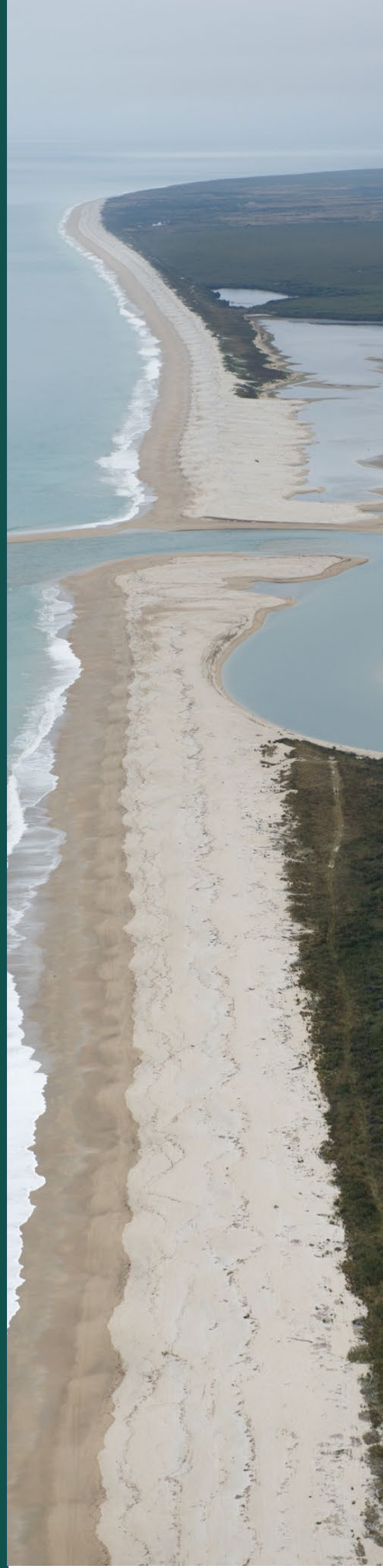


# Periodic opening of Waituna Lagoon to maintain and restore ecological health and cultural values of the lagoon ecosystem

Resource Consent Application and  
Assessment of Environmental Effects

Te Rūnanga o Awarua, Department of Conservation Te  
Papa Atawhai and Environment Southland

July 2024



## Report Information

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*Toitū te marae o Tāne*

*Toitū te marae o Tangaroa*

*Toitū te Iwi*

*When the land and waters are well, so are the people*

# 1 Introduction

This Assessment of Environment Effects (**'AEE'**) is provided in accordance with the requirements of Section 88 and the Fourth Schedule of the Resource Management Act 1991 (**'RMA'** or the **'Act'**).

It is in support of a resource consent application on behalf of Te Rūnanga o Awarua (**'Awarua Rūnanga'**), Department of Conservation Te Papa Atawhai (**'DOC'**) and Environment Southland for the periodic opening of the Waituna Lagoon to maintain and restore the ecological health and cultural values of the lagoon ecosystem.

Given public interest in the application, full public notification is requested.

## 1.1 Proposal

Waituna Lagoon is a shallow, coastal lake with an extensive network of wetlands surrounding it. The lagoon would have once naturally opened and closed to the sea when certain climatic and sea conditions prevailed. This dynamic environment has resulted in a complex and sensitive ecosystem, and one that continues to rely on a delicate balance between freshwater and saltwater states to support the many ecological, cultural and recreational values it holds.

A history of artificial lagoon openings and nutrient and sediment inputs associated with land use in the catchment have affected the lagoon's ecology and water quality. Awarua Rūnanga, DOC, and Environment Southland seek to transition the management of water levels within the lagoon to a more ecologically optimal opening regime which supports ecological and cultural values, over a 20-year term.

This application is for a new lagoon opening regime to maintain and restore the

ecological health and cultural values of the lagoon ecosystem in accordance with Te Mana o te Wai, and the purpose of wetland restoration and maintenance under the National Policy Statement for Freshwater Management 2020 ('**NPSFM**').

In terms of the activities that are sought under this resource consent application, periodically opening Waituna Lagoon to the sea will involve:

- The diversion and discharge of water and sediment from Waituna Lagoon to the sea,
- The diversion and discharge of seawater and sediment to the lagoon,
- Earthworks and disturbance of the bed of Waituna Lagoon, its margins, and disturbance of the Coastal Marine Area ('**CMA**'), and
- Incidental indigenous vegetation clearance.

## 1.2 Waituna Lagoon

Waituna Lagoon sits at the bottom of an approximately 20,000ha intensively farmed catchment and is fed by three main waterbodies – Waituna, Moffat, and Carran Creeks. It is one of the few remaining examples of a natural coastal lagoon in New Zealand, is unique in Southland, and is nationally and internationally important.

The cultural significance of the area is recognised under a Statutory Acknowledgement within the Ngāi Tahu Claims Settlement Act 1998 (**Appendix A**). The Waituna Catchment is a significant cultural landscape to Awarua Rūnanga and the Waituna wetland, including the hāpua (coastal lagoon) and Waipārera (Waituna Lagoon), is a taonga for Ngāi Tahu ki Murihiku.

The lagoon and wider Awarua Wetland Complex is scheduled as a Regionally Significant Wetland in the Partially Operative Southland Water and Land Plan ('**SWLP**'), the lagoon and areas of lagoon margin are managed as public conservation land administered by DOC as a scientific reserve. It was designated as New Zealand's first Ramsar Wetland of International Importance in 1976, under the Ramsar Convention on Wetlands.

The catchment and lagoon contribute to the wider economy of the region and the local economy through agriculture, tourism, recreational experiences and food harvesting.

## 1.3 Achieving Hauora for Waituna Lagoon

As the health of the lagoon has deteriorated over recent years, Awarua Rūnanga, DOC

and Environment Southland have a shared interest in protecting and restoring its ecological health and cultural values. The applicants have partnered on this application given these shared interests and goals.

This application is an important part of a number of measures to protect and restore the lagoon. Many different individuals, groups and organisations are working towards lagoon health. This includes:

- On farm changes to practices by landowners in the catchment, including developing farm plans and farm environmental management plans, completing riparian fencing and planting, fencing off areas of native bush, and allowing various agencies to trial sediment and nutrient reduction methods on their farms;
- The 2013–2023 Living Water partnership between Fonterra and DOC which included designing and implementing a catchment-wide nutrient and sediment management approach, with the main goal of slowing the flow of water to decrease contaminants and build freshwater habitat;
- The Department of Conservation’s Arawai Kakariki wetland restoration programme at Awarua Waituna that has undertaken monitoring and research on the ecological health of Waituna Lagoon since 2008;
- The Whakamana te Waituna Trust, which was set up to coordinate activities of the partners involved in working to restore the mana of the Waituna Lagoon, including working with the Living Water partnership and catchment landowners;
- The Ministry for the Environment Freshwater Improvement Fund, which has contributed \$6,025,000 towards the Whakamana te Waituna programme to purchase land around the lagoon for the long-term purpose of restoration;
- Te Wai Pārera Trust, which was set up in 2019 to assist with the delivery of Whakamana te Waituna, specifically to manage land purchased as part of the project. After Whakamana te Waituna facilitated the purchase of a 404 hectare sheep and beef farm on the edge of the lagoon, Te Wai Pārera Trust took over management of the property and are gradually transforming it into a mahinga kai pā;
- Annual trout spawning surveys by Fish and Game New Zealand, to closely monitor trout population trends. Fish and Game have played a very important role in establishing the freshwater ponds at the mahinga kai pā site;

- The construction of mahinga kai ponds on the purchased land, supported by native tree planting work by Te Tapu o Tane, who are funded by through Jobs for Nature. Pest management is also undertaken.

A wide range of other individuals, groups, industry bodies, organisations and researcher bodies are also involved in maintaining and restoring the lagoon. Past efforts from the Waituna Landcare Group and other organisations have contributed to these efforts.

Other work to address poor water quality in the lagoon and catchment is underway, and Plan Change Tuatahi is to be notified in the future to set limits, targets and methods to implement to achieve Hauora for the lagoon and catchment.

This application is therefore one part of a much wider collective effort to protect and restore the lagoon.

## 1.4 Appendices

The application is supported by the following information:

### **Appendix A – Waituna Wetland Statutory Acknowledgement**

Acknowledgement within the Ngāi Tahu Claims Settlement Act 1998, including Statement of Association.

### **Appendix B – Science Advisory Report**

Entitled *Technical Review of Conditions for Opening Waituna Lagoon*, dated June 2024, and prepared by H. Robertson, N. Atkinson, M. de Winton, M. Schallenberg, R. Holmes, A. Rabel, K. Wilson, C. Jenkins, D. Whaanga.

### **Appendix C – Proposed Conditions of Consent**

The proposed conditions of consent as proffered by the co-applicants set out how the proposed opening regime will operate, including opening thresholds, how opening will occur, monitoring and reporting, and how the community will be informed.

### **Appendix D – Walker’s Bay Opening Location**

Map and coordinates for Walker’s Bay opening location and illustrating other previous alternative opening locations.

### **Appendix E – Photographs of Lagoon Opening**



Photographs of the 2019 lagoon opening at Walker’s Bay, and the 2024 opening at The Fence.

#### **Appendix F – Assessment of Restoration Plan Requirements**

Outlines how the restoration plan requirements of the National Environmental Standards for Freshwater are met.

#### **Appendix G – Survey Plan**

Survey Plan of the application area.

#### **Appendix H – Cultural Values Report**

Entitled *Mana Whenua Values, Associations and Connection to Waipārerā* (**‘Cultural Values Report’**), dated 2023, and prepared by Te Ao Marama Inc. for Te Rūnanga o Awarua. The report provides information about Awarua Rūnanga’s values and connections to Waituna Lagoon.

#### **Appendix I – Technical Report on Vegetation Status in Waituna Lagoon: 2009–2023**

Department of Conservation report which analyses the results of Ruppia and other macrophyte monitoring over the last 15 years against macrophyte/macroalgae targets for Waituna Lagoon.

#### **Appendix J – Summer 2023 and 2024 Vegetation Status Reports**

Department of Conservations latest annual monitoring reports for submerged plants for Waituna Lagoon. Entitled *Vegetation Status in Waituna Lagoon: Summer 2023*, and *Vegetation Status in Waituna Lagoon: Summer 2024*, and prepared by NIWA.

#### **Appendix K – Impacts and Implications of Climate Change on Waituna Lagoon 2019**

Department of Conservation report which provides an assessment of potential climate change-related impacts on the lagoon.

#### **Appendix L – Previous Resource Consents**

Permit AUTH-97283: Coastal Permit *‘To open Lake Waituna to the sea’*, held by the Lake Waituna Control Association, granted May 1999, expiry 21 May 2014, conditions amended in 2011 and 2012 to introduce ecological triggers for opening.

Permit AUTH-20146407: Coastal Permit, Coastal Discharge Permit, and Water Permit to *‘divert water from Lake Waituna and associated wetlands to the sea’*, *‘periodically*

*open Lake Waituna to the sea’ and ‘periodically discharge water from Lake Waituna to the sea’, held by the Lake Waituna Control Association, granted February 2017, expiry 14 February 2022.*

#### **Appendix M – NIWA Inundation Study**

Entitled “*Waituna Lagoon level impacts on land drainage and inundation. Investigation stages 1 and 2*”, prepared for the Department of Conservation by NIWA, dated 2017.

#### **Appendix N – Consultation Strategy and Material**

Outlines the consultation approach taken to inform the development of the application, the written communications with the parties consulted, and any formal written responses received.

#### **Appendix O – Lagoon Water Level Maps**

Illustrates the inundated extent of the lagoon and drainage impeded land at various lagoon water levels.

## **2 Mana Whenua**

Te Rūnanga o Ngāi Tahu is the tribal representative body of Ngāi Tahu whānui, established under the Te Rūnanga o Ngāi Tahu Act 1996. There are 18 Papatipu Rūnanga that constitute the membership of Te Rūnanga o Ngāi Tahu. The Te Rūnanga o Ngāi Tahu Act 1996 and the Ngāi Tahu Claims Settlement Act 1998 give recognition of the status of Papatipu Rūnanga as the repositories of the kaitiaki and mana whenua status of Ngāi Tahu Whānui over the natural resources within their takiwā boundaries.

In Murihiku there are four Papatipu Rūnanga whose members hold mana whenua status within the region:

- Waihōpai Rūnaka – centres on Waihopai and extends northwards to Te Mata-au sharing an interest in the lakes and mountains to the western coast with other Murihiku Rūnanga and those located from Waihemo southwards.
- Te Rūnanga o Awarua – centres on Awarua and extends to the coasts and estuaries adjoining Waihopai sharing an interest in the lakes and mountains between Whakatipu-Waitai and Tawhititarere with other Murihiku Rūnanga and those located from Waihemo southwards.

- Te Rūnanga o Oraka Aparima – centres on Oraka and extends from Waimatuku to Tawhititarere sharing an interest in the lakes and mountains from Whakatipu-Waitai to Tawhititarere with other Murihiku Rūnanga and those located from Waihemo southwards.
- Te Rūnanga o Hokonui – centres on the Hokonui region and includes a shared interest in the lakes and mountains between Whakatipu-Waitai and Tawhititarere with other Murihiku Rūnanga and those located from Waihemo southwards.

Te Ao Marama Inc. represents the interests of Rūnanga regarding the management of natural resources under the RMA. The takiwā of Te Rūnanga o Awarua includes Waipārera, therefore Te Rūnanga o Awarua hold kaitiaki status over the lagoon. Awarua Rūnanga are a co-applicant to this application.

## 3 Proposal

The application is for an opening regime to maintain and restore the ecological health and cultural values of the lagoon ecosystem, by transitioning to a more ecologically optimal opening regime over a 20-year term.

The activities sought under the application will include the diversion and discharge of water and sediment from Waituna Lagoon to the sea, the discharge of seawater and sediment to the lagoon, earthworks and disturbance of the bed of Waituna Lagoon, its margins, and the CMA, and incidental vegetation removal. The activities sought accord with the purposes of restoration and wetland maintenance, and the application seeks to give effect to Te Mana o Te Wai for Waituna Lagoon in accordance with the NPSFM, and to accord with the region-wide objectives of the SWLP:

### **Objective 1**

*Land and water and associated ecosystems are sustainably managed as integrated natural resources, recognising the connectivity between surface water and groundwater, and between freshwater, land and the coast.*

### **Objective 2**

*The mauri of water provides for te hauora o te taiao (health and mauri of the environment), te hauora o te wai (health and mauri of the waterbody) and te hauora o te tangata (health and mauri of the*

people)“.

A history of more frequent lagoon openings for land drainage purposes, coupled with nutrient and sediment inputs has adversely affected the ecological and cultural values of the lagoon. In achieving the lagoon objectives, the proposed opening regime seeks to manage poor water quality that results from the cumulative adverse effects of contaminant discharges and land use activities within the catchment, by opening the lagoon if there is an algae bloom. It also seeks to reduce the frequency of openings to protect the lagoon ecosystem by opening at higher threshold levels than consented previously to protect its biodiversity, and when necessary to provide for fish passage.

The proposal therefore utilises a combination of water level, ecological, water quality, and fish passage triggers and thresholds to guide lagoon openings. The proposal takes an integrated management approach, informed by scientific analysis of water quality, submerged plants, and indigenous species values, and an understanding and application of cultural values.

Whilst the purpose of the application is to maintain and restore the ecological health and cultural values of the lagoon ecosystem, it seeks to do so in a way that recognises landowners in the catchment need time to adapt. The new regime sought is for a different purpose to past opening regimes for land drainage, and providing a transition for landowners is therefore proposed. Water level thresholds will be progressively raised at years 6 and 16, to provide certainty of the future regime for landowners in the lower catchment, and time to transition.

The application is informed by a Science Advisory Report (**Appendix B**). The report builds on previous technical work undertaken in 2021 and reviews the conditions of the previous resource consent that was in place to manage lagoon openings, and the condition of the lagoon based on monitoring data. The report models various lagoon opening scenarios and makes recommendations on the new opening regime as it relates to ecological health, fish passage and water quality; and assesses the impacts of higher water levels on land use, infrastructure, and recreational activities.

Conditions of consent are proposed by the co-applicants to set out the relevant thresholds for openings, how opening will occur, monitoring and reporting requirements, and how the community will be informed when openings are to occur (**Appendix C**).

The application is described further in the following sections.

### 3.1 Proposed Lagoon Opening Regime

This application supports an opening regime to maintain and restore the ecological health and cultural values of the lagoon ecosystem. The proposed opening regime has been developed based on a comprehensive assessment of the influence of opening events on multiple lagoon values.

The application proposes a transition to a more ecologically optimal opening regime:

- for years 1-5 summer openings (1 September to 30 April) may occur if water levels are at or above 2.5m above mean sea level ('mASL') for 24 hours; and winter openings (1 May to 30 August) may occur if water levels are at or above 2.3mASL for seven consecutive days, and
- for years 6-15, openings may occur if water levels are at or above 2.5mASL for three consecutive days, and this increases to seven consecutive days for years 16-20.
- Additional openings will be enabled if required for ecological / water quality, biosecurity, and fish passage reasons consistent with the opening thresholds as recommended in the Science Advisory Report, and on the recommendation of a Science Advisory Group, if one or more indicators are exceeded.

The Science Advisory Group currently comprises technical experts with scientific and cultural knowledge of coastal lagoon ecosystems, including experts from external institutions. Suitably qualified members of the group represent DOC, Awarua Rūnanga and Environment Southland.

The co-applicants acknowledge the importance of providing opportunities for the local community in the catchment via the Lake Waituna Control Association ('**LWCA**') to have ongoing opportunities to input into the management of the lagoon. The LWCA will be invited to nominate a suitably qualified representative to join the Science Advisory Group. The co-applicants will also develop a Communication Management Plan with the purpose to inform the community and interested parties of lagoon openings and monitoring data.

A 5 yearly reporting and associated review condition is proposed, that can be exercised once five years of monitoring data is available. A condition will also enable anyone to raise an issue to the consent holders to consider an ecological opening.

The LWCA and other specified parties will be updated on water levels as they approach the opening thresholds, and will be informed when opening will take place. The public will be notified of the opening on the Environment Southland website.

Openings are recommended to continue at the long-term opening site at Walker's Bay

based on the knowledge of effects at this location. However, a condition that relates specifically to opening location is proposed, so that alternative opening locations can be considered if a comprehensive risk assessment has been submitted and certified by the Consent Authority. This assessment would consider potential adverse effects on water quality, ecological, and cultural values.

### **Short-term Consent for Interim Protection**

Although separate to this application, it is noted that a resource consent is intended to be lodged in the coming weeks to enable lagoon openings if there is a poor water quality event, or if it is necessary for fish passage, as a safeguard while this longer-term application is processed. This will not include lagoon openings for land drainage purposes as this is a prohibited activity under Clause 53 of the Resource Management (National Environmental Standards for Freshwater) Regulations 2020 ('**NESFW**').

## **3.2 How Openings Will Occur**

Openings of the lagoon will occur at the long-term opening site at Walker's Bay in the south-west corner of Waituna Lagoon, unless an alternative location is certified by the Consent Authority. A map of the opening location is provided at **Appendix D**.

Historically, Walker's Bay has experienced the greatest number of openings. Similar procedures to previous openings will be followed:

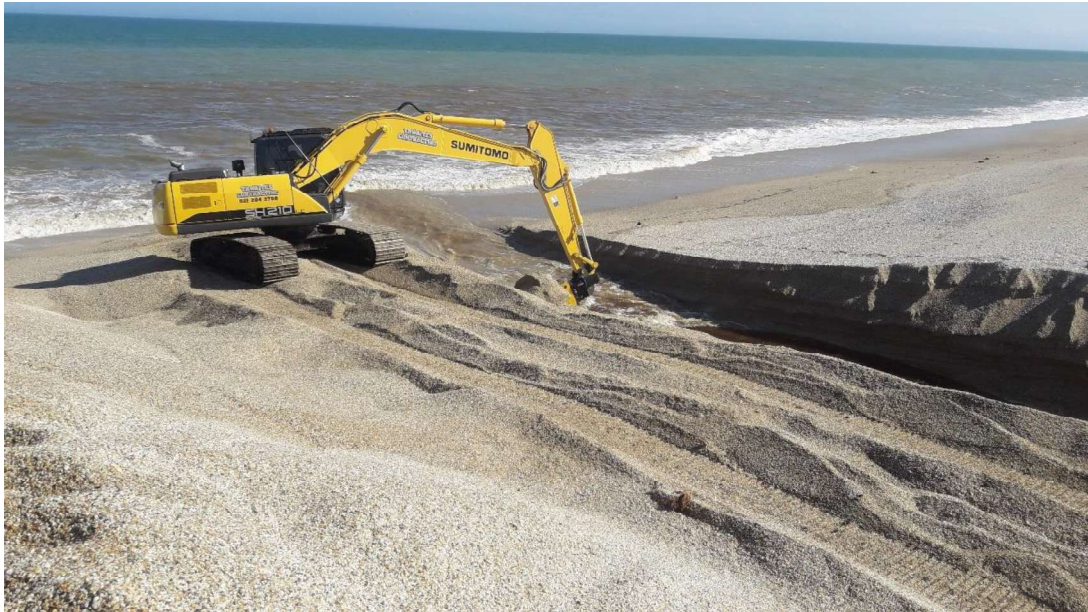
- A channel will be excavated using one or two excavators from the landward side of the lagoon on the dry gravel Waituna Bar.
- The excavator/s will be driven along the bar below the high-water mark from the east where an existing track provides access to Waituna Bar off Waituna Lagoon Road.
- The excavator will move gravels to form a channel between the lake and the sea. No material is removed from the bar, and the excavated material is deposited to the side of the bar and levelled off.
- Once the form of a channel has been excavated between the Lake and sea a breach is formed using a wide reach excavator.
- All reasonable precautions to minimise the spread of pest plants and aquatic weeds will be taken during each opening event, and there will be no storage or refuelling of plant within the CMA.
- All contractors will be made aware of the accidental discovery protocols to be in place in the event of an accidental discovery of any archaeological material,



and the other conditions of consent.

