Giving effect to the National Policy Statement for Freshwater Management – report on creation of dedicated website section for the first round of community engagement

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November 2023

Executive summary

As part of the process of giving effect to the National Policy Statement for Freshwater Management 2020 (NPSFM) every regional council must follow the National Objectives Framework (NOF) and is required to have long-term visions for freshwater in its region which must be developed through engagement with communities and tangata whenua at every step. Under Section 80A(4)(b) of the Resource Management Act 1991 (RMA) every regional council must publicly notify a freshwater planning instrument to give effect to the NPSFM by 31 December 2024.

This report provides details about the new "Freshwater Management" section of the Marlborough District Council's (the council's) website, which was developed in November 2022 for the first round of community engagement on the implementation of the NPSFM. The first engagement round took place between December 2022 and June 2023 and focused on proposed Freshwater Management Units (FMU), as well as gaining an understanding the community's values and aspirations/visions for the region's freshwater and freshwater ecosystems.

This report summarises the reasoning behind the decision to have a "Freshwater Management" section of the website (including relevance within the NPSFM context), the structure and design of the section, and the content of each new webpage.

Contents

NPSFM 2020 and NOF requirements

1 The National Policy Statement for Freshwater Management 2020 (NSPFM) requires that all decisions made by regional councils must be recorded, including all matters considered and decisions reached, the reasons for each decision, and published as soon as practicable (Part 3, Subpart 1, Clause 3.6). This requirement may be met by publishing a section 32 report. Marlborough District Council (the council) has decided to create individual reports on NPSFM implementation decisions as they occur, allowing additional transparency for staff and other users throughout the process.

2 This report describes the Marlborough District Council's (the council's) decision to create a dedicated "Freshwater Management" section of the website and the resulting website pages, their purpose, and their content, in relation to council's implementation of the NPSFM.

3 As part of the process of giving effect to the (NPSFM) every regional council must follow the National Objectives Framework (NOF) (Part 3, Subpart 2, Clause 3.7). This prescribes a step-by-step process for managing freshwater.

4 The NOF process has six steps (Table 1) and requires that at each step, a regional council must engage with communities and tangata whenua (Clause 3.7(1)(a)).

NOF Step	Process	Clause
1	Identify Freshwater Management Units (FMUs) in the region.	3.8
2	Identify values for each FMU.	3.9
3	Set environmental outcomes for each value and include them as objectives in regional plans.	3.9
4	Identify attributes for each value and identify baseline states for those attributes.	3.10
5	Set target attribute states, environmental flows and levels, and other criteria to support the achievement of environmental outcomes.	3.11, 3.13, 3.16
6	Set limits as rules and prepare action plans (as appropriate) to achieve environmental outcomes.	3.12, 3.15, 3.17

Figure 1 - Table of NOF steps

5 Creation of the dedicated Freshwater Management website pages (the pages) was part of council's community engagement. The pages related to both the NOF process directly and the wider NPSFM.

6 The pages related directly to the NOF process as they provided background information and context to the public regarding NOF step 1: identification of Freshwater Management Units (FMU), and NOF step 2: each FMU's freshwater values.

7 Together with the NOF, the NPSFM also requires every regional council to have long-term visions for freshwater in its region which must be developed through engagement with communities and tangata whenua (Clauses 3.3 (1) and (3)(a)).

8 The long-term visions must be informed by an understanding of the history of, and environmental pressure on, the Freshwater Management Unit (FMU), part of the FMU, or catchment. (Sub part 1, section 3.3(3)(b)).

9 For this reason, historic land use, freshwater monitoring results, and environmental pressure information for each FMU was also included on the Freshwater Management website pages.

10 In this way, creation of new Freshwater Management website pages met several requirements of both the NPSFM and the NOF process, while also providing for robust and informed community engagement.

Council's approach and process

11 This report describes the Marlborough District Council's (the Council's) process and resulting decision on the content of public information, related to Freshwater Management Unit (FMU) boundaries and environmental background information for each FMU, released by the council for the first round of community engagement on the NPSFM implementation in November 2022.

12 The council is required to share this information so that the public can be informed about the history of each FMU's land use, water use, and environmental pressures and be adequately informed to participate in the engagement.

13 In tandem, Council is undertaking engagement with tangata whenua with the aim of understanding the history and land use of each FMU by tangata whenua, both in a historical and current context.

14 Council staff considered what information would be most applicable to meet the requirements in the sections, and additionally which information would be most useful for the community to have for the first round of community engagement, from December 2022 to June 2023 (**Figure 2**).

Figure 2 - Timeline of community engagement

15 Significant amounts of freshwater management information were already available on the council website. However, separate pieces of information were generally housed across different pages or sections of the website, meaning they were not easily accessible to the public as one topic.

16 Due to the requirements of (cl 3.7(1)(a)), relevant freshwater information needed to be collated into a central place for public viewing.

17 For practical purposes, creating a new website section “Freshwater Management", with specific pages summarising relevant information and with links through to full reports in other areas of the council website, was the most realistic option.

18 Further reasoning for a separate website section was structural longevity; enabling future updates of the section as new water quality and quantity monitoring and reporting is completed. In this way, each page is ‘future proofed’ and easily updated as stages of the NPSFM are implemented and into the future.

Information provided on each webpage

19 The “Freshwater Management” website section comprised of 11 new pages, including the home page. The new section was placed under the “Environment” area of the website as shown below (Figure 3). A new “Freshwater Management Marlborough” waterdrop logo, also pictured below, was designed for the workstream.

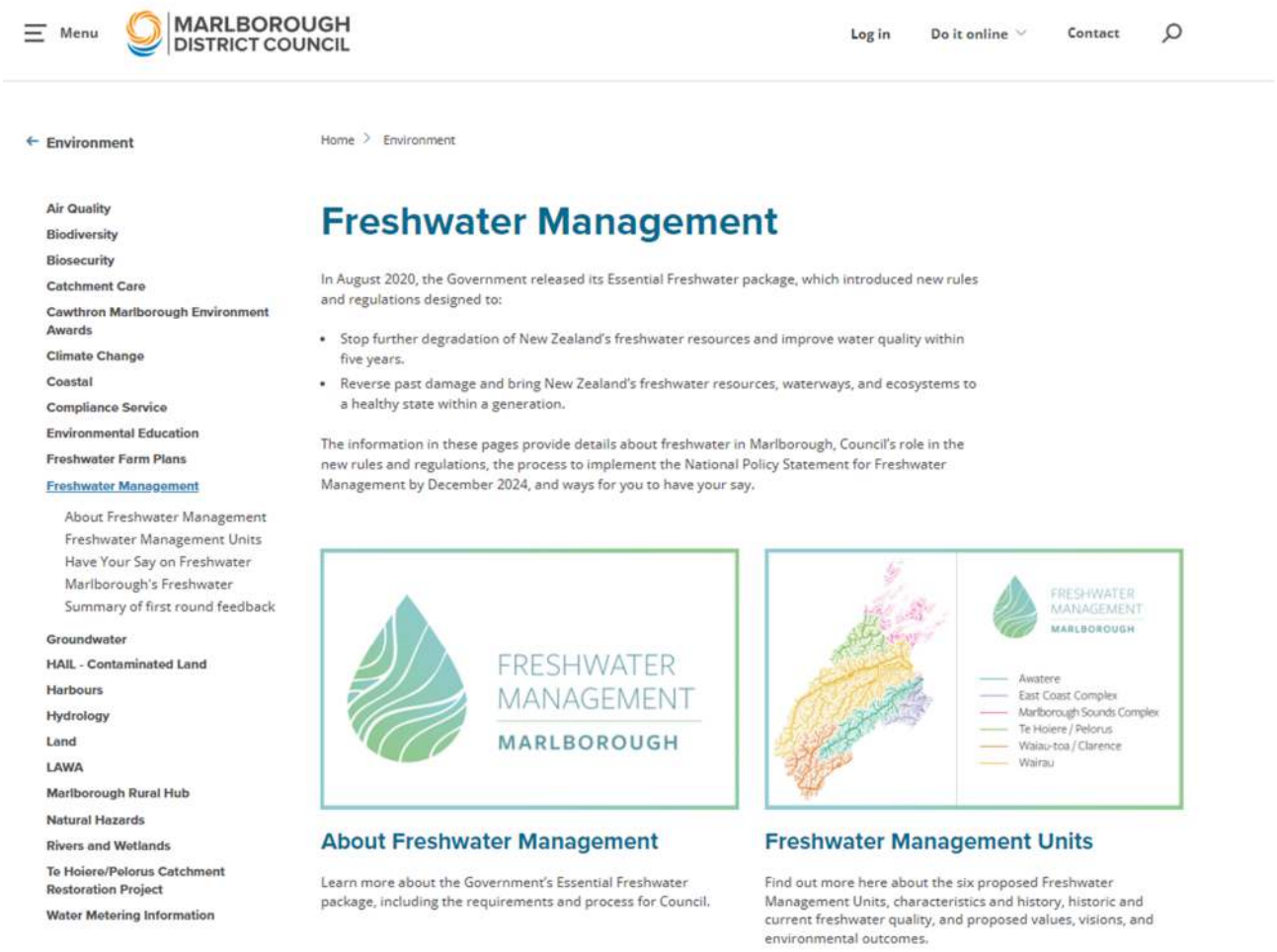


Figure 3 Freshwater Management section under "Environment"

20 Each new website page and its contents are summarised below.

21 “Freshwater Management” the home page. Comprising an introductory paragraph about the Essential Freshwater package and NPSFM. Further links to the below pages, primarily as “tiles”, which are photographic links.

22 “About Freshwater Management”. Providing details on the wider Essential Freshwater Package, the background to the NPSFM 2020, council’s process, and timeline.

23 “Have your Say of Freshwater”. Providing information on the different ways for the public to be engaged in the NPSFM implementation process, e.g., webinars, freshwater email, presentations.

24 “Marlborough’s Freshwater”. A high-level summary at a regional scale of land use, surface water quality, and ground water quality.

25 “Freshwater Management Units”. A landing page for the six proposed Freshwater Management Units, presented as six photo tiles with associated links through to further information (Figure 4).

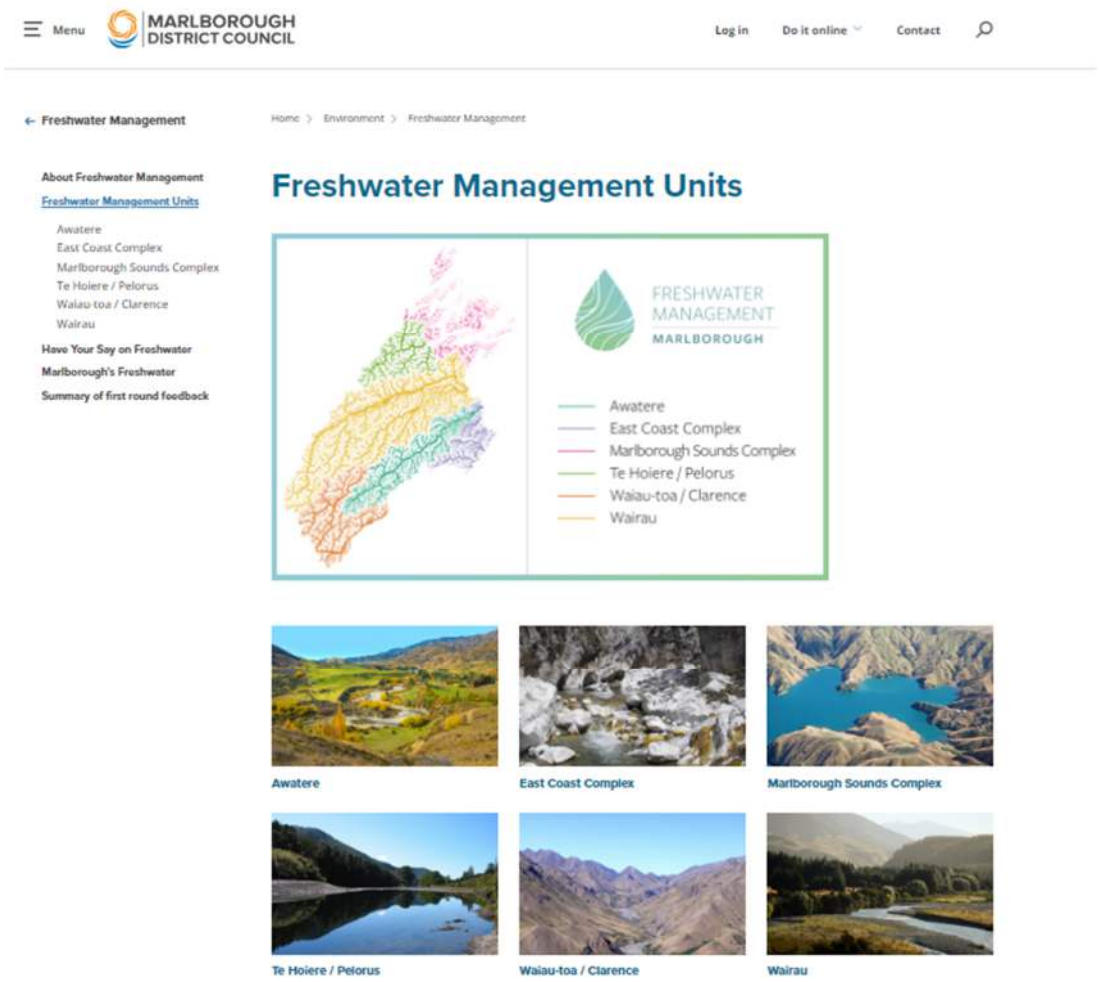


Figure 4 Freshwater Management Unit website page, with six FMU tiles leading to further information

26 Six FMU pages as shown in Figure 4, one for each proposed FMU area:

- Awatere
- East Coast Complex
- Marlborough Sounds Complex
- Te Hoiere/Pelorus
- Waiau-toa/Clarence
- Wairau

27 Each FMU page comprised of a general summary of the physical characteristics of the area and then further information split into similar headings. The headings enabling comparison between each area and provided a clear page structure for readers. The headings are further described below and each full FMU page is attached in Appendix 1 – Freshwater Management website section page copies

28 Climate – summary of known characteristics e.g., generally dry or wet area, average rainfall, wind direction.

29 Geology and soils – known rock types by location within the FMU and their attributes. Relevant geological significant features, such as mountains. Associated explanation of physical landforms and their geology.

30 Bodies of water – explanation of major rivers in each FMU and their tributaries, including locations, flow characteristics, and use of water from within the water way e.g., irrigation dams. Mention also of lakes if present.

31 Historic and current land use – a brief overview of land use trends from pre-human times through to current day. Clear distinction of recent trends, such as viticulture growth and identification of current major land use(s).

32 Urban areas – identification of urban settlements in an area and a summary of their amenities and approximate size. Some historical information included regarding the residential component of the area.

33 Flora and fauna habitats – known habitats of native species in each FMU and their general location e.g., beaches vs. river headwaters.

34 Surface water quality – identification of current monitoring sites and their respective monitoring programmes. Latest relevant water quality monitoring results and associated work streams in areas with identified degradation. Linking between any poorer monitoring results and potential causes, e.g., livestock access to the river. A summary table of seven identified NPSFM attributes and their 2019 monitoring results.

35 Groundwater – discussion of groundwater present, if relevant for the FMU, with characteristics of aquifers and their monitoring locations and results. Groundwater availability linked to geology of the area and explanation of why no groundwater is present, if applicable.

36 Freshwater challenges – known freshwater challenges identified by previous council monitoring and reporting, as well as a summary of their known causes and link to land use, if applicable.

37 FMU quick facts – a summary list of short facts, mainly numerical, across a range of features for each FMU. Including: number of water take/use consents, number of municipal water supplies, rainfall averages, number of different types of freshwater monitoring sites.

Appendix 1 – Freshwater Management website section page copies

Freshwater Management - Marlborough District Council

The below were captured late October 2023 (28/10/2023) before changes were made to support the second round of community engagement.

Freshwater Management

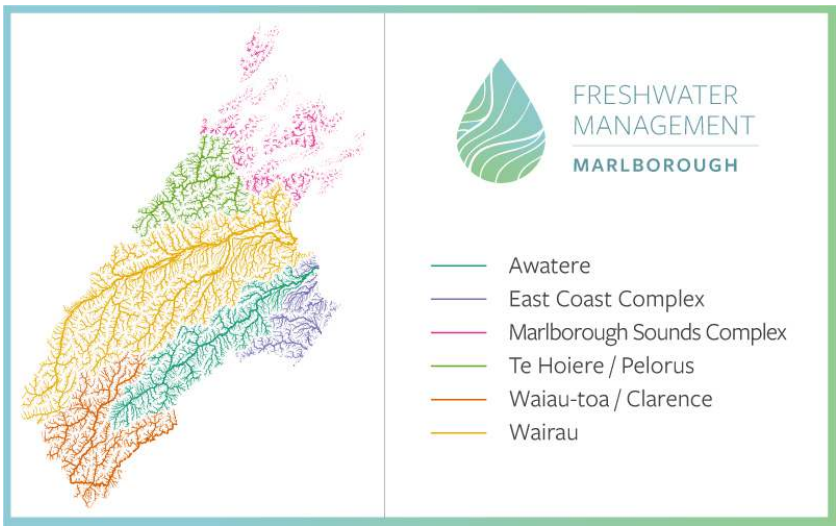
In August 2020, the Government released its Essential Freshwater package, which introduced new rules and regulations designed to:

- Stop further degradation of New Zealand's freshwater resources and improve water quality within five years.
- Reverse past damage and bring New Zealand's freshwater resources, waterways, and ecosystems to a healthy state within a generation.

The information in these pages provide details about freshwater in Marlborough, Council's role in the new rules and regulations, the process to implement the National Policy Statement for Freshwater Management by December 2024, and ways for you to have your say.

About Freshwater Management

Learn more about the Government's Essential Freshwater package, including the requirements and process for Council.



Freshwater Management Units

Six Freshwater Management Units (FMUs) have been proposed for Marlborough. Find out more here, including boundaries and current information about these FMUs.

Have Your Say on Freshwater

The first round of public engagement opened in December 2022 and closed in June 2023. It focused on FMU boundaries, visions and values.

Marlborough's Freshwater

From current improvement programmes to sources of water quality degradation, learn about the current state of Marlborough's freshwater.

Summary of first round feedback

In December 2022 to June 2023, we sort feedback on community freshwater visions and values and the division of the region into freshwater management units.

About Freshwater Management - Marlborough District Council

About Freshwater Management

On this page

- **The Process for Council**
- **Timeline of public engagement**
- **Links to key elements of Essential Freshwater**

Why an Essential Freshwater package?

The Government-commissioned report "Our Freshwater 2020", which forms part of the Ministry for the Environment and Stats NZ's environmental reporting series, found freshwater and the life it supports are under threat, particularly in urban and intensively farmed areas.

The report found New Zealand's land uses result in excess nutrients (like nitrogen), chemicals, pathogens (disease-causing microorganisms), and sediment entering freshwater and causing harm. Water pollution is not the result of any single land use, but comes from the mosaic of urban areas, farms, and plantation forests found in many catchments.

Introduction of inappropriate species, modifications to natural waterways and changes to the courses in our rivers and aquifers have altered water levels and flows. This affects our freshwater and puts species at risk, reducing the benefits we receive from nature and affecting our connections to freshwater.

Read more about Our Freshwater 2020

In August 2020, the Government responded with national direction for protecting, enhancing, and preventing further damage to waterways, lakes, and streams with the release of its Essential Freshwater package. A fundamental concept across the package is Te Mana o te Wai, which means the first priority is to ensure the life-supporting capacity of freshwater. This package includes requirements for resource users, as well as direction for councils to engage with communities and tangata whenua to give effect to Te Mana o te Wai in regional policies and plans.

The National Policy for Freshwater Management

A key element of the Government's Essential Freshwater package is the National Policy Statement for Freshwater Management 2020 (NPSFM 2020). This is a Government policy that gives local authorities direction on how to manage freshwater under the Resource Management Act (RMA).

