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Executive Summary

Upper Clutha Freshwater Vision 2050

Based on information gathered at forum, the taskforce developed a vision for the future of freshwater. The recommendations included within this report are steps towards achieving the vision.

The vision has three parts:
- Pure Water
- Healthy Ecosystems
- Engaged Community

Freshwater Challenges in the Upper Clutha

Freshwater in the Upper Clutha faces immediate and big challenges into the future, including:

- Rapid population growth (both visitor and resident) has led to significant land use changes including urban development, rural land changes, loss of habitat and wetlands, increased demand for water to support land use changes and unknown impact of historic and current contamination of freshwater resources.
- Incursions of new invasive species and the spread of existing pest species in natural eco-systems.
- Lack of a co-ordinated, informed approach to freshwater management that prioritises the quality, quantity and health of freshwater systems.
- Lack of time series (longitudinal) research and monitoring that is specific to Upper Clutha to inform decision-making.
- Length of timeframes for implementing change, agreeing to actions and results to show within freshwater bodies.
- Climate Change – uncertain but potentially serious implications for water quality and quantity.

We cannot accomplish all that we need to do without working together.
Bill Richardson

A dream becomes a goal when action is taken toward its achievement.
Bo Bennett
Summary of Key Recommendations

The taskforce recommends the following steps towards achieving the community's 2050 vision for freshwater. The current challenges of growth, community culture and funding were considered in establishing the recommendations. Further detail including who is responsible for the key recommendations is included on page 10.

1. **Leadership and Management**
   - Establish a formal process for ORC, QLDC and MfE to work closely with the community to effectively manage development, run-off systems and monitoring – the diagram below is an example of how this process might work:

   ![Process for Managing Upper Clutha Catchments Diagram]

   - Develop and implement water-sensitive Urban Design and Rural Land Use Policies for the Queenstown Lakes District.
   - Review all legislation relating to the development of residential and commercial subdivisions to ensure minimal impact on freshwater.

**Protecting and Enhancing Eco-Systems**

- Establish and implement an Upper Clutha Freshwater Management Plan to ensure wetland regeneration, continuing riparian planting, reduced waterway contamination, aquatic habitat renewal, mahinga kai re-establishment, and understanding and management of the effects of Climate Change.
2. **Community Culture – Education and Awareness**
   - Implement a creative education and awareness programme for freshwater to provide positive, strong and effective guidance to our businesses, residents and visitors as to how they care for our water. It will be well co-ordinated driven by, and supported, by the whole community resulting in wide spread community culture change.
   - Educate and encourage everyone – households, farmers, developers, and businesses - to minimise water consumption, water run-off, contamination entering freshwater systems and to support and improve the health of our water and eco-systems.

**Commercial / Tourism / Business**
   - Encourage businesses to have active water management plans that include reducing water use, reducing contaminant run-off and proactive wastewater/recycling treatment systems.

**Rural Environment**
   - Support monitoring to identify baseline information to assist in developing better rural land use practices.
   - Research and Education to help reduce water use, nutrient, sediment, bacterial, protozoan and chemical run-off, while maintaining profitability/viability.
   - Implement a more robust, transparent and accessible system for managing water takes.

**Urban Environment**
   - Encourage everyone living in urban settings to adapt and adopt a community culture of caring for freshwater to minimise water consumption, encourage water re-use, reduce contamination entering freshwater systems and to support and improve the health of our water and eco-systems.
   - Adopt a variety of creative approaches to raise awareness and encourage residents and visitors to care for our water.

3. **Research and Monitoring**
   - Establish a research and monitoring system for the lakes, rivers and catchments of the Upper Clutha that is robust, nationally comparable and with greatly expanded scope and funding.
   - Provide funding to understand the impact of invasive organisms and to establish a management plan to prevent, eradicate or control invasive organisms.
   - Undertake a review and assessment of science and global best practices to inform policy, planning and management decisions.
   - Support monitoring to identify baseline information to assist in developing better urban and rural land use practices.
   - Undertake research to understand the implications and impacts of Climate Change.
Background

In April 2018 Shaping our Future held public forums in Wanaka and Queenstown on the topic of freshwater in the Queenstown Lakes District. Over 220 responses were gathered at the forums and online, including 85 forum attendees and 41 online responses directly related to the Upper Clutha. In addition, over 800 primary and secondary school pupils shared their views on the challenges, priorities and ideal future of freshwater.

Shaping our Future subsequently formed the Upper Clutha Freshwater taskforce and the Queenstown Freshwater taskforce. Both taskforces comprise volunteers from a range of backgrounds and committed to a sustainable and healthy future for freshwater. The taskforces have benefitted from the input of experts in different areas.

The vision, recommendations and background information in this report reflect the views of the Upper Clutha community and their goals for the future. Freshwater plays a vital role in the economic, environmental and social well-being of the Queenstown Lakes District. The iconic alpine lakes and their catchment areas are integral to the identity of the District and highly valued by residents and visitors.

This report acknowledges the challenges associated with freshwater management and provides an overview of a range of community concerns. In particular, the Upper Clutha taskforce identified an urgent need for the development of an active, community inclusive, water management process. Such a process should be informed by research to ensure a better understanding of catchment processes and ecosystems in the Upper Clutha.

Under the Ngāi Tahu Claims Settlement Act (1998), the Clutha River/Mata-Au is listed as an area of crown land subject to Statutory Acknowledgement. This was established to ensure that the cultural, spiritual, historical and traditional association of Kāi Tahu Whānui is fairly and equally represented in all the decisions and applications for resource consents relating to this awa tipuna (sacred river).¹ In preparing the report the taskforce was guided by the knowledge of Richie Hewitt, appointed by the Hokonui Runanga of Ngāi Tahu. The contents of this report are intended to be complementary to and supportive of the values and recommended actions contained within Kai Tahu Ki Otago water perspective, Te Rūnanga O Ngāi Tahu Freshwater Policy and Ngāi Tahu Climate Change Strategy.

A second public water forum has been scheduled to provide an opportunity for the Upper Clutha community to reflect on the taskforce’s findings and recommendations before the report is finalised and presented to the agencies, groups and individuals responsible for actioning.

¹https://www.orc.govt.nz/media/6939/cultural-values-statement.pdf
Scope of this report

- This report relates to the Upper Clutha incorporating the catchments and tributaries of Lakes Wanaka and Hawea, as indicated in the green area on this map. In preparing the report the taskforce was conscious of the impact of activity/actions both within the Upper Clutha and on areas downstream or nearby.

- Many aspects of this report are relevant to the entire Queenstown Lakes District.

- The Upper Clutha Water forum identified four primary themes of importance to the community
  - water quality and quantity;
  - strategic management;
  - community culture; and
  - research and monitoring.
  
  This report concentrates on these themes.

- The original forum information was also shared with the Upper Clutha Lakes Trust to inform the Upper Clutha Integrated Catchment Management Plan due for completion in December 2019.

- “Values” information was shared with Simone Langhans (SABER CULTURAL project).

- All information has been made available to agencies and community groups involved with freshwater in the Upper Clutha.
Upper Clutha Freshwater – Water Forum Results

A wide range of information was gathered during the Shaping our Future Water Forum and online. Over 200 people and 800 school children provided input on the challenges, values, priorities, future aspirations and potential actions from a community perspective. The information gathered provided the foundation for establishing the vision and recommendations included in this report. A summary of the information expressed by the community is provided below. The full Water Forum results are available in Appendix 2.

Key Priorities

- Water Quality & Quantity: 40%
- Strategic Management: 28%
- Community Culture: 26%
- Research & Monitoring: 6%

Greatest Challenge

- Eco-System Health
- Research and Monitoring
- Community Values
- Participatory Community Culture
- Excellent Water Quality
- Ample Water Quantity
- Evidence Based Strategic Management

Ideal Future

- Pristine
- Clean
- Pure
- Crystal-Clear
- Drinkable
- Sustainable
- Evidence Based
- Strategic Management
- Community Values
- Participatory Community Culture
- Excellent Water Quality
- Ample Water Quantity
- Evidence Based Strategic Management
Based on information gathered at the Water Forum, the taskforce developed a vision for the future of freshwater and identified a range of factors that may impact on reaching this vision. The recommendations included within this report are steps towards achieving the vision. The vision is complementary to QLDC’s Vision Beyond 2050 adopted in 2019.2

The Taskforce Vision Explained

Pure Water – The water in our waterways is naturally swimmable, drinkable, renewable and healthy. We value the availability of water, its ecosystem services, and use it wisely to have little or no impact on the natural state of our waterways through urban or rural, recreational or commercial activities.

