FEEDBACK DOCUMENT

Draft Head of Lake Whakatipu
Natural Hazards Adaptation Strategy

Summary and Survey Questions

COVER ARTWORK: CONNIE ANDERSON

Purpose

Otago Regional Council (ORC) has led the development of a Draft Natural Hazards Adaptation Strategy (the strategy) for the Head of Lake Whakatipu area.

The detailed Draft Strategy report is comprehensive and brings together technical, social and strategic information that has been gathered over the last five years.

Not everyone has time or interest to delve into a large report, so we also have this plain language summary that introduces the main ideas.

If you want to explore the detailed Draft Strategy content, you can download a copy from the ORC website at orc.govt.nz/holwfeedback

We need your feedback

The feedback period runs from 5 December 2024 to 11.59pm on 23 February 2025.

Your input will be considered by ORC and help us improve the strategy to make it practical and effective. The revised strategy is expected to be released in Quarter 2 of 2025.

This document includes:

- **A summary** of the Draft Strategy.
- **Survey questions** to collect your feedback. You may respond to as many or as few questions as you like, and we encourage you to explain your answers wherever possible.

Ways to submit feedback

You can submit feedback in three ways:

- **Online**
  Use the ORC website **orc.govt.nz/holwfeedback** to complete the survey.
- **Written feedback by email**
  Email your feedback to **headofthelake@orc.govt.nz**
- **Written feedback by post**
  Mail hard copy to:
  Natural Hazards Department
  Otago Regional Council
  Private Bag 1954,
  Dunedin 9054

Summary

Head of Lake Whakatipu

The Head of Lake Whakatipu (Whakatipu Waimāori) area is home to about 450 people (Stats NZ, 2018), living in the close-knit townships of Glenorchy and Kinloch as well as in rural areas such as Paradise, Rees and Greenstone Valleys, Campbelltown and Wyuna Preserve. The area is located at the northern end ('head') of Lake Whakatipu and is the focus of this strategy. Figure 1 shows the location of the area.

The area holds deep significance for mana whenua, with its ancestral mountains, rivers and lakes forming a network of taoka (treasure). These natural features, along with pounamu (green stone) and tawhito (traditional travel routes) connected settlements, sustaining generations. The area's ikoa wāhi (place names) weave together the stories and histories of Kāi Tahu, grounding their identity, heritage, spiritual connection to and authority in the land. These all make the area significant to the mana whenua.

A defining geographical feature of the Head of Lake Whakatipu area is the broad braided river systems and floodplains of the Dart and Rees rivers, which form a combined delta at the lake, lying between the Humboldt and Richardson mountains to the west and east, respectively. A braided river system is characterised by multiple interweaving channels that flow around gravel or sand islands.

The Head of the Lake has a dynamic landscape, with the Dart and Rees rivers having a nearly unlimited sediment supply, moving active channels and building up sediment, and growing the delta into Lake Whakatipu. High rainfall in the mountains feeds these rivers and often causes flooding that impacts local roads and important infrastructure as well as the community's life and activities.

The area is exposed to seismic hazards including shaking, liquefaction and lateral spreading, partly due to its proximity to the Alpine Fault.

With a dynamic and seismically active environment, the Head of Lake Whakatipu area is exposed to a complex range of natural hazards, mainly flooding, landslide and earthquake-related hazards. These natural hazards can be relatively frequent and can be very disruptive. Climate and landscape changes could make some of these natural hazards worse. Natural hazards and associated risks are discussed in the detailed Draft Strategy Report, available on the ORC website at **orc.govt.nz/holwfeedback**