The objective of the NPSFM is to ensure that natural and physical resources are managed in a way that prioritises:

- First, the health and well-being of water bodies and freshwater ecosystems,
- Second, the health needs of people (such as drinking water),
- Third, the ability for people and communities to provide for their social, economic, and cultural well-being, now and in the future.

To give effect to NPSFM, Council is required to review the freshwater aspects of the Proposed Marlborough Environment Plan (PMEP) and notify a variation by the end of December 2024.

The first major step is for councils to identify areas called Freshwater Management Units (FMUs). An FMU is a water body or multiple water bodies at an appropriate scale for managing freshwater in a region. These can be a river catchment, part of a catchment or a group of catchments.

Learn more about Marlborough's Proposed FMUs here

Requirements for Marlborough

Councils are required to give effect to national policy statements through their regional plans. The plans contain objectives, policies, methods, and rules, which need to be updated to fulfil the requirements of the NPSFM.

There have been previous versions of the NPSFM and the Proposed Marlborough Environment Plan (PMEP), which was notified in 2016, gave effect to the 2014 version of the NPSFM. Through the plan hearings process, some changes were made to align the PMEP to the 2017 changes to the NPSFM, and currently mediation is being undertaken on appeals to the PMEP.

The PMEP, therefore, already contains many freshwater values, a comprehensive set of water quantity provisions and a set of water quality standards. This provides a good basis for the implementation of the 2020 version of the NPSFM. As such, a variation to the PMEP will be undertaken, which must be notified by 31 December 2024.

The focus of this variation will be to ensure that the PMEP provides for the sustainable management of our environment, so our freshwater bodies and ecosystems are healthy.

The Process for Council

Council is seeking input from the public, tangata whenua, local community groups, and industry to identify and understand issues, values and aspirations for freshwater in the Marlborough region. Over a two-year period to November 2024, several engagements will take place through online surveys, public events, and meetings. Anyone can take part in the engagement surveys, and hardcopies will be available from council offices, libraries and at public events.

The first round of engagement focussed on Freshwater Management Units (FMUs). Submissions opened in December 2022 and closed in June 2023. This round sought to identify how we value freshwater in our region and what aspirations we have for this water both now and into the future. The proposal was to divide Marlborough's freshwater into six FMUs, which are single catchments or a group of catchments with similar characteristics.

These public engagements will ultimately inform environmental outcomes and objectives in Marlborough's plan for freshwater, supported by policies and rules around resource use limits and targets for freshwater health. There are many demands on our region's freshwater and often these can be competing. The challenge is to identify and prioritise where and how we can safeguard what we currently have, take action to improve what has been degraded and restore what we have lost.

Council encourages you to make a submission, stating what you value most about freshwater, how and where you currently use and interact with it and what you would like to see for the future of freshwater in Marlborough.

Timeline of public engagement

View a more comprehensive timeline:

- NPSFM Timeline of Public Submissions (PDF, 117.1KB)

If you are a community, commercial or industry group and would like a meeting to learn more or have your views heard, please e-mail us at freshwater@marlborough.govt.nz to arrange a place and time.

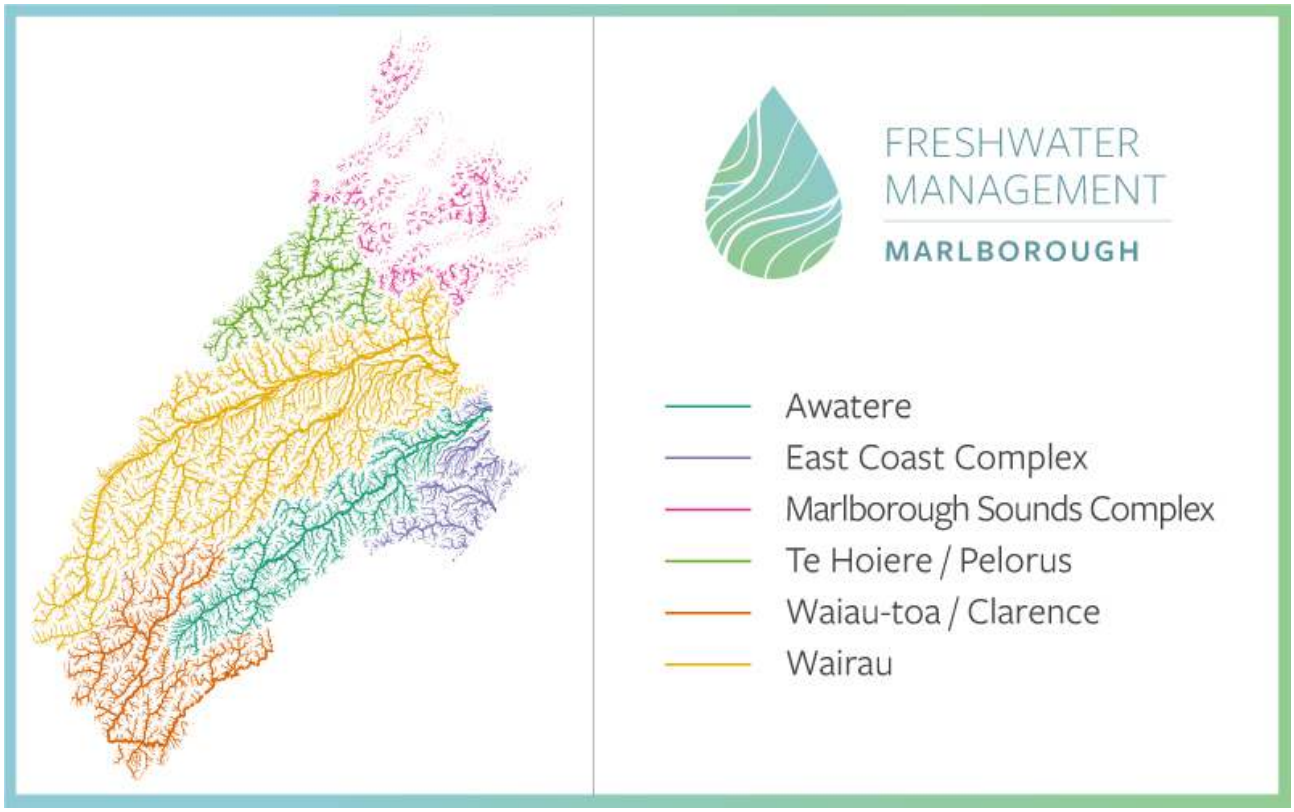
Links to key elements of Essential Freshwater

- Resource Management Act – Freshwater planning process
- National Environmental Standards for Freshwater 2020 (NES-F)
- Resource Management (Stock Exclusion) Regulations 2020
- Resource Management (Measurement and Reporting of Water Takes) Regul

- National Policy for Freshwater Management 200 (NPSFM)
- Freshwater farm plans (FWFP) under part 9A of the RMA
- Implementation guidance for freshwater farm plans

Freshwater Management Units - Marlborough District Council

Freshwater Management Units



Awatere

East Coast Complex

Marlborough Sounds Complex

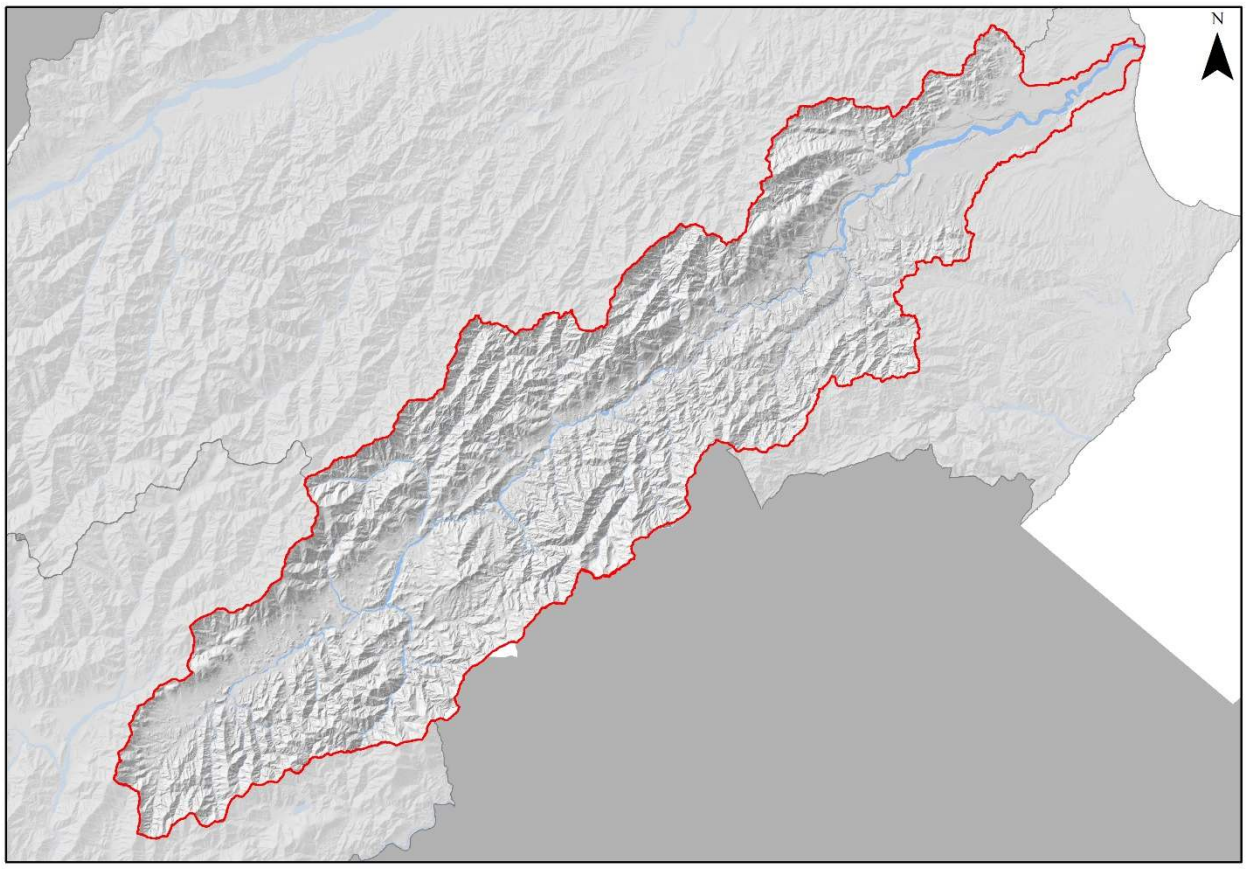
Te Hoiere / Pelorus

Waiau-toa / Clarence

Wairau

Awatere

On this page



Proposed Awatere FMU Boundary

The Awatere Freshwater Management Unit (FMU) takes its name from the largest river in the catchment, the Awatere River, and is 1,573 square kilometres in area. The Awatere FMU stretches over 110 kilometres from mountains southeast of Molesworth to the sea between Clifford Bay and Cloudy Bay. To the south are the Inland Kaikoura Mountains with the highest peak being Mt. Tapuae-O-Uenuku (2885m) and to the west and north are several ranges of mountains with peaks between 1600-1800m, including the Black Birch Range. This range separates the Awatere Valley in the south from the Wairau/Waihopai valleys to the north.

Over most of its length, the valley floor is narrow and flanked by intermittent terraces. Inland, the valley floor is largely made up of discontinuous terrace surfaces which, together with low rainfall and severe winters, largely preclude intensive forms of farming. The lower Awatere Valley area is more suited for intensive land use, with a more agreeable climate and more continuous, well-developed terraces.

Explore the proposed FMU boundaries

Climate

The climate of the Awatere FMU is similar to eastern Marlborough and is classed as warm and temperate. It has a moderate supply of moisture, an average temperature of 10.8°C and mean annual rainfall of 500 to 1490 mm. Rainfall is lowest in the coastal area on the south side of the Awatere River, increasing inland and on the north side of the river due to the rain shadow effect of the northern hills. Rainfall is typically greatest in the months of July and August with the least amount of rainfall generally in February.

Geology and soils

Geology in the lower Awatere FMU is dominated by soft mudstones and conglomerates from the late Miocene and Pliocene epochs, which are easily erodible giving the river its typically silty appearance. The higher peaks further up the valley are predominately greywacke with some volcanic intrusions. The major geological feature responsible for the Awatere Valley and its notable straightness is the Awatere Fault, a branch of the Alpine Fault that stretches over 200 kilometres.

Soils in the lower Awatere Valley display a fragmented soil pattern from the active tectonic environment and river downcutting that has resulted in numerous terraces. The soils in this lower area are dominated by former river alluvium with half being shallow and stony. On the southern side of the Awatere River, loess of variable thickness covers the higher elevation river terraces.

Recreation along the Awatere River

Photo by MarlboroughNZ

Bodies of water

The Awatere River has several major tributaries, as well as many smaller tributaries and streams. The most notable to the north are Castle River, Grey River and Blairich River. To the south are the Tane River, Hodder River and Medway River. Other prominent streams in the lower Awatere Valley include Black Birch Stream and Starborough Creek. There are no large lakes in the catchment, but smaller lakes, such as Lake Jasper and multiple significant wetlands, have been identified throughout the FMU.

The road to Molesworth Station, along the Awatere River

Photo by MarlboroughNZ and Bare Kiwi

Historic and current land use

Originally, the valley was dominated by tussock with beech forest covering the hills and side valleys. However, much of this native landscape was burnt 150 years ago and converted to pasture with large sheep runs established from 1840. Today, pastoral farming continues with several high-country stations, most notably Molesworth Station, which is New Zealand's largest farm. In recent years, the Awatere has seen significant land use change with the conversion of the lower valley to viticulture. Other land use includes plantation forests on the lower slopes, particularly the Black Birch Ranges.

Seddon is the main urban centre

Urban areas

The Awatere Valley is sparsely populated with the town of Seddon as its main urban centre towards the eastern end of the FMU. A resident population of just over 500 live in the town, which services the surrounding rural land. The town's municipal water supply is sourced from the Black Birch Stream to the northwest of the town and originally required boiling. However, in early 2019—after nearly ten years of discussion, deliberations, and consultations—the Seddon Water Treatment Plant was opened. The boil water notice was lifted for Seddon township, but water provided from council's reticulation network providing water to the Awatere and Dashwood rural areas still requires boiling. This service can be disrupted by heavy rainfall resulting in high turbidity in the Black Birch Stream that renders treatment ineffective.

Learn more about Awatere water supply

Marlborough Rock Daisies

Flora and fauna habitats

The upper Awatere provides fish habitats for northern flathead galaxias, koaro, upland bully and longfin eel, as well as brown trout. It also provides a bird habitat for black-fronted terns. The ranges around the valley support some unique alpine plants, including the Marlborough rock daisy, mountain violet, and north pink broom. The lower Awatere also provides fish habitat for īnanga, common bully, upland bully, giant bully, bluegill bully, torrentfish, longfin eel and shortfin eel and brown trout habitat. The lower region provides a bird habitat for black-fronted tern, black-billed gull, pied oystercatcher, pied stilt, banded dotterel and black-fronted dotterel.

Surface water quality

Currently, three monitoring sites are located within the Awatere FMU for surface water quality, which are located at the mouth of the Awatere River, Black Birch Stream, and at the confluence of the Medway River (Awapiri). For the parameters measured, all of these sites show that water quality is above national bottom lines as detailed in the NPSFM. For the Awatere FMU, the most significant parameter affecting surface water quality is turbidity (sediment in the water), which is a feature of the valley's geology.

The table shows the 2019 results for seven surface water parameters (attributes) that are currently monitored for rivers, and the results as classified under the NPSFM 2020. The NPSFM provides limits for these attributes, which define bands ranging from A to D/E. The A-band represents healthy ecosystems, while attribute states in the D and E bands are referred to as "below the national bottom line". Unless caused by natural sources, attributes below the national bottom line are considered unacceptable.

Monitored parameters Monitoring Site Name	Periphyton	Ammonia	Nitrate	E-Coli	MCI*	ASPM**	Dissolved Reactive Phosphorus
Mid Awatere	N/A	A	A	B	B	B	B
Black Birch Stream	N/A	A	A	N/A	B	B	C
Lower Awatere	N/A	A	A	B	C	B	B

*Macroinvertebrate Community Index - NPSFM State 1
**Macroinvertebrate Average Score Per Metric - NPSFM State 2

Groundwater

The impermeable nature of the local geology generally precludes high-yielding aquifers in the lower Awatere Valley. Groundwater is instead supplied from shallow wells in thin gravel beds overlying the distinctive mudstone papa which represents the base of the aquifer and doesn't contain groundwater itself. Compared to the Wairau aquifer, well yields are low and rely on recharge from nearby streams.

Water quantity

With the lack of significant groundwater aquifers in the Awatere, water abstractions come directly from rivers or shallow wells and infiltration galleries alongside the river. For the Awatere River, water takes are controlled by the Council and daily allocation limits placed on municipal water supplies as well as other takes. For other rivers, where allocations are not specified, controls are placed on takes relating to the river's mean flow levels. For the Awatere River, there is also a minimum flow restriction of 2 metres cubed per second placed on takes, as flow is measured at the river's outlet to the sea as well as cut off levels for different classes of takes.

Freshwater challenges

The key challenges for freshwater in the Awatere FMU are turbidity and water quantity. The highly erodible mudstone geology causes comparatively high turbidity, which only reduces after longer dry spells. Most of the original native vegetation has been removed and low production grassland is the main land cover, which has likely increased erosion. However, because so little native vegetation remains, it is difficult to determine the contribution of human activity to the river's high turbidity. Although high turbidity is known to affect the ecological health of rivers, the relatively good macroinvertebrate score for the mid Awatere River does suggest that aquatic life can still thrive. Increases in demand for water, particularly crop irrigation, also create a management challenge due to the lack of suitable ground water aquifers, resulting in water takes being directly from the Awatere River or its tributaries.

Awatere FMU quick facts

FMU area = 1573 km2

Approximate total river/stream length = 4,265 km

Main river = Awatere River

Mean annual rainfall average range = 500 to 1490 mm

Water quality monitoring sites = At Awapiri, Awatere River mouth, Black Birch Stream

Swim spot monitoring sites = None

River flow monitoring sites = Awapiri and Awatere River mouth

Overall surface water quality = Marginal to good

Groundwater aquifers = None

Groundwater quantity = N/A

Water take/use consents = 231 / 160

Municipal supply urban centres = 1

Water storage dams (stock & irrigation) = 618

Significant wetlands (identified) = 137

Land use zoning = Pastoral – 52%, Open Space – 41%, Viticulture – 6%, Forestry – 1.4%, Urban – 0.05%

As further information becomes available through future investigations and monitoring, the details on these FMU pages will be updated.

