WAIORA NORTHLAND WATER

Draft Doubtless Bay Catchment Management Plan

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Introduction

The purpose of this Draft Doubtless Bay Catchment Plan is to identify solutions to water quality and water quantity issues/problems in the Doubtless Bay catchment. The Draft Doubtless Bay Catchment Plan (draft catchment plan) has been developed by a collaborative stakeholder group supported by Northland Regional Council and made up of members representing a range of parties with an interest in freshwater in the Doubtless Bay catchment (such as farming, forestry and Tangata Whenua).

The draft catchment plan sets out the issues identified by the group, their objectives for water quality and quantity in the Doubtless Bay catchment and includes a range of methods to achieve the outcomes sought.

The plan has been developed alongside the Draft Regional Plan for Northland. These documents should be read together, as the Draft Regional Plan sets out the region-wide objectives, policies and rules for fresh and coastal water management (among other things), while the draft catchment plan provides a catchment-specific approach using both regulatory (rules) and non-regulatory methods. Once finalised, the regulatory methods in the draft catchment plan will be included in a section of the Regional Plan specific to Doubtless Bay.

The objectives, methods and actions are recommendations only unless included in statutory documents by local authorities or other agencies with regulatory powers.

Both the draft catchment plan and the Draft Regional Plan will be revised as needed following community feedback before being finalised.

Catchment overview

The Doubtless Bay catchment is located on the east coast of Northland, approximately 33km east of Kaitāia and is 55,605 hectares in area (Figure 1). It is made up of three primary sub-catchments formed around the larger rivers in the catchment – the Oruaiti, the Taipā/Ōruru and the Awapoko/Aurere. Land use in the catchment is predominantly a mix of agricultural use, plantation forestry and indigenous vegetation with a strip of urban development extending along SH10 and the coast from Hihi in the east, through Mangonui, Coopers Beach and Cable Bay to Taipā in the west.

Several dune lakes are located on the Karikari peninsula and have unique ecological values (such as Lake Waiporohita) and/or are valued for recreational use (such as Lake Rotopokaka – also known as Coca Cola). Cultural and ecological values are high across the catchment with fresh and coastal water also valued for recreational use and as a food source. Socio-economic values are also significant and beyond urban areas for the most part relate to primary production (such as farming and forestry) and tourism.
For a more detailed description of the Doubtless Bay Catchment please see: [INSERT LINK TO CATCHMENT DESCRIPTION]:

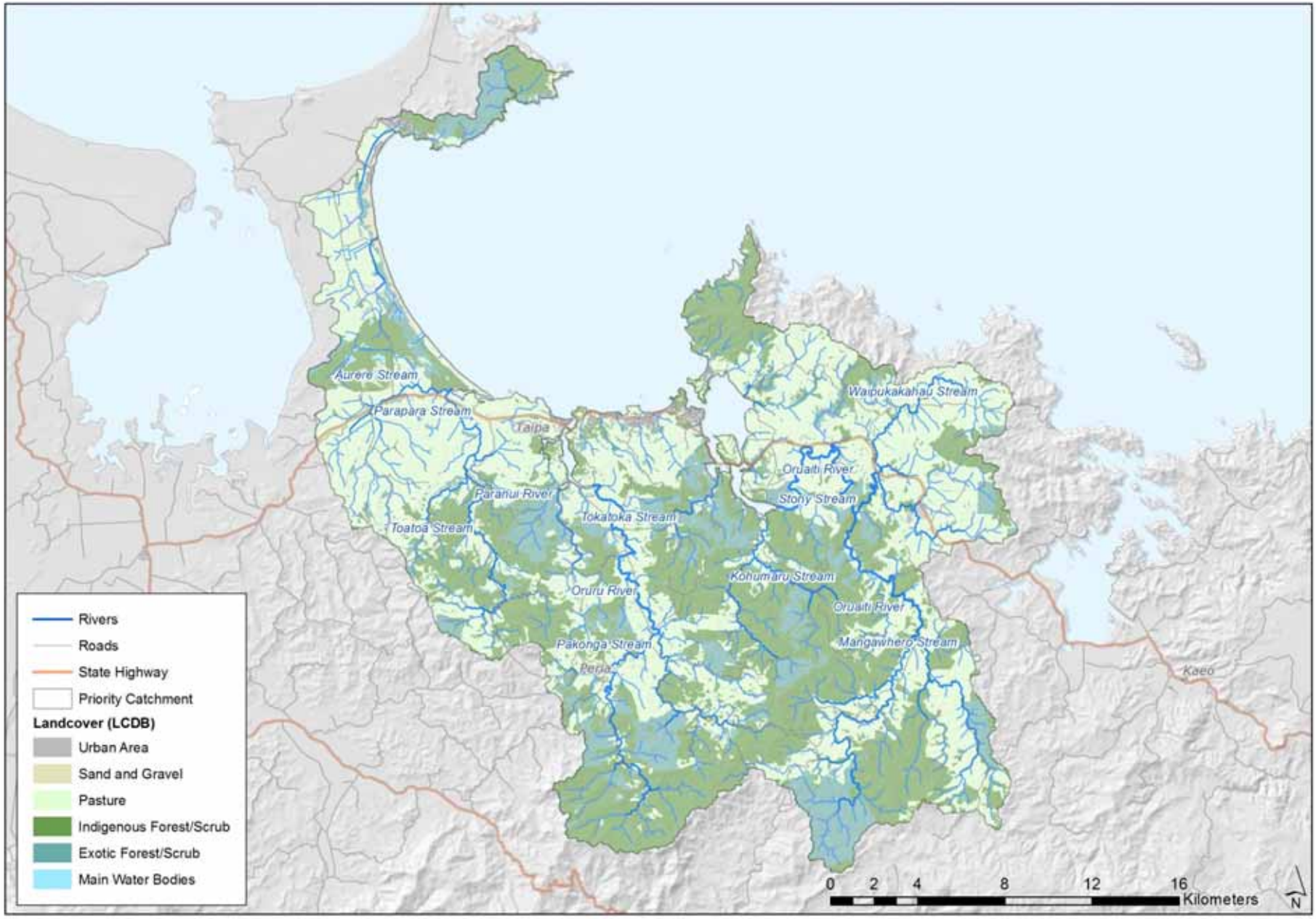

Figure 1: Doubtless Bay catchment showing main rivers and land cover.

Water quality

Rivers: water quality is monitored by Northland Regional Council at a number of rivers in the Doubtless Bay catchment (See Figure 2). A number of water quality indicators are monitored to understand the condition of the water for ecological health and human health. Council also monitors stream macroinvertebrates (MCI) and stream habitat as indicators of water quality and stream health. The results of this monitoring are shown in Table 2.

Table 2 sets out a number of different measures – those identified under the heading of the "National objectives framework (NOF)" are compulsory. In its current form the NOF does not address all the water quality issues of concern in Northland. For this reason we have also included a number of other guidelines/indicators to give a more complete picture of water quality. While the NOF and guidelines such as the ANZECC[1] are quite different and are not directly comparable, it is useful to provide results for both to give an overall indication of water quality throughout the catchment.

It is worth noting that results for dissolved reactive phosphorus (DRP) are elevated in many cases, which is likely due to catchment geology (naturally high phosphorous levels) and the fact that DRP and sediment tend to bond and 'travel' together. We also have limited data on periphyton (nuisance algal growths in rivers) as three years' data is required – also a number of the streams in the Doubtless Bay catchment don't support periphyton growth as they are 'soft bottom' rivers and periphyton prefers rocky bottomed rivers.

For the purposes of managing freshwater quality in the Draft Regional Plan, the Northland Regional Council has divided Northland into two freshwater quality management units (or FMU). These are the Lowland FMU, which is land below an average15^0 slope, and the Hill Country FMU, which is land above 15 degree slope (Figure 2).

Lakes

The Northland Regional Council also monitors Lake Waiporohita, which is a small shallow dune lake in the northern part of the catchment. While Lake Waiporohita has very high ecological values, monitoring shows the lake is subject to high levels of nutrients and is in an enriched state, meaning it is at risk of algal blooms, which impact on ecosystem health (the habitat value for native plants and animals).

