

Memo

Date	08/05/19
To	Alastair Picken
CC	
From	Zeb Etheridge, Jarred Arthur

Assessment of Ashley Estuary (Te Aka Aka) and Coastal Protection Area

1. Summary

A Coastal Protection Area is proposed for the Waimakariri Zone in recognition of the important natural resources and values found here. The area encapsulates the main spring-fed streams, lagoons, wetlands and estuary near the Waimakariri coast. We have assessed the stream lengths that would benefit from the improved protection and management associated with a requirement to obtain a Resource Consent and to produce an audited Farm Environment Plan (FEP) for several different consenting threshold options. The results highlight the trade-off between the number of consents required (and associated financial and administrative burden on the farming community) and the stream lengths which benefit from improved protection. Option 1 requires property areas >5 ha with > 0.5 ha of winter grazing or >0.5 ha of irrigation to produce an audited FEP. This option would protect an additional 100 km of streams and localised areas in the estuary, whilst requiring a relatively modest increase in the number of consents (50) relative to the current Regional Plan rules.

2. Background

The coastal area between the Pegasus Bay sand dunes and State Highway 1 is an important and unique area of the Waimakariri Water Zone. It encompasses Te Aka Aka, spring-fed streams, wetlands, and lagoons. The diversity of aquatic habitat in the waterbodies within this coastal area makes it an area of high ecological, cultural, recreational and aesthetic value. The waterbodies support a variety of shellfish and native fish species including pipi, cockles, eels, inanga spawning habitat, and the critically threatened Canterbury mudfish. They also serve as important nursery, rearing and feeding habitat for a diversity of bird species. There are high biodiversity values associated with wetland flora including the extensive areas of saltmarsh in Te Aka Aka. Flora and fauna in the area are taonga and of critical importance for mahinga kai. As a whole, the coastal waterbodies in this area are wahi tapu (sacred waters) to iwi. It is an important recreational area with several popular walkways, fishing and whitebaiting spots, and swimming areas (Arthur et al., 2019).

Water quality issues affect the waterbodies that are present within and drain into the coastal area. Runoff contaminants have degraded many of the spring-fed streams and other aquatic

ecosystems. Excessive sediment has smothered stream and estuary beds, impacting the habitat of invertebrates and fish, while high *E. coli* concentrations provide a high risk of infection or illness to public gathering and consuming mahinga kai or swimming. Elevated nitrogen levels promote excessive aquatic plant and macroalgae growths, and barriers to fish passage impact recruitment and migration. Bankside and margin habitats have degraded as the result of historic vegetation removal, and stream shading effects have been lost as well as many terrestrial food sources. The effective management of riparian margins and adjacent land, coupled with on-the-ground rehabilitation actions, will improve the protection and health of the aquatic ecosystems in this coastal area.

Intensively farmed land (e.g. winter grazed or heavily stocked) is particularly susceptible to generating the high runoff contaminant discharges to water which adversely impact the waterbodies in the coastal area. Irrigated land can support higher stock numbers than dryland farming; higher stock numbers, all else being equal, are associated with increased runoff contaminant risk. Winter forage crop grazing can also generate significant runoff contaminant loads.

Farm Environment Plans (FEPs) contain mechanisms for identifying and managing sources of runoff contaminants on land (sediment, phosphorus, nitrogen and *E. coli*). Increasing the number of properties that are managed through FEPs, and the associated auditing process, could deliver greater protection for coastal waterbodies. Given that we have identified irrigation and winter grazing (as defined in the LWRP) as high-risk activities in the coastal area, we have explored options for improved management via stricter FEP requirements in a designated Coastal Protection Area. We have also explored options which only use property area as a threshold for requiring a Resource Consent and audited FEP, in recognition of the fact that irrigated land and winter grazing are not the only activities which can impact on natural resources in the coastal area.

