

Proposed new rules and regulations Dunstan Rohe

This summary provides an overview of the provisions relating to the Dunstan Rohe (area). This includes environmental outcomes, target attribute states and area-specific rules and limits. The rules and limits are in addition to those in the region-wide rules covered in the other summaries.

If you are unsure of any particular terms, there is a glossary of terms.

Recent content updates:

- 13 October 2023:
Amended information on cultivation in Table 2 for clarity
- 25 September 2023:
Added Dunstan Rohe boundary map
- 24 September 2023:
Added timeframe for achieving the environmental outcomes for target attribute states

A map of the Dunstan Rohe map is shown below.



Environmental outcomes

In its new Land and Water Regional Plan ORC must set environmental outcomes for the freshwater values identified in the Dunstan Rohe. An environmental outcome statement describes the desired future state that communities in the Dunstan Rohe and tangata whenua would like to see for a specific value.

The environmental outcome statements are very similar across all FMUs and rohe in Otago, which reflects the fact that the aspirations that tangata whenua and the different communities have for the environment are largely consistent across the region. Table 1 sets out the draft environmental outcomes for the Dunstan Rohe.

Table 1: Draft environmental outcomes

Value	Environmental Outcomes for Dunstan Rohe	Attributes
NPS-FM compulsory values (apply to every FMU/rohe)		
Ecosystem health		<p>Rivers:</p> <ul style="list-style-type: none"> Ammonia Nitrate Suspended fine sediment E.Coli Dissolved reactive phosphorus Periphyton Macroinvertebrates (MCI/ASPM) Fish IBI E. Coli primary contact sites Macroinvertebrates (QMCI) score*1 Deposited fine sediment* Dissolved oxygen* Ecosystem metabolism* <p>Lakes:</p> <ul style="list-style-type: none"> Phytoplankton (Chlorophyll-a) Total nitrogen Total phosphorus Ammonia Cyanobacteria* Submerged plants (natives)* Submerged plants, (invasive)* Lake-bottom dissolved oxygen* Mid-hypolimnetic dissolved oxygen*

<p>Human contact</p>	<p>Freshwater bodies support healthy freshwater ecosystems with thriving habitats for a range of indigenous species, and the life stages of those species, that would be expected to occur naturally.</p>	<p>Rivers:</p> <p><i>E. Coli</i></p> <p>Suspended fine sediment</p> <p>Periphyton</p> <p><i>E. Coli</i> primary contact sites</p> <p>Lakes:</p> <p>Phytoplankton (Chlorophyll-a)</p> <p>Cyanobacteria (Biovolume cubic millimetres per litre)*</p>
<p>Threatened species</p>	<p>The freshwater habitats of threatened species are protected and support the persistence and recovery of threatened species over time.</p>	<p>All the attributes listed for Ecosystem Health above.</p> <p>Recency of presence</p> <p>National conservation category and status</p> <p>Regional conservation category and status</p> <p>Number of sub-populations</p>
<p>Mahika kai (food and resource gathering)</p>		<p>Mahika kai resources are restored to a condition in which populations of valued mahika kai species are self-sustaining and plentiful enough to support cultural take.</p> <p>Mana whenua are able to safely access, harvest and use these resources now and in the future.</p>
<p>Other values (apply to every FMU/rohe)</p>		

Other values (apply to every FMU/rohe)		
<p>Natural form and character</p>	<p>Freshwater bodies and their riparian margins, and any connected receiving environment including any estuaries and hāpua (lagoon) are able to behave in a way that reflects their natural form and character to the greatest extent practicable, and the natural form and function of unmodified water bodies is protected.</p>	<p>Rivers:</p> <ul style="list-style-type: none"> Suspended fine sediment Periphyton Macroinvertebrates (QMCI) score* Deposited fine sediment* <p>Lakes:</p> <ul style="list-style-type: none"> Phytoplankton (Chlorophyll-a) Cyanobacteria* Submerged plants (natives)* Submerged plants, (invasive)* Lake-bottom dissolved oxygen* Mid-hypolimnetic dissolved oxygen*
<p>Drinking water supply</p>	<p>Provided the health and wellbeing needs of water bodies and freshwater ecosystems are met, source water from waterbodies (after treatment) is safe and reliable for the drinking water supply needs of the community.</p> <p>Activities do not introduce or increase the concentration of contaminants in water, so that, after existing treatment, it no longer meets drinking water standards</p>	
<p>Wāhi tūpuna</p>	<p>Cultural associations with wāhi tūpuna are maintained, visible, and whānau are able to access, use and relate to wāhi tūpuna now and in the future.</p>	<p>Coming soon.</p>

