In the Environment Court
At Auckland

I te Kōti Taiao o Aotearoa
KiTāmaki Makaurau

ENV-2021-AKL-000104
ENV-2021-AKL-000105
ENV-2021-AKL-000106

Between **TE TAIWHENUA O HERETAUNGA, TE RUNANGANUI O HERETAUNGA, TE MANAAKI TAIAO O HERETAUNGA AND NGATI KAHUNGUNU IWI INCORPORATED**

ROYAL FOREST AND BIRD PROTECTION SOCIETY OF NEW ZEALAND INCORPORATED and

THE MĀORI TRUSTEE

Appellants

And **HAWKE'S BAY REGIONAL COUNCIL**

Respondent

EVIDENCE IN CHIEF OF DR ANDY HICKS ON BEHALF OF HAWKE'S BAY REGIONAL COUNCIL

Ecology

11 August 2023

SIMPSON GRIERSON

Matt Conway / Gemma Plank
T: +64-4-499 4599
matt.conway@simpsongrierson.com
gemma.plank@simpsongrierson.com
PO Box 2402 Wellington

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1. INTRODUCTION

1.1 My full name is Andrew Steven Hicks and I am a Principal Scientist at *Science that Helps*. I have been asked by the Hawke's Bay Regional Council (**HBRC** or **Council**) to prepare ecology evidence in relation to Proposed Change 7 to the Hawke's Bay Regional Resource Management Plan (**PC 7**).

1.2 I hold the qualifications of BSc/BA (Hons) from the University of Melbourne and a PhD in Ecology from the University of Otago.

1.3 I am an ecologist with specialisation in freshwater (especially rivers and lakes) along with broader expertise in general ecology including riparian, wetland, estuarine and coastal habitats. I have over 12 years' experience providing technical advice to the Department of Conservation (2010-2012), Environment Southland (2012-2014) and Hawke's Bay Regional Council (2014-2022). This has included overseeing various monitoring programmes that span rivers, lakes, wetlands and the coastal environment and has covered various components of ecology (fish, macroinvertebrates, birds, water quality, habitat structure etc.). I have supported plan changes and their implementation, along with consents and compliance investigations. I have led various mitigation projects aimed at improving ecological values including constructed wetlands, river and riparian enhancement and fish barrier remediation. I was Team Leader / Principal Scientist for the Water Quality and Ecology Team at the HBRC until 2022.

1.4 While employed at the HBRC, I provided expert ecological evidence on the proposed Ngaruroro Water Conservation Order for the Special Tribunal and Environment Court, with a focus on water quality and native fish values.

1.5 I have been a member of the New Zealand Freshwater Sciences Society since 2006 and currently sit on the Expert Fish Panel for the Department of Conservation's New Zealand Threat Classification System.

1.6 My current full-time employment is as a Senior Analyst at the Ministry for the Environment, where I provide science and other technical advice for policy

implementation and development of both the Resource Management Act and the Natural and Built Environment Bill. But to be clear, I am not representing the Ministry for the Environment in any capacity whilst providing this evidence.

1.7 I confirm that I have read the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2023 and that I agree to comply with it. I confirm that I have considered all the material facts that I am aware of that might alter or detract from the opinions that I express, and that this evidence is within my area of expertise, except where I state that I am relying on the evidence of another person.

1.8 The key documents I have used, or referred to, when preparing my evidence are:

(a) Black, M., Brady, M., Cheyne, J. Curtis, A., Kelly, B., Winlove, T. 2019. *Outstanding Water Bodies in Hawke's Bay: Report of the Expert Panel*. HBRC Report No. SP19-19.[1]

(b) Cameron, F. 2008. *Pekapeka swamp ecological monitoring*. HBRC Plan Number 4025.[2]

(c) Harper, B. 2020. *Ngaruroro River and Estuary. Summary of Values For Proposed Plan Change 7: Hawke's Bay Regional Resource Management Plan (Outstanding Water Bodies Plan Change).* HBRC Publication Number 5497.[3]

(d) Harper, B. 2020. *Lake Poukawa and Pekapeka Swamp. Summary of Values For Proposed Plan Change 7: Hawke's Bay Regional Resource Management Plan (Outstanding Water Bodies Plan Change).* HBRC Publication Number 5485.[4]

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1 https://www.hbrc.govt.nz/assets/Document-Library/Outstanding-Water-Bodies/1.-Other-supporting-information/Local-Expert-Panel-Report.pdf

2 https://www.hbrc.govt.nz/assets/Document-Library/Projects/TANK/TANK-Key-Reports/A-Review-of-Hawkes-Bay-Regional-Councils-Wetland-Monitoring-2008.pdf

3 https://www.hbrc.govt.nz/assets/Document-Library/Outstanding-Water-Bodies/3.-Values-reports/Ngaruroro-River-ID18-Summary-of-Values-Aug-2020-5497.pdf

4 https://www.hbrc.govt.nz/assets/Document-Library/Outstanding-Water-Bodies/3.-Values-reports/Lake-Poukawa-Pekapeka-ID6-Summary-of-Values-Aug-2020-5485.pdf

(e) Harper, B. 2020. *Tukituki River and Estuary. Summary of Values For Proposed Plan Change 7: Hawke's Bay Regional Resource Management Plan (Outstanding Water Bodies Plan Change).* HBRC Publication Number 5510.[5]

(f) Holmes, R. 2019. Relative value of the lower Ngaruroro River native fish community. Prepared for Hawke's Bay Regional Council. Cawthron Report No. 3089.

(g) Hughey, K.F.D., Cameron, F., Cheyne, J., Dickson, R., Forbes, A., Hashiba, K., Rook, H., Sharp, T., Stephenson, B., and Welch, B. 2012. *Native birdlife in Hawke's Bay: Application of the River Values Assessment System (RiVAS and RiVAS+)*. Land Environment and People Research Paper No. 14. HBRC Plan No. 4376.

(h) Hughey, K.F.D., Clapcott, J., Goodwin, E., Jonas, H., Cheyne, J., Rook, H., Cameron, F., Maxwell, I. and Sharp, T. *Native fish in Hawke's Bay: Application of the River Values Assessment System (RiVAS and RiVAS+).* Land Environment and People Research Paper No. 14. HBRC Plan No. 4379.

(i) Jellyman, P.G. and Sinton, A.M.R. 2017. A comparison of the lower river fish communities in large Hawke's Bay rivers: Hawke's Bay fish survey work. Prepared for Hawke's Bay Regional Council. NIWA Client report No. 2017138CH.

(j) McArthur, N., Cotter, S., Curzon-Hobson, G., Flux, I., Flux, M., Mosen, C. 2022. *State and trends in the abundance and distribution of riverbed-nesting shorebirds on the Tutaekuri, Ngaruroro and Tukituki Rivers*. Client report prepared for Hawke's Bay Regional Council, Napier.

5 https://www.hbrc.govt.nz/assets/Document-Library/Outstanding-Water-Bodies/3.-Values-reports/Tukituki-River-ID31-Summary-of-Values-Aug-2020-5510.pdf

(k) McArthur, N., Thomas, D., and Lees, D. 2021. *A baseline survey of the indigenous bird values of the Hawke's Bay coastline*. Client report prepared for Hawke's Bay Regional Council, Napier.[6]

(l) Parrish, G.R. 1988. *Wildlife and wildlife habitat of Hawke's Bay Rivers.* Science and Research Series No. 2. Department of Conservation, Wellington.[7]

(m) Singers, N. *Mapping of Hawke's Bay wetlands*. Prepared for Hawke's Bay Regional Council. NSES Ltd Report 28: 2015/16.

(n) Walls, G. 1998. *Threatened plants of Hawke's Bay.* Conservation Advisory Science Notes No. 200. Department of Conservation, Wellington.[8]

1.9 I have reviewed the final draft evidence of the following experts filed alongside this ecology evidence for the Council:

(a) Dr Greg Ryder, evidence in chief (peer review), dated 11 August 2023;

(b) Belinda Harper, evidence in chief (planning), dated 11 August 2023; and

(c) Jens Rekker, evidence in chief (geology), dated 11 August 2023.

1.10 I have lived and worked in an environmental science capacity in Hawke's Bay for almost 10 years. I have visited all of waterbodies mentioned in this evidence at least once during that time; and most waterbodies numerous times. I most recently visited key sites in the Ngaruroro, Tukituki and Karamū catchments, Lake Poukawa and Pekapeka Swamp, on 7 August 2023 with Ms Harper, Mr Rekker and Dr Ryder. I also have familiarity with Lake Poukawa from work I carry out for Brownrigg Agriculture in relation to its farming operation in the vicinity of the lake.