Sediment modelling

Recent sediment modelling has provided an estimate of the sources of sediment in Doubtless Bay – total sediment volume from the whole catchment is estimated at 162,218 tonnes per year from 553km^2. It is estimated that 15% of sediment comes from areas in woody vegetation, 62% from pasture and 23% from streambank erosion. Addressing erosion processes

[1] Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC 2000 Guidelines)

on pasture is the most effective approach to managing sediment run-off from land – critical sources of sediment from pasture are gully and landslide erosion processes which generate proportionately high percentages of the load from comparatively small areas of the catchment (See Appendix 1: Figure 5 critical source areas and Figure 6 affected properties). It is important to note that these are modelled estimates, not measured.

Coastal water quality

Council monitors coastal water quality for recreational bathing at three sites on the Doubtless Bay coast to assess the risk of contamination using the indicator bacteria Enterococci (Ent.). Results are summarised in Table 1.

Table 1: coastal bathing water quality results 2014/15.

Site name	Result	Risk
Coopers Beach	**Blue**	Suitable for swimming 95-100% of the time.
Taipā	**Green**	Suitable for swimming 90-95% of the time (92%).
Tokerau Beach	**Blue**	Suitable for swimming 95-100% of the time.

Water quantity

There are 15 active water take consents within the Doubtless Bay catchment; three of these are surface water takes and 12 are groundwater takes. The two largest surface water takes are 3110m^3/day for domestic water supply and 3000m^3/day for irrigation. The largest groundwater takes are 2085m^3/day for stock drinking in Rangiputa and 400m^3/day and 200m^3/day both for public water supply in the Coopers Beach/Cable Bay area. The total consented water allocated in the catchment is 15,587m^3/day for both ground and surface water takes.

Based on the best information available, water taken for stock drinking and dairy shed use in the Doubtless Bay catchment is estimated at 716m^3/day. The total consented and estimated allocation of water from rivers in the Doubtless Bay Catchment is comparatively low – the amount of water taken from rivers is around 10% of the Mean Annual Low Flow (MALF) of the river. This indicates that extraction of water for human use has only altered flows to a small extent.

The Northland Regional Council has grouped rivers in the region into four different FMU for managing river water quantity based on their uses, values and sensitivity to extraction. Each FMU is subject to different limits on the taking of water – how much water should remain in rivers (minimum flow) and the total amount that can be extracted (allocation limit). These limits will be included in the Draft Regional Plan and serve to protect aquatic habitat values and reliability of supply for water users. The limits are expressed as a percentage of the river's MALF. Under the regional approach, the Doubtless Bay Catchment would have two FMU – small rivers and coastal rivers (See Figure 4). The limits for the small and coastal rivers FMU are set out in Table 3.

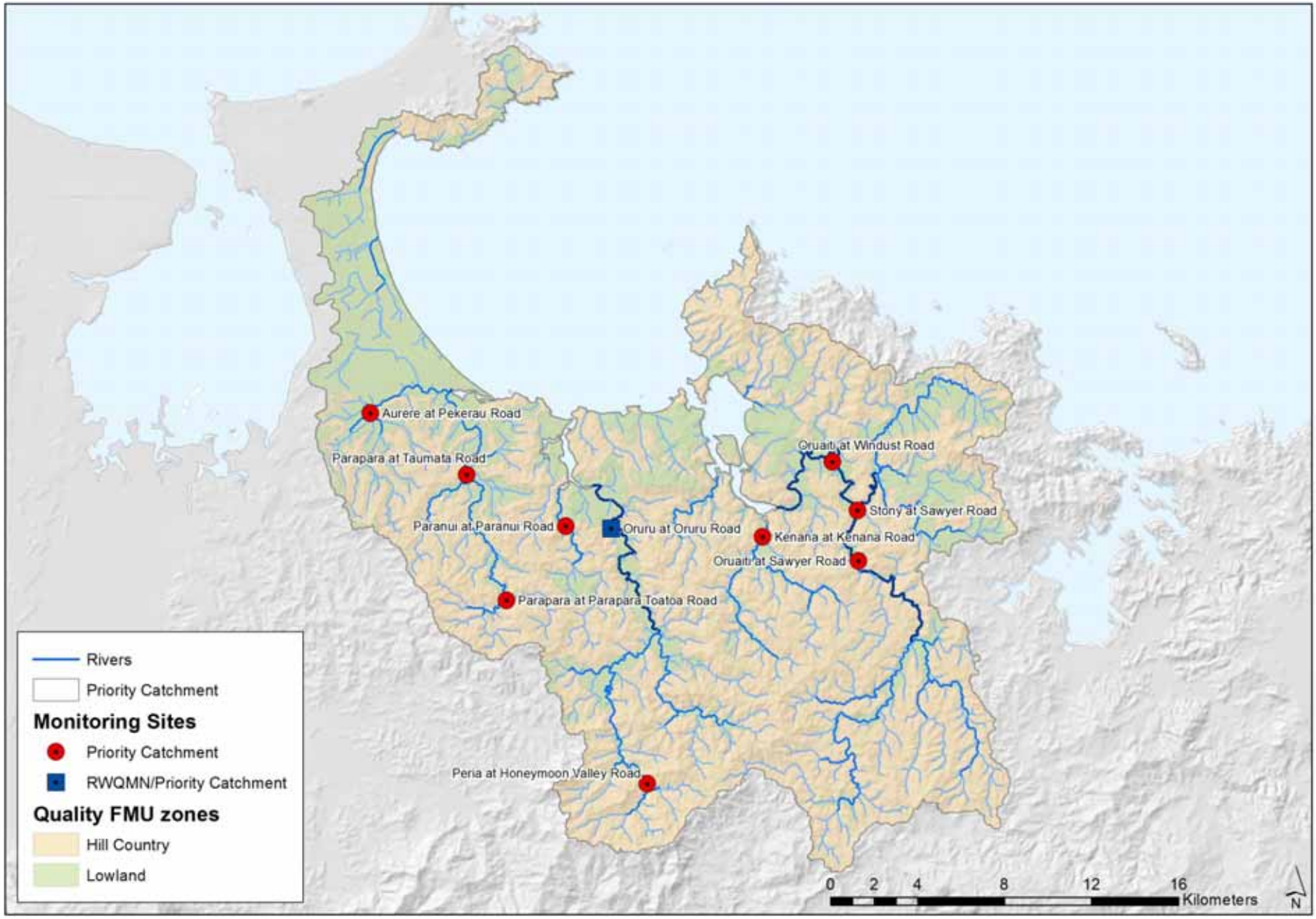

Figure 2: river water quality monitoring sites and lowland/hill country FMUs and in Doubtless Bay catchment from July 2014.

Water quality monitoring site	National Objective Framework (NOF) attributes				ANZECC guideline value		RMA 1991	Ecological indicators	
	Nitrate nitrogen toxicity (mg/L)	Ammoniacal nitrogen toxicity (mg/L)	Escherichia coli (*E.coli*/100mL)	Periphyton Exceeds no more than 8% of samples (Chl a mg/m²)	Dissolved reactive phosphorus (mg/L)	Turbidity (NTU)	Dissolved oxygen (% saturation)	Macro-invertebrates	Stream habitat
	95th percentile A ≤1.5 B >1.5 ≤3.5 C >3.5≤9.8 D >9.8	Annual maximum A ≤0.05 B>.05≤0.4 C >0.4≤2.2 D >2.2	Annual median A ≤260 B >260≤540 C >540≤1000 D >1000	Chlorophyll a A ≤50 B >50≤120 C >120≤200 D >200	Annual median <0.01	Annual median <5.6 NTU	Annual median 80 % sat	MCI score	% rating compared with reference site
Aurere at Pekerau Rd	A	C	C	ND	Above	Above	Below	73.6	21
Parapara at Parapara Toatoa Rd	A	B	B	ND	Below	Below	Below	89	43
Parapara at Taumata Rd	A	B	B	ND	Above	Above	Below	87.45	50
Peria at Honeymoon Valley Rd	A	A	A	B	Above	Below	Above	132.86	91
Oruru at Oruru Rd	A	B	A	ND	Above	Below	Above	79.23	47
Paranui at Paranui Rd	A	A	A	ND	Below	Below	Below	60	59
Kenana at Kenana Rd	A	B	A	ND	Above	Below	Above	114	42
Oruaiti at Sawyer Rd	A	A	A	C	Above	Below	Above	97	67
Stony at Sawyer Rd	A	B	A	B	Below	Below	Above	117	78
Oruaiti at Windust Rd	A	B	A	A	Below	Below	Above	107	58

Table 2: river water quality monitoring results in Doubtless Bay catchment July 2014 – July 2015.

