

RPS – LF – Land and Freshwater

LF – LAND – Land

Scope and background

*Land** management issues stem mainly from the *effects** of human activities on *land**. Erosion is a naturally occurring process which can contribute sediment to *waterbodies**, but can also be exacerbated by human activities. This chapter focuses on the impacts of human activity and *accelerated erosion*. Potential for adverse environmental *effects** depends upon two factors: the capability of the *land** and soil to support particular uses and the *effects** of a given activity on different *land** and soil types. Mismanagement of the *land** resource has major implications for *water** quality and aquatic biological diversity in terms of sediment and nutrient inputs. These implications stem from the very strong links that exist between the *land** and *water** resources.

Agriculture, particularly pasture-based farming, is the foundation of the Region's economy and is one of the key elements that has defined the Region's social and visual landscape. However, in some areas, past and present agricultural practices have damaged the very resource upon which the agricultural sector is based – the *land** and soil. Future *land** management practices have the potential to increase the rate of damage if they do not take the natural limitations of the *land** into account.

Content

This chapter covers *accelerated erosion**, including the management of *vegetation clearance**, *land disturbance**, *forestry** and *cultivation**

Activities related to *land** management which are covered in other chapters include:

1. *discharges** of *agrichemicals**, *agricultural wastes** and other *contaminants** onto or into *land**, addressed in RPS-LF.
2. activities involving the *beds** of *rivers** and *lakes**, addressed in RPS-LF.
3. clearance of indigenous vegetation and drainage of significant *wetlands**, addressed in RPS-ECO.

Accelerated erosion*

*Accelerated erosion** is often caused by historical and current clearance of *woody vegetation** and earthworks such as tracking, particularly on *land use capability classes** VII and VIII *land**. The Region has approximately 274,000 ha of hill country *land** at risk of moderate-severe erosion (Figure 2), 116,000 ha of which were affected by the storms of 2004. Approximately 200 million tonnes of soil was eroded during the February 2004 storm, causing approximately 30 million tonnes of sediment to enter the Region's *rivers**. The sediment *discharged** by *rivers** in the Region during this single storm event was likely to be several times the average annual sediment *discharge** for the Region.

The Region's western coast, particularly the foredune and associated inland soils, is easily eroded when the protective vegetation cover is removed as part of coastal development, and as a consequence of activities such as *land** recontouring and vehicle movement. *Vegetation clearance** and *land disturbance** expose these fragile soils to wind erosion.

The present extent of erosion has occurred despite the work by catchment boards and other individuals and organisations to manage soil erosion since the 1940s. Where these activities brought about meaningful *land** use change, the results have been successful in decreasing erosion rates. For

instance, in steep hill country, tree cover has reduced erosion rates by approximately 75% when compared with grass. However, the size and scale of the erosion issue is such that to date no agency has been able to deal with all erosion-prone *land*^{*}. Further, in some areas, large-scale *land*^{*} use changes are likely to be required, to which there is understandable landowner resistance.

Accelerated erosion^{*} can cause a number of on-site and off-site impacts:

1. to the landowner – loss of soil and productive capability, reduced stock-carrying capacity, impacts on property and assets such as *tracks*^{*}, fences and buildings, and the costs of carrying out repairs
2. to the *environment*^{*} – reduced *water*^{*} quality in terms of nutrient loads (much of the phosphate load in *water*^{*} is the result of sediment run-off), reduced *water*^{*} clarity, and major impacts on instream life
3. to others in the Region – damage to infrastructure and loss of flood protection to lowland communities as *river*^{*} *beds*^{*} within *river*^{*} and drainage schemes fill up with silt.

Soils that are damaged by slipping take a very long time to recover. Studies have shown it can take in the order of 20 years to regain 80% of pre-erosion productivity levels, and more than 100 years to achieve near-full recovery. Some soil types may never fully recover. Efforts to maintain farm productivity on *land*^{*} that has been affected by slipping generally increase pressure on less damaged parts of the *property*^{*}, thereby increasing the likelihood of further erosion and the loss of nutrients from increased *fertiliser*^{*} use.

Disturbed sandy soils can take many years to revegetate and stabilise naturally. In the interim, large quantities of sand can be eroded by the wind, threatening buildings and *property* and causing the inundation of productive *land*^{*}.

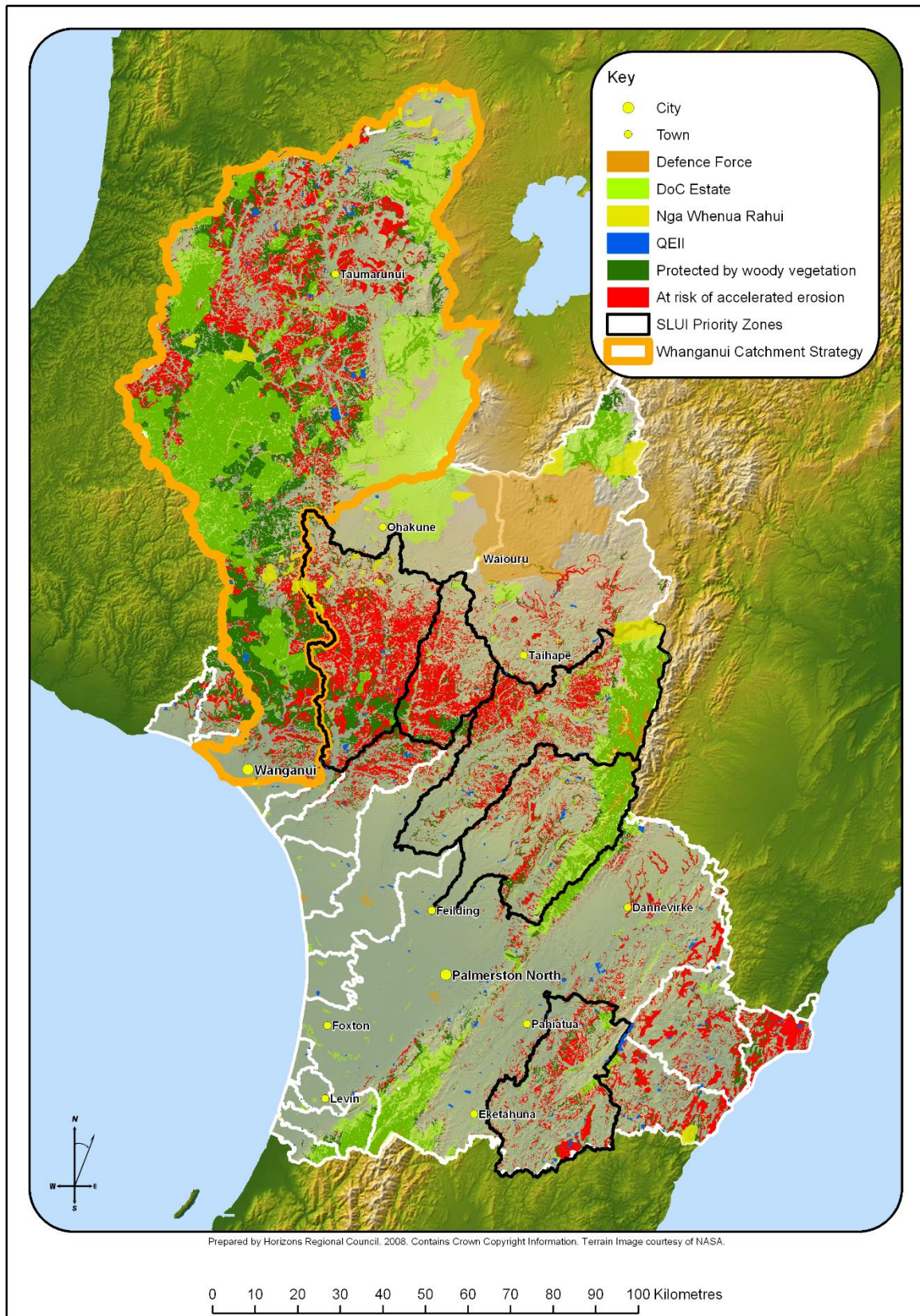


Figure 2 - Distribution of hill country *land subject to an elevated risk of *accelerated erosion****

In addition to the damage that can be caused to the Region's fragile *land** types and soils discussed above, erosion rates and sediment run-off from other parts of the Region can be increased through activities that involve significant *vegetation clearance** and *land disturbance**. Such activities are typically involved with major infrastructure development (for example, *road** construction and *upgrades* or energy projects such as windfarm development), *land** development (such as new *subdivisions** for residential or *industrial activities** on the edge of urban centres or recontouring of *land** associated with dairy conversions or intensification), or aggregate extraction (for example, gravel pits or *quarries**).

Insufficient attention to batter slopes, stormwater management, fill compaction, overburden containment, debris clearance and revegetation can significantly increase sediment loads in adjoining streams or sediment *discharges** onto neighbouring properties.

Land and Soil Management

This section focuses on reducing *accelerated erosion**.

The Regional Council's focus continues to be largely non-regulatory, with the Council's Sustainable Land Use Initiative and Whanganui Catchment Strategy programmes being critical components of this approach.

The Regional Council's regulatory focus for *land** centres on protecting the stability of the Region's soil and maintaining or enhancing *water** quality.

This regulatory focus recognises that under s9(2) of the RMA, the use of *land** can occur as of right unless a rule in a plan states otherwise. Therefore, the Regional Council does not require rules allowing the use of *land** unless it wishes to control the way in which that use of *land** occurs.

Under this Plan, the majority of activities involving the use of *land** can continue to occur as of right provided they are not within a *rare habitat**, *threatened habitat** or *at-risk habitat**. However, four specific activities can only continue to be undertaken without the need for a resource consent if conditions are met. These activities are:

1. Small-scale *land disturbance**, including earthworks,
2. *forestry**
3. *cultivation**, and
4. *vegetation clearance**.

These activities are permitted by Rules RP-LF-LAND-R1, RP-LF-LAND-R2, RP-LF-LAND-R3 in addition to the regulations contained in the NES-PF, RP-LF-LAND-R4 and RP-LF-LAND-R5 respectively.

*Vegetation clearance**, *land disturbance** and *cultivation** require a resource consent if they are undertaken adjacent to *waterbodies**, in *Hill Country Erosion Management Sites** or *coastal foredune** areas subject to an elevated risk of *accelerated erosion*. These specific activities are the subject of Rule RP-LF-LAND-R7 and RP-LF-LAND-R8.

Issues

LF-LAND- I1: Accelerated erosion*

1. Farming and other *land** uses in hill country

Some aspects of current farming and other *land** use practices in the Region's hill country and adjacent to *waterbodies** are unsustainable. Where *vegetation clearance**, roading, tracking or other types of *land disturbance** (including filling) are carried out in hill country or adjacent to *waterbodies**, there is potential to destabilise slopes, causing *accelerated erosion**. *Accelerated erosion** is often causing:

- a. a significant reduction in the productive capability of *land**
- b. increased sediment loads in *waterbodies** which are reducing *water** quality, smothering aquatic ecosystems, infilling *rivers**, *lakes** and estuaries, and increasing flood risk to lowland communities
- c. *land** stability hazards, particularly in steep hill country, which threaten people, buildings and infrastructure.

2. **Coastal foredune***

Vegetation and soil disturbance associated with vehicle movement, tracking, coastal protection works and *land** recontouring have the potential to destabilise fragile *coastal foredunes** if not well managed.

3. **Large-scale *land disturbance** including earthworks**

Most other *land** use activities are not of a sufficient scale to have significant regional adverse *effects**. However, large-scale earthworks related to urban expansion and other development can have significant adverse *effects** on *waterbodies** if sediment from these earthworks is poorly managed. Large-scale *land disturbance** activities can also destabilise sandy soils in coastal areas which can cause significant adverse *effects** associated with wind-blown sand.

4. **Forestry***

*Forestry** is considered to be a generally beneficial *land** use in the Region's hill country due to its ability to facilitate the long-term stabilisation of *land** subject to an elevated risk of *accelerated erosion**. However, *forestry** needs to be prudently managed, in a manner consistent with industry best practice, to ensure that sustainable *land** use is realised and off-site adverse *effects** are minimised.

5. **Cultivation***

*Cultivation** does not generally cause soil erosion problems within the Region. However, the potential for increased sediment loads to *waterbodies** can increase as the slope of the *land** being cultivated increases and when undertaken adjacent to *waterbodies**. Therefore *cultivation** should be appropriately managed, including by the use of appropriate industry best practice sediment run-off control measures.

Objectives

LF-LAND-O1: Managing *accelerated erosion**

By the year 2017, 50% of farms within hill country *land** subject to an elevated risk of *accelerated erosion** will have in place, or be in the process of putting in place, farm-wide sustainable *land** management practices to minimise *accelerated erosion** and to provide for the Surface *Water** Management Values set out in RP-SCHED2 by reducing sediment loads entering *waterbodies** as a result of *accelerated erosion**.