Once flows start in the excavated channel it very quickly develops into a wide opening approximately 40m in width. Over time the excavated channel will naturally infill, and the excavated material will flatten out. Visually the bar and beach will return to a very similar state to what it was pre works.

The Walker's Bay lagoon opening in October 2019 is illustrated in the images below:



*Figure 1: Opening the Lagoon at Walker's Bay October 2019*



*Figure 2: Lagoon mouth four days after October 2019 opening*

The alternative opening locations if a future risk assessment deems them appropriate for use may include Hansens Bay or The Fence. These locations are also illustrated on the **Appendix D** map.

Additional images of the opening at Walker's Bay in 2019 and the opening at The Fence in January 2024 are provided in **Appendix E**.

## 3.3 Conditions and Monitoring

A number of conditions of consent are proposed as part of the application, to implement the proposed opening regime outlined above. These are set out in full in **Appendix C**, and are summarised below.

### 3.3.1 Thresholds for Opening

#### Lagoon Level Thresholds

A transition to a more ecologically optimal opening regime is set out in proposed Condition 4:

- For years 1-5, summer openings (1 September to 30 April) may occur if water levels are at or above 2.5mASL for 24 consecutive hours and winter openings (1 May to 30 August) may occur if water levels are at or above 2.3mASL for seven consecutive days;
- For years 6-15, openings may occur if water levels are at or above 2.5mASL for three consecutive days; and
- For years 16-20, openings may occur if water levels are at or above 2.5mASL for seven consecutive days.

#### Ecosystem Health and Water Quality Indicators

Openings will be enabled for ecological and water quality reasons on the recommendation of the Science Advisory Group where this is triggered in accordance with the lagoon water quality and ecosystem health indicators. These indicators are detailed further below and are set out in Appendix 1 and 2 to the proposed conditions.

Any person can also request in writing that the lagoon be opened for ecological and water quality reasons, and these requests will be considered in accordance with the lagoon water quality and ecosystem health indicators and recommendations of the Science Advisory Group.



## **Fish Passage Triggers**

Openings will also be enabled for diadromous fish passage as proposed in Condition 6:

- Between 1 April and 30 November, provided that:
- the lagoon has not been opened in the previous 24 months, or
- if the lagoon was opened during the past 24 months, the timing of the open period did not support upstream migration of threatened or at-risk fish species, and
- the Science Advisory Group have considered the indicators, and other relevant scientific information.

If fish population monitoring indicates fish populations decline substantially, or if fish populations are doing better than expected under prolonged lagoon closures, then the conditions regarding opening for fish passage can be reviewed accordingly. Proposed Condition 16 provides for this.

### **3.3.2 Role of the Science Advisory Group**

The Science Advisory Group will be responsible for recommending whether the lagoon should be opened in accordance with the ecological and water quality indicators, and for fish passage, as outlined above.

The Science Advisory Group will comprise qualified and experienced persons with scientific or cultural knowledge of coastal lagoon ecosystems as set out in proposed Condition 11.

It will comprise representatives of the DOC, Awarua Rūnanga, Environment Southland and other technical experts for the purpose of ensuring the Science Advisory Group has the necessary scientific or cultural knowledge of coastal lagoon ecosystems. The LWCA will be invited to contribute a qualified and experienced representative.

For context the Science Advisory Group currently includes:

- H. Robertson, Principal Science Advisor Freshwater, Department of Conservation, Chair of Ramsar Scientific and Technical Review Panel;
- N. Atkinson, Freshwater Ecosystems and Threats Manager, Department of Conservation;
- C. Jenkins, Team Leader Hydrological Response, Environment Southland;

- K. Wilson, Chief Scientist, Environment Southland;
- A. Rabel, Team Leader, Aquatic Ecosystems, Environment Southland;
- M. de Winton, Manager Aquatic Plant Group and Freshwater Ecologist, NIWA;
- M. Schallenberg, Associate Professor and Freshwater Ecologist, Department of Zoology, University of Otago;
- R. Holmes, Team Leader – River and Lake Ecology and Freshwater Ecologist, Cawthron Institute; and
- D. Whaanga, Kaiwhakahaere Kaupapa Taiao, Te Ao Marama Inc.

All members of the Science Advisory Group will be funded by their respective organisations, unless additional external expertise is considered necessary.

If lagoon monitoring indicates that the primary indicators below are exceeded, then the Science Advisory Group will consider the primary and secondary indicators, and recommend to the consent holders whether opening the lagoon to the sea is necessary to manage ecological risk to the lagoon as set out in proposed Condition 12.

### 3.3.3 Communications

The co-applicants heard through consultation feedback that there is a need for improved communications with the community and those with an interest in Waituna Lagoon. Proposed Condition 13 will enable the Consent Holder to develop a Communication Management Plan with the purpose of the plan to inform interested parties of lagoon openings and monitoring data, within six months of the commencement of the consent.

### 3.3.4 Monitoring of Lagoon Health

The lagoon will be monitored in accordance with the water quality and ecosystem health indicators proposed in Appendix 1A and 2A of the Science Advisory Report.

In particular, the monitoring must collect and record the following information:

- changes in the primary and secondary, or other indicators of lagoon water quality and ecosystem health;
- when and where the lagoon is opened to the sea;
- the water level in the lagoon at the time it was opened;

- information to demonstrate compliance with the opening conditions, and
- how long the lagoon is open to the sea, and when it closes.

The primary and secondary ecosystem health indicators are outlined below:

## Appendix 1A: Primary and Secondary Indicators Levels for Waituna Lagoon

	Water quality, biosecurity or ecosystem health indicator	Warning indicator level	Critical indicator level
<b>PRIMARY indicators</b>	Chlorophyll- <i>a</i> (a sustained visible algal bloom* over a period of 14 days or longer)	0.012 - 0.06 mg/L	≥ 0.06 mg/L
	Cyanobacteria	Biovolume great than 5mm <sup>3</sup> /L (and more than 50% of phytoplankton biovolume present as toxic or potentially toxic cyanobacteria)	Biovolume greater than 10mm <sup>3</sup> /L (and more than 80% of phytoplankton biovolume present as toxic or potentially toxic cyanobacteria)
	Bottom water dissolved oxygen concentration	< 2 and ≥ 0.5 mg/L	< 0.5 mg/L
	Incursion of a new non-native species that is a significant biosecurity risk	Incursion of worrisome species but low risk of proliferation	High risk species incursion (eDNA or positive sighting or capture of new non-native species)

\* A "visible algal bloom" shall be identified by:

- (i) A chlorophyll-*a* concentration and/or (ii) An observations by an appropriately qualified and experienced person. These observations shall include the location and approximate extent and intensity of the visible algal bloom on each day of observation.

## Appendix 2A:

	Water quality or ecosystem health indicator	Warning indicator level	Critical indicator level
<b>SECONDARY indicators</b>	Total phosphorus concentration	≥ 0.05 and < 0.1 mg/L	≥ 0.1 mg/L
	Total nitrogen concentration	≥ 0.75 and < 1.5 mg/L	≥ 1.5 mg/L
	Water clarity (Secchi disc depth)	≥ 0.5 m and < 1 m	< 0.5 m
	Nuisance epiphytes or benthic algae**	>10% cover	>30% cover
	Macrophytes**	<30% lagoon wide cover abundance	<20% lagoon wide cover abundance
	<i>Ruppia megacarpa</i> **	Present at <20% of lagoon monitoring sites	Present at <10% of lagoon monitoring sites
	Diadromous fish (Inanga, lamprey/kanakana, eel/tuna) density (Waituna Creek)	Declines in diadromous fish populations (density and/or biomass)	Substantial declines in diadromous fish populations (density and/or biomass)
	Toxins/pathogens	Cyanotoxin producing genes in cyanobacteria present, but no cyanotoxins detected. Prolonged level of <i>E. coli</i> >260 cfu/100ml and not human source	Cyanotoxins detected across lagoon <i>E. coli</i> prolonged level above 1200 cfu/100ml

\*\* Based on the results from annual surveys undertaken in late summer.

Table 1: Proposed indicator of ecosystem health

### 3.3.5 Consent Effectiveness Review

The Consent Holder will prepare and submit to the Consent Authority 5-yearly reviews of the effectiveness of the permit in protecting lagoon health, commencing at the end of the first five years, as outlined in proposed Condition 16. This condition requires the Consent Holder to assess:

- whether any amendments are required to better protect ecosystem health and cultural values;
- whether the conditions of the permit are adequate to deal with any adverse effect on the environment arising from the exercise of the permit, which are appropriate to deal with at a later stage, or become evident after commencement, including the effects on fish populations and the effects of climate change;
- the effectiveness of the monitoring programme; and
- whether any amendments to the lagoon water quality and ecosystem health indicators are necessary.

The Consent Authority may then decide to review the conditions of consent based on these recommendations, as outlined in proposed Condition 20.

### 3.3.6 Opening Protocols

Prior to opening the Lagoon, Fish and Game New Zealand, the Lake Waituna Control Association, private landowners that are adjacent to the Lagoon, and the Consent Authority will be notified at least 24 hours in advance, and a notice will be placed on the Environment Southland website. These notices will include details about the opening and why it is required, as outlined in proposed Condition 7.

Accidental discovery of archaeological and cultural sites and accidental spill response conditions are proposed as outlined in proposed Conditions 17 and 18.

### 3.3.7 Opening Location

Proposed Condition 1 outlines that the lagoon will be opened at Walker's Bay between NZTM 1,262,340E 4,831,360 N and 1,261,460E 4,831,000 N or unless otherwise certified by the Consent Authority in accordance with Condition 19. Proposed Condition 19 sets out

that should the Consent Holder seek to open the lagoon at an alternative location to Walker's Bay, a risk assessment must be submitted to the Consent Authority, which must assess:

- The risk to ecological and cultural values of the Lagoon, including: habitat for submerged and emergent aquatic plants, habitat and migration pathways for fish species, and fringing wetlands,
- The suitability of the location for managing poor water quality, and protecting the ecological and cultural values of Lagoon, and
- The overall environmental benefits of the proposed location, relative to Walker's Bay, and taking into account the recommendations of the Science Advisory Group.

If the Consent Authority certifies the alternative location, then the lagoon may be opened at that location.

## 4 Resource Consent Requirements

This section of the application sets out the relevant rules that trigger resource consent in the SWLP, the Regional Coastal Plan, and the NESFW.

Waituna Lagoon is within the coastal environment, but is outside the CMA, as outlined in 4.2 below.

The RMA defines the term **lake** as '*a body of fresh water which is entirely or nearly surrounded by land*' and the term **wetland** as '*permanently or intermittently wet areas, shallow water, and land water margins that support a natural ecosystem of plants and animals that are adapted to wet conditions*'. The NPSFM defines the term **natural inland wetland** to mean '*a wetland (as defined in the Act) that is not: (a) in the coastal marine area*'.

The applicants are aware of the positions of various parties with an interest in Waituna vary regarding its status as a lake or wetland.

In considering the RMA definition of **lake**, the lagoon is a body of water surrounded by land, however the water of the lagoon is not entirely freshwater as it is subject to saltwater intrusion through the Waituna Bar, and is home to freshwater, brackish and saltwater tolerant species.

In considering the RMA definition of **wetland** and **natural inland wetland**, the lagoon is a body of shallow water that supports an ecosystem of plant and animal species adapted to wet conditions, and is outside the CMA.

It is the applicants' view that as the lagoon is a part of the wider Awarua Wetland Complex, is mapped as a Regionally Significant Wetland in the SWLP, is outside the CMA, and supports a natural ecosystem of plants and animals, that it is a wetland under the RMA and relevant statutory documents. It is noted that the fringing wetlands that encircle the lagoon and comprise its margins are also clearly wetlands under the Act and the applicants are not aware of any parties that have a contrary view regarding the fringing wetlands.

The advice provided by Environment Southland's resource consents team during a pre-application meeting has also been to define the lagoon as a wetland as well as a lake for the purpose of this application.

For the avoidance of doubt, as the lagoon has to characteristics of both types of waterbodies, consent is sought in accordance with the rules that apply to both wetlands and lakes.

## 4.1 Operative Water Plan

As the SWLP is partially operative and those parts that are partially operative therefore have full legal effect. The remaining provisions of the Operative Water Plan that are subject to appeal are not relevant to this application.

## 4.2 Partially Operative Southland Water & Land Plan

Within the issues section of the SWLP, under the issue of Water Quality, the plan acknowledges that Southland's smaller catchments can end with estuaries, freshwater lakes, coastal lagoons or coastal lakes, which are all particularly sensitive to nutrient and sediment loads. The SWLP acknowledges that,

*"There has been little regulatory management of non-point source discharges from rural activities, which cumulatively contribute significant amounts of contaminants to water bodies. Despite some improvements being made, non-point source discharges from agricultural land are the most significant contributors of contaminants".*

Also within the issues section of the SWLP, under the issue of Indigenous Biodiversity,

wetlands are considered an important issue for Southland. The plan sets out that they are a vital link between land and water, provide important hydrological functions and ecosystem services, are an important natural and cultural resource, rich in biodiversity, and an important source of mahinga kai.

The SWLP recognises that wetlands which were once more prevalent within Southland have reduced by approximately 90%, and that land use change has led to conflict between productive use of land and protecting habitats and biodiversity.

The SWLP describes the importance of Waituna Lagoon and the wider Awarua Wetland Complex as follows:

*“The Awarua Wetlands, comprising of Awarua Bay and Waituna Lagoon, are one of the largest remaining wetland complexes in Southland and are important for their biological diversity and cultural values. The wetlands are officially recognised on the Ramsar Convention on Wetlands: List of Wetlands of International Importance. The Awarua site includes four major wetland types: coastal lagoons (notably Waituna Lagoon), freshwater swamps, extensive peatlands, and estuaries.*

*Each ecosystem is unique and maintained by different ecological processes. Awarua Wetlands is frequented by diverse trans-equatorial migrating and wading bird species, as well as threatened plants and insects including sub-alpine species”.*

The Waituna Lagoon is within the Waituna Freshwater Management Unit. Part of the application site is identified as being within the Physiographic Zone: Oxidising and it has the Water Quality Type: Lowland / Coastal lakes.

The lagoon is scheduled as a Regionally Significant Wetland in the SWLP and is mapped as being outside the CMA. Regionally Significant Wetlands outside the CMA are mapped in green, with sensitive waterbodies inside the CMA mapped in blue in the figure below:



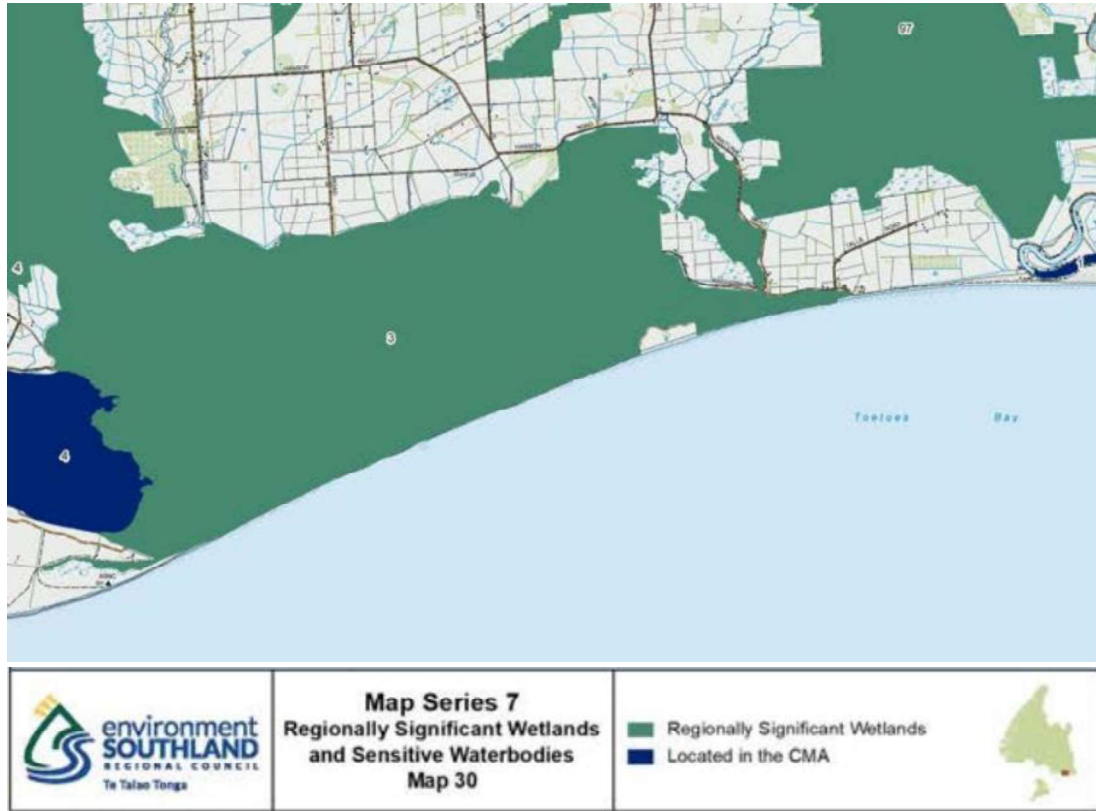


Figure 3: SWLP Regionally Significant Wetlands and Sensitive Waterbodies

## 4.2.1 Discharge of Water and Contaminants

### Rule 4

Rule 4(a) requires that any activity that would otherwise contravene Sections 13(1), 14(2), 14(3) or 15(1) of the RMA; and is not classified by this Plan as any other class of activity listed in Section 87A of the RMA, is a discretionary activity.

Under s14(1), no person may take or divert open coastal water, and under s15(1), no person may discharge any contaminant into water or onto land in circumstances where it may enter water, unless the activity is expressly allowed by resource consent.

As there will be coastal water and sediment flows into the lagoon once the lagoon is open, the **discharge of coastal water and sediment** to the lagoon is therefore a **discretionary activity** under Rule 4(a).

## 4.2.2 Taking and Diversion of Water

### Rule 49 – Abstraction, diversion and use of surface water

A **non-complying activity water permit** is sought for the **taking and diversion** of surface water from Waituna Lagoon to the sea under Rule 49(d). Due to the volume and nature of the take and diversion Rules 49(a)-(c), cannot be met, and rules 50(a)-(b), 51(a)-(c), 52(a)-(b), and 52A(a)-(b) are not relevant.

#### **Rule 51 Minor Diversions of Water**

Under Rule 51(d) of the SWLP the diversion of water for the purpose of land drainage is a discretionary activity where it is from a Sensitive Water Body identified in Appendix A of the Plan, and under 51(e) the diversion of water from a natural wetland for the purpose of land drainage is a non-complying activity.

The diversion is from a sensitive water body and from a natural wetland, but the purpose is not for land drainage. Rule 15(a) also does not apply, as the diversion of surface water will result in a net catchment loss. It is therefore considered that the application is not a minor diversion of water and Rule 51 is not applicable.

### **4.2.3 Works Within the Bed of a Wetland or Lake**

#### **Rule 71 – Channel realignment, widening or deepening**

**Discretionary land use consent** is sought for excavation and disturbance of the bed of a lake for the purpose of realigning, widening or deepening a channel within the bed under Rule 71. The mechanical opening of the lagoon will create an artificial channel through the Waituna Bar which will result in excavation and disturbance of the bed.

#### **Rule 74 – Wetlands**

Permitted rule 74(a) cannot be met, as the activity does not comply with Condition 1 as the lagoon opening will result in vegetation removal at the opening location.

**Discretionary land use consent** is therefore sought under Rule 74(b) for the use of land within a wetland for the purposes of maintaining or enhancing the wetland. Although the size of the area that is inundated will be potentially reduced while the lagoon is opened to the sea, the drainage channel will close naturally over time and the lagoon and fringing wetlands will return to natural levels, typically in a matter of months, as has been recently shown in the January 2024 emergency opening.

## **4.3 Regional Coastal Plan**

The regional Coastal Plan identifies Waituna Lagoon as part of a wider Area Containing

Significant Values ('**ACSV**') in Appendix 5 – being Area 14-02.

### **Diversion of Water**

Section 14(2) of the RMA states that no person may dam or divert water (other than open coastal water) within the CMA unless allowed (under subsection (3)) by a national environmental standard or a rule in a regional plan or a resource consent none of which currently apply to the activity.

Under Section 87B(1)(a) an application for a resource consent for an activity must, with the necessary modifications, be treated as an application for a resource consent for a discretionary activity if Part 3 requires a resource consent to be obtained for the activity and there is no plan or proposed plan, or no relevant rule in a plan or proposed plan.

The **diversion of water** in the CMA is therefore considered a **discretionary activity** under Sections 14 and 87B of the Act.

### **Disturbance of the CMA**

Under Rule 10.1.6, the disturbance of the seabed or foreshore where the disturbance is not rectified within one month of completion of the activity giving rise to the disturbance is a discretionary activity. Although the disturbance of the foreshore and seabed associated with the mechanical opening will be undertaken in a matter of days, the lagoon is typically open for more than one month. It is not until the lagoon closes naturally that the disturbance would be considered rectified under this rule.

The **disturbance of the CMA** therefore requires a **discretionary activity** resource consent in accordance with Rule 10.1.6.

### **Discharge of Water**

Under Rule 7.4.2.2 – 'Opening of the Waituna Lagoon' the opening of the Lagoon to the sea, is a discretionary activity under the Regional Coastal Plan.

It is also possible that some of the standards under Rule 7.2.2.1 regarding discharges generally may not be able to be met, and resource consents for a discretionary activity is also sought under this rule out of an abundance of caution.

