

9.1. Head of Lake Whakatipu Natural Hazards Adaptation

Prepared for: Safety and Resilience Committee

Report No. OPS2428

Activity: Governance Report

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Date: 7 August 2024

PURPOSE

- [1] To update the Committee on progress towards development of a natural hazards adaptation strategy for the Head of Lake Whakatipu area.

EXECUTIVE SUMMARY

- [2] Otago Regional Council (ORC) is following the Dynamic Adaptive Pathways Planning approach (DAPP or 'Adaptation Pathways') as a framework for development of a Head of Lake Whakatipu natural hazards adaptation programme.
- [3] The ORC led natural hazards adaptation programme for the area at the Head of Lake Whakatipu is progressing well. This paper provides an update on activities since the previous committee paper presented in May 2024.
- [4] A revised sequence of key programme activities is proposed which aims to present a finalised strategy document to Council for endorsement in early 2025.
- [5] Natural hazard investigations are progressing: it is expected that the natural hazards risk assessment for Glenorchy and Kinloch and the feasibility assessment for floodplain hazard management approaches for the Dart-Rees floodplain will be completed in the middle of 2024.
- [6] Updates are given on engagement activities completed since May 2024. Engagement planning is underway for the next series of engagement activities proposed for September 2024. The focus will be to share the findings of two significant technical studies and discuss preferred adaptation responses and pathways.

RECOMMENDATION

That the Safety and Resilience Committee:

- 1) **Notes** this report.
- 2) **Notes** the Head of Lake Whakatipu natural hazards adaptation work programme and community engagement.

BACKGROUND

- [7] Otago Regional Council (ORC), in collaboration with project partners, is leading a programme of work to develop a natural hazards adaptation strategy for the head of Lake Whakatipu area.
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- [8] The area at the head of Lake Whakatipu (Whakatipu-Wai-Māori) is exposed to multiple natural hazard risks, including those due to seismic events, flooding and slope-related processes. This risk setting is compounded by a changing climate and landscape-scale geomorphic change.
- [9] ORC is using the Dynamic Adaptive Pathways Planning approach (DAPP, or ‘Adaptation Pathways’) as a framework for development of a head of Lake Whakatipu natural hazards adaptation programme. ORC is also using this approach in natural hazards adaptation planning for the South Dunedin Future¹ and Clutha Delta² natural hazards adaptation programmes.
- [10] The adaptation project approach and work activities completed are outlined in the series of papers previously presented in 2021-2024³. The most recent paper, presented in May 2024, proposed to deliver the completed (first iteration) strategy by November 2024.
- [11] Quarterly update papers to the Safety and Resilience Committee will continue through until the delivery of the strategy.
- [12] This paper is focused on updates on current or planned activities in this work programme, including community engagement activities; natural hazard risk assessment for Glenorchy and Kinloch; and feasibility assessment for floodplain hazard management approaches for the Dart-Rees floodplain (including nature-based solutions).
- [13] Figure 1 shows an overview of key activities in the Head of Lake Whakatipu natural hazards adaptation work programme, with the programme currently focussing on the third phase “*What can we do about it?*” and building towards delivery of a first iteration of the strategy document. Figure 1 updates the similar figure presented in the previous committee papers.

DISCUSSION

- [14] The ORC-led natural hazards adaptation programme for the area at the Head of Lake Whakatipu is progressing well. Two significant technical studies are aiming for completion in the middle of 2024.
- [15] ORC is proposing a revised schedule to deliver the completed (first iteration) strategy in early 2025, with timing subject to partners, stakeholders and community feedback on the draft documents. A draft of the strategy document will be available for community/public consideration and feedback from late 2024.
- [16] The revised schedule is partly to allow more time for external review (partners and peer-reviewers) of the natural hazards risk assessment for Glenorchy and Kinloch, and to address reviewer comments. This will contribute to the robustness in the findings of the assessment. The revised schedule also extends the public feedback period to three

¹ <https://www.dunedin.govt.nz/council/council-projects/south-dunedin-future>

² van Woerden T, Conroy A and Payan J, 2023. Clutha Delta Natural Hazards Adaptation. Report OPS2341 to the Otago Regional Council Safety and Resilience Committee, 9 November 2023.

