapped extent of freshwater.
WONI_UnitO	The Waters of National Importance database Unit number in which the observation occurs.
Catch_IDCa	The Waters of National Importance Catchment number in which the observation occurs.
FWENZ5thID	The Freshwater Environments of NZ 5th order unit ID number in which the observation occurs.
FWENZ4thID	The Freshwater Environments of NZ 4th order unit ID number in which the observation occurs.
REC_HydoID	River Environment Classification Hydro Unit ID number in which the observation occurs.

FMUFMU_Nam	The name of the Freshwater Management Unit in which the observation occurs.

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A E Esler 918, A E Wade, A E Wright, A E Wright 337, A Hamilton, A Lee 48/06, A Lee 49/06, A M Brandon, R J Stanley, M J Thorsen, A P Druce, A. Cunningham, G. Walls, A. Hamilton, A. Hamilton and W. Colenso, A. Hamilton. W. Colenso, A. Lee, A. P. Druce, A. P. Druce, W.B. Shaw, S.M. Beadel, A. T. Pycroft (Auckland), A. T. Pycroft (Auckland), G Archey, A. T. Pycroft (Auckland), Sir Frank Mappin (Auckland), A. Townsend, A. Townsend & M. Thorsen, A. Ure, A. Ure. P.B. Heenan, A.Hamilton, T.Kirk, H.Hill, A.M. Buchanan, A.P. Druce, A.P.Druce, A.P.Druce, B.D.Clarkson, P.J. Garnock-Jones, A.P.Druce, B.D.Clarkson,P.J. Garnock-Jones,, A.P.Druce, H.H.Allan, A.P.Druce, W.B.Shaw,S.M.Beadel, A.P.Druce,W.B.Shaw,S.M.Beadel, ael, aelyshumphreys, agoranomos, AH, Whitaker, ajackson, ajw, al45, Alan & Donna McKenzie, Alan Lee, Alan Lee & M. Thorsen (revisited), albeer23, alexjesk, alice_shanks, Allan Lee, amca, Andrew Wilson, andrewlowe, andyb, Ann Crawford, Anthony Caprio, aramata, Armitage, Ian, Armstrong, JS;, arnim, arthur, Aston per Petrie, BCD;, Aston, Bernard Cracroft, Auld, H;, B Bensemen, B C Aston, B Williams, B, Christensen, B, Slade, B, Teague, B, Turner, B. Rogan & J. Valentine, B. Rogan J. Valentine, B. W. Hayward, B.D. Clarkson, B.H.Macmillan 81/49, FRI herbarium: 17425, B.R. Burns, W. Shaw, Barry Ovenden, Bartlett, JK;, Bayly, Michael; Wotton, Debra, Baynes, Hugo, BC Jerebine, Beadel S.M.; Shaw, W.B., Beadel, S.M., Ben Keen, benackerley, benknight, benmannell, Bernie Kelly, Beveridge, P; Beveridge, P;, Beveridge, Peter, Birds NZ Wellington Region Data, Bisley, L;, BJ Sanders, booboo, Braggins, JE;, Braggins, John, Brandon, Andrea, brettpayne, briartaylorsmith, Bruce McKinlay, Bruce Wedderburn, BSMI team, Buchanan AM, Buchanan, John, bugman-nz, Burke, Warren, Burns,