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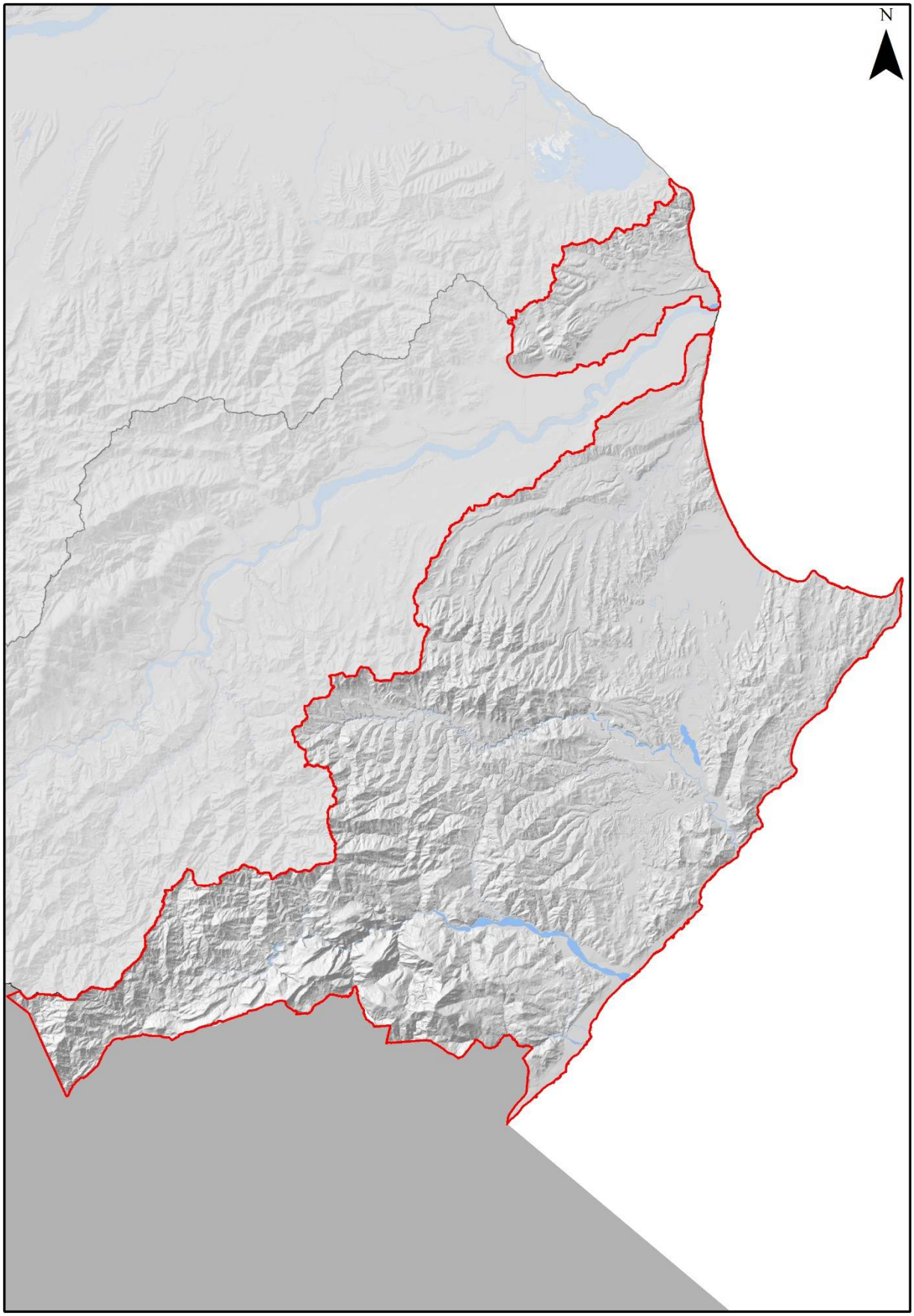
East Coast Complex - Marlborough District Council

East Coast Complex

On this page

- Urban areas
- Flora and fauna habitats
- Surface water quality
- Groundwater
- Water quantity
- Freshwater challenges
- East Coast Complex FMU quick facts



East Coast Complex proposed FMU boundary

The East Coast Complex Freshwater Management Unit (FMU) is a grouping of catchments situated along Marlborough's East Coast that enter the Pacific Ocean between the White Bluffs/Te Parinui o Whiti, south through to Willawa Point. The FMU is split into two parts by the Awatere FMU where the Awatere River meets the sea. The northern section contains several small streams, while the southern portion comprises three larger river catchments of the Blind, Flaxbourne and Waima (Ure) Rivers. To the north is the Wairau FMU and to the west is the Awatere FMU, with the southern border being the regional authority boundary between Marlborough and the northern Kaikoura District. The FMU also contains Lake Grassmere, a saltwater lake used for commercial solar salt production, and Lake Elterwater which is within the Flaxbourne River catchment. The landscape of the northern half of the FMU is characterised by lowland hills and wide valleys, with the foothills of the Inland Kaikoura Range reaching heights of between 100 and 300m. Moving south, the topography increases in height and valleys become narrow and steep with peaks reaching between 1,000 to 1,300m in the Chalk Range on the FMU's southern boundary.

Explore the proposed FMU boundaries

Climate

The climate of the East Coast Complex is one of the driest in Marlborough, with low annual rainfall of between 600 and 700mm. High evaporation rates are caused by hot temperatures in summer combined with strong north-westerly winds. Rainfall does increase towards the southwestern, more mountainous part of the FMU with mean annual rainfalls of 1200mm.

Geology and soils

Geology in the FMU is complex and includes a range of rock types that have been modified by folding and faulting. The rocks in the northern part of the FMU are known as the Ward Syncline which comprise layers of mudstone rocks, thousands of metres thick, folded into a basin shape. This is overlain by a thin veneer of aquifer-forming gravels. The basement rock mudstones are known as *papa-rock* and occur along with greywacke, sandstone, and rarer carbonaceous rocks.

Moving south, the Flaxbourne catchment is also dominated by folded sedimentary rock. Most of the upper catchment consists of Pahau basement sandstone, which also contains mudstone, basalt and limestone. Towards the coast, the surface geology is dominated by alluvial gravels among pockets of exposed siltstone. Furthest to the east, sandstone and limestone have formed in narrow bands parallel to the coast, which are seen as coastal outcrops at Chancet Rocks and Needles Point. Limestone geology then becomes dominant in the Waima (Ure) catchment in the southern part of the FMU with steep valleys and gorges.

Waima (Ure) River mouth

Bodies of water

In the northern part of the FMU, Boundary Stream and its major tributary, Toe Toe Creek, are part of a series of small streams that flow a short distance from the Redwood Pass Hills to the coast and meet the sea to the north of the Awatere River mouth.

The southern part of the FMU comprises three main catchments—Blind River, Flaxbourne River, and Waima (Ure) River.

Blind River is the most northerly of the three rivers and flows in a north-easterly direction from its source in the Haldon Hills to reach the coast towards the centre of Clifford Bay. Blind River has smaller tributary streams, which are primarily situated to the south of the river. Both Blind River and its tributaries flow intermittently due to low rainfall and a lack of large aquifers to sustain flows. Because many areas dry up during the summer months, there are many earth dams within the catchment that are required to capture and retain water for crop irrigation.

To the southeast of the Blind River catchment is Lake Grassmere. Until 1800 years ago, it was an estuary characterised by alternating seasons of dry and dusty summers followed by being covered in water during the winter months. In 1938, three-quarters of the lake area east of the railway line was surveyed by the Government and officially designated as Land for Aviation Purposes. In 1942, a licence to manufacture salt was granted, with the current ponds constructed in 1943.


Sawcut Gorge

The Flaxbourne River is situated in the centre of the FMU, between the Haldon Hills to the north and the Blue Mountain Range to the south. The river flows in an easterly direction for most of its length before heading in a more south-easterly direction at the State Highway. It reaches the coast between the Chancet Rocks and Needles Point at Ward Beach. The river has two main tributaries to the south, Needles Creek and Tatchell Creek, which join it east of the township of Ward not far from the coast.

Lake Elterwater is a shallow coastal lake with outlets that flow into the Flaxbourne River during periods of high rainfall. Lake Elterwater is rarely more than one meter deep and has dried up at least 10 times over the past 1,000 years, four of which occurred in the past 20 years. The lake is filled by rainfall and streams from the lake catchment. The largest stream is Elterwater Stream, which collects rainfall from more than half of the 1,600 hectares of lake catchment before flowing into the lake at the northern end. More than 90 dams within the lake catchment reduce the amount of rainfall run-off available to fill the lake. Most of the dams are small and serve to supply stock water, but three larger irrigation dams also exist. The 2016 Kaikoura earthquake raised the southern outlet end of the lake, and therefore the lake is likely to retain water for longer periods in times of drought.

The most southerly river in the FMU is the Waima (Ure) River which rises in the Blue Mountain Range and flows in a southerly direction until reaching the Chalk Range. Here, it changes to a more easterly direction until it reaches the coast south of Needles Point, just north of Wharanui. For much of its 30 kilometre length the river flows through limestone landscapes, with high cliffs and gorges, until its lower reaches where its bed widens and becomes braided. Several smaller tributaries join the river along its length, the largest being Dunsandel Creek, while Isolation Creek is a well-known small stream which flows through the spectacular Sawcut Gorge. Much of this landscape was affected by the 2016 Kaikoura earthquake.

Lake Elterwater

Historic and current land use

Before human settlement, the East Coast Complex FMU was covered with forest which included totara, black beech, mahoe and matai. Human arrival led to land clearance by fire, with nearly all the trees destroyed by the time European settlers arrived. Fire continued to be used for vegetation clearance. As a result, only small areas of native vegetation remain in the natural shelter of steep slopes, primarily in the upper catchments.

The FMU also contained large areas of harakeke/flax, particularly in the Flaxbourne catchment, which gave the area its name. These have all but disappeared, together with wetland areas around Lake Elterwater. In the 1850s to the 1870s the area was home to one of the first and largest pastoral stations, Flaxbourne Station, which was 23,000 hectares in size and ran over 70,000 sheep.

Today, the land use is still dominated by pastoral farming with beef cattle joining sheep. Small areas are also used for cropping and viticulture especially in the lower parts of catchments.

Urban areas

The largest urban area in the East Coast Complex FMU is Ward, the southernmost township in Marlborough. The town is a small rural service town on State Highway 1 with a school and service station with café. In the 1850s to 1870s the area was part of the Flaxbourne Station. However, this was later split up by the Government and the town was established in 1905, with the railway line arriving in 1911. Today, the wider area has a dispersed rural population with pastoral farming and some viticulture as the dominant land uses.

Banded kōkopu

Flora and fauna habitats

The FMU contains small remnant areas of native vegetation, particularly in steep valleys and in the upper gorges of the area, which contain plant species that have become rare in South Marlborough. These include lowland totara, leafless clematis, lancewood, ongaonga, and red rock daisy. Across the FMU, fish habitats are present for the banded kokopu, common bully, upland bully, bluegill bully, giant bully, īnanga, longfin eel and shortfin eel. Lake Elterwater provides bird habitats for pied stilts, dabchick, crested grebe, shags, paradise shelduck, grey teal and other waterfowl, with other areas of the FMU providing habitats for banded dotterel, black shag and New Zealand scaup and marsh crake.

Surface water quality

Currently, two monitoring sites are located within the East Coast Complex FMU for surface water quality, one located on the Flaxbourne River at the quarry near the river's mouth and the second on the Waima (Ure) River at SH1 bridge.

For the Waima (Ure) River, all measurements are above national bottom lines as detailed in the NPSFM. However, because of the river flowing through a limestone area, water quality is characterised by high pH and conductivity.

For the Flaxbourne River, ratings for periphyton, E. coli and Macroinvertebrate Community Index are in the D category, which is below national bottom lines as detailed in the NPSFM. To better understand the water quality in the catchment, a more detailed study was undertaken in August 2022 that found degraded water quality was a widespread problem in the catchment. This was attributed to livestock access to the river, resulting in direct nutrient inputs and elevated turbidity from sediment due to bank erosion. This was combined with a lack of shading riparian vegetation, especially in the lower reaches.

Water quality monitoring for Lake Elterwater started in 2021 and has now been added to the State of the Environment monitoring programme in 2022. The initial monitoring results showed that the health of the lake is severely impacted, with several parameters below the NPSFM national bottom line. These include total nitrogen and total phosphors concentrations as well as concentrations of E. coli and chlorophyll-a. Concentrations of E. coli are likely a function of rainfall events, lake volume (dilution capacity) and the number of birds present on the lake.

The table shows the 2019 results for seven surface water parameters (attributes) that are currently monitored for rivers, and the results as classified under the NPSFM 2020.

The NPSFM provides limits for attributes, which define bands ranging from A to D/E. The A-band represents healthy ecosystems, while attribute states in the D and E bands are referred to as “below the national bottom line”. Unless caused by natural sources, attribute states below the national bottom line are considered unacceptable.

Monitored parameters Monitoring Site Name	Periphyton	Ammonia	Nitrate	E. Coli	MCI *	ASPM **	Dissolved Reactive Phosphorus
Flaxbourne River	D	A	B	D	D	C	B
Waima (Ure) River	B	A	A	A	C	B	A

*Macroinvertebrate Community Index - NPSFM State 1

**Macroinvertebrate Average Score per Metric - NPSFM State 2

Groundwater

Local groundwater resources in the Blind River catchment are limited, and most crop irrigation water is either imported from the neighbouring Awatere River catchment or represents spring runoff that has been intercepted and captured in earth dams. A thin, discontinuous shallow riparian aquifer exists associated with alluvium overlying the papa-rock mudstone basement. This small natural reservoir provides baseflow for wetlands, Blind River, and freshwater flow into the coastal estuary. Where the alluvium is thin, the water appears as the river. In thicker parts, the river flow is lost to groundwater and the river dries up. This is frequent during summer months and explains why the flow is intermittent along its length.

Similarly, no large aquifers have been found for the Flaxbourne catchment, which is mostly formed of bedrock with limited alluvium to store water. Even less is known about the Waima (Ure) catchment. Groundwater and surface water are essentially the same within the alluvial gravels, and flows move between the ground and the surface depending on local conditions. Recharge of these alluvial aquifers is from rainfall. While there is continual flow in the headwaters, flow becomes ephemeral in the middle and lower reaches where the natural steep grades of these rivers means that water drains more quickly than it is replenished. Consented takes for irrigation of groundwater have existed in the lower reaches of these catchments for some years. Recent irrigation-related investigations have, however, identified a moderate groundwater resource in the coastal reach of these catchments.

Council has a permanent flow recorder site on the Flaxbourne River and a groundwater level recorder on Needles Creek downstream of State Highway 1. Since the 2016 Kaikoura earthquake, there have been no measurements of groundwater quality or chemistry in these catchments, but these are planned to recommence in the future.

Water quantity

Demand for water within the East Coast Complex FMU was historically low as large-scale dryland farming was the predominant land use. However, this has changed since the early 2000s when viticulture began expanding into the area. For areas around Blind River and Lake Grassmere, domestic and stock water supply is provided by the Awatere's Black Birch Scheme. Wells into the shallow groundwater within alluvium provide the other source of water on the coastal lowland terraces for pastoral farming, viticulture, and the Ward community supply. There is a limited amount of water abstracted from the Waima (Ure) River for the irrigation of vineyard and pasture.

Freshwater challenges

The key challenges for freshwater in this FMU relate to its land use and its dry, warm climate. Water supply is critical in the area due to prolonged and serious droughts, combined with a lack of significant aquifers. Other challenges relate to the predominately pastoral land use with livestock accessing waterways, resulting in turbidity and excessive nutrients. When combined with high water temperatures and lack of riparian vegetation, this can lead to excessive periphyton growth and elevated E. coli levels, which has been found to be the case in the Flaxbourne catchment.

East Coast Complex FMU quick facts

FMU area = 673 km2

Approximate total river/stream length = 1,658 km

Main river(s) = Blind River, Flaxbourne River and Waima (Ure) River

Mean annual rainfall average range = 500 to 1,170 mm

Water quality monitoring sites = Flaxbourne River at quarry, Lake Elterwater at jetty, Waima (Ure) River at SH1 bridge

Swim spot monitoring sites = None

River flow monitoring sites = Flaxbourne River at Corrie Downs, Waima (Ure) River at Blue Mountain

Overall surface water quality = Marginal to Fair

Groundwater aquifers = None

Groundwater quantity = Unknown

Water take / use consents = 55 / 86

Municipal supply urban centres = 1 (Black Birch Scheme)

Water storage dams (stock & irrigation) = 1,146

Significant wetlands (currently identified) = 84

Land use zoning = Pastoral – 79.3%, Viticulture – 9%, Open Space – 7.2%, Urban – 3.9%, Forestry – 0.6%

As further information becomes available through future investigations and monitoring the details on FMU pages will be updated.

Marlborough Sounds Complex

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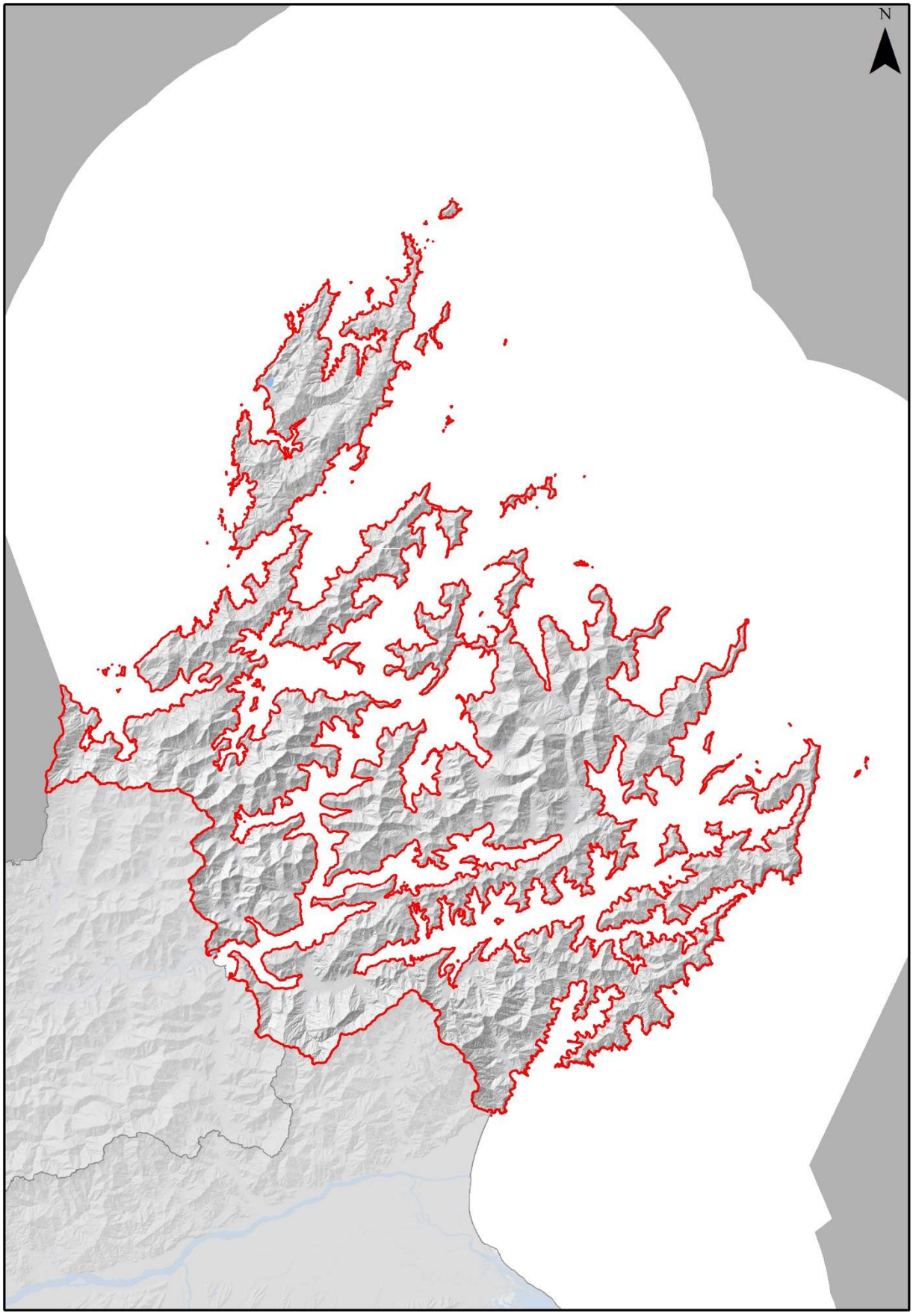

Proposed Marlborough Sounds Complex Boundary

The Marlborough Sounds Complex Freshwater Management Unit (FMU) is a grouping of catchments that flow into the Marlborough Sounds, Cook Strait, and Tasman Bay. The area has an extensive coastline, roughly equating to one-tenth of New Zealand's coastline. The FMU encompasses the northeast part of Marlborough with the Te Hoiere/Pelorus and Wairau FMUs to the west and south, respectively. Tectonic activity has had a significant influence on the Marlborough Sounds with regional subsidence leading to the drowning of the original river valleys, which now form the Sounds. The remaining land above the sea level represents what was originally the top of mountains. This has resulted in steep-sided catchments, and short rivers and streams. Today, the highest point is Mount Stokes at 1,203 metres, and the largest catchments are found in the Linkwater, Picton/Waikawa and Kenepuru Head areas. The main urban centres in the FMU are Picton/Watohi and Waikawa. The remainder of the population is dispersed throughout the FMU, primarily in the inner sounds of Queen Charlotte Sound/Totaranui and Pelorus/Te Hoiere Sound.