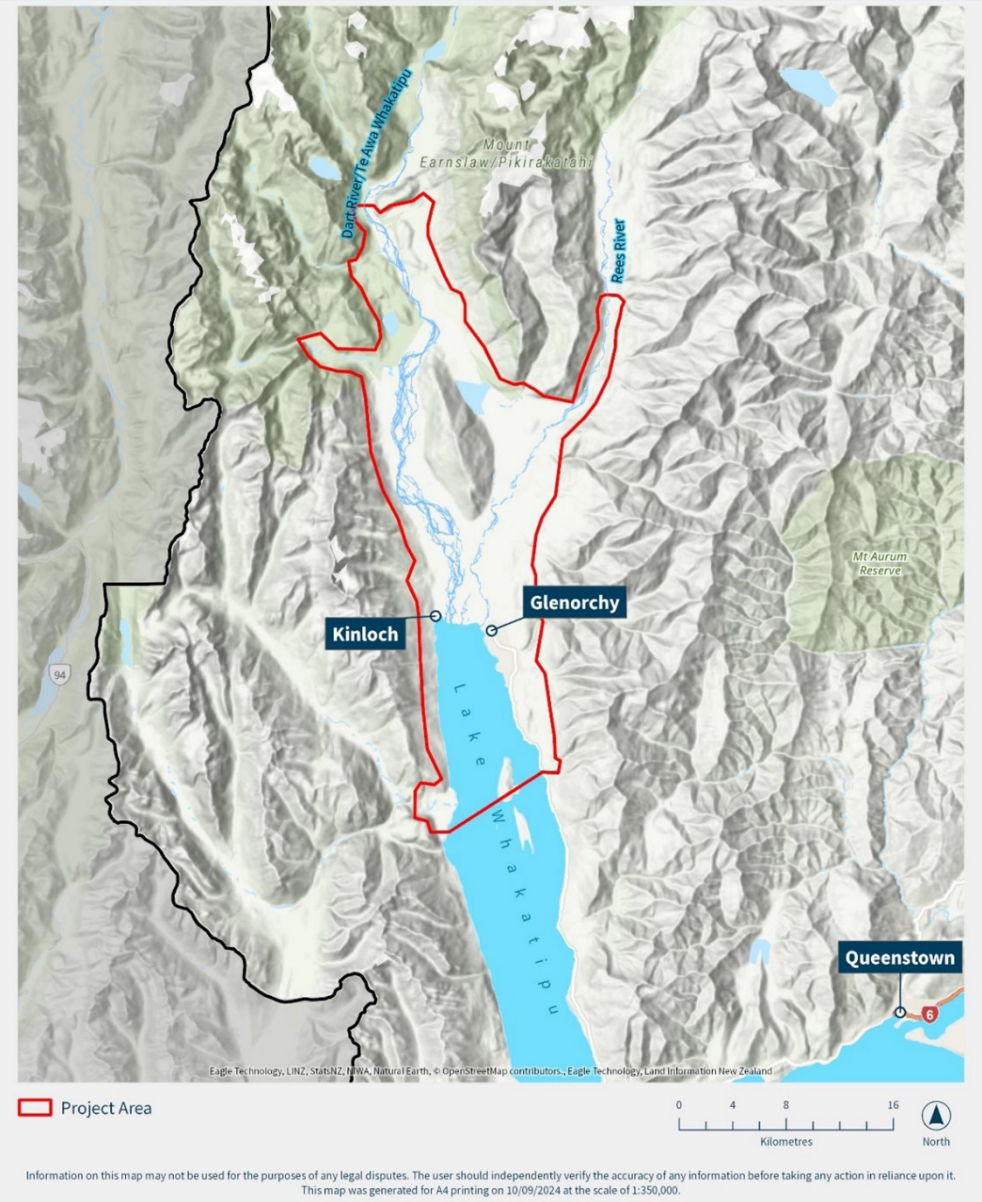

Figure 1. The Head of Lake Whakatipu (Whakatipu Waimāori) map, showing the location of the area included in the Natural Hazards Adaptation Strategy (outlined in red).

What matters most to the community?

The community — through community engagement sessions — has shared the things they care about most, which greatly helped us in developing the strategy and identifying adaptation response options. The key points identified by the community include:

- **Values:** The community highlighted their most important values, including safety, self-reliance, preserving the natural environment and protecting essential infrastructure, fostering economic resilience and self-sufficiency, maintaining and enhancing recreational spaces, respecting unique rural atmosphere and the area's history.
- **Resilience:** The Head of the Lake has a strong community, whereby people come together and "chip in" in difficult times. Key strengths of the community include strong engagement in adaptation planning efforts, emergency preparations and response, active local groups, and social cohesion (a strong sense of support and cooperation among community members).
- **Vulnerability:** There exist factors and conditions which may impede the adaptation efforts of the community to natural hazards, including a small population, limited healthcare services and emergency personnel, older population, high-need with many residents in low-wage jobs and large numbers of tourists.
- **Concerns:** The community's key fears and concerns include impacts of the adaptation programme and potential adaptation actions at the Head of the Lake, rising insurance costs and availability for properties, potential damage to brand, and inadequate preparations for natural hazards and adaptation actions due to a lack of sufficient information.

Why is adaptation needed?

'Adaptation' in its simplest form means making changes, adjustments to reduce the risks and impacts from natural hazards events like floods, helping communities stay safe and resilient.

The complex natural hazards in the Head of Lake Whakatipu pose risks to the community's life and their social and economic activities as well as critical infrastructure of the area.

With a changing landscape and climate, these challenges are expected to intensify. While there are no simple solutions, taking adaptation actions now will lay the groundwork for stronger, more resilient communities in the Head of Lake Whakatipu — now and in the future.

What is this strategy?

The Head of Lake Whakatipu Natural Hazards Adaptation Strategy (draft) establishes a long-term vision, goals, actions plans and ways of working to manage and adapt to natural hazards in the Head of Lake Whakatipu area.

The strategy is developed to support the communities in the Head of Lake Whakatipu area to address challenges posed by natural hazards.

It is a non-statutory plan. It does not have any decision-making power or create any obligations. It is intended to lay a good foundation, and provide a common direction to support decision making and effective adaptation in the area.

The strategy takes a long-term view and encompasses all types of natural hazards. It is focused on adapting to natural hazards only, as it aligns with the capacities of the strategy's partner agencies: Otago Regional Council, Queenstown Lakes District Council (QLDC) and Civil Defence Emergency Management Otago.

Simply put, this strategy is intended to be a reference document designed to guide and support the Head of the Lake's community, mana whenua, ORC and other agencies in preparing for and responding effectively to natural hazards impacts, both now and in the future.

How was the strategy developed?

ORC has taken a collaborative approach and have worked closely with the community, mana whenua representatives and partners (Queenstown Lakes District Council and Civil Defence Emergency Management Otago) throughout the process of the development of this strategy.

We have carried out a series of activities to support the development of the strategy, including community engagement sessions and technical studies.

The community at the Head of the Lake has been actively engaged over the past five years, participating in meetings, workshops and studies, and provided significant feedback. The contribution of the community is a very valuable outcome and plays a crucial role in shaping this strategy.

Vision of the strategy

The proposed vision of the strategy is a resilient and sustainable Head of Lake Whakatipu, where proactive natural hazard and climate adaptation enhance community wellbeing and safety and contribute to a flourishing environment.

Goals and objectives of the strategy

The strategy proposes five goals to help achieve the vision. They are:

Goal 1

Adaptation is woven into our everyday work

- Make plans and recommendations that align with council strategies, policies and processes, and integrate with business-as-usual workstreams.
- Work in partnership with mana whenua, coordinate and collaborate with other agencies and communities with a common purpose to incorporate adaptation into what we do.
- Build connections across and between agencies and work together effectively across work programmes.
- Encourage and amplify existing good practice and initiatives.