³ Reports to Council (27 May 2021), the ORC Data and Information Committee (9 June 2022) and the ORC Safety and Resilience Committee (10 May 2023, 10 August 2023, 9 November 2023, 8 February 2024 and 8 May 2024)

months (instead of one month previously allowed for), since it now falls over the busy summer season for the community.

ADAPTATION STRATEGY DEVELOPMENT

- [17] The revised sequence of key programme activities with Council and community is as follows:
- Presentation of technical assessment results (Aug/Sept 2024)
 - Adaptation pathways discussion (Sept 2024)
 - Draft of strategy documents released for community feedback and comment (late 2024)
 - Finalised strategy document presented to Council (early 2025) – timing is subject to the feedback on the draft documents
- [18] A screening assessment of the potential cultural significance of a long-list of possible adaptation responses at the Head of Lake Whakatipu is being undertaken separately by Aukaha to incorporate a Te Ao Māori worldview into decision-making processes.
- [19] Adaptation strategy development is currently focussed on drafting potential pathways, including suitable signals, triggers, and thresholds, to support community discussion and input.
- [20] The Strategy will include Action Plans that describe adaptation responses that are underway or in progress.

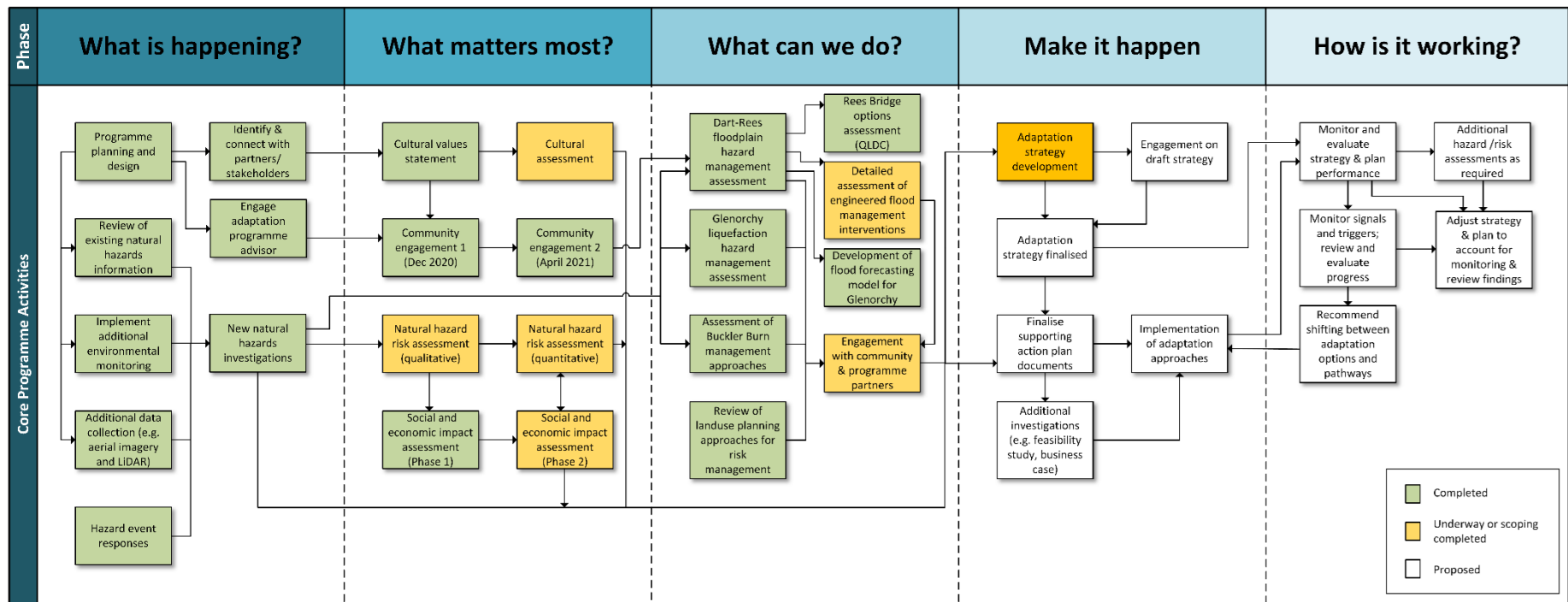


Figure 1: Head of Lake Whakatipu programme overview of key activities. This diagram updates from the previous (May 2024) and earlier committee papers.