Explore the proposed FMU boundaries

Climate

The climate of the Marlborough Sounds is characterised by prevailing west to northwest winds with frequent gales. Rainfall is reliable with a southwest-northeast gradient, where there is a higher mean average annual rainfall of 2,000mm in the southwest that declines to 900mm in the far outer reaches of the north-eastern sounds. Summers are generally warm, and winters are mild.

Geology and soils

The geology of the Marlborough Sounds FMU is complex. The basement rocks in the west are dominated by argillite and igneous conglomerates, with some areas of ultramafic "Mineral Belt" rocks and volcanics. The centre is primarily greywacke and argillite, and the east is dominated by schists. These are arranged in belts or strips along a northeast-southwest axis.

The area is home to steep land soils that have formed from the parent rocks and include fragmented debris flows of soils downslope. Many soils are highly erodible with clay content of over 60%. Generally, the soils are moderately fertile, but in the higher rainfall areas they have been leached and are infertile. In the ultramafic (mineral belt) areas, concentrations of metallic minerals create soils that can inhibit plant growth.

Graham River

Bodies of water

The regional subsidence in the Marlborough Sounds has resulted in the drowning of the original river systems, which used to flow southwards connecting with the Pelorus River at Havelock and then flowing through the Kaituna Valley to join the Wairau River. The resulting landscape is dominated by steep to very steep hill and mountain slopes, sea cliffs, rocky shorelines, and islands.

There are many unnamed streams and creeks in the FMU, and the largest catchments are in the south. The exception is Kenepuru Stream, which is located more centrally, rising on the southern side of Mount Stokes. The Kenepuru catchment is not typical of the Marlborough Sounds as the river meanders over a wide alluvial floodplain for much of its length. The river is steeply incised in some places, and during the summer months the lower sections can run dry. Over half the catchment is in native bush and scrub with pastoral farming on the lower slopes and valley.

The most easterly of the larger river catchments is Linkwater, which is a low-lying alluvial plain of around 5 kilometres in length. It separates the head of Queen Charlotte Sound/Totaranui and the Mahakipawa Arm of the Pelorus/Te Hoiere Sound. The largest river in this area is Cullen Creek, which flows from the northern side of the Richmond Ranges and west into Pelorus/Te Hoiere Sound. Its catchment is an equal mix of native and exotic forestry in the upper reaches with dairying in the lower reaches. The western side of the Linkwater plain has two streams, Duncan and Ada streams, which also flow north from the Richmond Ranges and enter into the head of Queen Charlotte Sound/Totaranui. Like Cullen Creek, these streams' upper reaches are dominated by native and exotic forestry with dairying in the lower areas.

The Waitohi River and the Waikawa River flow through the urban centres of Picton/Waitohi and Waikawa, respectively. The Waitohi River rises on the northern slopes of Mount Robertson and has a steep upper catchment dominated by native forest and regenerating bush. It flows north through urban Picton in its lower reaches before reaching Picton Harbour. The Barnes Dam is in the upper catchment and serves as part of the water supply for the town. Similarly, the Waikawa River rises at Piripiri between Mount Robertson and Mount McCormick and flows north through native forest and regenerating bush in the upper catchment and the urban area of Waikawa in the lower reaches before reaching Waikawa Bay. Both the Waitohi and Waikawa Streams have a special place in the rohe of Te Ātiawa. A 2018 report provides further information on the history and cultural significance of these streams and an assessment of water quality in the two catchments.

Read the 2018 report on Waitohi and Waikawa Streams

The most westerly of the larger river catchments is the Graham River, which rises to the southeast of Mount McCormick and flows northwards into Whatamango Bay on the south side of Queen Charlotte Sound/Totaranui. Its catchment is dominated by native forest and scrub with pastoral farming in the lower reaches. Rainfall is moderate to high in the catchment, which has resulted in flash flooding.

Freshwater along the Queen Charlotte Track

Photo by MarlboroughNZ and BareKiwi

Historic and current land use

The Marlborough Sounds have a long history of human influence, with Māori travelling through the area centuries before the first Europeans arrived. At this time, the area was covered with extensive beech forests and bush, while Māori inhabited the sheltered waterways that were rich with food.

European discovery of the area began in the late 1770s with three visits from Captain James Cook. In 1828, Te Atiawa migrated from Taranaki and established the settlement at Waitohi. The following year, the New Zealand Company began its surveying for colonisation, and exploration of the Sounds continued. In 1850, land at Waitohi was purchased from Te Atiawa and Picton was established.

Early industries included whaling, logging, mining, and farming. The first whaling station was set up in the Sounds in 1820, but it wasn't until 1911 that the whaling industry really began. It peaked in the 1960s but only continued for another four years due to falling prices and foreign competition. Gold exploration in 1873 led to the discovery of antimony in Endeavour Inlet. Mining began in 1874 and became one of the largest industries in the area until its closure in 1908.

The late 1800s also saw significant land clearance for pastoral farming through logging and fire. By the 1910s, more than two-thirds of the Sounds had been cleared. In the 1930s, plantation forests began to be established on the steep land that was not suitable for farming. Many farms were also surrendered to the Crown at this time and are now in reserves.

Although there are still areas of plantation forestry and pastoral farming in the Sounds today, much of the area's higher elevations and steeper slopes are covered in regenerating native bush. The area's most significant industries include tourism and marine aquaculture.

Picton foreshore

Urban areas

Picton/Waitohi and Waikawa are the main urban centres in this FMU, situated towards the head of the Queen Charlotte Sound/Totaranui. Picton/Waitohi is built around a sheltered harbour and is the South Island base of the Cook Strait ferries that link the North and South Islands. Today, the town provides a tourism hub and a gateway to the Marlborough Sounds, hosting both local and international visitors including cruise ships. To the northeast of Picton is Waikawa and Waikawa Bay, which also open onto Queen Charlotte Sound/Totaranui. Waikawa also provides access to the Sounds with one of largest marinas in New Zealand.

Picton's main water supply is bore water drawn from an aquifer at Speeds Road in the Wairau FMU. In summer, this supply is supplemented by treated water from the Essons Valley. The Essons Valley water supply comes from a stream-fed source, a tributary of the Waitohi Stream, and is held by Barnes Dam. However, it can have quality problems during the summer if the stored water stratifies and algal growths are allowed to bloom.

Outside of these centres, the population is dispersed through the Sounds with residential properties primarily located at the heads of bays and along the roads. The more populous settlements are in the inner Sounds along Grove Arm of Queen Charlotte Sound/Totaranui—including Ngakuta Bay and Anakiwa—and across the Sound in Lochmara Bay, Double Cove and Bay of Many Coves. Similarly, the Mahakipawa Arm of the Pelorus/Te Hoiere Sound has many properties along Queen Charlotte Drive. Many of these communities have water supply systems that are operated by residents, using water from streams, wells, and roof run-off.

The native Maud Island frog is a threatened species

Flora and fauna habitats

The Marlborough Sounds are an important habitat for both terrestrial and aquatic species. The well-known species include the king shag, blue penguin and Hector's dolphin, but there are many other threatened species such as the giant land snails, giant weta, skinks and gekos, and Hamilton's and the Maud Island frogs.

Fish habitats are present throughout the FMU for a variety of species, including banded, shortjaw and giant kokopu; several types of bully, including common, bluegill, upland, giant and redfin; habitats for both shortfin and longfin eel; as well as inanga, koaro and dwarf galaxis. In the Kenepuru area, common smelt are present and torrent fish have been found in several Sounds streams.

Common wetland birds are ducks, paradise shelduck and pukeko, but also found in the area are banded rail, marsh crake and Australasian bittern. Islands and peninsulas in the area provide for predator-free native wildlife sanctuaries and reserves. These include the 'mainland island' sanctuary of Kaipupu situated at Kaipupu Point between Port Marlborough and Shakespeare Bay, as well as Maud and Motuara Islands.

While most of the original vegetation was cleared, much of the land is regenerating back to native bush. Weed pests are an issue with wilding pines being a visually prominent one for which there is active work to poison these trees and prevent further spread.

Surface water quality

Five sites for water quality monitoring are located within the FMU, and another site at Ngakuta Bay Stream will be added soon. The most recent water quality index shows that three of the sites have a fair index grade, while the remaining two, Linkwater Stream and Waitohi River, have a marginal score. Assessment against the NPSFM standards show that for all sites E. coli is an issue with levels below the national bottom line. Conversely, all sites are in the A grade for nitrate and ammonia with the remaining attributes all above national bottom lines.

E. coli concentrations can reach very high levels during rainfall when faecal material from livestock is washed from paddocks into nearby streams. This can occur after relatively small rainfall events, particularly when the ground is dry. For the Linkwater catchments, the lower flats are covered in pasture, which is mainly grazed by dairy cattle. However, additional monitoring as part

of a catchment study in 2016/17 showed that small areas of unfenced beef pasture were also a significant contributor to elevated E. coli concentrations.

There are 10 sites that monitor bathing water quality in this FMU, reflecting the recreational importance of the Marlborough Sounds area. All these sites are in popular bays with estuaries, so results can be affected by riparian sources. Of the 10 sites, the long-term trend for four sites is good, five sites are graded as fair, and Ngakuta Bay is poor. An additional monitoring site is being established on Ngakuta Bay Stream to help determine what is causing this poor water quality.

The table shows the 2019 results for seven surface water parameters (attributes) that are currently monitored for rivers, and the results as classified under the NPSFM 2020. The NPSFM provides limits for attributes, which define bands ranging from A to D/E. The A band represents healthy ecosystems, while attributes in the D and E bands are referred to as “below the national bottom line”. Unless caused by natural sources, attributes below the national bottom line are considered unacceptable.

Monitored parameters Monitoring Site Name	Periphyton	Ammonia	Nitrate	E. Coli	MCI *	ASPM **	Dissolved Reactive Phosphorus
Cullen Creek	N/A	A	A	D	C	B	C
Linkwater Stream	N/A	A	A	D	B	B	C
Waitohi River	C	A	A	D	B	B	B
Graham River	B	A	A	D	C	B	B
Kenepuru River	N/A	A	A	D	C	B	B

*Macroinvertebrate Community Index - NPSFM State 1

**Macroinvertebrate Average Score per Metric - NPSFM State 2

Groundwater

There are no significant groundwater aquifers in the Marlborough Sounds FMU, which is a function of both the area’s geology and its formation as drowned river valleys. The largest aquifer in the region is located in the Linkwater area, which is a low-lying alluvial plain of 5 kilometres in length that separates the head of Queen Charlotte Sound/Totaranui and the Mahakipawa Arm of the Pelorus/Te Hoiere Sound. Due to the natural downwards tilting of the region to the north, the creeks and streams flowing north into the Linkwater area have more extensive catchments, wider valleys, and higher flows than those flowing south. This has determined the way the aquifer has formed and is thought to be alluvium of up to 100 metres thick. The Linkwater Aquifer is unique amongst the Marlborough Sounds catchments as it lacks a perennially flowing river and has two seaward coastal

boundaries. Drilling in the area showed that around 50,000 years ago, the area was a lake. Groundwater is also known to exist in the Picton/Waitohi area, but it has never been found in sufficient quantities to warrant a commercial supply.

Water quantity

The requirement for water takes are not on the scale of the Wairau FMU, but there are still a number of water takes in the area. These are primarily from creeks and streams for community domestic supplies for residences and visitor accommodation. Seven of these schemes supply greater than 25 households, including schemes based in Okiwi Bay, Anakiwa, Ngakuta Bay and Belview Bay. However, within the Linkwater catchment water is also used for pasture and crop irrigation.

Freshwater challenges

One of the key challenges for freshwater in this FMU relate to elevated contaminants in the waterways, particularly E. coli levels. There are many factors that influence the amount of faecal material and other contaminants washed into rivers and streams, including activities relating to stock, urban environments, and poorly performing rural septic tank discharges. Sediment is also known to be a challenge, particularly in areas where deforestation has occurred of plantation forest. The geology combined with the steepness of catchments can result in high sediment input into marine environments through rivers and streams as well as though landslips and debris flows. Another challenge is the provision of domestic water for the larger urban areas of Picton/Waitohi and Waikawa, as well as the dispersed rural populations.

Marlborough Sounds Complex FMU quick facts

FMU area = 1,473 km2

Approximate total river/stream length = 2,618 km

Main river = No single large river, several smaller streams

Mean annual rainfall average range = 900 to 2,000mm

Water quality monitoring sites = (5) Cullen Creek at Road Bridge, Duncan Stream at Outlet, Graham River at Road Bridge, Kenepuru Stream at Kenepuru Head, Waitohi River at SH1

Swim spot monitoring sites = (10) Anakiwa, Governor's Bay, Mistletoe Bay, Momorangi Bay, Ngakuta Bay, Picton Foreshore, Robin Hood Bay East, Robin Hood Bay West, Waikawa Bay, White's Bay

River flow monitoring sites = None

Overall surface water quality = Fair to marginal

Groundwater aquifers = Linkwater

Groundwater quantity = Variable

Water take/use consents = 10/57

Municipal supply urban centres = Picton and Waikawa

Water storage dams (stock & irrigation) = 10

Significant wetlands (identified) = 113

Land use zoning = Open Space – 71%, Pastoral – 16%, Forestry – 10.5%, Urban – 2.5%, Viticulture – 0.03%

As further information becomes available through future investigations and monitoring, the details on FMU pages will be updated.

Te Hoiere / Pelorus - Marlborough District Council

Te Hoiere / Pelorus

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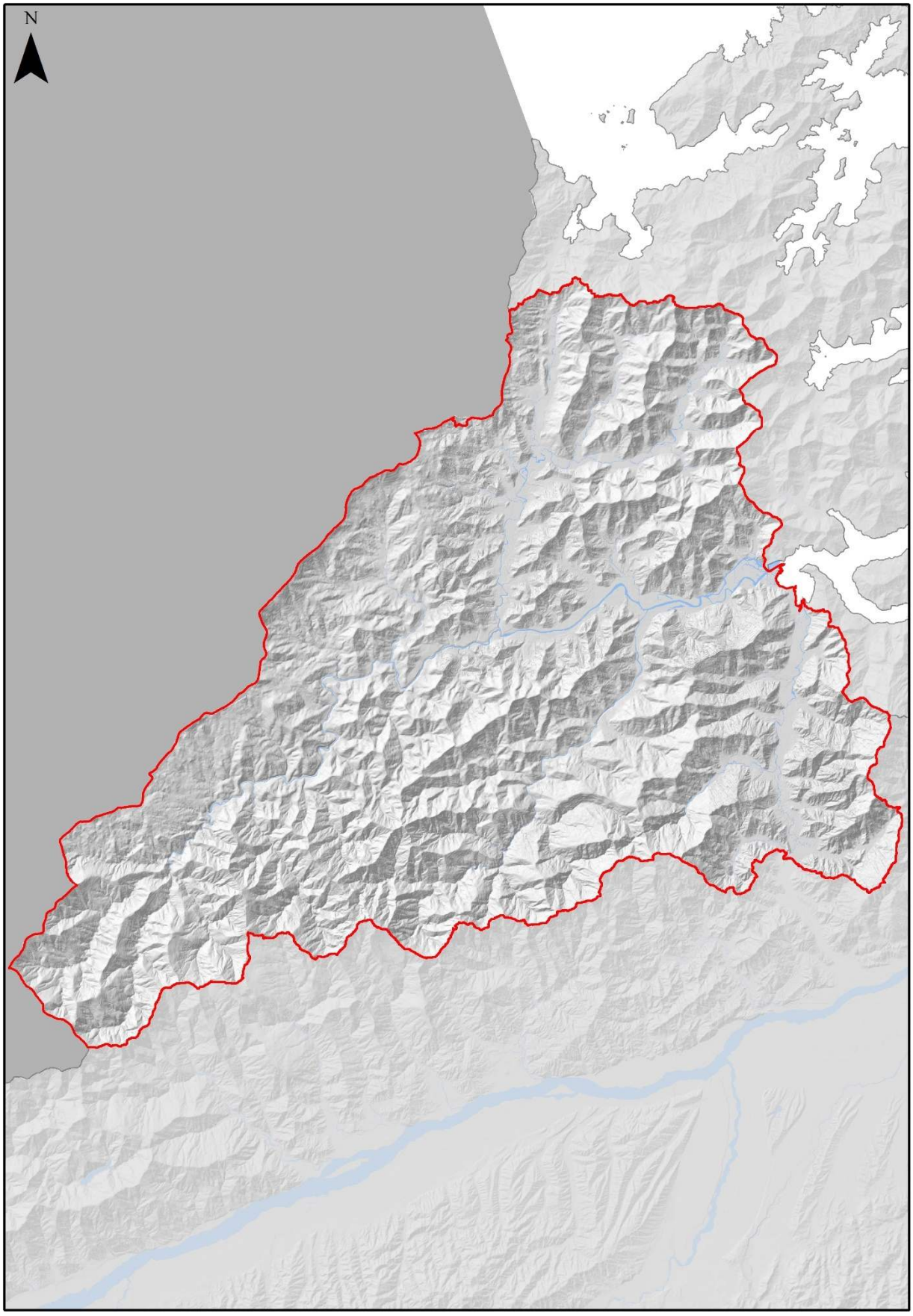


Proposed Te Hoiere/Pelorus FMU Boundary

The Te Hoiere/Pelorus Freshwater Management Unit (FMU) takes its name from the largest river in the catchment, the Te Hoiere/Pelorus River, and is 1,042 square kilometres in area, stretching over 45 kilometres from its south-westerly point in the Richmond and Bryant Ranges widening to the northeast to adjoin the Marlborough Sounds Complex FMU. The Richmond Range is the southern boundary of the FMU with the highest peak being Mt. Richmond (1,760m), while to the northwest the Bryant Range forms the boundary between the Marlborough and Nelson regions, with the Marlborough Sounds to the northeast. The rivers within this FMU all flow into the marine environment at the Motuweka/Havelock Estuary which is the largest in the Marlborough Sounds and is situated at the head of the Te Hoiere/Pelorus Sound.

A significant portion of the upper catchment area and river headwaters for the Te Hoiere/Pelorus FMU is covered in native bush while most development has occurred on the valley floors, primarily with farming and forestry activities on the lower slopes.