B.; Shaw, W.B., Burns, W. Shaw, Butcher, CF;, butterfly4, Buzz Crowston, bwessling, C E Ecroyd, C, Berry, C. Ogle, C.C. Ogle, C.E. Ecroyd, C.Ogle, caleb187, Cameron Poole Smith, candler, Canterbury Conservancy Database, caqalai, Carsten Fog, Cashmore, P, Cashmore, P., Cashmore, P.B., ccrummack, Charmaine Jones, Cheeseman. Elder (1950), Cheesman and Elder, Che'ree Grimsley, Cheryl Walton, cheryldawson19, chhf, Chinnock, Robert (Bob), chrismorse, Christine Cullen, christinealawrence, ci, Colenso, Colenso 1149, Colenso, B.C. Aston, Colenso, William, Colin T. Richardson, Colin Taylor, connie cloud, conservation_company, Conway, T;, corokid, Cottier, W;, courtney_92, CR, Pickard, Craig Doolan, curtisnz, D M Tara, D M Tiffen, D myhr, D Petrie, D, King, D. King, D. King?, D. McLean, D. Petrie, D. Rudd, D.E. Hofstra, P.D. Champion, and J.S. Clayton, D.E. Hofstra, P.D. Champion, J.S. Clayton, D.King, D.R. Given, A.W. Purdie, Dan Burgin, Dan Burgin and Tansy Bliss, Daniele Mitchell, danilo_hegg, Darren Lees, darrylh, dave228, Davey, IW;, David Anderson, David Holyoak, David King, David Lawrie, Davies, TH; Davies, JM;, davo, debbie81, delautourt, Dept Agric.;, dgroberts, dhobonnel, dianevallienne, docb, doce, doch, docn, docw, dominic auld, Don McLean, dougbridge, Douglas Long, Dr Fred Brook (Tasman), dragonermine, Druce, Druce AP, Druce, A.P., Druce, A.P. (DSIR), list based on visits from 1957 to 1984, Druce, AP;, Druce, record sheet (CHR), Druce, record sheet; (CHR), Duncan Watson, Duncan Wright, E A Brown, E A Brown 86/19, E A Brown 86/2, E A Brown 86/7, E A Hodgson, E A Hodgson 101, E A Hodgson 142, E A Hodgson 18, E K Cameron, E K Cameron 14461, E K Cameron 14462, E Phillips Turner, E Phillips Turner ?, E. Williams, E.J. Remson, E.P.Turner, S.M.Beadel, H.H.Allan, eafg, eam, earnst, Ecroyd CE, Ed Lowe, Elder NL, Elder NL 195/3, Elder NL 31/162, Elder NL; Wardle P, Elder, N.L., Elder, NL, Elder, NL;, emma-and-tom, enzedfred, Eric de Leeuw, ewanbennett, Eyles, AC;, F. J. Shirley, fergus, Fishermen in Waiau, flackfamily, flyingkiwigirl, fordk, Frank Hall, fredderks, frufan, G Archey, G Archey, A. T. Pycroft (Auckland), G C Platt, G O K Sainsbury, G O K Sainsbury No.2, G Sturgeon, G T Jane, G Y Walls, G. Jane, G. Rogers, G. Walls, G.O.K. Sainsbury, G.O.K. Sanbury, G.O.K.Sainsbury, G.O.K.Sanbury, G.Walls, Gary Stone, gary14, Gasson P; Dahm R; Whiting R; Jonas H, gem2016, Geoff de Lisle, Geoff Rogers;, Geoff Walls, Geraldine King, gerry_kessels, Given DR 10676; Purdie A, Given DR; Purdie AW, gizz, Grahame Brind, Grant A, Grant, D;, greenfalcon, Greg Hottman, greghart, Guthrie-Smith, gwyn_ashcroft, H H T Kirk, H Hill, H Rendle, H. Grubner, H. Hill, H. Hill, T.F. Cheeseman, H. Jonas, H. R. Grenfell, B. W. Hayward, M. S. Morley, H. Tryon and Colenso, H. Tryon. Colenso., H.Hill, H.Hill,