LF-LAND-O1: *Te whakahaere horo whenua tere*

Ā te tau 2017 kia 50% o ngā pāmu kei ngā puke teitei ka whai tūponotanga nui ka pāngia pea e te horo whenua tere kua whakarite kē – kei te whakarite rānei – i ētahi tikanga whakauka mō te whakahaere whenua kei te pāmu katoa hei whakaiti i te horo whenua tere, ā, hei taunaki hoki i ngā Uara Whakahaere Wai Mata kua whakatakotoria i roto i te Pukapuka Āpiti 2 mā te whakaiti i te nui o te parakiwai e uru ana ki ngā wai e hua mai ai i te horo whenua tere.

LF-LAND-O2: Regulating potential causes of *accelerated erosion**

*Land** is used in a manner that ensures:

1. *accelerated erosion** and increased sedimentation in *waterbodies** (with resultant adverse effects* on people, buildings and *infrastructure*^*) caused by *vegetation clearance**, *land disturbance**, *forestry**, or *cultivation** are avoided as far as reasonably practicable, or otherwise remedied or mitigated, and
2. sediment loads entering *waterbodies** as a result of *accelerated erosion* are reduced to the extent required to be consistent with the *water** management objectives and policies for *water** quality set out in RPS-LF-LW of this Plan.

LF-LAND-O2: Te whakahaere pitomata e takea mai ai horo whenua tere

Ka whakamahia te whenua kia hua ai:

1. *te horo whenua tere, ā, ka piki haere te parahanga ā-matū i roto i ngā wai (me te hua ko ngā pānga kino ki te tangata, ngā whare, me ngā kaupapa o raro) nā te whakapara tupu, te raweke whenua, te mahi rākau, te mahi māra – i ngā wā e tika ana ka pareā, ka whakapaingia rānei, ka whakamemehatia rānei ēnei, ā,*
2. *ka whakaitingia te nui o te parakiwai e uru ana ki roto i ngā waie takea mai ana i te tere horo o te whenua kia taea ai te hāngai ki ngā whāinga, ki ngā kaupapa here mō te kōunga o te wai kua whakatakotoria ki RPS-LF-LW o tēnei Mahere.*

Policies

LF-LAND-P1: Encouraging and supporting sustainable *land management**

The Regional Council will encourage and support the adoption of sustainable *land** management practices by:

1. working with relevant owners and occupiers of farms within hill country *land** subject to an elevated risk of *accelerated erosion** to prepare voluntary management plans under the Council's Sustainable Land Use Initiative or Whanganui Catchment Strategy, which identify sustainable *land** management practices for each farm and work programmes for implementing any agreed changes,
2. monitoring the implementation of voluntary management plans and sustainable *land** management practices within hill country *land** subject to an elevated risk of *accelerated erosion** and reporting this information on a two-yearly basis, and reviewing the effectiveness of the sustainable *land** management practices, and
3. responding to requests from owners or occupiers of *land** that is not within hill country *land** subject to an elevated risk of *accelerated erosion** to prepare a management plan, provided this does not impede the achievement of (1).

LF-LAND-P2: Regulation of *land use activities**

1. In order to achieve LF-LAND-O2 the Regional Council must regulate *vegetation clearance**, *land disturbance**, *forestry** and *cultivation** through *rules*^ in this Plan and decisions on *resource consents*^, so as to minimise the risk of *accelerated erosion*, minimise *discharges** of sediment to *water**, and maintain the benefits of riparian vegetation for *waterbodies**.
2. *Territorial Authorities** may regulate, through *rules*^ in *district plans*^ and decisions on *resource consents*^, the actual or potential effects* of the use, development, or

protection of *land*^{*}, in order to achieve LF-LAND-O2. However, *Territorial Authorities*^{*} must not have *rules*[^] that are contradictory to the *rules*[^] in this Plan that control the use of *land*^{*}.

3. The Regional Council will generally allow small scale *vegetation clearance*^{*}, *land disturbance*^{*}, *forestry*^{*} and *cultivation*^{*} to be undertaken without the need for a *resource consent*[^] if *conditions*[^] are met. *Vegetation clearance*^{*} and *land disturbance*^{*} require a *resource consent*[^] if they are undertaken adjacent to some *waterbodies*^{*} (including certain *wetlands*^{*}) in *Hill Country Erosion Management Sites*^{*} or in *coastal foredune*^{*} areas. Any other large scale *land disturbance*^{*} will also require a *resource consent*[^].

LF-LAND-P3: Supporting codes of practice, standards, guidelines, environmental management plans and providing information on best management practices

The Regional Council must, and *Territorial Authorities*^{*} may:

1. support the development of codes of practice, standards, guidelines and other sector-based initiatives targeted at achieving sustainable *land*^{*} use,
2. recognise appropriately developed and administered codes of practice, standards, guidelines or environmental management plans targeted at achieving sustainable *land*^{*} use, and incorporate them within the regulatory framework where applicable, and
3. make information describing best management practices for reducing erosion and maintaining *water*^{*} quality and soil health available to all relevant landowners, occupiers, asset owners, consultants, developers and contractors.

Methods

Managing activities on *land*^{*} is a mix of regulatory and non-regulatory approaches. Part II of this Plan contains regional rules relating to the activities described in this chapter.

LF-LAND-M1 Sustainable Land Use Initiative – Hill Country Erosion	
Description	The aim of this method is to reduce hill country <i>accelerated erosion</i> [*] . While the emphasis will be on hill country, all <i>land</i> [*] at risk of erosion will be eligible for assistance under this programme. Staff from the Regional Council and other agencies will work with landowners and occupiers to develop voluntary management plans. These plans will provide the blueprint for long-term environmental, economic and social sustainability. Research, publicity, education, information, incentives, joint ventures and <i>land</i> [*] purchase will be used to encourage the landowner or occupier to manage their <i>land</i> [*] in a sustainable manner.
Who	Regional Council, central government, <i>Territorial Authorities</i> [*] , Crown Research Institutes, landowners or occupiers, recognised organisations representing farmers, and farm consultants.
Links to Policy	This method implements —RPS-LF-LAND-P1.
Targets	50% of properties within hill country <i>land</i> [*] subject to an elevated risk of <i>accelerated erosion</i> [*] will have a voluntary management plan in place by 2017.

LF-LAND-M2 Whanganui Catchment Strategy	
Description	The aim of this method is to reduce hill country <i>accelerated erosion</i> [*] within the Whanganui catchment. Whilst the emphasis will be on hill country <i>land</i> [*] subject to an elevated risk of <i>accelerated erosion</i> [*] , all <i>land</i> [*] at risk of erosion within the

LF-LAND-M2 Whanganui Catchment Strategy	
	<p>catchment will be eligible for assistance under this programme. Staff from the Regional Council and consultants will work with landowners and occupiers to develop management plans. These plans will provide the blueprint for long-term environmental, economic and social sustainability. Research, publicity, education, information and incentives will be used to encourage the landowner or occupier to manage their <i>land*</i> in a sustainable manner.</p> <p>The Whanganui Catchment method is a pilot for the much larger Sustainable Land Use Initiative – Hill Country Erosion method (LF-LAND-M1). Eventually, the Whanganui Catchment Strategy method will be integrated with this method.</p>
Who	Regional Council, Ruapehu and Whanganui District Councils, landowners or occupiers, relevant <i>hapū*</i> and <i>iwi*</i> , the Whanganui River Enhancement Trust, Department of Conservation, recognised organisations representing farmers and farm consultants.
Links to Policy	This method implements RPS-LF-LAND-P1.
Targets	50% of properties within hill country <i>land*</i> subject to an elevated risk of <i>accelerated erosion*</i> in the Whanganui Catchment will have a voluntary management plan in place by 2015.

LF-LAND-M3 Soil Health	
Description	<p>The aim of this method is to reduce the impact of horticulture, cropping and intensive farming activities on soil health, and the consequent off-site environmental impacts. Education on best management practices will be made available to landowners through a variety of means to encourage the adoption of sustainable <i>land*</i> use practices. Research and monitoring will be used to identify and fine-tune best practice. This method includes the provision of advice and information to owners of <i>land*</i> in the fragile sand country along the Region's west coast.</p>
Who	Regional Council, landowners or occupiers, Landwise, Horticulture New Zealand, Federated Farmers, agricultural contractors, <i>fertiliser*</i> companies and research institutes.
Links to Policy	This method implements RPS-LF-LAND-P3(3).
Targets	<ul style="list-style-type: none"> • All major croppers/horticulturists in the Region are operating under best management practice regimes by 2017. • All major agricultural contractors are operating under industry standards regimes by 2010. • All pasture-based farms are being managed in accordance with the relevant sector-based best management practice by the agreed target dates.

LF-LAND-M4 Sustainable <i>Land*</i> Use Codes of Practice and Best Management Practices	
Description	<p>This method will provide support for the development of codes of practice, best management practices and other sector-based initiatives for sustainable <i>land*</i> use, construction, production and operating methods on all types of <i>land*</i> within the Region – hill country, plains, sand country and along the coast.</p> <p>This method will also recognise, and where appropriate support, initiatives that raise awareness of sustainable <i>land*</i> use. Examples include the monitor farm programme, sustainable farming and management funds, and Ballance Farm Environment Awards.</p>
Who	Participation in this project is very much dependent upon approaches from industry and sector groups.

Links to Policy	This method implements RPS-LF-LAND-P3.
Targets	<ul style="list-style-type: none"> • All approaches for Regional Council assistance will be considered. • Where proposals are aligned with Regional Council objectives, assistance will be provided where possible.

LF-LAND-M5 Land* Research, Monitoring and Reporting Programme	
Description	The aim of this method is to develop an integrated research, monitoring and reporting programme that supports delivery and refinement of existing policies and methods, guides implementation planning, and allows implementation effectiveness to be assessed. This will include a five-yearly assessment of the effectiveness of the above methods, particularly the Sustainable Land Use Initiative – Hill Country Erosion Method.
Who	Regional Council, landowners and occupiers, research institutes, universities, and non-government agencies and community groups.
Links to Policy	This method implements RPS-LF-LAND-P1, RPS-LF-LAND-P2 and RPS-LF-LAND-P3.
Target	A research, monitoring and reporting programme that supports delivery and refinement of existing policies and methods, and guides and assesses implementation.

LF-LAND-M6 Infrastructure Protection	
Description	<p>The aim of this method is to reduce the erosion risk to, and caused by, the provision, <i>maintenance*</i> or <i>upgrade*</i> of infrastructure.</p> <p>Advice and information will be provided to infrastructure owners in the planning stages of new works, the carrying out of <i>maintenance*</i> or <i>upgrade*</i>, and protection of existing networks from erosion risks.</p>
Who	Regional Council, <i>Territorial Authorities*</i> and owners of major infrastructure.
Links to Policy	This method implements RPS-LF-LAND-P3.
Target	The Regional Council will have formed working partnerships with all major infrastructure owners for the purposes of assessing and identifying options to manage erosion risks.

LF-LAND-M7 Education in Schools – Land*	
Description	The aim of this method is to implement a range of initiatives to raise awareness amongst the youth of the Region of the significance of the <i>land*</i> and soil resource, the threats to it, and what they can do to protect/restore it. This will be achieved through various environmental education programmes/initiatives eg., Green RIG, Trees for Survival etc.
Who	Regional Council, national and local environmental education providers and youth organisations.
Links to Policy	This method implements RPS-LF-LAND-P-3.
Targets	The Regional Council will develop and implement a <i>land*</i> and soil related environmental education programme.

Principal reasons

LF-LAND-PR1

Objectives for *land** management are presented in this Plan to encourage sustainable *land** use and minimise erosion. These focus on responding to the fact that 65% of the Region consists of gullies and hillsides subject to *accelerated erosion**. A target has been introduced into Objective RPS-LF-LAND-O1 to ensure that the progress toward sustainable hill country *land** use can be measured. This is particularly important because the policy platform that underpins this objective is largely non-regulatory.

RPS-LF-LAND-P1 recognises that regulation is not the appropriate tool to encourage change toward sustainable *land** management practices. Instead it uses non-regulatory farm plans that contain a programme of works involving the landowner's active participation. RPS-LF-LAND-P1 and associated methods acknowledge that the achievement of sustainable farming practices on hill country *land** subject to an elevated risk of *accelerated erosion** is a complex task. There are three reasons for this.

1. Recognition that sustainable *land** use means changing from unsustainable farming practices. This may mean the introduction of new practices such as employing different stocking rates, introducing *forestry** or retirement of *land** and fencing *waterbodies**.
2. Commitment to implementing new *land** management practices will require capital outlay and most importantly require a willingness from the landowner to introduce change.
3. Sustainable *land** management practices need to be tailored to the specific *land** capability of an individual holding, which means a blanket approach introducing one solution for all hill country farming will probably fail.