3. Options assessment

We used four criteria to define landowners who would need to apply for Resource Consent and produce an audited FEP:

1. Falls within the Coastal Protection Area (CPA), which is delineated using the Surface Water Allocation Zone boundaries for Saltwater Creek, Little Ashley Stream, Waikuku Stream, Taranaki Creek, Kairaki Creek and Macintosh Drain
2. Land located within 50 m of a stream, river or lagoon
3. Property area (see options below)
4. Irrigation and winter grazing area (see options below)

We used these criteria to define three options for determination of which properties within the CPA would require resource consent and an FEP:

- Option 1: Property area >5 ha and (> 0.5 ha of winter grazing or >0.5 ha of irrigation)
- Option 2: Property area >5 ha
- Option 3: Property area >20 ha

We have estimated the approximate number of resource consents associated with each of these options and the stream lengths located within 50 m of the properties that would require resource consent. The results of our assessment are summarised in Table 1 below. Figure 1, Figure 2 and Figure 3 provide an approximate indication of the land areas that could require consent under Option 1, 2 and 3 respectively. We have included results from modelling with current LWRP rules (as per Plan Change 5) and the Waimakariri Water Zone Committee ZIPA recommendations for revisions to the Permitted Activity Rules for winter grazing.

The results highlight the trade-off between the number of properties which require consent and the length of stream that would be better protected and managed via improved runoff management. Option 1 would protect an additional 100 km of streams whilst requiring a relatively modest increase in the number of consents (50) relative to the current Regional Plan rules.

Table 1 Options assessment results

Option	Description	Approximate number of consents	Stream length (km)
LWRP (PC5)	LWRP WG & IRR rules	15	56
ZIPA	ZIPA WF PA rules	22	-
CPA Option 1	>5 ha property, > 0.5 ha WG or >0.5 ha IRR	65	152
CPA Option 2	>5 ha property	282	204
CPA Option 3	>20 ha property	98	184

Notes

WG – winter grazing as defined in the LWRP. IRR = irrigation. WF = winter fodder. PA = permitted activity

We used a 0.5 ha WG and IRR threshold in our analysis in recognition of the resolution of our source dataset: modelling results for smaller areas are more uncertain.

The property boundary classifications used in our analysis do not align with property and Farm Enterprise definitions in LWRP. The structure of the GIS layer used in our analysis is likely to result in larger areas of land being classified as requiring FEP. The stream length estimates and consent numbers in Table 1 are therefore likely to be overestimates, to some degree. Nonetheless, the results are suitable for relative comparison and provide a useful approximate indication of the scale of costs and benefits.

4. Implications for Te Aka Aka

Broadscale ecosystem health in Te Aka Aka will more than likely remain limited by nitrogen as it is the major driver of ecological degradation in the estuary. Plan provisions associated with the CPA (i.e. those that result in reduced winter grazing or irrigation) may mitigate some effects of localised nitrogen and sediment runoff, but there is still the broad-scale nitrogen loading occurring in the Ashley River/Rakahuri catchment and in the catchment of the spring fed streams and creeks. This continued broader-scale loading is likely to result in the same eutrophication susceptibility conditions (i.e. increased eutrophication over time) as detailed under the ZIPA solutions scenario assessment for water quality, ecology and biodiversity (Arthur *et al.*, 2019). However, localised contaminant loadings may decrease, which may reduce macroalgae growth and fine sediment accumulation in localised areas near inputs of nitrogen and sediment from diffuse runoff from proximate land uses. This may benefit the health of estuary communities in these localised areas and their use for mahinga kai gathering or other activities.

5. References

Arthur, J., Bolton-Ritchie, L., and Meredith, A. 2019. Waimakariri Land and Water Solutions Programme Options and Solutions Assessment: Aquatic Ecology and Biodiversity. Environment Canterbury Report No. R19/76.