Pure water also relates to the aesthetics of our waterways, the enjoyment and economic benefits for both residents and visitors.

Healthy Eco-system – A diverse and species-rich eco-system which has good biological functionality, no species life-cycle impairment, no new invasive organisms and is one in which existing invasive species are managed or eradicated. Migratory species populations are restored and maintained (e.g. longfin eels). A healthy eco-system is safe for swimming and contact recreation, with high indigenous aquatic biodiversity. The waterways' natural flows and wetlands are restored and the waterways are resilient to natural changes and climate change.

Land use that is consistent with the local climate, soils, water resources, ecosystems and therefore enduring and sustainable over centuries/generations.

Engaged Community – Our people, community groups and agencies are educated and aware of the importance and value of our waterways. The community takes an active and collaborative approach to advocacy, leadership and strategic management of our waterways, with everyone understanding the issues and working together to secure the best possible outcomes for future generations.

The impact of growth, tourism, urban and rural land use, climate change and business practices are each considered to be potential threats to achieving the vision for the Upper Clutha.

Key Recommendations

The following key recommendations are steps towards achieving this vision for freshwater and are based on the priorities and workshop information gathered at forum and subsequent discussion by the taskforce. Consideration was given to addressing the impact of growth within the Upper Clutha. Further detail on the recommendations, KPI’s, baseline information and background information used to develop the recommendations is available on page 19.

1. Leadership and Strategic Management

<table>
<thead>
<tr>
<th>Leadership and Strategic Management Recommendation</th>
<th>Why?</th>
<th>Responsibility?</th>
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</thead>
</table>
| Establish a formal process for ORC, QLDC and MfE to work more closely with the community to address management aspects such as urban development, run-off, funded research and effective monitoring (process example below). | To provide transparent, accessible information and water management decision-making for the Upper Clutha.  
  ORC and QLDC developing a culture of working with the community, listening to feedback and actioning. | ORC  
  QLDC  
  MfE  
  Community  
  Kai Tahu |
**Leadership and Strategic Management Recommendation**

<table>
<thead>
<tr>
<th>Develop and implement Water Sensitive Urban Design and Rural Land Use policies for the Queenstown Lakes District to reduce the impacts of growth on freshwater systems.</th>
<th>Why?</th>
<th>Responsibility?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infrastructure and development changes take time to implement and having a design policy encourages and ensures the protection of waterways. Desired outcomes include:</td>
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<td>▶ Achieving 100% treatment of wastewater/stormwater with no contamination entering waterways.</td>
<td>QLDC</td>
<td></td>
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<tr>
<td>▶ Implementation of widespread water recycling systems – both residential and commercial e.g. rainwater capture systems, greywater recycling systems.</td>
<td>ORC</td>
<td></td>
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<tr>
<td>▶ Leadership from agencies, individuals and organisations to utilise global best practice and build on learnings from local examples e.g. Camp Glenorchy, Kirimoko.</td>
<td>Central Government</td>
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<tr>
<td>▶ Assisting in preparing for the impacts of climate change e.g. more frequent heavy rainfall events.</td>
<td>Property developers</td>
<td></td>
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<tr>
<td>▶ Ensuring better urban planning to reduce urban sprawl and consequent negative impacts on waterways.</td>
<td>Landowners</td>
<td></td>
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<tr>
<td>▶ Growth in the Upper Clutha has resulted in large scale residential and commercial development on previous natural landscapes. The conversion of so much porous ground to hard surfaces has adverse effects on freshwater through contaminated and concentrated run-off.</td>
<td>Builders / Architects</td>
<td></td>
</tr>
<tr>
<td>▶ Tighter design rules and enforcement required to reduce the impact of urban development on water quality and the health of the lakes that eventually receive urban stormwater.</td>
<td>New house owners</td>
<td></td>
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<tr>
<td>▶ Current penalties are considered a cost of doing business and fail to ensure compliance with conditions.</td>
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</table>

**Strengthen legislation applying to development of residential & commercial subdivisions to ensure development activities have no adverse impact on freshwater. Legislation should promote best practice and provide for enforcement and penalties.**

All new development proposals evaluated for water sensitive design elements, appropriate use of land and impacts on local freshwater systems.

**Carry out a regular, independent review of National Policy Statement for Freshwater Management attributes and their application and compliance in the Upper Clutha.**

The Upper Clutha has deep, cold, clear lakes and rivers, with apparently excellent water quality so the application of national standards may be inappropriately weak for this area.

Assess lake quality attributes and revise standards as appropriate to improve fitness for purpose for our region.
<table>
<thead>
<tr>
<th><strong>Leadership and Strategic Management Recommendation</strong></th>
<th><strong>Why?</strong></th>
<th><strong>Responsibility?</strong></th>
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</thead>
</table>
| Undertake a review and assessment of science and global best practices to inform policy, planning and management decisions. | ▶ Allows for informed innovative decision making that best suits the region, preserving the quality of our freshwater and the health of our freshwater ecosystems and delivering pure water. | ORC  
QLDC  
UCLT  
Landowners/Developers |

<table>
<thead>
<tr>
<th><strong>Protecting and Enhancing Eco-Systems Recommendation</strong></th>
<th><strong>Why?</strong></th>
<th><strong>Responsibility?</strong></th>
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</thead>
</table>
| Establish and implement an Upper Clutha Freshwater Management Plan that includes:  
▶ Wetland re-generation, protection and expansion.  
▶ Continuation of appropriate riparian planting.  
▶ Reduced contamination from urban and rural activities.  
▶ An understanding of Climate Change effects.  
▶ Establishment of a habitat renewal and re-stocking programme for native aquatic species (eels, bully, galaxiids).  
▶ Evaluation of hydro lake levels and their impact on eco-systems, habitats, flows, and migration patterns. | ▶ A comprehensive plan for the catchments of the Upper Clutha is essential to the health of the eco-system and waterways.  
▶ Re-establish and protect the Mahinga kai of the Upper Clutha.  
▶ Residents and visitors place great value on the accessibility of the Upper Clutha Lakes and rivers for recreation, aesthetics.  
▶ The Upper Clutha waterways provide daily community needs including electricity generation and drinking water. | UCLT  
Key Stakeholders³ |
## 2. Community Culture - Education & Awareness

### Community Culture - Education & Awareness Recommendation

<table>
<thead>
<tr>
<th>Why?</th>
<th>Responsibility?</th>
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<tr>
<td>Develop and implement an education and awareness programme for freshwater to give positive, strong and effective guidance to our businesses, residents and visitors in how they care for our water. It will be well co-ordinated driven by, understood and supported by the whole community.</td>
<td>Upper Clutha Lakes Trust Key Stakeholders</td>
</tr>
</tbody>
</table>

**Key short-medium term areas for education and awareness include:**
- Water use.
- Contaminants directly/indirectly entering freshwater systems and all their impacts including: fertilizer, herbicides, pesticides, animal sewage, human sewage, paints, detergents, metals, plastics, pathogens, development runoff (NB these contaminants come from rural, urban and industrial properties).
- Invasive species.
- Opportunities, education and engagement in practical ways for the community to positively impact on local freshwater systems.
- Available, transparent and accessible information and research to inform decision making.

### Commercial/Tourism/Business Recommendation

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<th>Why?</th>
<th>Responsibility?</th>
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| Encourage businesses to have active water management/environmental plans that include reducing water use, reducing contaminant run-off and proactive wastewater/recycling treatment systems. These may include:  
  - Star system or grading introduced for businesses through ORC or QLDC.  
  - Water metering (to be further consulted on). | ORC QLDC Lake Wanaka Tourism Business Roundtable Chamber of Commerce Holiday Park Association |

Ensuring responsible use of water and protecting the quality of water in our lakes and rivers.