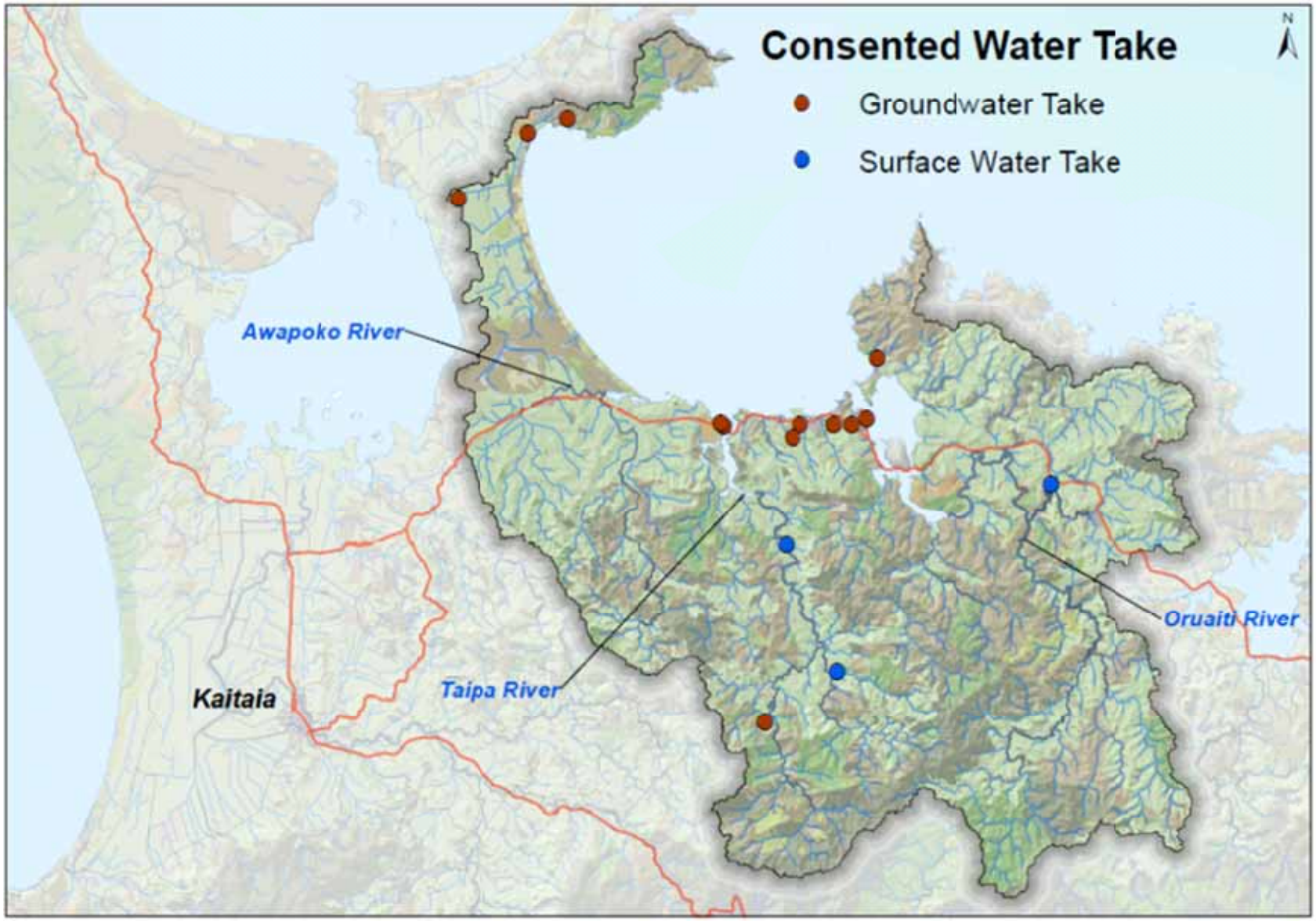

Figure 3: consented water takes.

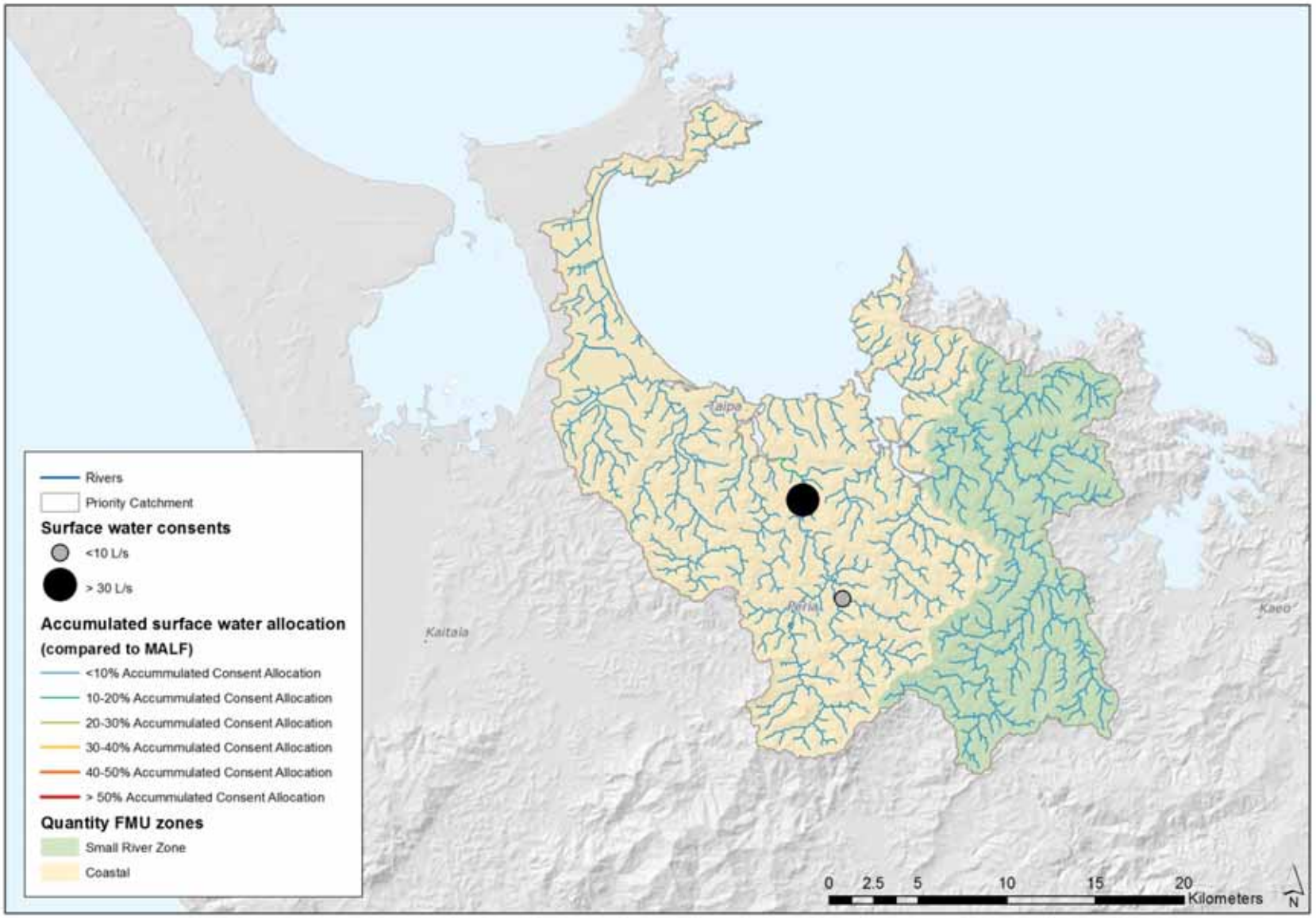

Figure 4: regional approach – the Doubtless Bay catchment would have two FMU, small rivers and coastal rivers. The map also shows the locations of the main surface water consents.