Rule 7.3.2.1 requires that '*Any discharge to the coastal marine area in respect of which the applicant may desire to rely on Section 107(2), shall be a discretionary activity*'. Section 107(2) provides for the granting of a permit where the discharge is of a temporary nature where the activity may give rise to adverse effects under S107. There

will be a change of colour and visual clarity in the Coastal Marine Area at the location of the opening, however this plume will reduce over time, and will be temporary until the lagoon closes.

A **coastal permit for discharges** is therefore sought under Rules 7.4.2.2, 7.2.2.1 and 7.3.2.1 of the Regional Coastal Plan.

### **Removal of Vegetation**

Under 'Rule 10.5.3 - Removal of live vegetation from the coastal marine area' the removal of live vegetation from the CMA, whether by mechanical or non-mechanical means is a discretionary activity. Vegetation within the CMA may be incidentally removed during lagoon opening at the location of the opening. Rule 10.5.9 and Rule 5.4.2.7 are not applicable to this activity.

A **discretionary activity coastal permit for vegetation removal** is therefore sought under Rule 10.5.3 of the Regional Coastal Plan.

## **4.4 National Environmental Standards for Freshwater**

Resource consent is sought in accordance with the rules that apply to natural inland wetlands.

Regulation 38 permits vegetation clearance, earthworks and land disturbance within 10 metres from a natural inland wetland, and the diversion and discharge of water within or within a 100m setback, if it is for the purpose of natural inland wetland restoration, wetland maintenance, or biosecurity, and where the conditions can be met.

The NPSFM defines **restoration**, in relation to a natural inland wetland, as '*active intervention and management, appropriate to the type and location of the wetland, aimed at restoring its ecosystem health, indigenous biodiversity, or hydrological functioning*'.

The NPSFM defines **wetland maintenance** as '*activities (such as weed control) which prevent the deterioration, or preserve the existing state, of a wetland's ecosystem health, indigenous biodiversity or hydrological functioning*'.

The NPSFM defines **biosecurity** as '*activities to eliminate or manage pests and unwanted organisms (as those terms are defined in the Biosecurity Act 1993)*'.

The activity is therefore considered to be both restoration and maintenance. The opening regime seeks to maintain and restore the ecological health and cultural values of the lagoon ecosystem, including preventing deterioration of ecosystem health and indigenous biodiversity, and it is active intervention and management that is appropriate to Waituna Lagoon.

In this case, not all permitted conditions under Regulations 38 and 55 can be met as:

- the discharge will temporarily change the water level range and hydrological function of the lagoon and fringing wetlands for more than 2 weeks (Regulation 55(5)(d),
- there will be a short-term change of colour and visual clarity in the CMA and lagoon as a result of the discharge (Regulation 55(3)(a)(ii)),
- the activity will temporarily discharge water from the wetland (Regulation 55(3)(d)),
- the activity will temporarily alter the natural movement of water within and from the wetland (Regulation 55(3)(c)),
- the works will change the point at which water flows out of the lagoon (Regulation 55(7)(c)); and
- the works will disturb an area that the plans refer to as habitat for threatened indigenous fish (Regulation 55(9)(d)).

The lagoon may also be opened for biosecurity reasons in accordance with the maintenance and restoration purpose of the application.

The activity is therefore a **restricted discretionary activity under Regulation 39** as it is for the purpose of natural inland wetland restoration, and wetland maintenance, and does not comply with all of the conditions in Regulation 38(4).

It is also noted that Clauses 39(5) and (6), set out that an application for a restricted discretionary activity must include a restoration plan that includes the information set out in Schedule 2 of the NESFW, and must impose a condition that requires compliance with the restoration plan. The Science Advisory Report contains the Schedule 2 requirements for a restoration plan, noting no vegetation planting is proposed but all other matters required to be addressed in a restoration plan are met. As the proposed conditions of consent will be to implement the recommendations of the Science Advisory Report, Clause 39(6) will be satisfied. An outline of how the Science Advisory

Report and application meets the restoration plan requirements is provided at **Appendix F**.

Clause 39(7) also sets out that an application for a restricted discretionary activity must not be granted unless the consent authority has first applied the effects management hierarchy. The NPSFM effects management hierarchy is applied in Section 10.3 of this AEE.

## 4.5 Bundling and Activity Status

As the activities related to this application overlap and cannot be realistically or properly separated, the applicant requests the activities have a bundled status of **non-complying** (being the most stringent activity).

# 5 Site & Surrounding Environment

## 5.1 Waituna Catchment

### 5.1.1 Catchment Description

The Waituna Catchment is approximately 20,000ha in size. There are approximately 130 properties located within the catchment with a mix of rural residential, arable, forestry, sheep, beef and dairy land use activities.

The catchment is illustrated in the figure below, and Waituna Lagoon is located at the bottom of the catchment, at its lowest point:

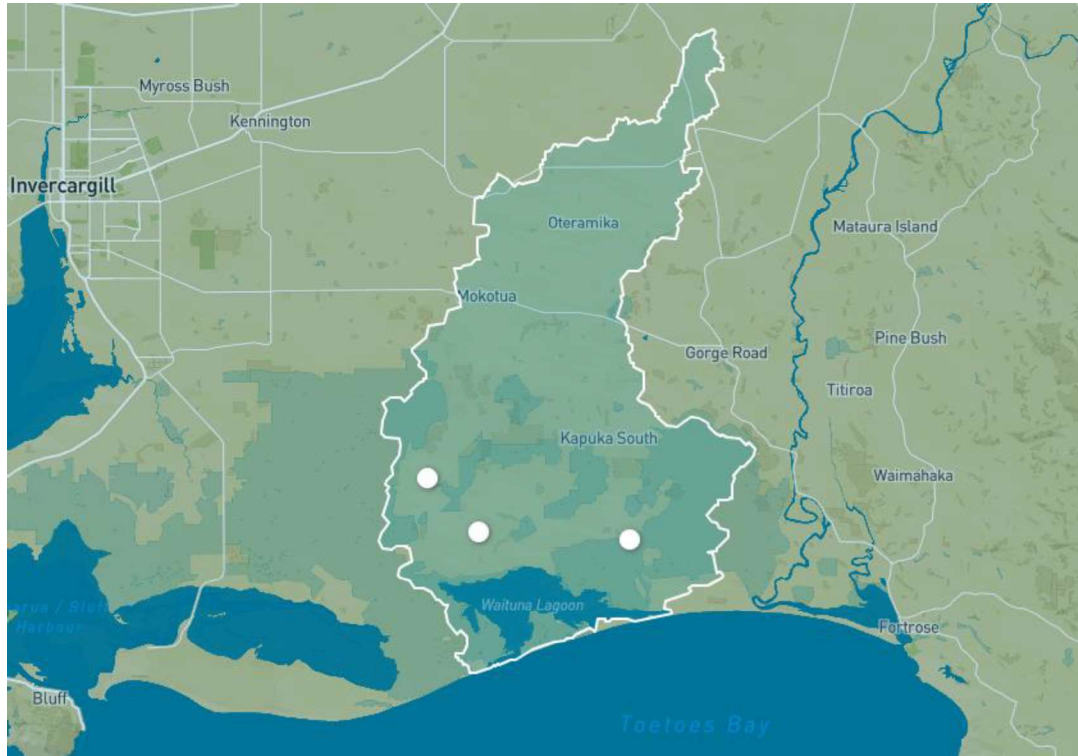


Figure 4: Waituna Catchment

## 5.1.2 Land Use and Land Tenure

Land ownership in the lower catchment adjacent to the lagoon comprises a mix of properties in private ownership, sites administered by the Te Wai Pārera Trust, Southland Regional Council and public reserves and unformed roads. The balance of the lower catchment is largely private land used for primary production.

Of the areas closest to the lagoon that are either inundated or drainage impeded for short periods of time at a lagoon level of 2.5mASL, most of these parcels are either in public reserves, or in the ownership of Southland Regional Council and Te Wai Pārera Trust.

### **Waituna Wetlands Scientific Reserve**

The Waituna Wetlands Scientific Reserve is identified in the New Zealand Gazette 1983 p 2315, and is held and classified as a scientific reserve under the Reserves Act 1977. A survey plan showing the boundaries of the reserve is provided in **Appendix G**. Section 21(1) of the Reserves Act states that scientific reserves are held:

*“for the purpose of protecting and preserving in perpetuity for scientific*

*study, research, education, and the benefit of the country, ecological associations, plant or animal communities, types of soil, geomorphological phenomena, and like matters of special interest.”*

A small number of private recreational huts are located in the Waituna Wetlands Scientific Reserve.

The Waghorn Waituna Scenic Reserve is immediately to the north of the Waituna Wetlands Scientific Reserve. This is the area through which most of the Waituna Lagoon Loop track passes through, accessed at the end of Waghorn Road.

**Land Owned by Southland Regional Council and Te Wai Pārera Trust**

The figure below outlines sites administered by the Te Wai Pārera Trust, and the Southland Regional Council, in black and blue outline. These comprise those areas closest to the lagoon that are either inundated or drainage impeded at a lagoon level of 2.5mASL.



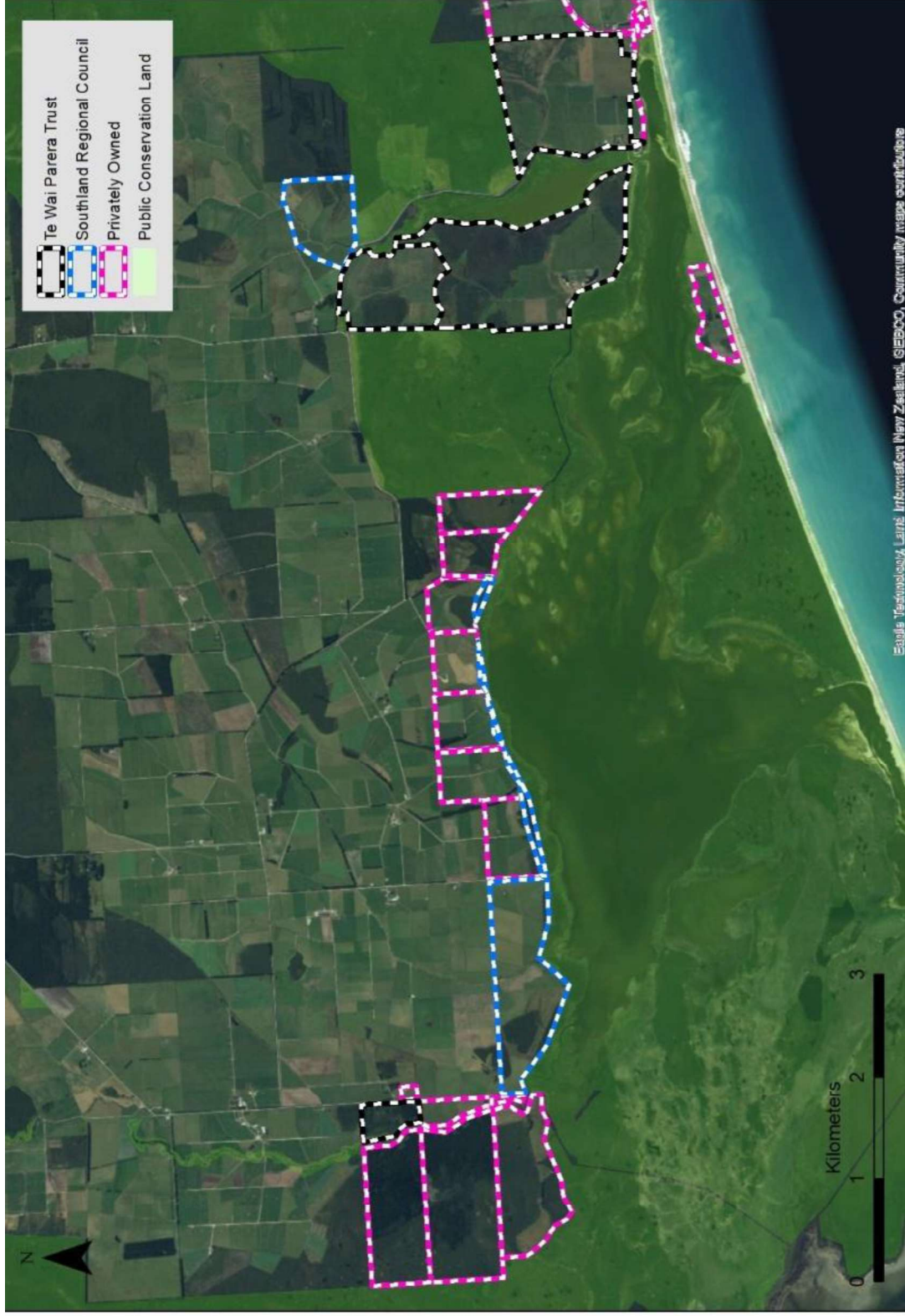


Figure 5: Areas of private land, and land owned by Southland Regional Council and the Te Wai Pārerā Trust surrounding Waituna Lagoon

## **Private Land**

The figure above outlines sites that are adjacent to the lagoon or tributary streams and in private ownership. Most of these sites are outside those areas that are inundated or drainage impeded at a lagoon level of 2.5mASL.

Of these, few properties are partially inundated (~3.5ha of land in total) or partially drainage impeded (~28ha of land in total) at this level. It is estimated that water levels will be over 2.4mASL for only 5 days per year on average and it is noted the Southland region is naturally subject to periods of high rainfall.

To ensure that these landowners are made aware of the application and their ability to submit, the co-applicants will request they be directly notified as part of the public notification process.

### **5.1.3 Awarua Wetland Complex and Ramsar Site Status**

The ecological significance of Waituna Lagoon and the surrounding wetland (an area of 3,500 hectares) was given special recognition in 1976 as a Ramsar Wetland of International Importance (Ramsar Site no. 102).

The Ramsar Convention on Wetlands is an international treaty for the conservation and sustainable utilisation of wetlands, recognizing the fundamental ecological functions of wetlands and their economic, cultural, scientific, and recreational value. The extent of the Waituna Lagoon Ramsar site was increased in 2008 to include nearby wetland areas, and the wider site was renamed Awarua Wetland. The Awarua Wetland Ramsar Site which the Waituna Lagoon forms part of now totals approximately 20,000 hectares.

The Ramsar site consists of a coastal lagoon, peatlands, swamps, saltmarsh, estuarine habitat, gravel beach and ponds. The Ramsar site meets multiple criteria for international importance. For example, the site supports wetland types (including a coastal lagoon) that are representative, rare or unique natural or near-natural wetland types (Criterion 1). The Site also contains wetlands habitats (including Awarua Bay and New River Estuary) that provide important staging areas for wading birds, as well as breeding, feeding, and moulting areas for various other waterbirds. Endemic butterfly species occur, as well as a number of at-risk threatened fish. The Site supports numerous native plant species, some typical of alpine regions. Human activities include sport fishing, bird hunting, and general recreation.

The location of the lagoon within the wider Awarua Wetland Complex is illustrated

below:



Figure 6: Awarua Wetland Complex (Beacon, 2024)

## 5.2 Waituna Lagoon

Waituna Lagoon is a large, brackish coastal lagoon located 40km southeast from Invercargill, fed by the Waituna, Carran and Moffat Creeks, and is approximately 1350ha in size. Waituna Lagoon is the lowest point in the Waituna Catchment and three creeks, other smaller waterways and farm drains (either as open surface water or sub-surface) all drain to it.

Over the last century the Lagoon was periodically opened to the sea through artificial managed openings. There is no resource consent currently in place to open the lagoon so until the recent opening in January this year, the lagoon had remained closed since September 2021.

Historically Waituna Lagoon was surrounded by peat bog wetland, the drainage from which gave the lagoon its characteristic clear brown stain. It has high ecological habitat diversity, a unique macrophyte community (ruppia dominated), important birdlife, and large areas of relatively unmodified wetland and terrestrial vegetation hosting a number of significant ecosystems. It is highly valued for its aesthetic appeal, its rich biodiversity, duck shooting, fishing (for brown trout), boating, walking, scientific, and cultural values.

### 5.2.1 Wai as a Taonga

The Cultural Values Report (**Appendix H**) sets out that water is a taonga, or treasure of the people, and that it is the kaitiaki responsibility of mana whenua to ensure that this taonga is available for future generations in as good as, if not better, quality. The value of water to mana whenua is further explained below:

*“Water has the spiritual qualities of mana, mauri and wairua. The continued wellbeing of these qualities is dependent on the physical health of the water. Water is the lifeblood of Papatūānuku and must be protected. It must be understood that humans cannot live without healthy water and the effects on water quality have a cumulative effect on mahinga kai and other resources, and in turn on ourselves. Both tangible and intangible aspects of water and waterways feature in all aspects of Ngāi Tahu culture, and waterways provide links between the spiritual world of tūpuna and tangata whenua. They feature in pūrākau, wāhi ingoa, moteatea and waiata which consistently reflect symbolic and important messages...*

*The history of intermittent opening and closing of Waipārera to the sea, alongside the high nutrient and sediment input from the catchment, are features that strongly influences ecology and water quality of Waipārera...*

*The mechanical opening of Waipārera to facilitate land drainage has contributed to the notable decline over time to Waipārera health and quality of wai and whenua in the catchment, which is of great concern to Ngāi Tahu”.*

### 5.2.2 Water Levels

An assessment of lagoon water levels is provided in the Science Advisory Report, and is summarised below.

Waituna lagoon is shallow, the water depth is usually less than 2mASL, and it is usually isolated from the sea by a gravel bar. Prior to human management of the lagoon opening, the bar was breached and an opening to the sea was temporarily established when high lagoon water levels overtopped the barrier bar. This overtopping would cut a gap in the barrier bar, effectively draining much of the lagoon. In a natural state the lagoon would have had prolonged freshwater periods due to closed conditions with water levels over 2.0mASL much more frequently than under recent management which was designed to maintain lowered water levels.

When the lagoon was open to the sea it became estuarine and tidal for a time until

certain conditions, likely related to neap tides, low freshwater inflows and calm wind and sea conditions would close the mouth.

With the advent of farming and land development, the lagoon has been mechanically opened to the sea, typically with excavators, to facilitate land drainage. For the last 100 or so years the lagoon has been opened approximately once a year, usually when the lagoon water level exceeded 2.0mASL.

Prior to 2017, the water level threshold at which the lagoon was consented to be opened to the sea was 2.0mASL. However the specific water level when openings occurred varied, as the opening activity is also dependent on suitable wind and sea conditions.

With the increasing risk to ecological health recognised, a short-term 5-year consent for opening Waituna Lagoon was approved in February 2017. This short-term consent retained a primary focus on land drainage but included some provisions to open the lagoon to alleviate poor water quality (e.g., opening to disrupt algal blooms) and established a higher opening water level threshold of 2.2mASL during spring-summer months in an effort to avoid frequent opening events during the early part of the macrophyte growing season. The short-term consent expired on 14 February 2022.

The lagoon was then closed for a period of 28 months from August 2021 until it was opened in late January 2024 at a level of approximately 1.5mASL. The consenting history is outlined in more detail further in Section 7 of this report.

The water levels in Waituna Lagoon are continuously monitored by Environment Southland at the Waghorns Road bridge/monitoring site. The levels of the lagoon naturally fluctuate as a result of inflows and climate conditions including seasonal variations between winter and summer. The gravel bar between the lagoon and the sea is highly porous resulting in the water levels receding quickly, particularly at higher levels.

This is illustrated in the hydrograph below that shows lagoon water levels between January 2022 and January 2024 when there was no mechanical opening.