T.F.Cheeseman, H.Jonas, H.M.Hodgson, B.D.Clarkson, P.J.Garnock-Jones, Hamilton, Augustus, hamish_carson, hamishmcw, Hamlin, BG;, Hamlin, Bruce, Hans Rook, Harry Boorman, harrylurling, hawkdoc, hbfg, hbrc, Healy, AJ;, Heenan P 9/97, Heenan, P.B., heeni, heidimeudt, Helen Jonas, Helen Jonas, Roger Dahm, Henry Hill (Napier), HG, Calvert, hilary5, Hill, Henry Thomas, Hodgson, Hodgson EA, Hodgson Mrs, houi, hovmoller, Howard-Williams, C; John Davies;, hudsonianjoe, Hughes, P, Hughes, PM, Hume 1990, Hunterpark Kindergarden, Hutchinson, Iain Johnson, Ian Armitage, Ian Smith, iansfinds, ind, indeynz, inds, irene_r, isaac162, izogi, J E Beever, J E Braggins, J E Morton, J G Bilkey, J Harding, J K Bartlett, J K Bartlett 26102b, J K Bartlett 26671, J K Bartlett 26678, J M McEwan 697, J R Rolfe, J R Rolfe 15019, J Ronaldson, J Salter, J. Buchanan, J. Fuller 17, J. Quirke, J. Ronaldson, J. Yaldnif, J. Yaldwin, J.A. Langbein, J.Buchanan, Jack Levene (from Wildlife Recorder), Jake Holland, James Boccia, Jamie Ross, Jane John, Jason Wilder, Jeff Yunke, Jenkins, F;, Jenny Stiles, jeremyc-nz, jessielee, JM, Winn, jnleastcoast, Joanna McVeagh, Joanna Roberts, joduncan, John & Abby Dux, John Groves, John Lewis, John McLean, John McLennan, John Phelps, john_barkla, johnb-nz, johnhb, johnvandenhoeven, jon_sullivan, Jonathan Boucher, Judy Rash, juliekaahu, June, SR;, K A Riddell, K Broster, K Hewitt, K Hewitt, J Adams, B Kappers, K Hewitt, T Billing, J Adams, K M Wood, K P Tupper, K, Hawkins, K. Hewitt, K. Lloyd, K. Riddell, K.J.Whaley, Clarkson, B.D., Emmett, D.K., Innes, J.G., Leathwick, J.R., Smale, M.C., Whaley, P.T, K.J.Whaley, ., Clarkson, B.D., Emmett, D.K., Innes, J.G., Leathwick, J.R., Smale, M.C., Whaley, P.T., K.J.Whaley, B.D.Clarkson,D.K.Emmett, J.G.Innes, J.R.Leathwick, M.C.Smale, K.J.Whaley, Clarkson, B.D., Emmett, D.K., Innes, J.G., Leathwick, J.R., Smale, M.C., W, K.J.Whaley, Clarkson, B.D., Emmett, D.K., Innes, J.G., Leathwick, J.R., Smale, M.C., Whaley, P.T, K.J.Whaley, Clarkson, B.D., Emmett, D.K., Innes, J.G., Leathwick, J.R., Smale, M.C., Whaley, P.T,, K.J.Whaley,B.D. Clarkson, D.K.Emmett, J.G. Innes,J.R. Leathwick,M.C. Smale,P.T. Whaley, K.J.Whaley,Clarkson, B.D., Emmett, D.K., Innes, J.G., Leathwick, J.R., Smale, M.C., Whaley, P.T., kal, Karen Riddell, Kath Shurcliff, Keith Hawkins, Keith Taylor, Kellow, Alison with Lee, Julia, kellyeaton, Ken George, Ken Janes, Ken Mills, Ken Noble, Kerry Hewitt, Kevin Campbell, Pete Shaw, kevin_frank, kirsty-b, kiwifergus, k-ko, Kuschel, G;, kyleb, L J Gordon, L, Coham, Lance Dew, Landcare Research Herbarium, Langbein JA A/14, Langbein, JA;, leonperrie, Leslie Feasey, linda_johnson, Lisa Jones, lisa_bennett, lizid, M A M Renner, M A M Renner 01/39, M A M Renner 01/41, M A M Renner 01/51, M A M Renner 4452, M A M Renner 4453, M D Hampton, M E Sexton, M F Hynes, M J Bayly MJB 865, B