<p>Fishing</p>	<p>Fish are safe to eat; and</p> <p>Insofar as it is consistent with the protection of indigenous and threatened species, the spawning and juvenile rearing waters for trout and salmon are provided for</p>	<p>Rivers:</p> <p>E. Coli</p> <p>Suspended fine sediment</p> <p>Periphyton</p> <p>Nitrate</p> <p>Suspended fine sediment</p> <p>Macroinvertebrates (MCI/ASPM)</p> <p>Fish IBI</p> <p>Macroinvertebrates (QMCI) score*</p> <p>Lakes:</p> <p>Phytoplankton (Chlorophyll-a)</p> <p>Cyanobacteria (Biovolume cubic millimetres per litre)*</p>
<p>Irrigation, cultivation and production of food and beverages</p>	<p>Provided the health and wellbeing of water bodies and freshwater ecosystems and human health needs are met, the cultivation and production of food, beverages and fibre is enabled.</p>	<p>Rivers:</p> <p>Suspended fine sediment</p> <p>Periphyton</p> <p>Water quantity</p>
<p>Wetlands</p>	<p>Wetlands are protected, and their ecosystem health, indigenous biodiversity, and hydrological functioning is restored where degraded.</p>	<p>Coming soon.</p>
<p>Taoka species (treasured species)</p>	<p>Thriving, connected habitats for indigenous species are restored and sustained for ever and their mauri is intact.</p>	<p>Coming soon.</p>

Values that apply to specific FMU		
Hydro-electric power generation	Existing hydro-electric generation activities are developed, operated, maintained and upgraded in a way that meets the environmental outcomes to the greatest extent practicable.	

Target attribute states

Attributes are indicators that we can measure and monitor. Attributes tell us about the state of a river or lake. A target attribute state (TAS) is the state that an attribute must achieve to make sure that an environmental outcome is met. The timeframe for achieving the TAS for each FMU is set by the environmental outcomes for the FMU. For the Dunstan rohe, the environmental outcomes are to be achieved by 2045. By monitoring attributes and comparing their baseline state with their TAS we learn how well we are on track towards achieving the environmental outcomes for this FMU or rohe.

While the environmental outcome statements are largely consistent across Otago, baseline states and TAS are usually specific to each FMU and rohe. Attributes for each value and baseline states for those attributes have been identified along with trends derived from the Otago Regional Council's State of the Environment (SoE) monitoring data.

The baseline state and TAS for the Dunstan rohe are in the map below.

Zoom into an area and view the various locations of proposed monitoring sites in an area(s).

Select the yellow dot representing a proposed monitoring site to see the Target Attribute States.

You can further select the Target Attribute States table to view a larger version of the table.

(Note: If you are on a mobile device, tap on the arrow next to the 'X' icon for the table to show.)

A map of these water bodies is available online for you to view:
www.orc.govt.nz/landwatermaps

FMU provisions

National direction requires Council to set limits as rules or action plans (as appropriate) to achieve the environmental outcomes. This can be done at a region-wide level or at FMU/rohe level. The draft region-wide rules are set out in different briefing papers, including the briefing papers Primary Production, Wastewater, Stormwater, Earthworks, Water Quantity and various others. However, for the Dunstan Rohe a number of specific rules are proposed that are needed to make sure the environmental outcomes for this rohe are achieved overtime. These additional rules, which will be included in the Dunstan Rohe chapter of the new Land and Water Regional Plan, are shown in the table below.

Contaminants of concern	Draft LWRP
<p>Rivers</p> <ul style="list-style-type: none"> Periphyton (TNTP) E. Coli Suspended fine sediment <p>Lakes</p> <ul style="list-style-type: none"> TN TP Chlorophyll-a <p>Groundwater</p> <ul style="list-style-type: none"> Arsenic E. Coli 	<ul style="list-style-type: none"> Cultivation permitted subject to conditions relating to setbacks from waterbodies, depending on slope. 5m on a slope of less than 10 degrees 10 metres on slopes between 10 and 20 degrees Cultivation on slopes over 20 degrees, only permitted if the following conditions are met: for the renewing or establishing of pasture only, using no tillage or direct seed drilling only 10 m setbacks from water bodies and wetlands. If the permitted activity conditions cannot be met the activity requires a discretionary consent. <p>Action plan for Lake Hayes catchment that outlines actions to be taken to reduce key contaminants, including phosphorus.</p>

Environmental flows and levels and limits on take, diversion and damming of water

The Dunstan Rohe chapter will also include take limits and environmental flows and levels for rivers, lakes and aquifers in this rohe.

Take limits reflect the total quantity of water that can be taken, dammed or diverted from a stream, river, lake or aquifer. Once the combined rate of take for all consented water takes, diversion or damming activities from a water body matches this take limit no further water can be allocated in new consents.

Environmental flows (for rivers or streams) or environmental levels (for lakes and aquifers) include minimum flows or levels at which any all consented (and some permitted) takes, diversions and damming activities must cease. These restrictions on water taking, diversions or damming activities typically occur during dry periods and are needed to make sure after important values, such as threatened fish, drinking water supply or mahika kai (food and resource gathering) values, are looked after.