6 https://www.hbrc.govt.nz/assets/Uploads/5560-A-baseline-survey-of-the-indigenous-bird-values-of-the-Hawkes-Bay-coastline.pdf
7 https://www.doc.govt.nz/globalassets/documents/science-and-technical/sr2.pdf
8 https://www.doc.govt.nz/globalassets/documents/science-and-technical/casn200.pdf.

2. SCOPE OF EVIDENCE

2.1 My evidence addresses the following matters:

(a) PC7 background, to the extent it is relevant to my evidence;

(b) the proposed PC7 Screening Criteria; and

(c) the relief sought by appellants, and in particular:

(i) The request by Te Taiwhenua o Heretaunga, Te Runanganui o Heretaunga, Te Manaaki Taiao o Heretaunga and Ngāti Kahungunu Iwi Incorporated (**TTOH et al**) to include the Lower Ngaruroro River in Schedule 25 for the outstanding values of indigenous fish habitat and indigenous bird habitat.

(ii) The request by TTOH et al to include the Waitangi Estuary in Schedule 25 for the outstanding values of indigenous fish habitat and indigenous bird habitat.

(iii) The request by TTOH et al to include the Tukituki River in Schedule 25 for the outstanding values of native fish habitat and bird habitat.

(iv) The request by TTOH et al to include the Tukituki Estuary in Schedule 25 for the outstanding values of fish spawning and indigenous bird habitat.

(v) The request by TTOH et al to include Lake Poukawa and Pekapeka Swamp in Schedule 25 for the outstanding values of indigenous plants and indigenous bird habitat.

(vi) The request by TTOH et al to include Makaroro River in Schedule 25 for the outstanding values of indigenous plant habitat and indigenous habitat.

(vii) The request by the Royal Forest and Bird Protection Society of New Zealand Incorporated (**Forest and Bird**) to amend the Screening Criteria in Part 1 to provide for an "Outstanding Values Criteria," which includes criteria for outstanding values that determine whether a water body (or part thereof) is outstanding, the Expert Panel's "OWB Assessment Criteria" and any additional matters supported through expert evidence which would determine an outstanding value (such as including screening criteria to give effect to the National Policy Statement for Freshwater Management 2020 (**NPS-FM**)).

(viii) The request by Forest and Bird to include the Tukituki River in Schedule 25 for outstanding ecological and landscape values.

(ix) The request by Forest and Bird to include Lake Poukawa and Pekapeka Swamp in Schedule 25 for outstanding ecological value.

(x) The request by Forest and Bird to include the Ngaruroro River in Schedule 25 for outstanding ecological (native bird habitat) value.

3. EXECUTIVE SUMMARY

3.1 The key conclusions reached in my evidence are that:

(a) The original screening criteria for ecological values contained unnecessary inconsistencies among the screening criteria for native birds, native fish and indigenous plants. I have recommended changes to make the ecology value sets more consistent with each other.

(b) I have recommended an additional value set relating to habitat for above ground ecology values not otherwise provided for in the screening criteria. This is because there may be outstanding ecology values in the region that are not captured by consideration of only birds, fish and plants.

(c) After reviewing the available information, I consider that Lake Poukawa and Pekapeka Swamp should be recognised as outstanding habitat for native aquatic birds. These interconnected systems support a regionally unique bird assemblage due to the large area of diverse freshwater lake and wetland habitats that are capable of supporting an abundance of a range of native aquatic bird species. I consider there is sufficient evidence to support recognition of this outstanding habitat.

(d) I note that the Water Conservation Order for the Ngaruroro River identified this system as providing outstanding habitat for avifauna in both its upper (whio) and lower (banded dotterel) reaches. This means the full length of the Ngaruroro River meets PC7's definition of outstanding water body, and should be recognised as an outstanding water body for ecological values.

(e) I do not consider there is evidence to support outstanding habitat for indigenous plant communities in Lake Poukawa and Pekapeka Swamp.

(f) I do not consider there is evidence to support outstanding water body status for ecological values for any of the other water bodies I investigated. Namely, the Tukituki upstream of State Highway 50 (fish and birds); Tukituki downstream of State Highway 50 (fish); the lower Ngaruroro (fish) and Waitangi Estuary (fish and birds); and the Makaroro River (plants).

4. BACKGROUND

4.1 PC7 is a change to the Hawke's Bay Regional Resource Management Plan to include a list of the region's outstanding water bodies.

4.2 PC7 requires these values to be outstanding in a regional context.

4.3 An outstanding water body in PC7 is one that is truly exceptional or stands out from the rest. The definitions of 'outstanding' and 'outstanding water body' in PC7 are:

> ***Outstanding****: for the purposes of an outstanding water body: outstanding means conspicuous, eminent, and/or remarkable in the context of the Hawke's Bay Region.*
>
> ***Outstanding water body*** *means freshwater bodies and estuaries, or parts thereof, identified in Schedule 25 that have one or more outstanding cultural, spiritual, recreation, landscape, geology, natural character or ecology value(s).*

4.4 The PC7 Independent Hearing Panel (**IHP**) decided on a list of outstanding waterbodies in Schedule 25 of the decisions version of PC7. The PC7 IHP considered the definition of 'outstanding', information set out in submissions, as well as information provided as part of expert and lay evidence, to identify water bodies that qualified as outstanding.

4.5 Following the PC7 hearing, the IHP introduced a set of OWB identification screening criteria into Schedule 25, to ensure consistency across all value sets and transparency in their decision making.

5. PC7 SCREENING CRITERIA – ECOLOGY – HABITAT FOR AQUATIC BIRDS (NATIVE AND MIGRATORY)

5.1 The screening criteria in the Council's 13 July 2023 preferred version of PC7 reads (red strikethrough/underline against the decisions version of PC7):

Habitat for native aquatic birds ~~(native and migratory)~~

For a Water body to provides an outstanding habitat for native aquatic birds ~~where~~ it must meets:

- at least one matter in List A; and
- all matters in List B.

List A

a) ~~One of the highest regional populations of a native aquatic bird species which is endangered, threatened or distinctive[14].~~ A native aquatic bird assemblage that is regionally unique in terms of diversity, abundance, or distinctiveness.

b) ~~One of the highest natural diversity of aquatic birds (native and migratory) in the region, which includes endangered or threatened species.~~ Supports 5% or more of the national population of a particular native aquatic bird species listed as Nationally Critical, Nationally Endangered or Nationally Vulnerable on the New Zealand Threat Classification List.

List B

a) The aquatic bird habitat is reliant on the water body's flows or levels, other aquatic characteristics, or is an integral part of the water body.

b) Evidence is provided in support of outstanding features.

Comments on screening criteria – Ecology (habitat for native aquatic birds)

5.2 I have recommended a number of changes to the ecology value set (habitat for native aquatic birds) which are the basis of the above changes, and which I discuss below.

Title of screening criteria

5.3 I recommended replacing the title for this value set to read *"Habitat for native aquatic birds"*, which is a simpler and more appropriate title. In my opinion, the title in the decisions version of PC7 is unclear given "migratory" is a subset of "native".

Screening criteria List A and B

5.4 I recommended deleting criteria (a) and (b) from List A and replacing them with two new criteria that are more appropriate for the screening requirements with respect to aquatic birds. Additionally, I recommended adding a new criterion (a) to List B to ensure the water body is a critical feature of the bird habitat. I have discussed these changes below.

List A(a): Assemblage

5.5 I recommended adding a new criterion (a) to List A which reads *"A native aquatic bird assemblage that is regionally unique in terms of diversity, abundance or distinctiveness*". I consider this wording to be appropriate because it captures two conspicuous features of a bird assemblage that may demonstrate outstandingness, namely its diversity and abundance. The additional term, distinctiveness, allows for a broad range of other characteristics to be included that contribute to a waterbody being potentially outstanding. Use of the term 'regionally unique', however, ensures a suitably high bar is being applied for regional outstandingness.

List A(b): Percentage of population of threatened taxa

5.6 I recommended adding a new criterion (b) to List A that reads "Supports more than 5% of the national population of a particular native aquatic bird species listed as Nationally Critical, Nationally Endangered or Nationally Vulnerable on the New Zealand Threat Classification List."

5.7 I consider this wording to be appropriate because it allows recognition of waterbodies that support a substantial proportion of a particular and notable species.

5.8 I think a 5% national population threshold should be reserved to taxa that need most prioritisation due to conservation concern, and so I suggest inclusion of only

the three conservation classes that fall under the 'threatened' umbrella. Nationally critical, nationally endangered or nationally vulnerable taxa are of *highest* conservation concern. And so I think habitats that support substantial populations of these threatened taxa warrant being considered for outstandingness.