Maich, M J Bayly|B Maich, M J Thorsen, M Lusk, M Merrett, M R Woodhead, M Thorsen, M. F. Weeks, M. Merrett, M. Renner, M. S. Morley, B. W. Hayward, H. R. Grenfell, M. Smith, M. Thorsen, M. Thorsen & A. Townsend, M. Thorsen & D. King, M. Thorsen, K. Griffiths, C. Howell, M.D. Hampton, M.J.A.Bolfin, R.B.Allen, M.Thorsen, M.Thorsen, D.King, Macmillan, B;, Malcolm Smith, mandln, Marcia Balestri, Margaret Twydle, Marie Taylor, Marie Taylor;, Marilynne Keyser, Mark Lewis, mark_smale, mark-mitchell, marshy, Mason, Mason R, Mason R 8414, Mason, R;, mattbrady, Matthew Pierce, matthieu_gauvain, mattward, mcarthurn, mcleary, Meinrat O. Andreae, melissa_hutchison, Merrett M, Meudt, Heidi with Prebble, Jessica, meurkc, Michael Moshier, michael reavey, Mike Leslie, Mike Thorsen, Mike Thorsen 079/07, Mike Thorsen, Fran Muckle, Mike Thorsen, Murray King, Rebecca Stanley, Andrea Brandon, Mike Thorsen;, mike68lusk, mikefake, mikepirie, MMD, mmiller1, Moar, NT;, Moniqua Nelson-Tunley, Mr O M Weaver (Hastings), Mr Ronald J Scarlett, C Wiffen, Mr Ronald J Scarlett, R. A. Whittle, Mr Skudder, Mr W H Hartree, Mr W H Hartree, Mr Ronald J Scarlett, Mr William Gregory, Mrs Alford, Mrs Hodgson, Mrs Hodgson;, Mrs Lois Wagener, mrutherford, Murray Heays, mwh, N Cartwright, N. Singers, N.L. Elder, N.L. Elder, A.P. Druce, N.Singers, N.T. Moar, n/a, Nathan Cross, National Park Ranger, naturewatchwidow, neil_fitzgerald, New Zealand, Nic Goodman, Nichola Nelson, Nicholas Allen, Nicholas Singers, nickg-nz, nigel kendall, Nikki McArthur, Nikki McArthur & Hayley Ricardo, Nikki McArthur and Hayley Ricardo, Nikki McArthur and Keiko Hashiba, Nikki McArthur and Tansy Bliss, Nikki McArthur, Hayley Ricardo, Keiko Hashiba, Nikki McArthur, Samantha Ray and Darren Lees, Nikki McArthur, Samantha Ray and Keiko Hashiba, Nikki McArthur, Samantha Ray, Darren Lees, NIWA, NMNZ, Noam Markus, nsingers, nzgardenbirdsurvey, oaag1993, obscurus, obsr1000633, obsr1014519, obsr101835, obsr1020468, obsr1024645, obsr1034746, obsr103682, obsr1058520, obsr1072242, obsr107304, obsr1078701, obsr1088879, obsr1115038, obsr1120934, obsr1121224, obsr1138577, obsr1142496, obsr1176319, obsr1224986, obsr1226951, obsr1230406, obsr123276, obsr1256802, obsr1263287, obsr1278080, obsr1294975, obsr1309687, obsr133255, obsr1347812, obsr1364040, obsr1369101, obsr1369296, obsr1380189, obsr1381981, obsr1382495, obsr1384437, obsr1386827, obsr1388074, obsr1388385, obsr1388411, obsr1390789, obsr1397773, obsr1398322, obsr1399994, obsr1403133, obsr141265, obsr1413197, obsr1427575, obsr1427822, obsr1429892, obsr1432039, obsr1437316, obsr1437516, obsr1437751, obsr1439924, obsr1439925, obsr1440356, obsr1440374, obsr1440778,