Lakes

Environmental levels and take limits for the lakes in the Dunstan Rohe are shown in the table below.

Given their high values, it is proposed that a narrative take limit is set for all natural lakes in the Dunstan Rohe. This limit will prohibit any new takes, damming or diversions that could impact water levels in these lakes (except for takes that are permitted under the Resource Management Act 1991) and will ensure that these lakes will continue to behave in their natural or near natural state.

Alternative regimes are proposed for the rohe's controlled lakes. Lake Dunstan will continue to be managed in accordance with its consented lake level conditions, while any takes from this lake will be subject to the take limits that apply to the Clutha River/Mata-Au. Downeys Dam will be subject to the minimum environmental flow and take limit set for Mill Creek.

Name	Environmental level(s)	Take limit
Natural lakes (unmodified)		
Dukes Tarn Lake Kirkpatrick Lake Luna Lake Te Kōhua Little Lake McKay Lochnager/Ōtaka Sheehey Lake Moke Lake/Punamāhaka/Waikā māhaka	Natural minimum water level	Narrative - no new taking, diversions, damming or discharges from the lake or upper catchment
Natural lakes (with current consents)		
Lake Alta (Rastus Burn river catchment) Lake Hayes (Mill Creek catchment) Lake Johnson (Shotover River catchment) Lake McKay (Luggate Creek catchment)	Lake level managed by the minimum flow of the river catchment that the lake is located within	Narrative - no new taking, diversions, damming or discharges from the lake or upper catchment. Existing takes subject to the take limit of the river catchment that the lake is located within
Controlled lakes		
Lake Dunstan	Consented levels	Subject to the Clutha River/ Mata-Au catchment take limit
Downeys Dam (Mill Creek catchment)	Lake level managed by the minimum flow of the river catchment that the lake is located within	Subject to the take limit of the river catchment that the lake is located within

River catchments

Environmental flows and take limits for the Dunstan Rohe's rivers and streams are shown in the table below. Take limits and environmental flows are often set as a percentage of the 7-day Mean Annual Low Flow (7-day MALF). The 7-day MALF is a flow statistic that provides an indication of how low the flow gets in a typical year.

For smaller rivers or streams with a mean flow of 5,000 litres per second or less, such as the Cairnmuir Creek or Dairy Creek, a total take limit will be set as 20% of the 7-day MALF. For larger rivers with a mean flow of more than 5,000 l/s, such as the Nevis and Shotover, a take limit of 30% of the 7-day MALF is proposed.

Restrictions on water takes, diversions and damming activities in catchments of smaller rivers will be triggered when flows are at 90% of the 7-day MALF, whereas for larger rivers these restrictions will not kick in until flows are at 80% of the 7-day MALF.

Bespoke limits and environmental flows will be set in the Land and Water Regional Plan for various other rivers including the Arrow river, Cardrona river and Luggate Creek. For some bespoke catchments where a transition may be needed to achieve the environmental outcomes of the catchment and phase out over-allocation it is proposed to set a common consent duration expiry date for any new consent granted under the LWRP framework, the proposed common catchment date for rivers where this will apply in the Dunstan Rohe is 2033.

Finally, for a third category of streams and rivers, such as the Rastus Burn and Bendigo Creek, Otago Regional Council proposes to set interim take limits and environmental flows according to the default method above. These will be implemented through the resource consent replacement process. However, prior to this resource consent replacement process Council will assess whether there is a need to set bespoke minimum flows and take limits for these rivers through a plan change process. Given the current level of water use and allocation, these rivers will in effect be either fully allocated or over-allocated and any new taking of water will not be available.

Draft Land and Water Regional Plan: Dunstan Rohe

Name	Environmental flow (litres per second)	Take limit (litres per second)
River catchments managed by default limits (Mean flow \leq 5,000 litres per second)		
Burn Cottage Creek Burton Creek Byford Creek Cairnmuir Creek Campbells Creek Cascade Stream Champagne Gully Creek Crook Burn Dairy Creek Dead Horse Creek Devils Creek Franks Creek Gibbston Back Road Creek Goat Camp Creek Italian Creek Jackson Creek Kidd Creek Kingston Road Creek Leaning Rock Creek Long Gully Creek Maori Point Creek McKenzie Creek Mt Pisa Creek Muddy Creek Nine Mile Creek Owens Creek Pigeon Creek Queensberry Hills Creek Raupo Creek Ripponvale Road Creek Sheepskin Creek School Creek Sonora Creek Trig Burn Walkers Creek Weatherall Creek	90% of 7-day MALF	20% of 7-day MALF