Table 3: water quantity freshwater management unit limits.

FMU	Minimum flow	Allocation limit	Rationale
Coastal rivers	90% MALF	30% MALF	Coastal rivers have the highest diversity in native fish (as many native fish move between fresh and coastal waters as part of their life cycle). These rivers are sensitive to water takes given their typically small flow, which also means they have the lowest natural reliability for users. The limits for coastal rivers deliver higher minimum flows and lower allocation to provide for aquatic habitat values but still allow for use.
Small inland rivers	80% MALF	40% MALF	Small rivers have less fish diversity than coastal rivers given the distance from the coast and are used more for productive use. The small river limits provide for a lower minimum flow and higher allocation given the less sensitive habitat value.

For more detail on the state of water quality and quantity in the Doubtless Bay catchment see [INSERT LINK TO CATCHMENT DESCRIPTION

Catchment objectives (the outcomes sought)

Table 4 identifies draft objectives (high level and specific) to address the issues that affect the values identified by the Doubtless Bay Catchment Group.

Table 4: catchment objectives.

Uses and values	Issues that impact uses and values[2]	High level objectives	Catchment-specific objectives
Ecosystem health • Native fish nursery/habitat. • Native birdlife. • Conservation land. • Wetlands • Connection between estuary and rivers.	• Livestock access to waterbodies. • Sediment from hill slope and stream bank erosion. • Nutrient enrichment in Lake Waiporohita. • Extraction of water from rivers (during low flows). • Exotic species (for example, trout, alligator weed). • Effluent discharges to rivers.	**Improve fresh and coastal habitats for native aquatic species.** **Measures:** Macroinvertebrates index; Stream habitat assessment; Turbidity & Trophic state (lakes)	• Reduce the amount of sediment in fresh and coastal waters from high yield areas on pasture and from stream bank erosion. • Ensure the management of water quantity and water takes from rivers provides for flow variation and a high level of protection for the habitat of native fish species. • Adopt a precautionary approach to protect Lake Waiporohita from the potential impacts of water extraction. • Reduce nutrient inputs into Lake Waiporohita and maintain its outstanding ecological status.
Recreation • Swimming. • General recreation. • Education. • Kayaking.	• Livestock access to waterbodies. • Effluent discharges to land and rivers.	**Improve water quality for recreational activity and food gathering purposes.** **Measures:** E.coli	• Reduce *E.coli* levels during base-flows so that there is a very low risk (<0.1% risk) from activities in freshwater with occasional immersion/ingestion (A-state for secondary contact). • Reduce the incidence of water quality non-compliance for shellfish gathering at Cable Bay, Coopers Beach and Taipā monitoring sites. • Reduce the risk of consuming food gathered from freshwater.

Uses and values	Issues that impact uses and values[2]	High level objectives	Catchment-specific objectives
		(freshwater)	
Cultural values • Significant sites. • Healing waters. • Mahinga kai (traditional food sources).	• Livestock access to waterbodies and effluent discharges • Exotic species (for example, trout, alligator weed). • Commercial harvest of native fish/eels. • Lack of public awareness of cultural values/sites of significance.	**Improve cultural 'health' and awareness.** **Measures:** Incidents of damage; Native fish records	• Improve public awareness and understanding of cultural values at sites of significance to tangata whenua within the Doubtless Bay catchment. • Improve public 'conduct' at popular recreational sites in order protect cultural values. • Enhance the sustainability of populations and habitat of important mahinga kai species.
Socio-economic • Tourism. • Commercial eeling. • Dairy washdown/ cooling. • Apiculture. • Forestry. • Small industry water use/ discharge. • Quarrying. • Horticulture. • Drinking water.	• Availability of freshwater (in rivers). • Hill-slope erosion on pasture. • Streambank erosion (and associated damage to assets, for example, fences).	**Enhance the productive capacity of land in the Doubtless Bay catchment.** **Measures:** Incidents of streambank erosion/debris damage; Total allocation / number of water takes	• Ensure minimum flows and allocation limits provide capacity for economic growth and reasonable reliability of supply for the use of water. • Minimise the loss of productive soils through erosion. • Minimise damage to land or infrastructure from flood debris and streambank erosion.
Natural character • Isolation.	• Sediment from hill slope and stream	**Maintain the natural character**	• Encourage the retention and enhancement of riparian vegetation particularly where this will most benefit native aquatic species and

Uses and values	Issues that impact uses and values[2]	High level objectives	Catchment-specific objectives
• High biodiversity in upper reaches.	bank erosion. • Exotic species (for example, trout, alligator weed).	**of waterbodies in the Doubtless Bay catchment.** **Measures:** Reports of new pest species; % increase in riparian cover	avoid erosion. • Minimise the impact of pest plants on important aquatic habitats. • Restrict the introduction of exotic fish species.

Implementation measures

This section outlines the draft implementation methods identified by the Doubtless Bay catchment group to achieve the draft objectives. Table 5 sets out the regulatory measures (rules) and non-regulatory measures (voluntary methods / actions) identified by the group. Once finalised, the regulatory measures can be included in the new regional plan and apply specifically to the Doubtless Bay catchment in addition to the other region-wide rules in the regional plan. Implementation of non-regulatory measures can be set-out in an Implementation Plan after considering community feedback.

Table 5 Implementation measures

Issues and current management approach	Draft regional plan methods (to be confirmed):	Draft Doubtless Bay catchment plan approach
Livestock access to water bodies There are currently no regional rules requiring stock be excluded from rivers and lakes. Dairy farmers have largely excluded livestock from streams wider than 1m and deeper than 30cm through industry good practice and supplier contracts.	The Draft Regional Plan stock exclusion rules for rivers apply to: Dairy (milking) & pigs – • Permanently flowing rivers and drains greater than 1m wide	**Regulatory:** Require: Dairy (milking) & pigs to be excluded from *all permanently flowing* rivers and drains by the operative date of the regional plan. Dairy support, beef and deer to be excluded from *all*

Issues and current management approach	Draft regional plan methods (to be confirmed):	Draft Doubtless Bay catchment plan approach
Approximately 36% of rivers in the lowland area (land <15^0 slope) of the Doubtless Bay catchment are fenced (meaning about 300km of stream margins are unfenced). Stock exclusion can reduce sediment (under normal flow conditions) by up to 80% and *E.coli* by up to 60% (annual averages). Stock exclusion can also limit damage to physical habitat by stock, and stock losses in waterways.	and 30cm deep at operative date of plan • All permanently flowing rivers and drains by January 1 2025 Dairy support, beef and deer – • Permanently flowing rivers and drains greater than 1m wide and 30cm deep in the lowland FMU (Figure 2) by January 1 2025. • All permanently flowing rivers and drains in the lowland FMU by January 1 2030	*permanently flowing* rivers and drains in the lowland FMU by 1 January 2025. **Non regulatory:** • Encourage livestock exclusion from waterbodies in hill country (land >15^0 slope).
Effluent discharges Regional rules currently provide for dairy effluent discharges to land as a permitted activity (subject to conditions). Where farms cannot meet the permitted rules resource consents are required for discharge to water – of the 24 dairy farms in the catchment 20 have consent to discharge to water during extremely wet conditions (they normally apply it to land); four rely solely on land	Improved controls on dairy effluent discharges to land (greater storage and stormwater separation). Controls on on-site wastewater discharges.	**Regulatory:** Not applicable. **Non regulatory:** • Work with dairy industry to encourage more dairy effluent disposal to land[3]. • Regional council to consider need for tighter controls on on-site human effluent treatment and disposal systems. • Encourage Far North District Council compliance with