Goal 2

Lay a robust foundation for decision making

- Point us in the same direction, with a common understanding to build from.
- Continue to build understandings of natural hazard risks, uncertainties, and opportunities — of now and the future — that come with natural hazards and climate change.
- Increase awareness around current and future natural hazards risks and impacts of climate change, as well as effective adaptation responses.
- Build capacity around adaptation and support communities and decision makers to take advantage of opportunities.
- Incorporate mātauraka Kāi Tahu into the decision-making framework

Goal 3

Healthy and resilient communities

- Lead and support others to actively manage and reduce risk to natural hazard and impacts of climate change.
- Support and enable community-led action and behavioural change.
- Promote community safety by managing and reducing risk from natural hazards and impacts of climate change.
- Strengthen communities, businesses, and organisations so that they are well-prepared for natural hazard events and are better able to cope and recover.
- Support and strengthen Kāi Tahu connections to, and cultural values associated with, the area.

Goal 4

Resilient built places, infrastructure and systems

- Lead the way and support others to increase the resilience of infrastructure, resources and systems.
- Encourage responsible management of resources and infrastructure that prioritises resilience and sustainability, and avoids maladaptation.
- Provide information for individuals, businesses and agencies to consider natural hazard risks and the impacts of climate change as part of planning and development processes.
- Combine local traditional knowledge and modern knowledge and technology into planning and development of local infrastructure.

Goal 5

A flourishing environment

- Support and enable nature-based solutions and principles to adapt to natural hazard risks and climate change and deliver other socio-economic and environmental benefits.
- Integrate adaptation across council work programmes to deliver natural hazards, biodiversity and wider environmental outcomes.

Existing and possible future responses

The natural hazard challenges at Head of Lake Whakatipu are complex, and there is no simple solution.

The strategy has identified a range of existing and possible future responses that offer potential benefits for adaptation. The identification process has involved the following steps:

a) **Identify a range of possible responses, including crowdsourced ideas from community and local knowledge**

b) **Screen out responses that are not technically feasible**

c) **Develop a 'long-list' of adaptation responses, including existing and planned responses, and a future toolbox with both standard ways to manage hazards and innovative ideas**

d) **Community engagement on the long-list, get feedback on and add new ideas from the community**

e) **High-level socio-economic screening and mana whenua assessment of possible responses**

f) **Technical evaluation of some responses (i.e. potential responses for liquefaction management and floodplain management).**

The identified responses are summarised in Table 1 on the following pages.

The future possible responses (Future Toolbox) are not commitments, as they do not have business cases or future funding identified at this stage. Some future possible responses fall outside the currently established roles and responsibilities of partner agencies.

These potential future responses will be considered if we find that current approaches become unsustainable or unsuitable under changing conditions. This will help us improve our adaptation efforts for the area.

Table 1: Existing and possible future responses

CATEGORY	EXISTING OR FUTURE TOOLBOX?	LONG LIST OF RESPONSES (OCTOBER 2024)	TYPE OF RESPONSE	CURRENT AREA OF RESPONSIBILTY	WHAT IS THE MAIN OBJECTIVE OF THE RESPONSE?
Hazard awareness and mitigation	Existing **	Societal, behavioural, and institutional changes (improve over time) when considering natural hazards and changes to the physical environment	Accommodate	Everyone	Support awareness and informed decision making
	Future Toolbox **	➡ Review and accept residual risk for existing development	Accommodate	ORC, QLDC, community	Informed decision making
	Existing	Emergency readiness and response (improve over time)	Accommodate	CDEM, ORC, QLDC, community	All hazards emergency response
Road access	Existing	Maintenance, reactive repair and planned works for the Glenorchy-Queenstown Road	Accommodate / protect	QLDC	Maintain resilience of regional road access to flood, erosion and alluvial fan hazards
	Existing	Maintenance, reactive repair and planned works for the Kinloch and Glenorchy-Paradise local road system	Accommodate / protect	QLDC	Maintain resilience of local road access to flood, erosion and alluvial fan hazards
	Future Toolbox	➡ Small-scale improvement to existing Kinloch and Glenorchy-Paradise local road system road (as well as maintenance and reactive repair)	Accommodate / protect	QLDC	Reduce impacts of flood, erosion and alluvial fan hazards on local road access
	Future Toolbox	➡ Reduced level of service of existing Kinloch and Glenorchy-Paradise local road system (e.g. some parts 4WD only)	Accommodate	QLDC	Maintain local road access at a lower level of service
	Future Toolbox	➡ Major works to increase resilience of Kinloch and Glenorchy-Paradise local road system (e.g. protect, raise, realign)	Protect	QLDC	Reduce impacts of flood, erosion and alluvial fan hazards on local road access
	Future Toolbox	➡ Reactive re-design Kinloch and Glenorchy-Paradise local road system for changed conditions (e.g. post event)	Protect	QLDC	Post-event replacement to restore local road access