River catchments managed by default limits (Mean flow > 5,000 l/s)		
Nevis River	80% of 7-day MALF	30% of 7-day MALF
Shotover River		
Arrow River	1000 litres per second	700 litres per second
Cardrona River – Up- per Reach to Mt Barker	750 litres per second Nov – April 2100 litres per second May - Oct	600 litres per second (max instantaneous rate of take
Cardrona River – Mt Barker to SH6	0 litres per second	0 litres per second
Cardrona River – SH6 to confluence	340 litres per second	30-35 litres per second
Lindis River	550 litres per second Oct – May 1600 litres per second Jun - Sept	1612 litres per second
Low Burn	80 litres per second Oct – March 100 litres per second April - Sept	140 litres per second
Luggate	Awaiting (technical) recommendation	
Mill Creek	180 litres per second	80 litres per second

River catchments – default limits set as interim and to be given effect to at the time of consent renewal unless bespoke limits set		
Albert Burn (1)	158	35
Amisfield Burn	149	35
Bannock Burn	222	49
Bendigo Creek	276	61
Camp Creek (1)	324	72
Five Mile Creek (1)	277	62
John Bull Creek	207	46
Locharburn	132	29
Locharburn	207	207
Park Burn	367	81
Pipeclay Gully Creek	313	39
Poison Creek	313	56
Quartz Reef Creek	1069	70
Rastus Burn	98	70
Roaring Meg	174	238
Schoolhouse Creek	98	22
Scrubby Stream	129	29
Toms Creek	367	82

Aquifers

The Dunstan Rohe contains a large number of aquifers.

For some aquifers that are not hydraulically connected to surface water, such as the Mid Mill Creek Aquifer and Frankton Flats Aquifer, take limits will be set based on a proportion of the mean annual recharge of that aquifer (35%), while for others, such as the aquifers in the Hawea Basin and the Wanaka-Basin Cardrona Gravel Aquifer bespoke take limits will be set in the Land and Water Regional Plan.

National direction also requires Otago Regional Council also to set environmental levels for this type of aquifers, we do currently not have sufficient groundwater level monitoring data to set environmental levels in the plan when it will be notified. Therefore, environmental levels for these aquifers will be set at a later date.

For aquifers with a close hydraulic connection to a river or stream, such as the Cardrona or Lindis Alluvial Ribbon Aquifers, any taking of water will be subject to the take limits and environmental flows set for these rivers.

Name	Environmental level(s)	Take limit (volume)
Aquifers managed by default limits		
Frankton Flats Aquifer Ladies Mile Aquifer Luggate Groundwater Management Zone Mid Mill Creek Aquifer Morven Aquifer Queensbury Groundwater Management Zone Speargrass-Hawthorn Aquifer Upper Mill Creek Aquifer Pisa Groundwater Management Zone	Not required to be included in the new LWRP at this time	35% mean annual recharge
Aquifers managed by bespoke limits		

Ardgour Valley Aquifer		190,000 cubic metres a year
Bendigo Aquifer		29,000,000 cubic metres a year
Cromwell Terrace Aquifer		4,000,000 cubic metres a year
Dunstan Flats Aquifer		Awaiting (technical) recommendation
Earnsclough Terrace Aquifer		Awaiting (technical) recommendation
Lower Tarras Aquifer		18,800,000 cubic metres a year
Wanaka-Basin Cardrona Gravel Aquifer		Western Zone: 1,300,000 cubic metres a year + allowance for SW takes from Cardrona losing reach going to ground-water Eastern Zone: 50% MAR
Hawea Flat Zone		Awaiting (technical) recommendation
Grandview Zone		
Terrace Aquifer -Hill -River		
Sandy Point		
Te Awa		
Maungawera Flat		
Maungawera Valley		
Butterfield Exclusion Zone		
Campbell's Exclusion Zone		

Alluvial ribbon aquifers		
Cardrona Alluvial Ribbon Aquifer	Groundwater level managed by the river catchment minimum flow	Subject to river catchment take limit
Lindis Alluvial Ribbon Aquifer		
Lowburn Alluvial Ribbon Aquifer		
Shotover Alluvial Ribbon Aquifer		

Outstanding water bodies

Outstanding water bodies are water bodies that have one or more outstanding values. National direction requires the Otago Regional Council to identify outstanding water bodies and protect their important values. The table below lists the outstanding water bodies in this rohe and describes their outstanding values.

Below is a map featuring all the water bodies in Otago.

You can zoom in and view the various water bodies in an area(s).

Water bodies are shown in a blue colour. Select an area to view the water body name.

(Note: if you are on a mobile device, after selecting a water body, tap on the arrow next to the 'X' icon to view more information.)