5.9 I do not think taxa in the "At risk" umbrella should be included here, because the sheer number of taxa in the "At Risk" umbrella makes it too low a threshold to qualify as outstanding based on a 5% of national population criteria alone. Noting that the presence of particular 'At Risk' species can still contribute to a waterbody meeting the List A(a) criterion, as long as they contribute to the assemblage being regionally unique.

5.10 I also note that the NPS-FM defines "threatened species" as *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,*[9] i.e. the NPS-FM does not include any of the "at risk" groupings.

5.11 I support including the term <u>particular</u> in "particular native aquatic bird species", because it reads more clearly.

List B(a): <u>bird habitat</u>

5.12 I recommended adding a new criteria (b) to List B that reads "*<u>The aquatic bird habitat is reliant on the water body's flows or levels, other aquatic characteristics, or is an integral part of the water body</u>*". I consider this wording to be appropriate because it ensures that outstanding habitats provided by a water body are targeted and should avoid the unintentional capture of avifauna habitats that are not directly related to water bodies.

9 National Policy Statement for Freshwater Management 2020, cl 1.4(1).

List B(b): Evidence requirements

5.13 I have not recommended any changes to criteria (b) of List B. I consider the evidence requirements to be appropriate because there should be an onus to demonstrate, with evidence, that a waterbody meets at least one screening criteria and passes the regionally outstanding test.

5.14 As such, I recommend rewording the matters in this criterion as marked up above.

6. PC7 SCREENING CRITERIA – ECOLOGY – NATIVE FISH HABITAT

6.1 The screening criteria in the Council's preferred version of PC7 reads (red strikethrough/underline against the decisions version of PC7):

> **Native fish habitat**
>
> For a water body to provide~~s~~ an outstanding habitat for native fish ~~where~~ it must meet~~s~~:
>
> - at least one matter in List A; and
> - all matters in List B.
>
> **List A**
>
> a) ~~A unique species or distinctive assemblage of native fish not found anywhere else in the region.~~ A native fish assemblage that is regionally unique in terms of diversity, abundance or distinctiveness.
>
> b) ~~Native fish that are landlocked and not affected by presence of introduced species.~~ Supports more than 5% of the national population of a particular native fish species listed as Nationally Critical, Nationally Endangered or Nationally Vulnerable on the New Zealand Threat Classification List.
>
> c) ~~One of the highest diversities of native fish species in the region, which includes a threatened, endangered or distinctive species.~~
>
> d) An outstanding customary fishery.
>
> **List B**
>
> a) Evidence is provided in support of outstanding native fish habitat value.

Comments on screening criteria – Ecology (native fish habitat)

6.2 I have recommended a number of changes to the ecology value set (native fish habitat) which I discuss below.

Consistency

6.3 I have recommended changes that aim to achieve consistency between the criteria for native fish and aquatic birds screening criteria. There were significant

differences in the criteria applied to these two groups, which in my opinion is inappropriate because the fundamental reasons why an assemblage of birds may demonstrate an outstanding habitat are broadly aligned with the reasons why an assemblage of fishes may be outstanding.

6.4 There is a current paucity of data on the abundance of different native fish species in water bodies around New Zealand. Ideally, I do not consider criteria should be set based on the presence or absence of suitable datasets. Rather, I consider the criteria should be set based on sensible logic, and the collection of necessary datasets to enable a waterbody to be tested against the most sensible criteria should inevitably follow. Noting that the "List B" screening criteria for all aspects is that evidence has been provided.

6.5 With the above in mind, and given that general principles of ecology can be applied, I do not consider the criteria for fish and birds should be so different. So I recommended the new criteria set out above.

Screening criteria List A and B

6.6 I recommended deleting criteria (a), (b), and (c) from List A and replacing them with two new criteria that are more appropriate for the screening requirements with respect to native fish.

List A(a): <u>Assemblage</u>

6.7 I recommended adding a new criterion (a) to List A that reads "A native fish assemblage that is regionally unique in terms of diversity, abundance or distinctiveness". I consider this wording to be appropriate for the same reasons I outlined for birds.

6.8 I note that this proposed version does not specifically include reference to landlocked populations unaffected by the presence of introduced species, which was a feature noted by the Independent Hearing Panel when identifying one of the Kaweka Lakes as an outstanding water body. But the former characteristic could

qualify the fish community as being 'distinctive' and so could have still passed the screening criteria. As a result, I do not consider that the Council's preferred version requires a reference to landlocked populations.

List A(b): percentage of population

6.9 I recommended adding a new criterion (b) to List A that reads "Supports more than 5% of the national population of a particular native fish species listed as Nationally Critical, Nationally Endangered or Nationally Vulnerable on the New Zealand Threat Classification List." I consider this wording to be appropriate for the same reasons previously outlined for birds.

7. PC7 SCREENING CRITERIA – ECOLOGY – HABITAT FOR INDIGENOUS PLANT COMMUNITIES

7.1 The screening criteria in the Council's preferred version of PC7 reads (red strikethrough/underline against the decisions version of PC7):

> **Habitat for indigenous plant communities**
>
> For a Water body to provide~~s~~ an outstanding habitat for an indigenous plant community ~~where~~ it must meet~~s~~:
>
> - at least one matter in List A; and
> - all matters in List B.
>
> **List A**
>
> a) ~~The indigenous plant community has a high diversity of habitats, or rare and threatened plant species in the region.~~ The indigenous plant community contains special features not found anywhere else in the region.
>
> b) ~~The indigenous plant community contains special features not found anywhere else in the region.~~ Supports one of the highest numbers of a national population of a particular indigenous plant species listed as Nationally Critical, Nationally Endangered or Nationally Vulnerable on the New Zealand Threat Classification List.
>
> **List B**
>
> a) The indigenous plant community is reliant on the river flows, other aquatic characteristics, or is an integral part of the water body.
>
> b) Evidence is provided in support of outstanding features.

Comments on screening criteria – Ecology (indigenous plant communities)

7.2 I have recommended a number of changes to the ecology value set (indigenous plant communities) which I discuss below.

Consistency

7.3 I have recommended changes that aim to achieve consistency between the criteria for native fish, aquatic birds and indigenous plant screening criteria. There were significant differences in the criteria applied to these two groups. As explained earlier, I consider these differences were inappropriate because the general principles of ecology can be applied to different forms of life.

7.4 I note that the term 'native' is used for birds and fish, whereas the phrase 'indigenous' is used for plants. In my opinion this does not create a problem, however, if the Court prefers a consistent approach, I recommend the term 'indigenous' be used for all. 'Indigenous' is a subset of 'Native' and refers to those species that are naturally found in a specific area, rather than being 'native' to New Zealand as a whole.

Screening criteria List A and B

7.5 I recommended deleting criteria (a) and (b) from List A and replacing them with two new criteria that are more appropriate for the screening requirements with respect to indigenous plant communities.

List A(a): <u>Special features</u>

7.6 I recommended adding a new criterion (a) to List A that reads "The indigenous plant community contains special features not found anywhere else in the region". I consider this wording to be appropriate because it is provides a consistent element of regional uniqueness with the equivalent List A(a) items for fish and birds. I suggested retaining the term 'features' to reflect the original wording used for plants, which better suits how botanical characteristics of a community are recognised.

7.7 The reference to "high diversity of habitats' in criteria (a) of List A in the decisions version of PC7 seemed a lower bar for outstandingness, when compared with the equivalent criteria within the native fish and aquatic birds value sets. In my opinion

it is appropriate to be as consistent as possible in approach for the native fish, aquatic bird, and indigenous plant criteria.

List A(b): Population

7.8 I recommended adding a new criterion (b) to List A that reads "Supports one of the highest numbers of a national population of a particular indigenous plant species listed as Nationally Critical, Nationally Endangered or Nationally Vulnerable on the New Zealand Threat Classification List". I consider this wording to be appropriate because it reflects the same rationale applied to birds and fish, but uses the term 'highest numbers' which seems better suited for threatened plant species that may be highly localised in their distribution and not well screened if a 5% of national population threshold was used.

8. PC7 SCREENING CRITERIA – ECOLOGY – HABITAT FOR ABOVE GROUND ECOLOGY VALUES NOT OTHERWISE PROVIDED FOR IN THE SCREENING CRITERIA

8.1 Water bodies provide habitat for more than just fish, birds and plants. For example, the nymph stages of a number of Nationally Critical, Nationally Endangered or Nationally Vulnerable mayflies, stoneflies, caddisflies and a damselfly require aquatic habitat. So too does the Nationally Endangered tadpole shrimp (*Lepidurus apus viridis*), the Nationally Critical diving beetle (*Rhantus schauinslandi*) and Nationally Critical clam shrimp (*Eulimnadia marplesi*).