obsr1445244, obsr1455657, obsr1481356, obsr1506580, obsr1517522, obsr153472, obsr1536484, obsr1538086, obsr154724, obsr154907, obsr155721, obsr157963, obsr1602235, obsr160792, obsr1619115, obsr1642984, obsr167943, obsr171928, obsr181946, obsr189143, obsr192698, obsr194930, obsr204031, obsr211340, obsr211537, obsr240018, obsr248569, obsr274477, obsr276721, obsr280848, obsr282729, obsr28733, obsr293526, obsr303341, obsr309402, obsr329679, obsr332007, obsr337803, obsr339135, obsr339900, obsr341625, obsr346382, obsr397019, obsr411589, obsr414154, obsr414650, obsr419820, obsr420036, obsr420781, obsr426063, obsr442312, obsr443677, obsr446448, obsr447864, obsr450350, obsr450566, obsr459322, obsr478877, obsr495297, obsr497821, obsr524767, obsr526423, obsr527767, obsr531804, obsr532139, obsr533022, obsr539909, obsr540062, obsr542691, obsr549964, obsr554219, obsr578535, obsr614601, obsr616840, obsr619713, obsr620829, obsr621803, obsr626605, obsr632799, obsr633792, obsr649505, obsr651829, obsr664076, obsr675260, obsr676872, obsr677708, obsr678136, obsr684259, obsr686788, obsr711366, obsr733046, obsr744169, obsr7509, obsr753189, obsr761869, obsr777918, obsr795765, obsr798393, obsr800441, obsr805669, obsr809267, obsr817235, obsr826510, obsr837645, obsr837867, obsr888581, obsr910184, obsr921115, obsr941871, obsr944808, obsr952709, obsr955058, obsr955314, obsr95766, obsr980301, obsr98133, obsr984050, obsr994784, odonata, OFC team, offtrackecology, Ogle CC 1721, Ogle CC 1826, Ogle CC 2030, Ogle CC 556, Ogle, CC;, Ogle, Colin, Oliver, Oliver, W. Reginald B., Oliver, WRB, one of several populations on stable gravel terraces of this section of Taruarau River braids., oscarkokako, P Cashmore, P Cashmore and Rotorua Botanical Society, P Cashmore, G Boyt, P D Champion, P Hynes, P J de Lange, P J de Lange 10906, P J de Lange 11063, P J de Lange 11263, P J de Lange 11267, P J de Lange 11299, G M Crowcroft, P J de Lange 11305, G M Crowcroft, P J de Lange 11306, G M Crowcroft, P J de Lange 11317, G M Crowcroft, P J de Lange 11346, P J de Lange 11356, P J de Lange 11360, G M Crowcroft, P J de Lange 11476, P J de Lange 11517, P J de Lange 13027, T J de Lange, P J de Lange 13028, T J de Lange, P J de Lange 13029, G M Crowcroft, P J de Lange 4383, P J de Lange 4633, P J de Lange 4655, P J de Lange 4663, P J de Lange 4669, P J de Lange 4685, P J de Lange 4711, D A Norton, P J de Lange 5297, P J de Lange 5650, P J de Lange 5994, P J de Lange 6413, P J de Lange 6414, P J de Lange 6417, P J de Lange 7425, P J de Lange 7557, P B Cashmore, P J de Lange 7558, P B Cashmore, P J de Lange 7766, P J de Lange|D A Norton, P J de Lange|G M Crowcroft, P J de Lange|P B Cashmore, P J de Lange|T J de Lange,

