Proposed Plan Change 6 to the Canterbury Land and Water Regional Plan - Section 10 Banks Peninsula

I hereby certify this is Plan Change 6 to the partially operative Canterbury Land and Water Regional Plan as adopted by the Canterbury Regional Council at its meeting on 24 September 2015.

The Common Seal of the Canterbury Regional Council was fixed in the presence of:

Bill Bayfield
Chief Executive
Canterbury Regional Council

CANTERBURY REGIONAL COUNCIL
THE COMMON SEAL OF

David Caygill
Acting Chairperson
Canterbury Regional Council

24 September 2015

Table of contents

1 Introduction

1.1 Scope of this Plan Change

This Plan Change proposes changes to the Canterbury Land and Water Regional Plan in accordance with Policy 4.9 of that Plan and Appendix 2 to the Canterbury Regional Policy Statement 2013.

Changes are proposed to Section 10 'Banks Peninsula' of the Canterbury Land and Water Regional Plan for the Lake Forsyth / Wairewa catchment. The Plan Change addresses water quality and quantity issues for the Lake Forsyth / Wairewa catchment, and introduces provisions specific to the catchment. A new management area, the 'Valley Floor Area', is introduced to the Map series. A new Schedule 24c (Valley Floor River Bank Erosion Plan) sets out matters to be addressed when undertaking river bank stabilisation works in the Valley Floor Area. This schedule is referred to in the Lake Forsyth / Wairewa catchment rules.

1.2 How to Read this Document

In reading this plan change, the following should be noted:

- Any reference to 'the Plan' in this document is a reference to the Canterbury Land and Water Regional Plan.
- This document shows only those provisions that are proposed to be amended, relocated or new provisions proposed to be inserted, as part of Plan Change 6.
- Proposed insertions are <u>underlined.</u>
- Proposed deletions are shown in ~~strikethrough.~~
- Headings to be inserted are preceded by the phrase ('Insert Heading') and are not underlined.
- Instructions are shown in italics and contained in a box.

Example Instructions

Where text has been included for the purposes of context, this is shown without underline or strikethrough font. This text does not form part of Plan Change 6.

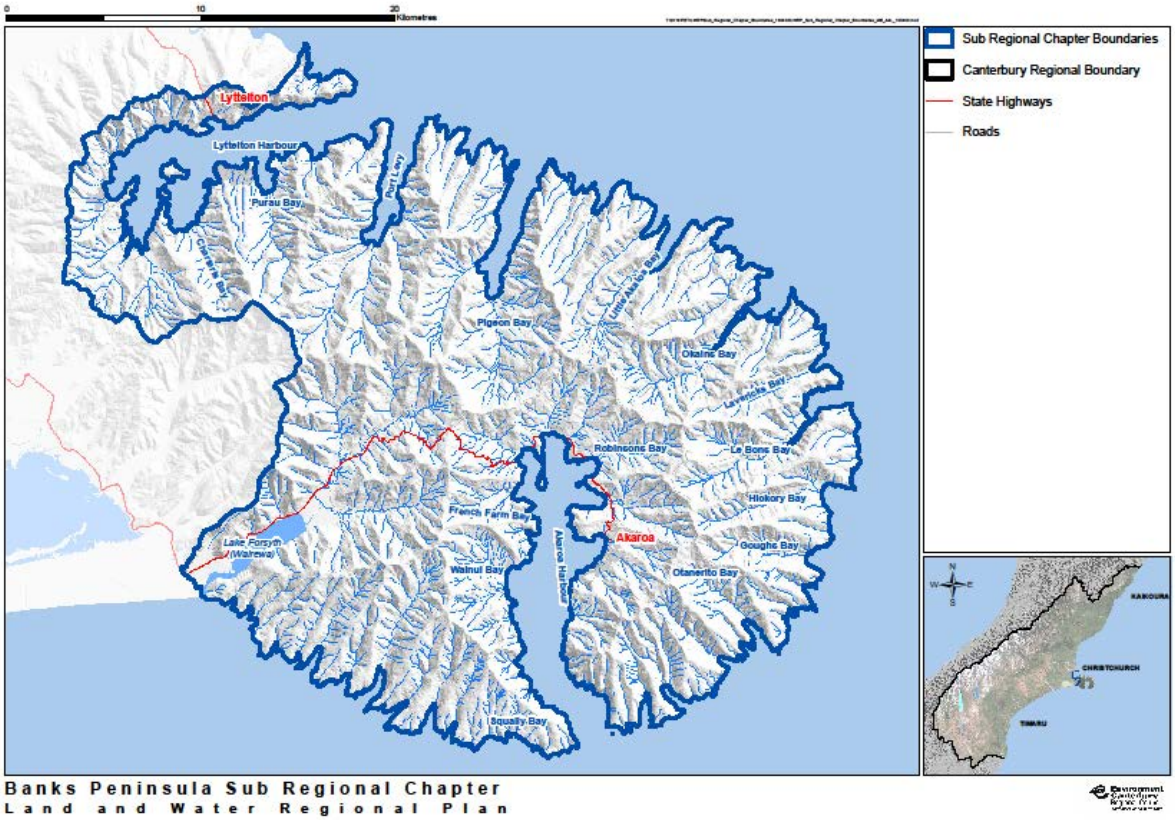
(This page is intentionally blank)

Section 10- Banks Peninsula

The area covered by this sub-region section is shown below. It generally corresponds with the area covered by the Banks Peninsula Water Management Zone Committee.

Many of the rivers and streams on Banks Peninsula have steep, short catchments, generally with riffle-run pool sequences. These waterways are rain-fed, are subject to rapid flow recession, and some may be seasonally dry. Banks Peninsula waterways also typically have long periods of low flow, low base flows and infrequent large floods of short duration, with higher flows occurring in winter when precipitation is higher. Some small streams exit to small estuaries situated in pocket beaches, before entering the sea.