[3] Note: all dairy effluent discharges to water require resource consent

Issues and current management approach	Draft regional plan methods (to be confirmed):	Draft Doubtless Bay catchment plan approach
application and three do not use land application but have consent to discharge treated effluent to water (these are small farms with a high level of treatment). Regional rules also apply controls to on-site effluent disposal and waste-water treatment systems. The Far North District Council currently monitors on-site effluent disposal systems under the control of on-site wastewater disposal systems bylaw – this requires an inspection every five years.		regional wastewater rules for Taipā wastewater treatment plant. • Encourage effluent disposal to land. • Encourage remedy of stormwater intrusion in wastewater network, including into the treatment ponds. • Review faecal source tracking to assess proportion of contributions (human, stock, wildfowl), when technology becomes available. Targeted follow-up where issues are identified.
Hill slope erosion from pasture The current approach to managing hill slope erosion is: • Working with land owners to address erosion on a voluntary basis through Farm Erosion control plans, with some financial assistance provided (for example, for poplars). Critical erosion areas have been modelled for the Doubtless Bay catchment (using SEDNET[4]). This indicates gully and landslide erosion are responsible for most of the sediment generated from pasture (gully erosion generates 63% of the erosion on pasture (5% by area), while landslide generates 34% (18% by area). Streambank erosion is estimated to generate around 23% of sediment.	While there are generic earthworks controls, there are no rules specifically targeting critical sources of erosion or requiring erosion control plans in the draft plan.	**Regulatory:** Erosion control plans for critical areas of erosion in pasture to be compulsory after 2025 (See **Error! Reference source not found.** in Appendix 1 – indicative erosion prone land). Pastoral land use in erosion prone areas – draft rule: *"**Pastoral land use** after 1 January 2025 in a mapped **erosion prone area** is a controlled activity if an **erosion control plan** has not been developed for the land.* *Matters of control* • *The effectiveness of measures to control or mitigate sediment from areas of gully, landslide and earthflow erosion.* • *The location, timing and prioritization of measures to control or mitigate sediment from areas of gully, landslide and earthflow erosion* • *Information and monitoring requirements*

[4] SEDNET is a model used to identify types of erosion processes and their relative yield to total sediment load

Issues and current management approach	Draft regional plan methods (to be confirmed):	Draft Doubtless Bay catchment plan approach
		Meaning of words: *"**Pastoral land use** means: effective grazing area and includes all contiguous land areas in herbaceous species including isolated trees. It excludes those forested areas which achieve 100% canopy closure or other woody vegetation which prevents pastoral growth* ***"Erosion control plan** means: a Regional Council approved plan which specifically identifies gully, landslide, and earthflow erosion and remediation measures".* ***"Erosion prone land** means: "Erosion prone land means: an area of land identified as erosion prone on Regional Plan maps which identifies land subject to a high risk of gully, landslide and earthflow erosion - but not surficial and stream bank erosion."* **Non regulatory:** • Provide a 50-100% subsidy for poplars/willows associated with erosion control plan implementation (case by case basis). • Encourage erosion control plans on land subject to other areas of erosion. • Review uptake and implementation of compulsory erosion control plans by 2023.
Stream bank erosion The current approach to managing streambank erosion is primarily reactive in that regional rules: • Enable removal of obstructions from rivers (for example, debris and gravel) to maintain	Livestock exclusion rules (see above). Rules enabling the removal of debris/gravel	**Regulatory:** Not applicable. **Non regulatory:** • Encourage riparian setbacks when fencing waterways

Issues and current management approach	Draft regional plan methods (to be confirmed):	Draft Doubtless Bay catchment plan approach
the free flow of water. • Limit the removal of riparian vegetation (this is for a number of reasons that also relate to water quality and aquatic ecosystems). • Enable construction of erosion protection structures (subject to conditions). However, there are currently no regional rules restricting stock access to rivers and lakes.	to maintain the free-flow of water. Limits on riparian vegetation removal ($200m^2$).	(through education and regional council land management advice). • Facilitate land owner removal of gravel/debris from rivers where it exacerbates stream bank erosion. • Identify and address areas of severe stream bank erosion (through erosion control plans and the potential for a regional council consent to extract nuisance debris). • Actively encourage landowners to proactively manage riparian vegetation and address waterbody obstructions/debris on their land. • Investigate the potential for regulatory requirements to remove obstructions/debris causing erosion and/or a flood hazard.
Exotic/pest species Pest species (such as Alligator weed) can be addressed through Regional Pest Management Plans. The regional council can also support community efforts to address pest plants through Community Pest Control Areas (CPCAs). There is a CPCA established at Whakaangi in Doubtless Bay. Alligator weed has built up in a number of areas causing nuisance, damage to fences during floods and impeding recreational use of rivers. The release/transfer of exotic fish species (for example, trout) is authorised by the Department of Conservation and typically implemented by Fish & Game. Trout have been released in Doubtless Bay rivers in the past.	The draft regional plan contains rules restricting the deliberate introduction/spread of pest species identified in regional pest management plans under the Biosecurity Act. Provisions provide exceptions from vegetation clearance rules to enable the removal of pest plants.	**Regulatory:** Not applicable. **Non-regulatory:** • Regional council to investigate options to address alligator weed and *Egeria densa*, including the potential for a community control programme. • Seek formal restrictions on the release of exotic fish species (for example, trout) from Fish & Game/Department of Conservation.

Issues and current management approach	Draft regional plan methods (to be confirmed):	Draft Doubtless Bay catchment plan approach
Nutrient enrichment in Lake Waiporohita Regional rules currently restrict discharges of contaminants into lakes and require setbacks for land disturbance, vegetation clearance and discharges of effluent/fertiliser. However, there are currently no nutrient water quality limits for lakes nor are there rules requiring stock be excluded (however the lake is currently well fenced with a vegetated riparian buffer). The effects of waterfowl are also a likely cause of nutrient enrichment and council is currently investigating this issue (for a number of lakes/habitats).	Stock exclusion: the draft regional plan rules require stock be excluded from natural lakes by 2020. Lake water quality objectives (trophic state – shallow lakes to be eutrophic or better) and associated nutrient limits. Controls on discharges to lakes. Setbacks for land disturbance and vegetation clearance. Setbacks for discharges of fertiliser and animal effluent.	**Regulatory:** Not applicable. **Non-regulatory:** • Design and construct wetlands/interception devices on surface drains prior to discharge into Lake Waiporohita. • Work with land owners to encourage fencing of farm drains that drain to the lake. • Regional council to continue assessing the impacts of waterfowl on lake water quality and the need for population control. • Investigate potential for targeted lake monitoring at wildfowl congregation areas on the lake.
Water extraction – Lake Waiporohita Regional rules currently provide a high level of protection for extraction of water from listed dune lakes (including Lake Waiporohita). Lake Waiporohita is listed as an outstanding waterbody due to its biodiversity. The lake is nutrient enriched likely due to surrounding landuse and waterfowl.	The draft regional plan provides for permitted activity takes for 'reasonable' stock drinking and up to $10m^3$/day for other uses. (Lake Waiporohita is identified as an outstanding lake and is shallow).	**Regulatory:** Require **all water takes** from Lake Waiporohita to obtain resource consent as a discretionary activity. ***Water takes from Lake Waiporohita****:* *The taking and use of freshwater from Lake Waiporohita for any purpose is a discretionary activity provided that the taking of water does not exceed a water quantity limit.* **Non-regulatory:**

Issues and current management approach	Draft regional plan methods (to be confirmed):	Draft Doubtless Bay catchment plan approach
		• Construct wetlands/interception on surface drains prior to discharge into Lake Waiporohita. • Work with land owners to encourage fencing of farm drains that drain to the lake.
Water extraction/flows in rivers Regional rules currently apply a minimum flow (the lowest level rivers can be reduced as a result of extraction of water – typically around 80% of Mean Annual Low Flow), but do not provide a 'hard' limit on the total volume that can be extracted (an allocation limit). Allocation limits protect both aquatic habitat (providing for flushing) and reliability of supply for water users. Currently the total volume of water extracted from rivers (by resource consent or permitted activity rules) in the Doubtless Bay catchment is low at around 10% of Mean Annual Low Flow. This means there is a relatively high level of habitat protection for aquatic species and good reliability of supply.	The draft regional plan identifies the Oruaiti sub-catchment as being within the Small Rivers FMU, meaning lower minimum flows (80% MALF) and higher allocation limit (40% MALF).	**Regulatory:** Apply the more precautionary Coastal Rivers FMU water quantity limits and rules to the entire Doubtless Bay catchment (minimum flow 90% MALF and allocation limit 30% MALF and associated water extraction rules). See Appendix 1 Figure 7 for map **Non-regulatory:** • Regional council to continue to work with industry to encourage water use efficiency and good practice. • Encourage storage of peak winter river flows.
Impacts on mahinga kai species The commercial harvest (and total allowable catch) of fresh and marine fish species is managed by the Ministry for Primary Industries under the Fisheries Act 1996. Currently commercial harvest of eels is occurring in the catchment and is of concern to tangata whenua. There are current regional rules that provide	Rules require structures in freshwater bodies to provide for fish passage. Restrictions on the disturbance to river/lake beds and wetlands. Minimum flows and	**Regulatory:** Apply the more precautionary Coastal Rivers FMU water quantity limits and rules to the entire Doubtless Bay catchment (minimum flow 90% MALF and allocation limit 30% MALF) and associated water extraction rules). See Appendix 1 Figure 7 for map. **Non-regulatory:** • Regional council to facilitate identification of important