---

4 Key Stakeholders include: Kai Tahu, all rural catchment groups, rural land owners, Touchstone, community groups, individuals (includes citizen scientists), business owners, property developers, Fish & Game, DOC, Upper Clutha Lakes Trust, Lake Guardians, Research Institutes and Researchers, Federated Farmers
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<tr>
<th>Rural Environment Recommendation</th>
<th>Why?</th>
<th>Responsibility?</th>
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<tbody>
<tr>
<td>Support education, research and monitoring to identify baseline information and help develop</td>
<td>Assist rural land owners to understand the benefits/trade offs and</td>
<td>MfE/ORC</td>
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<tr>
<td>better rural land management practices in the Upper Clutha in order to reduce water use,</td>
<td>impacts of their activities to ensure they are able to make a living</td>
<td>Key Stakeholders</td>
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<tr>
<td>nutrient, sediment, bacterial, protozoan and chemical run-off.</td>
<td>while also supporting long term ecosystem health.</td>
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<tr>
<td>Fund land-use research and utilisation of tools/technology to establish best use/profitability</td>
<td>Provides incentives for change, facts and information to inform</td>
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<td>for land within the catchment areas that ensures minimal impact on freshwater in the future.</td>
<td>decision making.</td>
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<tr>
<td>Implement a more robust, transparent and accessible system for managing water takes.</td>
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<th>Urban Environment Recommendation</th>
<th>Why?</th>
<th>Responsibility?</th>
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<tbody>
<tr>
<td>Encourage individuals, landowners and households to learn about and take responsibility for:</td>
<td>Contaminants enter our waterways from urban areas, through stormwater, wastewater, rubbish, cars, boats and everyday activities.</td>
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<td>▶ Water usage ie how much they use:</td>
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<td>o Amount of run-off from hard surfaces.</td>
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<td>o Contaminants in run-off e.g. paints, detergents etc.</td>
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<td>o Contaminant source identification.</td>
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<td>▶ Initiatives might include:</td>
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<tr>
<td>o Installing rainwater tanks.</td>
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<td>o Recycling water/greywater systems.</td>
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<td>o Water Metering.</td>
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<td>o Painting fish on storm water inlets.</td>
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<tr>
<td>o Placing nets on storm water outlets.</td>
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5 Federated Farmers, Beef & Lamb, NZ Deer Assn, all rural catchment groups, Landcare, UCLT, Touchstone, AgResearch et al
### 3. Research and Monitoring

<table>
<thead>
<tr>
<th>Research and Monitoring Recommendation</th>
<th>Why?</th>
<th>Responsibility?</th>
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<tbody>
<tr>
<td>Establish a research and monitoring system for the lakes, rivers and catchments of the Upper Clutha this is robust, nationally comparable and with greatly expanded scope and funding. Outcomes to include:</td>
<td>Currently this is the responsibility of ORC under the RMA, the current programme of research is included in ORC 10 year plan. However, additional research and monitoring are at times carried out by Fish &amp; Game, DOC, QLDC and others.</td>
<td>Principally Central Government</td>
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<td></td>
<td>Understand eco-system health by establishing robust baseline information.</td>
<td>Supported by: Otago Regional Council</td>
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<td></td>
<td>Understand contaminants; where they are coming from and their impacts to inform decision making / remediation work.</td>
<td>QLDC</td>
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<td></td>
<td>Improve our community’s understanding of the impacts of climate change.</td>
<td>Kai Tahu</td>
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<td></td>
<td>Inform the management/eradication of invasive pest species.</td>
<td>Key Stakeholders&lt;sup&gt;6&lt;/sup&gt;</td>
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<td></td>
<td>Create time series (longitudinal) data, to identify trends and establish processes to ensure eco-system and waterway health and quality.</td>
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<td></td>
<td>Provide robust information to better manage land and water use within the Upper Clutha.</td>
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<td>Provide an overall picture of the Upper Clutha – accessible information on quality/quantity/eco-system health.</td>
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<td></td>
<td>Identify innovative solutions for the Upper Clutha to reduce contamination entering the waterways.</td>
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<td></td>
<td>Understand the impacts and implications of climate change.</td>
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</tbody>
</table>

Provide funding to understand the impact of invasive organisms and to establish a management plan to prevent, eradicate or control invasive organisms in the Upper Clutha.

To protect the water quality in the Upper Clutha.

Central Government
ORC
QLDC
Kai Tahu

Undertake a review and assessment of science and global best practices to inform policy, planning and management decisions.

Allows for informed innovative decision making that best suits the region, preserving the quality of our freshwater and the health of our freshwater ecosystems and delivering pure water.

ORC
QLDC
UCLT
Property developers
Landowners
DOC

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<sup>6</sup> Key Stakeholders include: Kai Tahu, Wanaka Catchment Group, Touchstone, Community Groups, Individuals (includes citizen scientists), Business owners, Farmers, Property developers, Fish & Game, DOC, Upper Clutha Lakes Trust, Lake Guardians, Research Institutes and Researchers, Federated Farmers
Overall Baseline Analysis (Current Situation)

In developing this report, the Upper Clutha Freshwater taskforce had access to a range of information provided by local, regional and central government, Land Air Water Aotearoa (LAWA), Fish & Game, Ngai Tahu, UCLT and other interested parties. More detailed information relating to each of the sections examined is included in Appendix 1.

Freshwater has become a major focus nationally and locally. In 2018 the Upper Clutha community clearly expressed a desire to start work on achieving a vision for the future of a precious resource. Current legislation is complex and research or monitoring information is often absent or the responsibility of different agencies or private research projects. Examination of this information was, out of necessity, undertaken at a high level.7

Water Quality

The quality of water in much of the Upper Clutha is among the highest in New Zealand. The available water quality monitoring data indicates that rivers flowing into and out of the large lakes in Central Otago usually have high water quality, based on the limited measures currently in place.

Current monitoring work is carried out by the Otago Regional Council which adopted an extended monitoring programme in their 10 year plan (pg 78) in 2018. Monitoring includes localised annual monitoring for swimmability and five-year monitoring of groundwater, weeds, periphyton, macroinvertebrates, fish and wetland extent/hydrology and vegetation. Monthly samples are taken from 8 river sites and 4 Lake sites in the Upper Clutha as part of the ORC's State of the Environment monitoring. Monitoring within the rivers includes ammoniacal nitrogen, total nitrogen dissolved reactive phosphorus (DRP) and turbidity, depending on the site.

Water Quantity and 3 Waters

Work is also underway for urban stormwater management, the updating of mining rights/deemed permits (due 2021) and the introduction by ORC of freshwater management units (FMU) to meet National Freshwater Policy requirements. The Upper Clutha is included in the Clutha / Mat-au FMU.

QLDC has responsibility for 3 waters in the Upper Clutha – drinking water, stormwater and wastewater.

Stormwater in the Upper Clutha is currently managed in a variety of ways. Some new developments have measures in place to reduce direct run off. However, large rain events lead to stormwater discharging straight into the lakes and rivers or large amounts of sediment running off developments into waterways.

Wastewater is managed by a variety of methods including septic tanks, Project Pure and schemes like the Hawea treatment plant. Overflows, contamination events and non-compliance with consents do occur.

Drinking water is supplied to urban areas by QLDC. All drinking water provided by QLDC is currently chlorinated following the outbreak of gastroenteritis in Havelock North in August 2016. Private water bores and schemes are managed by the individual or organisation and depending on amount of take may require resource consent from ORC.

Working together

In 2019 ORC and QLDC agreed to work more closely together to monitor and manage development and its impacts on our waterways following a number of land development events affecting Wanaka’s Bullock Creek, Stoney Creek,  

Bremner Bay, Roys Bay and the Clutha River. Currently, management of consent infringements is poor. Penalties do not appear to offer a deterrent to ensuring proper run-off management.

The Upper Clutha has a strong community focus on freshwater with a number of community groups including the Upper Clutha Lakes Trust, Touchstone, Friends of Bullock Creek and Guardians of Lakes Wanaka and Hawea collaborating to contribute to the wellbeing of the area.

**The human impact on waterways**

Growth within the Upper Clutha, changing land use, power generation, increased water takes and urban sprawl all impact on freshwater in the area.