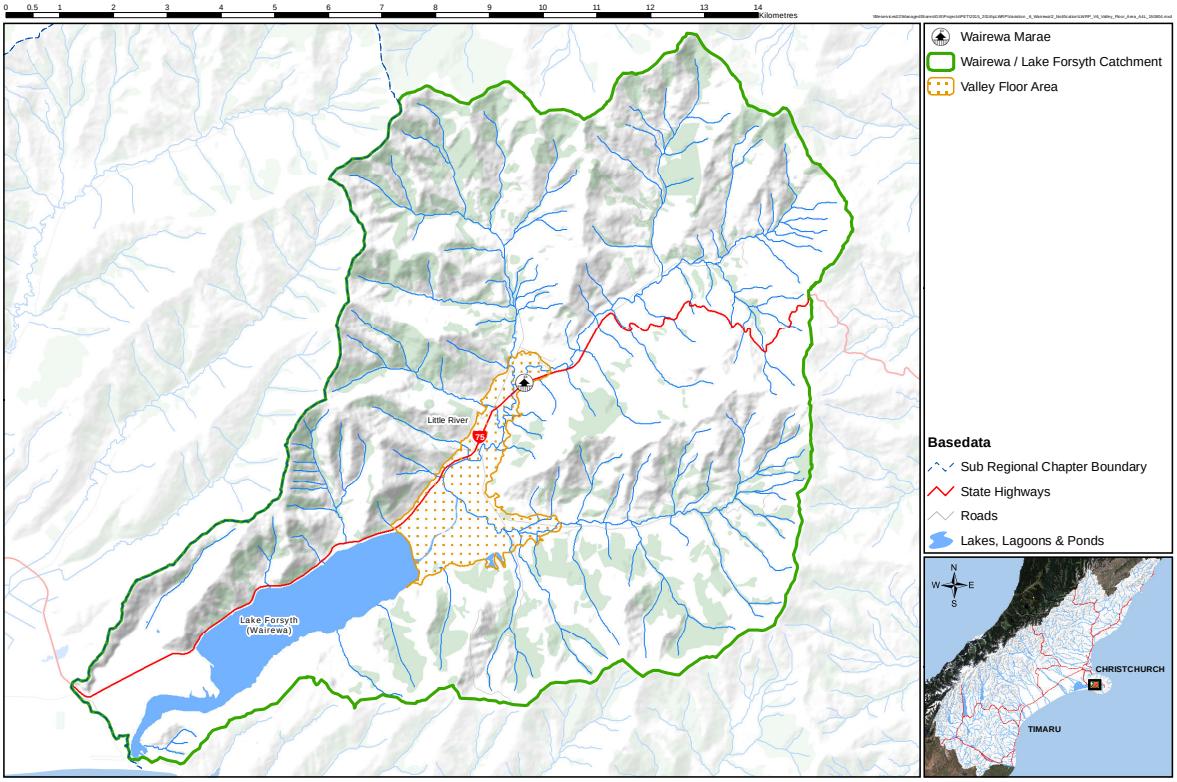
Figure 1: Banks Peninsula Sub-Region



Lake Forsyth / Wairewa catchment

The Lake Forsyth / Wairewa catchment covers the land from mean high water springs at Birdlings Flat to the south, Mount Fitzgerald and Mount Sinclair to the north, High Bare Peak to the west and Saddle Hill / Wainui Pass to the east. The main water resources in this catchment include Lake Forsyth / Te Roto o Wairewa and the waterways that flow into the lake, such as the Okana, Okuti and Takiritawai Rivers. The catchment includes the townships of Little River, Birdlings Flat and Cooptown.

Figure 2 Lake Forsyth/Wairewa catchment



The hapū with kaitiakitanga responsibilities for the Lake Forsyth / Wairewa catchment are Kāti Irakehu and Kāti Makō, represented in a modern-day context by Wairewa Rūnanga. The marae of Kāti Irakehu and Kāti Makō is located in the catchment, as shown in Figure 2.

The outstanding cultural significance of Lake Forsyth / Te Roto o Wairewa is recognised in the Ngāi Tahu Claims Settlement Act 1998, including by the Statutory Acknowledgement for the lake, and by the creation of a reserve at the head of the lake. Lake Forsyth / Te Roto o Wairewa is renowned for its mahinga kai values, with tuna (eel), pātiki (flounder) and inanga (whitebait) the main kai taken. Commercial fishing is prohibited in the Wairewa/Lake Forsyth Mātaitai Reserve which includes Lake Forsyth / Te Roto o Wairewa and the Takiritawai River. The lake is also one of only two customary lakes in New Zealand, which means that only Ngāi Tahu may take tuna from the lake.

Lake Forsyth / Te Roto o Wairewa is also recognised as a nationally and regionally significant wetland area. Lake Forsyth / Wairewa provides lake-margin and swamp habitats for waterfowl (including the crested grebe), a variety of salt and freshwater marsh plants and invertebrate species. The lake and its tributaries provide habitats for a variety of fish species including tuna (long finned and short finned eel), inanga, patiki, banded kokopu, and common and upland bullies. The Okuti River is a known spawning site for the kanakana (lamprey). Apart from the upland bully, all these species require access to the sea to complete their lifecycle. Perch and brown trout can also be found in Lake Forsyth / Te Roto o Wairewa and its tributaries.

Over the last 160 years, the Lake Forsyth / Wairewa catchment has changed dramatically. Historically the lake was a shallow estuary but the growth of the Kaitorete Spit has enclosed it, and there is insufficient flow to maintain an opening to the sea. Deforestation of the catchment has accelerated the natural processes of erosion and the subsequent loss of sediment into waterways and the lake, and there is insufficient water movement to move sediment and phosphorus out into the sea. The once abundant eel fishery is in decline, though the exact reasons for this decline are unclear.