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Approved for release:	Tim Davie <i>Chief Scientist</i>	June, 2019

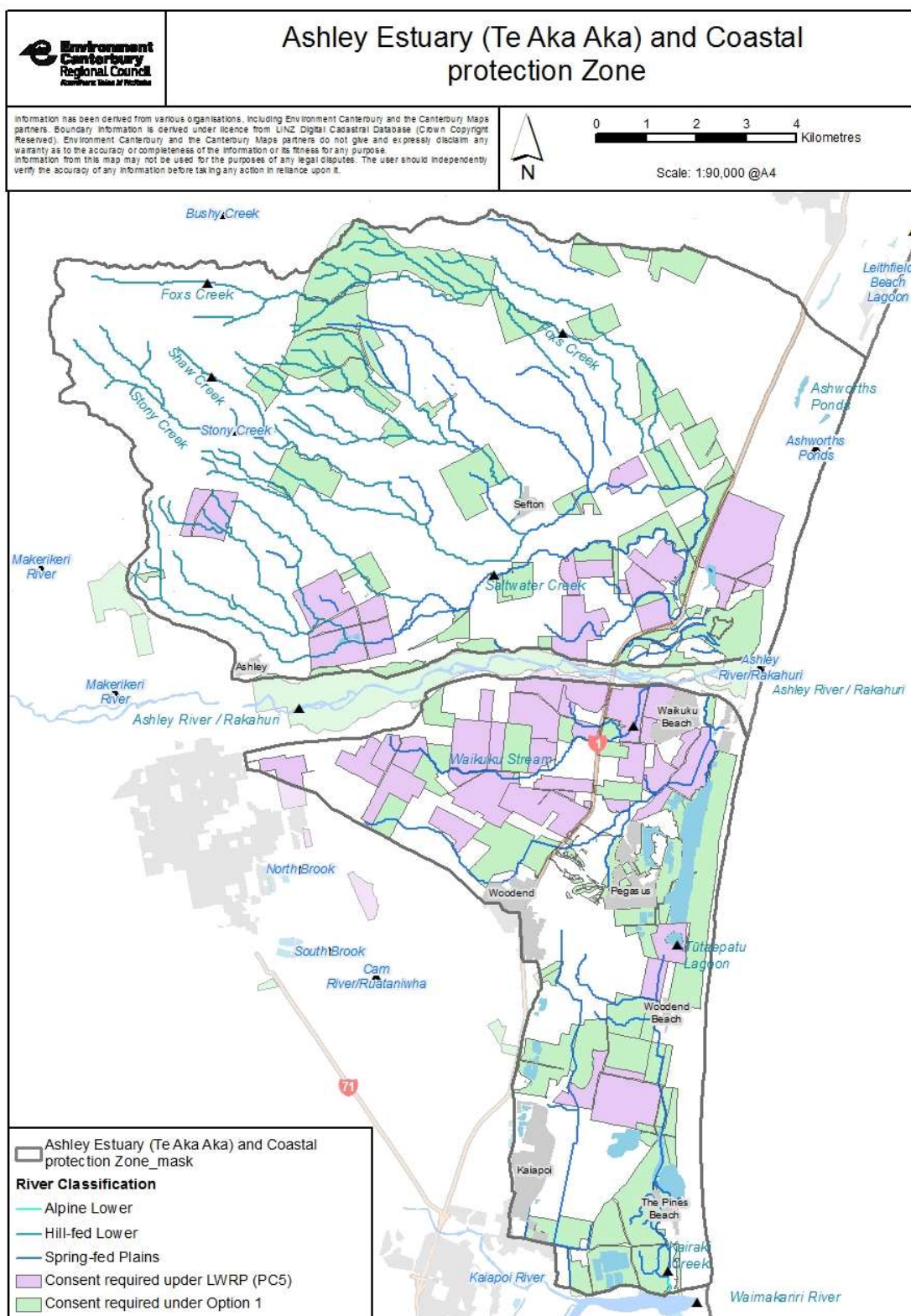


Figure 1 Indicative land areas requiring consent under LWRP (PC5) and Option 1¹.

¹ Note the Coastal Protection Zone is synonymous with the Coastal Protection Area mentioned in the text.