P Shaw, M Merrett, P Shaw|M Merrett, P T Corson, P. Cashmore, P. Gasson, R. Dahm, R. Whiting, H. Jonas, P. Shaw & M. Merrett, P. Shaw, M. Merrett, P.B. Heenan, P.J. de Lange, P.J.de Lange, D.A. Norton, G.M. Crowcroft, paddy18, Park, Geoffrey (Geoff), parkecology, Partride, Partridge, Paterson B, Patricia Schleiffer, Patrick Crowe, Patrick Crowe and Dan Burgin, Patrick Crowe and Hayley Ricardo, Patrick Crowe and Tansy Bliss, Patrick Crowe, Dan Burgin and Hayley Ricardo, Paul Coddington, Paul Gasson, Paviour-Smith, K;, PD, Dilks, Perrie, Leon, Pete Corson, Pete Shaw, Peter Allison, Peter Hein;, Peter MacIntyre, Peter Williams, Petrie, D, Petrie, Donald, PFC team and Forest&Bird volunteers, pfolsen15, pfolsenstaff, Phil Barnes, Phil Rhodes, pjd1, Polly, Barbara, Poole AL, Pouwer, M;, questagame, R M Bellingham, A Davis, R M Bellingham|A Davis, R Mason, R Mason 8342, R O Gardner, R O Gardner 7504, R O Gardner 7505, R O Gardner 7507, R Willet, R, Cooper, R, Parrish, R, Willet, R, Woods, R. A. Whittle, R. Mason, R. Platt, R.Cotter, J.Cotter, RA, Fordham, Ramsay, G.W.;, regan22, Rex Platt, Rex Platt (06 8391863), Richard Hawkins, Richard Moore, Rob Fraser and Jenny Hurst, Grant Craill, Colin Taylor, Rob Fraser, Jenny Hurst, Grant Craill and Colin Taylor, robert coffman, Rod Lowther, Rogan B; Valentine J, Roger Hunt, Roger McGlashan, Ron Morris, Ronald J Scarlett, Ros Batcheler, Rose Swift, Ross Silcock, Roy Lappalainen, rubecula, Rudge, M;, Russell Cannings, russelljsmith, ryan_nz, S Beadel, S Bennie, S Berggren, S Berggren 193, S Phillips, S. Hampton, S.M.Beadel, Sacha Heath, sacredheart, Sainsbury GOK, Samantha Ray and Darren Lees, Samantha Ray, Darren Lees and Bernie Kelly, Samantha Ray, Darren Lees, Bernie Kelly, Keiko Hashiba and Nikki McArthur, samcarruthers, Sandra Elia, Sandy Hampton, santiago Imberti, Sarah King, sarah_richardson, savvy, scott_phares, sea-kangaroo, seastar, seaview, Shane McPherson, shane_orchard, shaun-lee, Shaw and Beadel, Shaw P; Merrett M, Shaw, et al., Shellie Evans, Shepherd, Lara, silversea_starsong, Simon Turner, simon-waugh, Simpson MJA; Allen RB, Simpson NC; Druce AP, Simpson, MJA; Allen, RB;, Singers N.; Thorsen, M., Sir Frank Mappin (Auckland), Sir Frank Mappin (Auckland), A. T. Pycroft (Auckland), Sir Frank Mappin (Auckland), G Archey, Sir Frank Mappin (Auckland), Sir Carrick Robertson (Auckland), Smith M, Sneddon, Barry, Stephan Lorenz, stephen_thorpe, Steve Deverell and Marie Tonnberg, strewick, surfap, Susanne Govella, T C Chambers, T F Cheeseman, T K James, T, Grant-Taylor, tamsinwardsmith, tamswardsmith, Tansy Bliss, Tansy Bliss and Dan Burgin, Tansy Bliss and Hayley Ricardo, Tansy Bliss, Darren Lees and Hayley Ricardo, Tansy Bliss, Darren Lees, Keiko Hashiba and Samantha Ray, Taylor, M.; Thorsen, M.; Walls, G.Y., TH Worthy, TH Worthy, RN