RPS-LF-LAND-P2 recognises that *vegetation clearance** and *land disturbance** are two of the main contributors to *accelerated erosion**. It also recognises that *vegetation clearance**, *land disturbance** and *cultivation** within or close to *waterbodies** have a high risk of causing *discharges** of sediment to *water**. The policy describes the regulation of *land** use activities to provide guidance to regional and district plan preparation.

RPS-LF-LAND-P3 states the Regional Council's support for codes of practice, standards, guidelines and environmental management plans as these can assist with reducing *accelerated erosion**.

Anticipated environmental results

Anticipated Environmental Result	Link to Policy	Indicator	Data Source
LF-LAND-AER1 By 2017, there will be a net reduction in the adverse <i>effects</i> * on <i>water</i> * quality, people, buildings and infrastructure caused by <i>accelerated erosion</i> *, and hill country and <i>coastal foredune</i> * wind erosion in the Region.	RPS-LF-LAND-P1, RPS-LF-LAND-P2, RPS-LF-LAND-P3, RPS-LF-FW-P4, RPS-LF-FW-P5, RPS-LF-FW-P6, RPS-LF-FW-P7 and RPS-LF-FW-P11	<ul style="list-style-type: none"> • Water quality monitoring results, especially for "muddy waterways" in the Whanganui and Rangitīkei Rivers • Rate of deposition of sediment in coastal <i>river</i>* reaches, focusing on the Whanganui, Rangitīkei and Manawātū Rivers • Costs of storm damage • % of Region's <i>land</i>* being used in accordance with sustainable use guidelines 	<ul style="list-style-type: none"> • Regional Council's state of environment <i>water</i>* quality monitoring programme • Regional Council's and <i>Territorial Authorities</i>* incidents databases • Regional Council's <i>river</i>* <i>bed</i>* level survey results • Regional Council's and <i>Territorial Authorities</i>* storm damage reports • <i>Land</i> use mapping • Regional Council's Sustainable Land Use

Anticipated Environmental Result	Link to Policy	Indicator	Data Source
<p>Advice Note: There are linkages from this AER to the RPS-LF-FW AERs.</p>		<ul style="list-style-type: none"> • Level of achievement of deposited sediment, visual clarity and phosphorus <i>water quality targets*</i> specified in RP-SCHED5. • Changes to long-term mean sediment <i>discharges*</i> of <i>rivers*</i> to sea. • % of farms within the SLUI priority catchments that have voluntary management plans in place and are being implemented. 	Initiative monitoring and implementation reports

LF – FW – Freshwater

Scope and background

Scope

This chapter addresses the management of *fresh water** in the Region. It covers:

- **Water Management Areas* and Sub-areas* and Values** - the establishment of *Water Management areas** and *Sub-areas** and associated *water** management Values for each *Sub-area**, for the purpose of managing *water** quality, *water** quantity and activities in the *beds** of *rivers** and *lakes**.
- **Surface *water** quality** - the establishment of *water quality targets** for *rivers** and *lakes**, in order to give effect to the Values, together with a policy regime of maintaining *water** quality in those *Water Management Sub-areas** that meet their *water quality targets**, and improving *water** quality over time in those *Water Management Sub-areas** that do not.
- **Groundwater quality** - the *maintenance* of existing groundwater quality and its improvement where it is degraded.
- **Discharges* and land* use activities affecting *water** quality** - the management of *discharges** into surface *water**, *discharges** onto or into *land**, and diffuse run-off and other *land** use activities affecting surface *water** and groundwater quality.
- **Surface *water** quantity and allocation** - the establishment of minimum flows and allocation regimes for *rivers**, and the management of *water** takes and other activities affecting surface *water** quantity.
- **Groundwater quantity and allocation, and bores*** - the establishment of *Groundwater Management Areas**, identification of the respective allocable volumes and the active management of groundwater takes.
- **Beds* of rivers* and lakes*** - the management of activities that disturb the *beds** of *rivers** and *lakes**, the management of existing and new *structures** in the *beds** of *rivers** and *lakes**, and the establishment of sustainable gravel extraction limits for *rivers**.
- **Land* adjacent to the beds* of rivers* and lakes*** - the management of some activities in relation to flood control or drainage purposes.

The *effects** of hill country erosion on *water** quality are addressed in RPS-LF. The ecological impacts of takes, diversions, *discharges** and drainage on *rare habitats**, *threatened habitats** and *at-risk habitats** are addressed in Chapter RPS-ECO.

Overview

*Water** is critical for life to exist. People living in the Region enjoy a temperate climate, a large number of *rivers**, streams and *lakes** and an extensive groundwater system. The Region does not experience the severity of droughts that impact on some other parts of New Zealand and generally there is enough *water** to meet everyone's needs. People have grown up with an expectation of access to clean, safe *water**. But ready access means that *water** has not always been valued highly. The health of the surface *water** resource has steadily declined in most catchments as a result.

Despite this decline, there has been a revolution around *water** in the past few decades. In response to public concerns, significant improvements have been made to the quality of *discharges** from towns

and *sites** where *industrial activities** occur. For example, untreated *sewage** is no longer *discharged** directly into *waterbodies**, and *rivers** no longer receive blood *discharged** from freezing works. Many former *discharges** to *water**, particularly *discharges** of dairy shed effluent, are now *discharged** to *land**. New large *water** takes, such as those associated with hydroelectric development, are carefully managed to ensure that the downstream needs of people and ecosystems are catered for. Although there have been substantial improvements in the quality of point source *discharges** to *water**, improvement is still possible and is necessary.

There has been a substantial intensification within the agricultural sector in recent years. This has contributed to a vibrant and booming regional economy but has also increased pressure on the Region's *water** resources. There has been a significant increase in irrigation demand and the amount of nutrients leaching to surface *water** and groundwater. Although the impacts of agricultural intensification are less obvious than those caused by the major point source *discharges** and abstractions mentioned above, they have increased progressively over time.

As the Region has grown, we have significantly altered the physical nature of many of its *waterbodies** and their *beds** with *structures**, drainage and flood protection works, particularly in the Manawatū Plains. These changes have led to a poor and declining state of physical health in the Region's *waterbodies** and their *beds**.

The impact of *discharges** and run-off on *water** quality and the increasing demand for *water** abstraction are two of the four most critical issues addressed in this Plan.

Water* quantity

The demand on surface *water** and groundwater resources is one of the most critical issues addressed in this Plan.

*Water** from the two main *fresh water** sources within the Region - surface *water** (*rivers** and *lakes**) and groundwater - is abstracted for a variety of uses, including *drinking water** supply, stock *water** supply, irrigation, electricity generation and *industrial activity** use.

The single largest user of *water** in the Region is the energy sector. Hydroelectric power generation takes are concentrated around Mount Ruapehu and on the Mangahao River. The amount of *water** used for power generation has not changed significantly in the past decade, although there is potential for more hydroelectricity generation in the future.

In contrast, with the exception of consented *water** supply abstraction from surface *water**, other uses have steadily increased over the past few decades in response to stock numbers increasing and the establishment of plants for *industrial activities**. In recent years there has been a dramatic increase in *water** demand. From 1997 to 2009, consented groundwater takes almost doubled and consented surface *water** takes more than doubled (Table 6).

Table 6 Change in Consented *Water** Abstraction Volumes from 1997 to 2009 (excluding hydroelectric power generation)

1997 to 2009 Percentage Change in Consented <i>Water</i> * Takes				
Source	Sector	1997 (m ³ /d)	2009 (m ³ /d)	Increase (%)
Groundwater	All Sectors	287,000	537,179	+85%

1997 to 2009 Percentage Change in Consented <i>Water</i> * Takes				
Source	Sector	1997 (m ³ /d)	2009 (m ³ /d)	Increase (%)
Surface <i>water</i> *	Agriculture	70,668	385,579	+446%
	Industry	38,835	97,782	+152%

1997 to 2009 Percentage Change in Consented <i>Water*</i> Takes				
Source	Sector	1997 (m ³ /d)	2009 (m ³ /d)	Increase (%)
	<i>Water*</i> supply	162,024	133,259	-18%
	All Sectors	271,527	616,620	+127%

The greater the amount of *water** taken from a *waterbody**, the greater the potential impact on instream life, recreational activities (including fishing, swimming and boating), cultural/spiritual values and the ability of the *waterbody** and its *bed** to assimilate *waste**. As important as the volume of *water** abstracted is the timing of abstraction. *Rivers** in the Region experience natural low flows during summer, which coincides with the period of greatest demand. The taking of *water** during higher flows generally has little impact, but even small takes during summer low flow conditions can have adverse *effects**. Measures which avoid those *effects** during the more critical summer low flow conditions should be encouraged. Maintaining natural flow variability is important for the habitat requirements of fish species, natural character and *water** quality. The ever-increasing demand on the Region's surface *water** resource means that it must be used efficiently, so that the amount of *water** allocated for abstraction is available to as many users as possible.

Groundwater monitoring indicates that groundwater levels are stable and research indicates that there is sufficient *water** for all users at a regional scale. A recent increase in large groundwater takes along the west coast has raised the potential for saltwater intrusion. This occurs when enough *water** is removed from an aquifer to allow seawater to migrate inland. Groundwater contaminated with saltwater is no longer suitable for irrigation or as stock *water**. Saltwater- contaminated groundwater will clear with time, but the timescale is measured in centuries.

The high density of *bores** in some areas has caused localised problems. These include:

1. impacts on other groundwater users. Allowing too many new users to access the groundwater resource will impact on the amount that is available to existing users and can affect the ability of existing *bores** to draw *water**.
2. impacts on groundwater-fed streams, *lakes** and *wetlands**. Many of the streams, *lakes** and *wetlands** along the west coast of the Region (eg., Lakes Papaitonga and Horowhenua) are dependent upon groundwater. Groundwater is particularly important during summer, as it may be the only source of inflow.

*Bores** are the main means of accessing groundwater resources. They provide the principal way of studying the subsurface *environment* by enabling sampling of subsurface geology, allowing direct measurement of groundwater levels and quality and allowing testing of aquifer yields. This Plan adopts the NZS 4411:2001 Environmental Standard for Drilling of Soil and Rock in its entirety for the management of *bores** (design, drilling, completion, development, testing, *maintenance**, cleaning/disinfection, record keeping and decommissioning).

Water quality

There is significant variation in *water** quality across the Region. *Rivers** (including streams) emerging from the mountains or areas that have retained their original vegetation cover tend to have very good *water** quality. The one exception to this is the Whangaehu River, which flows from the crater *lake* on Mt Ruapehu. It is naturally acidic and contains high levels of sulphur and heavy metals.

As *rivers** flow towards the sea, they pick up sediment and nutrients from the surrounding *land**. As would be expected, *water** quality in the lower reaches of *rivers** and streams is poorer than in the headwaters.

In the past, the biggest threats to *water** quality were municipal (eg., *sewage**), *industrial activity** (eg., meat works and fellmongers) and agricultural (eg., dairy shed effluent) *discharges**. Although considerable improvements have been made to *discharges** to *water**, further improvement is still possible and necessary.

The intensification in agriculture during the past 10 to 15 years has been especially marked in the dairy sector. Raising stock numbers increases the quantity of dairy shed effluent requiring disposal, the quantity of stock urine produced (a concentrated source of nutrients), and the opportunities for stock to access *waterbodies** and their *beds**. The agricultural sector is recognising the impact it is having on the nation's *waterbodies** and has started to act. The dairy sector was the first to respond, with the Dairying and Clean Streams Accord (an agreement between Fonterra, the Ministry for the Environment, Regional Councils and others on an approach to enhance *water** quality). Such voluntary approaches are one way of lowering nutrient and faecal levels in the Region's *waterbodies** and the Regional Council supports them, although further improvements are needed. Further improvements will require a mix of regulatory and non-regulatory approaches that may alter over time.

Groundwater quality within the Region varies according to both depth and location. Generally, deeper groundwater is of higher quality. For example, shallow groundwater within the Horowhenua District near Levin has high concentrations of nitrates, which are believed to be the result of septic tank *discharges** and *fertiliser** use on market gardens. There have been no significant changes in groundwater quality over the length of the Regional Council's monitoring record (more than 15 years). There is no evidence that groundwater quality is deteriorating.

The overall state of *fresh water** quality in the Region is as follows:

1. The middle reaches of many *rivers** are unsafe to swim in because of bacterial contamination, or are unpleasant to swim in because of slime (periphyton) growth (Figure 3). Elevated nitrate and phosphate levels promote slime growth. The slime also impacts on fish and instream invertebrate communities.
2. The lower reaches of many *rivers** have high concentrations of bacteria, nitrates, phosphates and sediments, and these levels are increasing.
3. There is minimal contamination of surface *water** from heavy metals, hydrocarbons and other toxic substances.
4. The quality of groundwater in the Region is generally suitable for stock needs and irrigation, with a low sodium hazard and a low-medium salinity hazard.
5. Nitrate levels are high in shallow groundwater in parts of the Region, but the levels have not changed during the period of monitoring.
6. Groundwater is free of herbicides and pesticides.