CATEGORY	EXISTING OR FUTURE TOOLBOX?	LONG LIST OF RESPONSES (OCTOBER 2024)	TYPE OF RESPONSE	CURRENT AREA OF RESPONSIBILTY	WHAT IS THE MAIN OBJECTIVE OF THE RESPONSE?
Boat access	Existing	Existing boat access at Kinloch and Glenorchy (limited by existing and ongoing sediment accumulation)	Accommodate	QLDC	Maintain alternative access
	Future Toolbox	➡ Short-term improvements to existing boat access (e.g. dredging)	Accommodate	QLDC	Improve alternative access
	Future Toolbox	➡ Upgrade boat access with resilient solution (e.g. relocatable wharfs)	Protect	QLDC	Provide alternative access with higher level of service
	Future Toolbox	➡ Relocate wharfs periodically to maintain future access	Protect	QLDC	Maintain alternative access with higher level of service
Flood mitigation and protection	Existing	Maintain the flood monitoring network (rainfall and water level stations) and flood data history	Accommodate	ORC	Flood hazard readiness and emergency response
	Existing	Flood monitoring, forecasting and warning (improve over time)	Accommodate	ORC	Flood hazard emergency response
	Existing	Existing low level Rees River flood protection by Glenorchy floodbank (maintenance and reactive repair)	Protect	QLDC	Maintain existing Rees River flood protection
	Future Toolbox	➡ Small-scale improvements to Glenorchy floodbank to maintain/reduce flood risk	Protect	QLDC	Increase resilience of Rees River flood protection
	Future Toolbox	➡ Major works to increase level of service of Glenorchy floodbank	Protect	QLDC	Reduce impacts of Rees River flood hazard on Glenorchy township
	Future Toolbox	➡ Redesign Rees flood protection for changed conditions (e.g. post event)	Protect	ORC, QLDC	Post-event replacement to restore protection
	Existing	Existing river management (vegetation and gravel)	Accommodate	ORC, QLDC	Maintain resilience to flood, erosion and alluvial fan hazards

CATEGORY	EXISTING OR FUTURE TOOLBOX?	LONG LIST OF RESPONSES (OCTOBER 2024)	TYPE OF RESPONSE	CURRENT AREA OF RESPONSIBILTY	WHAT IS THE MAIN OBJECTIVE OF THE RESPONSE?
Flood mitigation and protection continued	Future Toolbox	➡ River management and nature-based interventions (e.g. targeted planting)	Accommodate	ORC	Reduce impacts of flood, erosion and alluvial fan hazards
	Future Toolbox	➡ Redesign nature-based interventions for changed conditions	Accommodate	ORC	Post-event replacement
	Future Toolbox	➡ Small-scale works to reduce Buckler Burn erosion and/or flood risk	Protect	ORC	Reduce impacts of Buckler Burn flood, erosion and alluvial fan hazards
Public asset resilience	Future Toolbox	➡ Improve resilience of critical assets in higher hazard areas (such as floodproofing, floor raising, ground or structure strengthening, retrofit, move elsewhere)	Accommodate	Asset owner	Reduce impacts on critical assets
Community-wide resilience (public and private)	Future Toolbox	➡ Community-wide improvement works for liquefaction hazard (such as ground improvement and strengthening existing buildings)	Accommodate	Not defined	Reduce impacts from seismic hazards on Glenorchy township
Private property resilience	Existing	Household emergency planning	Accommodate	Household	Reduce impacts on existing development
	Existing	Property and business insurance (adjust coverage as needed)	Accommodate	Property/business owner	Support recovery
	Future Toolbox	➡ Improve property and land resilience (such as floodproofing, floor raising, ground or structure strengthening)	Accommodate	Property owner	Reduce impacts on existing development
	Existing	Consider local risk and hazard information when property decisions are required (e.g. buying/selling) are required	Accommodate	Property owner	Informed decision making

CATEGORY	EXISTING OR FUTURE TOOLBOX?	LONG LIST OF RESPONSES (OCTOBER 2024)	TYPE OF RESPONSE	CURRENT AREA OF RESPONSIBILTY	WHAT IS THE MAIN OBJECTIVE OF THE RESPONSE?
Policy	Existing	Policy — existing land use zoning, rules and building controls	Accommodate	ORC, QLDC	Reduce impacts on future development
	Future Toolbox NEW**	➡ Policy — review hazard and risk information and set appropriate requirements for new development	Accommodate	ORC, QLDC	Reduce impacts on future development
	Future Toolbox	➡ Policy — strengthen land use controls in higher hazard areas to avoid additional exposure	Avoid	ORC, QLDC	Avoid impacts on future development
	Future Toolbox	➡ Policy and services — identify and make available lower hazard land for new building and/or relocation	Avoid	QLDC	Avoid impacts on future development
	Future Toolbox	➡ Recovery plan improvement	Accommodate	CDEM, QLDC, community	Support effective recovery
	Future Toolbox	➡ Proactive relocation plan	Retreat	Not defined	Support effective relocation
	Future Toolbox	➡ Voluntary proactive relocation from higher hazard areas	Retreat	Not defined	Avoid / reduce impacts on existing community (by relocating before an event)
	Future Toolbox	➡ Voluntary reactive post-event retreat from higher hazard areas	Retreat	Multi-agency, property owners	Avoid repeat impacts

** Three additional responses have been added to the long-list since March 2024

How will the strategy be implemented?

It is proposed that the strategy is implemented by the community and partner agencies through well-established planning processes, such as long-term plans, QLDC District Plan and Otago CDEM Group Plan. The plans have a regular update cycle and this is when decisions on continuing and future investment are made by the partner agencies.

The following are key activities the strategy's partners are responsible for within this strategy:

- **ORC** implements activities to reduce the impact of natural hazards, including, but not limited to, (1) monitoring and maintaining a network of rain and river flow gauges and sharing the data, (2) analysing incipient information to provide early warning and (3) river management activities.
- **QLDC** makes decisions about the effects of land use, activities on the surface of rivers and lakes, providing for sufficient development capacity for residential and business growth and subdivision. It also conducts activities including, but not limited to, (1) maintaining public roading and three waters assets, the Glenorchy marina and jetty, and the Glenorchy floodbank, (2) working closely with ORC, CDEM Otago and emergency services to prepare for and respond to natural hazards events.
- **CDEM Otago** implements activities to safeguarding communities across the area in emergencies, including, but not limited to, (1) taking lead on preparedness, response and recovery from natural hazards events, including development of emergency plans and early warnings, and (2) conducting emergency drills and raising awareness of the importance of preparedness for emergency events.
- **The Head of the Lake Whakatipu community** is responsible primarily for ensuring their own safety, the protection of any dependents and property, reducing their potential for loss, maintaining readiness, and responding appropriately during an event.