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Unique identifier	Site identifier	Values and characteristics
Ecology		
ECL11	Punamāhaka / Waikāmāhaka / Moke Lake	<ul style="list-style-type: none"> • Upland bully have only been reported rarely at Punamāhaka/Waikāmāhaka/Moke Lake. • Punamāhaka/Waikāmāhaka/Moke Lake is recommended as outstanding with intact plants communities extending from the waters edge to depths of 40-50 metres deep. None of these lakes are subject to large water level fluctuations that can impact on shallow water plant communities (e.g., turf communities).
ECL12	Waiwhakaata / Lake Hayes	<ul style="list-style-type: none"> • Considered as one of two most important breeding sites for Australasian crested grebe. The other is Lake Heron in Canterbury. Waiwhakaata/Lake Hayes continues to have a large number of sightings and supports breeding pairs.
ECL13	Te Papapuni/Nevis River	<ul style="list-style-type: none"> • The Nevis galaxias occupies the Nevis River and tributaries and is restricted to this catchment.

Physical		
PHY11	Kawarau gorge	<ul style="list-style-type: none"> Nationally Significant A spectacular steep gorge notable for the volume and fast flowing nature of its water. The gorge is continually being modified by landslides. Between Gibbston and Ripponvale on Kawarau River.
PHY12	Ōtaka / Lochnagar debris dam and lake	<ul style="list-style-type: none"> Regionally Significant. One of Aotearoa's best and larger examples of a debris-dammed lake caused by a large scale blockslide. No direct outlet, water flows through the dam with a subterranean outlet. Ōtaka/Lochnagar, Richardson Mountains in the headwaters of the Kimiākau/Shotover River.
PHY13	Lake Alta cirque	<ul style="list-style-type: none"> Regionally Significant. A classic lake-filled cirque with steep rocky sides and back, and patches of moraine over schist bedrock at the front lip. Lake Alta, Kawarau/Remarkables.
PHY14	Pisa Range cirques	<ul style="list-style-type: none"> Regionally Significant. Good examples of small cirque lakes and moraine. On east side of crest of Pisa Range, 1-2km south of Mt Pisa.

Recreation		
REC42	Clutha River / Mata-au (Wānaka to Hāwea River)	<ul style="list-style-type: none"> Outstanding for recreation (Greenaway 2018). Nationally significant for jet boating and angling from multiple sources (QLDC District Plan, Sports F&G Management Plan for Otago, RiVAS). Regionally significant for rafting and used for packrafting.
REC43	Clutha River / Mata-au (Hāwea River to Te Wairere/Lake Dunstan)	<ul style="list-style-type: none"> Nationally significant for recreation (Greenaway 2018). Nationally significant for jet boating and angling from multiple sources (QLDC District Plan, Sports F&G Management Plan for Otago, RiVAS). Regionally significant for rafting and used for packrafting. Outstanding due to multiple significant recreation values.
REC44	Kawarau River	<ul style="list-style-type: none"> Protected by a Water Conservation Order. Recognised for rafting, jetboating, and kayaking. Nationally significant for jet boating and white water kayaking by a variety of sources (Proposed QLDC District Plan, Greenaway 2018, RiVAS)
REC45	Te Papapuni / Nevis River	<ul style="list-style-type: none"> Protected by a Water Conservation Order. Outstanding for recreation (Te Papapuni/Nevis River mainstem gorge from Nevis Crossing to Kawarau River confluence (recreational purposes, in particular fishing and kayaking), Te Papapuni/Nevis River mainstem above Nevis Crossing to source (recreational purposes, in particular fishing)). Nationally significant for white water kayaking and angling (RiVAS). Considered outstanding for packrafting.
REC46	Kimiākau / Shotover River	<ul style="list-style-type: none"> Protected by a Water Conservation Order. Outstanding for recreation (recreational purposes, in particular rafting, kayaking, and jetboating). Nationally significant for jet boating with very high commercial value, white water kayaking and rafting (RiVAS). Considered outstanding for packrafting.