Soils in the catchment are naturally high in phosphorus and this is thought to be a driving factor in the regular summer blooms of the toxic cyanobacteria, *Nodularia spumigena,* within Lake Forsyth / Te Roto o Wairewa. These blue-green algal blooms produce toxic byproducts which are harmful to humans and animals, and

impact on cultural, recreational and amenity values associated with the lake. Erosion of stream banks in the valley floor is the single biggest source of phosphorus. Preventing eroded soil from entering waterways, and eventually the lake, is a critical challenge for the catchment.

Other issues in the Lake Forsyth / Wairewa catchment are the phosphorus rich sediment that is already in the lake ('legacy phosphorus'); controlling other sources of phosphorus; the setting of minimum flows and allocation limits for the Okana, Okuti and Takiritawai rivers; and providing for the migratory habits of the tuna so as to enhance mahinga kai.

During 2013-2015 the Banks Peninsula Zone Committee engaged with the local community and stakeholders to develop a package of actions (the 'Solutions Package') to protect community values and opportunities to safely gather mahinga kai, improve water quality in Lake Forsyth /Te Roto o Wairewa, and manage water quantity in the rivers in the catchment while also sustaining a healthy economy and community. The Wairewa Zone Implementation Programme Addendum November 2014 records the full package of actions to be implemented, and includes those that are best given effect to through regulation and those that are best achieved through other means.

The key actions include:

- Addressing the key source of phosphorus in the catchment by encouraging works to stabilise the banks of rivers in the Valley Floor Area;
- Preventing stock accessing the river banks in the Valley Floor Area so as to reduce bank erosion and collapse, and prevent animal effluent entering waterways;
- Intercepting phosphorus-rich sediment before it enters the lake through the construction of a sediment retention basin or wetland at the head of Lake Forsyth / Te Roto o Wairewa;
- Providing for lake investigations to address the phosphorus that is already present in the lake;
- Requiring community wastewater treatment systems to remove phosphorus from discharges where practicable, and minimise the volume of wastewater;
- Introducing a minimum flow and allocation limit for the Okana, Okuti and Takiritawai rivers and their tributaries that protects the ecosystems and cultural health of these water bodies;
- Setting a nitrate-nitrogen concentration for rivers that protects the existing high water quality; and
- Providing for a lake opening and closing regime that maintains lake levels for flood control and land drainage, while recognising the cultural values of Ngāi Tahu.

This section of the Plan includes policies and rules that, in addition to those in Sections 4 and 5, will support the implementation of the Solutions Package for the Lake Forsyth / Wairewa catchment and will sustainably manage water resources to achieve the purpose of the Resource Management Act 1991. It does so within the scope of a regional plan and regional council functions under the Resource Management Act 1991.

10.1 Other Regional Plans that apply to the Banks Peninsula Sub-region

Nil.

(Insert Heading)10.1A Definitions

For the Lake Forsyth / Wairewa catchment the following definitions apply in addition to those contained in Section 2.9.

Word or Phrase	Definition
Lake Forsyth / Wairewa catchment	means the area shown as the Okana - Lake Forsyth Nutrient Allocation Zone on the Planning Maps.
Valley Floor Area	means the area identified as the Valley Floor Area on the Planning Maps.

10.2 Water Conservation Orders that apply to the Banks Peninsula Sub-region

Nil.

~~**10.3 Fresh water Outcomes**~~

~~Objectives in Section 3, Policies 4.1, 4.2, 4.3 and 4.4.~~

10.3 (Insert Heading) Iwi Management Plans that apply to the Banks Peninsula Sub-region

Mahaanui Iwi Management Plan 2013.

Te Rūnanga o Ngāi Tahu Freshwater Policy Statement.

10.4 Policies

~~No additional policies apply in the Banks Peninsula Sub-region, in addition to those set out in Section 4 of this Plan.~~

Note: No policies additional to those in Section 4 of this Plan apply in the Banks Peninsula Sub-region, except that the following policies also apply in the Lake Forsyth / Wairewa catchment.

Improving Water Quality

10.4.1 Enhance the cultural values of Ngāi Tahu and the ecological health and water quality in the Lake Forsyth / Wairewa catchment by:

(a) excluding stock from the bed and riparian margins of the Okana, Okuti, and Takiritawai rivers, their tributaries, and the lake within the Valley Floor Area, in order to reduce the risk of bank erosion and collapse and avoid animal effluent entering water; and

(b) reducing the risk of bank erosion and collapse and the loss of soil into water through providing for bank stabilisation activities that are consistent with a Valley Floor Area River Bank Erosion Plan prepared in accordance with Schedule 24c; and

(c) encouraging the planting of native species in riparian margins where this is compatible with achieving bank stabilisation; and

(d) providing for the removal of phosphorus and sediment by diverting river flows through a wetland or sediment basin before entering Lake Forsyth / Te Roto o Wairewa; and

(e) requiring discharges from community wastewater treatment systems to minimise phosphorus, and to minimise the volume of wastewater; and

(f) preventing inundation of septic tanks from floodwaters in flood-prone areas.

10.4.2 Improve water quality in Lake Forsyth / Te Roto o Wairewa by achieving the targets in Table 10(e) and 10(f)by 2030.

Flood Management

10.4.3 Improve the flood-carrying capacity of the Okana, Okuti, and Takiritawai rivers and their tributaries by excluding stock from the beds and riparian margins of those rivers, and by enabling bank stabilisation works, so that induced bank erosion and collapse is avoided.