COMMUNITY ENGAGEMENT

[21] Proposed engagement activities to align with the updated programme delivery schedule are outlined in Table 1. This table updates overviews presented in previous Committee updates. In addition to these activities, regular programme updates are provided to the community through the monthly newsletter (attached) and programme webpage.

Table 1: Overview of proposed engagement activities for the delivery of the programme.

Engagement activity (and level of participation*)	Purpose	Early 2024	Sept 2024	Late 2024 - early 2025
Collaborate with EnviroSchools to facilitate learning activities at Glenorchy Primary School ➤ 'Involve'	Build youth understanding of hazardscape and adaptation approaches	✓		
Head of the Lake youth art competition ➤ 'Involve/Collaborate'	Involve youth in Strategy design	✓		
Share Socio-Economic Impact Assessment (SEIA) Phase 1 findings ➤ 'Inform'	Update community of the findings of technical studies in an accessible way	✓		
Share natural hazards risk assessment and feasibility assessment findings ➤ 'Inform'	Update the community on the findings of technical studies, in an accessible way			
Discuss and develop preferred adaptation responses and pathways ➤ 'Involve/Collaborate'	Build understanding and generate ideas on signals, triggers, trade-offs, preferred pathways and how to monitor changes			
Gain feedback on draft strategy document ➤ 'Consult'	Receive feedback on the Strategy document and strategic framework for adaptation so that the Strategy works for this community			

[22] The programme team collaborated with EnviroSchools to facilitate two sessions with senior students at Glenorchy Primary School, during April and May. The first session focused on landscape changes over time and how people have adapted to these changes in the past and present, linking to the school focus on gold mining history. The second session used NIWA's Township Flood Challenge⁴ to facilitate discussions around climate change and its impacts, potential adaptation responses, complex decision-making and risk.

[23] From 8 April to 9 May 2024, ORC held the 'Head of the Lake Youth Art competition'. The theme was 'what does the Head of the Lake mean to you?' and the competition was open to children and young people aged 17 and under. In total there were 17 entries (see Figure 2), with one overall winner and three age group winners (5 and under, 6-8 and 9 and above).

⁴ <https://niwa.co.nz/township-flood-challenge-game>

- [24] The art entries build upon previous engagement about community values and what matters most to them about Glenorchy, emphasising nature, cultural heritage, social connections, and play. Winners' art will be incorporated into the design of the Head of Lake Whakatipu Natural Hazards Adaptation Strategy documents.
- [25] An online presentation and Q&A session was held on Wednesday 22 May to share the findings of Phase 1 of the Socio-Economic Impact Assessment with local community members. The session was also recorded and uploaded to the programme webpage⁵.



Figure 2: Montage of all entries received for the Head of the Lake Youth Art Competition.

Planning for Upcoming Engagement Activities

- [26] Planning is underway for in-person community engagement sessions in September 2024 to share the findings of technical studies and to discuss preferred adaptation responses and pathways. The purpose of these engagement activities is listed in Table 1.
- [27] It is proposed to use a variety of engagement tools and activities over a couple of days. This will likely include:
1. Town hall presentation and Q&A with technical experts
 2. Opportunities for household/small group discussions with technical experts

⁵ <https://www.youtube.com/watch?v=x3ac7aAgpPQ>

3. Drop-in session with interactive activities to facilitate discussion about adaptation pathways

[28] A multi-pronged approach to engagement aims to provide opportunities for different parts of the community to better understand what this new information means for them, and to provide feedback on how best to respond and adapt for the future.

[29] Engagement planning is a collaborative process, working with QLDC and the community. Engagement planning is considering other community engagement programmes across Queenstown Lakes District, or that local communities may be interested over the same time period. This aims to avoid engagement fatigue and better support alignment across ORC community engagement programmes.