8.2 Invertebrate communities and other taxa that are lower 'on the food chain' are captured by inference when a water body is demonstrated as outstanding habitat for birds or fish, because the invertebrates form part of the habitat that supports birds and fish. There may still, however, be elements of the broader ecosystem that are not well captured by limiting the criteria to a subset of biodiversity. I therefore recommended an additional and broader ecology criterion to provide an eligibility gate for water bodies that demonstrate outstandingness in characters that are not clearly captured by the fish, birds or plants criteria.

8.3 Because of this, I have recommended the inclusion of a new value set within the screening criteria which relates to above ground ecology values which do not include birds, plants, or fish.

8.4 The screening criteria for this value set in the Council's preferred version of PC7 reads (red strikethrough/underline against the decisions version of PC7):

> For a water body to provide an outstanding habitat for above ground ecology values it must meet:
>
> - at least one matter in List A; and
> - all matters in List B.
>
> **List A**
>
> a) The ecosystem contains distinctive aquatic features not found anywhere else in the region
>
> b) Supports one of the highest numbers of a particular indigenous taxa listed as Nationally Critical, Nationally Endangered or Nationally Vulnerable on the New Zealand Threat Classification List.
>
> **List B**
>
> a) The ecosystem is above ground and reliant on the water body's flows or levels, other aquatic characteristics, or is an integral part of the water body.
>
> b) Evidence is provided in support of outstanding features.

Comments on screening criteria – Ecology (Habitat for above ground ecology values not otherwise provided for in the screening criteria)

8.5 I discuss the new ecology value set below.

List A(a): Special features

8.6 Criterion (a) of List A reads "The ecosystem contains distinctive aquatic features not found anywhere else in the region". I consider this wording to be appropriate because it applies a consistent test of regional uniqueness regarding the features

of an aquatic community that a waterbody may support. The criterion allows for more than just fish, birds and plants to be considered.

List A(b): Population

8.7 Criterion (b) of List A reads "Supports one of the highest numbers of a national population of a particular indigenous taxa listed as Nationally Critical, Nationally Endangered or Nationally Vulnerable on the New Zealand Threat Classification List." I recommended this criterion using language that was consistent with the language used for plants, and for the same reasons.

List B(a): Habitat

8.8 Criterion (a) of List B reads "The ecosystem is above ground and reliant on the water body's flows or levels, other aquatic characteristics, or is an integral part of the water body." I recommended this criterion because it ensures that outstanding habitats provided by a water body are being targeted and should avoid the unintentional capture of habitats for above ground ecological values that are not directly related to water bodies. The 'above ground' stipulation was included because groundwater systems are already represented by the Karst System criteria.

List B(b): Evidence

8.9 Criteria (b) of List B reads "Evidence is provided in support of outstanding values". I recommended this criteria because there should be an onus to demonstrate, with evidence, that a waterbody meets at least one screening criteria and passes the regionally outstanding test.

9. ASSESSMENT OF WATER BODIES SOUGHT TO BE ADDED BY APPELLANTS

LOWER NGARURORO RIVER

9.1 Here, I discuss the request to reinstate the Ngaruroro River into Schedule 25 for the following outstanding values:

(a) indigenous fish habitat; and

(b) indigenous bird habitat.

9.2 I have reviewed all of the relevant information that I am aware of and have access to, including the Ngaruroro River and Estuary Summary of Values prepared by Harper (2020).[10]

Description of Lower Ngaruroro River

9.3 The Lower Ngaruroro River is a braided river system that provides large areas of gravel riverbeds and beaches for fish and native river-breeding birds. The development of stopbanks and willow edge protection has confined the natural extent of braided river habitat, but the remaining habitat remains of a comparably high quality for a lowland river environment.

9.4 Most fish encountered in freshwater in Hawke's Bay are migratory and will have entered freshwater habitats after spending some time in the ocean. These migratory species are widespread and found in many other river systems in both Hawke's Bay and New Zealand. Most fish species in the Ngaruroro are therefore migratory and they form the same assemblages of species found in many other rivers in Hawke's Bay. It is therefore unlikely that the Ngaruroro, or any other river in Hawke's Bay, could be demonstrably unique or distinct due to the presence of any combination of these migratory fish species, because the same combination of species will be found in many other waterbodies in Hawke's Bay.

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10 Above n 3.

9.5 There are two species of threatened freshwater fish found in Hawke's Bay: the piharau/lamprey (*Geotria australis*) and the shortjaw kokopu (*Galaxias postvectis*), which are both Threatened: Nationally vulnerable. Hawke's Bay is not a stronghold for either of these species, however, and there is unlikely to be 5% of the national population of either species in the entire region, let alone in a specific waterbody.

9.6 The presence of non-migratory fish species may be more likely to trigger some element of 'distinctiveness' or uniqueness to an indigenous fish community, because they have more restricted ranges than the migratory species. There are only two native species of non-migratory native fish in Hawke's Bay, the dwarf galaxias (*Galaxias divergens*) and Dinah's bully (*Gobiomorphus dinae*). Both species are widespread in Hawke's Bay, however, and so their presence alone is not particularly distinctive or unique.

9.7 Dinah's bully is found in upper and lower reaches of rivers throughout Hawke's Bay. Dwarf galaxias tends to be found in systems with cleaner gravels, which tends to mean they are found at higher abundance in more upland sites in Central Hawke's Bay and the upper Ngaruroro River and tributaries where gravels tend to be less affected by fine sediment. Fine sediment is more likely to settle out in the lower gradient lowland sites and infill gravels, and I think this is one reason why the abundance of dwarf galaxias typically decreases in the lower reaches of these river systems. The lower Ngaruroro provides an exception to this pattern, however, and dwarf galaxias have been detected closer to the river mouth, albeit in relatively low numbers (see Jellyman and Sinton 2017[11], and discussion in Holmes 2019[12]).

9.8 The absence of exotic species may also qualify some element of distinctiveness, but exotic species such as brown trout (*Salmo trutta*), rainbow trout (*Oncorhynchus mykiss*) and mosquitofish (*Gambusia affinis*) are present and sometimes abundant in the lower Ngaruroro River.

11 Jellyman, P.G. and Sinton, A.M.R. 2017. A comparison of the lower river fish communities in large Hawke's Bay rivers: Hawke's Bay fish survey work. Prepared for Hawke's Bay Regional Council. NIWA Client report No. 2017138CH.

12 Holmes, R. 2019. Relative value of the lower Ngaruroro River native fish community. Prepared for Hawke's Bay Regional Council. Cawthron Report No. 3089.

Comments on whether Lower Ngaruroro River provides outstanding native fish habitat

9.9 The diversity and abundance of some or many indigenous fish species in a waterbody could represent a unique or distinctive feature.

9.10 I provided evidence to the Special Tribunal for the proposed Water Conservation Order for the Ngaruroro that indicated the reach scale diversity in the lower Ngaruroro may be particularly high (my statement of evidence 25 January 2019). Appropriate datasets for undertaking a comparison of population sizes was limited then, however, and still is. My opinion then was the native fish community in the Ngaruroro was excellent and regionally significant, but not outstanding. I am not aware of any new information that would change my position with regards to the test of outstanding under a WCO.

9.11 Native fish values were not recognised as outstanding for any part of the Ngaruroro River by either the Special Tribunal or the Environment Court.

9.12 The RiVAS report for native fish (Hughey et. al. 2012[13]) considered the Ngaruroro catchment (as a whole, not just the lower river) to be nationally significant, along with 3 other large river catchments in Hawke's Bay (the Ngaruroro, Tūtaekurī and Wairoa). In my view, however, there were no features identified for the Ngaruroro River that were not also present in other river catchments. And evidence for uniqueness was not apparent, given the equal ranking of the Ngaruroro catchment with 3 other river catchments.

9.13 I am not aware of any datasets that could underpin an assessment of whether the lower Ngaruroro River supports an outstanding customary fishery.

9.14 Based on the available evidence I do not consider that the Lower Ngaruroro River passes the screening criteria for ecology (native fish habitat) value set. Neither the diversity nor abundance of native fish is demonstrably unique in Hawke's Bay. I do not consider the presence of dwarf galaxias close to the coast is notably

13 Hughey, K.F.D., Cameron, F., Cheyne, J., Dickson, R., Forbes, A., Hashiba, K., Rook, H., Sharp, T., Stephenson, B., and Welch, B. 2012. *Native birdlife in Hawke's Bay: Application of the River Values Assessment System (RiVAS and RiVAS+).* Land Environment and People Research Paper No. 14. HBRC Plan No. 4376.