Explore the proposed FMU boundaries

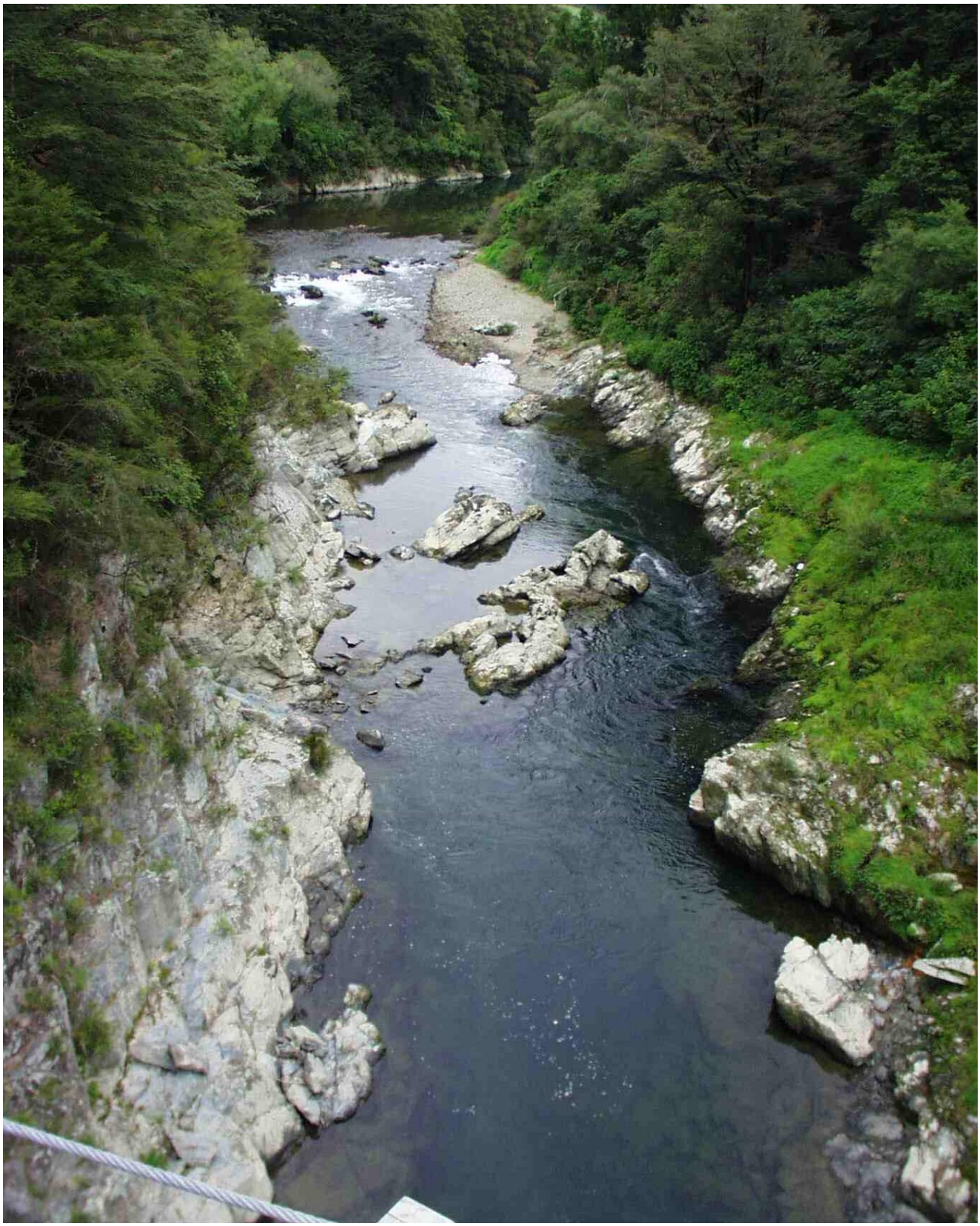
Climate

The climate of the Te Hoiere/Pelorus FMU is characterised by the highest annual rainfall in Marlborough, with annual rainfall across the FMU having been recorded as high as 2,650mm. Winters are generally cold and wet in the valleys with frosts, though the hills are warmer, while summer months are warmer but often still wet. The mean annual rainfall for the Te Hoiere/Pelorus FMU is 1,500 to 2,700mm and average monthly temperatures can range from below 5oC to above 20oC.

Geology and soils

Tectonic activity in the wider Marlborough Sounds area has had a significant influence on the Te Hoiere/Pelorus area. Tectonic tilting northwards of the Wairau Fault resulted in the uplifting of the Richmond Ranges and regional subsidence in the Marlborough Sounds area. For the Te Hoiere/Pelorus FMU, the consequence of the tilting has been the reversal of ancient river drainage patterns with the present-day Te Hoiere/Pelorus and Kaituna Rivers originally being tributaries of the Wairau River.

The Richmond and Bryant Ranges are comprised of greywacke and schist with argillite basement rocks, with greywacke in the valleys which has been overlain by alluvial sediments. These formed as outwash glacial terrace surfaces, which were subsequently excavated in the warmer Post Glacial period and have formed the modern-day floodplain system. These soils are highly erodible, with clay content up to 60 percent.



Rai River is a major tributary of the Te Hoiere/Pelorus River

Bodies of water

The Te Hoiere/Pelorus River is the longest river in the FMU rising in the Richmond Ranges in the southwest of the FMU and flowing in a north-easterly direction until its confluence with its major tributary, the Rai River, just to the east of Pelorus Bridge. The Rai River is situated in the north-eastern part of the FMU and flows directly south from its northern tributaries, the Ronga, the Tunakino and the Opouri Rivers which rise in the Bull Range. The Te Hoiere/Pelorus River then takes a more easterly path towards its entry into Te Hoiere/Pelorus Sound at the Motuweka/Havelock Estuary, with the Wakamarina River joining it at Canvastown.

To the southeast of the FMU, the Kaituna River flows north from its source near Mt Riley in the Richmond Range to its entry into Motuweka/Havelock Estuary to the eastern side of the Havelock township.

Recreation along the Te Hoiere/Pelorus River

Photo: MarlboroughNZ

Historic and current land use

Before the arrival of Europeans, the FMU was dominated by native beech and mixed beech and podocarp forest. Māori lived in coastal settlements in Te Hoiere/Pelorus Sound and would visit the area, camping on the riverbanks while hunting, undertaking some clearing for farming activities, exploring for stone materials, and travelling across the Marlborough – Nelson/Tasman region.

Since the arrival of Europeans, the land use in the FMU has been dominated by forestry and farming activities. From the early 1880s onwards, timber milling was the dominant industry with several sawmills and widespread land clearance and road building occurring. Clearance of the valley flats and lower slopes provided for the establishment of farming activities, and the first dairy factory opened in 1909. Gold was also found in the Wakamarina River in 1864 which led to a short gold rush. The miners' canvas camp founded the settlement of Canvastown and fuelled the growth of Havelock. In 1912 the Te Hoiere/Pelorus Bridge Scenic Reserve was proclaimed a reserve by Governor-General Lord Islington, which increased the area's popularity for recreation. This recreation has continued to the present day and resulted in the protection of a significant proportion of the original forest.

By the 1930s, farming of the hillsides declined due to erosion and soil fertility issues. Farms were converted to pine plantations, or the land was left to regenerate to native forests. Similarly, later years saw a brief resurgence in farming activities, but by the early 1980s widespread regeneration to native forest, or conversion to pine plantations occurred throughout the area.

Today, most of dairy farms in the Marlborough region are located on the valley floors within the Te Hoiere/Pelorus FMU and in particular Rai Valley, with plantation forestry dominating the lower valley slopes. The upper catchment areas are covered by native forests and bush providing popular recreational activities and associated tourism.

Havelock is the largest town in the FMU, situated at the head of the Motuweka/Havelock Estuary

Urban areas

Several small townships are located within the Te Hoiere/Pelorus FMU, the largest of which is Havelock at the head of the Motuweka/Havelock Estuary. Today, this town provides services to dispersed communities within the Te Hoiere/Pelorus Sound, tourists, and the local rural areas, with a marina, green lipped mussel processing factory and several cafes and restaurants. Continuing along State Highway 6 towards Nelson, the small centres of Canvastown and Rai Valley provide services to the wider dispersed rural communities.

Endemic long-tailed bat

Photo by Forest & Bird/Laura Keown

Flora and fauna habitats

The Te Hoiere/Pelorus FMU has high freshwater biodiversity values where 14 species of native freshwater fish have been recorded, including two 'Threatened' and seven 'At Risk' species. Several species of 'Threatened' and 'Data Deficient' freshwater invertebrates have also been recorded in the catchment. A population of the endemic long-tailed bat resides within the Te Hoiere/Pelorus catchment, and Forest and Bird have been actively involved in securing their protection for several years through an intensive predator control project centred at Pelorus Bridge.

Pygmy Button Daisy

The valley floors contain several important alluvial forest remnants – large podocarp and beech forests with a rich understory of broadleaf species. Several important and rare plants and animals are present throughout the catchment, including shovel mint, the Pygmy Button Daisy and giant land snails. The wetlands and estuary margins are home to an array of wetland birds, such as the banded rail and fernbird. The estuary is a wintering site for black-billed gulls and provides significant areas of seagrass habitat. Key threats to biodiversity values, ecosystems and taonga species include predation, weed incursion, habitat loss, land modification and climate change.

Surface water quality

Currently, seven surface water quality monitoring sites are located within the Te Hoiere/Pelorus FMU. Two are located on the Te Hoiere/Pelorus River, one on the Upper Te Hoiere/Pelorus at Kahikatea Flat, the other on the Lower Te Hoiere/Pelorus at Fishermans Flat. Four sites are located on the larger Te Hoiere/Pelorus tributaries of the Ronga, Opouri, Rai and Wakamarina Rivers, and the last site is located on the Kaituna River.

The most recent water quality index results used by the Council show the Upper Te Hoiere/Pelorus and Wakamarina Rivers having good water quality, the Lower Te Hoiere/Pelorus and Kaituna Rivers having fair water quality and the Opouri, Rai and Ronga Rivers showing poor water quality. The most significant parameters affecting surface water quality are elevated nitrogen, E. coli and dissolved reactive phosphorus levels, with more minor effects due to sediment.

Sampling as part of bathing water quality occurs at two sites on the Te Hoiere/Pelorus River, at Pelorus Bridge and Totara Flat as well as the Rai River at the Rai Falls. In the past five years, Pelorus Bridge monitoring has reported that for 96% of the time this location is suitable for swimming, while the Totara Flat site has been suitable for swimming 89% of the time. This difference is reflective of the Totara Flat site being below the confluence of the Upper Te Hoiere/Pelorus River and Rai River.

Explore the latest data from the recreational water quality monitoring programmes

The table shows the 2019 results for seven surface water parameters (attributes) that are currently monitored for rivers, and the results as classified under the NPSFM 2020. The NPSFM provides limits for attributes, which define bands ranging from A to D/E. The A-band represents healthy ecosystems, while attribute states in the D and E bands are referred to as “below the national bottom line”. Unless caused by natural sources, attribute states below the national bottom line are considered unacceptable.

Monitored parameters Monitoring Site Name	Periphyton	Ammonia	Nitrate	E-Coli	MCI*	ASPM**	Dissolved Reactive Phosphorus
Ronga River	A	A	A	B	C	B	B
Opouri River	N/A	A	A	A	B	B	B
Rai River	B	A	A	A	C	B	A
Upper Pelorus River	N/A	A	A	A	B	B	A
Wakamarina River	N/A	A	A	A	B	B	B

Lower Pelorus River	N/A	A	A	A	C	C	A
Kaituna River	B	A	A	B	C	B	B

*Macroinvertebrate Community Index - NPSFM State 1

**Macroinvertebrate Average Score per Metric - NPSFM State 2

Groundwater

The scale of groundwater resources in the FMU are small due to the mountainous topography of the area. Groundwater systems are riparian-type aquifers, formed by the alluvial gravels that fill the base of the river valleys. Due to their narrow extent, they have limited storage and rely on continual recharge from the associated rivers or streams and rainfall. It is likely that water moves back and forth between the aquifers and the rivers depending on the nature of the sediments and the gradient of the river reach. The Council operates a groundwater quality monitoring well at Rai Valley. As part of the Te Hoiere Restoration Project, a groundwater recorder will be established to observe levels and flows. To assist with our understanding of the catchment, a further six wells are also planned to be drilled in 2023 in the mid to upper reaches of the catchment to study groundwater quality and chemistry.

Water quantity

Historically most domestic and stock supply was provided by individual water wells. However recent demand for water has increased due to dairy farm and pasture irrigation requirements and further wells have increased the knowledge and understanding of the groundwater systems. Water pumped from bores is effectively considered surface water because most wells are shallow and located close to rivers or streams. As such wells pumped at high rates are reliant on continuous recharge from the rivers or rainfall.

Te Hoiere Restoration Project

Within the Te Hoiere/Pelorus FMU, the Te Hoiere catchment has been identified as an exemplar catchment as part of the Ministry for the Environment's *At Risk Catchments'* programme and by the Department of Conservation (DOC) as one of its *Ngā Awa* rivers. This project seeks to bring people together to carry out landscape-scale restorative actions to increase catchment health and put measures in place to prevent further degradation.

Learn more about the Te Hoiere/Pelorus Catchment Restoration Project

Explore the interactive catchment and cultural map of Te Hoiere/Pelorus

Freshwater challenges

The key challenges for freshwater in Te Hoiere/Pelorus FMU are nitrogen runoff through pasture leaching, E. Coli from stock access to waterways and run-off from pastures, and fine sediments eroded from the land during storm events washing downstream and deposited in the Motuweka/Havelock Estuary. Work by farmers, the Landcare Trust and Council has significantly improved water quality in the past 10 years. However, water quality in some parts of the FMU could still be improved. Careful management to reduce the environmental impact of farming and forestry activities will enable further improvements, and the Te Hoiere Restoration Project seeks to achieve this through strong community-led actions.

Te Hoiere/Pelorus FMU quick facts

FMU area = 1,042 km2

Approximate total river/stream length = 2,019 km

Main river = Te Hoiere/Pelorus River

Mean annual rainfall average range = 1,500 to 2,700 mm

Seven water quality monitoring sites = Ronga River, Opouri River, Rai River, Upper Te Hoiere/Pelorus River at Kahikatea Flats, Wakamarina River, Lower Te Hoiere/Pelorus River at Fisherman's Flat and the Kaituna River

Swim spot monitoring sites = Two sites along the Te Hoiere/Pelorus River, at Pelorus Bridge and Totara Flat

River flow monitoring sites = One site on the Rai River at Rai Falls

Overall surface water quality = Of the seven sites, two are classified as Good, two as Fair and three as Poor on the Water Quality Index used by the Council

Groundwater aquifers = Small, shallow riparian gravel aquifers

Groundwater quantity = Small, considered surface water

Water take/use consents = 67 / 62

Municipal supply urban centres = Havelock

Water storage dams (stock & irrigation) = 16

Significant wetlands (identified) = 73

Land use zoning = Open Space – 81%, Forestry – 10%, Pastoral – 9%, Urban – 0.01%

As further information becomes available through future investigations and monitoring the details on the FMU pages will be updated.

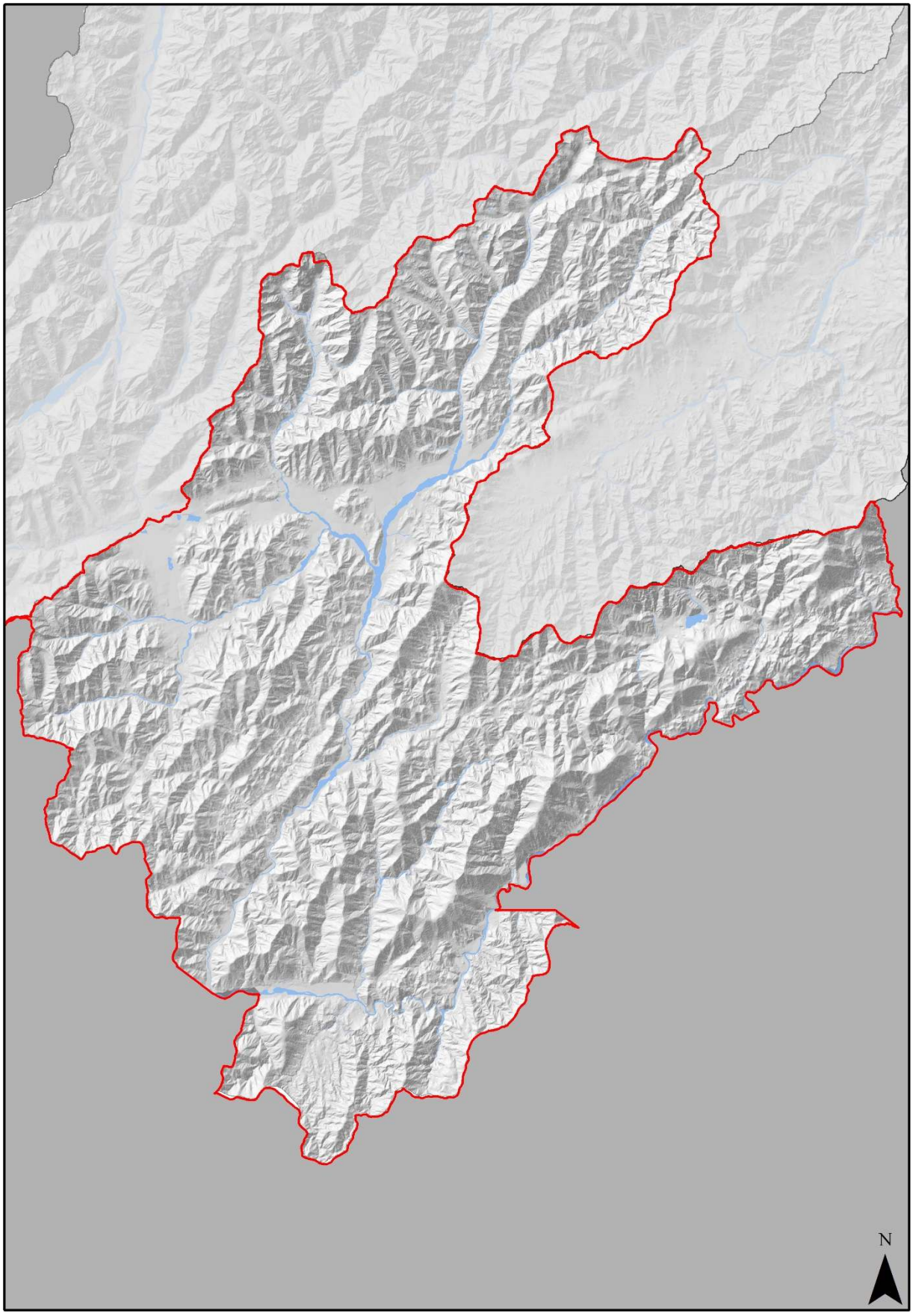
Waiau-toa / Clarence - Marlborough District Council

Waiau-toa / Clarence

On this page

- Urban areas
- Flora and fauna habitats

- Surface water quality
- Groundwater
- Water quantity
- Freshwater challenges
- Waiau-toa/Clarence FMU quick facts



Proposed Waiau-toa/Clarence FMU Boundary

The Waiau-toa/Clarence Freshwater Management Unit (FMU) is 1,545 square kilometres in area and takes its name from the largest river in the area, the Waiau-toa/Clarence River. The FMU only covers part of the Waiau-toa/Clarence River's 3,300-square-kilometre catchment, which traverses the Hurunui, Marlborough, and Kaikoura districts. The FMU is predominately mountainous terrain with the Boddington Range in the north and the Inland Kaikoura Range in the south—with peaks ranging from 1,145 metres to 2,149 metres. The FMU shares a northern boundary with the Wairau FMU, wraps around the western end of the Awatere FMU and shares a southern and western boundary with the Hurunui and Kaikoura.

Approximately 70 kilometres of the Waiau-toa/Clarence River's 230-kilometre length is situated in the Marlborough region. The Acheron River, a major tributary of the Waiau-toa/Clarence River, and its tributaries dominate the northern half of the FMU. The Acheron River flows from the north-eastern point of the FMU, in a south to south-westerly direction, to join the Waiau-toa/Clarence River on the southwestern boundary of the FMU. At this point, the Waiau-toa/Clarence River flows into the FMU from the west then continues in a north-easterly direction becoming the south-eastern boundary line of the FMU. Here, the Dillon River is the longest northern tributary of the Waiau-toa/Clarence, while the Hossack River its most southerly tributary.

A large proportion of the Rangitahi/Molesworth station, New Zealand's largest farm, is located within the Waiau-toa/Clarence FMU. The area has a long history of providing access routes between the West Coast, Nelson, Marlborough, and Canterbury regions. Passage across this mountainous region was found along the river valleys and through the open plains associated with the high plateau areas around Isolated Saddle and the Severn and Alma Rivers and Tarndale Brook, tributaries of the Acheron River. These areas also contain many of the lakes, tarns, and wetlands in the FMU.

Explore the proposed FMU boundaries

Climate

The Waiau-toa/Clarence FMU experiences a continental mountainous climate of extremes characterised by hot and generally dry summers and harsh winters. Average temperatures range from over 30oC in the summer to -10oC in the winter season, with over 250 frost days a year. Rainfall ranges from 670mm in the east to 3,000mm in west and snowfalls regularly occurring during the winter. The growing season is therefore very short, and soils and vegetation reflect these temperature extremes and the rainfall gradient.