NATURAL HAZARD RISK ASSESSMENT

[30] Beca Group Limited (Beca) has been undertaking a detailed natural hazard risk assessment for Glenorchy and Kinloch. This includes reviewing and analysing natural hazard investigations previously completed in the area by ORC and others. Beca is conducting qualitative and quantitative risk analyses using this data. The analyses are nearing completion and independent peer-review of the work and findings is underway.

[31] The results of this study will inform decision-makers and the community about the varying levels of natural hazard risk. Additionally, it will guide future efforts in risk management and adaptation. This initiative is in line with the Adaptation Pathways approach developed by the Ministry for the Environment, which aims to utilise insights into natural hazards and risk to identify optimal pathways for managing, mitigating and avoiding risks effectively.

[32] Details about the investigations were provided in a May 2024 paper⁶ to this committee.

[33] All risk assessment findings will be presented to both the community and to councillors once they have been externally reviewed and finalised. This is expected to be from late August 2024.

FLOOD AND EROSION MITIGATION AND NATURE-BASED SOLUTIONS FEASIBILITY ASSESSMENTS

[34] Damwatch Engineering Ltd (Damwatch) are nearing completion of a technical feasibility study to explore potential floodplain hazard management approaches for the Dart-Rees floodplain.

[35] Details about the investigations were provided in a May 2024 paper⁷ to this committee.

[36] The 'nature-based solutions' aspects of the investigations are being supported financially by the Ministry for the Environment (MfE) funding programme, *Nature Based Solutions for Resilience Planning*.

⁶ Report OPS2407, dated 8 May 2024: <https://www.orc.govt.nz/media/2pyhtc30/safety-and-resilience-committee-agenda-8-may-2024.pdf>

⁷ Report OPS2407, dated 8 May 2024: <https://www.orc.govt.nz/media/2pyhtc30/safety-and-resilience-committee-agenda-8-may-2024.pdf>

- [37] All findings from this study will be presented to both the community and to councillors once they have been externally reviewed and finalised, expected to be from late August 2024.

CONSIDERATIONS

Strategic Framework and Policy Considerations

- [38] The information presented and the adaptation approach discussed in this paper reflects Council's Strategic Directions, *"Otago builds resilience in a way that contributes to the wellbeing of our communities and environment through planned and well-managed responses to shocks and stresses, including natural hazards"*.⁸
- [39] The proposed Otago Regional Policy Statement June 2021⁹, notified in late March 2024,¹⁰ states that ORC and territorial authorities are both responsible for specifying objectives, policies, and methods in regional and district plans for managing land subject to natural hazard risk. ORC specifically is responsible for *"identifying areas in the region subject to natural hazards and describing their characteristics as required by Policy HAZ–NH–P1, mapping the extent of those areas in the relevant regional plan(s) and including those maps on a natural hazard register or database."*¹¹

Financial Considerations

- [40] The Ministry for the Environment (MfE) funding programme, *Nature Based Solutions for Resilience Planning* is financially supporting the 'nature-based solutions' aspects of the flood protection feasibility assessments.
- [41] The budget in the 2024-34 Long Term Plan provides funding towards delivery, implementation and monitoring of the Head of Lake Whakatipu natural hazards adaptation strategy. The proposed budget for the 2024/25 financial year is approximately \$175,000.

Significance and Engagement

- [42] Engagement planning considers and is designed to be consistent with organisational commitments made through He Mahi Rau Rika: ORC Significance, Engagement and Māori Participation Policy.

Legislative and Risk Considerations

- [43] The work described in this paper helps ORC fulfil its responsibilities under sections 30 and 35 of the RMA.
- [44] There is not currently a formalised programme governance agreement between ORC and QLDC for this adaptation programme, although there is a strong collaborative relationship at staff level. It will be critical to the successful delivery and implementation of the strategy that both councils endorse the strategy. Joint ELT discussions occurred in late May. It was agreed that having a joint Natural Hazards Steering Group would be useful and staff are working on standing it up.

⁸ ORC Draft Strategic Directions: <https://consult-orc.objective.com/kseapi/public/keyplan/events/800B1ECE-7245-4C6B-A6DA-49709F913F94/supportingfiles/876/content>

⁹ Section HAZ-NH-M1

¹⁰ Note that the RPS is still subject to appeal.