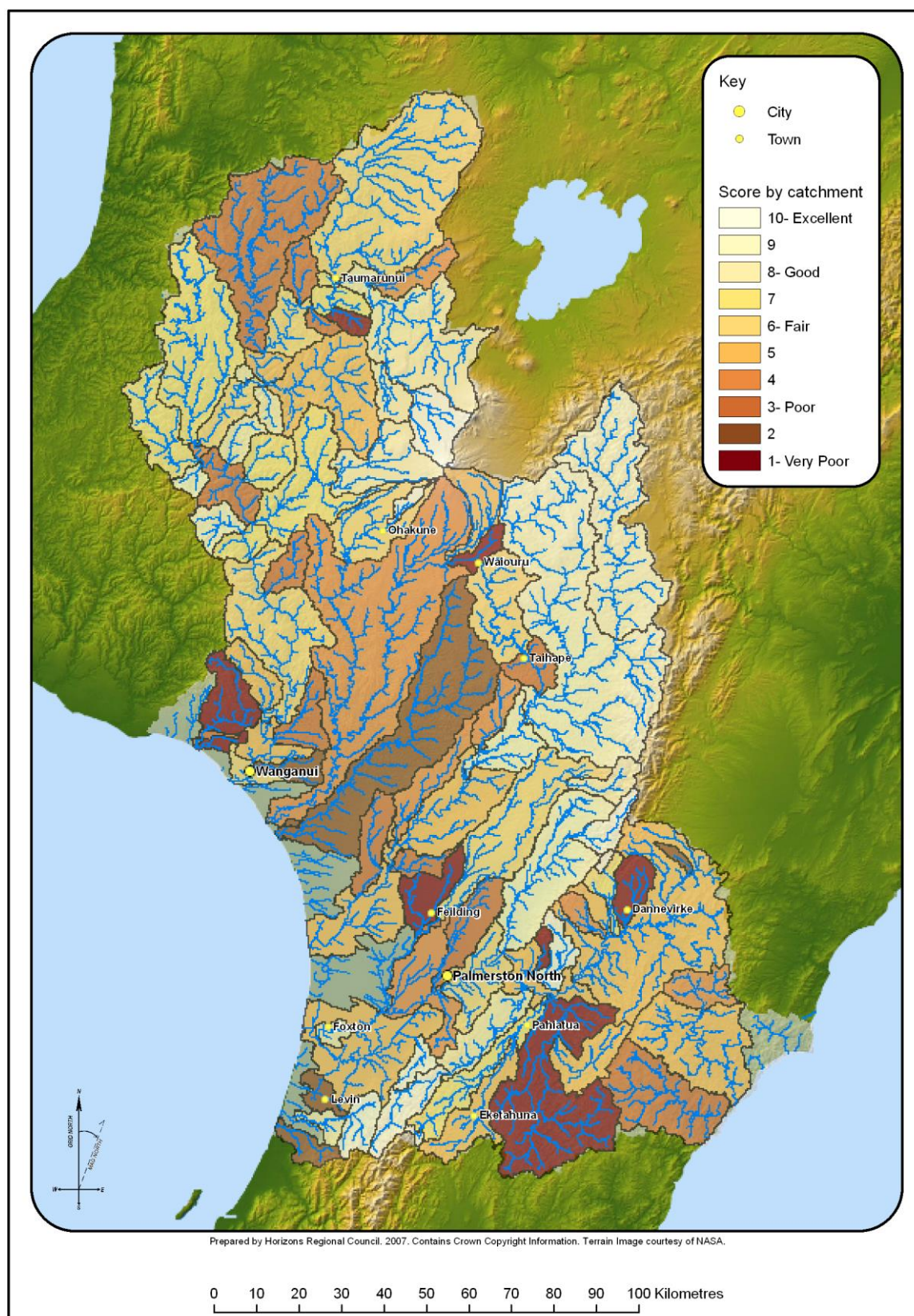


Figure - 3 Suitability of *water** quality for contact recreation within the Region

Beds* of rivers* and lakes*

People have always been attracted to *rivers** and *lakes** to live, work and play. Despite the economic, cultural, social and environmental importance of *rivers** and *lakes**, many of the *rivers** and *lakes** in the Region have been highly modified over the years. Works to control flooding and erosion, dams, and diversions for hydroelectricity generation can be large scale and have significant *effects** on the physical nature of the Region's *rivers** and *lakes**. Smaller-scale changes like *river** crossings and small dams can have negative cumulative impacts. Urban expansion often alters *rivers**. Utilisation of the Region's gravel resource provides an economic benefit and there may be flood protection benefits from having it removed from *rivers**. However, gravel extraction, when not managed well, can lead to increased flooding and erosion risk.

This modification has contributed to the economic growth and wellbeing of the Region, but it has also negatively altered the character and ecology of most *rivers** and *lakes** in the Region, impacting on cultural values attributed to them and leading to the loss or fragmentation of indigenous plant and animal populations.

Issues

LF-FW-I2: *Water quality**

The quality of many *rivers** and *lakes** in the Region has declined to the point that ecological values are compromised and contact recreation such as swimming is considered unsafe. The principal causes of this degradation are:

1. nutrient enrichment caused by run-off and leaching from agricultural *land**, *discharges** of treated *wastewater**, and septic tanks
2. high turbidity and sediment loads caused by *land** erosion, *river** channel erosion, run-off from agricultural *land** and *discharges** of stormwater
3. pathogens from agricultural run-off, urban run-off, *discharges** of *sewage**, direct stock access to *waterbodies** and their *beds** and *discharges** of *waste** from agricultural and *industrial activities**.

Shallow groundwater in areas of intensive *land** use in the Horowhenua and Tararua Districts has elevated nitrate levels in excess of the New Zealand drinking water standard. However, the quality of groundwater in the Region is generally suitable for stock needs and irrigation, and there has been no evidence of deteriorating groundwater quality during the past 15 years.

LF-FW-I3: *Water quantity and allocation**

The use of both surface *water** and groundwater has increased dramatically during the last decade. The demand for surface *water** in the Ōhau, Ōroua and parts of the upper Manawatū catchments already exceeds supply, and other catchments are experiencing marked increases. This increased demand has the potential to adversely affect both instream values and the natural character of *rivers**, *wetlands** and *lakes**, if not managed. The amount of groundwater is generally capable of meeting demand within the Region, although there is a need to actively manage *effects** between *bores** at a local level, the *effects** of groundwater takes on surface *water**, and to be vigilant about the risk of saltwater intrusion along the west coast.

LF-FW-I4: *Beds* of rivers* and lakes**

The demand for flood and erosion control to protect many types of *land** use has led to significant modification of the Region's *rivers** and *lakes** and their margins. *Structures** required to be located within the *beds** of *rivers** and *lakes**, including bridges, culverts, *water** intake and *discharge** pipes and hydroelectricity *structures**, also affect the natural character of *rivers** and *lakes** and their margins. These types of uses and developments, in conjunction with gravel extraction, have modified, and continue to modify the physical characteristics and ecology of many of the Region's *rivers** and *lakes**.

Objectives

LF-FW-O3: *Water*^{*} management Values

Surface *waterbodies*^{*} and their *beds*^{*} are managed in a manner which safe guards their life supporting capacity and recognises and provides for the Values in RP-SCHED2.

LF-FW-O3: He ūara whakahaere wai

Ka āta whakahaeretia ngā mata wai me ngā papa o ērā kia whakamaru ai i te āheinga toko ora o ērā, ā, ka mōhiotia, ka pukumaharatia hoki ngā Uara kei roto i Pukapuka Āpiti 2.

LF-FW-O4: *Water*^{*} quality

1. Surface *water*^{*} quality is managed to ensure that:
 - a. *Water*^{*} quality is maintained in those *rivers*^{*} and *lakes*^{*} where the existing *water*^{*} quality is at a level sufficient to support the Values in RP-SCHED2
 - b. *Water*^{*} quality is enhanced in those *rivers*^{*} and *lakes*^{*} where the existing *water*^{*} quality is not at a level sufficient to support the Values in RP-SCHED2
 - c. accelerated eutrophication and sedimentation of *lakes*^{*} in the Region is prevented or minimised
 - d. the special values of *rivers*^{*} protected by *water conservation orders*[^] are maintained.
2. Groundwater quality is managed to ensure that existing groundwater quality is maintained or where it is degraded/over allocated as a result of human activity, groundwater quality is enhanced.

LF-FW-O4: *Te kounga o te wai*

1. *Ka whakahaeretia te kounga o te mata wai kia hua ai:*
 - a. *ka tiakina te kounga o te wai kei roto i ngā awa me ngā roto he kaha tonu te kounga o te wai hei hāpai i ngā Uara kei roto i Pukapuka Āpiti 2*
 - b. *ka whakapaingia te kounga o te wai kei roto i ngā awa me ngā roto kāore i te kaha te kounga o te wai hei hāpai i ngā Uara kei roto i Pukapuka Āpiti 2*
 - c. *ka āraia, ka whakaitingia rānei te tere parahanga ā-matū whakamōmona, te parakiwai hoki o ngā roto o te Rohe, ā,*
 - d. *ka tiakina ngā uara motuhake o ngā awa e whakamarumarutia e ngā whakahau whakauka wai, arā, ko ngā water conservation orders.*
2. *Ka whakahaeretia te kounga o te waiopapa kia hua ai ka tiakina tonutia te kounga o te waiopapa kei reira kē; ka whakarākaitia rānei te kounga o te waiopapa, ka whakaparungia rānei, ka tuhenetia te tuaritanga rānei nā te mahi a te tangata.*

LF-FW-O5: *Water*^{*} quantity and allocation

Water^{*} quantity is managed to enable people, industry and agriculture to take and use *water*^{*} to meet their reasonable needs while ensuring that:

1. For surface *water*^{*}:
 - a. minimum flows and allocation regimes are set for the purpose of maintaining or enhancing (where degraded) the existing life-supporting capacity of *rivers*^{*} and their *beds*^{*} and providing for the other Values in RP-SCHED2 as appropriate

- b. takes and flow regimes for existing hydroelectricity are provided for before setting minimum flow and allocation regimes for other uses
- c. in times of *water** shortage, takes are restricted to those that are essential to the health or safety of people and communities, or drinking *water** for animals, and other takes are ceased
- d. the amount of *water** taken from *lakes** does not compromise their existing life-supporting capacity
- e. the requirements of *water conservation orders*[^] are upheld
- f. the instream geomorphological components of natural character are provided for.

For the avoidance of doubt this list is not hierarchical.

2. For groundwater:

- a. takes do not cause a significant adverse *effect** on the long-term groundwater yield
- b. groundwater takes that are hydrologically connected to *rivers**, are managed within the minimum flow and allocation regimes established for *rivers**
- c. groundwater takes that are hydrologically connected to *lakes** or *wetlands** are managed to protect the life-supporting capacity of the *lakes** or *wetlands**
- d. the significant adverse *effects** of a groundwater take on other groundwater and surface *water** takes are avoided
- e. saltwater intrusion into coastal aquifers, induced by groundwater takes, is avoided.

3. In all cases, *water** is used efficiently.

LF-FW-O5: *Te nui o te wai me tōna tūaritanga*

Ka whakahaeretia te wai kia āhei ai te tangata, ngā ahumahi, me te hunga ahuhenua te tango me te whakamahi i te wai hei whakatutuki i ō rātou hiahia, kia hua ai hoki:

1. *Mō te mata wai:*

- a. *ka whakatauria ngā rerenga iti me ngā tikanga whakahaere tuaritanga hei tiaki rānei, hei whakarākai ake rānei i te oranga tonutanga o ngā awa me ngā papa o ērā (mehemea kua paru) hei taunaki hoki i ngā Uara e tika ana kei roto i Pukapuka Āpiti 2*
- b. *ko ngā tikanga tango, tikanga rere hoki mō te hikowai kua pukumaharatia i mua i te whakatau i ngā rerenga iti me ngā tikanga whakahaere tuaritanga mō whakamahinga kē atu anō*
- c. *i ngā wā kōpaka wai, ka whakatikina te tango wai hāunga rā hei tiaki i te hauora, te haumaruru rānei o te tangata, ngā haporī, hei wai inu mō ētahi kararehe rānei, ā, ka katia rawatia te tango mō take kē atu*
- d. *e kore e waimeha te oranga tonutanga mā te tango wai i ngā roto*
- e. *ka hāpaitia ngā whakaritenga o ngā tauākī whakauka wai me ngā pānui ā-takiwā mō te whakauka wai, arā, ko ngā Water Conservation Orders*
- f. *ko ngā wāhanga tinipapa roto-wai o te āhua māori ka pukumaharatia. Hei papare i te rangirua, ehara tēnei i te rāangi aroākapa.*

2. *Mō te waiopapa:*

- a. *e kore te tango wai e pā kaha atu ki te huanga roa o te waiopapa*
- b. *ka whakahaeretia te tango waiopapa e pā ana ki ngā awa i runga i ngā tikanga whakahaere rerenga wai iti, tūaritanga hoki kua whakaritea*
- c. *ka whakahaeretia te tango waiopapa e pā ana ki ngā roto, ngā papa waiwai rānei hei whakamarumaru i te oranga tonutanga o ngā roto, ngā papa waiwai rānei*

- d. *ka parea ngā pānga kino o te tango waiopapa ki te mahi tango i waiopapa kē, tango mata wai rānei*
 - e. *ka parea te urunga o te waitai, nā te tango waiopapa, ki roto i ngā kahupapa takutai moana, ā.*
3. *I ngā wā katoa ka whakamahia te wai i runga i te tikanga whakamau.*

LF-FW-O6: Beds* of rivers* and lakes*

The *beds** of *rivers** and *lakes** will be managed in a manner which:

1. sustains their life supporting capacity
2. provides for the instream morphological components of natural character
3. recognises and provides for the RP-SCHED2 Values
4. provides for *infrastructure*[^] and flood mitigation purposes.