Lake Forsyth / Te Roto o Wairewa - Management and Investigations

10.4.4 Recognise the cultural values of Ngāi Tahu for Lake Forsyth / Te Roto o Wairewa, and enhance the ecological health of the lake, while maintaining flood control and land drainage functions by:

(a) reducing the sediment and phosphorus load entering the lake; and

(b) allowing activities that are for the purpose of investigating legacy phosphorus issues in the lake and that facilitate restoration of the lake; and

(c) providing for the artificial opening and closing of the lake.

10.5 Rules

~~No additional rules apply in the Banks Peninsula Sub-regional area, in addition to those set out in Section 5 of this Plan.~~

Note: For all activities in or near waterways, refer also to requirements and restrictions under the Canterbury Regional Council Flood Protection and Drainage Bylaw 2013.

Bank Erosion and Flood Management

10.5.1 Despite Rules 10.5.2 and 10.5.3, any activity that is classified as a permitted activity by a rule in Section 5, and that meets the conditions of that rule is a permitted activity in the Valley Floor Area.

10.5.2 Within the Valley Floor Area, the use of land in the riparian margin or the disturbance of the bed and banks of the Okana, Okuti and Takiritawai rivers and their tributaries, or Lake Forsyth / Te Roto o Wairewa, that includes:

(a) planting or removal of vegetation; or

(b) installation, maintenance, use and removal of a structure; or

(c) installation, maintenance, use and removal of cables or wires and associated support structures; or

(d) earthworks, including excavation; or

(e) diversion of water; or

(f) the incidental discharge of sediment-laden water into surface water, or into or onto land in circumstances where it may enter surface water; or

(g) deposition of substances on, in or under the bed of a lake or river;

and that is to reduce bank erosion and collapse is a restricted discretionary activity, provided the following condition is met:

1. A Valley Floor Area River Bank Erosion Plan has been prepared in accordance with Schedule 24c and is submitted with the application for resource consent.

The exercise of discretion is restricted to the following matters:

1. The content and adequacy of the Valley Floor Area River Bank Erosion Plan; and

2. The content and characteristics of any deposited material; and

3. The species of any plant to be introduced; and

4. Effects on water quality, sources of human or animal drinking-water, aquatic ecosystems, and inanga spawning habitat; and

5. Effects on mahinga kai or sites of importance to Ngāi Tahu; and

6. Effects on the flood carrying capacity of the river; and

7. Effects on fish passage; and

8. Effects on lawfully established structures and access to those structures; and

9. Effects on flood protection vegetation; and

10. Effects on the stability of river banks upstream and downstream of the activity; and

11. The potential benefits of the activity to the applicant, the community and the environment.

10.5.3 Within the Valley Floor Area, the use of land in the riparian margin or the disturbance of the bed and banks of the Okana, Okuti and Takiritawai rivers and their tributaries, or Lake Forsyth / Te Roto o Wairewa, that includes:

(a) planting or removal of vegetation; or

(b) installation, maintenance, use and removal of a structure; or

(c) installation, maintenance, use and removal of cables or wires and associated support structures; or

(d) earthworks, including excavation; or

(e) diversion of water; or

(f) the incidental discharge of sediment-laden water into surface water, or into or onto land in circumstances where it may enter surface water; or

(g) deposition of substances on, in or under the bed of a lake or river;

and that is to reduce bank erosion and collapse, and that does not meet the condition of Rule 10.5.2 is a non-complying activity.

Stock Exclusion

Note: Within the Lake Forsyth / Wairewa catchment, and excluding the Valley Floor Area, Rules 5.68, 5.69 ,5.70 and 5.71 apply.

10.5.4 Until1 January 2020, within the Valley Floor Area, the use and disturbance of the bed (including the banks) of the Okana, Okuti, and Takiritawai rivers and their tributaries, or of Lake Forsyth / Te Roto o Wairewa by stock, and any associated discharge to surface water is subject to Rules 5.68, 5.69, 5.70 and 5.71.

10.5.5 10.5.5 From 1 January 2020, within the Valley Floor Area, the use and disturbance of the bed (including the banks), and the riparian margin of the Okana, Okuti, and Takiritawai rivers and their tributaries, and of Lake Forsyth / Te Roto o Wairewa by all stock, and any associated discharge to surface water is a prohibited activity.

Lake Forsyth / Te Roto o Wairewa - Management and Investigations

10.5.6 **Within the Valley Floor Area, the use of land and the disturbance of the bed and riparian margin of a river or lake to construct, maintain or use a sediment basin or wetland, and the associated deposition of substances, on, in, or under the bed, and any associated taking, using or diverting of surface water, or the discharge of sediment-laden water to surface water, is a discretionary activity.**

10.5.7 **The disturbance of the bed of Lake Forsyth / Te Roto o Wairewa for the purpose of investigating legacy phosphorus, and the associated deposition of substances, on, in, or under the bed, or the discharge of sediment-laden water to surface water, is a permitted activity, provided the following conditions are met:**

1. The activity does not include the deposition of any substance, other than bed material, on the bed; and
2. The activity is undertaken more than 50m from any lawfully established surface water intake; or more than 150m from any lawfully established water level recorder; or closer where there is evidence that permission has been obtained from the owner of the intake or recorder; and
3. The activity and any associated equipment or materials do not obstruct or alter access to, or navigation on, the lake; and
4. The activity is not undertaken in an inanga spawning site listed in Schedule 17; or undertaken in any inanga spawning habitat during the inanga spawning season of 1 March to 1 June inclusive; and
5. The activity does not restrict the passage of migratory fish species; and
6. The activity does not take place on a site listed as an archaeological site on the New Zealand Archaeological Association Site Recording Scheme website; and
7. The activity does not occur within 100m of birds which are nesting or rearing their young.