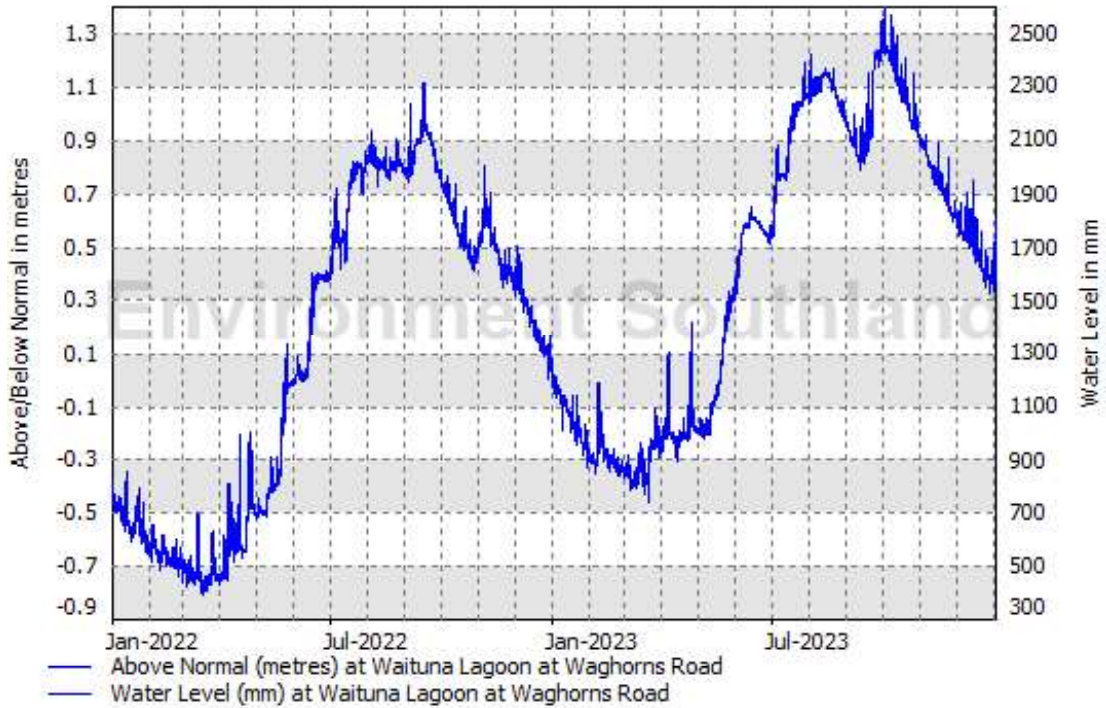
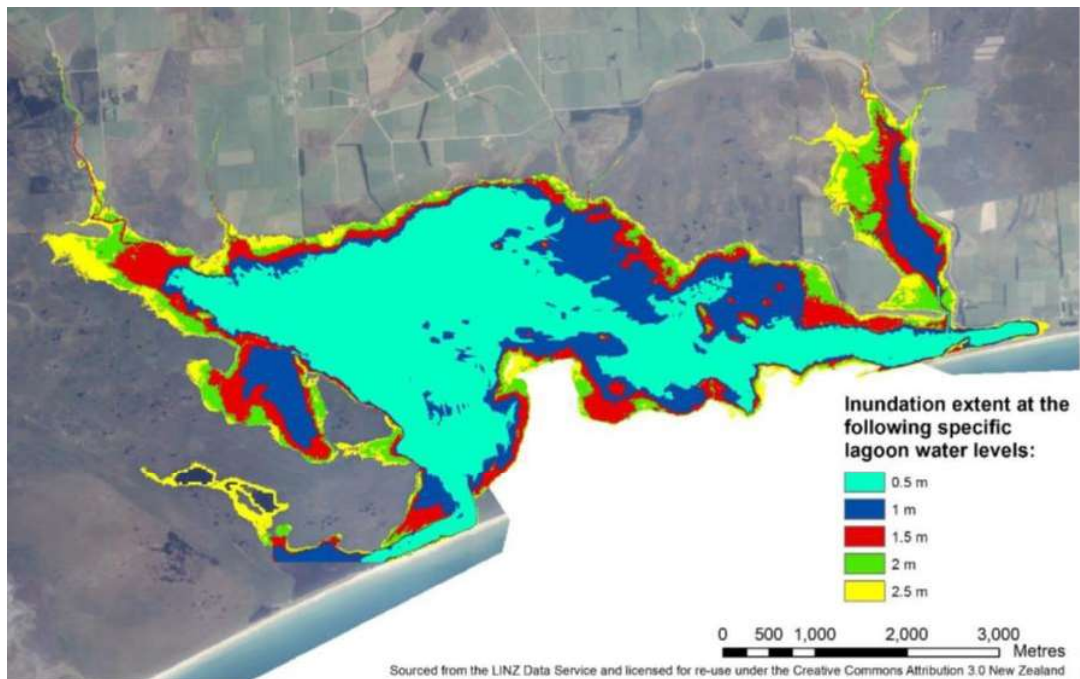


Figure 7: Lagoon water levels between January 2022 and January 2024 (Figure 4, Science Advisory Report)

The spatial extent of lagoon inundation was modelled by NIWA in 2017. These modelled scenarios are illustrated in the figure below.



*Figure 8: Waituna Lagoon inundation extent at different levels. Inundation extents are derived from the simple 'bathtub' model (Figure 3-2 NIWA Inundation Study, 2017)*

NIWA also developed a one-dimensional hydraulic models of Waituna Creek, Carran Creek and Moffat Creek to assess drainage impairment and inundation resulting from stream flow.

This study suggests that for Waituna, Moffat and Carran Creeks the areas of inundated and drainage impeded land is a function not just of lagoon level, but also of flow rate and plant growth in the creeks. The relative importance of these three factors varies spatially.

The most downstream parts of the Creeks are strongly affected by lagoon level but further upstream this has little or no effect and channel vegetation and flow rates are the primary cause of inundation or drainage impairment. Under high flow conditions the area of farmland with potentially affected drainage is much higher as a result of a vegetated channel and stream flow conditions, than due to high lagoon water levels for all three creeks.

## 5.2.2 Water Quality

An assessment of lagoon water quality is provided in the Science Advisory Report, and is summarised below.

Water quality has been monitored since the early 2000s as part of monthly water quality sampling undertaken by Environment Southland. The monitoring includes analysis of nutrients, phytoplankton (measured as chlorophyll-a ('chl-a'), the Trophic Level Index ('TLI'), which provides an overall measure of water quality), water clarity and other water quality indicators.

The Science Advisory Report sets out that water quality of the lagoon is affected by nutrient and fine sediment inputs from the catchment (riverine and groundwater), macrophyte and phytoplankton abundance, internal recycling of nutrients from sediments, and the open/close status of the lagoon.

The monitoring indicates:

- The TLI has remained fairly stable over the period of 2001–2023 during both open and closed conditions, though short-term fluctuations in TLI are known to occur. This is illustrated in Figure 9 below.
- Total Nitrogen ('TN') concentrations are typically lower when the lagoon is open

to the sea and build up when the lagoon is closed, with concentrations peaking in winter due to greater inflows. When the lagoon is closed, the TN concentration is typically above 0.5mg/l the majority of the time. When the lagoon is open, TN above 0.5mg/l occurs approximately 40% of the time. This is illustrated in Figure 10 below.

- Total Phosphorus ('**TP**') concentrations are more similar between open and closed status, with concentrations often peaking in summer. When the lagoon is closed, TP concentrations are typically above 0.03mg/l approximately 60% of the time. When the lagoon is open, TP concentrations are typically below 0.03mg/l approximately 60% of the time. This is illustrated in Figure 10 below.
- Previous assessment of long-term water quality trends indicate dissolved reactive phosphorus ('**DRP**'), chl-a and turbidity are decreasing over time (when the lagoon is closed, Figure 11), suggesting an improvement of lagoon water quality. However, this does not necessarily equate to an improvement in ecosystem health as other nutrient pools (e.g., sediment, macroalgae, epiphytes) are not measured.
- September 2021 - January 2023 coincided with a period of prolonged closed conditions. During this time chl-a concentrations were low (<0.01 mg/l) without some of the higher peaks (>0.2 mg/l) observed in 2009, 2012, 2015 and 2018 to 2021, TN levels showed similar patterns to previous years with winter peaks, and TP concentrations were in a low range <0.05 g/m<sup>3</sup>. This is illustrated in Figure 11 below.
- During December 2023 - January 2024, an algal bloom occurred in the lagoon that resulted in very high concentrations of phytoplankton, with chl-a between 0.06 to 0.3 mg/L, and dominated by a potentially toxin producing cyanobacteria. The algal bloom appeared to be in response to the high nutrient levels in Waituna Lagoon that had increased steadily during 2023 and warm summer conditions. Water quality monitoring on 10 January 2024 indicated TN was >2 mg/L and TP was >0.150 mg/L. Monitoring also showed the increase in nutrients during the 2021-2024 closure, highlighting the caution needed during prolonged closed periods. This event has informed the proposed water quality and ecosystem indicators and proposed conditions of consent as outlined in Section 3.3 of this AEE.
- The closed freshwater phase for 2 consecutive years supported a lagoon-wide recovery of macrophytes (see submerged macrophyte section in 5.2.6 below)



and phytoplankton levels initially remained relatively low. However, as the lagoon remained closed for more than two years chl-a increased in mid-late 2023 leading to the algal bloom observed in December 2023. This data indicates prolonged closure over more than two years increases the risk of eutrophication, given the ongoing catchment inputs and nutrient recycling.

TLI during open and closed conditions between 2002 and 2023 is illustrated below:

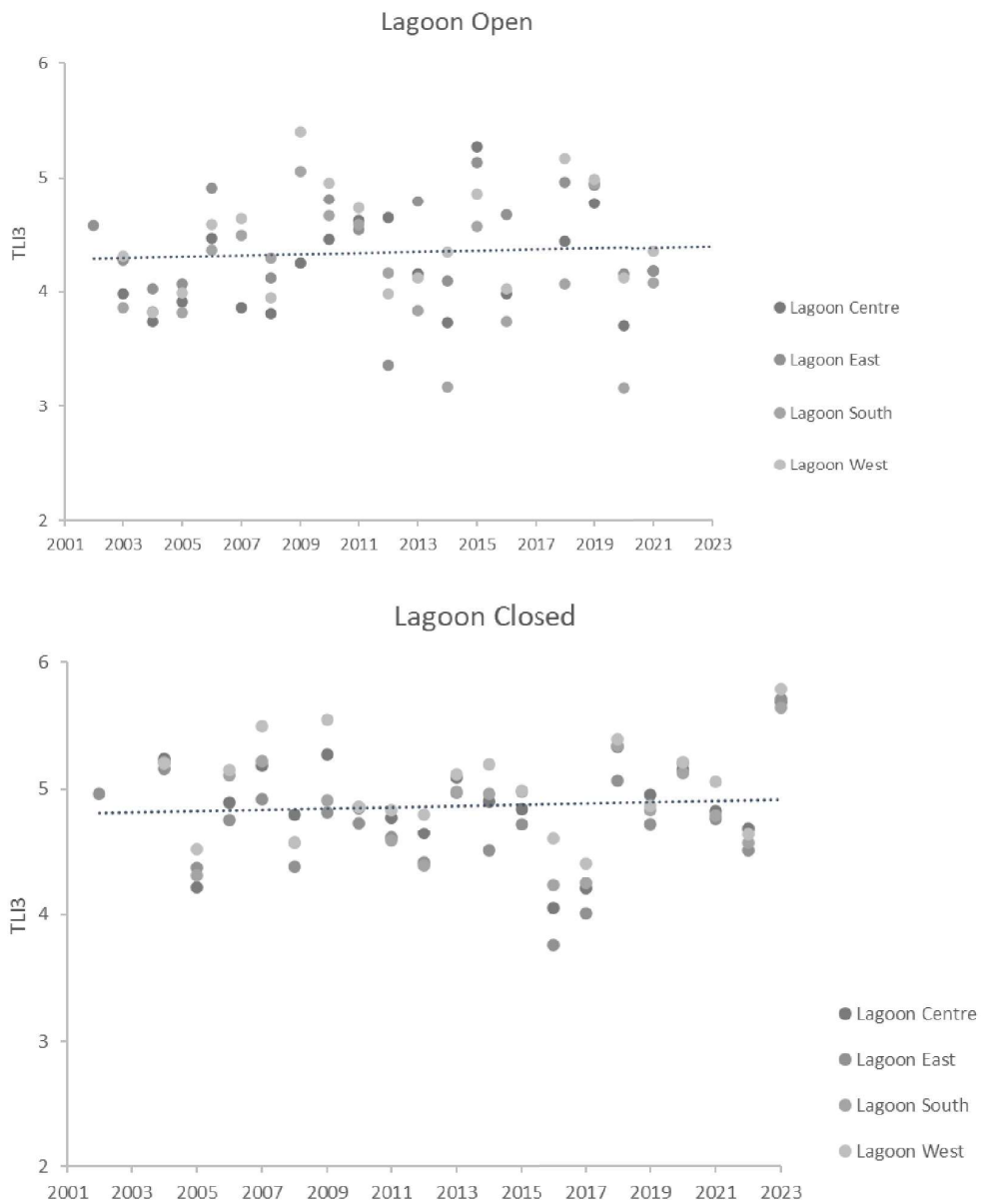
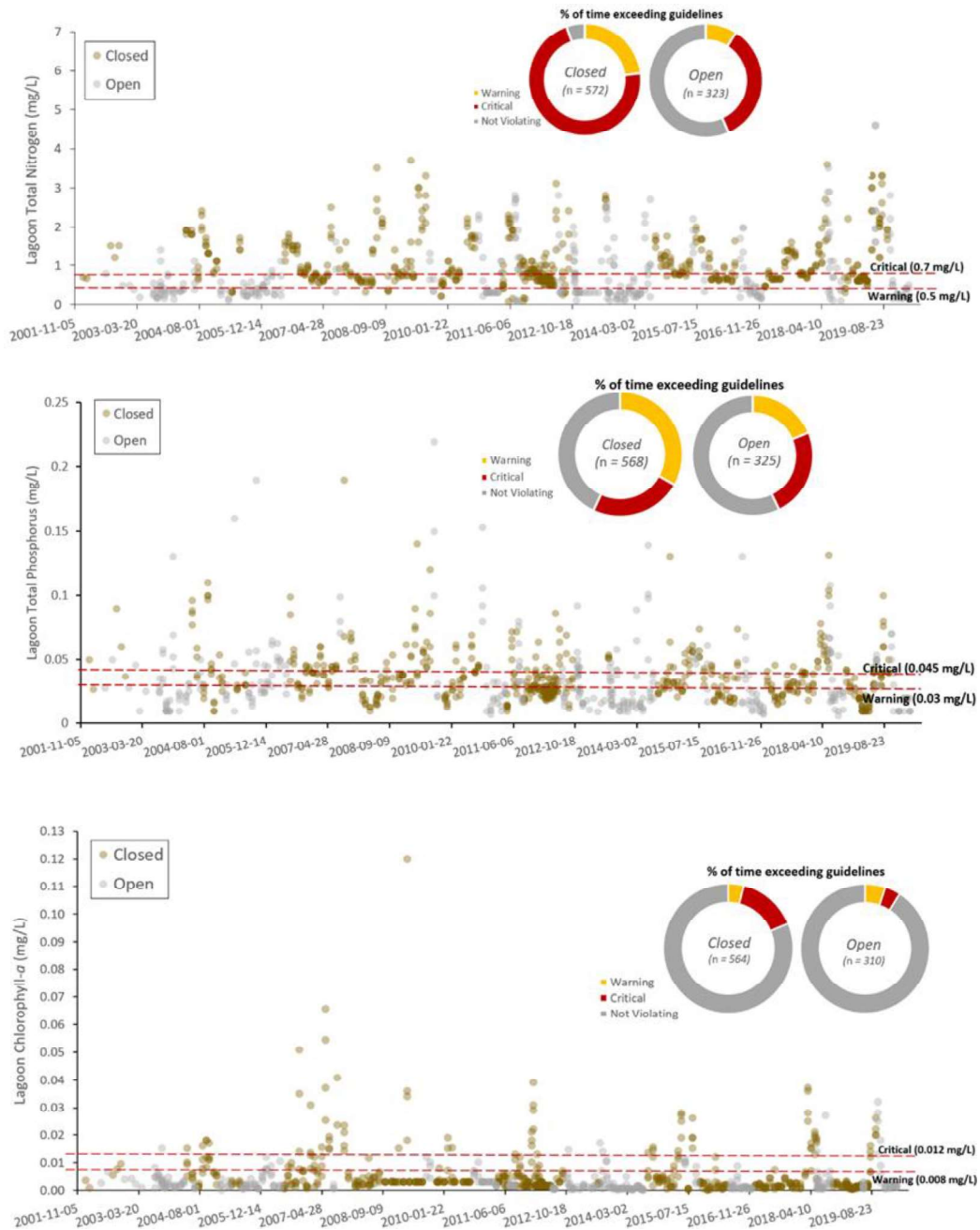


Figure 9: Lagoon-wide trophic status (TLI3<sup>1</sup>) from 2001 to 2023 for when the lagoon is open and closed (Fig.7, Science Advisory Report).



<sup>1</sup> TLI3 is an index that uses chlorophyll-a, Total Nitrogen and Total Phosphorus concentrations, and known relationships to trophic status, to determine the trophic status of a lake.

Figure 10: Total nitrogen (TN), total phosphorus (TP) and chlorophyll-a concentrations in Waituna Lagoon for the period 2001 to 2020 (Figure 8a, Science Advisory Report)

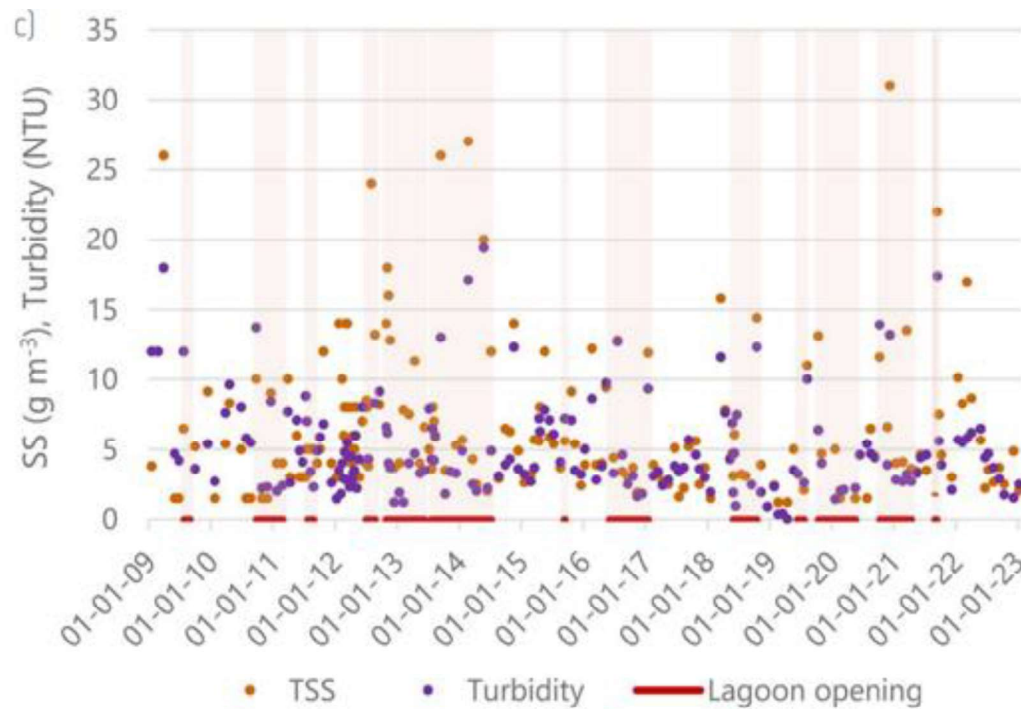
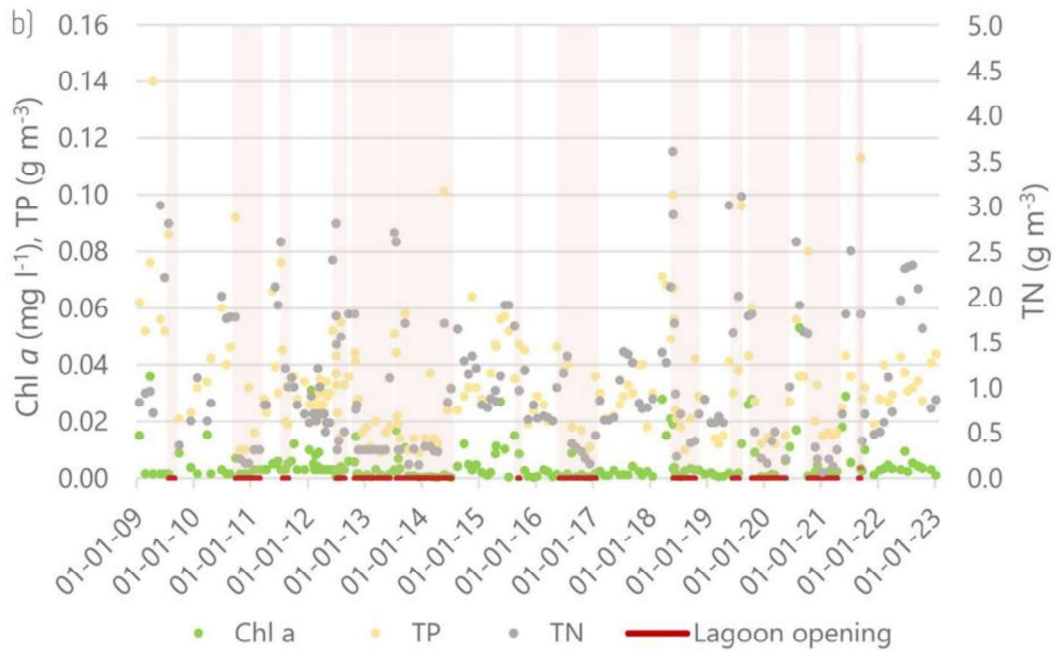


Figure 11: TSS and turbidity in Waituna Lagoon between 2009 and 2023 - NB data is from the central monitoring site only (Figures 8b and 8c Science Advisory Report, Source: de Winton et al. (2023)).

Overall, the Science Advisory Report concludes that TN, TP and chl-a monitoring indicates Waituna Lagoon remains under threat from eutrophication and catchment action remains essential to reduce nutrient loads.

The Report recommends that *“a future consent would enable the lagoon to be opened should water quality and ecosystem indicators reach levels of concern, while supporting closed conditions that promote a restoration gradually towards a more natural hydrological regime for Waituna Lagoon, within the constraint of contemporary catchment inputs”*. The recommendations for the report have been adopted in the application, and the conditions proposed and as summarised in Section 3.3 seek to achieve this outcome.

#### 5.2.4 Biodiversity Values

The ecological values of the lagoon are unique and diverse. Macrophyte, avifauna, fish, wetland and invertebrate values, and changes to these values as the lagoon system has degraded, are outlined further below.

The Science Advisory Report provides an overview of the threats to these values:

*“The history of intermittent opening and closing of the lagoon to the sea, alongside the high nutrient and sediment inputs from the catchment above, are features that have strongly influenced the lagoon’s ecology and water quality. The fluctuations in water level and salinity have created a highly variable environment with associated high variability in species dominance and ecological community structure. Species alter their distribution and abundance in response to changes in water level, salinity, other environmental factors, and species interactions, creating an ecologically diverse and productive ecosystem, but one that is also at risk of being degraded by additional, anthropogenic stressors...*

*... The ecosystem health of Waituna Lagoon is supported by submerged native aquatic plants known as Ruppia (two species: R. megacarpa and R. polycarpa), which are foundational species that help regulate water quality. However, the Ruppia-dominated plant community is vulnerable to a range of stressors including nutrient enrichment, decreased water clarity, prolonged high salinity and frequent lagoon opening events”*.

The subsequent sections below on taonga species, submerged macrophytes and macroalgae, fringing wetlands, fish, invertebrates, and avifauna provide further detail

on the biodiversity values of the lagoon.