Holdaway, Thomas Boni, Thomas GouÃ«llo, Thorsen, M., Thorsen, M.; Townsend, A.J., Tier 1-Brian Lloyd, Tim Barnard, Tim Senington, tim_hopley, timquinnell, Tina Greenawalt, todd nachowitz, Tom Laeser, tom_saunders, Tony Druce, Townsend, JI;, Travis Cullen, Travis Cullen and Bevan Eagle, Travis Cullen, Bevan Eagle and Ken Mills, Trevarthen and Mason, Trewick, SA; Morgan-Richards, M;, Tryon, Tryon, H, Tryon, Henry, tuilover, two plants covered 1 m x 30 cm. Short tussock of Festuca novae zelandiae & Dracophyllum subulatum., Type of var. lobulatus. Allan, unknown, Unknown (Biodiversity inventory compiled by Bec Stanely), Unknown (Biodiversity inventory compiled by Bryce Jerebine), Unknown (Biodiversity inventory), Unknown (landowner), Unknown, per Canterbury Museum, Ure A, Vince Griesemer, vitex_lucens, W B Shaw, W Colenso, W Colenso 1711, W H & T Hartree, W H Guthrie-Smith, W. B. Shaw, S.M. Beadel, W. Colenso, W. Shaw, B.D. Clarkson, S. Beadel, W.B. Shaw & S.M. Beadel, W.B. Shaw and S.M. Beadel, W.B. Shaw, S.M.Beadel, M. Thorsen, W.B. Shaw, S.M. Beadel, W.B. Shaw, S.M.Beadel, D. King, W.B.Shaw, W.B.Shaw and S.M.Beadel, W.B.Shaw, B.D.Clarkson, S.Beadel, W.B.Shaw, B.D.Clarkson, S.M.Beadel, M.Thorsen, W.B.Shaw, S.M. Beadel, W.B.Shaw, S.M.Beadel, W.B.Shaw,S.Beadel, W.B.Shaw,S.M.Beadel, W.Colenso, T.F.Cheeseman, H.H.Allan, W.L. Williams, W.L.Williams, T.Kirk, W.R.B.Oliver, Walker, JTS;, Walls, Walls G, Wesley Hochachka, West, E, Westerman, WH Hartree, Whaley, K.J., Clarkson, B.D., Emmett, D.K., Innes, J.G., Leathwick, J.R., Smale, M.C., Whaley, P.T., whio, wilfredlandon, William Colenso, Williams E, Worthy, Trevor, Worthy, Trevor with Cross, T, Worthy, Trevor with Jones, Jenny, Yaldnif J, Zotov, Zotov, VD.

Appendix 6. Database use agreements

DOC bioweb plant & reptile, bat & marine mammal databases: provided via email

eBird database: provided under terms of use 2 May 2016

Landcare Research Manaaki Whenua Allan Herbarium (CHR): http://creativecommons.org/licenses/by/3./nz/ via GBIF

Landcare Research Manaaki Whenua Arthropod Collection: http://creativecommons.org/licenses/by/3./nz/ and via email.

Auckland War Memorial Museum: http://creativecommons.org/licenses/by/4./legalcode via GBIF and via email.

NIWA NZ Freshwater Fish database (NZFFD): "Access to NZFFD data is freely available and users can search the NZFFD to return all records, or to return records for specific river catchments, areas, years, species and fishing methods" (from website)

NIWA Invertebrate Type Collection: CC BY 4. via GBIF

NIWA Marine Biological Observations & OBIS catch data: CC BY 4. via GBIF

NIWA Lake Macrophyte data: CC BY 4. via GBIF

Cawthron Institute Freshwater Invertebrate database: CC BY-NC 4. via GBIF

National Vegetation Survey (NVS) under terms of use 8 November 2019

iNaturalist database provided under email and implied terms of use.

Appendix 7. Species records that could not be matched with a known entity

The following entries could not be attributed to a currently-recognised species as the name is either of uncertain usage or the species is not known to occur in the Bay of Plenty and it is not possible to re-assign the name to a species currently known in the Bay of Plenty.

From BOPRC_ThreatenedSpeciesData_20210824_BiodiversityKeySites

Cardamine aff. Corymbosa

Gastrodia sesamoides agg.

Pterostylis aff. montana agg.

Thelymitra Ã–dentata

Other (species with observations in the metadataset within the Bay of Plenty, but that are not known to currently occur in that region.

Chionochloa vireta

Kunzea ericoides

Leucopogon parviflorus

Myosotis uniflora

Pimelea lyallii

Veronica dieffenbachii

Carex tenuiculmis

Carmichaelia petriei

Metrosideros kermadecensis

Myosotis concinna