NAT8	Shotover	<p>Active Bed</p> <ul style="list-style-type: none"> Pristine or largely unmodified water bodies in Conservation Areas and reserves which encompasses the majority of the Richardson and Harris Mountains, including alpine tarns, streams and wetlands. Headwaters of the Kimiākau/Shotover River include Ōtaka/Lochnagar and Church Hill wetland complex. Steep upper catchments and streams largely weed-free and free of man-made structures. Shotover Gorge between McCarrons Beach and Arthurs Point is inaccessible and has low level of modification, while gravel extraction occurs in the section above. High water quality throughout the area with minor stock influence in the mid and lower Kimiākau/Shotover River (below the Branches excluded from outstanding water bodies). Historic gold mining has led to contamination of some streams around Skippers. Unmodified flow regimes throughout the area (however, historic remnants relating to water abstraction and gold mining).
		<p>Margins</p> <ul style="list-style-type: none"> Along incised steep streams predominantly native vegetation along margins with few small-scale modifications, such as tracks. Grey shrublands, particularly those in steep, shaded gullies unaffected by fire and browsing animals, are important wildlife habitats.
		<ul style="list-style-type: none"> Land use modification includes extensive grazing and limited 4WD tracks on high-country farmland along lower slopes in the mid Kimiākau/Shotover River catchment. Areas with more extensive modification around Skippers, including weed species such as lupins along river banks, are excluded from outstanding water body identification. Kimiākau/Shotover River Valley floor are excluded due to more intensive grazing and higher level of weed infestation, as well as gold mining.
		<p>Context</p> <ul style="list-style-type: none"> Within mountainous areas pristine, highly natural landscape context including the headwaters and alpine valley floors. Conservation areas in the catchment are adjacent to the highly natural area that falls within Tititea/Mount Aspiring National Park. Landscape Context on lower slopes in mid Shotover Valley includes extensively grazed land along the Skippers Road (gravel). Areas of tussockland and alpine herbfields on upper and mid mountain slopes. Beech forest remnants and shrublands are confined to gullies.
		<ul style="list-style-type: none"> Small-scale settlement with individual buildings associated with high-country farming and historic gold mining in mid Kimiākau/Shotover River Valley (Skippers) are excluded from the outstanding water bodies. Gold mining has led to historic landscape change in vicinity of waterways. Sensitive landscape due to its high natural character values and openness. Conservation areas around Skippers and in upper catchment visited by recreationists (popular 4WD route).

NAT9	Nevis	<p>Active bed</p> <ul style="list-style-type: none"> Pristine or largely unmodified water bodies in Kawarau/the Remarkables Conservation Area which encompasses the tops of Kawarau/the Remarkables Mountains and part of the Tāpuae O’Uenuku/Hector Ranges (eastern slopes within Te Papapuni catchment) including alpine tarns, streams and wetlands. Headwaters of the Te Papapuni encompass extensive alpine wetlands in the Garvie Mountains that drain into Roaring Lion Creek, containing meanders and oxbows in an upland valley with a mixture of bogs and fens on the valley floor. <p>Steep riverine gorge habitats, and only habitat for the Nevis galaxias.</p> <ul style="list-style-type: none"> Steep upper catchments and streams largely weed-free and free of man-made structures. Very high-water quality throughout the area with minor stock influence in the mid and lower Te Papapuni catchment (excluded from outstanding water bodies, apart from gorge section). Unmodified flow regimes throughout the area (lower Coal Creek, Drummond Creek and mid-lower Te Papapuni with water abstraction and gold mining excluded from outstanding water bodies). <p>Margins</p> <ul style="list-style-type: none"> Within conservation area and along incised steep streams predominantly native vegetation along margins with few small-scale modifications, such as tracks. Land use modification includes extensive grazing, limited presence of crack willow, and limited 4WD tracks on high-country stations along lower slopes along Nevis River. Fans of streams draining into Te Papapuni, are excluded due to more intensive grazing and higher level of weed infestation, as well as gold mining. <p>Context</p> <ul style="list-style-type: none"> Within Kawarau/the Remarkables Conservation Area and upper Garvie mountains pristine, highly natural landscape context including the mountainous headwaters and alpine valley floors. Landscape Context on lower slopes includes extensively grazed land along the Nevis Road (gravel). Areas of tussockland on upper and mid mountain slopes. Typical alpine ecosystems are well represented, although shrublands are confined to the wetter parts of the area or as remnants around rock tors. Very limited forest remnants in Nevis Gorge. Small-scale settlement with individual buildings associated with high-country farming and historic gold mining in mid Nevis Valley are excluded from the outstanding water bodies. Sensitive landscape due to its high natural character values and openness. Conservation area in upper catchment and Nevis Valley visited by recreationists (popular 4WD route).

<p>NAT10</p>	<p>Pisa</p>	<p>Active Bed</p> <ul style="list-style-type: none"> Intact small order streams and alpine wetlands and tarns within the plateau area of the Pisa Range. Several alpine fens in the upper reaches of the Roaring Meg catchment which are browsed during the summer months by sheep. Steep and confined catchments feeding the Kawarau River, Ōrau/Cardrona River, and Te Wairere/Lake Dunstan. No structures and limited modifications. Discharge to land permit current near Plank Creek. Waterways in modified areas around Snowfarm and lower Roaring Meg catchment are excluded from outstanding water bodies. Unmodified flow regimes due to absence of bores and water takes on the high-lying plateau area. Water quality is particularly high, as confirmed by ORC testing. <p>Margin</p> <ul style="list-style-type: none"> Margins in the steep streams in lower reaches of the catchment are predominantly lined with matagouri and mingimingi, as well as Olearia spp. hebe subalpina, desert broom, mountain lacebark, koromiko, wineberry and Hebe propinqua. Upper reaches are dominated by alpine fescue, snow tussock, and blue tussock. Alpine wetlands are predominantly surrounded by sedges. Limited structures and modifications including historic gold workings, vehicle tracks, and stock access. Hydro-generation on Roaring Meg and skiing/ vehicle testing area around Snowfarm are excluded from outstanding water body identification. <p>Context</p> <ul style="list-style-type: none"> Largely encompassed within the Pisa Conservation Area, the area is highly natural and largely undisturbed with the exception of sheep grazing. Upper reaches of the catchment are characterised by several schist tors and are clad in tall tussock grassland including snow tussock, golden speargrass and blue tussock. Immediate context includes the Snow Farm excluded from the area of ONC. No settlements and limited modification and structures with several vehicle tracks associated with high country farms, stock grazing, tramping tracks, and huts. Overall, the natural elements, patterns, and processes remain dominant and legible. The Pisa Conservation Area includes an open and vast landscape with a high level of perceived naturalness that offers visitors opportunities for exposed and remote experiences throughout the year. Modifications to the east of the upper Roaring Meg catchment include extensive earthworks around the Snowfarm area and hydro power generation in the lower catchment (near Kawarau confluence).