### 5.2.5 Taonga Species

Mana whenua recognise a range of taonga species present in the Waituna wetland and lagoon system. Freshwater species including tuna (longfin and shortfin eels), kanakana /lamprey, īnanga/whitebait, koura/freshwater crayfish, pātiki/flounder, smelt, kokopu/whitebait, and kākahi/freshwater mussel. Around and within the fringes of the lagoon, taonga species include swan, waterfowl, pūkeko, cabbage trees, flax, manuka and other bird and plant species. A more comprehensive list of taonga species is provided in Schedule 97 of the Ngāi Tahu Claims Settlement Act 1998, and Appendix M of the PWLP.

The Statutory Acknowledgement (**Appendix A**) sets out that Raupō, tōtara and tōtara bark, and Pīngao were also regularly harvested cultural materials. Local black mud (paru) is also used for dyeing textiles.

### 5.2.6 Submerged Macrophytes and Macroalgae

The Summer 2024 Vegetation Survey (**Appendix J**) is the latest annual monitoring report for submerged plants, provides information regarding the importance of submerged plants to the health of Waituna Lagoon, especially the indigenous species Ruppia. Ruppia safeguards water quality in Waituna Lagoon. It tolerates but is sensitive to fluctuating levels of saltwater in lagoons.

The macrophyte community supports the At-Risk- Naturally Uncommon Ruppia megacarpa. Other plants, including a nationally rare, charophyte, are also present. The report outlines that if submerged plant communities become too stressed, they can collapse, and the lagoon then enters a new, dirty water state, with high levels of resuspended sediment and development of macroalgal mats or phytoplankton blooms instead of plants.

The Science Advisory Report confirms that the Ruppia-dominated macrophyte community is an important ecosystem engineer that promotes ecosystem health. The report sets out that Ruppia megacarpa and R. polycarpa are sensitive to water level, salinity, and nutrient state. While Ruppia spp. may not be recognised as a taonga, the status of Ruppia provides an indication of the lagoon condition, which relates to the health of many taonga species.

#### **Monitoring Since 2009**

DOC oversee the monitoring of Ruppia and other aquatic plants and macroalgae to determine status and trends in ecological health of the Lagoon. The Technical Report on Vegetation Status in Waituna Lagoon: 2009–2023 (**Appendix I**) analyses the results of Ruppia and other macrophyte monitoring over the last 15 years against macrophyte/macroalgae targets. The monitoring examines whether the lagoon ecosystem is meeting its objectives in terms of lagoon closure, macrophyte abundance and macroalgae abundance. Six ecological targets are evaluated, including achieving a lagoon-wide cover of 30–60% for Ruppia species.

Monitoring results over the 2009–2023 period are illustrated below:

Year	Lagoon closure	Ruppia cover	Ruppia biomass index	Macroalgae cover	Ruppia reproductive success	Status of Ruppia megacarpa	Targets met
2009	✓	✗	✗	✓	✗	✗	2
2010	✓	✗	✗	✓	✗	✓	3
2011	✗	✗	✗	✓	✗	✗	1
2012	✓	✗	✗	✓	✓	✗	3
2013	✗	✗	✗	✗	✗	✗	0
2014	✗	✗	✗	✓	✗	✗	1
2015	✓	✗	✓	✗	✓	✗	3
2016	✓	✓	✓	✗	✓	✗	4
2017	✗	✗	✗	✗	✗	✗	0
2018	✓	✗	✓	✓	✓	✓	5
2019	✓	✓	✓	✗	✓	✓	5
2020	✗	✗	✗	✗	✗	✓	1
2021	✗	✗	✗	✗	✗	✗	0
2022	✓	✗	✗	✗	✗	✓	2
2023	✓	✓	✓	✓	✓	✓	6

Table 2: Results for macrophyte/macroalgae targets since 2009 – A tick indicates the target has been met, a cross indicates the target has not been met (Table 8, Summer 2023 Vegetation Status Report, Appendix J)

### Trends over 2017–2021

The 5-year consent in 2017 implemented a 2.2m threshold level, intended to limit

spring-summer openings (higher than the previous 2m level), to prevent lagoon openings from occurring during the ruppia early growing season. However, this was only partly successful in preventing annual openings, with the Science Advisory Report Stating:

*“Five of the six ecological targets were achieved in 2018 and 2019 following a closed lagoon period, however the status of the macrophytes declined again in 2020 and 2021 (de Winton & Elcock 2021) in response to prolonged opening events. The abundance of macroalgae remained relatively high in 2020 and 2021 (target was not met), suggesting drivers other than mouth status (e.g. temperature, sediment and nutrients) are also important”.*

In 2021 the lagoon ecosystem was in a poor state following two consecutive years of open conditions. None of the six ecological targets for macrophytes and macroalgae were met, the lagoon was open to the sea over the critical spring-summer period for Ruppia growth for the second consecutive year, and this is likely responsible for the poor performance of submerged plants that year.

There was a further reduction in the distribution and abundance of submerged plants, comprising mainly Ruppia species, since reductions were recorded 2020. Lagoon-wide Ruppia cover, the biomass index and Ruppia reproductive success was only 1/10th of the ecological target, and submerged plants were not recorded in approximately half the lagoon area. Ruppia megacarpa was limited to only three sites, which was 1/3rd of the ecological target, while macroalgae development exceeded the maximum acceptable threshold of >10% cover.

The report concludes that based on all six ecological targets:

- *“2021 was the third monitoring year the lagoon failed to achieve any targets, with 2013 and 2017 also not meeting any ecological targets.*
- *Surveys that achieved only one or no targets were years when the target for lagoon closure (closed >3months before survey) was not met.*
- *The evidence indicated that having a closed lagoon for at least two consecutive growing seasons was important”.*

### **Trends in 2022 to present**

Similar to the trend observed in the 2018/2019 closure period, a significant recovery of



Ruppia occurred in 2022 and 2023 as the lagoon remained in a closed, freshwater state for two consecutive growing seasons. All ecological targets were met in 2023, the first time this has been achieved since monitoring began in 2009. The 2023 monitoring report concluded that:

- *“Ecological targets for Waituna Lagoon are not met when lagoon openings occur or extend over late spring to summer.*
- *Two or more consecutive years of openings during the main vegetation growth period should be avoided to ensure Ruppia can regenerate successfully.*
- *At least two consecutive years of a favourable closed lagoon over the main vegetation growth period enable higher Ruppia development.*
- *There may be trade-offs between a stable closed lagoon for good Ruppia development and risk of nutrient build-up fuelling macroalgae and phytoplankton blooms.*
- *Ecological targets for lagoon-wide Ruppia cover and biomass index are likely to be met when Ruppia megacarpa is more prevalent, due to its ability to form tall, high cover beds”.*

A summary of performance against the targets for 2023 is provided below:

Ecological target	Targets met?	Comment
Lagoon closure	✓	Lagoon had been closed for two consecutive <i>Ruppia</i> growing seasons prior to monitoring.
<i>Ruppia</i> cover	✓	Lagoon-wide <i>Ruppia</i> cover exceeded the target (>30% cover) and was the highest cover yet monitored.
<i>Ruppia</i> biomass index	✓	<i>Ruppia</i> biomass index exceeded the target (>1000) and was the highest value yet monitored.
Macroalgae cover	✓	Macroalgae development was within the acceptable threshold of 10% cover.
<i>Ruppia</i> reproductive success	✓	The target for reproductive success (≥40% of samples flowered) was exceeded with reproductive <i>Ruppia</i> at almost all sites.
Status of <i>Ruppia megacarpa</i>	✓	<i>Ruppia megacarpa</i> contributed significantly to lagoon vegetation.

Table 3: Summary of 2023 macrophyte monitoring results (Table 3, Science Advisory Report, Source: de Winton et al. 2023)

The Science Advisory Report confirms that the response of aquatic plants following two consecutive years of closed conditions illustrates the ability of the lagoon ecosystem to



recover from lagoon opening, as plants re-establish from the seed bank and vegetative propagules. However, poor water quality and fluctuating growth of aquatic plants between 2021 and 2023 may also highlight that the lagoon ecosystem remains under-stress. The report confirms that the target range of 30–60% *Ruppia* cover is healthy for the lagoon.

The Science Advisory Report notes that while the benefits from an abundant macrophyte community are sought, there is potential risk to lagoon health if adverse conditions (e.g., turbidity event/phytoplankton bloom, sustained high water level) trigger a rapid, wide-spread macrophyte decline, and a balance is therefore required:

*“A decline in the aquatic plant community was observed in late 2023, prior to the development of the significant cyanobacterial bloom of early 2024, although the reason for this decline is unknown. This information highlights the need for a balance between closed lagoon status to promote periods of freshwater and higher water levels and the need to regularly flush algae and nutrients out of the system via lagoon openings. The cyanobacterial bloom that occurred in early 2024 suggests that prolonged closures of greater than c. 2.5 years may be detrimental, given the current nutrient loads to the system”.*

The Summer 2024 Vegetation Status Report was released immediately prior to lodgement of this application (**Appendix J**), and confirms the need for balancing the risk of prolonged closure with more frequent openings. While the macroalgae cover target was met, the other targets were not.

### 5.2.7 Fringing Wetlands

The Science Advisory Report outlines that a diverse native plant community is present within the fringing wetlands surrounding the lagoon. These wetlands provide habitat to support indigenous fauna, including threatened species and benefit from fluctuating water levels in the lagoon.

The fringing wetlands as surveyed in 2012 are illustrated in the Figure below:

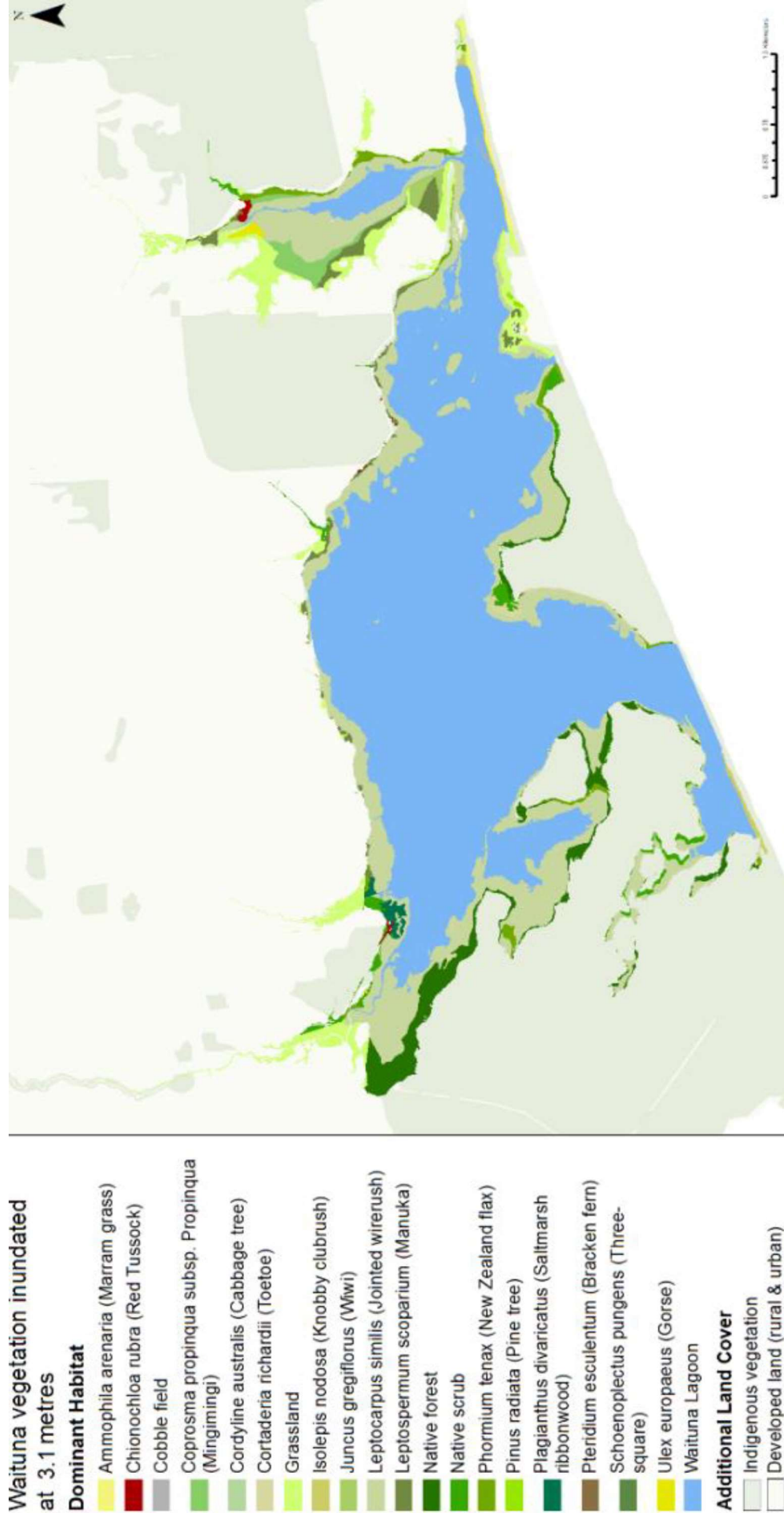


Figure 12: Fringing wetland habitats of Waituna Lagoon (Science Advisory Report 2017, Source: Wriggle 2012)

## 5.2.8 Fish, Invertebrates, Avifauna

### Fish

Waituna Lagoon and its catchment has relatively strong populations of indigenous and taonga fish species. Thirteen fish species have been recorded in the Waituna lagoon catchment tributaries and within Waituna Lagoon itself.

The catchment is known for its significant population of the At Risk–Declining giant kōkopu as well as other fish species including, common bullies, shortfin eel, the At Risk–Declining longfin eel, and flounder. The catchment has no known introduced pest fish, with brown trout being the only introduced fish present.

Many of the species found within the Waituna lagoon catchment are migratory (e.g. īnanga, and the Threatened–Nationally Vulnerable lamprey), meaning that at least one aspect of their life stage requires access to or from the sea or brackish water. The lagoon also contains marine wanderers such as kahawai.

The Science Advisory Report notes that the high biomass of large predatory fishes (e.g. longfin eel) is maintained in Waituna Creek through its connectivity to Waituna Lagoon. Research found that īnanga migrating upstream from the lagoon supported 60%–80% of longfin eel and 40%–90% of brown trout biomass over the two years sampled, these species often rely on the lagoon for >50% of their food resource, and larger fish are particularly reliant on the lagoon for their diet.

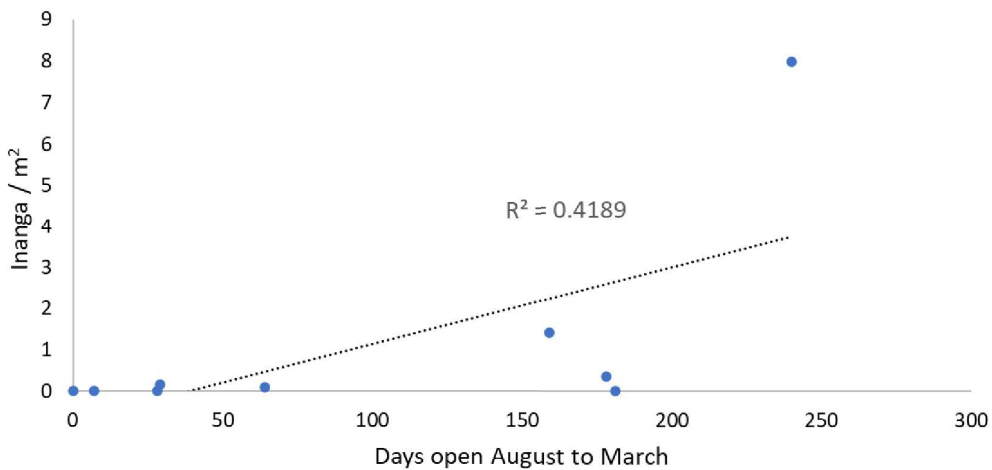
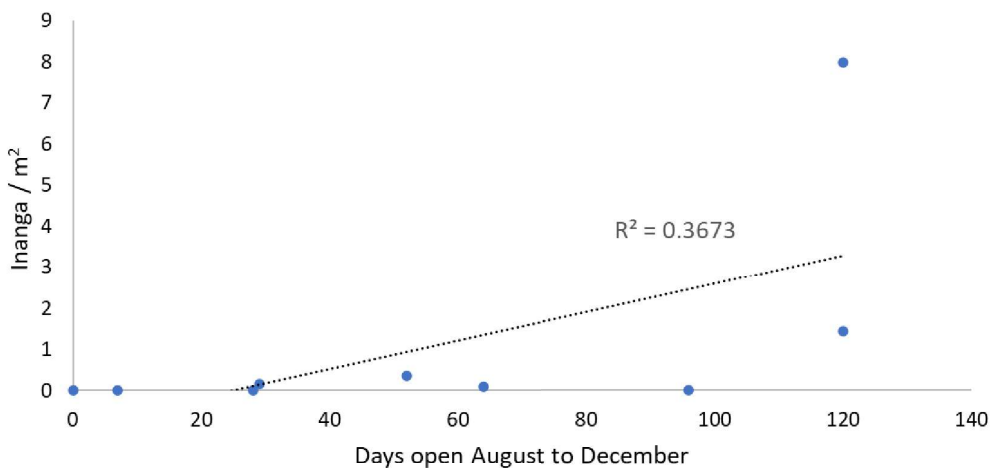
Monitoring of fish abundance over 2014–2023 lagoon open and closed periods observed that:

- *“both īnanga and kanakana/lamprey abundance in Waituna Creek tends to increase with the number of days that the lagoon is open to the sea—either during the preceding spring for īnanga or the winter–spring period (three years previous) for lamprey/kanakana.*
- *Giant bullies also showed a positive (but weaker) correlation with increasing open days during summer (two years previous).*
- *No patterns were observed between eel density or biomass and lagoon opening duration”.*

The Science Advisory Report also comments that recent fish monitoring data over

2020–2023, consistent with earlier surveys, indicated that the lagoon opening regime influences the recruitment of īnanga and kanakana/lamprey. The intermittent nature of opening and closing the lagoon therefore influences fish passage of these species, noting that īnanga populations naturally vary between years in normal river systems and coastal lagoons based on coastal and river conditions.

The monitoring data illustrates that the winter–spring period is a critical migration period for most migratory species in the Waituna catchment. Since 2017 there were regular periods when the lagoon was open for the winter–spring period, and although the opening was not for the purpose of fish migration, opening events for other reasons may support migratory fish populations, as illustrated in the figures below.



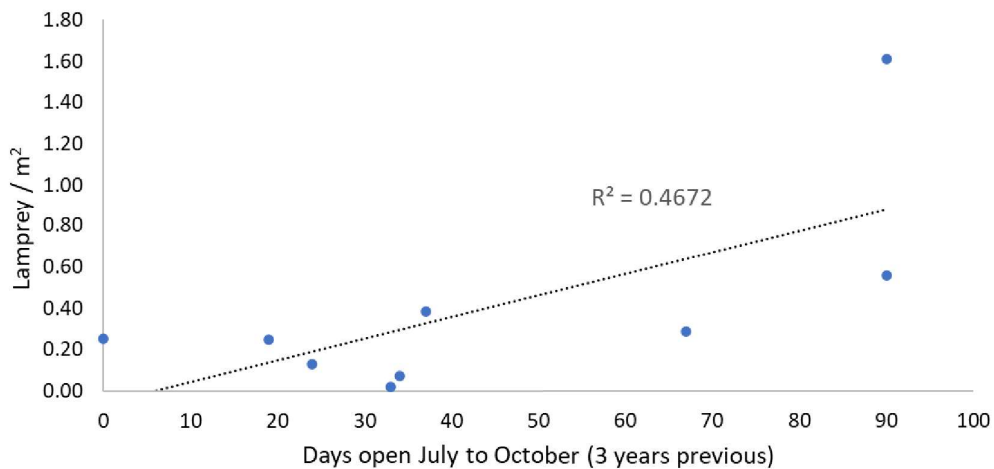


Figure 13: Average inanga and lamprey/kankana density (fish/m<sup>2</sup>) from all sites during the annual March fish population sampling in Waituna creek (2014-2023) correlated against the number of days Waituna Lagoon was open to the sea (Fig. 9 Science Advisory Report)

### Invertebrates

The Science Advisory Report sets out that invertebrates in the lagoon include benthic and pelagic species which likely play important roles in the lagoon's food web. Large invertebrates such as the At Risk-Declining koura (freshwater crayfish, *Paranephrops zealandicus*) and At Risk-Declining kākahi (freshwater mussel, *Echyridella menziesii*) are also present in low numbers near the tributary inflows.

### Avifauna

The lagoon and wetlands provide habitat for a broad range of bird species with many native and threatened species, including waterfowl, and migratory wading birds. This habitat extends across the wider Awarua-Waituna wetland complex of Awarua Bay, the New River estuary, extensive peatlands and the lagoon. Other coastal wetlands also occur nearby, including Fortrose estuary.

Collectively these areas form an important feeding area for more than 80 bird species including threatened species and trans-equatorial migrants, such as the far eastern curlew (*Numenius madagascariensis*), whimbrel (*N. phaeopus*), and the Threatened-Nationally Vulnerable caspian tern (*Hydroprogne caspia*).

The Awarua wetland complex also supports notable populations of Threatened-Nationally Critical Australasian bittern, At Risk-Declining fernbird, Threatened-Nationally Critical southern NZ dotterel, black swan, grey duck, At Risk-Relict black shag and the At Risk-Naturally Uncommon royal spoonbill.

### 5.2.9 Climate Change

The Impacts and Implications of Climate Change on Waituna Lagoon report published by DOC in 2019 (**Appendix K**) provides an assessment of potential climate change-related impacts on the lagoon. The report sets out that coastal hydrosystems such as Waituna Lagoon (e.g. including lagoons, estuaries and wetlands) are particularly susceptible to the impacts of climate change as they will be affected by changes to freshwater inflows, air temperature, rainfall, wind patterns as well as sea level rises. It sets out that the response of hydrosystems to these changes will be highly dependent upon the nature of the systems, the local topography and hydrological regimes and the potential for adaptive management interventions.