In 2019 the Ministry for the Environment and Stats NZ released Environment Aotearoa. The following diagram summarises the impact of the way we choose to live on our environment.

---

Legislation and Regulation

Legislation and regulation around freshwater is complex. Central Government set the direction through statements and policies e.g. National Environment Standards, National Freshwater Policy Statement and the Resource Management Act. Regional Council are responsible for regional plans and often research and monitoring. The local council are responsible for local infrastructure and activities affecting water that take place on the land.

In preparing the report the taskforce was guided by the knowledge of Richie Hewitt, appointed by the Hokonui Runanga, Ngai Tahu. The taskforce reviewed Kai Tahu Ki Otago water perspective, Te Runanga O Ngai Tahu Freshwater Policy and Ngai Tahu Climate Change Strategy and consider the contents of this report to be complementary and supportive of the values and actions contained within the reports.

Under the Ngāi Tahu Claims Settlement Act (1998), the Clutha River/Mata-Au is listed as an area of crown land subject to Statutory Acknowledgement. This was established to ensure the cultural, spiritual, historical and traditional association of Kāi Tahu Whānui is fairly and equally represented in all the decisions and applications for resource consents relating to this awa tipuna (sacred river)⁹. The following diagram is not exhaustive but indicative of the different legislation and regulation in New Zealand.

Summary of Legislation/ Regulation in New Zealand (note this is a summary list and not exhaustive)

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Supporting Background Information

In order to establish the vision and key recommendations included in this report more detailed work was undertaken for each of the key elements of the vision – Pure Water, Healthy Eco-systems and Engaged Community.

At each stage and during the forum, a lack of easily accessible information and co-ordinated research and monitoring was identified. Information is often held by different agencies or part of different research. Each section therefore also looked at the need for research and monitoring specific to the Upper Clutha. In many instances the limited information that does exist is not used for effective freshwater management and/or is not fit for purpose.

The following sections set out the key discussion points, ideal future state, possible impediments and more detailed baseline analysis that informed the establishment of the key recommendations.

Engaged Community

“Our people, community groups and agencies are educated and aware of the importance and value of our waterways. The community takes an active and collaborative approach to advocacy, leadership and strategic management of our waterways, with everyone understanding the issues and working together to secure the best possible outcomes for future generations.”

Responsibility for our freshwater sits not only with national, regional and local agencies but also with the people and community groups within the Upper Clutha. Individuals, community groups and businesses are undertaking positive work towards enhancing water quality and biodiversity within the Upper Clutha already. Consideration was given to how to engage the community within each of the Pure Water and Healthy Eco-system parts of the report.

Māori have long emphasised the need to consider the environment in its entirety through the ki uta ki tai concept (from the mountains to the sea)\(^1\). Māori use this concept to describe their holistic understanding of freshwater ecosystems and how the health and well-being of the people are intrinsically linked to the natural environment.

Ki uta ki tai recognises the movement of water through the landscape and the numerous interactions it may have on its journey. Ki uta ki tai acknowledges the connections between the atmosphere, surface water, groundwater, land use, water quality, water quantity, and the coast. It also acknowledges the connections between people and communities, people and the land, and people and water.\(^1\)

Key to a successful future for freshwater includes communities that:

- Embrace a collaborative multi-agency approach to protecting and improving freshwater quality in the Queenstown Lakes District.
- Have strong, strategic leadership with water as a priority in decision making.
- Are educated, aware and actively engaged in valuing and protecting our waterways.
- Are informed and have access to transparent information, research, monitoring and to examples of global best practice to support evidence-based decision making.
- Are actively involved in community projects e.g. citizen science.
- Value water - its availability, quality, economic and aesthetic attributes.
- Have robust legislation that is co-ordinated, relevant to the district, adhered to, monitored and carried out.
- Support and advocate for a comprehensive catchment plan to be established and carried out.
- Actively find ways to protect our freshwater through reducing contamination, reducing water use, and using recycling systems.

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\(^1\) Tipa et al, 2016
“Pure Water” is one of the key elements identified by the community for the future of freshwater in the Upper Clutha. For the purpose of this report the term “pure water” has been defined as:

“The water in our waterways is naturally swimmable, drinkable, renewable and healthy. We value the availability of water, its ecosystem services, and use it wisely to have little or no impact on the natural state of our waterways through urban or rural, recreational or commercial activities.”

The term “pure water” also includes the aesthetic beauty of our waterways and the enjoyment and economic value to both residents and visitors, acknowledging tourism as a major contributor to the district’s economy.

In the vision, “Healthy Ecosystems” is closely related to “Pure Water”

“A diverse and species-rich eco-system has good biological functionality, no species life-cycle impairment, no new invasive organisms and is one in which existing invasive species are managed or eradicated. Migratory species populations are restored and maintained (e.g. longfin eels). A healthy eco-system is safe for swimming and contact recreation, with high indigenous aquatic biodiversity. The waterways’ natural flows and wetlands are restored and the waterways are resilient to natural changes.

Land use that is consistent with the local climate, soils, water resources, ecosystems and therefore enduring and sustainable over centuries/generations.”

Healthy Eco-systems are closely related and interlinked with the concept of “Pure Water” and have been combined in the following section that looks at:

1. Eco-systems
2. Recreation
3. Infrastructure – 3 Waters
4. Land Use – rural, urban, wetlands, tussock land
5. Our commercial environment - urban, businesses, tourism

Each section looks at requirements for, and threats to, our waterways, key success factors for the future, potential impediments and recommendations for the future to help us to achieve our vision of “Pure Water and Healthy Eco-systems” for the community.
1. Eco-Systems – Invasive species, Organisms, Hydro, Wetlands, Catchments

This section looks at eco-systems in terms of organisms living in or around the waterways. Hydro dams are included as they seriously disrupt freshwater eco-systems.

The current situation includes:

- Introduced species and native species being adversely affected by hydro schemes, disappearing habitats/excessive water takes and declining water quality. Contaminants from rural and urban intensification are likely to be having a negative impact on the health of most freshwater aquatic life.
- Lake Wanaka is home to three New Zealand native fish species (Koaro, Common Bully and Long Fin Eel) and three self-sustaining introduced fish species (land-locked Chinook Salmon, Rainbow Trout and Brown Trout).12
- Lindavia (Lake snow) is present in Lakes Wanaka, Hawea, Wakatipu and Dunstan; Lagarosiphon is present in Lake Wanaka, Lake Dunstan and some rivers; Didymo is present in the clear and low nutrient rivers flowing out of lakes of the Upper Clutha.
- There is limited scientific research to establish robust baselines for water quality and the health of the freshwater eco-systems.
- Unknown impact of water takes/irrigation on eco-system health.
- Wetlands within the catchments of the Upper Clutha have been reduced over time.
- Aquifer ecosystems and water quality are inadequately managed.
- Large scale hydro development over 6 decades has resulted in the disappearance of the Upper Clutha’s top aquatic predator, the longfin eel, and caused major disruption to the lamprey population. Other migratory species (galaxiids) are also affected. An eel fishery has contributed to this situation. Long-term consents and lack of communication from hydro operators with local communities make it difficult to work towards change and improvement.