It is proposed that ORC and the strategy's partners will continue working on activities to monitor how effectively the strategy will be implemented. It is proposed to monitor changes in social, economic and environmental conditions by using different methods, such as wellbeing surveys, physical monitoring and community feedback.

We will also monitor the progress of this strategy by tracking the actions listed in the Action Plan.

The strategy will be reviewed thoroughly every six years to make any needed updates.

Action Plan

To manage the natural hazards as well as reducing the risk and impacts from those hazards to the area of the Head of the Lake, ORC and the strategy partners over the past years have undertaken or planned to take several activities/actions. The following are key activities:

- Building community awareness and adaptive capacity regarding natural hazard risks and climate change.
- Integrating natural hazards management approaches into local policies such as QLDC's Spatial Plan and District Plan.
- Allocating budget within long-term plans to manage local infrastructure like Rees and Dart bridges and Glenorchy floodbank as well as activities of river and floodplain management and flood monitoring and warnings.
- Implementing the four principles in emergency management: reduction, readiness, response and recovery.
- Preparing emergency management personnel.
- Developing community emergency management documents
- Setting up Civil Defence Emergency Management Centres and Community Emergency Hubs.
- Land use planning.

These activities are detailed in the Action Plan part of the strategy.

The Action Plan focuses on planning time horizons to align with Councils' 10-year long-term plans and 30-year infrastructure strategies. Where appropriate, longer time horizons are considered for natural hazards impacts and climate change information.

Actions are based on currently defined roles and responsibilities and aligned with current legislation, systems, processes and policies. Table 2 on the following pages presents all current activities and commitments of ORC and the strategy's partners.

Table 2: Action plans and activities of the strategy

Governance and collaboration				
Status	**Action**	**Goal this contributes towards**	**Agency responsible**	**Time frame**
Underway or planned	Otago Regional Council (ORC) and Queenstown Lakes District Council (QLDC) collaborate to develop a governance framework or memorandum of understanding (MoU) for addressing adaptation issues at the Head of the Lake and/or across the district, including the implementation of adaptation actions to improve resilience.	1	Otago Regional Council (Natural Hazards) Queenstown Lakes District Council	
Underway or planned	ORC to partner with mana whenua to ensure mana whenua values and aspirations and mātauraka Kāi Tahu is embedded into decision making and implementation of the strategy, following the lead of Aukaha and Te Ao Mārama.	All goals	Otago Regional Council (Natural Hazards) Aukaha and Te Ao Mārama Inc	
Underway or planned	Work together with QLDC, Civil Defence Emergency Management Otago (CDEM), mana whenua and local community to ensure coordinated and consistent approach to implementation of actions aligning with this strategy.	All goals	Otago Regional Council (Natural Hazards) Queenstown Lakes District Council Civil Defence Emergency Management Otago Aukaha and Te Ao Mārama Inc Glenorchy Community Association	
Underway or planned	Work together to mainstream adaptation across ORC work programmes and ensure our work aligns with this strategy and towards achieving each goal.	All goals	Otago Regional Council (Natural Hazards, Environmental Implementation, Engineering, Integrated Catchment Management)	Ongoing

Information gathering and monitoring

Status	Action	Goal this contributes towards	Agency responsible	Time frame
Existing	ORC to Investigate hazards and risks as part of usual business.	1, 2	Otago Regional Council (Natural Hazards)	Ongoing
New	<u>Geomorphic change monitoring and assessment.</u> Maintain an awareness of locations and scale of geomorphic changes (e.g. active river channel position, bed levels and rates of change) which may have direct impacts, or exacerbate natural hazard characteristics. • Collect LiDAR, aerial imagery — spatial extent to include at least Dart, Rees and Buckler (at least extent of 2019 survey). • Cross section survey and/or bathymetric LiDAR. • Undertake geomorphic change detection analysis. This information will; • enable proactive response to issues. • enable the updating of flood hazard assessments to ensure they provide representation of current conditions (e.g. bed levels).	2	Otago Regional Council (Natural Hazards) with external support	Periodic (at least every five years) or when new LiDAR is available
Existing	<u>Data collection to document major flooding (or other hazard) events.</u> Improve the recording and understanding of hazard event characteristics (e.g. floodwater extents, depths and flow pathways), and the impacts of those events. The types of data collected will depend on the hazard and the impact and may include the following: • Post-event LiDAR. • During-event or immediately post-event aerial imagery. • During-event or post-event observations (on-ground inspections and/or drone imagery). • Develop an online data portal to enable collation of crowdsourced natural hazard event observations (e.g. photographs). • On-ground post-event survey (debris survey).	2, 3	Otago Regional Council (Natural Hazards) with external support	After hazard events

Information gathering and monitoring

Status	Action	Goal this contributes towards	Agency responsible	Time frame
	• Assessments/observations of damages/impacts (infrastructure, or residential). • Geotechnical assessments. • Post-earthquake assessments (landsliding, liquefaction, subsidence). This information will; • Assist with hazard/risk assessments by providing ground-truthed observations of hazard events. • be valuable for calibration/validation of future hazard modelling, helping to ensure models represent reality.			
	<u>Monitoring and analysis of signals/triggers/thresholds.</u> SIGNALS — give us a heads up about changes • Growth in costs to maintain and repair assets. • Lower level of service (e.g. due to delta growth, river bed aggradation, channel movement). • Frequency, number or impacts of flooding events reaching nuisance level (this signal includes residential areas, roads and agricultural land). • Movement of active river channel towards high value areas and assets. • Negative impacts on community wellbeing (e.g. concern and anxiety, increased demand for protection or for doing things differently). • Insurance affordability or coverage. TRIGGERS — points where review and decisions are made • Decision-making cycles (3-year, 10-year, 30-year). • Opportunities. • Significant natural hazard event with unacceptable outcomes.	2	Otago Regional Council (Natural Hazards) with input from Queenstown Lakes District Council and external support	Periodic (at least every five years)