'distinctive', because this species is more abundant in many other reaches in both the Ngaruroro and Tukituki catchments. It does not support more than 5% of the national population of any threatened fish species. I am not aware of any assessments that demonstrate it being an outstanding customary fishery.

Outstanding indigenous bird habitat

9.15 I note that in 2022, the Environment Court issued an interim decision on the Ngaruroro River Water Conservation Order application, which found the upper and lower Ngaruroro River to contain nationally outstanding avifauna habitat values. I refer to the evidence of Belinda Harper at section 19, who concludes that the Ngaruroro River should be recognised as providing an outstanding habitat for aquatic birds on this basis.

Conclusion

9.16 After reviewing the available evidence, in my opinion the Lower Ngaruroro River does not meet the screening criteria for the native fish ecology value set. It should, however, be included as outstanding for the native bird value set because avifauna habitat values have been recognised through the Water Conservation Order process.

WAITANGI ESTUARY

9.17 Here, I discuss the request to reinstate the Waitangi Estuary into Schedule 25 for the following outstanding values:

(i) indigenous fish habitat; and

(ii) indigenous bird habitat.

9.18 I have reviewed all of the relevant information that I am aware of and have access to, including the Ngaruroro River and Estuary Summary of Values prepared by Harper (2020).[14]

Description of Waitangi Estuary

9.19 The Waitangi Estuary provides the outlet (river mouth) of the combined catchments of the Tūtaekurī, Ngaruroro and Karamū, which each provide a separate tidal arm of the estuarine complex. The estuary is recognised as a nationally significant fisheries habitat and is listed as a Significant Conservation Area in the Regional Coastal Environment Plan. There is a high diversity of native aquatic birds that utilise the estuary.

Comments on whether Waitangi Estuary provides outstanding native fish habitat and / or bird habitat

Native fish habitat

9.20 In the OWB description of the Ngaruroro River and Estuary provided by Harper (2020)[15], it is noted the lower river and estuary supports 22 species of fish. This contrasts with the 29 species of fish noted for the Te Whanganui a Orotū (Ahuriri Estuary) in Harper (2020).[16]

9.21 Data is limited, but based on my understanding of the available habitats in the Waitangi Estuary, I have no reason to expect it to support a higher diversity of fish species than other moderate or large estuaries in Hawke's Bay. I would, in fact, expect the species found in the Waitangi Estuary to be present in many other estuaries in Hawke's Bay.

9.22 I would expect the Waitangi Estuary to support a lower diversity of fish than Te Whanganui a Orotū, due to its more abrupt connection with the open ocean and

14 Above n 3.
15 Above n 3.
16 Harper, B. 2020. *Te Whanganui a Orotū (Ahuriri Estuary) – Summary of Values for Proposed Plan Change 7: Hawke's Bay Regional Resource Management Plan (Outstanding Water Bodies Plan).* HBRC Publication Number 5509. https://www.hbrc.govt.nz/assets/Document-Library/Outstanding-Water-Bodies/3.-Values-reports/Ahuriri-Estuary-ID30-Summary-of-Values-Aug-2020-5509.pdf

therefore lesser diversity of estuarine habitats available. The expectation of a lesser diversity in Waitangi seems supported by the limited data available.

9.23 The Waitangi Estuary does provide a migration bottleneck for all fish species that spend some time in the sea before entering the freshwater habitats in the Ngaruroro, Tūtaekurī and Karamū catchments, which is a combined drainage area of about 330,000 hectares. In other words, it is a critical fish passage route to a large extent of freshwater habitat. So too, however, is the Wairoa estuary, which is the outlet for the Wairoa catchment that is over 350,000 hectares. For completeness, the Tukituki catchment is about 250,000 hectares and the Mohaka is about 240,000 hectares. I therefore do not think this fish passage angle provides any particular distinctiveness to the Waitangi Estuary in a regional context.

9.24 I am therefore unaware of any evidence to suggest the Waitangi Estuary has a native fish assemblage that is regionally unique in terms of diversity, abundance or distinctiveness. I do not consider it is likely to support more than 5% of a particular native fish species listed as Nationally Critical, Nationally Endangered or Nationally Vulnerable.

9.25 I am not aware of any datasets that could underpin an assessment of whether the Waitangi Estuary supports an outstanding customary fishery.

Native aquatic bird habitat

9.26 McArthur et. al. 2021 counted 11 indigenous bird species in the Waitangi estuary during a coastal bird survey, which was the equal 11th highest bird diversity among all sites surveyed.[17] They also counted a total of 1047 indigenous bird species, which was the 3rd highest abundance of all sites surveyed. Both the Ahuriri Estuary and Pōrangahau Estuary had a higher diversity (33 and 24 species, respectively) and overall abundance (3,356 and 1,311 birds, respectively) of indigenous bird species than the Waitangi Estuary.

17 Above n 6.

9.27 Bird counts presented in Parish (1988)[18] in the estuarine river mouths of the Mohaka, Ngaruroro, Tukītukī and Tūtaekuri showed the highest diversities were observed in the Ngaruroro and Tūtaekuri (both part of the Waitangi Estuary), which both had 40 indigenous water-associated bird species recorded. The Mohaka had 23 species, and the Tukituki had 31 species. No comparable counts were undertaken on the Pōrangahau or Ahuriri at this time.

9.28 The counts in Parish (1988)[19] on the Ngaruroro, Tukituki, and Tutaekuri were from the ornithological society of New Zealand, and were tallied from counts in 1962, 1967 and 1972. Counts for the Mohaka were undertaken by Hawkins separately and reported in 1985. I consider the higher numbers presented for the Waitangi Estuary in Parish (1988), as compared with McArthur et. al. (2022),[20] are likely due to different methodologies and more sampling effort. The absence of data from other systems at this time makes it difficult to use the Parish dataset for an assessment of regional outstandingness, and so I prefer the evidence provided in McArthur et. al. 2022.

9.29 Based on the above, I do not consider that the Waitangi Estuary is demonstrably regionally unique in terms of diversity, abundance or distinctiveness. Both the Ahuriri Estuary and Pōrangahau Estuary seem to support more diverse and abundant native bird assemblages. The Ahuriri Estuary provides for a higher diversity of native fish. I am not aware of any data suggesting the Waitangi Estuary supports more than 5% of the national population of a Nationally Critical, Nationally Endangered or Nationally Vulnerable species.

9.30 After reviewing the available evidence, in my opinion the Waitangi Estuary does not meet the screening criteria for either the ecology native fish habitat value set or the ecology native aquatic bird value set. I am not aware of any assessments that demonstrate it being an outstanding customary fishery.

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18 Above n 7.

19 Above n 7.

20 McArthur, N., Cotter, S., Curzon-Hobson, G., Flux, I., Flux, M., Mosen, C. 2022. State and trends in the abundance and distribution of riverbed-nesting shorebirds on the Tutaekuri, Ngaruroro and Tukituki Rivers. Client report prepared for Hawke's Bay Regional Council, Napier.

TUKITUKI RIVER AND ESTUARY

9.31 Here, I discuss the request to reinstate the Tukituki River upstream of State Highway 50 into Schedule 25 for the following outstanding values:

(i) native fish habitat; and

(ii) bird habitat.

9.32 The Tukituki River downstream of State Highway 50 including the Tukituki Estuary was recognised as providing outstanding habitat for native birds by the IHP.

9.33 I also discuss the request to reinstate the Tukituki River downstream of State Highway 50 for native fish habitat.

9.34 I have reviewed all of the relevant information that I am aware of and have access to, including the Tukituki River and Estuary Summary of Values prepared by Harper (2020).[21]

Description of Tukituki River upstream of State Highway 50 (in terms of birds and fish habitats) and Tukituki River downstream of State Highway 50 including the Tukituki Estuary (in terms of fish habitat)

9.35 The Tukituki River is the mainstem of a large braided river system that starts in the Ruahine Ranges and enters the sea at Haumoana approximately 117km downstream. It flows over and through the Ruataniwha Plains, where land use is comparatively intense, and there are complex interactions between surface water and groundwater. Major tributaries include the Waipawa, Makaretu and Tukipo Rivers. The braided reaches of this river and its major tributaries provide large areas of gravel riverbeds and beaches for fish and native river-breeding birds.

21 Above n 5.

Comments on whether Tukituki River and Estuary provide outstanding native fish habitat and / or bird habitat

Native fish habitat

9.36 Similar to the potential outstandingness of native fish habitat in the Ngaruroro River, I do not consider the Tukituki River or its estuary can be demonstrated as being regionally unique in terms of diversity, abundance or distinctiveness based on the data currently available. There are no species found in the Tukituki River and nowhere else, and the wide ranges of both migratory and non-migratory fish species that occur in Hawke's Bay mean the diversity of fish among sites is often similar.