Issues and current management approach	Draft regional plan methods (to be confirmed):	Draft Doubtless Bay catchment plan approach
protection for aquatic species including: • Restrictions on the removal of riparian vegetation. • Restrictions on discharges of contaminants to water. • Controls on structures in/disturbance to coastal and freshwater bodies. • Minimum flows for rivers and controls on the extraction of water.	allocation limits. Water quality limits and restrictions on discharges to water.	native fish spawning sites in the catchment in order to focus habitat enhancement/riparian restoration efforts. • Seek restrictions on the release of exotic fish species (for example, trout) from Fish & Game/Department of Conservation. • Continue catchment survey to identify structures and other impediments to fish passage up and down rivers. • Investigate (with the assistance of MPI) the sustainability of commercial eeling within the catchment to restrict commercial take to short fin eels only. • Investigate the potential to use traditional tools or other fisheries management options for the eel fishery in the catchment.
Limited public awareness of cultural values and sites of significance to tangata whenua There are few sources of information advising the public of cultural values or appropriate conduct in general and at culturally sensitive sites in particular. There are no sites of significance to tangata whenua currently identified in regional plans (an acknowledged gap).	Provides criteria for the identification of sites of significance to tangata whenua Rules/policy to protect sites of significance to tangata whenua identified in the plan.	**Regulatory:** Not applicable. **Non-regulatory:** • Interpretative/story board signage at important cultural sites to raise awareness (Taipā estuary was identified). • Signage at Lake Rotopokaka to outline a 'code of care' for the lake and advising that use of soaps, shampoos and other contaminants should be avoided.

Conclusion

The recommendations of the Doubtless Bay Catchment Group can be grouped into two types – regulatory (that is, rules) and non-regulatory (that is, voluntary measures or actions). Regulatory measures only have effect once adopted into statutory documents by local authorities or other agencies with regulatory powers. The Doubtless Bay Catchment Group has considered the regulatory approach in the Draft Regional Plan – in doing so the group has recommended that additional rules be applied specifically to the Doubtless Bay Catchment to meet the draft objectives they have identified. These are:

1. Stock exclusion:
   a) Require Dairy milking stock be excluded from all permanently flowing rivers and drains by operative date of the plan
   b) Require dairy support, beef and deer be excluded from all permanently flowing rivers and drains in the lowland FMU by 2025.

On the grounds that:

- excluding stock from all permanently flowing streams in the Doubtless Bay lowland areas is realistic by 2025 (the lowland FMU is 29% of the catchment by area)
- Dairy farmers have largely excluded livestock from streams wider than 1m and deeper than 30cm through industry good practice and supplier contracts
- Approximately 36% of rivers in the lowland area (land $<15^0$ slope) of the Doubtless Bay catchment are fenced (meaning about 300km of stream margins are unfenced).
- Stock exclusion can reduce sediment (under normal flow conditions) by up to 80% and *E.coli* by up to 60% (annual averages). Stock exclusion can also limit damage to physical habitat by stock, and stock losses in waterways.

The Doubtless Bay group consider

2. Compulsory Erosion Control Plans for critical areas of erosion on hill country pasture (See Figure 6 in Appendix 1) on the grounds that:
   a) There is no proposal in the Draft Regional Plan to target pastoral hill-slope erosion;
   b) Prioritising a reduction of hill-slope erosion in areas of land with the highest rates of erosion is a desired outcome in the catchment; and
   c) The rule would only apply if assistance is available to landowners in these areas to develop erosion control plans and with remediation. A voluntary approach should be used prior to a regulatory one, where land holders in these areas would be encouraged to take action to reduce hill-slope erosion on pasture by:
      i. The council providing assistance to identify and manage hill slope erosion (by development of a Erosion Control Plan prepared by a council officer); and
      ii. The council providing assistance with measures to reduce erosion – by subsidising poplars and willow.

A window of opportunity prior to 1 January 2025 is a reasonable amount of time for land owners to voluntarily address sediment but the catchment group considers there should be a regulatory measure applied beyond this date to ensure action is taken – after this land holders in these areas will be required to lodge a consent and will be required to bear the costs of identifying erosion and development of a plan to address erosion

(a land owner may need to engage an appropriately qualified expert).

3. More restrictive rules for water takes from Lake Waiporohita on the grounds that:
    - The lake has very high ecological values and being small and shallow is very susceptible to the effects of even very small water takes.
    - The draft regional plan rules would permit takes for stock drinking, domestic and other small uses ($10m^3$) from Lake Waiporohita, which while unlikely could impact the lake's ecological value.

4. A more precautionary water quantity management regime for the Oruaiti sub-catchment of the Doubtless Bay Catchment (applying the coastal rivers water quantity limits instead of the small rivers) on the grounds that:
    - Providing for native fish habitat is an objective of the Doubtless Bay Catchment Group.
    - The draft regional plan applies the Small Rivers FMU (and associated minimum flow and allocation limits) to the Oruaiti sub-catchment – the remainder of the Doubtless Bay Catchment is in the Coastal Rivers FMU. The Small Rivers FMU provides less protection for aquatic fish species than the Coastal Rivers FMU.
    - The Oruaiti sub-catchment has similar aquatic habitat value for native fish as the rest of the catchment (and is very likely to support the same species and diversity) and therefore should be subject to the same level of protection.
    - Current levels of allocation in rivers across the catchment as a whole are comparatively low (around 10% of MALF) and applying the Coastal Rivers FMU (and limits – minimum flow 90% MALF and allocation 30% MALF) will not unduly restrict access to water or materially reduce reliability of supply for water users.

The non-regulatory measures identified by the Doubtless Bay Group do not directly impose compulsory obligations or costs on land owners or agencies as these are voluntary and subject to other processes (such as council Long Term Plans). They therefore do not require the same level of explanation outlined above.

The Doubtless Bay Group considers that the combination of regulatory and non-regulatory methods suggested in this draft catchment plan provide a good balance of approaches and will over time achieve the objectives/outcomes sought for the Doubtless Bay Group. On-going lake monitoring by the Northland Regional Council will enable an assessment of progress towards the objectives and an indication of success (or otherwise) of the draft catchment plan.

Non-regulatory implementation plan (to be confirmed)

Table 6: indicative non-regulatory implementation plan.

Recommended action	Description	Who
Construct wetlands/interception on surface drains prior to discharge into Lake Waiporohita.	A number of farm and roadside drains discharge into Lake Waiporohita, which contribute to nutrient enrichment. The action is to work with land owners (DOC, Far North District Council and Landcorp) to design and construct wetlands/or other interception to improve water quality prior to discharge to the lake.	Northland Regional Council to lead.
Fence farm drains discharging to Lake Waiporohita.	Work with land owners to encourage fencing of farm drains that drain to the lake – prioritise those with greatest volume/flow.	Northland Regional Council.
Regional council to continue assessing the impacts of waterfowl on lake water quality and the need for population control.	Wildfowl survey and monitoring of water quality at congregation sites/littoral margins with high bird density. Continue investigation into nutrient contributions from wildfowl	Northland Regional Council.
Encourage livestock exclusion in hill country (land >15^0 slope). Encourage erosion control plans on land subject to other areas of erosion. Encourage riparian setbacks when fencing waterways (through education and regional council land management advice).	As part of voluntary Farm Erosion control plans encourage: • Application of methods to reduce stock access to waterbodies where practical. • Application of methods to address sources of streambank erosion. • Use of riparian setbacks and planting in association with stock exclusion options.	Northland Regional Council (land management advisors).
50-100% subsidy for poplars/willows associated with erosion control plans (case by case basis).	Increasing the subsidy available for poplars to address erosion requires a decision of council and could have a significant impact on council costs (and potentially rates). Subsidy up to 100% on a case by case basis, as recommended by regional council land management and approved by council.	Northland Regional Council governance.