<table>
<thead>
<tr>
<th>Eco-Systems success is….</th>
<th>Impediments</th>
<th>KPI’s</th>
<th>Actions / Recommendations</th>
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</thead>
<tbody>
<tr>
<td>Native aquatic species stocks re-established. Our lakes and rivers are accessible and support healthy ecosystems.</td>
<td>Competing interests – e.g. commercial vs. environmental; introduced vs. native species. Some barriers exist e.g. hydro levels / fish nursery areas that need to be re-established / remediated.</td>
<td>The Upper Clutha lakes and rivers are accessible and healthy for food gathering, with sustainable stocks of a wide variety of native freshwater species.</td>
<td>Lake levels e.g. Hawea are re-evaluated, eel re-stocking and habitat and food chain reconstruction given priority e.g., bully’s, galaxiids. Fund and establish comprehensive baseline information to be able to evaluate trends. Ensure any future hydro schemes are on a smaller scale and utilise new technology to maintain stream flows.</td>
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12 www.catchmentsotago.org
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<tbody>
<tr>
<td>Prevent, eradicate or manage invasive organisms.</td>
<td>Lack of understanding of current invasive organisms and their impact or ability to be managed.</td>
<td>Develop research-based management plans for all invasive species.</td>
<td>Provide funding for understanding the impact, management or eradication of invasive organisms.</td>
</tr>
<tr>
<td>Hydro electric generators adopt global best practice for ensuring passage for migratory fish species.</td>
<td>Failure to acknowledge the role of hydro-electric dams in disrupting migratory fish in Upper Clutha rivers, lakes and wetlands has significantly affected the health of the area’s freshwater eco-systems</td>
<td>Hydroelectric generating companies annually review and maintain ways or routes of safe passage for longfin eels, lampreys and galaxiids past dams.</td>
<td>Review the Contact Energy resource consent conditions relating to migratory fish in Upper Clutha rivers, lakes and wetlands.</td>
</tr>
<tr>
<td>Re-establishment of wetlands throughout the Upper Clutha</td>
<td>Wetland areas have been modified or removed by development / agriculture. Difficult to re-establish.</td>
<td>Wetlands and catchments are healthy, protected and enhanced, aiding in the health of the waterways and eco-systems.</td>
<td>Wetlands are re-generated, protected and expanded. Riparian planting continues, greatly reducing or eliminating impact on waterways from agriculture. Develop an active, informed Upper Clutha Freshwater Management Plan. Encourage and support re-establishment of wetlands / riparian planting.</td>
</tr>
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</table>

2. Recreation

This section examines how we use our water for recreational purposes – swimming, fishing, boating etc. Access to the lakes and rivers in the Upper Clutha is part of the attraction of the area, both in its aesthetic appeal and for recreational opportunities. Pure water and a healthy eco-system are essential for residents and visitors to continue using and enjoying our waterways.

Current Situation: Otago Regional Council set new swimmability targets for Otago in December 2018. These standards are higher than the current national standards of 90% of lakes and rivers to be swimmable by 2040. Presently swimmability is measured by two main types of testing – E.Coli and toxic algae. Monitoring occurs at limited sites at Lake Wanaka and Lake Hawea weekly Dec – March. Information is made available to the public via www.lawa.org.nz.
Southern Lake Wanaka (e.g. Roys Bay) is under intense pressure from boating with 90% of boats using 10% of the lake. With over 1,000 boats on the lake at peak times, and pressure appearing to increase each year, pollution in localised areas becomes of concern, as does the aesthetic value and enjoyment for all recreational users.

- Main boat launch sites are under pressure.
- There is pressure on infrastructure and parking and expansion of commercial and recreational groups onto the foreshore.
- It is increasingly difficult to balance the needs of recreational and commercial users.

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<th>Recreation success is...</th>
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<tr>
<td><strong>On-water recreation - fishing / boating are accessible and appreciated</strong></td>
<td>Activities on the water like boating can conflict with those in the water like swimming. Finding a balance is hard e.g. close to Wanaka foreshore. Increasing numbers of recreational users, visitors and commercial users accessing the lake</td>
<td>Comprehensive water management plans in place for access / infrastructure / protection of the waterways Reduction in carbon footprint of recreational vessels</td>
<td>Education and awareness for all recreational users with citizen science bringing greater understanding of actions on our waterways Graded costing for boat launching i.e. the closer to town, the more you pay Boat parking / traffic limited close to Wanaka foreshore Prohibition of washing of commercial / recreational boats and of putting contaminants into waterways. (e.g. Waterfall Creek) National registration for boats, limits on decibel allowances Increased access to recreational infrastructure e.g. toilets, more and improved boat launching and wash-down facilities that eliminate waterway contamination</td>
</tr>
</tbody>
</table>
### 3. Urban Land Use – 3 waters and private households

QLDC is responsible for providing 3 waters infrastructure to urban areas in the Upper Clutha.

- Project Pure was established in 2011 with outputs now going into underground seepage near Wanaka Airport. Luggate wastewater treatment is part of Project Pure.
- Hawea Wastewater Treatment Plant has been in breach of consent conditions since at least 2012. A detailed business case is due to be undertaken by QLDC in 2019 to identify solutions, including connecting to Project Pure.
- Smaller townships in outlying areas (e.g. Makarora) and some tourism operators (e.g. Hawea Motor Camp) are on septic tank systems. Some (those with resource consent) are monitored, however there are many private systems/tanks that are not actively monitored or managed.
- Stormwater is currently not treated within the Upper Clutha, resulting in a range of contaminants entering the waterways. Increased growth and development have increased the amount of stormwater run-off from urban areas (see commercial development section).
- Greywater is not currently separated from wastewater, resulting in higher amounts of wastewater needing to be managed and treated.
- Since 2018 drinking water has been chlorinated in all QLDC townships with a reticulated water supply, following the Havelock North incident. There is currently discussion underway at national level to remove responsibility for 3 waters from local councils.
- Water is currently ‘free’ for urban users across the district. Water meters were installed in a number of Wanaka households in 2017 to understand use per household. There is a large amount of inefficient use of treated water e.g. irrigation for urban gardens.
- Aquifers and drinking water sources in the Upper Clutha are shown in the QLDC 30 year infrastructure plan and work is being undertaken by Otago Regional Council.
- Consultation occurred in 2017 and 2018 for the Otago Regional Council Urban stormwater policy.

#### Urban land use success is….

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<tr>
<th>Impediments</th>
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<tbody>
<tr>
<td>No contamination entering our waterways from: Stormwater</td>
<td>100% of wastewater treatment plants operating within consents and compliant with global best practice</td>
<td>Water sensitive Urban Design policy implemented by QLDC / ORC e.g. Wellington Water Sensitive Urban Design</td>
</tr>
<tr>
<td>Wastewater</td>
<td>Septic tanks are regularly monitored and maintained.</td>
<td>All development is closely monitored with heavy penalties for contamination.</td>
</tr>
<tr>
<td>Development</td>
<td>Change of land use (e.g. development or subdivision) does not result in contaminated run-off to waterways.</td>
<td>Review of compliance with National Policy Standards for Freshwater Management for suitability to UC deep, cold, clear lakes and rivers (research needed on lake quality attributes and processes).</td>
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</table>

13 Hawea WWTP Annual Report 2017 - 2018
### Urban land use success is….

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<tr>
<th>Impediments</th>
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<th>Actions / Recommendations</th>
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<tr>
<td>Difficult to plan for increasing variability of weather events due to Climate Change.</td>
<td>Innovative technological solutions implemented in all new developments reducing their impact on our waterways.</td>
<td>Education and awareness, citizens science campaigns for the community on what is suitable to go ‘down the drains’.</td>
</tr>
<tr>
<td>Trade-offs between development and finding the right balance to protect the waterways</td>
<td>Community awareness and behavior change achieved to reduce water use / stormwater contamination and wastewater generation.</td>
<td>Science and global best practice inform policy, planning and management decisions.</td>
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<tr>
<td>Recycling of greywater is possible but not widely implemented and often needs high population density to be effective.</td>
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#### Drinking water that is free from chemicals

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#### 4. Urban Land Use – Commercial

This section considers urban land use and in particular commercial operations (excluding agriculture) e.g. cafes, transport businesses, development (e.g. dwellings and subdivisions), and tourism operations (e.g. ski fields), recreation (e.g. golf courses).