9.37 The RiVAS report for native fish (Hughey et. al. 2012[22]) considered the Tukituki catchment to be nationally significant, along with 3 other large river catchments in Hawke's Bay (the Ngaruroro, Tūtaekuri and Wairoa). In my view, however, there were no features identified for the Tukituki that were not also present in other river catchments. And evidence for uniqueness was not apparent, given the equal ranking of the Tukituki catchment with 3 other river catchments.

9.38 A feature of the riverine fish community that may stand out is its relatively higher abundance of species like torrentfish, when compared with the Tūtaekurī or Ngaruroro (Jellyman and Sinton (2017)[23]). Comprehensive, comparative analyses that may demonstrate distinctive features of the Tukituki River are not forthcoming.

9.39 I am not aware of any datasets that could underpin an assessment of whether the Tukituki River supports an outstanding customary fishery.

9.40 Based on the available evidence I do not consider that the Tukituki River passes the screening criteria for the ecology native fish habitat value set. Neither the diversity nor abundance of native fish is demonstrably unique in Hawke's Bay. It does not

22 Hughey, K.F.D., Clapcott, J., Goodwin, E., Jonas, H., Cheyne, J., Rook, H., Cameron, F., Maxwell, I. and Sharp, T. Native fish in Hawke's Bay: Application of the River Values Assessment System (RiVAS and RiVAS+). Land Environment and People Research Paper No. 14. HBRC Plan No. 4379.

23 Above n 11.

support more than 5% of the national population of any threatened fish species. I am not aware of any assessments that demonstrate it being an outstanding customary fishery.

Native Aquatic Bird habitat

9.41 The decisions version of Schedule 25 includes the Tukituki River downstream of State Highway 50, including the Tukituki Estuary, as outstanding habitat for native aquatic birds. Only the mainstem of the Tukituki River was designated as an outstanding water body, and not any of its tributaries.

9.42 The decisions version of Schedule 25 describes the lower river of the Tukituki and estuary as having the "largest population of wading birds in the region".

9.43 For clarification, the bulk of waders found along the Tukituki River system are found in the freshwater, gravel-bed reaches, and not in the estuary itself. The study which provides the evidence of the Tukituki River supporting the largest population of wading birds in the region (Parrish 1988) did not separate out different reaches of the Tukituki. Rather, this population assessment was done on the broader Tukituki River system including major tributaries (Waipawa, Mangaonuku, Makaroro, Tukipo and Makaretu Rivers). Therefore, for the Tukituki to qualify as having the "largest population of wading birds in the region", it would need to include the entire length of braided river habitat in the mainstem and major tributaries.

9.44 I understand, however, that main tributaries of the Tukituki River such as the Waipawa River are outside the scope of this appeal. There is minimal braided river bird habitat upstream of State Highway 50 on the Tukituki River itself, because the river corridor narrows considerably, and recent bird counts show these reaches contribute only minor additional bird counts to the overall river bird population (see McArthur et. al. 2022[24]). This means the bird population on the Tukituki River upstream of State Highway 50 does not contribute to the uniqueness or distinctiveness of the bird assemblage that was identified as outstanding by the

24 Above n 20.

IHP. As such, I do not consider that extending the area identified as an outstanding water body upstream of State Highway 50 is warranted.

9.45 On its own, I do not consider the Tukituki River upstream of State Highway 50 supports a native aquatic bird assemblage that could be considered regionally unique in terms of diversity, abundance, or distinctiveness. Nor, on its own, does it support more than 5% of a Nationally Critical, Nationally Endangered or Nationally Vulnerable species. The birds utilising the Tukituki River upstream of State Highway 50 are a minor fraction of the total bird population that was recognised as outstanding when the Tukituki River downstream of State Highway 50 was included as an Outstanding Water Body by the Independent Hearing Panel.

9.46 After reviewing the available evidence, in my opinion the Tukituki River upstream of State Highway 50 does not meet the screening criteria for the ecology aquatic bird value set. As such, I do not recommend the Tukituki River upstream of State Highway 50 is included in Schedule 25 for bird values.

LAKE POUKAWA AND PEKAPEKA SWAMP

9.47 Here, I discuss the request to reinstate Lake Poukawa and Pekapeka Swamp into Schedule 25 for the following outstanding values:

(i) indigenous plants; and

(ii) indigenous bird habitat.

9.48 I have reviewed all of the relevant information that I am aware of and have access to, including the Lake Poukawa and Pekapeka Swamp summary report prepared by Harper (2020).[25]

25 Above n 4.

Description of Lake Poukawa and Pekapeka Swamp

9.49 Lake Poukawa is a large, shallow lake fringed by raupō and surrounded by farmland. Some of the surrounding farmland is an ephemeral wetland area, and has been referred to as a 'water meadow' by Singers 2015[26]. Pekapeka Swamp is described as the only large swamp remaining in Hawke's Bay. The outflow of Lake Poukawa forms the Poukawa Stream which flows through Pekapeka Swamp before joining the Awanui Stream, Karamū Stream, Te Awa o Mokotūāraro (previously Clive River) and Waitangi Estuary.

Comments on whether Lake Poukawa and Pekapeka Swamp provide outstanding habitat indigenous plant communities and/or native aquatic bird habitat

Habitat for Indigenous Plant Communities

9.50 The swamp nettle has been noted in both Lake Poukawa and Pekapeka swamp (*Urtica perconfusa,* synonymous with *Urtica linearifolia*). This species has sometimes been referred to as 'threatened' in reports, but the term 'threatened' is often used loosely, and the species is currently listed as At Risk: Declining under the New Zealand Threat Classification System. It has been of lower conservation concern since at least 2005 (Hitchmough 2007).[27]

9.51 In Hawke's Bay, the swamp nettle is also known to occur in at least Lake Whatuma, Lake Runanga, Lake Oingo, and Willow Swamp (Walls 1998[28]; Cameron 2008[29]). As such, the presence of swamp nettle in both Pekapeka swamp and Lake Poukawa does not in my view trigger anything unique or particularly distinctive.

9.52 Cameron (2008)[30] noted that the swamp nettle was the only rare species known to occur in Pekapeka swamp.

26 Singers, N. Mapping of Hawke's Bay wetlands. Prepared for Hawke's Bay Regional Council. NSES Ltd Report 28: 2015/16.
27 Hitchmough R, Bull L, and Cromarty P (2007). *New Zealand Threat Classification lists 2005.*
28 Above n 8.
29 Above n 2.
30 Above n 2.

9.53 In my opinion, the presence of the swamp nettle does not mean that the Pekapeka Swamp meets criterion (a) of List A. The swamp nettle is not a special feature that is not found anywhere else in the region.

9.54 As noted in the Forest and Bird notice of appeal dated 5 August 2021, the description of Lake Poukawa as per the previous version of PC7 included:[31]

> "*The wetland area contains swamp nettles (Urtica linearifolia) and the acutely threatened aquatic liverwort (Ricciocarpos natans) which is nationally endangered*."

9.55 I am not sure what survey or report this record and description relates to. The aquatic liverwort is common in Lake Runanga and has also been noted from Horseshoe Lake (Lamason 2006).[32] I also note this species is found in freshwaters all around the world. The species was classified in the New Zealand Threat Classification System as At Risk: Declining for both the 2014 and 2020 updates for hornworts and liverworts. I am therefore not sure where the 'acutely threatened' or 'nationally endangered' descriptors of the *R. natans* in previous evidence stem from. But *R. natans* is not classified as threatened in the NZTCS, it is not unique to these water bodies, and so the presence of this species in Lake Poukawa does not in my view meet the screening criteria of either (a) or (b) of List A.

9.56 Based on this evidence, Lake Poukawa and Pekapeka Swamp do not appear to contain any special features not found anywhere else in the region, and do not support one of the highest numbers of a national population of a Nationally Critical, Nationally Endangered or Nationally Vulnerable species on the New Zealand Threat Classification List.

9.57 I am unaware of any other ecological evidence on the indigenous plant communities in Pekapeka or Poukawa that may support these systems being considered outstanding for indigenous plants.

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31 Appeal of Royal Forest and Bird Protection Society of New Zealand Incorporated to the Proposed Plan Change 7 to the Hawke's Bay Regional Policy Statement, 5 August 2021, at 23. https://www.hbrc.govt.nz/assets/Uploads/Notice-of-Appeal-HBRC-PC7-Forest-Bird-FINAL.PDF

32 Lamason, A. 2006. Oingo Lake Ecological Monitoring 2006.

9.58 After reviewing the available evidence, in my opinion, Lake Poukawa and Pekapeka Swamp do not meet the screening criteria for regionally outstanding ecology values for indigenous plant communities.