Recommended action	Description	Who
Work with dairy industry to encourage more dairy effluent disposal to land[5].	The majority of dairy farms in the catchment have consent to discharge to water – this is not normal practice but a necessity at times due primarily to limited pond storage capacity. There are a number of good practice options that are available to reduce frequency of such discharges (such as keeping stormwater out of ponds and water use efficiency). However, these need to recognise the individual farm operation be tailored on a case by case basis, with advice from farm management experts.	Dairy NZ, council and other dairy industry advisors/stakeholders.
Request to the Far North District Council to provide results of performance monitoring of on-site human effluent disposal systems in the Doubtless Bay catchment.	Far North District Council currently monitors on-site effluent disposal systems under the Control of on-site wastewater disposal systems bylaw – this requires an inspection every five years.	Northland Regional Council.
Recommendation for Northland Regional Council to consider the need for tighter controls of on-site human effluent treatment and disposal systems.	Council is currently developing a new regional plan (expected to publicly notify mid-late 2017) – this presents an opportunity to re-assess on-site effluent disposal rules. The data requested above should inform this action.	Northland Regional Council (planning and policy/monitoring).
Facilitate land owner removal of gravel/debris from rivers where it exacerbates streambank erosion.	Regional rules (current and proposed in the draft plan) enable the removal of obstructions from rivers to maintain the free-flow however guidance and advice on riparian management would limit the frequency and impact of debris in rivers.	Northland Regional Council.
Investigate options to address alligator weed.	Investigate potential control options available and the potential for a community control programme to control/manage alligator weed.	Northland Regional Council.
Seek restrictions on the release of exotic fish species (for example, trout).	Seek written confirmation from from Fish & Game/Department of Conservation that there will be no further authorised release of exotic fish species in Doubtless Bay Rivers.	Northland Regional Council/catchment group.

[5] Note: all dairy effluent discharges to water require resource consent.

Appendix 1

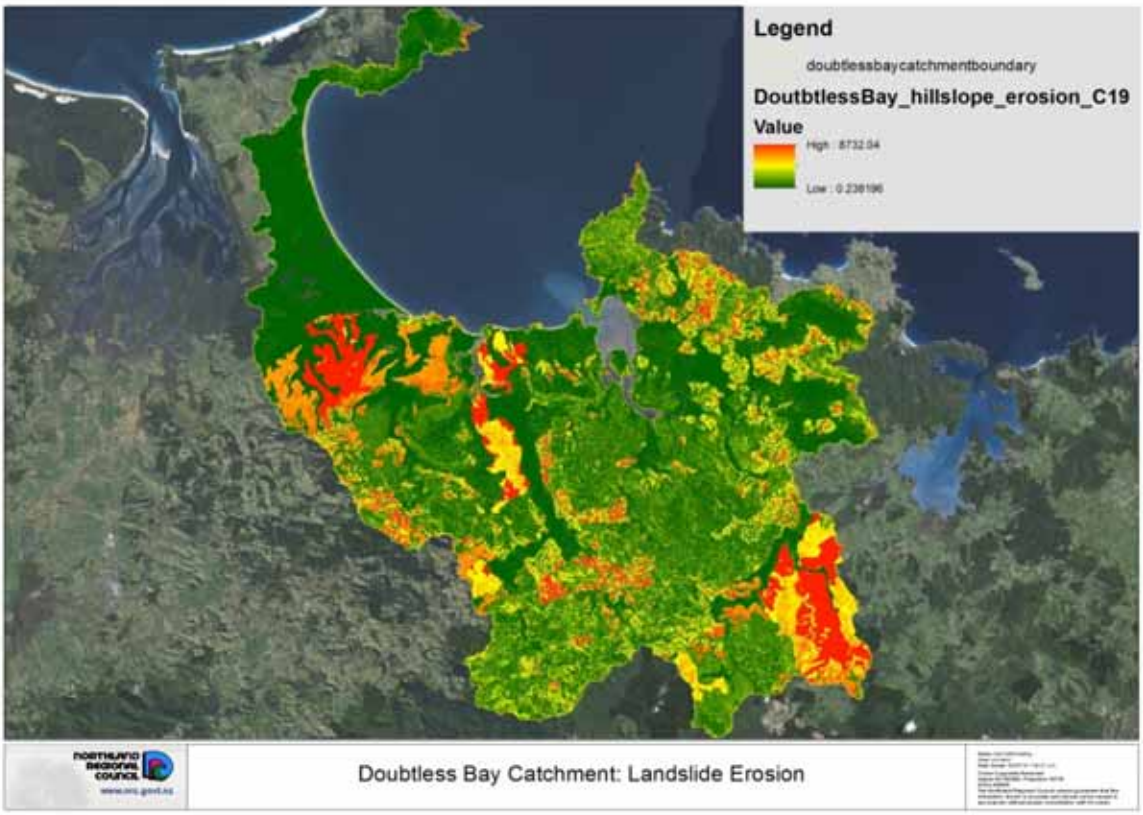

Figure 5: Indicative critical erosion sources. Note: the erosion threshold (tonnes/hectare/year) for compulsory erosion control plans is to be confirmed.