The *land** adjacent to the *bed** of reaches with a RP-SCHED2 Value of Flood Control and Drainage will be managed in a manner which provides for flood mitigation purposes.

LF-FW-O6: Ngā papa awa me ngā papa roto

Ka whakahaeretia ngā papa awa me ngā papa roto ka:

1. *whakauka tonu i te oranga tonutanga o ērā*
2. *pukumahara mō ngā wāhanga tinipapa roto-wai ka whai āhuatanga māori*
3. *āhukahuka, ka pukumahara hoki mō ngā Ūaratanga o Pukapuka Āpiti 2*
4. *pukumahara mō te kaupapa kei raro me ngā koronga whakamāmā waipuke.*

Ko te whenua ka āpiti atu ki te papa o ngā toronga me te Ūaratanga Whakahaere Waipuke, Rerenga hoki o te Pukapuka Āpiti 2 ka whakahaeretia kia pukumahara ai mō ngā koronga whakamāmā waipuke.

Policies

Water* Management Framework

LF-FW-P4: Water Management Areas* and Values

For the purposes of managing *water** quality, *water** quantity, and activities in the *beds** of *rivers** and *lakes**, the catchments in the Region have been divided into *Water Management Areas** and *Water Management Sub-Areas** in RP-SCHED1. Groundwater has been divided into *Groundwater Management Areas** in RP-SCHED4.

The *rivers** and *lakes** and their *beds** must be managed in a manner which safeguards their life supporting capacity and recognises and provides for the RP-SCHED2 Values when decisions are made on avoiding, remedying or mitigating the adverse *effects** of activities or in relation to any other function under the Resource Management Act 1991 exercised by the Regional Council or *Territorial Authorities**. The individual Values and their associated management objectives are set out in the RP-SCHED2 Surface *Water** Management Values Key and repeated in Table 7.

Table 7 Surface *Water** Management Values and Management Objectives

Value Group	Individual Values		Management Objective
Ecosystem Values	NS	Natural State	The <i>river*</i> and its <i>bed*</i> are maintained in their natural state
	LSC	Life-supporting Capacity	The <i>waterbody*</i> and its <i>bed*</i> support healthy aquatic life / ecosystems
	SOS-A	Sites of Significance – Aquatic	Sites of significance for indigenous aquatic biodiversity are maintained or enhanced
	SOS-R	Sites of Significance – Riparian	Sites of significance for indigenous riparian biodiversity are maintained or enhanced
	IS	Inanga Spawning	The <i>waterbody*</i> and its <i>bed*</i> sustain healthy inanga spawning and egg development
	WM	<i>Whitebait*</i> Migration	The <i>waterbody*</i> and its <i>bed*</i> are maintained or enhanced to provide safe passage of inwardly migrating juvenile native fish known collectively as <i>whitebait*</i>
Recreational and Cultural Values	CR	Contact Recreation	The <i>waterbody*</i> and its <i>bed*</i> are suitable for contact recreation
	AM	Amenity	The <i>amenity values</i> of the <i>waterbody*</i> and its <i>bed*</i> (and its margins where in public ownership) are maintained or enhanced
	MAU	<i>Mauri*</i>	The <i>mauri*</i> of the <i>waterbody*</i> and its <i>bed*</i> is maintained or enhanced
	SOS-C	Sites of Significance - Cultural	Sites of significance for cultural values are maintained
	TF	Trout Fishery	The <i>waterbody*</i> and its <i>bed*</i> sustain healthy rainbow or brown trout fisheries
	TS	Trout Spawning	The <i>waterbody*</i> and its <i>bed*</i> meet the requirements of rainbow and brown trout spawning and larval and fry development
	AE	Aesthetics	The aesthetic values of the <i>waterbody*</i> and its <i>bed*</i> are maintained or enhanced
<i>Water*</i> Use	WS	<i>Water*</i> Supply	The <i>water*</i> is suitable, after treatment, as a drinking <i>water*</i> source for human consumption
	IA	Abstraction for <i>Industrial activities*</i>	The <i>water*</i> is suitable as a <i>water*</i> source including for hydroelectricity generation*
	I	Irrigation	The <i>water*</i> is suitable as a <i>water*</i> source for irrigation
	SW	Stockwater	The <i>water*</i> is suitable as a supply of drinking <i>water*</i> for livestock
	DFS	<i>Domestic Food Supply*</i>	The <i>water*</i> is suitable for domestic food production

Value Group	Individual Values		Management Objective
Social/ Economic Values	CAP	Capacity to Assimilate Pollution	The capacity of a <i>waterbody</i> * and its <i>bed</i> * to assimilate pollution is not exceeded
	FC/D	Flood Control and Drainage	The integrity of existing flood and <i>river</i> * bank erosion protection <i>structures</i> * and existing drainage <i>structures</i> * is not compromised and the risks associated with flooding and erosion are managed sustainably
	EI	Existing <i>Infrastructure</i> [^]	The integrity of existing <i>infrastructure</i> [^] is not compromised

* *Water Management Areas** and *Water Management Sub-Areas** throughout the Region (and particularly those with good head and flow available) may have potential for hydroelectricity generation. Further *site**-specific assessment will be needed to establish the locations where such potential may be realised while having regard to the RP-SCHED2 Values of the relevant *waterbodies** and their *beds**.

Water* quality

Surface Water* Quality

LF-FW-P5: Water quality targets*

In RP-SCHED5, *water quality targets** relating to the RP-SCHED2 Values (repeated in Table 7) are identified for each *Water Management Sub-area**. Other than where they are incorporated into *permitted activity*[^] rules as *conditions*[^] to be met, the *water quality targets** in RP-SCHED5 must be used to inform the management of surface *water** quality in the manner set out in LF-FW-P6, LF-FW-P7 and LF-FW-P8.

LF-FW-P6: Ongoing compliance where *water quality targets** are met

1. Where the existing *water** quality meets the relevant RP-SCHED5 *water quality targets** within a *Water Management Sub-area**, *water** quality must be managed in a manner which ensures that the *water quality targets** continue to be met beyond the zone of *reasonable mixing* (where mixing is applicable).
2. For the avoidance of doubt:
 - a. in circumstances where the existing *water** quality of a *Water Management Sub-area** meets all of the *water quality targets** for the *Sub-area** (1) applies to every *water quality target** for the *Sub-area**
 - b. in circumstances where the existing *water** quality of a *Water Management Sub-area** meets some of the *water quality targets** for the *Sub-area** (1) applies only to those *water quality targets** that are met
 - c. for the purpose of (1) *reasonable mixing* is only applicable to a *discharge** from an identifiable location.

LF-FW-P7: Enhancement where *water quality targets** are not met

1. Where the existing *water** quality does not meet the relevant RP-SCHED5 *water quality targets** within a *Water Management Sub-area**, *water** quality within that *Sub-area** must be managed in a manner that enhances existing *water** quality in order to meet:

- a. the *water quality target** for the *Water Management Area** in RP-SCHED5, and/or
 - b. the relevant RP-SCHED2 Values and management objectives that the *water quality target** is designed to safeguard.
2. For the avoidance of doubt:
 - a. in circumstances where the existing *water** quality of a *Water Management Sub-area** does not meet all of the *water quality targets** for the *Sub-area**, (1) applies to every *water quality target** for the *Sub-area**
 - b. in circumstances where the existing *water** quality of a *Water Management Sub-area** does not meet some of the *water quality targets** for the *Sub-area**, (1) applies only to those *water quality targets** not met.

LF-FW-P8: Management of *water quality in areas where existing *water** quality is unknown**

1. Where there is insufficient data to enable a comparison of the existing *water** quality with the relevant RP-SCHED5 *water quality targets**, *water** quality within the *Water Management Sub-area** must be managed in a manner which, beyond the zone of *reasonable mixing** (where *reasonable mixing** is applicable):
 - a. maintains or enhances the existing *water** quality
 - b. has regard to the likely *effect** of the activity on the relevant RP-SCHED2 Values that the *water quality target** is designed to safeguard
 - c. has regard to relevant information about the existing *water** quality in upstream or downstream *Water Management Sub-areas**, where such information exists.
2. For the avoidance of doubt:
 - a. in circumstances where there is insufficient data to enable a comparison of the existing *water** quality with all of the *water quality targets** for a *Water Management Sub-area** (1) applies to every *water quality target** for the *Sub-area**
 - b. in circumstances where there is insufficient data to enable a comparison of the existing *water** quality with some of the *water quality targets** for a *Water Management Sub-area** (1) applies only to those *water quality targets** with insufficient data
 - c. for the purpose of (1) *reasonable mixing** is only applicable to a *discharge** from an identifiable location.

Groundwater quality

LF-FW-P9: *Maintenance of groundwater quality*

1. *Discharges** and *land** use activities must be managed in a manner which maintains the existing groundwater quality, or where groundwater quality is degraded/over allocated as a result of human activity, it is enhanced.
2. An exception may be made under (1) where a *discharge** onto or into *land** better meets the purpose of the RMA than a *discharge** to *water**, provided that the best practicable *option** is adopted for the treatment and *discharge** system.
3. Groundwater takes in the vicinity of the coast must be managed in a manner which avoids saltwater intrusion.

***Discharges** and *land** use activities affecting *water** quality**

LF-FW-P10: *Land use activities affecting groundwater and surface *water** quality**

The management of *land** use activities affecting groundwater and surface *water** must give *effect** to the strategy for surface *water** quality set out in LF-FW-P5, LF-FW-P6, LF-FW-P7 and LF-FW-P8, and the strategy for groundwater quality in LF-FW-P9, by managing diffuse *discharges** of *contaminants** in the following manner:

1. identifying in the regional plan targeted *Water Management Sub-areas**. Targeted *Water Management Sub-areas** are those sub-areas where, collectively, *land** use activities are significant contributors to elevated *contaminant** levels in groundwater or surface *water**
2. identifying in the regional plan intensive farming *land** use activities. Intensive farming *land** use activities are rural *land** use activities that (either individually or collectively) make a significant contribution to elevated *contaminant** levels in the targeted *Water Management Sub-areas** identified in (1) above
3. actively managing the intensive farming *land** use activities identified in (2) including through regulation in the regional plan, in the manner specified in LF-FW-P11
4. the Regional Council must continue to monitor ground and surface *water** quality in *Water Management Sub-areas** not identified in (1) and rural *land** uses not identified in (2). Where monitoring shows the thresholds in (1) and (2) are met then the regional plan must be amended so that those further *Water Management Sub-areas** and rural *land** uses are included in the management regime set out in (3).

LF-FW-P11: Regulation of intensive farming *land use activities affecting groundwater and surface *water** quality**

1. Nutrients

- a. Nitrogen leaching maximums must be established in the regional plan which:
 - i. take into account all the non-point sources of nitrogen in the catchment
 - ii. will achieve the strategies for surface *water** quality set out in LF-FW-P5, LF-FW-P6, LF-FW-P7 and LF-FW-P8, and the strategy for groundwater quality in LF-FW-P9
 - iii. recognise the productive capability of *land** in the *Water Management Sub-area**
 - iv. are achievable on most farms using good management practices
 - v. provide for appropriate timeframes for achievement where large changes to management practices or high levels of investment are required to achieve the nitrogen leaching maximums.
- b. Existing intensive farming *land** use activities must be regulated in targeted *Water Management Sub-areas** to achieve the nitrogen leaching maximums specified in (a).
- c. New intensive farming *land** use activities must be regulated throughout the Region to achieve the nitrogen leaching maximums specified in (a).