10.5.8 **The disturbance of the bed of Lake Forsyth / Te Roto o Wairewa for the purpose of investigating legacy phosphorus, and the associated deposition of substances, on, in, or under the bed, or the discharge of sediment-laden water to surface water, that does not meet one or more of the conditions of Rule 10.5.7 is a discretionary activity.**

10.5.9 **The use of land and the disturbance of the bed and riparian margins of Lake Forsyth / Te Roto o Wairewa for the purpose of opening or closing the lake, and the associated extraction and deposition of gravel, including the ancillary deposition of substances on the bed, the diverting of surface water, or the discharge of sediment-laden water to surface water, is a discretionary activity.**

10.6 (Insert Heading) Fresh Water Outcomes

~~**10.6 Allocation Limits**~~

~~10.6.1 Environmental Flow and Allocation Limits~~

~~See Rule 5.123.~~

~~10.6.2 Groundwater Allocation Limits~~

~~See Rule 5.128.~~

~~10.6.3 Catchment Nutrient Load Limits and Allowances~~

~~Nil. See 5.41 to 5.64.~~

The following tables set out the freshwater outcomes to be achieved in the Lake Forsyth/ Wairewa catchment by 2030. The freshwater outcomes for other areas in the Banks Peninsula Sub-region are set out in the Objectives in Section 3, and in Policies 4.1, 4.2, 4.3 and 4.4.

Table 10(a) Freshwater Outcomes for Lake Forsyth / Wairewa Catchment Rivers to be achieved by 2030

Freshwater Management Unit	River type	River	Ecological Health Attributes			Periphyton Attributes[3]		Siltation Attribute[3]	Human Health for Recreation Attributes				Cultural Attribute
			QMCI [1,3]	Dissolved oxygen [min % saturation] [min]	Temp [max] [°C]	Chlorophyll a maximum biomass [mg chl-a/m^2] [no more than 17% of samples]	Filamentous algae ≥20mm [max cover of bed]	Fine sediment <2mm diameter [max cover of bed] (%)	Cyanobacteria [% mat cover]	SFRG[2]	*E.coli* [*E.coli* /100mL]		
									-	-	Annual median	95th percentile	
Lake Forsyth / Wairewa catchment	Banks Peninsula	Okuti River Okana River - Takiritawai River	5	90%	20	120	20	20	30	Good	260	260	Freshwater mahinga kai species sufficiently abundant for customary gathering, water quality is suitable for their safe harvesting, and they are safe to eat.

[1.] QMCI = Quantitative macro invertebrate community index.

[2.] SFRG = Suitability for Recreation Grade from Microbiological Water Quality Guidelines for Marine and Freshwater Recreational Areas 2003.

[3] These attributes only apply to wadeable areas of wetted riverbed. For the purposes of this table, wadeable areas are defined as reaches of the river up to 600mm in depth.

Table 10(b) Freshwater Outcomes to be achieved for Lake Forsyth / Te Roto o Wairewa by 2030

Lake Type	Ecological health Attributes				Eutrophication Attribute TLI[2] [max annual average]	Visual Quality Attribute (Colour)	Human Health for Recreation Attributes				Cultural Attribute
	Dissolved Oxygen (min)		Temp. (max) [C]	Lake SPI [1] [min grade]			Cyanobacteria [either mm^3/L or cells/mL] [80th percentile]	SFRG	E.coli [E.coli/100ml]		
	Hypo-limnion saturation [%]	Epilimnion saturation [%]							Annual median	95th percentile	
Coastal lake	70	90	19	Moderate	6	The natural colour of the lake is not degraded by more than 5 Munsell units	1.8	Good	260	260	Freshwater mahinga kai species sufficiently abundant for customary gathering, water quality is suitable for their safe harvesting, and they are safe to eat.

1. Lake SPI = Lake Submerged Plant Indicators from Clayton J, Edwards T (2002) Lake SPI: a method for monitoring ecological condition in New Zealand lakes (Technical report version 1 by NIWA).

2. TLI = Trophic Level Index from: Protocol for Monitoring Trophic Levels of New Zealand lakes and reservoirs (Report by Lakes Consulting, March 2000). The scale is from less than 1 (very low nutrients) to more than 7 (very high nutrients). The TLI is calculated at TLI3 (using TP, TN and Chl. a.).

3. SFRG = Suitability for Recreation Grade from: Microbiological Water Quality Guidelines for Marine and Freshwater Recreational Areas, Ministry for the Environment, June 2003.

10.7 Environmental Flow and Allocation Regime and Water Quality Targets/Limits

Plan Change 6 re-numbers the existing provisions in 10.7 as 10.8 but retains the same content and heading.

~~**10.7 Flow Sensitive Catchments**~~

~~The following are to be applied when reading relevant policies and rules in Sections 4 and 5.~~

~~Catchment (see Planning Maps)~~	~~Sensitive part of catchment~~	~~Monitoring site – lower boundary of catchment~~
~~Dick Stream~~	~~Whole catchment~~	~~Confluence with Pigeon Bay Stream~~
~~Pawson Valley Stream~~	~~Whole catchment~~	~~Christchurch/Akaroa Road (State Highway 75)~~
~~Pipers Valley Stream (Duvauchelle)~~	~~Whole catchment~~	~~Governors Bay/Teddington Road and Allandale~~
~~Allandale Stream (Smarts Road Drain)~~	~~Whole catchment~~	~~Christchurch /Akaroa Road (State Highway 75)~~
~~French Farm Stream~~	~~Whole catchment~~	~~French Farm Valley Road recorder above Christchurch /Akaroa Road (State Highway 75)~~
~~Takamatua Stream~~	~~Whole catchment~~	~~Christchurch /Akaroa Road (State Highway 75)~~
~~Okuti River~~	~~Whole catchment~~	~~Kinloch Road Bridge~~
~~Okana River~~	~~Whole catchment~~	~~Christchurch /Akaroa Road (State Highway 75)~~
~~Pigeon Bay Stream~~	~~Whole catchment~~	~~Pigeon Bay Road~~
~~Police Stream~~	~~Whole catchment~~	~~Christchurch /Akaroa Road (State Highway 75)~~

10.7.1 (Insert heading) Environmental Flow Regime

Rules 5.123-5.125 (Minimum flows and allocation limits) and Table 10(c) apply in the Lake Forsyth / Wairewa catchment.