Geology and soils

Greywacke and argillite mudstones that date to the Triassic and Jurassic Periods (135-235 million years) form the basement geology for the Waiau-toa/Clarence FMU. The valley floors and basins, filled with glacial and outwash gravels, have subsequently been overlain by river-borne gravels and silts. Transecting the FMU are several major fault lines which have resulted in mountain uplift and more recent tectonic activity triggering landslides and rockfalls. Glaciation has also shaped the landscape with moraines, glacial outwash plains, hanging valleys and waterfalls, tarns and steep sided valleys and mountain peaks.

Soils are primarily greywacke derived. In western areas with higher rainfall, soils tend to be older and relatively infertile, while more fertile younger soils are found on eastern terraces and flood plains in lower rainfall areas

Lake McRae

Bodies of water

While the FMU takes its name from the Waiau-toa/Clarence River, located in the south of the FMU, the longest river in the FMU is the Acheron River. Rising in its headwaters near the Acheron Saddle in the northeast of the FMU, the Acheron River flows 60km south – southwest to its confluence with the Waiau-toa/Clarence River at the southwestern boundary of the FMU. The Acheron River has several major tributaries, the Saxton and Severn Rivers in the north, the Alma River and Tarndale Brook joining from the west and the Yarra and Guide Rivers and Five Mile Creek in the south.

The upper reaches of the western tributaries of Tarndale Creek and the Alma River are characterised by a plateau some 1000m in altitude, which extends east towards the Acheron River. A series of lakes, tarns and wetlands known as the Tarndale Lakes are in this expansive area, which include Bowscale Tarn, Lake Sedgemere and Island Lake, draining towards the Acheron River.

To the southeast of the FMU the Dillon River is the longest tributary of the Waiau-toa/Clarence River in this part of the FMU. Along with Blinkers Stream, Rough Creek, Elliot Stream and Spray Stream, the Dillon River joins the Waiau-toa/Clarence River from the north. Another northern tributary, Red Hill Stream marks the far eastern edge of the FMU and the regional authority boundary between Marlborough and the northern Kaikoura Districts. Also, on this northern side of the Waiau-toa/Clarence River, is Lake McRae which formed when two large landslides dammed the valley at the end of the last ice age about 15 thousand years ago. The lake is 42 metres deep and covers an area of 67 hectares, sitting at an altitude of 883 metres. Two tributaries of the Waiau-toa/Clarence River join the river from the south, the Hossack River and Tinline Creek.

Acheron accommodation

Historic and current land use

Prior to European settlement, Māori used the area extensively to travel between the West Coast, Nelson, Marlborough and Canterbury through the passes and extensive river valleys and plains. Ngāi Tahu used the established trails for food gathering as well as access between the west coast, where pounamu (greenstone) could be sourced, and the east coast.

With the arrival of Europeans, farming became established in the 1850s. The early European pioneers were shown the routes by Māori, and European settlers subsequently used the established trails to drive stock through the area from Nelson and Marlborough to markets in Canterbury. The discovery of gold in the South Island in the 1860s further added to the number of people travelling through the area. In the early 1860s, a chain of dwelling places serviced travellers and included accommodation houses at Tophouse, Rainbow, Tarndale and Acheron.

Between the late 1860s and early 1930s, extensive sheep runs were established in four high country stations: Tarndale, Molesworth, St Helens and the Dillon Run. However, by the late 1930s the stations were suffering from loss of vegetation and severe erosion caused by rabbits, overgrazing of sheep, and repeated burning of tussock. In 1938, run holders surrendered the unproductive land and the Crown took possession of three runs and combined them into one station, Molesworth Station. In 1949 Dillon Run was added, and gradual land improvement was beginning to occur through active management, including rabbit control, revegetation and replacements of sheep with cattle.

In the 1950s and 1960s two roads were established through the area to enable the construction and maintenance of power lines. The Hamner to St Arnaud Road was built in the 1950s to supply the Nelson and Buller regions, while the Acheron Road was built in the late 1960s to enable installation of the high-voltage cable that connects the North and South Islands.

Today, Molesworth is administered by the Department of Conservation, with Landcorp Farming Limited responsible for farming operation under a lease agreement that respects the property's outstanding conservation and recreation values as well as the working farm.

Urban areas

Despite the long history of human activity, there are no urban or rural settlements in the Waiau-toa/Clarence FMU. The only people who live in the area are 10 or so farm personnel, although up to 50 working dogs and 80 horses are resident. Most people accessing the area do so for recreational purposes using the access provided by the roads. Activities include fishing, hiking, walking, biking and just passing through the vast area in the car from Nelson or Blenheim to Hamner. Several of the original accommodation houses from the 1860s have gone, but the Acheron Accommodation House and Molesworth Cob Cottage at the eastern entrance to Molesworth (located in the Awatere FMU) are registered with the New Zealand Historic Places Trust and can be visited. Today, there are several Department of Conservation huts throughout the area where visitors can rest and take shelter.

Banded dotterel

Flora and fauna habitats

The Waiau-toa/Clarence FMU supports a wide variety of important flora and fauna. It has one of New Zealand's most diverse lizard faunas including the nationally endangered scree skink and spotted skink. Several species of large giant weta and speargrass weevils can also be found.

The area provides valuable habitat for many birds, particularly in the summer where breeding occurs on the braided riverbeds and in the shrublands. Species include black-fronted terns, New Zealand falcon, kea, yellow-crown kakariki, New Zealand pied oyster catcher and banded dotterel, as well as high populations of tomtits, robins, rifleman and brown creeper.

The lakes, tarns, and wetlands within the FMU provide excellent habitat for land-locked native fish species, members of the bully and galaxiid families, with many unique to Marlborough.

Vegetation reflects the mountainous nature of the FMU and the east-to-west rainfall gradient. Gravel field and scree communities along with tussock grasslands and shrublands are found in the dryer east. In the wetter western areas, red tussocks and remnants of mountain beech forest can be found, with manuka and kanuka shrublands regenerating in historically burnt areas. The lakes, tarns, wetlands also contained a multitude of moisture-loving plants.

Clarence River

Surface water quality

There are currently no water quality monitoring sites in the Waiau-toa/Clarence FMU due to its remoteness. However, to give effect to the NPSFM, there is work being undertaken to assess sites that could be used for NPSFM monitoring purposes with a focus on site representativeness of the FMU and the east – west rainfall gradient. The Waiau-toa/Clarence River is currently monitored by Environment Canterbury (ECan) and the Marlborough District Council will be working with ECan in relation to this monitoring.

Groundwater

Knowledge of groundwater in the Waiau-toa/Clarence FMU is limited, but the geology of the area prevents extensive aquifers like those of the Wairau. Some water is likely to be stored in the glacial and outwash gravels and river-borne gravels and silts in the valley floors and basins.

Water quantity

There is presently minimal demand for water abstractions within the Waiau-toa/Clarence FMU. Farming requires water for stock, which is provided for by the rivers. There are only two take consents for the FMU, which use water for wilding pine control.

Freshwater challenges

The Department of Conservation is undergoing a review of the Conservation Management Plan for Rangitahi/Molesworth Recreation Reserve. A public survey was undertaken in July and August 2022, which in part looked to identify the key challenges facing the area. The topics of public concern were focused on public access, farming, hunting, pests and invasive vegetation management, and protection of rivers, lakes and wetlands. The balance between farming, recreational access and activities, and pest and weed management will all have important implications for freshwater management in this FMU.

Learn more about the review of future management for Rangitahi/Molesworth

Waiau-toa/Clarence FMU quick facts

FMU area = 1,543 km2

Approximate total river/stream length = 2,907 km

Main river = Waiau-toa/Clarence

Mean annual rainfall average range = 700 to 2400 mm

Water quality monitoring sites = None

Swim spot monitoring sites = None

River flow monitoring sites = None

Overall surface water quality = Unknown

Groundwater aquifers = None

Groundwater quantity = Unknown

Water take/use consents = 2 / 1

Municipal supply urban centres = None

Water storage dams (stock & irrigation) = 7

Significant wetlands (identified) = 232

Land use zoning = Open Space – 98.1%, Pastoral – 1.89%, Forestry – 0.01%.

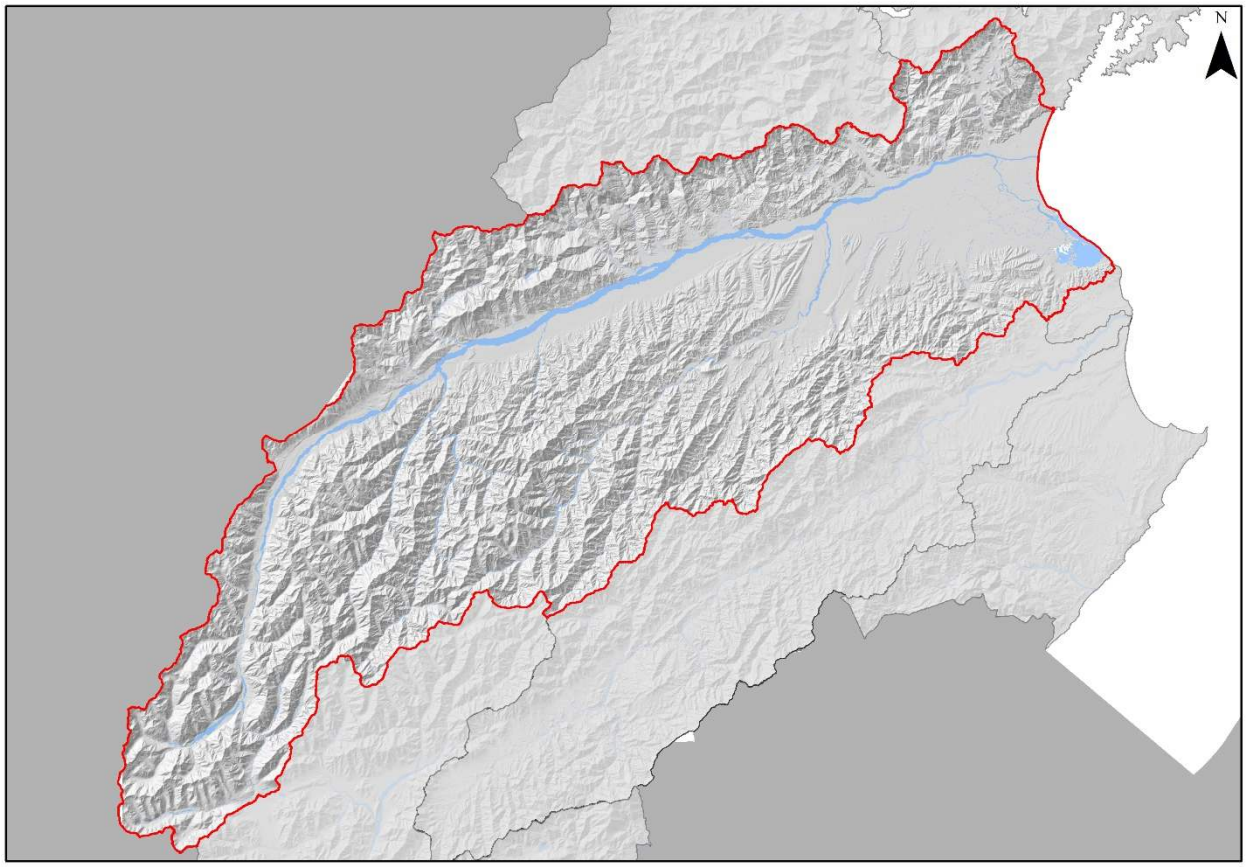
As further information becomes available through future investigations and monitoring, the details on the FMU pages will be updated.

Wairau - Marlborough District Council

Wairau

On this page

- **Historic and current land use**
- **Urban areas**
- **Flora and fauna habitats**
- **Surface water quality**
- **Groundwater**
- **Water quantity**
- **Freshwater challenges**
- **Wairau FMU quick facts**



Proposed Wairau FMU Boundary

The Wairau Freshwater Management Unit (FMU) is defined by the catchment of Marlborough's largest river, the Wairau River. The river's catchment is some 4,187 km2 and encompasses about one-third of the district's land area. The FMU extends the full length of the region from the western mountainous region through to the east, reaching the coast at Cloudy Bay. To the north are the Te Hoiere/Pelorus and Marlborough Sounds Complex FMUs. To the south are the Waiau-toa/Clarence and East Coast Complex FMUs. The Wairau River has many tributaries. Those to the north flow relatively short distances from the Richmond Ranges to join the river on the Wairau Plain, while the tributaries to the south are generally longer flowing from the Raglan Ranges.

The upper catchment is dominated by native bush, while the middle reaches have plantation forestry on the lower slopes with pastoral farming in the valleys. Moving further down the catchment, the valley widens into the Wairau Plain where agricultural land use is dominated by viticulture. The Wairau Plain has extensive groundwater aquifers that are essential for providing water to the agricultural sectors, as well as for drinking water and commercial/industrial uses. To the southeast of the FMU is the extensive Wairau Lagoons, which are both ecologically and archaeologically significant in the region. The Wither Hills also make a prominent southerly backdrop to Blenheim and are widely used for recreation.

The FMU contains the largest urban centres in the district, Blenheim and Renwick, which are located on the Wairau Plain in the east of the FMU. In addition to a dispersed rural population throughout the FMU, it is home to several smaller settlements—Grovetown, Tuamarina, Spring Creek, and Wairau Valley. The area has two airfields, which take advantage of the wide open plain, Blenheim airport which shares runway facilities with RNZ Air Force Base Woodbourne and the private airfield at Omaka Aerodome. There are also two hydroelectric power schemes within the FMU located on two of the Wairau River's tributaries, the Branch and the Waihopai Rivers.

Explore the proposed FMU boundaries

Climate

The climate of the Wairau FMU is characterised by a wet climate for those tributaries located on the north bank of the Wairau Valley, while the south bank tributary catchments have a dry climate. There is also a distinct west to east rainfall gradient from the mountainous western upper catchment which can experience high mean annual rainfalls from 1,500 to 2,500mm, down to the east coast where mean annual rainfall can be as little as 650mm. Summers in Blenheim are warm and dry; while winters are generally sunny, frosts are common. Inland temperatures are generally several degrees cooler and the number of frost days increases.

Geology and soils

Tectonic activity has had a major influence on the geology of the Wairau. Northwest tilting of land between the Wairau and Awatere faults has resulted in the main tributaries of the Wairau River being on the southern side of the Wairau Valley. Most of the geology in the catchment is greywacke and argillite with the lower reaches having extensive alluvial deposits laid down by the Wairau River and its tributaries from erosion of the inland mountain ranges during glacial periods. To the south-eastern side of the FMU are the Wither and Redwood Hills which were also formed from tectonic movements consisting of underlying gravel conglomerates topped by extensive wind-blown Wairau loess greywacke, which is highly erodible.

Soils on the Wairau Plain reflect this geological history with loess and more developed soils on the older alluvium terraces, with less well-developed soils on the younger redeposited terraces. The lower valley also contains organic floodplain deposits. To the east of State Highway 1, the soils occur on geologically recent sand dunes, gravel beach ridges, alluvium, and saline estuarine deposits.

Upper Wairau River

Bodies of water

The Wairau River is some 170 kilometres long, rising in the Spenser Mountains to the south of St Arnaud at a height of over 2,000 metres. Initially, the river flows north for around 50 kilometres before flowing northeast along the Wairau Fault for the remainder of its length and reaching the sea at Cloudy Bay on the edge of the Cook Strait. In its upper reaches, it is confined in a gorge with rapids. As the valley widens, the river becomes increasingly braided in its middle reaches. These middle reaches of the Wairau are known to be of importance for the recharge of the Wairau Aquifer and are the subject of a five-year study into braided rivers being undertaken by several councils and Lincoln Agritech.

Learn more about the Wairau Aquifer Project

In its lower reaches below the State Highway 1 bridge, the river divides into two. The tidal, meandering main channel flows in a south-easterly direction, past Grovetown Lagoon, before feeding the Wairau Lagoon area and discharging into the sea at the Wairau Bar. The second channel flows through the Wairau Diversion, built in the 1963 to reduce flood levels, which provides a more direct route east to the coast.

Grovetown Lagoon is an ox bow lake formed where the loop of the Wairau River has been cut off. Although it has been highly modified, it is one of the largest remaining areas of natural value on the Wairau Plain, with areas of open water, swampy ground, springs and adjoining land. Work is underway to restore the lagoon, which is highly valued by local iwi and communities.

Learn more about the Grovetown Lagoon Restoration Project

Branch River

Southern Wairau River Tributaries

The first major southern tributary of the Wairau River is the Branch River, which flows nearly 40 kilometres north through mountainous country to its confluence with the Wairau River. Part of the Branch River's catchment includes the Leatham River, which is of a similar length. Both rivers have headwaters with subalpine habitats, being replaced by beech forests until close to their confluence with the Wairau where plantation forestry occurs. Monitoring at the Branch River has shown it has the second-highest water quality in the region. The lower Branch River is the location of one of the hydro-electric power stations in the region

with water diverted from the river and into Lake Argyle, which was constructed as a storage reservoir in the early 1980s. The water passes through the two power houses before joining the Wairau River through a canal system.

Between the Branch River and the next major southern tributary of the Wairau, the Waihopai River, there are several small tributaries including the Wye River, Hillersden Stream and the Marchburn River. These are generally characterised by steeper gradient headwaters in the hill country, which decrease as the tributaries make their way across the Wairau Plain to join with the Wairau River.

The largest southern tributary of the Wairau River is the Waihopai River. Rising towards the southwest of the FMU, near the Acheron Saddle, it flows for 60 kilometres in a northeast direction to join the Wairau River just west of Renwick. The river is similarly confined by areas of gorges in its upper reaches but becomes braided in its lower reaches. The Spray River and the Avon River are significant tributaries of the Waihopai, joining it from the eastern side of the catchment. The Waihopai River and its tributaries experience varied rainfall across their catchments, which can be over 2,000mm in the headwaters to less than 800mm in the lower reaches. This results in variable river flows and high turbidity during high flows. The river is also known for the first hydro-electric scheme in Marlborough, which began operation in 1927 and still operates today. Due to the active erosion by the river, the original lake that built up behind the dam is now filled with gravel and shingle with regular maintenance required to keep the sluice gates free of material. The dam forms a barrier to sediment movement to the lower Wairau River catchment, contributing to falling riverbed levels there.

East of the Waihopai, the remaining southern Wairau tributaries include the dry southern valley catchments of the Omaka, Fairhall and Taylor Rivers which flow northeast from headwaters in the hills across the Wairau Plain. All these rivers are characterised by significant dry periods each year due to water loss from natural groundwater recharge. These tributaries flow into the Ōpaoa River, which flows in an easterly direction through the northern part of Blenheim before joining the Wairau River close to the Wairau Lagoons. The Taylor River is also worth a separate mention, as in 1965 the Taylor Dam was built on the river and remains the largest earth flood protection dam in New Zealand. Prior to the dam, Blenheim was often flooded due to the river levels rising rapidly during heavy rain events.

The lower Wairau Plain also has many springs that are the main conduit for groundwater leaving the area. The system is highly complex and has been highly modified since European settlement. Examples of these include Spring Creek, which is the largest emergence of groundwater in the Wairau Plain where crystal-clear water emerges in a series of springs near Hammerichs Road. The more southerly expression of these springs form the base flows for the Taylor River upstream of the High Street Bridge.

Rainbow River

Northern Wairau River Tributaries

On the northern side of the Wairau River, there are also several significant tributaries. The Rainbow River is the mostly westerly of these, rising to the north of the Wairau River and joining it just upstream near the turn off to Rainbow Ski Field Road. The next most significant northern tributary is the Goulter River, which has the highest water quality in the region with a catchment that is highly natural. It rises in the Richmond Ranges near Lake Chalice, which was formed by a landslip around 2,000 years ago and dammed the river. The lake is around 2 kilometres long and 200m wide and has no outlet. However, water seeps through the landslip and into the river, which flows counterclockwise around Mount Patriarch to join the Wairau River.