2. Faecal contamination

- a. Those persons carrying out existing intensive farming *land** use activities in the targeted *Water Management Sub-areas** listed in Table 11 or new conversions

to intensive farming *land** use activities anywhere in the Region must be required, amongst other things, to:

- i. prevent cattle access to some surface *waterbodies** and their *beds**
- ii. mitigate faecal contamination of surface *water** from other entry points (eg., race run-off)
- iii. establish programmes for implementing any required changes.

3. Sediment

- a. In those *Water Management Sub-areas** where agricultural *land** use activities are the predominant cause of elevated sediment levels in surface *water**, the Regional Council will promote the preparation of voluntary management plans under the Council's Sustainable Land Use Initiative or Whanganui Catchment Strategy for the purpose of reducing the risk of *accelerated erosion**, as described in RPS-LF-LAND.

LF-FW-P12: Point source *discharges** to *water**

The management of point source *discharges** into surface *water** must have regard to the strategies for surface *water** quality management set out in RPS-LF-FW-P6, LF-FW-P7 and LF-FW-P8, while having regard to:

1. the degree to which the activity will adversely affect the RP-SCHED2 Values for the relevant *Water Management Sub-area**
2. whether the *discharge**, in combination with other *discharges**, including non-point source *discharges** will cause the RP-SCHED5 *water quality targets** to be breached
3. the extent to which the activity is consistent with *contaminant** treatment and *discharge** best management practices
4. the need to allow reasonable time to achieve any required improvements to the quality of the *discharge**
5. whether the *discharge** is of a temporary nature or is associated with necessary *maintenance** or *upgrade** work and the *discharge** cannot practicably be avoided
6. whether adverse *effects** resulting from the *discharge** can be offset by way of a financial contribution set in accordance with RP-FC
7. whether it is appropriate to adopt the *best practicable option**.

LF-FW-P13: Point source *discharges** to *land**

*Discharges** of *contaminants** onto or into *land** must be managed in a manner which:

1. does not result in pathogens or other toxic substances accumulating in soil or pasture to levels that would render the soil unsafe for agricultural, domestic or recreational use
2. has regard to the strategies for surface *water** quality management set out in LF-FW-P6, LF-FW-P7 and LF-FW-P8, and the strategy for groundwater management set out in LF-FW-P9
3. maximises the reuse of nutrients and *water** contained in the *discharge** to the extent reasonably practicable
4. results in any *discharge** of liquid to *land** generally not exceeding the available *water** storage capacity of the soil (deferred irrigation)
5. ensures that adverse *effects** on *rare habitats**, *threatened habitats** and *at-risk habitats** are avoided, remedied or mitigated.

LF-FW-P14: Sewage* discharges*

Notwithstanding other policies in this chapter:

1. before entering a surface *waterbody** all new *discharges** of treated *sewage** must:
 - a. be applied onto or into *land**, or
 - b. flow overland, or
 - c. pass through an alternative system that mitigates the adverse *effects** on the *mauri** of the receiving *waterbody**, and
2. all existing direct *discharges** of treated *sewage** into a surface *waterbody** must change to a treatment system described under (1) by the year 2020 or on renewal of an existing consent, whichever is the earlier date.

Water* quantity and allocation

Policies applying to both surface *water** and groundwater

LF-FW-P15: Reasonable and justifiable need for *water**

Subject to LF-FW-P21, the amount of *water** taken by resource users must be reasonable and justifiable for the intended use. In addition, the following specific measures for ensuring reasonable and justifiable use of *water** must be taken into account when considering consent applications to take *water** for irrigation, *public water supply**, animal drinking *water**, dairy shed washdown or *industrial activity** use, and during reviews of consent *conditions*[^] for these activities.

1. For irrigation, *resource consent*^t applications must be required to meet a reasonable use test in relation to the maximum daily rate of abstraction, the irrigation return period and the seasonal or annual volume of the proposed take. When making decisions on the reasonableness of the rate and volume of take sought, the Regional Council must:
 - a. consider *land** use, crop *water** use requirements, on-site physical factors such as soil *water**-holding capacity, and climatic factors such as rainfall variability and potential evapo-transpiration
 - b. assess applications either on the basis of an irrigation application efficiency of 80% (even if the actual system being used has a lower application efficiency), or on the basis of a higher efficiency where an application is for an irrigation system with a higher efficiency
 - c. link actual irrigation use to soil moisture measurements or daily soil moisture budgets in consent *conditions*[^].
2. For domestic use, animal drinking *water** and dairy shed washdown *water**, reasonable needs must be calculated as:
 - a. up to 300 litres per person per day for domestic needs
 - b. up to 70 litres per animal per day for drinking *water**
 - c. up to 70 litres per animal per day for dairy shed washdown.
3. For *industrial activity** uses, *water** allocation must be calculated where possible in accordance with best management practices for *water** efficiency for that particular industry.
4. For *public water supplies**, the following must generally be considered to be reasonable:
 - a. an allocation of 300 litres per person per day for domestic needs, plus
 - b. an allocation for commercial use equal to 20% of the total allocation for domestic needs, plus

- c. an allocation for *industrial activity** use calculated, where possible, in accordance with best management practices for *water** efficiency for that particular industry, plus
 - d. an allocation necessary for hospitals, other facilities providing medical treatment, marae, schools or other *educational facilities**, New Zealand Defence Force facilities or correction facilities, plus
 - e. an allocation necessary for public amenity and recreational facilities such as gardens, parks, sports fields and swimming pools, plus
 - f. an allocation necessary to cater for the reasonable needs of animals or agricultural uses that are supplied by the *public water supply** system, plus
 - g. an allocation necessary to cater for growth, where urban growth of the municipality is provided for in an operative *district plan*[^] for the area and is reasonably forecast, plus
 - h. an allocation for leakage equal to 15% of the total of (a) to (g) above.
5. When making decisions on consent applications where the existing allocation for a *public water supply** exceeds the allocation determined in accordance with (4)(a) to (4)(h) above:
 - a. consideration must be given to imposing a timeframe within which it is reasonably practicable for the existing allocation to be reduced to the determined amount, or
 - b. if (1) is not imposed, an alternative allocation must be determined based on the particular social and economic circumstances of the community serviced by the *public water supply** and the actual and potential *effects** of the abstraction on the relevant RP-SCHED2 Values for the reach of *river** or its *bed** affected by the take.

LF-FW-P16: Efficient use of *water**

*Water** must be used efficiently, including by the following measures:

1. requiring *water** audits and *water** budgets to check for leakages and *water**-use efficiency as appropriate
2. requiring the use of, or progressive *upgrade** to, *infrastructure*[^] for *water** distribution that minimises the loss of *water** and restricts the use of *water** to the amounts determined in accordance with LF-FW-P15
3. enabling the transfer of *water permits*[^]
4. promoting *water** storage
5. raising awareness about *water** efficiency issues and techniques
6. requiring monitoring of *water** takes, including by installing *water** metering and telemetry.

Policies for surface *water**

LF-FW-P17: Overall approach for surface *water** allocation

1. The requirements of *water conservation orders*[^] must be given effect under this Plan.
2. Takes and flow regimes lawfully established for hydroelectricity generation as at 31 May 2007 must be provided for prior to implementing (3) and (4) below.
3. Core allocations of surface *water** from *rivers** must be determined in accordance with LF-FW-P18 and LF-FW-P19. Takes that comply with the relevant core allocation, when assessed in combination with all other takes, must be allowed.

4. Supplementary allocations of surface *water** from *rivers** must be determined in accordance with LF-FW-P20.
5. Takes from *rivers** must be apportioned, restricted or suspended when *river** flows are at or below their minimum flows in accordance with the provisions of LF-FW-P21.
6. Takes of *water** from *lakes** must comply with LF-FW-P22.

LF-FW-P18: Core allocations and minimum flows

1. The taking of *water** from *rivers** must be managed in accordance with the minimum flows and cumulative core allocations set out in RP-SCHED3.
2. The minimum flows and cumulative core allocations set out in RP-SCHED3 must be set after providing for any takes and flow regimes lawfully established for hydroelectricity generation as at 31 May 2007.

LF-FW-P19: Approach to setting minimum flows and core allocations

1. Where good hydrological information, such as a specific *water** resource study or a long-term flow record, is available it must be used to set minimum flows and core allocations in RP-SCHED3.
2. Where information described in (1) above is not available, the minimum flows and core allocations set out in RP-SCHED3 must generally be a minimum flow equal to the estimated or calculated one-day mean annual low flow, and a core allocation equal to a percentage of the minimum as specified in RP-SCHED3.
3. The setting of a revised minimum flow or core allocation that is an alternative to that set in RP-SCHED3 must occur through a plan change process.

LF-FW-P20: Supplementary *water allocation**

In addition to the core allocations set out in LF-FW-P18, a supplementary allocation from *rivers** may be provided:

1. in circumstances where *water** is only taken when the *river** flow is greater than the median flow, and the total amount of *water** taken by way of a supplementary allocation does not exceed 10% of the actual flow in the *river** at the time of abstraction, and
2. in circumstances where it can be shown that the supplementary allocation will not:
 - a. increase the frequency or duration of minimum flows
 - b. lead to a significant departure from the natural flow regime, including the magnitude of the median flow and the frequency of flushing flows
 - c. cause any adverse *effects** that are more than minor on the RP-SCHED2 Values of the *waterbody** or its *bed**
 - d. limit the ability of anyone to take *water** under a core allocation
 - e. derogate from *water** allocated to hydroelectricity generation.

LF-FW-P21: Apportioning, restricting and suspending takes in times of minimum flow

When a *river** is at or below its minimum flow, takes from it must be managed in the following manner:

1. **Permitted takes** - Takes that are permitted by this Plan (surface *water** and groundwater takes) or are for fire-fighting purposes must be allowed to continue regardless of *river** flow.
2. **Existing hydroelectricity generation takes** - must be allowed to continue subject only to any minimum flow restrictions specified in their consent *conditions*[^].
3. **Supplementary takes** - must cease at a flow specified in their consent *conditions*[^] and that cessation flow must be higher than the RP-SCHED3 minimum flow such that the requirements of LF-FW-P20(2)(a) are met.
4. **Essential takes** - The following core *water** allocation takes are deemed essential and must be managed in the manner described:
 - a. takes greater than permitted by this Plan (and therefore subject to *resource consent*[^]) that are required for reasonable domestic needs, reasonable needs of animals for drinking *water**, and reasonable dairy shed washdown *water** must be allowed to continue regardless of *river** flow, but must not exceed:
 - i. up to 250 litres per person per day for domestic needs
 - ii. up to 70 litres per animal per day for drinking *water**
 - iii. up to 70 litres per animal per day for dairy shed washdown
 - b. takes required to meet the reasonable needs of hospitals, other facilities providing medical treatment, marae, schools or other *educational facilities** New Zealand Defence Force facilities or correction facilities must be allowed to continue regardless of *river** flow, but must be required to minimise the amount of *water** taken to the extent reasonably practicable
 - c. takes which were lawfully established at the time of Plan notification (31 May 2007) required for industries which, if their take were to cease, would significantly compromise a community's ability to provide for its social, economic or cultural wellbeing or for its health or safety (including the hygienic production and processing of perishable food), must be allowed to continue regardless of *river** flow, but must be required to minimise the amount of *water** taken to the extent reasonably practicable
 - d. *public water supply** takes must be restricted to a total public *water** consumption calculated as follows:
 - i. an allocation of 250 litres per person per day for domestic needs, plus
 - ii. an allocation for commercial use equal to 20% of the total allocation for domestic needs, plus
 - iii. an allocation which meets the reasonable needs of those facilities and industries listed under (4)(b) and (4)(c) where such facilities and industries are connected to the *public water supply** system, plus
 - iv. any allocation necessary to cater for the reasonable needs of animals that are supplied by the *public water supply** system, plus
 - v. an allocation for leakage equal to 15% of the total of (i) to (iv) above.
5. **Non-essential takes** - Other core *water** allocation takes, including irrigation takes but excluding the essential takes described under (4), must be managed in the following manner:
 - a. *Water** takes must be required to cease when the *river** is at or below its minimum flow, as set out in LF-FW-P18.
 - b. *Water** takes must be allowed to recommence once the *river** flow has risen above its minimum flow.
6. **Meaning of “core *water** allocation take”** - For the purposes of this policy, a core *water** allocation take means a take that has been granted consent in accordance with a core allocation made under LF-FW-P18, or in accordance with a previous core allocation regime.

LF-FW-P22: Surface *water allocation – *lakes****

Decisions on *resource consent*[^] applications to take *water** from a *lake** must ensure that there are no significant adverse *effects** on the RP-SCHED2 Values of the *lake** and have regard to the policies for indigenous *biological diversity*[^] in RP-ECO.