The report states that, *“Projected increases in rainfall, freshwater inflows, flood events and inundation of surrounding land over the next several decades are likely to contribute to lower lagoon-bed light levels and higher levels of nutrients and sediment entering the lagoon”*. It recommends further research and ongoing monitoring as well as an adaptive management approach, which could include a variety of strategies for managing the lagoon and its biodiversity under both increasing freshwater inflow and saltwater inundation conditions.

The proposed 5 yearly reporting and associated review conditions proposed include the consideration of climate change, so that if changes are needed to the opening regime, these adaptations can be accommodated.

## 5.3 Coastal Environment

The coastal environment, extends from the CMA to the other side of the lagoon to Waituna Lagoon Road and Moffat Road, as illustrated below:

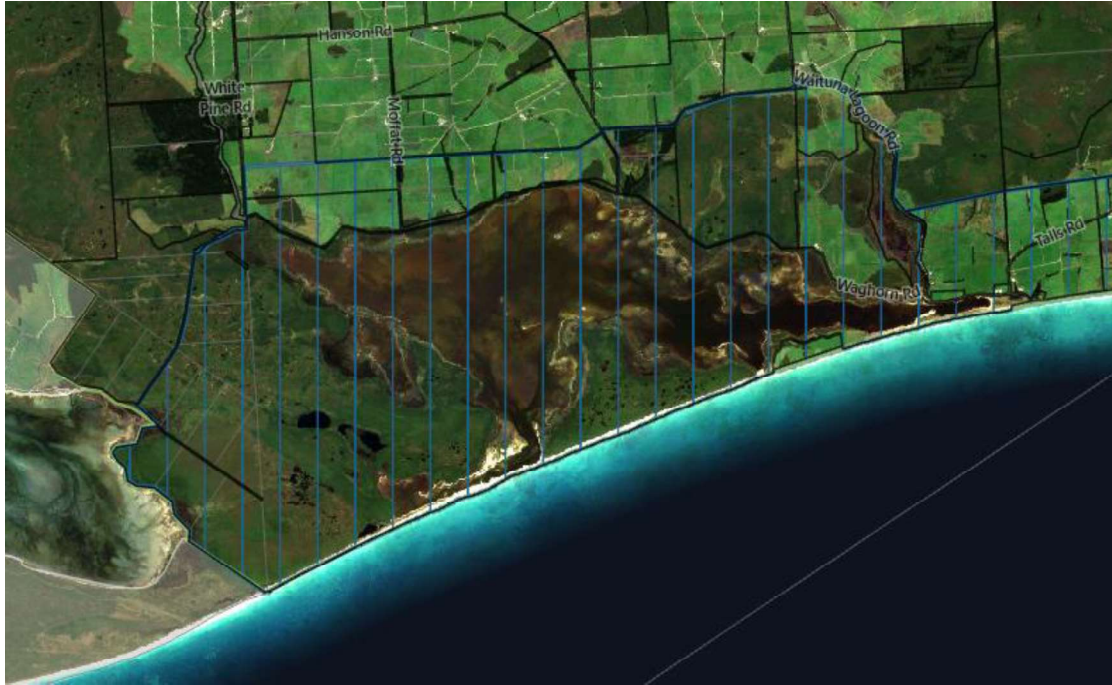


Figure 14: Coastal Environment - blue lined overlay (Southland District Plan Eplan Maps)

### 5.3.1 Waituna Bar

On the CMA side of the lagoon, the Waituna Bar forms a natural barrier which impounds the water in the lagoon and prevents it from draining directly to the sea. The Waituna Bar is located in Toetoes Bay which is a steep reflective coastline comprising gravel and mixed sand as illustrated in the figure below.





*Figure 15: Waituna Bar, looking west towards Bluff with Waituna Lagoon to the right and Toetoes Bay to the left*

The wave environment is slightly sheltered from the larger south-west swells of Foveaux Strait. Wave heights up to 2-3m are common, which can result in significant wave run up and overtopping of the Lake Waituna barrier. The Toetoes Bay area also has calm sea and wind conditions, especially in easterly weather patterns. Waituna Bar is a drift-aligned beach with no clearly defined wave zone offshore, but with very confined swash zone close to the shore. The near shore wave environment is dominated by 'up rush' surges and 'backwash' events.

### **5.3.2 Opening Location**

Three areas of the Waituna Bar have been used for artificial openings of Waituna Lagoon in recent times. The long-term and primary location for opening events has been Walker's Bay. While Hansen's Bay and The Fence have been used infrequently. The opening locations are illustrated in the aerial images below, where the 2024 emergency opening at The Fence can be seen.



This application seeks consent to open the lagoon at the Walker's Bay location.

Walker's Bay is located in the south-west corner of Waituna Lagoon. Historically, Walker's Bay has experienced the greatest number of openings.

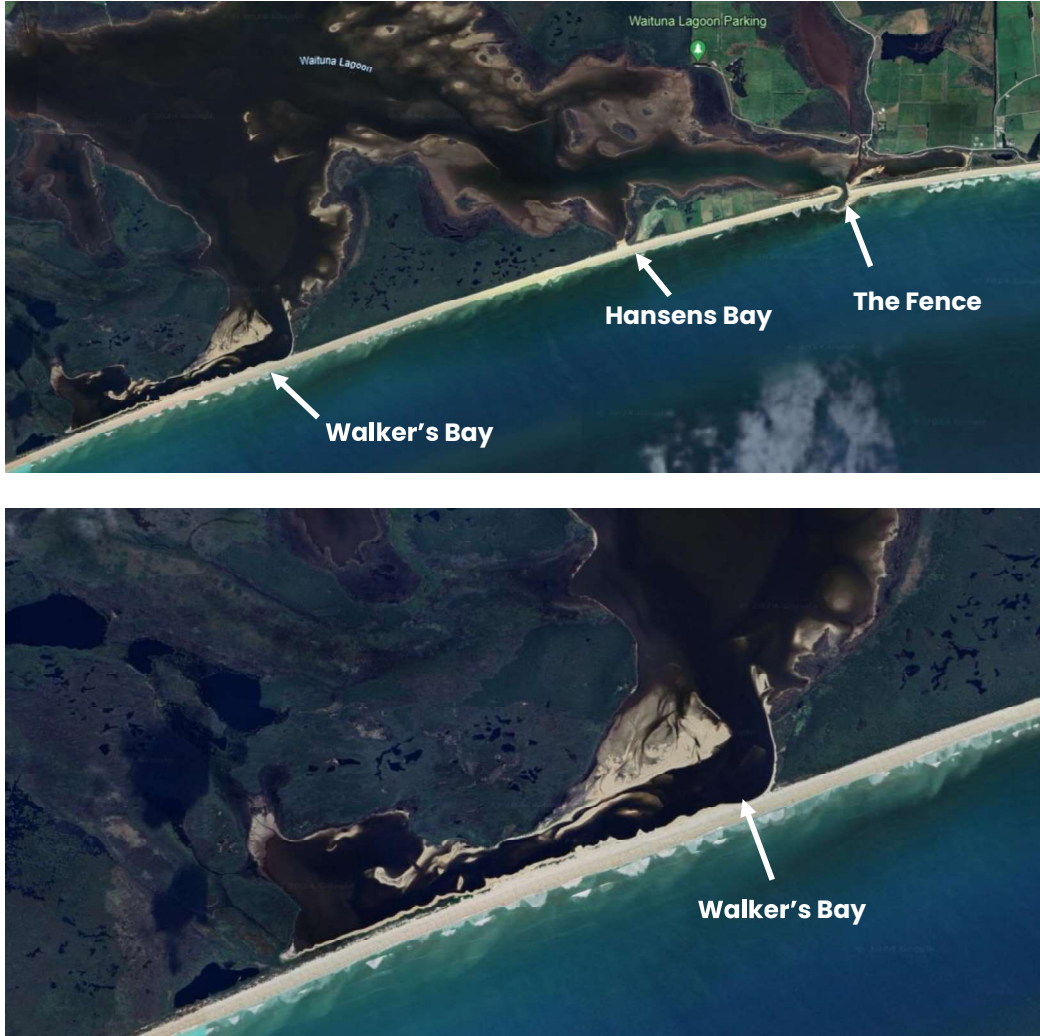


Figure 16: Aerial imagery of Walker's Bay opening location, and The Fence emergency opening location (Google Earth, imagery dated 13.02.2024)

The shape and depth of Walker's Bay has been largely modified by the openings of the bar, including recent openings. Two channels join and have a pronounced 'S' shape toward the bar. A series of over-wash fans have been created by the sea overtopping the berm during high tides and storm events due to the lower barrier height in this area.

Due to previous openings, there is little comparative vegetation cover.



*Figure 17: Aerial image of Walker's Bay*

## 6 Cultural Significance

The Cultural Values Report, prepared by Te Ao Marama Inc. for Te Rūnanga o Awarua, is attached at **Appendix H**. The purpose of the report is to provide information about Awarua Rūnanga's values and connections to Waituna Lagoon.

The report sets out that Ngāi Tahu ki Murihiku have a long association with Waipārera, the correct name for Waituna Lagoon, with tūpuna utilising the area for the abundance of mahinga kai and resources. The name Waipārera means the water body of the grey duck, which was found in great quantity and gathered by mana whenua. Despite the change in relationship with the landscape over time, the report reiterates that this has not affected mana whenua connection and obligations as

kaitiaki of the wai and whenua.

## 6.1 Historical Association

Ngāi Tahu has a long association with Waipārera. The Cultural Values Report sets out that:

*“To tūpuna, Waipārera was, and still is, a major food basket utilised by nohoanga and permanent settlements located in the immediate and distant vicinity of the wetlands for its wide variety of resources and mahinga kai. Ngāi Tahu had and still have an intimate knowledge of the resources available to them and utilised this knowledge to develop a seasonal cycle of harvesting of mahinga kai. The wetlands are home to many taonga species and are important kōhanga grounds for many indigenous fish species, including, but not limited to, giant and banded kōkopu, varieties of flatfish, tuna, kanakana, inaka, waikākahi and waikōura. Around and within the fringes of Waipārera other taonga species include several breeds of ducks, gulls, spoonbill, kōtuku, oystercatcher, dotterels, terns, and fernbirds. Harakeke, raupō, mānuka, tōtara and tōtara bark, and pingao were also regularly harvested cultural materials. Paru or black mud was particularly sought after for dyeing textiles.*

*The western end where the lagoon breaks out to the sea is known as Kāpuna-wai. Waituna creek and Waihao creek (common name is Currans creek) both flow into Waipārera and are both named after tuna. The wahi ingoa reinforce the value and importance of Waipārera to mana whenua still to this day and reflect the availability of mahinga kai. Ara Tawhito (traditional trails) were utilised by tūpuna to navigate to and around Waipārera, these trails linked settlements to each other and to the resources of Waipārera.*

*Wahi tapu and wahi taonga are found along the shores of Waipārera due to the many years of occupation and use. There have been some archaeological sites recorded in recent times, with the items found mostly associated with collecting and cooking mahinga kai. Tūpuna had considerable knowledge of whakapapa, traditional trails and tauranga waka, places for gathering kai and other taonga, ways in which to use the resources of Waipārera, the relationship of people with the lake and their dependence on it, and tikanga for the proper and sustainable utilisation of resources. Although the area is not utilised the same as it once was*

*for tūpuna, these values remain important to Ngāi Tahu today”.*

## 6.2 Contemporary Association

The Cultural Values Report sets out that Waipārera is, and will always be, considered taonga to Ngāi Tahu ki Murihiku, and emphasises the importance of reconnecting tangata whenua to place in contemporary times.

In 2021, Awarua Rūnanga, through its Te Wai Pārera Trust, strategically purchased a 404-hectare sheep and beef farm in the catchment. The purchasing and retiring of some of the farmland affected by inundation at higher lagoon levels accommodates higher lagoon levels, with the aim of maintaining and enhancing a broad range ecological and cultural values.

The report also sets out that a vision of Whakamana Te Waituna Trust is to re-establish Awarua Rūnanga connection and role as Kaitiaki:

*“This purchase has established new areas of land for Awarua Rūnanga and Ngāi Tahu whānau to access the area for mahinga kai, educational and capacity building programmes within a Te Ao Māori frame. Kaupapa such as this enables kaitiakitanga and rangatiranga at place, while supporting and uplifting the traditional relationship that Ngāi Tahu has with their ancestral lagoon”.*

## 6.3 Te Tiriti o Waitangi and Statutory Acknowledgement

The cultural significance of the area is recognised under a Statutory Acknowledgement within the Ngāi Tahu Claims Settlement Act 1998. Under Section 206 and Schedule 73, the Crown acknowledges Te Rūnanga o Ngāi Tahu's statement of Ngāi Tahu's cultural, spiritual, historic, and traditional association to Waituna. The Statutory Acknowledgement is provided in full in **Appendix A**.

The statement of association describes how Waituna was a major food basket, and the history of occupation and use of the area, evidenced by wāhi tapu and wāhi taonga all along its shores. The statement of association ends with a description of the importance of the mauri of the lagoon to Ngāi Tahu Whānui:

*“The mauri of Waituna represents the essence that binds the physical and spiritual elements of all things together, generating and upholding all life. All elements of the natural environment possess a life force, and all forms of life are related. Mauri is a critical element of the spiritual relationship of Ngāi Tahu Whānui with the area”.*

## 6.4 Cultural Values

The following values are identified in the Cultural Values Report as key to mana whenua and their connection to Waipārera:

**1. Kaitiakitanga** – *the exercise of guardianship and stewardship by tangata whenua to continue to protect cultural associations and values of an area and resources.*

**2. Mahinga kai** – *is about mahi ngā kai, to work the food and is about places and ways of gathering resources. It is central to Ngāi Tahu wellbeing and identity.*

**3. Wai** – *water is a taonga and it is the responsibility of tangata whenua to ensure that this taonga is available for future generations in as good as, if not better, quality.*

**4. Mauri** – *defined as life force or essence, is a central component of the Māori perspective on the environment and represents the essence that binds the physical and spiritual elements of all things together, generating and upholding all life”.*

The report acknowledges that although many of these values have been diminished for mana whenua over time, this does not diminish them in their entirety. The report sets out that they can be given mana again, and to restore the mauri of Waipārera the report recommends:

- *“Cultural frameworks, values, rights and interests and the environment are inextricably intertwined.*
- *Awarua Rūnanga should be enabled and supported to exercise kaitiakitanga and rangatiratanga over Waipārera and be actively involved in the restoration*

*and enhancement of Waipārera.*

- *Kaupapa Māori monitoring should be undertaken by and for Awarua Rūnanga throughout Waipārera and feeding waterbodies to ascertain a baseline for cultural health and then continue to do so to monitor the efficacy of any implemented measures.*
- *Cultural values, rights, interests and uses should be recognised and provided for to reconnect mana whenua to the area.*
- *It is necessary for an opening regime to prioritise the health of Waipārera and the taonga species that rely on it”.*

## 7 History of Lagoons Openings

### 7.1 Historical Opening Regime

The lagoon levels have been artificially managed over the last 100 years in order to lower the lagoon for drainage purposes on private farmland in the lower catchment. More recently, in addition to facilitating land drainage, there has been one instance where this has been required to flush accumulated sediment and manage water quality to protect the ecological health of the lagoon from algal blooms.

#### 7.1.1 1900s

Since the early 1900s the lagoon has been mechanically opened to the sea, initially to facilitate the trout fishery and subsequently to drain adjacent farmland. The lagoon closes again naturally when the right sea and wind conditions allow, which means it can remain open for prolonged periods (more than a year) or close quickly (in 1-2 months).

Land development within the catchment has included drainage of wetland areas; clearance of indigenous vegetation; and land use intensification since the 1950s when the main tributaries were straightened, and Government schemes cleared and developed land and encouraged other people to do so.

Since 1969 the LWCA has overseen the organising of lagoon openings for farm



drainage on behalf of local farmers with the permission of the then Southland Catchment Board. Initially the elected committee consisted of six landowners, plus one co-opted from the Acclimatisation Society. Subsidies towards the costs of lagoon openings were provided by the Acclimatisation Society and the Catchment Board.

### **7.1.2 1990's - 2014**

With the introduction of the RMA in 1991 resource consent was necessary for the activity of opening the lagoon. Up until 2017, the lagoon was generally opened when the water level reached 2mASL, in accordance with associated resource consent approved in 1999 (Permit 97283, **Appendix L**). This management regime was focused on farm drainage and did not take into account the ecological health of the lagoon.

In 2011 the lagoon was at risk of deteriorating into a poor ecological state because the macrophyte population had dropped to alarmingly low levels and algae blooms were becoming more frequent. Macrophytes are a foundational species in the lagoon ecosystem, regulating water quality and protecting the overall health of the ecosystem. If macrophytes drop to low levels, there is a risk that algae species will dominate affecting the whole ecosystems and making it significantly more difficult to restore.

Because of this, the consent was amended to also enable lagoon openings in the event of algae blooms or when certain water quality triggers were reached.

In response to the lagoon's deteriorating health, agencies came together to form the Waituna Partners Group in order to better coordinate their work and interests in the lagoon and catchment at an operational level. The Partners Group included Environment Southland, DOC, Awarua Rūnanga and Southland District Council, with linkages to DairyNZ, Fonterra, LWCA, the Waituna Recreational Users, and the Landcare Group.

### **7.1.3 2015-2017 Assessments and the Short-Term Consent**

At this time, the Waituna Partners Group recognised the need to find a long-term solution to give landowners certainty over lagoon levels while also ensuring the health of the lagoon was protected. A number of options were investigated to resolve this issue, including engineering solutions such as overflow canals to the Mataura River and installing gates at the opening site to ensure the lagoon could be closed at the

appropriate time, through to purchasing adjacent land affected by high water levels.

Through a process of recognising the range of different values the wider community held in Waituna, the Partners Group settled on land purchase as the most viable solution to resolving some of the key issues between agriculture productivity and protecting lagoon health.

To determine how much land would need to be purchased, the Partners Group commissioned a report from the Science Advisory Group on the optimal water level range to protect lagoon health. The Science Advisory Group recommended that 2.5mASL is the maximum water height the lagoon should reach if it was being managed for ecological health reasons rather than for land drainage.

NIWA was also engaged in 2016 to model and investigate the extent of land affected by high lagoon levels so options for the best future use of this land could be evaluated. The NIWA Inundation Study was completed in 2017 (**Appendix M**).

In 2017 a five-year consent to open Waituna Lagoon was granted to Chairman Ewen Pirie on behalf of the LWCA. The application was limited notified, several submissions were received, and through extensive pre-hearing negotiations prior to its approval between 2015 and 2017, a short-term consent was granted as an interim measure. This was to allow the activity to continue, while a longer-term consent application, to comprehensively address openings for lagoon health issues, was developed. As a result of this agreement, the affected parties who submitted to the application (DOC, Awarua Rūnanga, Fish and Game, Forest and Bird) withdrew their submissions in opposition.

The short-term consent (Permit AUTH-20146407, **Appendix L**) had a number of new and updated conditions:

- Different opening conditions depending on the time of year (2m in winter and a higher opening threshold of 2.2m in spring/summer), and related to aquatic plant health, intensity of rainfall and the number of openings in the past year;
- Updated conditions to enable opening in event of poor water quality;
- Monitoring requirements; and
- A change in the location of where the lagoon could be opened, to enable openings at Hansen's Bay as well as Walker's Bay, as it was thought by some that opening's at Hansens bay may close faster.



## 7.2 2018 – Land Purchases and Whakamana Te Waituna Charitable Trust

In 2018 the Waituna Partners Group successfully gained funding from the Ministry for the Environment's Freshwater Improvement Fund for a catchment-wide project that included interventions to enable the lagoon levels to be managed for ecological and cultural values. To govern this programme of work, the Whakamana te Waituna Charitable Trust (the '**Trust**') was formed in February 2018.

The Trust includes, Environment Southland, Awarua Rūnanga, Southland District Council, Fonterra, Ngāi Tahu as trustees, and DOC as an Advisor.

Since 2018, the Trust has facilitated significant land purchases of the majority of the surrounding private land that is inundated or drainage impeded at higher lagoon water levels. The 2017 Science Advisory Group report that determined 2.5mASL to be the maximum level the lagoon should reach to support ecological values, and this level was used to guide the Waituna Partners' Group application for Ministry for the Environment funding and subsequent purchase of land.

In 2021 the Trust also commissioned the Science Advisory Group to recommend a set of resource consent conditions to support ecological and cultural health (Technical Assessment – Review of conditions for opening Waituna Lagoon, 2021). That report recommended a 2.5mASL water level threshold and provisions to open the lagoon in the event of poor water quality or every two years to support fish passage.

## 7.3 2021 LWCA Application

In 2021 The LWCA lodged an application to renew their existing resource consent to continue to periodically open the lagoon on most of the same terms as the previous 5 year consent, including the same threshold levels, and for a 20-year term. The application was inconsistent with the Science Advisory Group recommendation of a 2.5mASL opening level. The LWCA application was publicly notified.

A number of submissions were received in support from a number of landowners in the catchment and from recreational users. The same parties that opposed the 2017 consent (including DOC and Awarua Rūnanga) again submitted in opposition, along

with several others. DOC and Awarua Rūnanga's position opposed the consent by LWCA and sought the regime as recommended in 2021 by the Science Advisory Group.

Also in 2021, and with support of the Whakamana Te Waituna Trust, DOC and Awarua Rūnanga submitted a separate application, with the primary objective to shift the purpose of lagoon management from drainage to supporting ecological and cultural health, in accordance with the regime recommended by the Science Advisory Group.

As the LWCA application had continuance rights until such time as a decision is made under Section 124 the RMA, processing of the DOC and Awarua Rūnanga application was suspended upon lodgement with Environment Southland.