Information gathering and monitoring				
Status	**Action**	**Goal this contributes towards**	**Agency responsible**	**Time frame**
	THRESHOLDS — unacceptable conditions we are trying to avoid. • Extended disruption to road access from Queenstown. • Frequent or severe damaging or disruptive events. • Loss of amenity and cultural values. • Lengthy displacement of people following extreme events. • Withdrawal of maintenance, decline in levels of service and increasing cost of repairs. • Unaffordable or high-excess insurance premiums or withdrawal of insurance and bank finance.			
	Communication and reporting of physical environment monitoring. • Data collection and analysis findings will be communicated to key project partners and stakeholders. • A brief environmental monitoring update report will be prepared every three years summarising any notable natural hazards event/ impacts (e.g. peak flows/lake levels observed) within that time period, and any post-event data collection or analysis completed. • One-off standalone event reports may be prepared for any natural hazards events which causes significant impact — summarising event causes, characteristics, effects/impacts, and ORC responses. • Reports will be distributed to key contacts, through existing communication channels (e.g. ORC e-newsletter and project website), and appended to any councillor update reports.	2	Otago Regional Council (Natural Hazards)	Three- yearly updates One-off reporting for significant events

Emergency Management

Status	Action	Goal this contributes towards	Agency responsible	Time frame
New	Develop a long-term recovery plan for a potential major hazard event, including ways to minimise maladaptation post-event and ensure recovery considers long-term adaptation opportunities.	1, 3, 5	Otago Regional Council (Natural Hazards) Civil Defense Emergency Management Otago Queenstown Lakes District Council	Ongoing
Existing	Operate a network of near real-time rainfall and water level stations across the region to support flood forecasting and emergency response with a 24/7 duty roster to support forecasting duties and any necessary response.	2, 3	Otago Regional Council (Natural Hazards, Engineering, Environmental Monitoring) Civil Defense Emergency Management Otago	Ongoing
Existing	Monitor and ensure ORC's network of environmental monitoring stations remains fit for purpose; providing information for flood response, for documentation of flood events, and for public awareness of river flow, lake and lagoon levels. • Review of performance of the flood forecasting systems (lake level and lagoon level forecasting). • Review of hydrological monitoring network (any opportunities for improvement?). • New/temporary monitoring in some circumstances (e.g. landslide dam formation). This action is intended to ensure the monitoring network and forecasting systems provides the most suitable coverage.	1, 2	Otago Regional Council (Natural Hazards, Environmental Monitoring)	Periodic reviews One-off temporary monitoring
Existing	Capability development and awareness raising. • Undertake public/internal education to develop knowledge and raise awareness of risks and natural hazards to communities and Community Response Group's members. • Share lessons learned from emergency response with communities. • Introduced and organised training sessions for Community Response Group members of how to use Community Emergency Hub Guide.	1, 2, 3	Civil Defense Emergency Management Otago	As needed Annually

Emergency Management

Status	Action	Goal this contributes towards	Agency responsible	Time frame
Existing	Engagement with communities and stakeholders. • Communicate prior to forecast weather events to have a common understanding around Lake and Lagoon levels, river flows and potential outcomes of the forecast weather. • Communicate with communities about changes in risk and readiness. • Work with Community Response Group to coordinate emergency support before, during and after an emergency. • Organised consultations with communities on emergency proposed plans and guidelines. • Convene meetings with communities and stakeholders to decide a scale of an emergency event.	1, 2, 3	Civil Defense Emergency Management Otago Community Response Group	As needed Annually
Existing	Risk communication and early warnings. • Provide right and trusted information about natural disasters to communities so that they can prepare effectively to emergency events.	3	Civil Defense Emergency Management Otago Queenstown Lakes District Council	Frequently Per event
Existing	Provide community resilience equipment. • Provide communications equipment to not only communicate locally but also communicate to the Emergency Operations Centre in Queenstown if BAU communications systems have failed. • Provided equipment for communities to better prepare for emergency events: ✓ 4000W petrol inverter generator ✓ Petrol container ✓ Extension cords ✓ Multi boxes ✓ Rechargeable LED light 20W work lights ✓ Tripod LED light 60W work lights ✓ Handheld torches and spare batteries.	3	Queenstown Lakes District Council Civil Defense Emergency Management Otago	As needed One-off

Emergency Management

Status	Action	Goal this contributes towards	Agency responsible	Time frame
Existing	Develop and share emergency guides and plans and update annually. • Glenorchy Community Resilience Guide (draft in progress). • Glenorchy Community Response Plan (draft in progress). • Developed Glenorchy Flood Guide. • Developed Community Emergency Hub Guide. • Developed Community Emergency Preparedness Brochure.	3	Civil Defense Emergency Management Otago Community Response Group	Update annually
Existing	Training and exercises for Community Response Group and Emergency Hub implementation. • Provided trainings to help Community Response Group set up Emergency hubs, operating radios and community response planning. • Exercise the implementation of the Community Emergency Hub to gain an understanding of expectations of the community, emergency services and local government as well as clarify any ambiguity or operational expectations that may present during an actual emergency.	3	Civil Defense Emergency Management Otago Community Response Group	One-off As needed