Between the Goulter River and the confluence of the Waihopai with the Wairau River, there are several north bank rivers flowing from the Richmond Ranges over short distances into the Wairau. These include Top Valley Stream, Timms Creek, Fabians and Bartletts Creek, and the Ohinemahuta Creek. The upper catchments of these rivers are dominated by native bush with increasing plantation forestry on lower slopes the further east travelled.

There are three main rivers on the lower banks of the Wairau Valley—Are Are Creek, Waikakaho River and Tuamarina River. All three of these rivers have catchments that are dominated by plantation forestry on the hills and pastoral farming in the valleys. The Tuamarina River runs through Para Swamp, a large wetland that contained kahikatea and totara in pre-colonial times, which supported large numbers of birds and fish as important Māori food sources. Due to its geomorphology, the swamp was impractical to drain and so survives today. However, willows planted to stop flooding resulted in the decline of native habitat. In recent years, there have been efforts to restore native vegetation with Fish and Game poisoning most of the willows.

Today, Taylor Dam is a popular recreation area

Photo by MarlboroughNZ

Historic and current land use

Like much of Marlborough, the Wairau FMU was dominated by native forest, bush, wetlands, swamps, and lagoons prior to European arrival. However, the area was well used and populated by Māori with its rich food sources. Archaeological evidence suggests the Wairau Bar and Wairau Lagoons were where some of the earliest humans arrived in New Zealand around 800 years ago with ongoing occupation since that time.

In the early 1840s, Europeans had begun to arrive in New Zealand. The Wairau Plains were a substantial area of flat land at the top of the South Island and pressure to survey land led to conflict, known as “The Wairau Incident”, between the Māori owners and the New Zealand Company who were undertaking land surveying. With increasing populations, clearing of land by fire and drainage of the wetlands/swamps, grasslands became a more dominant part of the landscape. Pastoral sheep farming became the major industry in the late 1800s, particularly with the advent of refrigerated ships at the turn of the 20th century and the rise of the meat industry.

Blenheim was founded in 1850. In the early days, it was known as Beavertown as both the Wairau floodplain and the town experienced at least one damaging flood every decade since European settlement. In 1855 an earthquake in the North Island resulted in sufficient subsidence of the Wairau Lagoons to enable navigation of the lower Wairau and Opaoa Rivers by ships leading to substantial trading with the North Island. Despite intensive river work carried out from 1877 to 1902, damaging floods continued until the Wairau River Board was established in 1920s. The board began a comprehensive plan for the rivers of the floodplain, raising stopbanks, widening the floodway and groyne construction. In 1956 to 1989 the Marlborough Catchment Board took over and further works were undertaken, including the Taylor Dam, the Wairau Diversion and extensive stopbank upgrading.

Cropping was prominent in the region with oats, barley, and peas. During the war years, flax was grown and milled to support the linen trade. After the war, land use on the Wairau Plains began to diversify with further cropping, market gardening and orcharding of pip and stone fruits. The 1950s saw a resurgence of pastoral farming with wool becoming profitable and dairying increasing. In 1973, the first vineyard was planted by Montana. Since that time, there has been a steady change of land use on the Wairau Plain from orcharding, market gardening and pastoral farming to viticulture. In 2000, there was 1,850 hectares of vines, which has increased to 18,590 hectares in 2021. Vineyards now cover most of the Plain, moving west up the Wairau and Waihopai Valleys. Today, the Wairau is the largest winegrowing area in New Zealand, and the region’s biggest industry which also supports a significant tourism industry as well.

The Taylor River near Blenheim’s CBD

Photo by MarlboroughNZ

Urban areas

Blenheim is the largest urban centre in Marlborough and is located towards the eastern side of the Wairau FMU. To the west are the settlements of Renwick and Wairau Valley, and to the north are the settlements of Grovetown, Spring Creek, Tuamarina and Koromiko situated along State Highway 1 towards Picton. There are also some smaller residential enclaves at Rarangi, Fairhall and

Woodbourne. The airport and RNZ Air Force Base Woodbourne is located between Renwick and Blenheim in the centre of the Wairau Plain which holds a significant number of Base personnel. There is also a dispersed rural population located close to the major roads along the Wairau and Waihopai Valleys and scattered across the Wairau Plain. These rural populations become sparser moving west up the valleys. South of Blenheim, off State Highway 1, are the industrial areas of the Riverlands and Cloudy Bay Business Parks where most of the industry is located for the region.

White-faced heron

Flora and fauna habitats

The Wairau FMU supports many areas for riparian, fish, bird, and invertebrate habitats. Examples include black flounder in Are Are Creek, along with common, redfin and upland bully, inanga, lamprey, longfin and shortfin eels and koura. Dwarf galaxias and their spawning areas are found in Barletts Creek and alpine areas; dwarf and northern flathead galaxias are found in the Branch River. The springs support banded and giant kokopu, freshwater mussels and the largest population of the indigenous *Potomogeoton cheesemannii* (red pondweed) on the Wairau Plains. The upper Wairau areas provide a feeding habitat for black-fronted terns, while the coastal Wairau provides bittern and waterfowl habitats. Within Lake Chalice is a scientifically important landlocked population of kaoro. Grovetown Lagoon provides a substantial bird habitat for the grey duck, Australasian shoveler, New Zealand scaup, paradise shelduck, kotuku, pukeko and white-faced heron. The Northbank rivers also support torrentfish and bluegill bully, while the lower Ōpaoa has yelloweye and grey mullet.

Much of the upper Wairau catchment is covered in beech forests. However, little native vegetation remains on the Wairau Plains. One significant area is the Rarangi wetlands, which are a series of wetland-filled troughs situated between dry post-glacial beach ridges parallel to the coast. These extend inland from the coast for some four kilometres, and a range of specialist plants and animal communities are associated with both the wet and dry environments.

The confluence of the Wairau River with the Branch and Goulter Rivers

Surface water quality

Seventeen sites for monitoring surface water quality are located within the Wairau FMU. The most recent water quality index results used by the Council show that four of these sites have a good index grade, six have a fair grade and eight are considered marginal. Assessment against the NPSFM attributes show that all sites have an A grade for ammonia. Similarly, all but Mill Creek, which has a B grade, are also A grade for nitrate. Meanwhile, E. coli grades are variable across sites, with Goulter and Branch Rivers showing A grades. These rivers have catchments that are predominantly native vegetation with low sources of faecal contamination. At the other end of the scale, are sites that are below the national bottom lines—Mill Creek and Taylor River with D grades and Doctor's Creek with an E grade. Similarly, attributes of Dissolved Reactive Phosphorus, Macroinvertebrate Community Index, and Macroinvertebrate Average Score per Metric also show variability in results across monitoring sites, but at least one site in the FMU contains a D grade. The main causes of degraded water quality in the FMU are livestock access to waterways and

erosion, leaching from cattle pastures, cropping, and potentially from the establishment of new vineyards. Urban and semi-urban areas are also a source of contaminants through damaged sewage infrastructure.

Learn more about surface water monitoring

Four sites are monitored for recreational bathing water quality in the Wairau FMU. The first is located on the Waihopai River at Craiglochart. Over the past five years, it has been suitable for swimming 84% of the time, while 8% of the time it was unsuitable. This site has a very poor grading for long-term E. coli. The Wairau River has two monitoring sites, one at the Blenheim Rowing Club and the other at Ferry Bridge. Both sites have long-term, E. coli grades of fair with the sites suitable for swimming around 93% of the time and unsuitable 4% of the time. The last site is located on the Taylor River at Riverside Park and has poor grading for long-term E. coli. Monitoring has shown that over the past five years swimming here was suitable 53% of the time and unsuitable 18% of the time. The high E. coli concentrations in the lower Taylor River are known to have been caused by earthquake damage to sewerage and stormwater infrastructure. Council has an ongoing repair programme that should decrease E. coli levels in the coming years.

Explore the latest data from the recreational water quality monitoring programmes

The table shows the 2019 results for seven surface water parameters (attributes) that are currently monitored for rivers, and the results as classified under the NPSFM 2020.

The NPSFM provides limits for attributes, which define bands ranging from A to D/E. The A band represents healthy ecosystems, while D and E bands are referred to as “below the national bottom line”. Unless caused by natural sources, attribute states below the national bottom line are considered unacceptable.

Monitored parameters Monitoring Site Name	Periphyton	Ammonia	Nitrate	E. Coli	MCI*	ASPM**	Dissolved Reactive Phosphorus
Upper Wairau	N/A	A	A	A	B	B	A
Goulter River	N/A	A	A	A	A	A	A
Branch River	N/A	A	A	A	B	B	A
Mill Creek	N/A	A	B	D	C	B	C
Mid Waihopai	N/A	A	A	B	C	B	B
Lower Waihopai	N/A	A	A	B	C	B	A
Ohinemahuta River	A	A	A	B	B	B	A

Are Are Creek	B	A	A	D	C	B	C
Lower Wairau	N/A	A	A	A	D	C	A
Tuamarina River	N/A	A	A	A	D	D	C
Omaka River	C	A	A	A	C	B	A
Mid Ōpaoa River	N/A	A	A	C	D	C	A
Doctors Creek	N/A	A	A	E	D	D	D
Murphys Creek	N/A	A	A	A	D	C	C
Taylor River	N/A	A	A	D	N/A	N/A	C
Lower Ōpaoa River	N/A	A	A	A	N/A	N/A	C
Spring Creek	N/A	A	A	B	D	D	B

*Macroinvertebrate Community Index - NPSFM State 1

**Macroinvertebrate Average Score per Metric - NPSFM State 2

Groundwater

The Wairau FMU contains the greatest number and most significant groundwater aquifers in the Marlborough region. The most important of these is the Wairau Aquifer, which underlies most of the northern Wairau Plain. This aquifer does and has received the greatest focus in the region as most of the water used by Blenheim and its hinterland for agricultural irrigation, industrial processing, and municipal and stock supplies are sourced from this aquifer. There are more than 20 other identified aquifers in the FMU. Some of these are riparian aquifers, such as the Are Are Creek gravels and the Waikakaho River gravels, which eventually feed into the Wairau River system. Other aquifers have been identified as being separate to the Wairau Aquifer and include the Benmovern, Brancott, Omaka, Omaka River and Taylor River Aquifers. Towards the coast, there are the Coastal Wairau Plain aquifers, Riverlands and the Rarangi Shallow Aquifer. Due to the location of these aquifers adjacent to the coast, abstraction of water from these aquifers creates the potential for seawater intrusion and as such is closely monitored. Many of these aquifers are also the source of water supply for the local communities with domestic water supplied from shallow wells.

The Wairau FMU aquifers are of critical significance to the region and the Proposed Marlborough Environment Plan (PMEP) has a range of policies, methods and rules to protect these systems from overuse and contamination. Rules around use of the water in the Marlborough region have been in place for a significant period, over 30 years, but the demand for water has also increased over this period. The PMEP recognises that several aquifers are overallocated and need to be addressed—Wairau Aquifer, Benmorven, Brancott and Omaka Aquifer and Riverlands Aquifer. Recent work has altered the status of the Wairau Aquifer, but caution is still required to ensure our water resources are used in a way that safeguards the life-supporting capacity of these freshwater systems.

The details and characteristics of this FMU's aquifers are too many and varied to describe here, but further details on these aquifers can be found on the groundwater pages of the Council's website.

Learn more about aquifers in Marlborough

The quality of groundwater is also monitored by the Council through several programmes. Every quarter, State of the Environment sampling is carried out in 23 sites across the area and measures a range of chemical and physical parameters. Some of these sites are also sampled annually for microbes, isotopes and pesticides. Every summer, six coastal sites are sampled to monitor the coastal aquifers to ensure there is no saline intrusion. Every four years, since the early 1990s, the Council has also participated in the National Pesticide Survey co-ordinated by the Institute of Environmental Science and Research (ESR). This involves testing 20 sites for 58 herbicides, fungicides, and insecticides. This ongoing study has detected very few pesticides, and all below maximum allowable values in the Drinking Water Standards for NZ (2005/2018). The next round of sampling will be in late 2022 and will including PFAS monitoring. There has also been some monitoring of aquifer invertebrates to characterise the biological communities that inhabit aquifers, but this is still in its infancy.

Further details can be found on the Council's website for groundwater reports and special investigations pages.

Learn more about groundwater reports and special investigations in Marlborough

Water quantity

The upper mountainous part of the Wairau River has no surface or groundwater takes and is in a highly natural state. Most water takes are between the Branch River confluence and the State Highway 6 bridge, as well as the lower reaches of the Waihopai River catchment. Between the Waihopai River confluence and Wratts Road, there are also major losses to groundwater, the consequence of which is low river flows at State Highway 1 in dry seasons.

Two hydroelectric power schemes also affect water quantity in the FMU, located on the Branch and Waihopai Rivers. The Branch Power scheme located on the lower Branch River diverts water from the river and into Lake Argyle, before passing through two power houses. Water then discharges into the Wairau River about seven kilometres from the Branch River confluence. This causes significant variations in the Wairau River flow of up to 20% either side of daily mean flow.

Most of the water used in the area is taken from the multiple aquifers in the region and primarily the Wairau Aquifer. Council maintains 30 wells as part of Council's groundwater quantity network which record aquifer levels, water temperature and electrical conductivity for some wells near the coast.

Abstraction or take of water in the region is strictly controlled through PMEP rules. Small water takes for domestic and other uses are permitted as long as they do not exceed certain volumes in a particular period. Council consents are required for greater quantities, and there are detailed rules relating to specific rivers and aquifers for allocation volumes, flows and levels which must be maintained. These controls and rules have been in place for around 30 years and have assisted to prevent over allocation of most of the aquifers. As further science is undertaken, our knowledge and understanding of these aquifers continues to increase and, in the future, this may result in changes to allocation regimes.

Freshwater challenges

A key challenge for freshwater in this FMU is maintaining the balance between the flows and levels for the area's rivers and aquifers and the need for urban and agricultural supplies. An example of this is that monitoring over the past 30 years has shown that the Wairau Aquifer level has dropped by at least a metre. Originally, the cause was thought to be because of abstraction, but

the story is more complex than that with current research highlighting that other factors also have a significant effect. These include a reduction in land area for the river water to spread and seep into the aquifer due to improved flood control, gravel quarrying lowering the river channel relative to groundwater in some places. The Wairau River flows may have also changed.

Another challenge is ensuring that freshwater sources, both groundwater aquifers and surface waters, do not become contaminated through land use activities and the effect of past land use activities. Monitoring of surface water quality has also shown degradation has occurred in some areas caused by livestock access to waterways and erosion, leaching from cattle pastures, cropping and potentially from the establishment of new vineyards. Urban and semi-urbans areas are also a source of contaminants through damaged sewage infrastructure.

Wairau FMU quick facts

FMU area = 4,187 km2

Approximate total river/stream length = 8,749 km

Main river = Wairau River

Mean annual rainfall average range = 650 to 2,500 mm

Water quality monitoring sites = 17 across the FMU (See table under Surface Water Quality)

Four swim spot monitoring sites = Waihopai at Craiglochart, Wairau River at Blenheim Rowing Club, Wairau River at Ferry Bridge, Taylor River at Riverside Park

River flow monitoring sites = 22 across the FMU

Overall surface water quality = Ranges from good to marginal

Groundwater aquifers = Most significant is the Wairau Aquifer, over 20 other aquifers identified

Groundwater quantity = Four aquifers identified in PMEP as over allocated – Wairau Aquifer, Benmorven, Brancott and Omaka Aquifer, and Riverlands Aquifer

Water take/use consents = 1,374 / 1,226

Municipal supply urban centres = (8) Blenheim, Riverlands, Spring Creek, Renwick, Grovetown, Wairau Valley, Marlborough Ridge, Source for Picton

Water storage dams (stock & irrigation) = 1,430

Significant wetlands (identified) = 721

Land use zoning = Open Space – 62.6%, Pastoral – 17%, Forestry – 13%, Viticulture – 6.7%, Urban – 0.7%

As further information becomes available through future investigations and monitoring the details on FMU pages will be updated.

Have Your Say on Freshwater - Marlborough District Council

Have Your Say on Freshwater

From December 2022 to December 2024, Council is holding three consultation periods for the public to have their say on the future of freshwater across the district. This engagement will take place through online surveys, public events, and meetings. Anyone can take part in the engagement surveys, and hardcopies will be available from council offices, libraries and at public events. If you are a community, commercial or industry group and would like a meeting, please e-mail us at freshwater@marlborough.govt.nz to arrange a place and time.

The first round of engagement was focused on Freshwater Management Units (FMUs). Submissions opened in December 2022 and closed 30 June 2023 (extended from the original close date in February 2023). The aim of this round was to find out how we value freshwater in our region and what aspirations we have for this water both now and into the future. The proposal was to divide Marlborough's freshwater into six areas, which are grouped because they are a single catchment or group of catchments with similar characteristics. Results of the first round will be available later this year when the second round opens for submissions.

The interactive GIS map, accessed via the link below, will allow you to explore the Marlborough region and find out more detailed information about the proposed FMUs, such as surface water monitoring sites, wetland locations, rainfall and much more.

Explore the proposed FMU boundaries

Your opportunity to comment

The Government's National Policy Statement for Freshwater Management 2020 requires councils to identify, through community and tangata whenua engagement, the values, visions, and aspirations for freshwater in the region. The findings of this engagement will be used to guide freshwater management.

During the first round of submissions, Council provided the public with an online survey and map-based survey, as well as hardcopies of submission forms at Council offices and libraries. Public outreach included industry meetings, community meetings, library displays and activities for youth, and stalls at public events. Ways to make a submission and community meetings organised by Council were advertised in newspapers, social media and Antenno over a seven-month period.

If you missed the first round of submissions or want to know more about the process and next steps, please contact us:

Policy Team
Freshwater Management
Marlborough District Council
15 Seymour Square
PO Box 443
Blenheim 7240
Email: freshwater@marlborough.govt.nz

Alternatively, the following recorded webinar is available, which explains the Government's freshwater rules and Council's obligations under these rules.

If you want to make a submission on the second and third round of submissions, check back to this page later this year. We will also announce submission periods in the newspapers, Council's Facebook page, Antenno and Marlborough Matters.