The LWCA application proceeded to a pre-hearing meeting which was not successful in bringing the parties closer together in their positions. Further confidential facilitated engagement arranged by DOC and Awarua Rūnanga was then pursued with LWCA but only partial agreement was reached. LWCA subsequently withdrew their application in early 2023, following further discussions with Environment Southland. Environment Southland then joined DOC and Awarua Rūnanga as a partner to this application.

Although full agreement was not reached, discussions between DOC, Awarua Rūnanga and LWCA were beneficial. There was general agreement that openings may also be needed for fish passage depending on monitoring of lagoon status, and that LWCA would continue to have input via a representative on the Science Advisory Group, and be consulted regarding openings.

Following discussions, the Science Advisory Group undertook further work to understand the effects of a staged transition of levels to 2.5mASL over a 15-year period to give landowners more time to adjust to the new regime.

The Science Advisory Group's ecological and hydrological work on this transition confirmed that although it is not optimal, this would still support a more ecologically optimal regime over time while also balancing the risks to lagoon health.

This is the approach that is proposed in this new application.

## 7.4 Proposed Application

In mid-2023 Environment Southland joined Awarua Rūnanga and DOC as partners to the application.

As the relevant regional plan provisions have changed since 2021, and the opening regime sought in the consent now includes a transitional component, the 2021 Awarua/ DOC application has been withdrawn and is replaced by this application.

## 8 Consultation

### 8.1 Public and Community Consultation

A consultation strategy was prepared to inform engagement with parties likely to have an interest in the application (**Appendix N**), with the scope and purpose of consultation to:

- Build on the engagement process that has already been undertaken with LWCA on their previous consent application, by targeting consultation to feedback on the proposed consent conditions, and particularly related to the Science Advisory Group and stakeholder consultation conditions for lagoon opening. The intention being to provide the opportunity to better target the conditions to the concerns the LWCA have regarding how the consent will be exercised. Constructive discussions have been ongoing with LWCA up to June 2024.
- Engage with other parties who are known to have an interest in the application. Consultation with these parties was broader – where the focus was to introduce the application and its purpose, and seek feedback targeted to their interest in the catchment. The purpose was to ensure that parties who were not affiliated with the LWCA and who had an interest had the opportunity to have their say on the application before it was formally notified, and the application considers and responds to any concerns that may not yet be known.

A webpage was created on the Environment Southland website to provide information to those with an interest in the application, and targeted consultation with parties in accordance with the above scope was then advanced.

A summary of this engagement and the associated outcome of engagement in terms of how it has informed the application is provided. Engagement letters sent to parties, and written feedback received from parties consulted is also provided in **Appendix N**. It is noted that much of the feedback received was verbal, and key themes are summarised further below:

- **Te Rūnunga o Ngāi Tahu:** Ngāi Tahu have been actively engaged in the development of the application and a letter of support is attached.
- **LWCA:** A community meeting and two hui were held with LWCA over late 2023 and 2024. Earlier discussions focussed on the lagoon levels and thresholds for opening, opening protocols and consultation, and the scientific and evidential basis for the application. Later discussions focussed on LWCA's suggestion of one or more short term consents as an alternative approach, and their preferred opening levels of 2.3mASL.
- Opening levels have been discussed at length with LWCA since 2021, and the proposed transitional regime adopts some of the above request. The application provides winter openings at 2.3mASL over the first 5 years of the consent, whilst protecting the lagoon from spring/summer openings with a level of 2.5mASL.
- While short-term consents have been discounted as an alternative approach for long term management, a short-term consent as an addition to this application does have merit as a safe-guard for the lagoon while this long term consent is being processed and heard. As outlined in Section 3.1 above, a short-term consent will be prepared and lodged in the coming weeks to provide for interim openings if necessary for fish passage and for poor water quality. It is noted however, that lagoon openings for land drainage purposes are prohibited and it is not the co-applicants' intention to include land drainage as part of this short-term application.
- **Southland Conservation Board:** An online hui was held with the Southland Conservation Board in February 2024, and a subsequent letter in support from the Southland Conservation Board was received and is attached.
- **Southland Fish and Game:** An outline of the application was sent to Southland Fish and Game in January 2024 and an online hui was held in February 2024.

Southland Fish and Game's primary feedback sought no transition, with the optimal levels of the opening regime to be applied at the outset.

- **Forest and Bird:** An outline of the application was sent to Forest and Bird in January 2024 and an online hui was held in February 2024. Forest and Bird's feedback was similar to that of Fish and Game.
- **Fonterra:** An outline of the application was sent to Federated Farmers in January 2024 and an online hui was held in February 2024. Fonterra's feedback related to ensuring the community was kept informed of the application and requested a copy of the application was provided to them on lodgement.
- **Southland District Council:** An outline of the application was sent in January 2024.
- **Te Wai Pārerā Trust:** An outline of the application was sent to in January 2024. A letter of support is attached.
- **Federated Farmers:** An outline of the application was sent in January 2024.
- **Other individuals and groups:** landowners in the catchment and other groups with an interest in the lagoon are to be informed by letter of the application, the opening regime proposed, and that the application will be publicly notified should they wish to submit to have their say.

As set out previously, given the level of interest in Waituna Lagoon and this resource consent application, public notification has been requested to provide anyone with an interest to have their say and for their submission to be heard.

The co-applicants will seek to work with the Consent Authority post lodgement to identify a list of parties to be directly notified. Whilst this is the role of the Consent Authority, this is anticipated to include properties that are partially inundated or partially drainage impeded at 2.5mASL, and those organisations that the co-applicants are aware have an interest in the application.

This also provides the opportunity for issues to be identified and narrowed through a pre-hearing process (if the decision makers direct this).

## 8.2 Marine and Coastal Area (Takutai Moana) Act 2011

Parts of the Natural and Built Environment Act 2023 came into force on 23 August 2023, and amended Section 88 of the Resource Management Act 1991. Section 88(7) of the RMA outlines that if a person applies for a resource consent relating to an area where an applicant group seeks customary marine title, s62A of the Marine and Coastal Area (Takutai Moana) Act 2011 (**MACA**) must be complied with. This requires that if an activity is planned in an area where a Customary Marine Title application is pending, the party seeking resource consent must first notify and seek the views from the group who has submitted the Customary Marine Title application, and record their views.

As Te Rūnanga o Ngāi Tahu have applied for Customary Marine Title of all coastal areas in Ngāi Tahu takiwā under the MACA, Ngāi Tahu have been notified of the application and their views have been provided. This is attached at **Appendix N**.

The response of Te Rūnanga o Ngāi Tahu supports the role of Awarua Rūnanga as co-applicants and the applicants intent to restore the customary relationship between mana whenua and taonga species.

# 9 Assessment of Effects

Clause 6 of Schedule 4 of the RMA outlines the information required in an assessment of effects. The following actual and potential effects of this proposal have been identified and are assessed in the subsequent sections below:

- Assessment of alternatives,
- Positive effects,
- Effects on wai,
- Effects on ecological values,
- Effects on cultural values,
- Effects on archaeology
- Landscape and natural character,
- Public access to the coast,

- Recreational values, and
- Effects on surrounding land use.

## 9.1 Permitted Baseline and Receiving Environment

### 9.1.1 Permitted Baseline

Under section 104(2) of the RMA, the Council may disregard an adverse effect of an activity on the environment if the district or regional plan or a national environmental standard permits an activity with that effect. There is no permitted baseline directly relevant to the application.

### 9.1.2 Receiving Environment

The receiving environment is the existing and reasonably foreseeable environment upon which a proposed activity might have effects. This includes the future state of the environment as it might be modified by permitted activities and as modified by implementing resource consents that have been granted where those consents are likely to be implemented.

There is currently no resource consent in place for an opening regime for the lagoon, and lagoon opening cannot be undertaken as a permitted activity.

For the avoidance of doubt, the environment as modified by the previous consented opening regime, does not form the receiving environment. The previous consents for opening activities have expired so cannot be considered to be part of the receiving environment or existing environment for the purposes of determining the application.

Therefore, the receiving environment upon which effects must be assessed is the lagoon as is, where lagoon levels naturally fluctuate and where the water quality varies, based on climate, meteorological, and land use factors.

## 9.2 Assessment of Alternatives

Clause 6(1) of Schedule 4 of the RMA, requires that if it is likely that the activity will result in any significant adverse effect on the environment, a description of any possible alternative locations or methods for undertaking the activity must be

included in the AEE.

No significant adverse effects are likely or reasonably anticipated by the exercise of this consent.

However, in developing the application, alternative opening scenarios were modelled to understand what opening scenario would be the most appropriate to maintain and restore the ecological health and cultural values of the lagoon.

It is also noted that while a 'do nothing' approach where the lagoon is not opened at all, may achieve some ecological and cultural benefits there is still a need to open the lagoon to provide fish passage and manage water quality in certain circumstances. A 'do nothing' approach may also result in adverse effects in relation to water quality/algal blooms, further impede land drainage, and would rely on emergency openings under s330 RMA to manage adverse effects.

### **Modelled Scenarios to Identify Preferred Approach**

As set out in Section 7 above regarding the history of lagoon openings, the Science Advisory Group Review of the 2017 short term consent identified that the 2.0mASL/2.2mASL lagoon opening threshold levels did not prevent spring-summer opening events, and these events corresponded with poor health of submerged macrophytes.

The Science Advisory Group then investigated lagoon opening levels that support ecosystem health to recommend a maximum level for opening and to address poor water quality. The Science Advisory Group review concluded that the health of the lagoon would benefit from a closed period of 2 consecutive years and recommended 2.5mASL as a maximum water level to limit the frequency of opening events that impact on ecosystem health, while providing for fish passage and managing water quality events.

A summary of the assessment is provided below:

<b>Value/Driver</b>	<b>Maximum level (mASL)</b>	<b>Details</b>
Preventing spring/summer openings during 'years of concern' to enable macrophyte regeneration.	2.5	Summer openings stress macrophytes and favour macroalgae. <i>Ruppia</i> benefits from closure and low salinity during key growth stage (spring/summer).



Value/Driver	Maximum level (mASL)	Details
Allowing the timing of opening events to benefit fish spawning and migration where possible.	na	Issues for fish include timing of events and the maximum water level.
Managing a fluctuating water regime to support fringing wetlands – e.g., Oioi, turf plants.	2.5	LiDAR elevation models indicate that most wetland vegetation will be inundated when lagoon levels are ~2.3m. Irregular inundation at higher levels is positive for these systems.
Providing a mechanism for excessive nutrients to be flushed to the ocean.	>1.8	Flushing of nutrients can occur above 1.8m when there is sufficient hydraulic gradient. The higher the water level, the better the flushing when opened.
Providing a mechanism to disrupt a prolonged algal bloom.	>1.5	Ecological guidelines suggested that if needed an opening could occur at 1.5m to disrupt a prolonged algal bloom. A minimum height is needed for an effective opening, not a maximum.
Ensuring maximum water levels do not cause negative effects on aquatic/wetland plants (e.g., light limitation).	2.0*	Light limitation is likely to have an impact on submerged vegetation in deeper parts of the lagoon. Prolonged inundation (>20 days per annum) at higher water levels (e.g., >2.3m) may limit productivity.
<b>Recommendation</b>	<b>2.5mASL</b>	

\*Note: Because the gravel barrier is leaky – such prolonged events may be unlikely. Unknown potential positive effect of raised level on turbidity and light penetration.

Table 4: Summary of threshold level considerations (Table 5, Science Advisory Report)

The recommended 2.5mASL maximum opening threshold is based on the following Science Advisory Group assumptions:

- *“the opening threshold level to 2.5m will reduce the frequency of opening events,*
- *the duration of high-water levels will be limited (e.g., less than 20 days above 2.2m), and therefore periods of light limitation on submerged plants and inundation of ex-farmed soils will be minimal*
- *that opening events will still occur to support fish passage and ecological and cultural values that benefit from open lagoon conditions”.*

To test these assumptions, a hydrological model of Waituna Lagoon was applied to predict the number and duration of water level events exceeding specified levels. Six opening scenarios were assessed under the model.

The specific scenarios assessed were:

- *“Previous consent: open when level is at 2.0m for the period May – 19 September, and open when level is at 2.2m for the period 20 September – 30 April*
- *Scenario 1: open when level is at 2.2m or above for 7 consecutive days*
- *Scenario A: open when level is at 2.5m or above for 7 consecutive days*
- *Scenario B: open when level is 2.5m or above for 7 consecutive days or, if no opening occurred in the previous year, open if the level exceeds 1.5 m (for fish passage)*
- *Scenario C: open when level is 2.5m or above for 7 consecutive days or, if no opening occurred in the previous 2 years, open if the level exceeds 1.5 m (for fish passage)*
- *Scenario D: open when level is 2.5m for 1 day for the period 1 September to 30 April, and open when level is 2.3m for 7 consecutive days for the period of 1 May to 30 August or, if no opening occurred in the previous 2 years, open if the level exceeds 2m (for fish passage)”.*

A summary of the model outputs is provided in the Science Advisory Report, and in the table below:

Summary statistics	Short term Consent	Scenario				
		1	A	B	C	D
Average Openings per Year	1.07	0.85	0.42	0.79	0.55	0.67
Average Num. Openings 1 Sep to 30 April	0.24	0.33	0.14	0.25	0.17	0.15
Annual average days above 2.0m	10.21	23.2	55.48	36.42	49.16	36.23
Annual average total events of 2.0m	1.31	1.79	2.11	1.59	1.93	1.93
Average duration of events above 2.0m (days)	8.9	21.41	53.37	34.84	47.23	18.75
Annual average days above 2.2m	2.01	4.61	24.18	15.11	21.24	11.72
Annual average total events of 2.2m	0.62	0.95	1.59	1.04	1.37	1.23
Average duration of events above 2.2m (days)	1.39	3.66	22.6	14.06	19.88	9.54

Summary statistics	Short term Consent	Scenario				
		1	A	B	C	D
Annual average days above 2.4m	0.38	0.69	5.78	4.03	4.98	1.66
Annual average total events of 2.4m	0.1	0.18	0.78	0.54	0.67	0.44
Average duration of events above 2.4m (days)	0.28	0.51	5	3.49	4.3	3.75

*Table 5: Opening scenarios and probabilities of the lagoon opening and for how long based on historic data (Table 6, Science Advisory Report)*

The summary illustrates that lagoon openings are likely to occur about once every year, being 1.07 openings/year under the 2017 short term consent scenario, with a slightly lower frequency for openings under the 2.2m/entire year scenario of 0.85 openings/year. Applying a 2.5mASL scenario results in lagoon openings decreasing substantially in frequency to as low as 0.42 openings/year depending on the scenario.

In considering the other values outlined in the subsequent sections of this AEE, Scenario C with an average of 0.55 openings/year was identified in the Science Advisory Report as the most appropriate scenario for long term management. This would see the lagoon opened when it is 2.5mASL or above for 7 consecutive days or, if no opening occurred in the previous 2 years, it is opened for fish passage.

It is noted that the hydrological model developed by Chris Jenkins (Team Leader Hydrological Response, Environment Southland) uses a ~50 year hydrological record to predict water levels of the lagoon under different opening scenarios. The model was last updated and validated in 2016. The figure below illustrates the performance of the model from 2017-late 2023 and shows that from time to time the model underpredicts water levels (e.g. beginning of 2022) or over-predicts (e.g. 2017). This variation is expected from a complex hydrological model and on the whole, the model performs well.

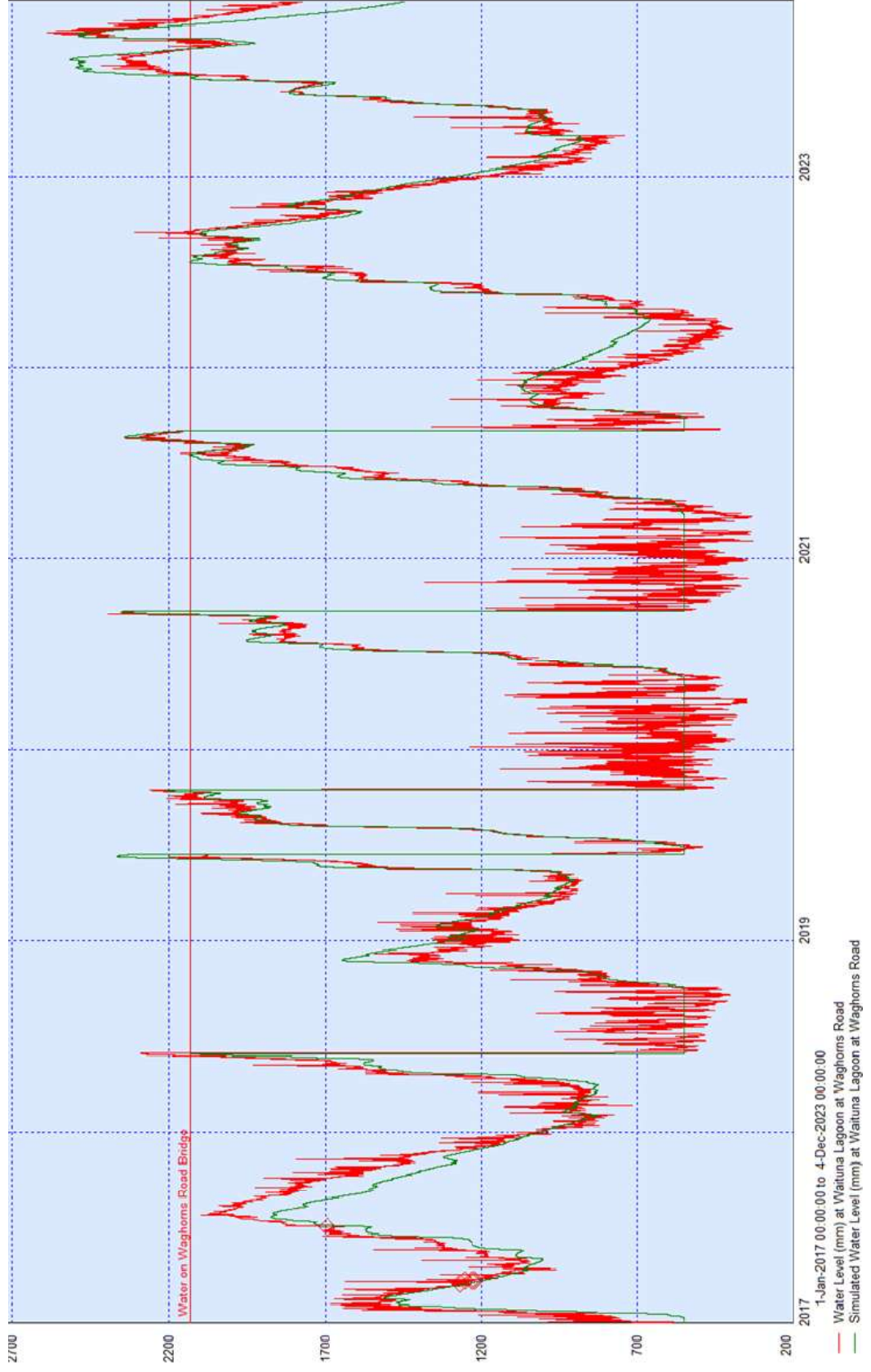


Figure 18: Hydrological model predictions (green line) and real water level data (redline) over the period 2017–Dec 2023.

### Multi Value Approach

In further assessing if Scenario C was the most appropriate opening regime for lagoon health and cultural values, the Science Advisory Group undertook an integrated assessment that specifically focused on effects of lagoon opening on submerged macrophytes, fish and taonga species, and water quality.

The integrated assessment of ecological and cultural values also considered potential effects of an opening regime on other ecological and cultural values using a multi value assessment approach, summarised in the table below:

Value	Impact of previous consent conditions	Predicted impact of recommended conditions (Scenario C)	Predicted change in value due to proposed conditions
<b>Taonga species</b>	Does not specifically provide for fish passage for taonga species. Opening events may or may not align with key migratory periods	Specific provisions for fish migration. Increased focus on monitoring	Improvement/Neutral
<b>Cultural significance</b>	Frequent opening events (>1x/year) not aligned with restoring ecosystem to more natural regime	Conditions specifically target a transition to a more natural state (longer freshwater phase)	Improvement
<b>Water quality</b>	Included provision for emergency opening to disrupt phytoplankton bloom	Conditions for emergency opening retained in case of poor water quality. Lagoon flushing will still occur (given conditions for fish passage)	Neutral
<b>Submerged macrophytes</b>	Spring/summer openings led to regular decline in abundance of submerged macrophytes	Conditions specifically target improved management of macrophytes due to higher (2.5m) opening threshold	Improvement
<b>Fish and invertebrate populations</b>	Does not specifically provide for fish passage. Opening events may or may not align with key migratory periods. Kōura and kākahi habitat may be limited with lower lagoon levels and more frequent saline conditions.	Specific provisions for fish migration. Increased focus on monitoring Kōura and kākahi may benefit from increased habitat from higher lagoon levels and less frequent openings and lower salinity	Improvement
<b>Bird populations</b>	Conditions provide for both open and closed lagoon conditions that support broad range of bird species.	Conditions provide for both open and closed lagoon conditions that support broad range of bird species. Longer freshwater phase will benefit threatened species (bittern) and	Neutral

Value	Impact of previous consent conditions	Predicted impact of recommended conditions (Scenario C)	Predicted change in value due to proposed conditions
		waterfowl (incl. ducks). A reduction in the estuarine phase is not considered to have a significant impact on the bird species that favour an open lagoon due to the availability of other estuarine habitats in the area (e.g., New River estuary, Awarua Bay, Fortrose estuary)	
<b>Fringing Wetlands</b>	Lack of high (>2.2m) water levels promoted more exotic weed species. Frequent draining of fringing wetlands.	Conditions provide for greater water level fluctuation to support fringing native plant communities, e.g. oioi, turf plants. Avoids prolonged periods of lower water levels that dewater fringing wetlands. .	Improvement

Table 6: Multi-value assessment of the predicted impact of recommended conditions (Table 8, Science Advisory Report)

A more detailed assessment of effects as they relate to the various values of Waituna Lagoon, informed by this analysis is provided in the subsequent sections below.