Policies for *bores and groundwater**

LF-FW-P23: Overall approach for *bore management and groundwater allocation**

1. New *bores** must be constructed and managed in accordance with RP-LF-TUD-P16.
2. *Groundwater Management Areas** are mapped in RP-SCHED4.
3. Total groundwater allocations must comply with the annual allocable volumes for *Groundwater Management Areas** set out in RPS-LF-FW-P24.
4. The measured or modelled *effects** of a proposed groundwater take on other groundwater users, surface *waterbodies** and saltwater intrusion must be managed in accordance with RP-LF-TUD-P13, RP-LF-TUD-P17, RP-LF-TUD-P18, and RP-LF-TUD-P19.

LF-FW-P24: *Groundwater Management Areas**

The total amount of consented groundwater allocated from each *Groundwater Management Area** mapped in RP-SCHED4 must not exceed the annual allocable volume for the *GWMA** specified in RP-SCHED4.

Beds** of *rivers** and *lakes*

LF-FW-P25: General management of the *beds of *rivers** and *lakes****

Activities in, on, under or over the *beds** of *rivers** and *lakes** must generally be managed in a manner which:

1. recognises and provides for the RP-SCHED2 Values for the *Water Management Sub-area(s)** in which the activity takes place, in the manner described in RPS-LF-FW-P26, RPS-LF-FW-P27 and RPS-LF-FW-P28
2. avoids any significant reduction in the ability of a *river** and its *bed** to convey flood flows, or significant impedance to the passage of floating debris
3. avoids, remedies or mitigates any significant adverse *effects** on the stability and function of the *beds** of *rivers** and *lakes**, and existing *structures** including flood and erosion control *structures**
4. avoids, remedies or mitigates any significant reduction in the habitat diversity, including the morphological diversity, of the *river** or *lake** or its *bed**
5. manages *effects** on natural character and public access in accordance with the relevant policies in RPS-ECO. Natural character can include the natural style and dynamic processes of the *river**, such as *bed** style and width and the quality and quantity of *bed** habitat
6. provides for the safe passage of fish both upstream and downstream
7. ensures that the existing nature and extent of navigation of the *river** or *lake** are not obstructed

8. ensures that access required for the *operation**, *maintenance**, and *upgrade** of *infrastructure*[^] and other physical resources of regional or national importance is not obstructed
9. provides for continued public access in accordance with RPS-NATC-P3.

LF-FW-P26: Activities in *sites with a Value of Natural State, Sites of Significance - Cultural, or Sites of Significance - Aquatic**

In *sites** with a RP-SCHED2 Value of Natural State, Sites of Significance - Cultural or Sites of Significance - Aquatic, activities in, on, under or over the *beds** of *rivers** and *lakes** must be managed in a manner which:

1. avoids adverse *effects** on these Values in the first instance, or
2. for *infrastructure*[^] and other resources of regional and national importance, or activities that result in an environmental benefit, remedies or mitigates those *effects** where it is not practicable to avoid them, and
3. maintains the habitat and spawning requirements of the species identified.

LF-FW-P27: Activities in *rivers or *lakes** and their *beds** with a Value of Flood Control and Drainage**

In reaches of *rivers** or *lakes** and their *beds** with a RP-SCHED2 Value of Flood Control and Drainage, activities in, on, under or over the *beds** of *rivers** and *lakes** and on *land** adjacent to the *bed** where the Value is located must be managed in a manner which:

1. enables the degree of flood hazard and erosion protection existing at the time of Plan notification (31 May 2007) to be maintained or enhanced
2. addresses adverse *effects** by:
 - a. in the first instance, avoiding, remedying or mitigating adverse *effects** on the instream morphological components of natural character and other RP-SCHED2 Values
 - b. providing consent applicants with the option of making an offset
 - c. allowing compensation by way of a financial contribution in accordance with the policies in RP-FC.

LF-FW-P28: Activities in *rivers or *lakes** and their *beds** with other RP-SCHED2 Values**

In *sites** with RP-SCHED2 Values other than Natural State, Sites of Significance - Cultural, Sites of Significance - Aquatic, or Flood Control and Drainage, activities in, on, under or over the *beds** of *rivers** and *lakes** must be managed in a manner which:

1. in the first instance avoids, remedies or mitigates significant adverse *effects** on the instream morphological components of natural character and RP-SCHED2 Values
2. provides consent applicants with the option of making an offset
3. allows compensation by way of a financial contribution in accordance with the policies in RP-FC.

LF-FW-P29: Essential and beneficial activities

Activities in, on, under or over the *beds** of *rivers** and *lakes** that are essential or result in an environmental benefit must generally be allowed, including:

1. the use, *maintenance** and *upgrading** of existing *infrastructure*[^] and other existing physical resources of regional or national importance
2. works designed to maintain or improve the stability and functionality of existing *structures**
3. the removal of derelict, unlawful or non-functional *structures**
4. the restoration or enhancement of natural habitats.

LF-FW-P30: Gravel extraction

Subject to Policies RPS-LF-FW-P25 to RPS-LF-FW-P29 and the need to ensure that gravel extraction volumes are sustainable, the benefit the gravel resource provides for use and development and the flood protection benefit of having it managed will be recognised.

Methods

The taking of surface *water** and groundwater, discharging *contaminants** to surface *water** and to *land**, and the undertaking of activities that disturb the *beds** of *rivers** or *lakes**, are largely regulated activities. Part II: Regional Plan contains rules relating to the activities described in this chapter. The key non-regulatory methods the Regional Council will pursue are outlined below.

LF-FW-M8 Large <i>Water</i> * Abstractors	
Description	<p>The aim of this method is to provide assistance to large <i>water</i>* abstractors to identify options for improving the <i>water</i>* abstraction, distribution and use components of their activities. It is expected this method will reduce the abstraction pressure on the groundwater and surface <i>water</i>* resources, while providing abstractors with financial benefits and their business/customers with greater certainty of supply.</p> <p>The emphasis will be on working with large abstractors to identify and implement opportunities for increasing <i>water</i>* use efficiency, reducing distribution network leakages, agreeing priority of use within distribution networks, and consideration of alternative <i>water</i>* supply and storage options.</p>
Who	The Regional Council, <i>Territorial Authorities</i> *, industry (including hydroelectricity generators) and large irrigators will work together to develop, fund and implement this programme.
Links to Policy	This method implements RPS-LF-FW-P15 and RPS-LF-FW-P16.
Target	All major abstractors in the Region have been contacted and assistance provided where requested by 2016.

LF-FW-M9 Sewage* Treatment Plant Upgrades	
Description	<p>The aim of this method is to assist <i>Territorial Authorities</i>* to seek central Government funding for <i>sewage</i>* treatment plant <i>upgrades</i>, given that the plants make a significant contribution to <i>contaminants</i>* to <i>waterbodies</i>* during low flows. The Regional Council will work with <i>Territorial Authorities</i>* to analyse their treatment and disposal options and to develop a package to present to Government with the aim of securing capital works funding to reduce the environmental impact of these <i>discharges</i>*.</p>

LF-FW-M9 Sewage* Treatment Plant Upgrades	
Who	Regional Council, <i>Territorial Authorities*</i> , Ministry of Health, local health agencies (eg., MidCentral Health) and iwi authorities.
Links to Policy	This method implements RPS-LF-FW-P5, RPS-LF-FW-P9, RPS-LF-FW-P12 and RPS-LF-FW-P14
Targets	Central Government funding applications completed for <i>upgrade</i> of <i>sewage*</i> treatment plants as required.

LF-FW-M10 On-site Wastewater* System Forum	
Description	<p>The aim of this method is to facilitate implementation of the Regional Council's Manual for On-Site Wastewater Systems Design and Management.</p> <p>The Regional Council will establish a forum to aid understanding and implementation of the manual and will undertake regular reviews of new types of on-site treatment and disposal systems.</p>
Who	The forum will comprise, as a minimum, representatives from the Regional Council, <i>Territorial Authorities*</i> , consulting engineers and system installers.
Links to Policy	This method implements RPS-LF-FW-P5, RPS-LF-FW-P9 and RPS-LF-FW-P13.
Target	Two meetings per year.

LF-FW-M11 Sewage* Discharges* to Water*	
Description	<p>The Regional Council will provide assistance to <i>Territorial Authorities*</i> to <i>upgrade</i> existing <i>sewage*</i> treatment systems that directly <i>discharge*</i> treated <i>sewage*</i> to the Region's <i>waterbodies*</i>.</p> <p>The Regional Council to work with <i>Territorial Authorities*</i> to reduce <i>water*</i> volume, explore <i>land*</i> application options and assist with funding opportunities.</p>
Who	Regional Council, <i>Territorial Authorities*</i> and iwi authorities.
Links to Policy	This method implements RPS-LF-FW-P5 and RPS-LF-FW-P14.
Target	To stop direct <i>sewage* discharges*</i> to <i>water*</i> by 2020.

LF-FW-M12 Stormwater System Discharge* Upgrades	
Description	<p>The Regional Council will provide assistance to <i>Territorial Authorities*</i> wanting to <i>upgrade</i> the treatment of their existing urban stormwater system <i>discharges*</i>, where these are into <i>waterbodies*</i>.</p> <p>The Regional Council to work with <i>Territorial Authorities*</i> to reduce <i>water*</i> volume, explore <i>land*</i> disposal options and assist with funding opportunities.</p>

LF-FW-M12 Stormwater System <i>Discharge*</i> Upgrades	
Who	Regional Council, <i>Territorial Authorities*</i> and iwi authorities.
Links to Policy	This method implements RPS-LF-FW-P5, RPS-LF-FW-P9, RPS-LF-FW-P12 and RPS-LF-FW-P13.
Target	To reduce the number, and improve the quality, of urban stormwater <i>discharges*</i> by 2016.

LF-FW-M13 Lake Horowhenua and Other Coastal <i>Lakes</i>	
Description	<p>The Regional Council and other agencies will work with all agencies to protect and enhance Lake Horowhenua and other coastal <i>lakes</i>.</p> <p>Landowners and other agencies will be provided with advice and project management assistance to carry out enhancement and protection measures including fencing, planting, sediment control, <i>wastewater*</i>/stormwater management and <i>fertiliser*</i> application management. The Regional Council will seek funding from third parties to assist with this method.</p> <p>The effectiveness of the protection and enhancement works in achieving improved <i>water*</i> quality within Lake Horowhenua and other Coastal <i>Lakes</i> will be monitored.</p> <p>The method will include publicity to increase public awareness about the importance of the <i>lakes</i>. The method will include utilising industry codes of practice as a means of enhancing and protecting <i>water*</i> quality eg., the Code of Practice for Commercial Vegetable Growing in the Horizons Region.</p>
Who	Regional Council, <i>Territorial Authorities*</i> , Fish & Game New Zealand, Department of Conservation, iwi, Horticulture NZ, landowners and other agencies.
Links to Policy	This method implements RPS-LF-FW-P10.
Target	The <i>Lake</i> is actively managed, including protection and enhancement measures, within 5 years of this Plan becoming operative.

LF-FW-M14 <i>Lake*</i> Quality Research, Monitoring and Reporting	
Description	<p>The aim of this method is to develop an integrated research, monitoring and reporting programme. The focus will be to define the current state of the quality of the Region's <i>lakes*</i>, particularly the Region's coastal lakes. The method will seek to assess the state and quality of the <i>lakes*</i> to better understand the influences on <i>water*</i> quality in those <i>lakes*</i>. The outcomes will link into work to refine existing policies, objectives and methods in terms of the need to add rural <i>land*</i> uses and <i>Water Management Sub-areas*</i> in managing nutrient management and <i>effects*</i> on <i>water*</i> quality. The outcomes will also guide implementation planning and allow implementation effectiveness is to be assessed.</p>
Who	Regional Council, Department of Conservation, Fish & Game New Zealand, Horticulture New Zealand, DairyLink, research institutes, universities, non-Government agencies, community groups and iwi authorities as required.

LF-FW-M14 Lake* Quality Research, Monitoring and Reporting	
Links to Policy	This method implements RPS-LF-FW-P6, RPS-LF-FW-P7, RPS-LF-FW-P10 and RPS-LF-FW-P11.
Targets	A research, monitoring and reporting programme that defines the current state of <i>water*</i> quality of the Region's <i>lakes*</i> (particularly coastal lakes) and measure changes in <i>water*</i> quality.

LF-FW-M15 Trout and Native Fish Spawning Habitat	
Description	<p>The Regional Council and other agencies will work with landowners to protect and enhance <i>waterbodies*</i> and their <i>beds*</i> that serve as spawning <i>sites*</i> for brown and rainbow trout and native fish. Resources will be directed towards the most significant <i>sites*</i>.</p> <p>Landowners will be provided with advice and financial/project management assistance to carry out enhancement and protection measures including fencing, planting, providing fish passage and pest plant and pest animal control. The Regional Council will seek funding from third parties to assist with this method.</p> <p>The effectiveness of the protection and enhancement works will be monitored.</p> <p>The method will include publicity to increase public awareness about the importance of trout and native fish.</p>
Who	Regional Council, <i>Territorial Authorities*</i> , Fish & Game New Zealand, Department of Conservation, landowners and funding agencies including He Tini Awa Trust.
Links to Policy	This method implements RPS-LF-FW-P5, RPS-LF-FW-P25 and RPS-LF-FW-P28.
Target	30 of the top trout spawning habitat <i>sites*</i> and native fish habitat spawning <i>sites*</i> are actively managed, including protection and enhancement measures, within 10 years of this Plan becoming operative.