Learn more about Antenno here

Sign up for Marlborough Matters here

Timeline of public engagement

View a more comprehensive outline of the timeline:

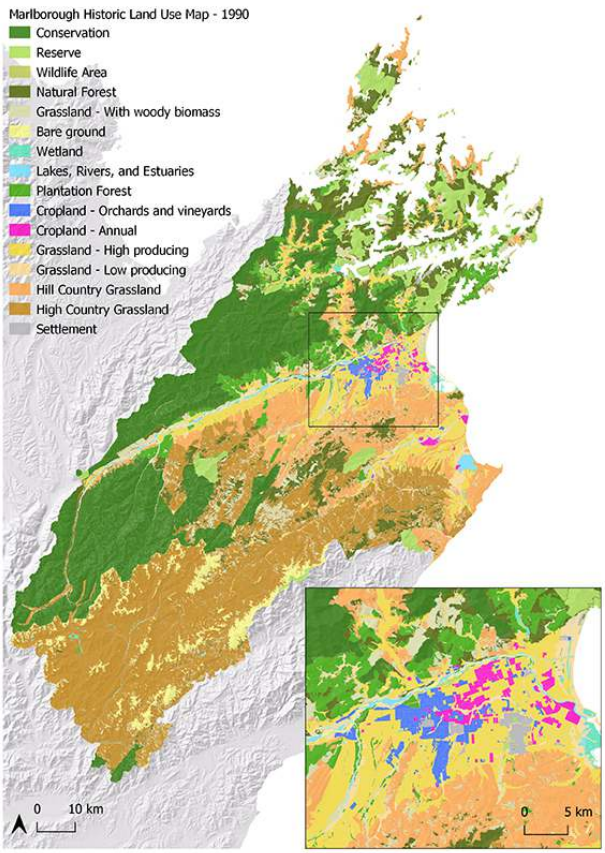
- NPSFM Timeline of Public Submissions (PDF, 117.1KB)

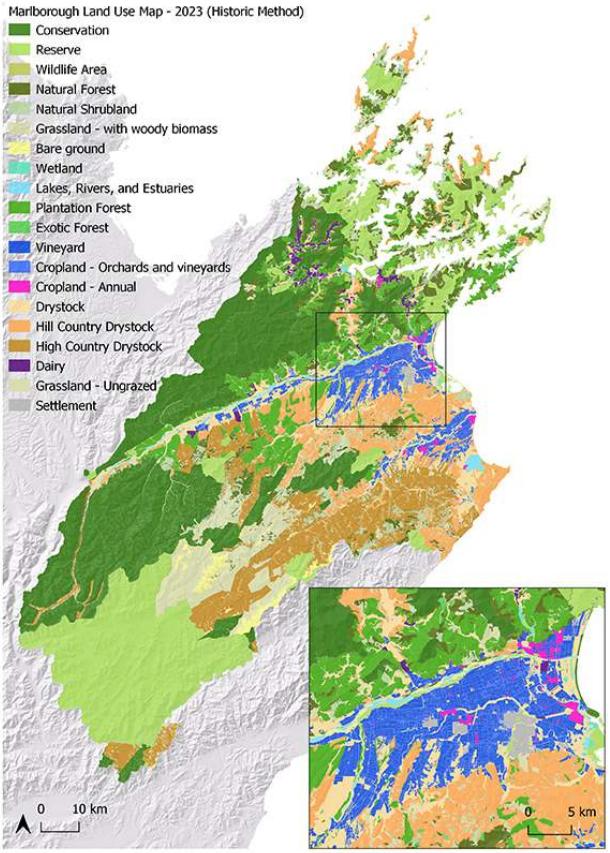
Marlborough's Freshwater - Marlborough District Council – This is not the original text as further changes were made in late September 2023

Marlborough's Freshwater

Water is central to life in Marlborough—from agricultural landscapes to recreational swimming holes and Mahinga Kai. However, changing landscapes and land uses are the most important factors influencing water quality and quantity, particularly changes away from natural landcover.

Prior to human settlement in New Zealand, most of the country was covered in forests. Since the arrival of humans, there has been a systematic clearance of these forests and as a result many of our waterways are no longer pristine. In Marlborough, much of the North and West remains in native vegetation, particularly at higher altitudes. Native forest, scrub and tussock still cover over 40% of the region. However, most of the river flats have been cleared of native vegetation and are now used agriculturally. Nearly 30% of the region has been converted to pasture with the majority used to graze sheep and beef. The region's growing viticultural landscape is mainly located on the Wairau Plain and the lower Awatere River, but vineyard development has moved further up through river valleys and into other areas of the region.





The three largest rivers in the Marlborough region are the Te Hoiere/Pelorus in the northwest, the Wairau River in the central part of the region and the Awatere River in the south. The Wairau River has the largest catchment and cumulatively the largest flow of all rivers in Marlborough, spanning the region from the mountains of the St Arnaud Range in the west to the Pacific Ocean in the East. There is also a striking variation in rainfall across Marlborough. The district is located on the eastern side of the South Island, where large parts of the region are in the rain shadow of the Southern Alps. The greatest rainfall (more than 2 metres a year) falls in the Te Hoiere/Pelorus catchment and around the upper reaches of the Waihopai River. The opposite extreme can be found in some areas along the East Coast and in the lower river flats of the Awatere River catchment. The total annual rainfall in these parts of the region is less than 600mm, making the East Coast catchments some of the driest places in NZ. Although the Awatere River catchment is approximately twice the size of the Te Hoiere/Pelorus catchment, the mean flow in the Awatere River is considerably less. During late summer, the eastern parts of the Awatere dry up completely.

Council has a network of rain, climate and river flow monitoring sites across the district.

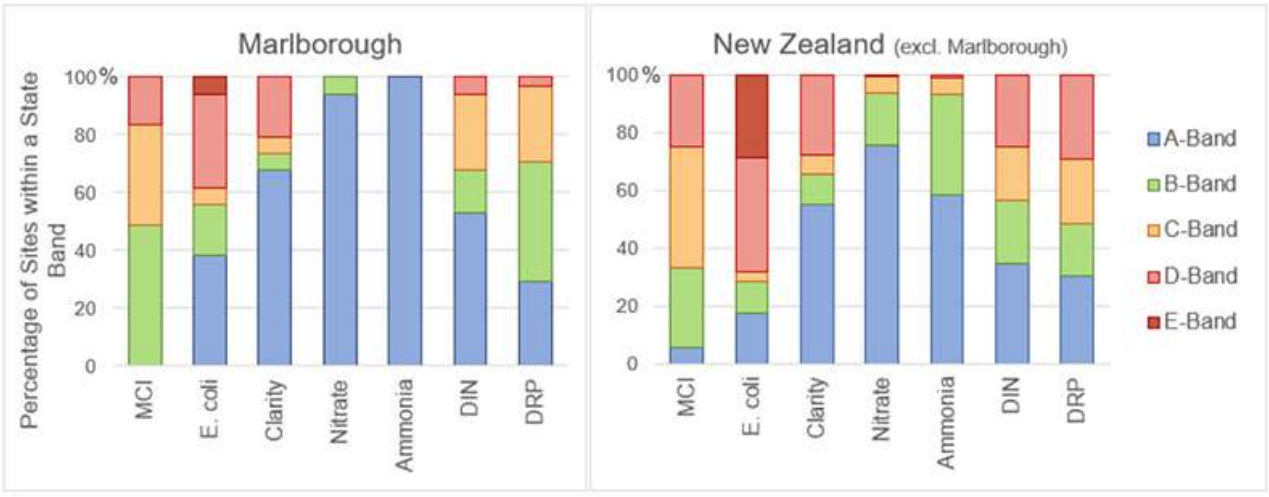
Learn more about monitoring sites

Surface water

Marlborough's surface water quality is assessed as part of the State of the Environment monitoring programme, which is reported annually and based on catchments. Currently, physical and chemical parameters are measured at 35 river sites across Marlborough monthly. Diffuse pollution has been found to be the biggest threat to Marlborough's water quality with poorer water quality noted in more intensively developed areas.

Learn more and view the Surface Water Quality SoE Reports here

The latest 2023 Surface Water State of the Environment reporting has been recently completed, utilising data from 2018-2022. This has resulted in more up to date NPS-FM attribute states analysed across the region. Comparing NPS-FM states for sites within Marlborough and the rest of New Zealand reveals that Marlborough boasts comparatively good river health. The percentage of sites with states in the A or B- band is higher for the Marlborough Region across all attributes, as shown in the chart below.



While most rivers are showing good or fair water quality, there are several waterways with indices in the marginal category. A slight improvement has been observed at five sites in recent years, while seven sites have shown an increase in nitrogen concentrations caused by higher rainfall and greater leaching. Except for the middle section of the Awatere River, all rivers in the marginal category are listed in the Marlborough Environment Plan as degraded or at-risk from degradation.

The Council has been successful in securing central government funding for several projects that aim to improve water quality in waterways that are degrading or at-risk of degradation:

- Catchment Care Programme
- Te Hoiere/Pelorus Catchment Restoration Project

In many cases the main cause of degraded water quality comes from several key sources, such as contamination with sewage from damaged infrastructure in urban areas. It also comes from septic tanks in rural areas, livestock accessing waterways, sediment from erosion and leaching of nitrogen from some agricultural land uses.

In terms of recreational water use, Council undertakes weekly sampling of the most popular rivers and beaches during the summer months. This sampling looks at bacteria levels as indicators of water quality for safe swimming. Of the eight river sites monitored, half of the sites have recently shown fair to good states. The remainder are graded poor to very poor when data from previous monitoring seasons is combined to determine the state of recreational water quality according to the NPSFM. Unsafe levels are generally caused by surface run-off as a result of rainfall.

Learn more and view the latest recreational water quality results

Learn more about surface water in Marlborough's rivers and wetlands

Groundwater

Marlborough has several groundwater aquifers, with the most significant located beneath the Wairau Plain. In other areas of Marlborough, groundwater is less prominent either because the local geological structure does not naturally store water or there is no significant source of recharge.

Almost all water used by Blenheim and its hinterland is for crop irrigation, industrial processing, municipal and stock supply is sourced from the Wairau Aquifer. Council monitors the state of the region's aquifers based on water levels in a network of 30 wells spread across the district.

Marlborough's groundwater is generally of very high quality and can normally be used without treatment. However, groundwater in some areas contain substances that can affect human health or aesthetics. Most contaminants found in Marlborough's groundwater, except for nutrients, are from natural sources, such as weathering of rocks. Relative to other parts of the country, pesticides have not been found in high concentrations in Marlborough groundwaters except for isolated cases involving wellhead contamination.

Groundwater levels vary across the district and for several reasons. Some of these reasons are caused by nature, such as earthquakes, or human pressures, such as localised abstraction. In the drier seasons when water is scarce, the council issues consents for water use. In most catchments in Marlborough, the water available for allocation is now approaching unsustainable limits. Some catchments are fully allocated, while others require water storage at high flows to be used in late summer conditions.

In certain catchments, all surface flows dry up over summer and groundwater represents the only viable source of water. In these areas it is essential to irrigate crops over summer to supplement the low rainfall and offset the naturally high evapotranspiration rate. Even in the Marlborough Sounds catchments, with relatively high rainfall, there is an increasing trend towards irrigation of dairy pasture.

Wairau Aquifer levels have been steadily declining for 50 years due to several factors which are currently being investigated as part of a national research programme. These include declining Wairau River channel levels and lower Wairau River summer flows (below 20 m3/second), both of which affect the rate of recharge available from the Wairau River.

Learn more about Marlborough's groundwater

Summary of first round feedback - Marlborough District Council – this section was also added in early October 2023

Summary of first round feedback

Our first round of engagement sought feedback on community freshwater visions and values and the division of the region into freshwater management units.

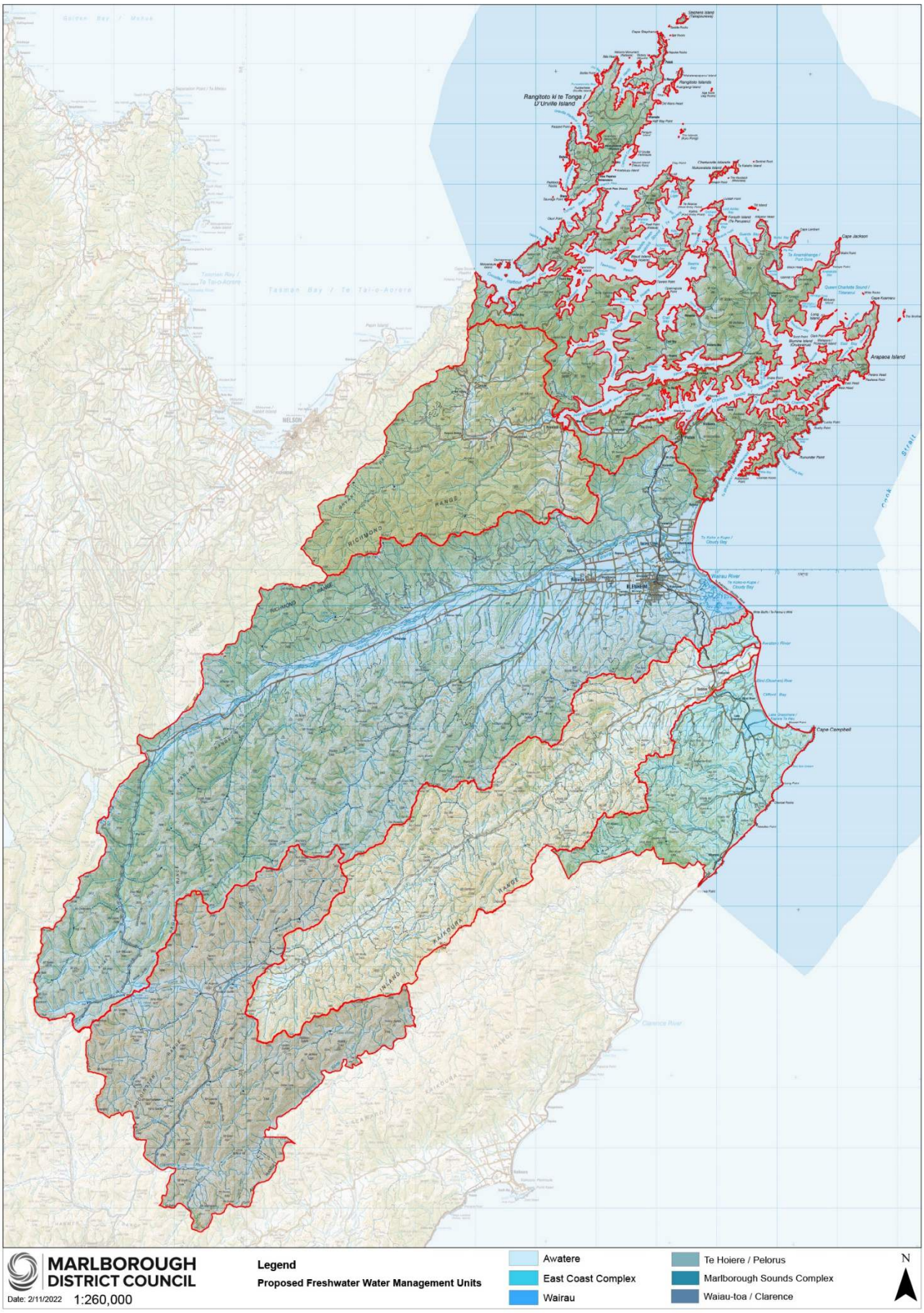
We had over two hundred individual submissions made up of multiple submissions points.

Thank you to everyone who took the time to make a submission.

The following summarises the feedback we received; full details can be found in the engagement summary report:

- 5 October 2023 - Item 6 - Report on Engagement 1 FMUs Visions and Values Sep 2023 v3 (PDF, 11.8MB)

Freshwater Management Units (FMUs)



We proposed six FMUs for the Marlborough Region based on hydrological catchments or collections of similar characterised catchments.

We asked if you thought the boundaries were appropriate for region wide freshwater management?

Most people agreed with using hydrological catchments but noted that this did result in large units and felt there should be the ability to identify and manage smaller areas.

We agree that freshwater management will need to occur across a variety of scales. We proposed to have additional management at the scale of smaller catchments and aquifer units, and potentially even down to individual waterbodies, within the context of the larger FMUs.

It is proposed that Catchment Care Units and Aquifer Management Units might be appropriate names for these smaller scale units which will sit within and make up the large FMUs.

Other feedback sort to move the "northern island" of the East Coast Complex FMU into the Awatere FMU. We agree that similar water management as the Awatere FMU would be appropriate for this area, and it should be incorporated into the Awatere FMU.

Please note that these changes to the FMUs are still proposed and without feedback from tangata whenua.

As Council, tanagta whenua and communities move together through the freshwater management process and gain further understanding of the region's freshwater environment it may be necessary to amend or further subdivided the FMUs.

Go to the Freshwater Management Units section

In summary region wide vision themes included:

- Future freshwater should be clean, clear, pure, and safe, healthy and pollution free.
- There should be safe water for drinking, swimming, fishing, and gathering food.
- The current state should at least be maintained with no deterioration and improved.
- The upper reaches of the region's major waterways should be protected, and the lower reaches restored.
- There should be access to freshwater bodies for all, particularly for recreation.
- Removal of pest species and weeds, including wilding pines.
- Increases to native biodiversity, riparian habitats and species protection.
- Natural flows and behaviour are enabled.
- Traditional Māori tikanga is acknowledged and realised.
- Te mana o te Wai is upheld locally.
- Freshwater is available for irrigation use.
- Food production is valued in the region.
- There are nature-based solutions to climate change effects.
- Investigation into hydroelectric generation encouraging small scale/domestic hydro.

Specific FMU visions included:

- Water storage for the Wairau, Awatere, and East Coast Complex FMUs.
- Flood protection and tighter controls of water allocation in the Wairau FMU.
- More stringent controls for forestry activities in the Marlborough Sounds Complex and Te Hoiere / Pelorus FMUs.
- Sustainable gravel management for the Wairau, Awatere, and East Coast Complex FMUs.
- Domestic water schemes in the Marlborough Sounds Complex, Awatere and East Coast Complex FMUs.
- Diversity of land use and no over intensification of industries in the Te Hoiere / Pelorus FMU.
- Return to pre-European freshwater quality in the Waiau-toa / Clarence FMU.

You also felt that future freshwater management should.

- Be given the highest priority, have an integrated approach, and be based on naturally occurring processes.
- The precautionary principle be applied.
- Users that cause degradation pay for this through levies, rather than the clean-up being paid by future generations.
- A clear and informed balance be achieved amongst water takes, flows and volumes.
- The focus be on maintaining the current water quality within the region, while continuing to target certain 'hotspot' areas, a complete overhaul is not required.
- Tension between economic development and environmental values managed to favour environmental values with Council enforcing the conditions of permitted water uses.
- Sound, long sited management, not compromised by demands from water users motivated by shorter term economic perspectives.
- When restriction levels are reached, a framework that permits graduated reductions in waters that provided for the survival of rural activities and businesses and their associated communities.
- Support for ongoing development of adequate information on water volumes, flows and takes to improve knowledge with the aim of maximising the health of the rivers and aquifers.

Values

We asked you what you valued about freshwater in Marlborough.

Almost four hundred community feedback points were made.

Each FMU's currently identified community values will shortly be available through the FMU pages.

Go to the Freshwater Management Units section

In summary all the compulsory values in the National Policy Statement for Freshwater Management (NPSFM) were identified across the region:

- Ecosystem health.
- Human contact.
- Threatened species.
- Mahinga Kai.

The majority of the nine other values that the NPSFM requires Council to consider were also identified:

- Natural form and character.
- Drinking water supply.
- Wai tapu.
- Transport and Tauranga waka.
- Fishing.
- Hydro-electric power generation.
- Animal drinking water.
- Irrigation, cultivation and production of food and beverages.
- Commercial and industrial use.

The exceptions were:

- Hydro-electric generation only specifically identified in the Wairau FMU.
- No commercial /industrial use and drinking water values specifically identified for the Waiau-toa / Clarence FMU.
- No wai tapu and transport and tauranga waka specifically identified for the Awatere FMU.
- No transport and tauranga waka specifically identified for Te Hoiere / Pelorus, East Coast Complex and Waiau-toa / Clarence FMUs.

Other values were also identified including:

- Recreation close to waterbodies,
- Spiritual / mental health.
- Amenity.
- Access.
- Education.
- Flood management and protection.
- Firefighting purposes.
- Water storage.
- Gravel management and abstraction.
- Production of medicinal plants/Rongoa.
- Fossil hunting / geology.

Positives and Concerns

We also wanted to hear about the positives and concerns community had with the current freshwater management for the region.

You told us the following positives:

- Water allocation has been used in the region for a “very long time” when compared to other regions and this process was felt to be well managed.
- The region still contains rivers and lakes with healthy freshwater ecology, and freshwater for drinking.
- Positive advances towards improving water quality were being made through the Te Hoiere Restoration Project.

Your concerns fell into six main areas:

1. River management
    a. Flood management - keeping river fairways clear including weed management, flood debris removal and gravel abstraction.
    b. Riparian management including weed management and lack of enhancement work.
2. Discharges and water quality degradation
    a. Discharges and leaching of contaminants from land use activities.
    b. Sediment.
    c. General waste management across local industries.
3. Water supply
    a. Long-term integrity of domestic and irrigation supply.
    b. Source water protection.
4. Access – Relationship of public accessibility to water bodies to efficient and safe land management by private landowners.
5. NPSFM process/Resource management
    a. Hierarchy within the compulsory values.

b. Lack of past holistic and/or balanced approach to water management.
c. Recognition of the paradigm shift in water resource management.
d. An understanding of the local context and history.

6. Equity/Balance
    a. Use of and payment for the water resource.
    b. Planning process consideration of different community sectors' values and subsequent application of regulatory controls.
    c. Environmental versus economic balancing in resource management.