- Due to rapid growth in the Upper Clutha, the demand for water and the impact on water quality and quantity is intensifying. Water is considered to be a “free” resource, resulting in little incentive to minimise, conserve and actively manage water use and waste outputs.
- Recent large-scale urban development e.g. Three Parks, Alpha Series and Northlake have resulted in contaminants and sediment entering the local waterways including Bullock Creek. There has been a perceived lack of action / co-ordination or accountability over the breaches. Some developments e.g. Kirimoko are experimenting with new systems, though their long-term effectiveness is currently undetermined.
- Impacts from multiple pollutants continue to run off into waterways e.g. fat poured into drains, air and ground pollution from dust or washing commercial vehicles or commercial premises, wind-blown and water-borne plastics. Some urban operators are beginning to understand and address such pollutants, but again there is a lack of research to measure and manage the impacts.
- Climate Change impacts are unknown e.g. extreme weather events, less rainfall in catchments.
- Current monitoring/penalties for impacting upon local eco-systems are not conducive to ensuring compliance, as exemplified by the contamination of the Clutha Mata-Au river by Northlake subdivision.
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<th>Impediments</th>
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<th>Actions / Recommendations</th>
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</thead>
<tbody>
<tr>
<td>Belief that water is an infinite resource and that it is there to be used without constraint.</td>
<td>100% active water environmental management plans for all commercial operators</td>
<td>Funding of research / establishment of systems and resources to ensure instigation of active water management plans for commercial operators. This may take the form of a grading system with people and staff to actively conserve, protect and enhance the health of waterways – “Water warriors”.</td>
</tr>
<tr>
<td>Belief by firms that their commercial operations have minimal impact on the quality and eco-system functioning of freshwaters.</td>
<td>Current and past chemical application rates known</td>
<td>Further work to understand the benefits / drawbacks of water payments – for the supply of water to urban areas and the use of water in rural areas.</td>
</tr>
<tr>
<td>Business owners’ perception that “meeting the standards” e.g. for design of developments is enough to ensure no water quality impacts.</td>
<td>Commercial operator nutrient run-off rates known</td>
<td>Review legislation including penalties and best practice in subdivision and/or development that changes land use.</td>
</tr>
<tr>
<td>The challenge of balancing the needs of people (for housing/infrastructure / income) with the needs of healthy aquatic eco-systems</td>
<td>Bacterial, viral and protozoan pathogens monitored</td>
<td>All new commercial operations need to have an active water / impact management plan in place based on global best practice.</td>
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<td></td>
<td>All of the above points are used to assess impacts and inform water management actions.</td>
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</table>
5. Rural Land Use

Current Situation:

- It is a national requirement that all consented water takes are measured and recorded. Currently, information provided to ORC is not readily available to the public. Current mining rights/water take/minimum flow levels are due to expire in 2021. These are currently being reviewed and renewed by ORC. Over allocation is a risk. Some historical rights or existing systems within the Upper Clutha are not measured or monitored e.g. streams.

- There is a lack of information, research and overall understanding specific to the Upper Clutha on contamination from run-off in rural areas. This is due to a lack of data eg changes to stocking rates over time, information on frequency and rates of application of fertilizer, herbicides/pesticides, burn-off or of removal of native vegetation. These factors all impact on receiving water bodies.

- For catchments feeding into Upper Clutha Lakes, ORC has introduced Plan Change 6A which states that nitrogen loss to waterways should not exceed 15 kg N/ha/year. There is also growing dependence for nutrient run-off limit-setting by Council on the use of the model OVERSEER which has received criticism for its use in calculating nutrient limits and calls for its independent review. The Government’s 2019 budget allocated an additional $44m to improve Overseer.

- The ORC is about to embark on a review of its water plan using a Freshwater Management Unit process. It is likely that this will lead to changes in the targets and expectations currently managed under Plan Change 6A.

- Farming practices in the Upper Clutha are improving through utilizing technology, a professional approach to sustainability, a raised awareness of social licenses to farm and some participation in riparian planting restoration of wetlands. In 2018 a Beef and Lamb NZ strategy outlined a goal for carbon neutrality by 2050.

- Rotorua and Taupo are examples of long-term degradation within catchment areas that have resulted in expensive remediation work, requiring subsidies and incentives to change agricultural practices.

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<tr>
<th>Rural land use success is...</th>
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</table>
| Rural land use and water takes do not result in adverse effects on our waterways. | Increasing reliance on irrigation for modern farming practices  
Frequently held belief that water is an infinite source and there to be used  
Absence of programs to assess ecological impacts of water takes  
Potential over-allocation of water | Rural water takes are measured and monitored with the information readily available to the public.  
Water take renewals and access are considered with the biological health of lakes, rivers and aquifers as a priority.  
Strict water take limits are agreed to and compliance reviewed and managed. | ORC review the way they are managing water extraction data, and make it easily accessible and understandable for the public.  
The health of waterways, aquifers and ecosystems are given priority when assessing applications for water extraction.  
Pro-active rather than re-active planning, including for the potential impact of climate change on water availability |
### Rural land use success is….

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<tr>
<td>Disagreement on biologically “safe” residual flow levels</td>
<td>Population sizes of non-farmed pest species assessed.</td>
<td>Support, education, research and funding to identify and enact changes to reduce rural water takes</td>
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<td></td>
<td>Current and past fertilizer application rates known.</td>
<td>Potential to charge for water to encourage more efficient use and capture some of the value that water clearly has to land users. Any funds raised to be ring-fenced for research to inform water management.</td>
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<td>Nutrient run-off types and rates known.</td>
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<td></td>
<td>Bacterial, viral and protozoan pathogen concentrations assessed.</td>
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</tr>
<tr>
<td></td>
<td>All of the above used to assess impacts and to inform water management actions.</td>
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<tr>
<td>Lack of funding for research and analysis to assist in understanding of the impacts of run-off and of remediation work needed in the Upper Clutha.</td>
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<tr>
<td>Current and past stocking rates are not available or unknown.</td>
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<tr>
<td>Lack of accurate models to estimate “safe” levels of nutrient loss from farmland.</td>
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<td>Lack of funding for research and implement aquatic eco-system priorities specific to the Upper Clutha.</td>
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<tr>
<td>“One size fits all” legislation.</td>
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<tr>
<td>Wetlands are re-generated, protected and expanded.</td>
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<tr>
<td>Riparian planting continues, reducing the impact on waterways from agriculture.</td>
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<tr>
<td>An active Upper Clutha Freshwater Management Plan.</td>
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Contamination from run-off in rural areas is minimised/negated.

Science and research are utilised to ensure sustainable, profitable farming practice.

Land use that is consistent with the local climate, soils, water resources and aquatic ecosystems.

Lack of funding to research and implement aquatic eco-system priorities specific to the Upper Clutha.

A specific Upper Clutha Water Management Plan is established, well-funded and actioned, utilising science, community, national, regional and local agencies to promote action.

Land-use research to establish best use / profitability for land in the catchment areas that has minimal impact on freshwater.
<table>
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</table>
| An entire rural community that is actively engaged in managing, protecting and improving freshwater quality in the Upper Clutha. | Profitability, income and land use versus waterways and healthy eco-systems. Lack of science, data and funding for change and regeneration. Lack of understanding of impacts of past land use changes nor of remediation work that is needed. Complexity and the length of time it will take to remediate (related to above). | Acceptance and implementation of an Integrated Catchment Management Plan. The number of riparian planting & wetland re-establishment projects. Number of active catchment & water user groups. All people making the environment part of every decision they make. | Acceptance and implementation of an Integrated Catchment Management Plan prepared in collaboration with all stakeholders. The community needs to be educated about their impact on water health and what they can do to reduce this impact. 
ORC to carry out a thorough and inclusive FMU process to educate and establish a Water Management (?) Plan that delivers positive results for our waterways and water users. Funding & support available for individuals or groups that want to make positive change e.g. water groups, planting projects etc. A greater understanding of waterway protection and community needs in the Overseas Investment Office process. Utilise this as a resource to fund positive projects. Implementation and adoption of widespread water recycling / water use by the community and developers. |
Glossary of Terms / Abbreviations used within the report

DOC – Department of Conservation

Drinkable - for the purposes of this report the term drinkable means water that people can trust, swim in and drink from the source with confidence that they will not fall ill.

Kāi Tahu – as used in this document refers to the kupenga (net) of whakapapa that embraces the three constituent indigenous iwi of Otago, being Kāi Tahu, Kāti Māmoe and Waitaha.

Key Stakeholders (note this is not an exhaustive list): Kāi Tahu, Wanaka catchment groups (currently 6 in total), Touchstone, Community Groups, Individuals (includes citizen scientists), Business owners, Farmers, Property developers, Fish & Game, DOC, Upper Clutha Lakes Trust, Guardians of Lake Wanaka, Guardians of Lake Hawea, Research Institutes and Researchers.

MfE – Ministry for Environment.

Pure – the word pure was heavily used by the community in their aspirational future. The term pure within the report refers to naturally healthy water, free from contamination, aesthetically pleasing, with healthy aquatic life and safe to swim in.