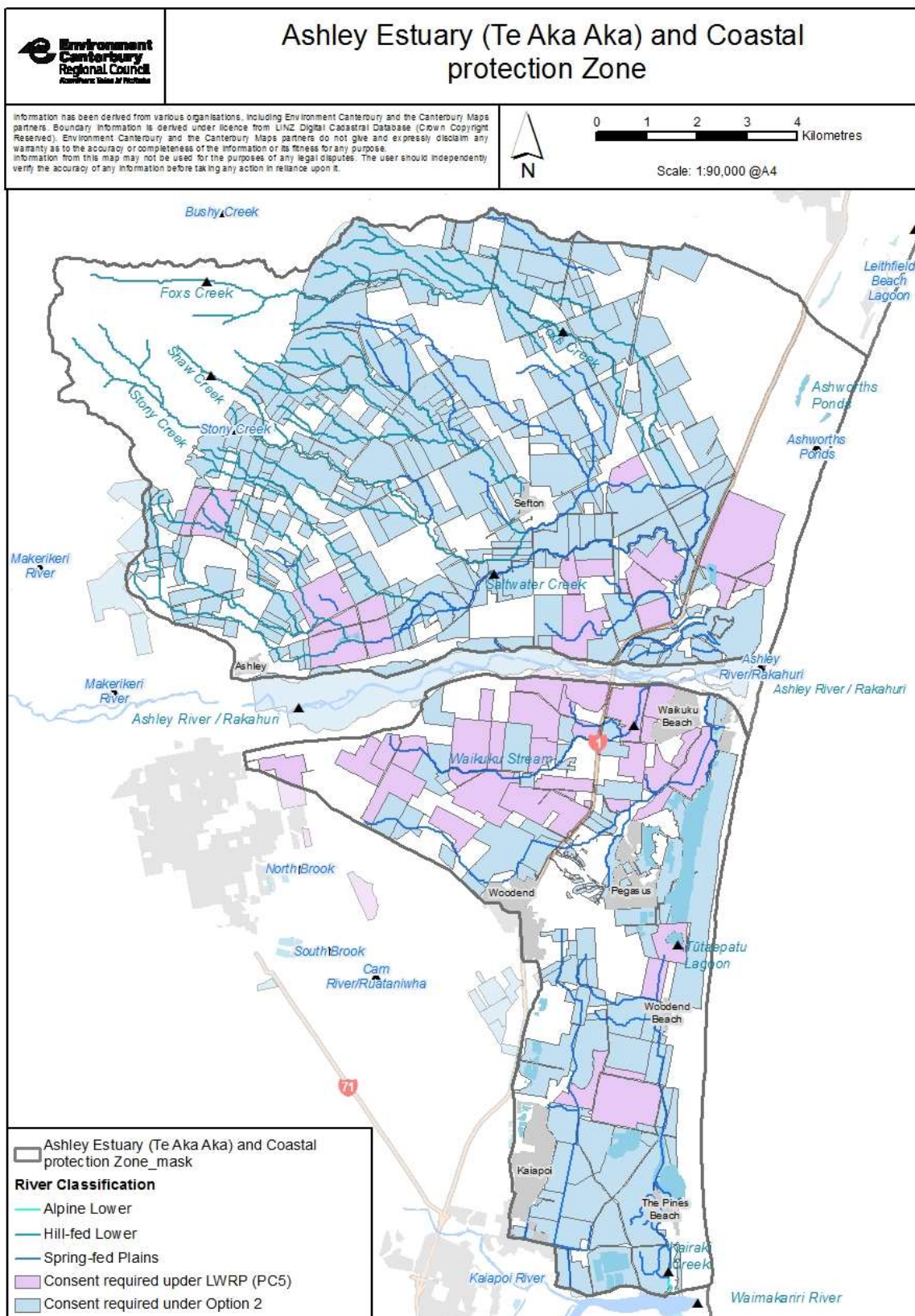


Figure 2 Indicative land areas requiring consent under LWRP (PC5) and Option 2