¹¹ ORC Natural Hazards Portal: <http://hazards.orc.govt.nz>

- [45] The QLDC 2024-2034 draft Long-Term Plan (LTP)¹² and QLDC 30-year Infrastructure Strategy¹³ were released for consultation in late June 2024. The 'Community Associations Work Programme' of the LTP includes support for ORC's Head of Lake Whakatipu natural hazards project. The QLDC Infrastructure Strategy also highlights the area in its key initiatives; for example, Glenorchy/Kinloch area resilience of the transportation network; and Glenorchy adaptation in the response to natural hazard risks and the effects of climate change.
- [46] Central government has repealed the Natural and Built Environment Act and the Spatial Planning Act. In May 2024, central government moved for the Finance and Expenditure Committee to conduct an inquiry into climate adaptation¹⁴. The purpose of the inquiry is to develop and recommend guiding objectives and principles for the design of a climate adaptation framework for New Zealand. Any legislation required to support the framework is expected to be introduced in early 2025.
- [47] There is no clear, specific, mandated requirement to reduce risk through planning and implementation of adaptation or relocation. Gaps identified in the current adaptation planning and planned relocation frameworks include the lack of national direction, insufficient powers, tools and mechanisms, and the lack of articulated roles and responsibilities¹⁵.

Climate Change Considerations

- [48] The effects of climate change have been considered in flood hazard assessments for Dart and Rees Rivers, and Buckler Burn, and in the assessment of risks and potential hazard management responses for those hazards.
- [49] Councillors recently endorsed ORC's draft Strategic Climate Action Plan for public consultation.¹⁶ ORC's vision is for a *"low-emissions Otago that is climate-resilient in its ecosystems, communities, and businesses has two components: climate mitigation and climate adaptation."*

Communications Considerations

- [50] ORC will continue to make all investigation findings available to the Head of Lake Whakatipu community and provide regular programme updates via the email newsletter¹⁷. The July 2024 newsletter is attached.
- [51] A communications plan has been developed as part of this work programme. The programme team is working closely with the Communications team to ensure communications and engagement planning is integrated, complementary and build off each other.

¹² https://www.qldc.govt.nz/media/hw3lhj3/qldc_long-term-plan_2024-2034_v17-260624.pdf

¹³ <https://letstalk.qldc.govt.nz/93956/widgets/440044/documents/289262>

¹⁴ <https://www.beehive.govt.nz/release/climate-change-%E2%80%93-mitigating-risks-and-costs>

¹⁵ Expert Working Group on Managed Retreat. 2023. Report of the Expert Working Group on Managed Retreat: A Proposed System for Te Hekenga Rauora/Planned Relocation. Wellington: Expert Working Group on Managed Retreat.

¹⁶ Report STG2403, 26 June 2024 <https://www.orc.govt.nz/media/nvjhft0/council-agenda-20240626.pdf>

¹⁷ <https://www.orc.govt.nz/managing-our-environment/natural-hazards/head-of-lake-whakatipu/community-get-intouch-be-involved>

NEXT STEPS

- [52] The key next step activities for the work programme which are in progress or scheduled are identified in Figure 1.
- [53] A high-level timeline for key programme and engagement activities, and development of an adaptation strategy, is given in Table 2.
- [54] Quarterly programme updates for the Safety and Resilience Committee are scheduled for 2024, and likely to continue into 2025. These may include workshops and/or committee papers, as appropriate.

Table 2: High-level timeline for key programme and engagement activities, and development of an adaptation strategy, for the Head of Lake Whakatipu programme.