Advice, information and education

Status	Action	Goal this contributes towards	Agency responsible	Time frame
Underway or planned	Ensure the ORC Natural Hazards Portal includes up-to-date information on natural hazards and the impacts of climate change, to provide the community with a single location for information.	2, 3	Otago Regional Council (Natural Hazards)	
Underway or planned	Maintain ORC Head of Lake Whakatipu adaptation webpages with relevant and up-to-date information, including latest reports, Council updates and key programme milestones.	2	Otago Regional Council (Natural Hazards and Communications)	Ongoing

Advice, information and education

Status	Action	Goal this contributes towards	Agency responsible	Time frame
Underway or planned	Provide newsletter updates about programme milestones and or progress towards actions to inform community members, and be accountable to the strategy.	2	Otago Regional Council (Natural Hazards and Communications)	As needed
New	ORC to attend Glenorchy Community Association (GCA) meetings as and when required, at least annually, to provide updates about programme milestones and progress towards actions and act as a check-in with the community.	2, 3	Otago Regional Council (Natural Hazards)	Annually or as needed
Underway or planned	Ensure that ORC's messaging about natural hazards adaptation and adaptation workstreams is communicated in a way that is understood by a wide audience.	2	Otago Regional Council (Natural Hazards and Communications)	Ongoing
Underway or planned	Monitor the **headofthelake@orc.govt.nz** inbox for public enquiries and information relating to the programme. Consider other methods and tools for capturing community feedback.	2	Otago Regional Council (Natural Hazards)	Ongoing

Policy and planning processes

Status	Action	Goal this contributes towards	Agency responsible	Time frame
Underway	Consider natural hazard property information for resource and building consents.	4	Queenstown Lakes District Council	Ongoing (BAU)
Underway or planned	ORC and QLDC to collaborate to ensure common adaptation priorities, information and actions identified in this strategy inform and input into the next ORC and QLDC long-term plans, Spatial Plan, District Plan and other relevant policies and plans.	1, 2	Otago Regional Council Queenstown Lakes District Council	Every LTP cycle
	Natural hazard information included on LIM reports.	1, 2	Queenstown Lakes District Council	
New	ORC and QLDC to collaborate on path forward for assessing risk tolerance with the community (once the proposed RPS is operative).	1, 2, 3, 4	Otago Regional Council Queenstown Lakes District Council	Once the proposed RPS is operative

Addressing impacts of natural hazards and climate change

Status	Action	Goal this contributes towards	Agency responsible	Time frame
Underway	Routine maintenance of transport network, including QLDC roading assets, Glenorchy jetty and marina.	1, 4	Queenstown Lakes District Council	Ongoing/BAU
Underway	Glenorchy Area Bridge Resilience (24-34 LTP): Non-routine work required to protect the serviceability of the Glenorchy, Paradise, Rees River bridge assets following damage, and to minimise threat of road closure due to natural phenomena.	1, 4	Queenstown Lakes District Council	As required, budgeted biennially
Underway	Raising Kinloch Road (24-34 LTP). Raising Kinloch Road in conjunction with two-yearly gravel extraction under the Rees River bridge.	1, 4	Queenstown Lakes District Council	As required, budgeted biennially
New	Develop Operational River Management Plans, including the Dart and Rees floodplains. • Operational Management Plans that outline the activities undertaken for river management. • These plans will be developed in 2025.	1, 4	Otago Regional Council (Engineering and Natural Hazards)	2025 Reviewed every two years
New	Develop a gravel management plan for the Buckler Burn. • ORC, Engineering held consent of Buckler gravel management plan. • This plan will be developed in 2025.	1, 4	Otago Regional Council (Engineering and Natural Hazards)	2025 Reviewed every two years
Underway	Annual vegetation management, rock armouring and gravel management. • Ongoing river management activities (such as regular vegetation control in Lagoon Creek/Lagoon area).	3, 4, 5	Otago Regional Council (Engineering)	Ongoing/Annually
Existing	Maintenance of Rees River floodbanks. • Maintain (not renew or increase) the existing banks — (Rees River floodbanks are not owned by ORC).	1, 4	Otago Regional Council (Engineering and Natural Hazards)	Every year
New	Floodplain and rivers. • Create/trial NBS groynes.	1, 4, 5	Otago Regional Council (Engineering and Natural Hazards)	Every two years

Addressing impacts of natural hazards and climate change

Status	Action	Goal this contributes towards	Agency responsible	Time frame
New	Glenorchy Adaptation Pathways (30-yr Infrastructure Strategy). Work on social infrastructure required to address selected adaptation pathways, as budgeted in the QLDC 30-year Infrastructure Strategy.	1, 3, 4	Queenstown Lakes District Council	2034-2054
New	Provide information and support property owners to undertake property-level interventions to improve their resilience to natural hazards risks.	3, 4	Otago Regional Council (Natural Hazards)	
New	Head of the Lake Adaptation (24-34 LTP). Strategy to inform responses to identified hazards, providing scoped and costed solutions for input to the next LTP (27-37) and other key planning documents.	1, 2, 4	Queenstown Lakes District Council	2034-2054

Additional information

Several resources related to the strategy are available on the ORC and QLDC websites. You can access these resources through the links below for more information:

- Head of Lake Whakatipu Programme: orc.govt.nz/get-involved/projects-in-your-area/head-of-lake-whakatipu/
- Technical reports of this strategy: orc.govt.nz/get-involved/projects-in-your-area/head-of-lake-whakatipu/investigations-reports-and-presentations/
- QLDC's long-term plans: qldc.govt.nz/your-council/council-documents/long-term-plan-ltp/

If you want to stay in touch, subscribe to our community newsletter:

- orc.govt.nz/holwnewsletter

If you have any feedback or enquires about the strategy or the supporting information, send it to our email or mail addresses:

- **Email:** headofthelake@orc.govt.nz
- **Mail:**
  Natural Hazards Department
  Otago Regional Council
  Private Bag 1954
  Dunedin 9054

PHOTO: MATT GARDNER

Survey questions

Feedback closes at 11.59pm on 23 February 2025.