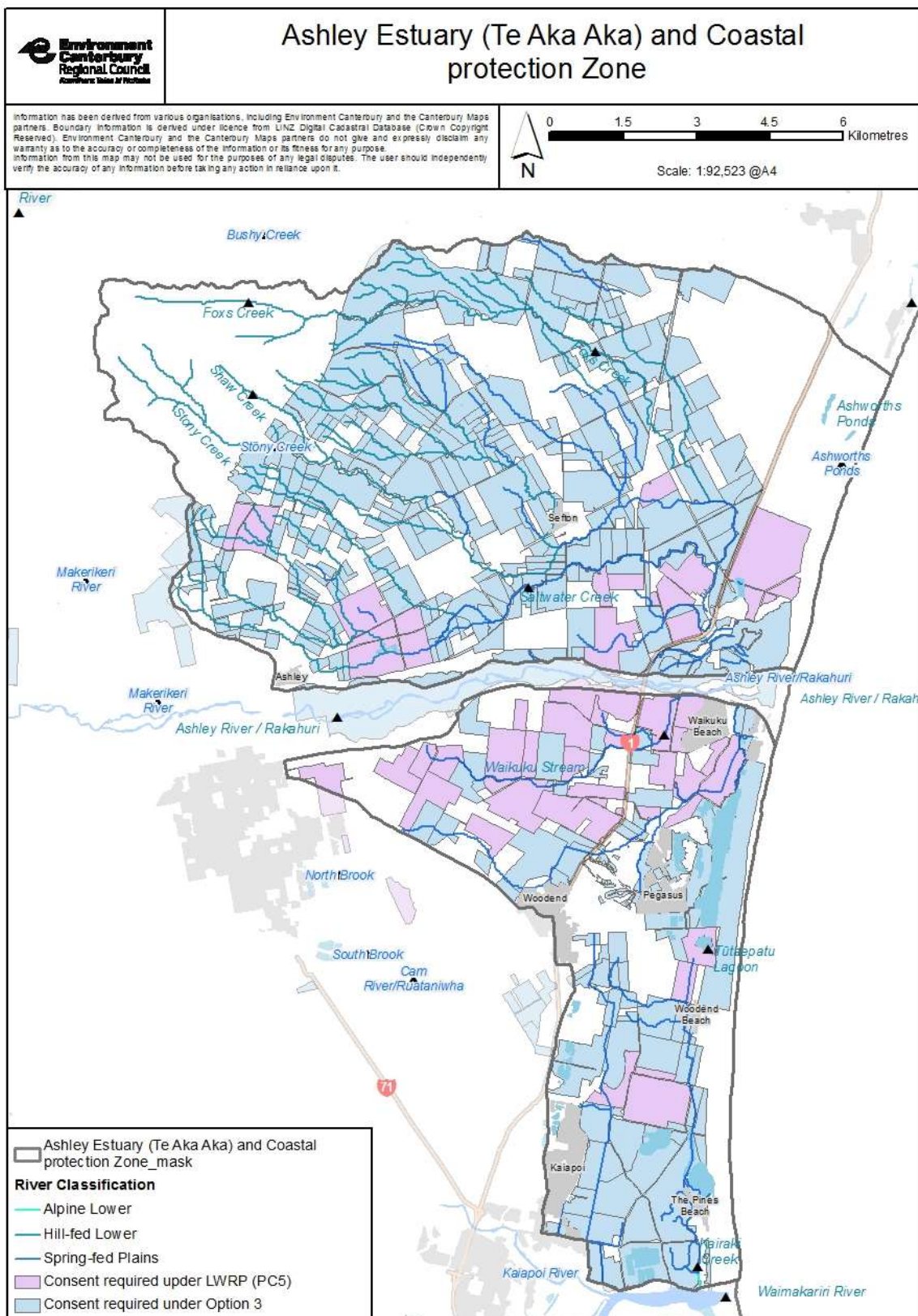


Figure 3 Indicative land areas requiring consent under LWRP (PC5) and Option 3