LF-FW-M16 Water* Quality Improvement	
Description	<p>The Regional Council and other agencies will work with landowners to protect and enhance the <i>water*</i> quality of the Region's <i>waterbodies*</i>. Landowners in those <i>Water Management Sub-areas*</i> where the nutrient management (non-point source <i>discharge*</i>) control rules are to be introduced will receive the highest priority for assistance. This method represents an expansion of the Regional Council's existing <i>water*</i> quality improvement programme, which focuses almost entirely on dairy farmers as part of the Dairying and Clean Streams Regional Action Plan for Manawatū-Whanganui Region.</p> <p>Landowners will be provided with advice and financial/project management assistance to carry out enhancement and protection measures including fencing and planting of riparian margins. The Regional Council will seek funding from third parties to assist with this method.</p> <p>The effectiveness of the protection and enhancement works will be monitored.</p>

LF-FW-M16 <i>Water*</i> Quality Improvement	
Who	Regional Council, DairyNZ, Fonterra, Horticulture NZ, <i>Territorial Authorities*</i> and funding agencies including the He Tini Awa Trust and Nga Whenua Rahui.
Links to Policy	This method implements RPS-LF-FW-P5, RPS- LF-FW-P7, and RPS-LF-FW-P11.
Targets	<ul style="list-style-type: none"> The targets of the Dairying and Clean Streams Regional Action Plan for Manawatū-Whanganui Region are achieved by the due dates. Advice and assistance is offered to all landowners affected by the nutrient management rules. All landowner requests for advice and assistance regarding <i>water*</i> quality improvement are responded to promptly.

LF-FW-M17 Education in Schools <i>Water*</i>	
Description	The aim of this method is to raise awareness amongst the youth of the Region of the significance of the <i>water*</i> (quantity and quality) resource, the threats to it, and what they can do to protect/restore it. This will be achieved through various environmental education programmes/initiatives - for example, Green RIG, EnviroSchools and Trees for Survival.
Who	Regional Council, various national and local environmental education providers and the Youth Environment Forum.
Links to Policy	This method implements RPS-LF-FW-P5.
Targets	The Regional Council develops and delivers a water-related environmental education programme.

LF-FW-M18 Water (Fluvial Resources, Quality and Quantity) Research, Monitoring and Reporting	
Description	The aim of this method is to develop an integrated research, monitoring and reporting programme. The focus will be to define the current state of the natural character of the Region's <i>rivers*</i> by analysing their habitat and morphological diversity through assessments of historical and current data. This may include: planform/ channel morphology classification; fairway width; sinuosity; barforms; percentage of pool, riffle, run, habitat; gravel resources, level of entrenchment, and location and extent of riparian and <i>wetland*</i> areas. The method will also seek to measure changes in natural character, including habitat and morphological diversity. The outcomes will link into monitoring undertaken by the River Works Environmental Code of Practice and support delivery and refinement of existing policies, objectives and methods. The outcomes will be reported in the Council State of the Environment Report and also guide implementation planning and allow implementation effectiveness to be assessed.
Who	Regional Council, Department of Conservation, Fish & Game New Zealand, research institutes, universities, non-Government agencies, community groups and iwi authorities as required.

LF-FW-M18 Water (Fluvial Resources, Quality and Quantity) Research, Monitoring and Reporting	
Links to Policy	This method implements RPS-LF-FW-P5, RPS-LF-FW-P17, RPS-LF-FW-P19, RPS-LF-FW-P25, RPS-LF-FW-P26, RPS-LF-FW-P27, RPS-LF-FW-P28, RPS-LF-FW-P29, and RPS-NATC-P1
Targets	A research, monitoring and reporting programme that defines the current state of the natural character of the Region's <i>rivers</i> * and measure changes in natural character, including habitat and morphological diversity.

Principal reasons

LF-FW-PR2: Values and targets

The Region has been divided into *Water Management Sub-areas** for the purpose of managing *water** quality and quantity. *Waterbodies** and their *beds** within these *Water Management Sub-areas** have been assigned Values which represent the ecosystem, recreational, cultural and social and economic attributes of the *waterbody** and its *bed** (RPS-PF-FW-O3, RPS-LF-FW-P4). *Water quality targets** have been assigned to protect these Values (RPS-LF-FW-P5 to RPS-LF-FW-P8).

LF-FW-PR3: *Discharges** to *water** and *land**

The *freshwater** section deals with *discharges** to *land** and *water** holistically. This is because *discharges** to *land** have the potential to adversely affect groundwater and surface *water** quality if not managed well. Three types of *discharges** of concern have been identified: point source *discharges** to *land** (including *domestic wastewater**), point source *discharges** to *water** (including *industrial activity** *discharges** and treated *sewage**) and non-point source *discharges** to *land** (from agricultural *land** uses). *All these types of discharges** will be managed to meet the objectives and policies for *water** quality (RPS-LF-FW-O3, RPS-LF-FW-P5 to RPS-LF-FW-P8), including *discharges** to *land** (RPS-LF-FW-P13).

Agricultural *land** uses contribute to *waterbodies** not meeting the Region's *water quality targets** for nutrients, faecal contamination and sediment levels. These need to be targeted for control in problem catchments and through the Regional Council's Sustainable Land Use Initiative (SLUI) and Whanganui Catchment Strategy and the regulation of intensive farming (RPS-LF-FW-P11).

Point source *discharges** to *water** need to be managed to achieve *water quality targets** (RPS-LF-FW-P12). This may mean that it is appropriate to consider alternatives to *discharging** to *water**. This may include considering alternative treatment options for all or part of the year, to achieve or move closer to *water quality targets** at critical times of the year. In all cases, point source *discharges** to *water** of untreated *sewage** are culturally unacceptable, and direct *discharges** of treated *sewage** should be changed to involve *land** application before *discharge** (RPS-LF-FW-P14).

LF-FW-PR4: Surface *Water** Quantity

*Water** will be used and allocated in a way which enables *water** to be used for the wellbeing of people and the community, while providing for other Values (RPS-LF-FW-O5, RPS-LF-FW-P17). *Water** allocation limits are set for each *Water Management Sub-area** and *water** will be managed to maintain these limits (RPS-LF-FW-P18 and RPS-LF-FW-P19). When *water** use needs to be restricted, life sustaining and essential *water** takes have first priority (RPS-LF-FW-P21). *Water** harvesting and alternative sources of *water** to surface *water** are also encouraged and provided for (RPS-LF-FW-P20). Efficiency of use is an important consideration, and will ensure that *water** is available to the maximum number of users and is not wasted (RPS-LF-FW-P15 and RPS-LF-FW-P16).

LF-FW-PR5: Groundwater

Groundwater quality and quantity is connected to that of surface *water** and this is recognised in this, while providing for its management separately. *Bores** will be managed to ensure that they are properly constructed, efficient and fully functioning and do not lead to contamination of groundwater, wastage of *water** or unnecessary *effects** on other *bores** or surface *water** bodies (RPS-LF-FW-P23). *Groundwater Management Areas** have been established and sustainable allocations set; groundwater takes will be managed within these allocations (RPS-LF-FW-P24). Groundwater quality within the Region is generally good and is not declining, but maintaining this good quality will be a consideration when managing *discharges** (RPS-LF-FW-P13).

LF-FW-PR6: *Beds* of rivers* and lakes**

The physical nature of the Region's *rivers** and *lakes** and their *beds** is important to maintaining the Values assigned to them. Management of activities in the *beds* of rivers** and *lakes** will be undertaken in order to maintain these Values, and other important physical attributes (RPS-LF-FW-O6, RPS-LF-FW-P25 and LF-FW-P29). Some Values are treated differently. Important aquatic biodiversity *sites**, cultural *sites** and natural state areas would be negatively and potentially permanently harmed by some activities and consequently are given a high level of protection (RPS-LF-FW-P26). Flood control and drainage schemes have damaged *water** Values in some areas, but also provide valuable protection services to the community. Maintaining this level of service is important, while ensuring that other Values are not further compromised (RPS-LF-FW-P27). While recognising the Values, acknowledgement is also needed that some activities, such as *river** restoration, are beneficial and should be allowed to occur (RPS-LF-FW-P29).

Gravel extraction is an important activity in *river* beds**, both for the benefit the gravel resource provides and the flood protection benefit of having it removed from the *river**. However, if not well managed, too much extraction or extraction in an inappropriate manner can damage *river** Values. Gravel extraction needs to be managed to ensure that extraction volumes are sustainable (RPS-LF-FW-P30).

Anticipated environmental results

Anticipated Environmental Result	Link to Policy	Indicator	Data Source
LF-FW-AER2 During the life of this Plan, <i>water*</i> quality and quantity maintain the Values set in this Plan. In <i>Water Management Sub-areass*</i> : <ul style="list-style-type: none"> where <i>water quality targets*</i> are met prior to this Plan becoming operative, they continue to be met where <i>water quality targets*</i> are not met prior to this Plan becoming operative, they are either met or improved from the current state where targeted for action or, where not targeted for action, they are no worse than prior to this Plan becoming operative. 	<i>Water</i> : RPS-LF-FW-P4, RPS-LF-FW-P5, RPS-LF-FW-P6, RPS-LF-FW-P7, RPS-LF-FW-P8, RPS-LF-FW-P11, RPS-LF-FW-P12, RPS-LF-FW-P13, RPS-LF-FW-P14, RPS-LF-FW-P15, RPS-LF-FW-P16, RPS-LF-FW-P17, RPS-LF-FW-P18, RPS-LF-FW-P20, RPS-LF-FW-P22, RPS-LF-FW-P25 RPS-LF-FW-P26, RPS-LF-FW-P27, RPS-LF-FW-P28 and RPS-LF-FW-P29 <i>Land*</i> : RPS-LF-LAND-P1, RPS-LF-	<ul style="list-style-type: none"> Measured <i>water*</i> quality compared to <i>water quality targets*</i>, especially measures for "muddy waterways", "safe swimming", "safe food gathering", and "aquatic ecosystem health" in priority catchments Incidents where surface <i>water*</i> quality is confirmed as unfit for use Measured flows of surface <i>water*</i> compared to the allocation and minimum flow regime outlined in this Plan 	<ul style="list-style-type: none"> The Regional Council's State of Environment <i>water*</i> quality and quantity monitoring programme The Regional Council's incidents database Ministry of Health raw <i>water*</i> monitoring

Anticipated Environmental Result	Link to Policy	Indicator	Data Source
	LAND-P2 and RPS-LF-LAND-P3, Living Heritage: RPS-ECO-P1, RPS-ECO-P2, RPS-ECO-P3, RPS-ECO-P4, and RPS-NATC-P1		
LF-FW-AER3 By 2017, the natural, physical and cultural qualities of the <i>beds* of rivers*</i> are suitable for specified <i>Water Management Sub-area*</i> Values.	<i>Water*</i> : RPS-LF-FW-P4, RPS-LF-FW-P25 RPS-LF-FW-P26, RPS-LF-FW-P27, RPS-LF-FW-P28 and RPS-LF-FW-P29	<ul style="list-style-type: none"> Confirmed incidents of damage to the <i>beds* of rivers*</i> Consents granted for activities in <i>beds* of rivers*</i> and <i>lakes*</i> 	<ul style="list-style-type: none"> The Regional Council's incidents database The Regional Council's consents database
LF-FW-AER4 The amount of groundwater used does not exceed replenishment rates and its quality is the same as or better than that measured prior to this Plan becoming operative, other than where <i>discharges* to land*</i> are a permitted activity or are allowed by resource consent.	<i>Water*</i> : RPS-LF-FW-P9, RPS-LF-FW-P13, RPS-LF-FW-P15, RPS-LF-FW-P16, RPS-LF-FW-P23 and RPS-LF-FW-P24	<ul style="list-style-type: none"> Groundwater levels Region-wide, but with a focus on Ōpiki and Himatangi areas Groundwater quality Region-wide, but with a focus on nitrates in Horowhenua and Tararua districts and conductivity along the Foxton-Tangimoana coast Confirmed incidents where groundwater sources become unavailable (ie., dry up) or <i>water*</i> quality is unfit for use 	<ul style="list-style-type: none"> The Regional Council's State of Environment groundwater monitoring programme The Regional Council's compliance monitoring programme The Regional Council's incidents database Ministry of Health raw <i>water*</i> monitoring