Native aquatic bird habitat

9.59 Lake Poukawa and Pekapeka Swamp provide a large area of diverse lake and wetland habitats to support aquatic birds. This includes large expanses of open water in Lake Poukawa, large areas of fringing wetland vegetation in both Lake Poukawa and Pekapeka Swamp, and a wide transition from more permanently wet habitat into the aptly named water meadows in Lake Poukawa (Singers 2015). The extent and diversity of this lake and wetland complex provides a huge expanse of productive habitat for aquatic bird species. The quality and diversity of these habitats are evidenced by a diverse and remarkably abundant aquatic bird community. I consider that Lake Poukawa and Pekapeka Swamp pass the screening criteria for the native bird value due to being both distinctive and remarkable in a Hawke's Bay setting, which I will expand on below.

9.60 Mr Cheyne has provided counts of bird species utilising Lake Poukawa on multiple sampling occasions. These counts are provided in Table 1 below, along with counts collated in the Local Expert Panel Report.

Table 1 Bird counts from Lake Poukawa. Not all species were counted on each visit. '-' denotes when species were not counted. Data from John Cheyne.

Species	June 1 2023	May 2 2023	August 4 2014	August 8 2011
Black swan	983	330	-	-
Black billed gull	76	607	-	-
Royal spoonbill	47	165	-	-
Pied stilt	1290	557	-	1067
White heron	1	0	-	-
Grey teal	-	7,045	2381	-
Shoveler duck	-	-	4815	-
Dabchick	-	-	108	-

9.61 Hawke's Bay Fish and Game undertake annual counts of Australasian shoveler, Paradise ducks and Black swan. Figures 1-3 provide the annual counts as a time series, with the Poukawa counts highlighted against the background of other systems in Hawke's Bay where counts were undertaken.

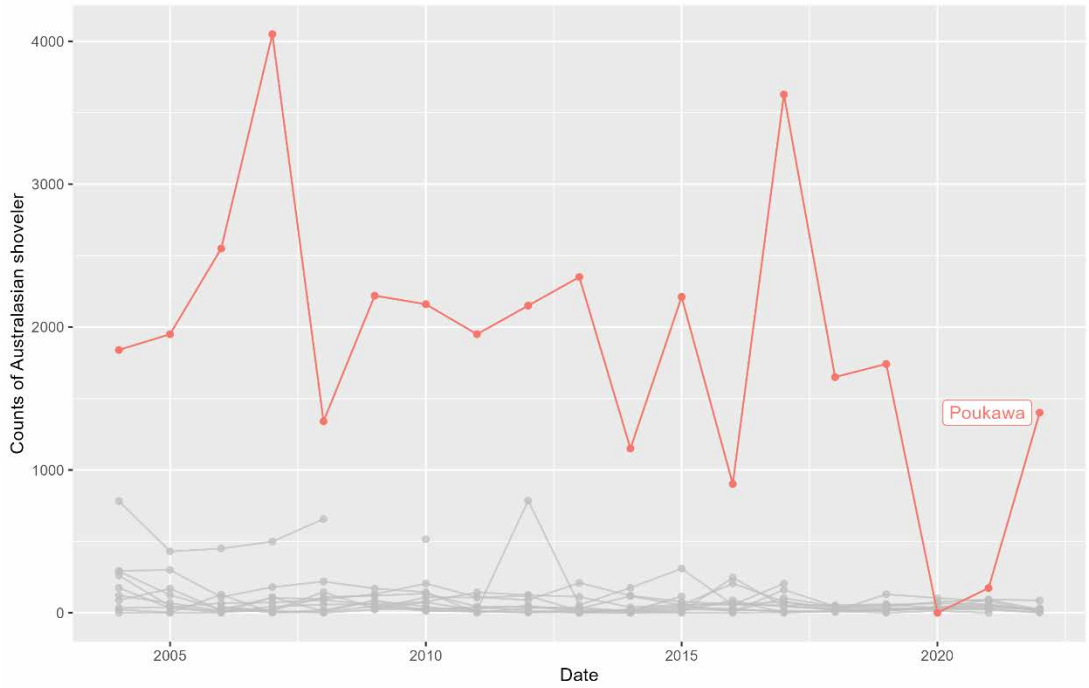

Figure 1 Annual counts of Australasian shoveler ducks. Counts provided by Hawke's Bay Fish and Game.

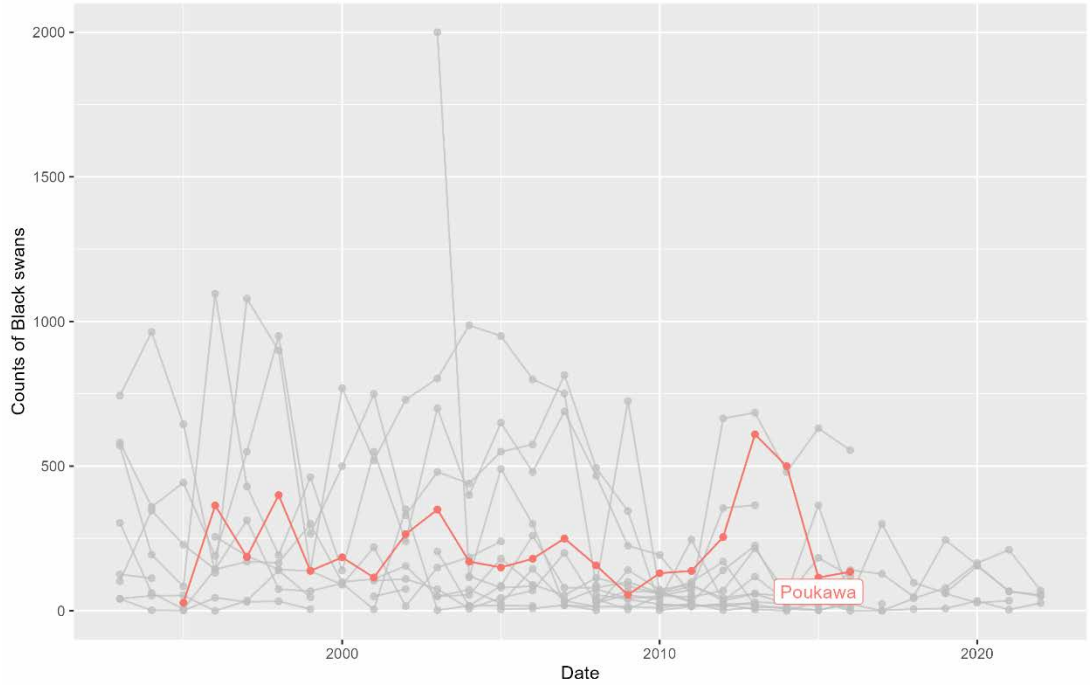

Figure 3 Annual counts of black swan. Data provided by Hawke's Bay Fish and Game.

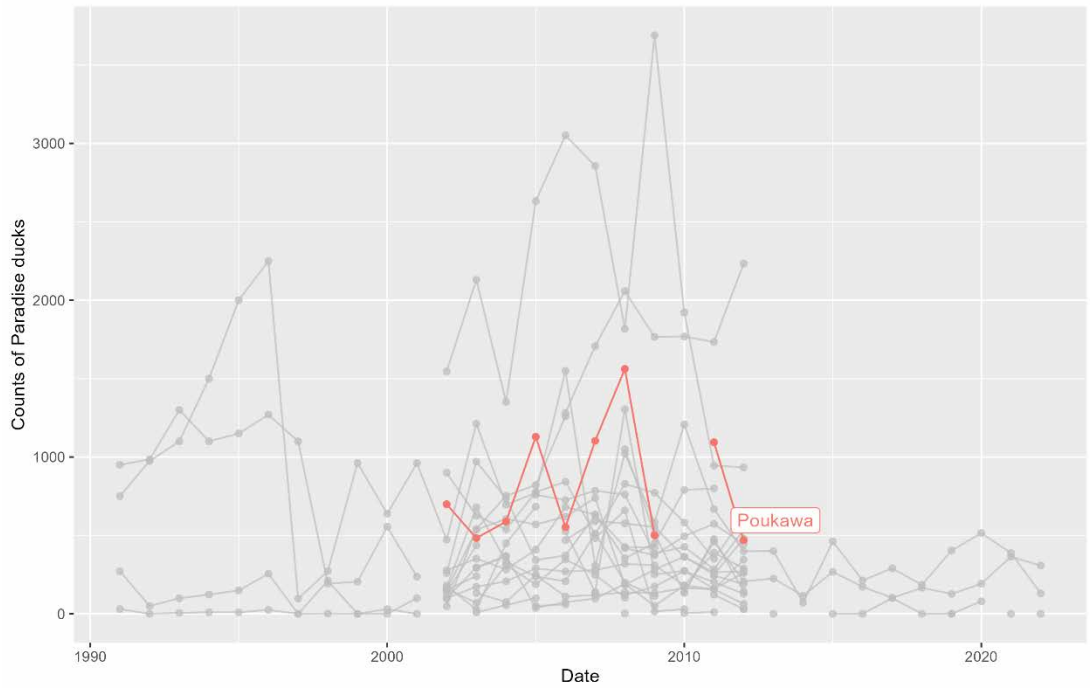

Figure 2 Annual counts of Paradise ducks. Data provided by Hawke's Bay Fish and Game.