NAT10	Dunstan Mountains	<p>Active bed</p> <ul style="list-style-type: none"> • Steep network of largely unmodified streams in the upper part of the Dunstan Mountains. • Includes the upper reaches of the Quartz Reef and Devils Creeks. • No structures or modifications to the active beds in these high-lying areas. • Unmodified flow regimes due to absence of bores and water takes at higher elevation. Lower catchments of some streams include water abstraction and have been excluded. • Very extensive grazing at these high elevations has minor influence on water quality. <p>Margin</p> <ul style="list-style-type: none"> • Margins of incised streams are largely lined with exposed schist tors and associated vegetation including snow tussock, golden speargrass, and matagouri. • Low intensity grazing by merino in the summer months within the upper reaches of the catchment, and throughout the year at lower altitude areas. • No structures and limited modifications, including vehicle tracks associated with high-country farming activities. <p>Context</p> <ul style="list-style-type: none"> • Located on the western slopes of the Dunstan Mountains and partially within the Bendigo Conservation Area, the area is an exposed and mountainous landscape, particularly near the summit ridges. • Upper slopes are dominated cushionfields near the exposed summit areas, and snow tussocklands below. • On the lower slopes, weed species are more common amongst areas of regenerating kanuka, golden speargrass, and short tussock. These include wilding conifers, and briar rose. • No settlements, and limited structures and modifications including vehicle tracks and huts on the plateau area. • Historic vegetation clearance caused by pastoral farming and fires. • While the land is used for extensive grazing, the natural elements, patterns, and processes remain dominant and largely unimpeded. • Opportunities for the public to experience the landscape’s largely natural, exposed and wild character within the Bendigo

Natural features and landscapes		
LAN25	Ōtaka / Lochnagar	<ul style="list-style-type: none"> • Unmodified, glacially carved lake within the upper reaches of the Shotover catchment. • Margins are clad in intact sub alpine and tall tussockland. • Lake is highly expressive of its glacial formative processes.
LAN26	Kimiākau / Shotover River and tributaries	<ul style="list-style-type: none"> • Largely intact braided river and wider catchment with historic modifications associated with gold mining. • Margins within the upper reaches are less modified and clad in tall tussockland and sub alpine vegetation. Lower reaches include grassland, tall tussockland, and areas of regenerating native vegetation (manuka and kanuka). • Highly memorable river within the Queenstown context for its history and vast catchment. • River is highly expressive of its formative processes with legible braided river channels. • Kimiākau is the Māori name for the Shotover River and was a kāinga mahinga kai (food-gathering place). • The Shotover River is associated with 1860s Otago Gold Rush with remnants of this activity still present today.
LAN27	Punamāhaka / Waikāmāhaka / Moke Lake	<ul style="list-style-type: none"> • Small, glacially carved lake forming the upper headwaters of Moke Creek.
LAN28	Arrow River	<ul style="list-style-type: none"> • Rocky narrow riverbed characterised by the schist underlying geology. • Margins of the river become more modified in the lower reaches with willows and grassland being the predominant vegetation. Upper reaches are clad in tall tussockland. • Distinctive and memorable local feature for the township of Arrowtown. • Haehaenui is the Māori name for the Arrow River. • The Arrow River is associated largely with the Otago Gold Rush during the mid-1800s with remnants of mining within the active bed still present.