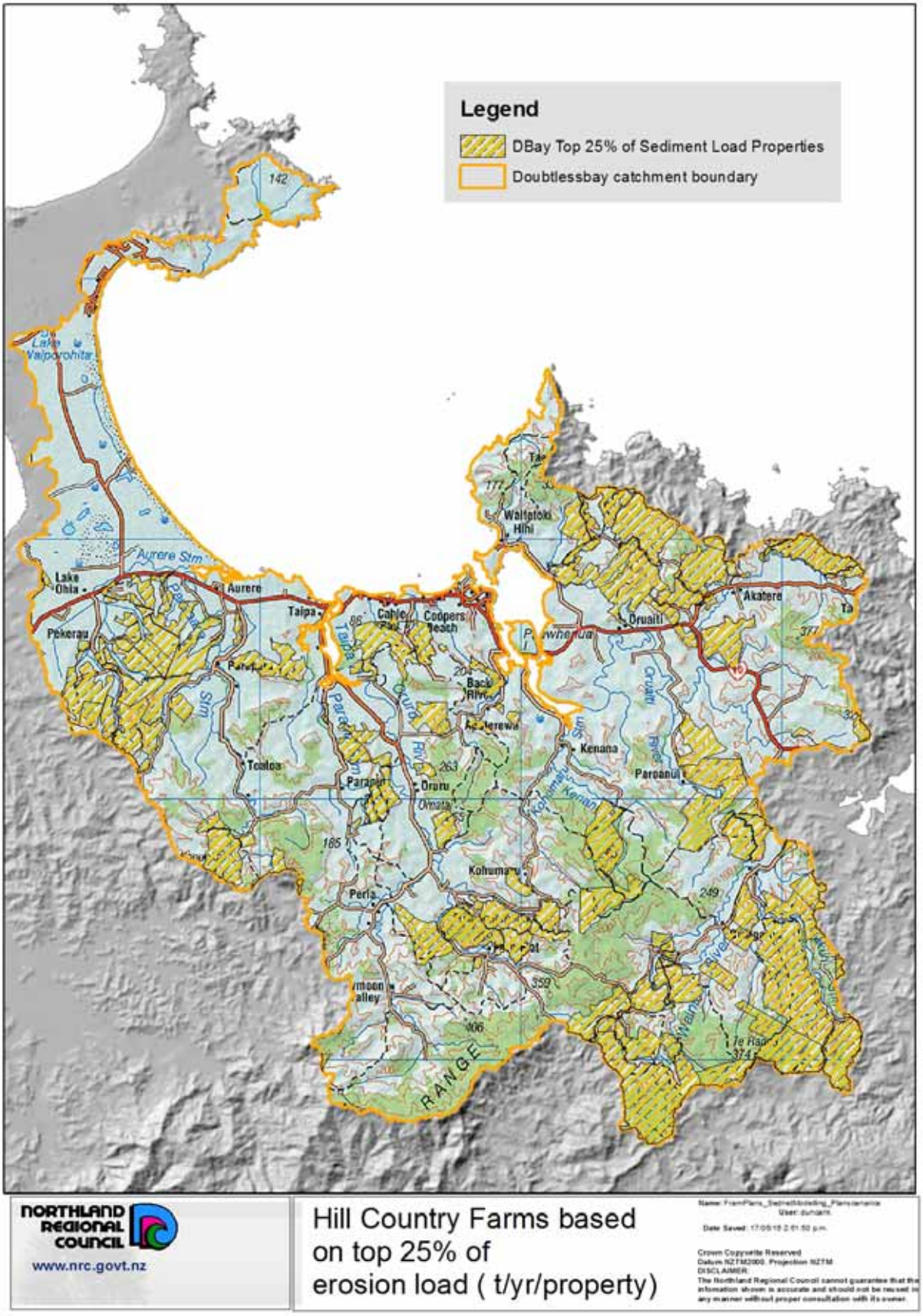

Figure 6: Indicative farms affected by critical erosion areas compulsory erosion control plans.

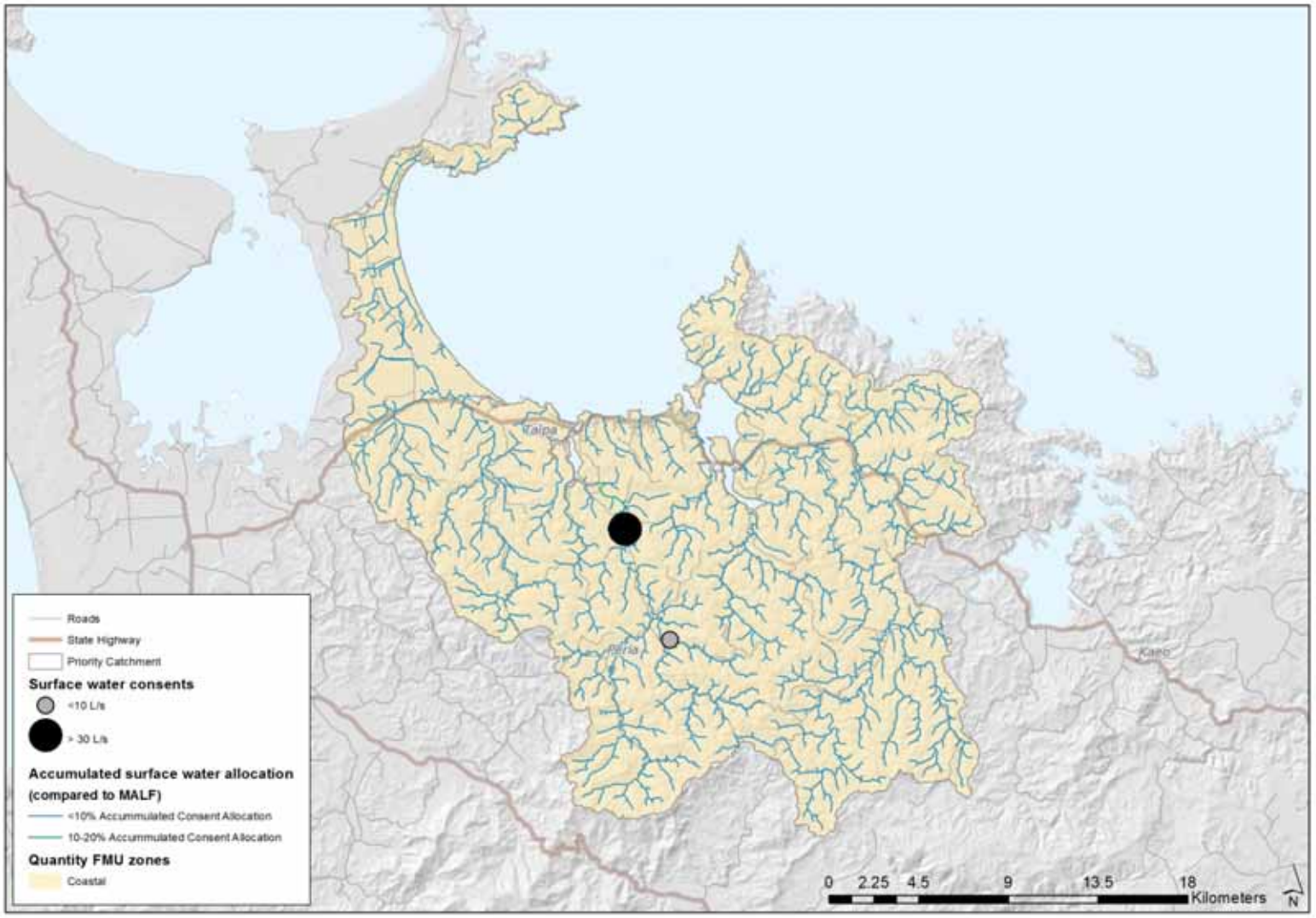

Figure 7: Coastal Rivers FMU applied to whole Doubtless Bay catchment.

Table 7: effect of issues on Doubtless Bay catchment values, as identified by the catchment group.

Issues identified by the catchment group	Ecosystem health impacts	Natural form and character impacts	Cultural values	Recreational impacts	Socio-economic impacts
Livestock access to water bodies.	• *Damage to in-stream and riparian vegetation.* • *Damage to streambed habitat.* • *Nutrient toxicity (reduced habitat quality for aquatic species).*	• *Damage to in-stream and riparian vegetation.* • *Stream bank erosion.* • *Increased sediment.*	• *Impact on mauri of water.* • *Restriction on traditional uses of water.*	*Increased health risk from contact with water (E.coli/pathogens).*	*Stock losses.*
Effluent discharges.	*Nutrient toxicity (reduced habitat quality for aquatic species)*		*Impact on mauri of water*	*Increased health risk from contact with water (E.coli / pathogens)*	
Erosion *Hill-slope erosion from pasture.* *Stream bank erosion.*	• *Impacts on native aquatic plant growth and fish habitat due to reduced water clarity.* • *Sediment deposition in*	• *Reduced water clarity.* • *Sediment deposition in estuaries.*	*Smothering of shellfish beds.*	• *Reduced water clarity.* • *Sediment deposition in estuaries.*	*Loss of productivity.* *Damage to land/infrastructure (for example, fences).*

Issues identified by the catchment group	Ecosystem health impacts	Natural form and character impacts	Cultural values	Recreational impacts	Socio-economic impacts
	estuaries.				
Exotic species (for example, trout, alligator weed).	• *Predation of native fish.* • *Competition for space/smothering.*	*Impact on native species populations.*	• *Predation of eels (for example, trout).* • *Smothering/reduced habitat for traditional foods (for example, alligator weed).*	*Reduced access to recreational sites (due to prolific weed growth).*	*Damage to infrastructure (for example, fences/water intakes) from weed debris.*
Nutrient enrichment in Lake Waiporohita.	• *Frequent algal blooms.* • *Reduced water clarity and impact on native plant growth).* • *Reduced habitat quality for native species.*	*Reduced habitat for native species.*			
Extraction of water from rivers.	• *Risk to fish habitat due to reduced flows.* • *Reduced flow variation (flushing flows).*	*Reduced flow variation (flushing flows).*	*Reduced habitat for aquatic mahinga kai species.*		*Reliability of water supply for users of water.*
Impact on			• *Reduced availability of*		

Issues identified by the catchment group	Ecosystem health impacts	Natural form and character impacts	Cultural values	Recreational impacts	Socio-economic impacts
mahinga kai species (for example, commercial harvest, habitat modification).			*mahinga kai.* • *Reduced capacity for manaakitanga.*		
Limited public awareness of cultural values and sites of significance to tangata whenua.			• *Impacts on the mauri of waterbodies.* • *Damage to sensitive sites.*		