Table 10(c) Lake Forsyth / Wairewa Catchment Environmental Flow and Allocation Limits

Surface water body	Minimum flow recorder site	Minimum flow (L/s)	Allocation limit (L/s)	Restrictions	
				Reduce take by	Flow rate at recorder (L/s)
Okuti River and its tributaries	Okuti River at Kinloch Road Bridge: map reference N36:93499-13299	59	20	25%	79
				50%	69
				100%	59
Okana River, Takiritawai River and their tributaries	Okana River at Kinloch Road Bridge: map reference N36:93059-14759	97	32	25%	129
				50%	113
				100%	97

10.7.2 (Insert heading) Groundwater Allocation Limits

See Rule 5.128.

10.7.3 (Insert heading) Water Quality Limits and Targets

For rivers and the lake in the Lake Forsyth / Wairewa catchment, the water quality limits in Table 10(d) and the water quality limits and targets in Table 10(e) prevail over the region wide limits in Schedule 8.

The National Policy Statement for Freshwater Management 2014 defines a target as a limit to be met within a defined timeframe. Targets for Lake Forsyth / Te Roto o Wairewa in Tables 10(e) and 10(f) are to be met by 2030.

Groundwater limits for the Forsyth / Wairewa catchment, and limits for all waterbodies in other areas in the Banks Peninsula Sub-region, are set out in Schedule 8.

Table 10(d) Water Quality Limits for Rivers in the Lake Forsyth / Wairewa Catchment

Freshwater Management Unit	River type	River name and measurement location	Nitrate-Nitrogen concentration (mg/L)		Ammoniacal Nitrogen concentration (mg/L)	
			Annual median	95th percentile	Annual median[1]	Annual maximum[1]
Lake Forsyth/Wairewa catchment	Banks Peninsula	Okuti River at SH75: map reference 2493700E, 5715750N	0.2	0.5	0.03	0.05
	Banks Peninsula	Okana River at Kinlock bridge: map reference 2493550E, 5713800N	0.2	0.5	0.03	0.05

[1]. Based on pH 8 and temperature 20°C. Compliance with the numeric attribute states should be undertaken after pH adjustment.

Table 10(e) Water Quality Limits, and Targets to be achieved by 2030, for Lake Forsyth / Te Roto o Wairewa

Lake type	Lake name and measurement location	Targets				Limits	
		Total Phosphorus (TP) concentration [mg/m³] [annual median]	Total Nitrogen concentration [mg/m³] [annual median]	Chlorophyll a concentration (mg/m³)		Ammoniacal Nitrogen concentration (mg/L)	
				Annual median	Annual maximum	Annual median[1]	Annual maximum[1]
Coastal lake	Lake Forsyth at Catons Bay: map reference 2481828E, 5754717N	50	800	12	60	0.03	0.05

[1] Based on pH 8 and temperature 20°C. Compliance with the numeric attribute states should be undertaken after pH adjustment.

Table 10(f) Total Phosphorus Load Target for Lake Forsyth / Te Roto o Wairewa to be achieved by 2030

Measurement	Target
Annual load (kg)	2,600

10.8 (Insert heading) Flow Sensitive Catchments

The following are to be applied when reading relevant policies and rules in Sections 4 and 5.

Catchment (see Planning Maps)	Sensitive part of catchment	Monitoring site – lower boundary of catchment
Dick Stream	Whole catchment	Confluence with Pigeon Bay Stream
Pawson Valley Stream	Whole catchment	Christchurch/Akaroa Road (State Highway 75)
Pipers Valley Stream (Duvauchelle)	Whole catchment	Governors Bay/Teddington Road and Allandale
Allandale Stream (Smarts Road Drain)	Whole catchment	Christchurch /Akaroa Road (State Highway 75)
French Farm Stream	Whole catchment	French Farm Valley Road recorder above Christchurch /Akaroa Road (State Highway 75)
Takamatua Stream	Whole catchment	Christchurch /Akaroa Road (State Highway 75)
Okuti River	Whole catchment	Kinloch Road Bridge
Okana River	Whole catchment	Christchurch /Akaroa Road (State Highway 75)
Pigeon Bay Stream	Whole catchment	Pigeon Bay Road
Police Stream	Whole catchment	Christchurch /Akaroa Road (State Highway 75)

10.9 (Insert heading) High Naturalness Waterbodies

Nil.

10.10 (Insert heading) Schedules

Schedule 24c Valley Floor Area River Bank Erosion Plan

A Valley Floor Area River Bank Erosion Plan must:

1. include a map(s) and aerial and other photograph(s) at a scale that clearly shows:
   (a) the area where activities to stabilise river banks will be undertaken, including a photograph of the view immediately upstream and downstream of the area of proposed activity; and
   (b) the location of existing riparian vegetation and fences adjacent to surface water bodies within the proposed works area; and
2. describe the proposed works, including any earthworks, contouring of river banks, anchored and/or weighted tree protection, and vegetation removal and planting, to stabilise the river banks and reduce bank erosion and collapse; and
3. describe the maintenance programme including the nature and frequency of expected works, and the period over which maintenance is expected to be required; and
4. describe the actions that will occur after flood events, the timing of those actions, and the responsibility for undertaking the actions, to ensure the effectiveness of the activities described in (2) above is maintained; and
5. provide an assessment of the effects of the proposed activities, at a level of detail commensurate with the scale and significance of the effects, on:
   (a) water quality of surface waterbodies, sources of human or animal drinking-water, aquatic ecosystems inanga spawning sites and inanga spawning habitat; and
   (b) the flood carrying capacity of the river; and
   (c) mahinga kai or sites of importance to Ngāi Tahu; and