	Programme Activity	Community Engagement
Aug/Sept 2024	Deliver technical studies: <ul style="list-style-type: none"> • Cultural assessment • Natural hazard risk assessment for Glenorchy and Kinloch • Flood mitigation and nature-based solutions feasibility assessments Strategy development and design	Focus of community engagement: <ul style="list-style-type: none"> • Technical studies update • Discussion of adaptation pathways
Late 2024	Deliver draft strategy and action plans (approved for public feedback)	Focus of community engagement: <ul style="list-style-type: none"> • Draft strategy
Early 2025	Feedback period for draft strategy Deliver finalised strategy document to Council	Focus of community engagement: <ul style="list-style-type: none"> • Draft strategy • Final strategy

ATTACHMENTS

1. Appendix 1 - Head of Lake newsletter update July 2024 [9.1.1 - 5 pages]

[View this email in your browser](#)

HEAD OF LAKE WHAKATIPU



COMMUNITY UPDATE 38 | JULY 2024

Kia ora koutou,

In this edition we provide a programme update and share plans for an upgraded lake level recorder at the Glenorchy boat ramp.

In August, we'll be presenting a general programme update to Councillors at the ORC Safety and Resilience Committee meeting.

This is a chance for us to share how different parts of the work programme are progressing, and we will include a link to this meeting in the next newsletter.

Programme updates

The following assessments are progressing well:

- **The flood and erosion mitigation and nature-based solutions feasibility assessment** studies potential engineered flood and erosion management and a 'nature-based solutions' approach for the Rees and Dart floodplain areas and the Glenorchy township.

- **The Glenorchy and Kinloch natural hazard risk assessment** studies flooding from the Rees and Dart rivers, Lake Whakatipu and the Buckler Burn, and liquefaction and lateral spreading at Glenorchy.

The consultants are working hard to finalise these studies, and they will be completed in the coming weeks. We know some of you may be eager to see the findings of these studies, and we plan to share the results with the community within the next few months.



Image: Current water level recorder at the Glenorchy boat ramp

Upgrade of Lake Whakatipu water level recorder planned at Glenorchy boat ramp

An upgrade of monitoring equipment at the Glenorchy boat ramp will improve the reliability of the information we collect about Lake Whakatipu level changes.

Over the next few months, the solar-powered water level recorder will be upgraded and raised to ensure it keeps monitoring, even at very high lake levels.

The boat ramp recorder was installed three years ago as a trial to complement the Glenorchy Lagoon water level recorder installed in December 2020 and the Rees River flow recorder installed in December 2021.

The data has been so valuable that we are futureproofing this monitoring site and making it a permanent part of the monitoring network.



Image: Proposed water level recorder at the Glenorchy boat ramp (mockup)

How is lake and river level information used?

The near real-time information we receive from these recorders enhances our monitoring and response during heavy rainfall events and provides a longer-term dataset of baseline information we can use to analyse flooding hazards.

For example, during a heavy rain event that caused elevated river and lake levels across Otago in September 2023, we could see:

- the Rees River reach its highest flow (235 cumecs) since the installation of the flow recording station in December 2021.
- the Glenorchy Lagoon also reach its highest level (312.49 m) since monitoring of its levels began in October 2020.
- Lake Whakatipu reach a level of 310.83 m.

The water level recorder also helps us compare lake levels between the head of the lake and the NIWA monitoring station at Frankton.

Data from environmental monitoring (e.g. rainfall, river flow and lake levels) is used to alert Emergency Management Otago of potential flooding to inform a response.

It also complements our other flood response tools, such as flood forecasting models which can be used to forecast water levels for Lake Whakatipu and the Glenorchy Lagoon.

Near real-time data from the Glenorchy boat ramp water level recorder is available on the [ORC's Environmental Data Portal](#).



Image: Example of water level data for Glenorchy on ORC's Environmental Data Portal

As always, we value your feedback

This adaptation programme was initiated because complex, increasing natural hazards in the Head of Lake Whakatipu require a comprehensive management response that takes a long-term view and encompasses all types of natural hazards.

This is your community, and we want to work with you to develop understanding and resilience. Check [here](#) to learn more about the whole programme.

If you have questions or need information, visit our [website](#) to see the [reports](#) and get [answers](#).

You can also speak to a member of the ORC Natural Hazards team on 0800 474 082 or email us for more information at headofthelake@orc.govt.nz.

We will provide responses to any emailed questions and facilitate answers from our consultants if needed.

Head of Lake Whakatipu newsletter sign-up

If you are currently not receiving our monthly newsletters, you can [sign up here](#) and view archives of past editions.

Contacts

If you have any questions or would like to get in touch with us, please email us at headofthelake@orc.govt.nz.



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