QLDC – Queenstown Lakes District Council.

ORC – Otago Regional Council.

UCLT – Upper Clutha Lakes Trust.
Appendix 1: Information reviewed

During the writing of this report the taskforce reviewed a wide range of information from a number of sources including:

Ministry for the Environment
Otago Regional Council regional and specific plans
Queenstown Lakes District – infrastructure and 3 waters
Kai Tahu Ki Otago water perspective
Te Runanga O Ngai Tahu Freshwater Policy
Ngai Tahu Climate Change Strategy
Cultural Values Statement

We also had the experience and wisdom of Richie Hewitt and other taskforce members that reviewed a number of articles, wrote summaries and helped inform the wider groups. Some of the topics included:

- Contamination sources
- Commercial and private wastewater schemes
- Water takes in the Upper Clutha – both rural and for private schemes
- Dung Beetles
- Closed urban water systems / greywater reuse
- Stormwater reviews
- Farming practices and information
- Mahinga Kai and native species

The Shaping our Future Full first forum results are included for your information in Appendix 2:
Appendix 2: Shaping our Future Forum Results

Wanaka Water Forum
85 attendees and 41 online responses\(^\text{14}\) - Tuesday 10\(^{th}\) April 2018 6pm – 9pm

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Introduction

The aim of this report is to capture the outcomes of the Wanaka Water forum in a way that can help the Taskforce shape its recommendations. It records the community’s long-term aspirations and values, their views about current challenges, priority issues and identifies steps that can be taken for the future of freshwater in the Queenstown Lakes District.

Shaping our Future also held the same forum in Queenstown on 9\(^{th}\) April 2018. A separate taskforce was established in the Queenstown with the two groups working closely together to share information and resources. The outcome of both reports will provide a high-level district wide view for freshwater.

Summary

There were four main themes identified and generally agreed by all respondents on what was important for the future and as key themes for change:

Water Quality (and Ecology) and Water Quantity

- The desire for accessible, affordable, clean, safe, drinkable and swimmable waterways
- Management of water quality and quantities in waterways and catchments
- 3 waters – drinking water, stormwater and wastewater quality and infrastructure
- Reduction and remediation of pollution e.g. run off

Strategic Management

- The need for strong, collaborative, visionary leadership in management of all freshwater
- Collaboration and clarification of policies and procedures, accountability and enforcement of freshwater standards at local, regional and national level.

Community Culture – Education and Awareness

- Residents, visitors, commercial and industrial understanding, value and respect for our freshwater
- Education around pollution, stormwater, consumption and impacts of our actions on our waterways e.g. cleaning boats, no plastics,

Research and Monitoring

- Need for consistent, robust monitoring of our waterways
- Increased communication of results and establishment of accurate baseline information
- Monitoring followed by evidence-based action

\(^{14}\) (13 Upper Clutha specific and 28 district wide online responses)
The Future of Freshwater

Attendees were individually asked to give one word that best described their ideal future. The results were put into the wordle below:

Attendees were asked “What’s the headline for Freshwater in the Upper Clutha in 2040”

- Wanaka Water Treatment Plant no longer leader
- Lakes District becomes 100% Pure
- New economic model discovered
- Wanaka announces 1st water neutral town
- Lakes District water quality best in the world
- Impact of climate change reversed
- Healthiest underwater ecosystem in the world
- All rivers drinkable
- Water use slashed by 50% in the Upper Clutha
- No attendees at the latest water meeting as there are no problems!
- Worlds 1st closed loop farm announced in Wanaka

Prior to the forums over 800 school children shared their views on freshwater in our district. Their views are expressed in wordles below.

What we love about Freshwater
Our Values

Attendees were asked to tell us what they value about freshwater. The full list of values is available.

Water Quality
- Swimmable, drinkable, accessible, sustainable and safe lakes, rivers and aquifers (highest value with over 65% of respondents having this as a value)
- Transparency of Lakes and Rivers
- All water is clean, low in nutrients, low in toxins, pathogens, low in protozoa, high in diversity
- Reduced agricultural water demand and better methods to reduce run off effects
- Recycling and cleaning of all water
- Water quality is better in the future than it is now
- Stormwater is clean and doesn’t pollute waterways

Water Quantity
- Water takes managed and priced with the environment as the priority
- Decrease in water use and sufficient quality water to meet demand environmentally and commercially.

Ecology
- Resilient, healthy waterways that support biodiversity – some measures:
  - No algae blooms
  - Return of birdsong, habitat restoration (Riparian), sustains a healthy and diverse ecosystem.
  - Wetland extent returned to 80% of original
  - Rivers kept close to natural hydrology % MALF and variability
  - Solve biosecurity issues e.g. Lake Snow, Didymo
  - All lakes to have a trophic level 2 or less & to exceed MFE National Objective Framework

Strategic Management
- Collaboration to manage water supply – our rivers, reservoirs, biodiversity.

Community Culture
- Community values and respects our freshwater
- All users contribute to the cost of improving our freshwater
- A balance between recreational, commercial and residential users
- Community engages in behaviour change e.g. consumption, recycling of water, use, pollution

Research and Monitoring
- Continuous and effective monitoring of freshwater quality and quantity including:
  - Minimum flows
The Priorities and Challenges facing freshwater today
Each attendee was asked to provide one word describing the greatest challenge in freshwater today – the results are in the wordle below (note the word pollution includes contamination and chemicals):

- Contamination – chemicals, run off
- Scientifically measurable
- Identify trends and warning signs
- Continuous research – biological markers and indicators
- Action from monitoring – communication, remediation, research

The Priorities and Challenges facing freshwater today
Each attendee was asked to provide one word describing the greatest challenge in freshwater today – the results are in the wordle below (note the word pollution includes contamination and chemicals):
Attendees workshopped the priority issues for today and into the future. An individual rating system was used to show the highest priority (higher number shows higher priority for respondents).