(d) fish passage; and

(e) lawfully established structures and access to those structures; and

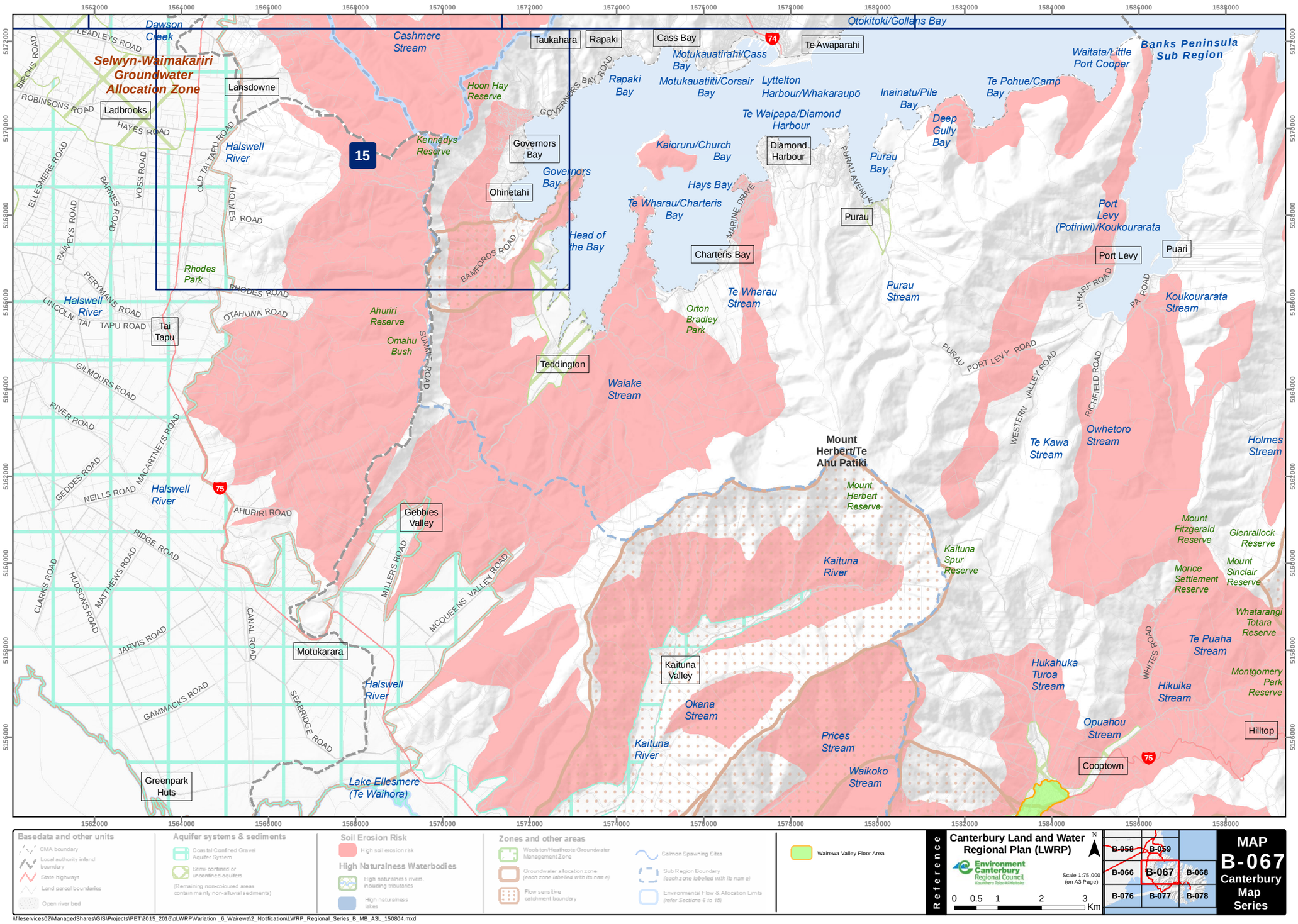
(f) flood protection vegetation; and

(g) river bank stability, including the stability of neighbouring or downstream banks and any adjacent installed erosion control measures; and

(h) surface water flowpaths and any deflection of surface run-off, including the potential for it to be deflected onto other properties.

10.11 Lake Forsyth / Wairewa Additions to Planning Maps

Planning Map B-067



Basedata and other units
- CMA boundary
- Local authority inland boundary
- State highways
- Land parcel boundaries
- Open river bed

Aquifer systems & sediments
- Coastal Confined Gravel Aquifer System
- Semi-confined or unconfined aquifers

(Remaining non-coloured areas contain mainly non-alluvial sediments)

Soil Erosion Risk
- High soil erosion risk

High Naturalness Waterbodies
- High naturalness rivers, including tributaries
- High naturalness lakes

Zones and other areas
- Woolston/Heathcote Groundwater Management Zone
- Groundwater allocation zone (each zone labelled with its name)
- Flow sensitive catchment boundary
- Salmon Spawning Sites
- Sub Region Boundary (each zone labelled with its name)
- Environmental Flow & Allocation Limits (refer Sections 6 to 16)

Wairewa Valley Floor Area

Reference

Canterbury Land and Water Regional Plan (LWRP)

Environment Canterbury Regional Council Kaunihera Taiao ki Waitaha

Scale 1:75,000 (on A3 Page)