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LAN29	Arrow River	<ul style="list-style-type: none"> • Intact, glacially carved lake.
LAN30	Kawarau River	<ul style="list-style-type: none"> • Incised, narrow, semi braided river turning into a gorge near the confluence with the Swift Burn. • Margins consist of several vegetation types including pasture, grassland, matagouri scrub, willows, and isolated areas of indigenous forest. • Highly legible and coherent feature within the Gibbston Valley and eastern extent of the Whakatipu Basin. • The Kawarau River was a traditional travel route between Lake Whakatipu and the Clutha River (Mata-au). The river is also recorded as a kāinga mahinga kai (food-gathering place) where weka, kākāpō, kea, and tuna (eel) were gathered.
LAN31	Lake Alta	<ul style="list-style-type: none"> • Small, glacially carved lake forming the headwaters of the Rastus Burn. • Margins are clad in coherent stands of tall tussockland, as well as scree slopes and bare rock. • Distinctive, legible, and highly accessible local feature within the Remarkables ski field.
LAN32	Cardrona River	<ul style="list-style-type: none"> • Narrow, and rocky active bed with limited structures and consents. • Margins have been modified for grazing at the base of the valley however the upper reaches remain tall tussockland. • The Nevis River forms the distinctive valley to the east of the Remarkables and is highly expressive of its tectonic formative processes (Department of Geology Otago University, n.d.). • While the river forms part of Ben Nevis Station, there are still remnants of historic mining activity within the margins of the river. • Wild and Scenic characteristics identified in Water Conservation Order: Kawarau (2013).

LAN33		<ul style="list-style-type: none"> • Narrow, and rocky active bed with limited structures and consents. • Margins have been modified for grazing at the base of the valley however the upper reaches remain tall tussockland. • The Nevis River forms the distinctive valley to the east of the Remarkables and is highly expressive of its tectonic formative processes (Department of Geology Otago University, n.d.). • While the river forms part of Ben Nevis Station, there are still remnants of historic mining activity within the margins of the river. • Wild and Scenic characteristics identified in Water Conservation Order: Kawarau (2013).
LAN34	Roaring Meg	<ul style="list-style-type: none"> • Incised and steep rocky river with limited structures in the upper reaches. The Roaring Meg power station is located at the confluence with the Kawarau River, and the dam is located mid-reach. • Margins within the upper reaches are clad in coherent stands of tall tussockland. Lower reaches are more modified with areas of grassland and exotic deciduous species. • Highly legible and memorable stream within the Kawarau River catchment.
LAN35	Lindis River	<ul style="list-style-type: none"> • Narrow, rocky riverbed with limited structures and consents. • Margins within the upper reaches are clad in tall tussockland and grassland, while lower reaches are more modified with productive farmland. • Highly memorable and legible feature within the Lindis Pass.

LAN36	Clutha River / Mata-au (Upper)	<ul style="list-style-type: none"> • Natural incised gorge extending from the outlet of Lake Wānaka to Sandy Point. • Margins of the river have been modified. Vegetation present includes exotic trees such as willows, regenerating native vegetation (manuka and kanuka), grassland, and farmland. • Highly memorable and legible river feature within the Hāwea and Wānaka area.
LAN37	Clutha River / Mata-au (Te Wairere / Lake Dunstan)	<ul style="list-style-type: none"> • Broad active bed due to raised river levels by the Clyde Dam. No other structures or consents present. • Margins of the river have been modified. Vegetation present includes mixed exotic vegetation and grassland. • Highly memorable and legible river feature within Cromwell and Clyde area.

Economic profile and snapshot

While freshwater policies might be designed and applied specifically to the Dunstan Rohe, their impacts may be felt beyond. Hence the Dunstan Rohe and the neighbouring Upper Lakes Rohe are combined when considering socio-economic information. These communities have close economic ties, i.e., residents are likely to live in one of the areas while working/spending in the other areas.

In 2018, the Upper Lakes Rohe and Dunstan Rohe were home to around 47,400 residents (21% of Otago’s population). In the previous 12 years, the population in these Rohe increased by 19,300 people (or 69%) from 28,000 residents in 2006. This rapid population growth is putting increasing pressure on water use (water takes and discharges of pollutants or contaminants) and its infrastructure. Overall, these Rohe have relatively low social deprivation, when considering factors such as income, home ownership, employment, access to transport and communications, and access to internet.

The local communities and the economy in the Upper Lakes and Dunstan Rohe are especially reliant on water resources. The most populated towns in this Rohe are built around the lakes. Tourism, the most important industry sector in the Rohe, relies on fresh water in some way or form (including snow, which is essential for the ski resorts operating in the Rohe). Agricultural activities, mainly dry stock (incl. deer and with little/no dairy in the Upper Lakes Rohe) and horticulture/viticulture operations, are dependent on freshwater supplies.

An understanding of Māori history and the Māori economy is essential for policy development and policy impact assessment. Not only does pre-European Māori history help shape modern day New Zealand, but the Māori economy is also integral to the New Zealand economic system. ORC is partnering with Aukaha and Te Ao Marama to develop an overview of Kāi Tahu history and economy.

- [View the Dunstan Rohe economic snapshot that provides local economy information](#)
- [View more regional economic information](#)
- [View the media release for new Otago economic reports](#)