See page 2 for return instructions or link to the online survey.

*Compulsory questions

Vision

The strategy puts forward a vision for a resilient and sustainable Head of the Lake Whakatipu.

Question 1: Does this vision align with your vision for adapting to natural hazards and climate change in the Head of Lake Whakatipu area?*

- ◯ Yes — go to Question 3
- ◯ Somewhat — go to Question 2
- ◯ Not sure — go to Question 2
- ◯ No — go to Question 2

Question 2: How does your personal vision differ? (250 words max)

Goals

The goals of the strategy reflect the type of work that ORC and partners can do to support Head of the Lake communities adapt to natural hazards and climate change.

Question 3: Which of these adaptation goals do you think ORC and partners should be working harder to address?* (Select all that apply and explain why)

- ◯ Integrating natural hazard adaptation into everyday decisions
- ◯ Collaborating with mana whenua and partners
- ◯ Supporting healthy and resilient communities
- ◯ Building resilient infrastructure
- ◯ Protecting and enhancing the environment

Please explain why you have selected the goals that you think are the most important for the community.

Action Plan and Future Toolbox

Given the ideas and inputs from the community and partners, we have developed a long-list of adaptation responses.

The **action plans** (see pages 16–25) are activities and commitments ORC and partners are taking or planning to take in order to support the Head of Lake Whakatipu's communities adapt to natural hazard risks and climate change impacts.

Question 4: Do you think we are doing enough to support this adaptation at the Head of the Lake?*

- ◯ Yes — go to Question 5
- ◯ Yes, but more could be done — please answer Question 4a below
- ◯ Not sure — please answer Question 4a below
- ◯ No — please answer Question 4a below

Question 4a: What additional actions do you think ORC and partners should consider to help Head of the Lake communities adapt to natural hazards and climate change? (250 words maximum)

The possible **future toolbox** (on pages 10–13) will be considered if we find that existing and current responses/approaches become unsustainable or unsuitable under changing conditions. These future responses are not commitments as they do not have business cases or future funding identified at this stage.

Question 5: Which potential responses in the Future Toolbox are most important to you and your household?* (You can choose up to three options and explain why).

- ◯ Review and accept residual risk for existing development
- ◯ Small scale improvement to existing Kinloch and Glenorchy-Paradise local road system road (as well as maintenance and reactive repair)
- ◯ Reduced level of service of existing Kinloch and Glenorchy-Paradise local road system (e.g. some parts 4WD only)
- ◯ Major works to increase resilience of Kinloch and Glenorchy-Paradise local road system (e.g. protect, raise, realign)
- ◯ Reactive re-design Kinloch and Glenorchy- Paradise local road system for changed conditions (e.g. post event)
- ◯ Short-term improvements to existing boat access (e.g dredging)
- ◯ Upgrade boat access with resilient solution (e.g. relocatable wharfs)
- ◯ Relocate wharfs periodically to maintain future access
- ◯ Small-scale improvements to Glenorchy floodbank to maintain/reduce flood risk
- ◯ Major works to increase level of service of Glenorchy floodbank
- ◯ Redesign Rees flood protection for changed conditions (e.g. post event)
- ◯ River management and nature-based interventions (e.g. targeted planting)
- ◯ Redesign nature-based interventions for changed conditions
- ◯ Small-scale works to reduce Buckler Burn erosion and/or flood risk
- ◯ Improve resilience of critical assets in higher hazard areas (such as floodproofing, floor raising, ground or structure strengthening, retrofit, move elsewhere)
- ◯ Community-wide improvement works for liquefaction hazard (such as ground improvement and strengthening existing buildings).
- ◯ Improve property and land resilience (such as floodproofing, floor raising, ground or structure strengthening)
- ◯ Policy — review hazard and risk information and set appropriate requirements for new development
- ◯ Policy — strengthen land use controls in higher hazard areas to avoid additional exposure
- ◯ Policy and services — identify and make available lower hazard land for new building and/or relocation
- ◯ Recovery plan improvement
- ◯ Proactive relocation plan
- ◯ Voluntary proactive relocation from higher hazard areas
- ◯ Voluntary reactive post event retreat from higher hazard areas

Please explain why you have selected your responses:

Additional feedback

If there is anything else you would like to tell us about the Draft Strategy, let us know below.

Optional: A bit about you

What is your connection to the Head of Lake Whakatipu? (Select all that apply)

- ◯ Glenorchy resident
- ◯ Glenorchy ratepayer
- ◯ Community organisation
- ◯ Farming
- ◯ Tourism operator
- ◯ Business owner
- ◯ Holiday home owner
- ◯ Recreational visitor
- ◯ Other: _____

Which age group do you belong to?

- ◯ 65 or over
- ◯ 30-64
- ◯ 15-29
- ◯ Under 15
- ◯ Prefer not to say

Where do you live in relation to the Head of Lake Whakatipu?

- ◯ Glenorchy Township
- ◯ Rees Valley
- ◯ Dart Valley
- ◯ Campbelltown
- ◯ Wyuna Preserve
- ◯ Queenstown
- ◯ Elsewhere in Otago
- ◯ South Island (outside of Otago)
- ◯ North Island
- ◯ Overseas

If you would like to receive updates about this strategy in our monthly Head of Lake Whakatipu newsletter, please provide your email address:

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