0 0.5 1 2 3 Km

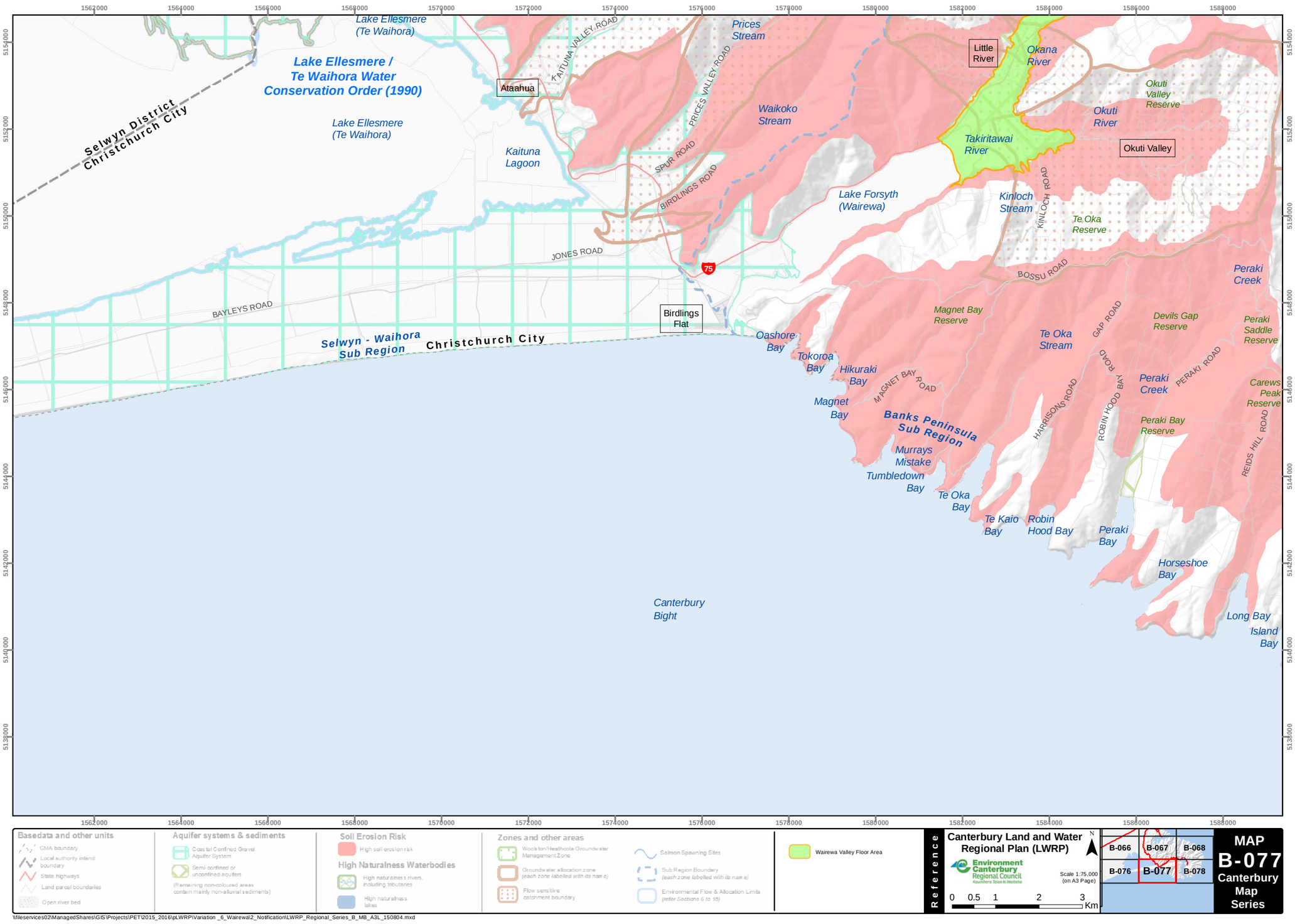
N

B-058 B-059
B-066 B-067 B-068
B-076 B-077 B-078

MAP B-067 Canterbury Map Series

\\fileservices02\ManagedShares\GIS\Projects\PET\2015_2016\pLWRP\Variation _6_Wairewa\2_Notification\LWRP_Regional_Series_B_MB_A3L_150804.mxd

Planning Map B-077



Basedata and other units
- CMA boundary
- Local authority inland boundary
- State highways
- Land parcel boundaries
- Open river bed

Aquifer systems & sediments
- Coastal Confined Gravel Aquifer System
- Semi-confined or unconfined aquifers
- (Remaining non-coloured areas contain mainly non-alluvial sediments)

Soil Erosion Risk
- High soil erosion risk

High Naturalness Waterbodies
- High naturalness rivers, including tributaries
- High naturalness lakes

Zones and other areas
- Woolston/Heathcote Groundwater Management Zone
- Groundwater allocation zone *(each zone labelled with its name)*
- Flow sensitive catchment boundary
- Salmon Spawning Sites
- Sub Region Boundary *(each zone labelled with its name)*
- Environmental Flow & Allocation Limits *(refer Sections 6 to 15)*

Wairewa Valley Floor Area

Reference

Canterbury Land and Water Regional Plan (LWRP)

Environment Canterbury Regional Council Kaunihera Taiao ki Waitaha

Scale 1:75,000 (on A3 Page)

0 0.5 1 2 3 Km

N

B-066 | B-067 | B-068
B-076 | B-077 | B-078

MAP B-077 Canterbury Map Series

\\fileservices02\ManagedShares\GIS\Projects\PET\2015_2016\pLWRP\Variation _6_Wairewa\2_Notification\LWRP_Regional_Series_B_MB_A3L_150804.mxd

Report Number R15/97
ISBN 978-0-947490-21-8 Hard Copy
ISBN 978-0-947490-22-5 CD
ISBN 978-0-947490-23-2 Electronic