9.62 The annual counts of native waterfowl by Hawke's Bay Fish and Game demonstrate the remarkably high numbers of Australasian shoveler that are consistently observed in Lake Poukawa. They also demonstrate consistently medium to high numbers of Paradise ducks and black swan relative to the other systems where these counts were undertaken in Hawke's Bay.

9.63 Hawke's Bay Fish and Game undertake these counts on a different collection of waterbodies for each species, based on where the highest abundances of each of the waterfowl species are known to occur in Hawke's Bay. Lake Poukawa therefore sits as 'high' amongst a collection of sites with a high abundance of these species.

9.64 John Cheyne has collated the counts of Australasian bittern that have been undertaken in Lake Poukawa and Pekapeka Swamp, which are summarised in Table 2 below.

Table 2 Counts of Australasian Bittern. Counts were not undertaken at most other sites in 2018 and 2019, and so regional figures are not presented due to a lack of coverage.

System	2011	2018	2021
Poukawa	7	7	7
Pekapeka	3	5	3
Whatuma	10[33]	11	5
Total Hawke's Bay	54	-	-

9.65 In 2011, the 10 males noted from Poukawa and Pekapeka constituted 16% of the regional counts. There were 12 males noted from Lake Whatumā during this year in the Report of the Expert Panel, based on the incorporation of counts that had occurred outside of the official DoC censusing.[34] This figure of 12 constituted 22% of the regional counts. The high numbers of Australasian bittern in Lake Whatumā was recognised as contributing to outstanding bird habitat by the Independent Hearing Panel. It is notable that the numbers of bittern in Lake Poukawa and Pekapeka wetland have been close to or higher than those in Whatumā when looking over all 3 years from which data is now available.

33 The Report of the Expert Panel recorded 12 bittern for Whatuma. Counts that have been provided more recently for the official censuses undertaken by DoC were provided in a summary produced by John Cheyne. These census figures are presented in this table, and is why the 2011 figure for Whatuma is noted as 10 and not 12. I do not consider this to make a material difference to the assessment I have undertaken. But I note both values here for completeness.

34 John Cheyne, "personal communication", 11 August 2023.

9.66 The exceptionally high abundance of Australasian shoveler in Poukawa is a regionally unique feature of this native aquatic bird assemblage. Additional features of the aquatic bird community contribute to the Poukawa and Pekapeka complex being unique in the region for its distinctiveness, and include:

(a) Large abundances of a range of native aquatic bird species, including dabchick, pied stilt, royal spoonbill, black billed gulls and grey teal.

(b) The combined area of Poukawa and Pekapeka support at least 10-12 breeding territories of male bitterns.

(c) Medium to exceptionally high counts of all three species of waterfowl that are consistently monitored by Fish and Game.

(d) The species in a) to c) exhibit different habitat preferences. So the fact that Poukawa provides for a high abundance of so many different aquatic bird species demonstrates that this system provides a uniquely large area of diverse lake and wetland habitats that are capable of supporting an abundance of a range of aquatic birds.

9.67 After reviewing the available evidence, in my opinion, Lake Poukawa and Pekapeka Swamp do meet the screening criteria for the ecology (habitat for aquatic birds) value set. I consider that Lake Poukawa and Pekapeka Swamp are regionally outstanding for ecology values.

MAKARORO RIVER

9.68 Here, I discuss the request to reinstate the Makaroro River into Schedule 25 for the following outstanding values:

(i) indigenous plant habitat; and

(ii) indigenous habitat.

9.69 I have reviewed all of the relevant information that I am aware of and have access to.

Description of Makaroro River

9.70 The Makaroro River flows from the slopes of the Ruahine Ranges and enters the Waipawa River near the town of Tikokino. Its catchment is predominately native cover.

9.71 It is unclear from the TTOH Notice of Appeal what part(s) of the Makaroro River, and specifically which plant communities, are being nominated as outstanding and are reliant on the river flows, other aquatic characteristics, or are an integral part of the water body (referred to as *waterbody-reliant plants* from here on).

9.72 There are some river-associated wetlands that have been identified in the catchment (oxbows). But oxbow wetlands are found in many other floodplains in the region, and so oxbows do not represent a special feature not found elsewhere in the region.

9.73 There are significant native conservation values identified in the Central Hawke's Bay (operative) District Plan, which includes a bush margin near Wakarara Road and the broader Ruahine State Forest Park area. These are not obviously dependent on aquatic characteristics.

9.74 The Central Hawke's Bay Proposed District Plan identifies a number of Significant Natural Areas (SNAs). Proposed SNAs that intersect or are in close vicinity to the Makaroro River floodplain are listed below, in a roughly downstream to upstream order:

(a) SNA-75: Rimu-Tawa-Kamahi forest;

(b) SNA-101: Rimu-Tawa-Kamahi forest;

(c) ***SNA-70:*** Rushland (wetland). A good-sized example for the region;

(d) SNA-78: Rimu-Tawa-Kamahi forest;

(e) SNA-83: Rimu-Tawa-Kamahi forest;

(f) ***SNA-6:*** Braided river channels with mixed exotic and native vegetation;

(g) SNA-92: Rimu-Tawa-Kamahi forest;

(h) SNA-98: Rimu-Tawa-Kamahi forest;

(i) SNA-99: Rimu-Tawa-Kamahi forest;

(j) SNA-9: Rimu-Tawa-Kamahi forest;

(k) SNA-10: Rimu-Tawa-Kamahi forest;

(l) SNA-2: Broadleaved – Kanuka treeland;

(m) SNA-5: Rimu-Tawa-Kamahi forest; and

(n) SNA-1: Podocarp forest and scrub tussock grassland.

9.75 Only 2 of these SNAs (italicised) would seem to potentially qualify as waterbody reliant. SNA-70 is described as a rushland, which is a type of wetland, and this site is an example of an oxbow formation. And SNA-6, which are the braided river channels of the Makaroro itself, which flow into the Waipawa River and then into the Tukituki River.

9.76 Although these SNAs are by definition significant from a natural value perspective, they do not obviously exhibit special features not found elsewhere in the region. I am not aware of any evidence that SNA-70 nor SNA-6 supports one of the highest numbers of a national population of a particular indigenous plant species listed as Nationally Critical, Nationally Endangered or Nationally Vulnerable. As such, I am

now aware of any evidence that indicates the Makaroro River would pass the screening criteria for the indigenous plant value set.

9.77 I am unclear what "indigenous habitat" for the Makaroro River in the TTOH Notice of Appeal refers to specifically, but I am not aware of any population data for plants, fish, birds or above ground ecology values that demonstrates any unique or special features not found elsewhere in the region. Nor am I aware of any evidence that would indicate the Makaroro supports one of the highest numbers of a national population of Nationally Critical, Nationally Endangered or Nationally Vulnerable species.

Conclusion

9.78 After reviewing the available evidence, in my opinion the Makaroro River does not meet the screening criteria for the indigenous plant value set, or any other ecology value set.

10. CONCLUSIONS

10.1 In my opinion Lake Poukawa and Pekapeka Swamp pass the screening criteria for the native aquatic bird value set due to the exceptional and regionally unique bird assemblage it supports. I consider that this system should be recognised as an outstanding water body.

10.2 I note that the Lower Ngaruroro passes the screening criteria due to a Water Conservation Order recognising there being outstanding habitat for avifauna. However, I do not consider that the Lower Ngaruroro passes the screening criteria for native fish.

10.3 I do not consider that Lake Poukawa and Pekapeka Swamp pass the screening criteria for any other ecology value set.

10.4 I do not consider that the Upper Tukituki River or Waitangi Estuary pass the screening criteria for the aquatic bird value set.

10.5 I do not consider that the Makaroro River passes the screening criteria for indigenous plant communities.

10.6 Based on the available information, I do not consider that either the Ngaruroro River, Tukituki River, Tukituki Estuary or Waitangi Estuary pass the screening criteria for native fish.

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Dr Andy Hicks

Date: 11 August 2023