**Big Issues – top priorities**

<table>
<thead>
<tr>
<th>Theme:</th>
<th>Issue:</th>
<th>Priority rating</th>
<th>Notes</th>
</tr>
</thead>
</table>
| Water Quality and       | Pollution from Land Use             | 97              | • Deforestation, farming and urban input (pesticides, chemicals, effluence)  
| Quantity                |                                     |                 | • Proximity of land use to water sources e.g. no development near headwater system catchments  
|                         |                                     |                 | • The proximity of our people to our waterways impacts on our water quality – run off, stormwater etc.  |
| Population Growth and   | Population Growth and its impacts on | 32              | • Rapid growth in both resident and tourism numbers  
| our water quality and   | our water quality and quantity       |                 | • Increased recreational and commercial use  
| quantity                |                                     |                 | • User pays, allocations of finances to assist with pressures from tourism.  |
| Supply of water and     | Supply of water and availability and | 6               | • Increasing demand for our water e.g. electric vehicles, risks to supply and climate change all impact on the amount of water available  |
| availability and        | quantity for Hydro                   |                 | • Growing demand for water e.g. electric vehicles, risks to supply and climate change all impact on the amount of water available  |
| Invasive species        |                                     | 9               | • Plants and algae, animals, degradation of our waterways. Lake snow, didymo and introduced species impacting on our natural eco-system  |
| Ecosystem resilience –  |                                     | 8               | • Biodiversity and protecting it – recreation vs ecosystem conflict  
| e.g. after a shock      |                                     |                 | • Protection of wetlands  |
| Balancing diverse       |                                     | 11              | • The need for an integrated shared vision, goals and objectives for everyone to work towards.  
| objectives and          |                                     |                 | • Courageous leadership and active management of lakes, rivers and catchments  
| commitment to them      |                                     |                 | • The need for transparency in communication  
|                         |                                     |                 | • Collaboration and consistency – councils, individuals, communities  
|                         |                                     |                 | • Economics and economical use  
|                         |                                     |                 | • Public accountability for water rights  
|                         |                                     |                 | • Need for partnerships and collaboration – scientific, policy community.  
|                         |                                     |                 | • Investigation of alternative methods – embrace innovation, look at overseas models, communication, action. Funding  |
| Strategic Management    | Lack of informed strategic leadership | 25              | • The need for an integrated shared vision, goals and objectives for everyone to work towards.  
|                         |                                     |                 | • Courageous leadership and active management of lakes, rivers and catchments  
|                         |                                     |                 | • The need for transparency in communication  
|                         |                                     |                 | • Collaboration and consistency – councils, individuals, communities  
|                         |                                     |                 | • Economics and economical use  
|                         |                                     |                 | • Public accountability for water rights  
|                         |                                     |                 | • Need for partnerships and collaboration – scientific, policy community.  
<p>|                         |                                     |                 | • Investigation of alternative methods – embrace innovation, look at overseas models, communication, action. Funding  |</p>
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<tr>
<th>Theme:</th>
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<tbody>
<tr>
<td></td>
<td>Water use rights allocated for the greater good</td>
<td>32</td>
<td>This applies to the community culture section as well</td>
</tr>
<tr>
<td></td>
<td>Lack of a value for water resource – societal and fiscal</td>
<td>32</td>
<td>The need for governance and regulation to change to protect and enhance our waterways e.g. National Government Policy</td>
</tr>
<tr>
<td></td>
<td>Governance – need for change to regulation Government Policy E.g. National Government policy.</td>
<td>21</td>
<td>Collaboration and consistency between regulations at local, regional and national level.</td>
</tr>
<tr>
<td></td>
<td>Governance held captive by lobby and economic interest groups</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td></td>
<td>User pays / polluter pays for all impacts</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Community Culture – education and awareness</td>
<td>51</td>
<td>Disconnect of people in understanding the impact of their actions, the reality of our situation and the value of water not imbedded into the community.</td>
</tr>
<tr>
<td></td>
<td>Stories and identification with the environment</td>
<td>24</td>
<td>Imbedding a love of and appreciation for our freshwater through the stories we tell</td>
</tr>
<tr>
<td></td>
<td>Reconciliation and alignment of people for our natural surroundings.</td>
<td>10</td>
<td>Reconnection of people to nature through culture change</td>
</tr>
<tr>
<td></td>
<td>Economic system – make a living with less impact.</td>
<td>16</td>
<td>Education and awareness for all members of the community about their actions and how they can assist e.g.</td>
</tr>
<tr>
<td></td>
<td>Willingness to pay to fix the problems</td>
<td>4</td>
<td>Education and awareness can assist with people’s willingness to apply rates, taxes, other contributions to be able fix problems and stop new ones occurring</td>
</tr>
<tr>
<td>Research and Monitoring</td>
<td>Lack of data / relevant data to make informed decisions.</td>
<td>22</td>
<td>Research and monitoring – the establishment of good baseline information, future triggers, indicators and remedial actions were identified as themes throughout the workshop.</td>
</tr>
</tbody>
</table>
Workshop Information
Attendees then worked through the top priorities in small groups, identifying critical driving influences, ideal future outcomes and potential next steps/solutions. Note despite the majority of attendees agreeing that the key biggest issue was pollution of our waterways there was insufficient interest to establish a group. This may be due to a number of factors including the depth and breadth of the subject, differing views and reluctance to enter into what might become heated discussions.

Theme: Water Quality and Quantity

Key Issue: Impact of land use on water quality and quantity

<table>
<thead>
<tr>
<th>Critical Driving Influences</th>
<th>2060 – Ideal future outcomes</th>
<th>Solutions/ Next Steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Economic models systems</td>
<td>1. Land use is within limits/is limited</td>
<td>1. Question whether effects based or more prescriptive governance/regulation</td>
</tr>
<tr>
<td>3. Government policy and regulatory frameworks</td>
<td>3. Understanding how natural systems work back to first principles</td>
<td>3. Need a lot of date – find the limits, indication and investment in research</td>
</tr>
<tr>
<td>4. Incentives for intensification</td>
<td></td>
<td>4. Economic Incentives – internal/external</td>
</tr>
<tr>
<td>5. Lack of payment for resource and accountability</td>
<td></td>
<td>5. Shared vision with a strong commitment by all stakeholders</td>
</tr>
<tr>
<td>6. Gap between research and application in land use.</td>
<td></td>
<td>6. Strong leadership – effective planning and shared values</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Measures of Success</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Reduced ecological footprint</td>
</tr>
<tr>
<td>2. Water supply is not an issue</td>
</tr>
<tr>
<td>3. Natural hydrological regimes supply indigenous or ‘novel’ ecosystems.</td>
</tr>
<tr>
<td>4. Few cars, public transport resulting in better stormwater quality</td>
</tr>
<tr>
<td>5. Public awareness and education – it’s everyone’s problem.</td>
</tr>
</tbody>
</table>
## Theme: Strategic Management

### Key Issue: Changing Government Policy

<table>
<thead>
<tr>
<th>Critical Driving Influences</th>
<th>2060 – Ideal future outcomes</th>
<th>Solutions/ Next Steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Lack of ecological priorities</td>
<td>1. Strong sustainable</td>
<td>1. Ongoing political consensus across parties</td>
</tr>
<tr>
<td>2. Lack of diversity in decision makers – central and local</td>
<td>a. Vision</td>
<td>2. Constitution including environmental rights</td>
</tr>
<tr>
<td>3. Lack of balance between urban and rural communities</td>
<td>b. Society</td>
<td>3. Consequences for non-compliant (fiscal – carrot and stick, taxes and rebates)</td>
</tr>
<tr>
<td></td>
<td>3. Sustainable urban drainage</td>
<td>5. Use of other political mechanisms (referendum)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6. Use of example to mode e.g. water framework directive</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7. Apply sound eco-system service methodologies.</td>
</tr>
</tbody>
</table>

### Key Issue: Reaching agreement, commitment and balance on differing objectives

<table>
<thead>
<tr>
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<th>2060 – Ideal future outcomes</th>
<th>Solutions/ Next Steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Drawing out interest groups and their differing objectives</td>
<td>1. Best use and quality of water – balancing needs and wishes and those that the community is prepared to pay for</td>
<td>1. Identifying interest groups and communicating</td>
</tr>
<tr>
<td>2. Communication</td>
<td></td>
<td>2. Develop commitment from relevant agencies – particularly government – central, local and regional</td>
</tr>
<tr>
<td>4. Existing policies and regulation and their ability to influence change</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Data Collection – definition of what is required to assign responsibility</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Measuring success:

1. An agreed management regime with measures in place to assess progress/achievement
### Theme: Community Culture

#### Key Issue – Lack of stories and our connection to water

<table>
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</tr>
</thead>
<tbody>
<tr>
<td>3. Operators/Group – common conversation about use of lake</td>
<td>3. Documentaries and strong stories</td>
<td>3. Space where we promote sharing of stories about water and lake – using different changes – physical space, radio, you tube, new invented technologies e.g. 3D or Holograms, VR</td>
</tr>
<tr>
<td>4. Lack of information</td>
<td>4. Clarity as a community and embedded as part of the culture</td>
<td>4. Use Whanau – learning our local Maori history – words and stories that invite others to tell their story to create a generic, shared identify and love for Wanaka and a connection to the water.</td>
</tr>
</tbody>
</table>

Who: Operators, locals, tourists, holiday makers, Iwi

Measuring Success:
1. Stories are an accurate reflection of the value we put on water
2. Quantifiable change based on story-based projects.

5. Examples include Love our Coast campaign and Iceland Tourism

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### Key Priority: Driving Behaviour Change

<table>
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<th>Solutions/ Next Steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Ignorance and apathy</td>
<td>1. People default to positive impact choices on the environment and consistently look for better options</td>
<td>1. Education for personal accountability</td>
</tr>
<tr>
<td>2. Lack of connection to our water</td>
<td>2. Measurable data outcomes</td>
<td>2. Education about consequences of actions e.g. car washing</td>
</tr>
<tr>
<td>3. Lack of understanding of consequences in the short and long term</td>
<td></td>
<td>3. Legislation changes</td>
</tr>
<tr>
<td>4. Knowledge of alternatives</td>
<td></td>
<td>4. Charging for water use</td>
</tr>
<tr>
<td>5. Growth tourism and housing development</td>
<td></td>
<td>5. Taxing, citations for incorrect use</td>
</tr>
</tbody>
</table>

6. Incentives and subsidies (carrot and stick)
7. Zero waste / zero pollution