### 9.3 Positive Effects

The application is for a new opening regime which seeks to maintain and restore the ecological health and cultural values of the lagoon ecosystem, in accordance with Te Mana o te Wai, and the purpose of wetland restoration and maintenance under the NPSFM. The opening regime seeks to accord with the region-wide objectives of the SWLP to:

- sustainably manage land, water and associated ecosystems as integrated natural resources, recognising the connectivity between water, land and coast; and
- ensure the mauri of water provides for te hauora o te taiao, te hauora o te wai, and te hauora o te tangata, the mauri and health of the environment, water and people.

Under section 104(1)(ab) of the RMA, the Council must have regard to any measure proposed or agreed to by the applicant for the purpose of ensuring positive effects on the environment to offset or compensate for any adverse effects on the environment that will or may result from allowing the activity.

As the primary purpose of the application relates to maintenance and restoration, the proposal is intended to result in primarily positive effects on the environment. This includes:

- Transitioning to a more ecologically optimal water level thresholds for opening – where the lagoon levels are able to function as naturally as possible, within the constraints of contemporary nutrient loads, but where the lagoon is lowered when the levels become too high and may impact the availability of light for macrophytes;
- The provision of diadromous fish passage to support biodiversity in the lagoon for both indigenous fish species, and the recreational trout fishery;
- The ability to open the lagoon where the water quality indicators identify that the lagoon may be at risk from a poor water quality event than could adversely affect lagoon and ecosystem health;
- An improved relationship of Awarua Rūnanga and their culture and traditions with Waipārera, and seeks to contribute to restoring the mauri of Waipārera;
- Transparency for catchment landowners regarding the Science Advisory Group recommendations on when the lagoon is opened, as a suitable qualified representative will be invited to represent LWCA; and
- Improve communication with the community and those with an interest on the lagoon via a Communication Management Plan. This will provide better certainty to the community and catchment landowners as to how lagoon openings will be administered in the future, and how the community will be informed when these occur.

These positive effects as assessed further below where relevant.

## 9.4 Effects on Wai

### 9.4.1 Freshwater

Water quality in the lagoon is primarily impacted by high contaminant loads from the catchment. As such, the proposed opening regime does not attempt to reduce these

inputs.

However, the proposed opening regime does enable the lagoon to be opened should water quality and ecosystem indicators reach levels of concern, while supporting closed conditions that promote a restoration gradually towards a more natural hydrological regime, within the constraint of contemporary catchment inputs. The proposed openings will therefore result in positive effects on lagoon water quality.

The proposed ecosystem health and water quality indicators in Appendix 1 to the proposed conditions specifically enable opening of the lagoon for ecological and water quality reasons on the recommendations of the Science Advisory Group. For algal blooms, opening the lagoon to the sea disrupts the bloom and decreases chl-a concentrations, to improve water quality and prevent further water quality degradation.

Monitoring against these indicators will alert the Consent Holder and Science Advisory Group to poor water quality where the primary indicators reach warning indicator levels for one or more of chl-a, cyanobacteria, or bottom water dissolved oxygen concentration, or biosecurity incursion. If one or more of the critical indicator levels are exceeded, then the Science Advisory Group must consider if the lagoon should be opened and will make this recommendation to the Consent Holder.

Without such a framework in place, and as there is no current resource consent in place to open the lagoon under these circumstances, the only recourse available is to open the lagoon utilising emergency works and powers under s330 of the RMA. Given the existing contaminant inputs from the catchment, relying on the RMA emergency provisions is not an appropriate alternative as it can only be used in an event which requires immediate intervention<sup>2</sup> and openings may necessitate retrospective resource consents<sup>3</sup> which would be inefficient.

Recently when the lagoon remained closed for more than two years phytoplankton levels (chl-a) increased in mid-late 2023 leading to the algal bloom observed in December 2023. These data indicate prolonged closure of more than 2 years increases the risk of eutrophication, given the ongoing catchment inputs and nutrient

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<sup>2</sup> In accordance with s330(1)(d-f) of the RMA.

<sup>3</sup> Where the adverse effects of the activity continue in accordance with s330A(2).



recycling.

However, it should be recognised that had the proposed opening regime been in place this poor water quality event would not have eventuated as the lagoon could have been opened in September 2023 to promote fish passage.

Adverse effects on freshwater values from the proposed opening regime are therefore anticipated to be either neutral or positive dependant on the reasons for lagoon opening. Lagoon openings due to poor water quality will result in positive effects, and lagoon openings to protect macrophytes/macroalgae or for fish passage will have neutral effects.

#### **9.4.2 Coastal Water**

The proposed openings will result in the discharge of water from a coastal lagoon into the sea. This will cause a visibly discoloured plume initially as the lagoon is opened and drainage of lagoon water occurs.

This effect is temporary and once the lagoon level stabilises, fresh water from the Waituna catchment will flow through, mixing with coastal water, and discharge into Toetoes Bay through the opening. It may still cause a visible plume, but it should not persist beyond reasonable mixing and will dissipate once the lagoon naturally closes.

Adverse effects on coastal water quality are therefore considered to be temporary and no more than minor.

### **9.5 Effects on Ecological Values**

The Science Advisory Report outlines that, on balance, managing the lagoon at the higher levels proposed will support ecosystem recovery by promoting two consecutive growing seasons for submerged aquatic plants, enabling inundation of fringing wetlands and providing diversity of habitat for birds and fish, while enabling lagoon opening to promote fish passage and protect against poor water quality or events or biosecurity incursions.

The implications of applying a transitional approach over the first 15 years were examined in the Science Advisory Report. This is anticipated to result in more frequent openings per year (0.66) in years 1–5, compared to less frequent opening per year in

years 16–20 (0.55). The report recorded general agreement that the transition provides a positive step forward to enhance the ecosystem health of Waituna Lagoon, noting,

*“...that ecological and cultural values remain at risk and would benefit from immediate application of the long-term regime (Scenario C). Maintaining water quality and fish passage provisions remain important during the transition period”.*

In evaluating the short (1–5 years) and medium term (6–15 years) outcomes of the proposal against the receiving environment,

- The transitional levels at years 1–5, while not optimal for lagoon health, are closer to the lagoon closure targets – being 0.66 openings/year, compared to 0.55 openings/year;
- The provision for fish passage will have positive effects on fish and food web values; and
- The ability to open the lagoon for water quality reasons will protect ecological values by enabling opening when the water quality indicators identify that the lagoon may be at risk from an algal bloom.

The adverse effects on submerged macrophytes and macroalgae, and fish, invertebrates and avifauna, along with biosecurity risks, are considered further below.

### **9.5.1 Submerged Macrophytes and Macroalgae**

The *Ruppia*-dominated plant community is a key component of ecosystem health in the lagoon as outlined in Section 5.2. The macrophyte community supports the At-Risk- Naturally Uncommon *Ruppia megacarpa*, and a nationally rare, salinity-tolerant charophyte. *Ruppia megacarpa* and *R. polycarpa* are species which are sensitive to water level, salinity, and nutrient state, and the status of *Ruppia* provides an indication of the lagoon condition, which relates to the health of other lagoon species.

If submerged plant communities become too stressed, they can collapse, and the lagoon then enters a new, dirty water state, with high levels of resuspended sediment and development of macroalgal mats or phytoplankton blooms instead of plants.

In order to protect submerged macrophytes and macroalgae, the Science Advisory Report in Table 1 identify the aims of an opening regime as:

- *“prevent frequent spring/summer opening to enable macrophyte regeneration;*
- *at least two consecutive years of closed lagoon over the main vegetation growth period to enable Ruppia development/flowering;*
- *ensure maximum water levels do not exceed 2.5m (may cause negative effects on aquatic/wetland plants due to light limitation);*
- *provide a mechanism for excessive nutrients to be flushed to the ocean; and*
- *reduce the risk of high salinity during key Ruppia growing period”.*

Monitoring of the macrophyte/macroalgae targets over the last 15 years has demonstrated that more frequent lagoon openings, and particularly where the lagoon was opened during the spring/summer Ruppia growing period, have not achieved these targets. Following longer closed lagoon periods (including over spring/summer), most ecological targets were achieved in 2018 and 2019, and all ecological targets were achieved in 2023, nothing the lagoon remained under stress and was opened in early 2024 to disrupt an algal bloom (noting the Summer 2024 Vegetation Status Report released immediately prior to lodgement of this application (**Appendix J**), confirms the need for balancing the risk of prolonged closure with more frequent openings).

The Science Advisory Report noted that *“this reiterated the balance between promoting lagoon closure to restore the natural hydrological and ecological functioning of the ecosystem and managing poor water quality when closed conditions extend beyond to 2 or 2.5 years”.*

The Science Advisory Report evaluated the performance of past openings with the macrophyte/macroalgae targets, other lagoon values and the aims above, and recommends the opening regime proposed in this application.

The Science Advisory Report review of the previous short-term consent identified that the 2.0mASL/2.2mASL lagoon opening threshold levels did not prevent spring-summer lagoon opening, and these events corresponded with poor health of submerged

macrophytes.

Building on the 2021 work of the Science Advisory Group and the modelled scenarios outlined in Section 9.2 above the analysis identifies that spring/summer opening at 2.5mASL are likely to occur almost half as frequently as they did under the short-term consent (0.14 vs 0.24 openings/year). This would better support Ruppia development/flowering and macrophyte regeneration over the spring/summer period, whilst still enabling the lagoon to be opened due to light limitation effects on aquatic/wetland plants where levels exceed 2.5mASL.

The proposal is therefore considered to have positive effects on macrophytes and macroalgae. When necessary, it will mitigate adverse effects on macrophytes and macroalgae by enabling opening when the water quality indicators identify that the lagoon may be at risk from an algal bloom.

### **9.5.2 Fringing Wetland Vegetation**

The proposed opening regime provides for greater water level fluctuation compared to previous consents. Increased fluctuation of water levels better supports fringing native plant communities, which include oioi and turf plants, and reduces invasion of exotic weed species. It also avoids prolonged periods of lower water levels that dewater fringing wetlands.

Historically, Walker's Bay has experienced the greatest number of openings and due to these previous openings, there is a significant build-up of marine gravels at this location, and little vegetation cover compared to other areas along the Waituna bar. This is evidenced in the aerial imagery in Section 5.3 which illustrates the vegetation cover along the edge of the Waituna Lagoon and Bar.

The incidental removal of indigenous vegetation cover at this opening location is therefore likely to be minimal and significantly less than opening the lagoon in other locations along the Waituna Bar.

Adverse effects on riparian and coastal vegetation loss at the opening site is therefore considered be less than minor, and the increased fluctuation of water levels on fringing wetlands is likely to improve the condition of this environment.

### **9.5.3 Fish, Invertebrates, Avifauna**

## Indigenous Fish

The open status allows for the migration of diadromous fish species which require access to the sea to complete their life cycle, such as īnanga and kanakana/lamprey. While the closed status allows for more successful rearing of giant kokopu, in the lagoon and productive rearing habitat for tuna/eel.

The Science Advisory Report sets out that many of the fish species within the Waituna Lagoon catchment are migratory, and the timing of lagoon opening to the sea has substantial impacts on fish populations and the fish community, particularly for at-risk species. Kanakana/lamprey could potentially temporarily disappear from the catchment if the lagoon stayed closed for more than four years as three to four years is thought to be the period that juvenile kanakana/lamprey typically spend in freshwater before they migrate to the sea.

Not all fish species in the lagoon are migratory. Fish species such as giant kōkopu are thought to benefit from the conditions created by prolonged lagoon closures, especially during summer.

To support the migration of indigenous and taonga fish species, the Science Advisory Report considers the lifecycles of indigenous and taonga fish species in Waituna Lagoon, and the key months for upstream and downstream migration to identify when lagoon openings would benefit fish species and life-stages. This is summarised in the table below:

Common name	Upstream migration period	Peak upstream migration period	Downstream migration period
Shortfin eel (glass eel)	July-December	August-November	March-September
Longfin eel (glass eel)	August-January	September-December	February-July
Giant kōkopu	October-January	November	?
Banded kōkopu	August-January	September-November	March-July
Īnanga	May-December	August	March-September
Kanakana/lamprey	May-December	August-October	March-September
Common bully	December-April	December-April	September-January
Giant bully	December-April	December-April	September-December
Redfin bully	November-April	November-April	September-December

Common name	Upstream migration period	Peak upstream migration period	Downstream migration period
Common smelt	August-December	September-November	November-May
Black flounder	September-December	December-December	November-May

*Table 7. Downstream and upstream migration periods for native fish in the Waituna Catchment (Table 7, Science Advisory Report).*

This illustrates that in August–October, an open lagoon would support the migration and recruitment of a number of fish species. The report notes that enabling opening events to promote upstream migration of threatened and at-risk fish species, particularly the Nationally Vulnerable kanakana/lamprey, and īnanga as a primary food resource, is particularly important.

The modelled 2.5mASL scenarios that factored in fish passage opening were then analysed to determine the preferred approach. While lagoon opening every three years would have the least potential for spring/summer openings that adversely affect the Ruppia-dominated macrophyte community, the Science Advisory Report recommends a 2-yearly cycle to ensure life-cycles of important migratory fish and taonga species are protected, including īnanga and kanakana/lamprey, while minimising openings in spring/summer.

This would allow a 2-yearly pulse of īnanga to migrate into the lagoon and catchment to supply predators, with the August to October period also coincides with the upstream migration of adult kanakana/lamprey.

The Science Advisory Group therefore recommended that the consent provides for passage for diadromous fish species where the water level is able to facilitate an opening and during the period 1 April to 30 November, provided that,

- The lagoon has not been opened in the previous 24 months, or
- If the lagoon was opened during the past 24 months, where the timing of the open period did not support upstream migration of threatened or at-risk fish species, and
- The Technical Advisory Group has considered the lagoon water quality and ecosystem health indicators.

A condition to this effect is proposed, and on this basis the adverse effects on

indigenous fish will be positive as the frequency of opening provides an appropriate balance to protect by migratory and non-migratory species. Without opening for fish passage, this could result in the loss of threatened/at risk taonga species, which in the case of īnanga are also an important food resource for other species in the lagoon.

### **Avifauna**

The lagoon and wider Awarua wetland complex, form an important feeding area for more than 80 bird species including threatened species and trans-equatorial migrants. Under the proposed opening regime, water levels are estimated to be above 2.2mASL for approximately 21 days per year and will still provide for lower water levels during other times of the year for those bird species that prefer more shallow water.

While higher water levels limit the use of these areas by wading species, waders also frequently use habitats at Awarua Bay and New River estuary, and the higher levels will provide habitat for waterfowl and specialist swamp-dwelling species. A longer freshwater phase will benefit threatened species such as the Threatened-Nationally Critical Australasian bittern.

As the proposed opening regime will provide for both open and closed conditions, and the lagoon provides for a range of species that favour a range of conditions across a wider wetland and coastal environment, adverse effects on avifauna values are anticipated to be neutral.

### **Invertebrates**

Invertebrates in the lagoon include benthic and pelagic species which likely play important roles in the lagoon's food web. A closed lagoon limits fish and invertebrate migration and poor water quality adversely affects invertebrates. Invertebrates and taonga species such as kōura/freshwater crayfish and kākahi/freshwater mussel may benefit from increased habitat from higher lagoon levels and less frequent openings and lower salinity. As with fish, the proposed opening regime will have positive effects on invertebrates.

## **9.5.4 Biosecurity Risk**

Given that the lagoon is dominated by predominantly indigenous flora and fauna, an extended freshwater phase may enable invasion by non-native freshwater pests, such as weeds, fish, or invertebrates. Providing for lagoon openings in order to disrupt freshwater pest incursions will protect the lagoon's ecological health by altering salinity or available habitat for the unwanted organism.

The lagoon indicators have therefore been developed to include a primary indicator for the incursion of non-native species which pose a biosecurity risk. On this basis, the proposal will have positive effects regarding biosecurity management of Waituna Lagoon.

## 9.6 Effects on Cultural Values

In terms of the cultural significance of Waituna Lagoon the overall purpose of the application is to return the lagoon to as natural state as possible whilst managing it where it is necessary to protect its values. The potential effects on the lagoon's cultural values are therefore anticipated to be positive.

An assessment of cultural values is provided in the Cultural Values Report, and a summary of the assessment in relation to kaitiakitanga, mahinga kai, wai and mauri is provided below.

### 9.6.1 Kaitiakitanga

The Cultural Values Report outlines the strong traditional and contemporary associations to Waipārera, and the loss of intergenerational responsibility for the environment as well as loss of the mauri of Waipārera and its people.

The report sets out that to recognise and provide for Ngāi Tahu values and uses:

*“Awarua Rūnanga must be provided opportunities to exercise kaitiakitanga over Waipārera to enable the active protection of the whenua, hapua, and taonga species. The past colonial management of the catchment and lagoon cannot continue if the mauri and ecological health of Waipārera is to be prioritised. Resources must be cared for and managed in a sustainable way, and it is the kaitiaki duty of mana whenua to ensure they are in a better state for future generations.*”



*Enabling kaitiakitanga and rangatiratanga can have positive outcomes for mana whenua by creating pathways to reconnect with their whenua and to exercise cultural rights and mahinga kai through Kaupapa such as Whakamana te Waituna”.*

As a co-consent holder responsible for the exercise of the opening regime in partnership with DOC and Environment Southland, Awarua Rūnanga are enabled to actively protect and exercise kaitiakitanga over Waipārera.

## 9.6.2 Mahinga Kai

The Cultural Values Report outlines that mahinga kai is considered by Ngāi Tahu as a key environmental indicator in natural systems, and that:

*“Ngāi Tahu ki Murihiku have been disconnected from mahinga kai at Waipārera not by choice, and this has had detrimental intergenerational impacts on Ngāi Tahu identity, as well as the active transfer of mātauranga and kaitiakitanga at place. Through many legal barriers access to Waipārera for mana whenua has been impeded, such as when it was given the status of Scientific reserve in 1983. This barred (and is still a barrier today) mana whenua from exercising their right of customary use of the area for mahinga kai, although still permitting the sport fishing of brown trout and game bird shooting. Legal structures such as this have directly resulted in an inability for Ngāi Tahu ki Murihiku to exercise their cultural rights and interests”.*

The Cultural Values Report seeks a holistic approach that considers the opportunities to enhance habitat, mahinga kai and addressing poor water quality, as well as consider the effects of land use on lagoon health and taonga species. It seeks to utilise the area for mahinga kai, and connect people back to Waipārera. The application seeks to contribute to these outcomes as its purpose is maintain and restore the ecological health and cultural values of the lagoon ecosystem.

## 9.6.3 Wai

The Cultural Values Report sets out that over the last decade or so, species that characterise a healthy lagoon environment have reduced and been replaced by species that are more commonly associated with enriched and degraded systems. It notes that the opening of Waipārera to facilitate land drainage has contributed to the

notable decline in the health and quality of wai and whenua in the catchment, which is of great concern to Ngāi Tahu.

The Cultural Values Report supports closed lagoon conditions during key submerged vegetation growing seasons through spring–summer to enhance the high macrophyte species diversity and development, noting that:

*“The decline of Waipārerā has been seen and experienced by mana whenua for decades, and it is important to Awarua Rūnanga and Ngai Tahu whanui to ensure that this decline in mauri ceases. The active involvement of mana whenua will ensure the health of Waipārerā by continuing to ensure that the wai has priority”.*

#### **9.6.4 Mauri**

The Cultural Values Report outlines that human interaction within the catchment and lagoon have diminished the mauri of the wai and the mauri of Waipārerā and considers that appropriate measures can be implemented to improve the mauri of the wai that many taonga species rely on. The Report is supportive of the proposed regime, to improve the mauri of Waipārerā.

## **9.7 Archaeological Effects**

There are no archaeological sites identified in the relevant District Plan planning map or Regional Coastal Plan as being located on the Waituna Bar where the openings will be undertaken at Walker’s Bay. Artificial openings in this location have taken place on numerous occasions over the last 100 years, and this has been the main opening location in recent decades.

Wahi tapu and wahi taonga are found along the shores of the lagoon due to the many years of occupation and use. There have been some archaeological sites recorded in recent times, with the items found mostly associated with collecting and cooking mahinga kai.

While there are no recorded archaeological sites detailed at the opening site, there is still the possibility of unrecorded archaeological sites being present, and there are archaeological sites present in the wider vicinity around the lagoon edge. The risk of

adverse effects on unrecorded archaeology can be mitigated by use of a suitable condition relating to accidental discovery. An accidental discovery protocol condition is proposed in **Appendix C**.

Provided the accidental discovery protocol is followed the proposal is not likely to give rise to any adverse effects on historic heritage and any adverse effects will be no more than minor.

## 9.8 Effects on Landscape and Natural Character

Part of the application site is identified as being within an area of Outstanding Landscapes or Natural Features in the Southland District Plan (the '**District Plan**'). The site is also identified as being located within the Coastal Environment Overlay in the District Plan and part of the site (Waituna Bar) is located in the CMA as identified in the Regional Coastal Plan.

Waituna Lagoon is located within Landscape Unit 5 in the Regional Coastal Plan. The lagoon it is recognised as a key landscape element and distinctive features of the landscape unit include '*the diversity of wildlife habitats*', and '*the extreme isolation and remoteness qualities*'. Potential activities that could adversely affect the natural character of the landscape unit include '*further drainage to the wetland*', '*any intensive land use of the fragile coastal elements*' and, '*reduction in the buffer zone around the margins of the wetlands*'.

The proposed activity will have temporary and transitory effects on landscape, natural character and visual amenity each time the lagoon is opened. The excavation of the channel connecting the lagoon to the sea will alter the appearance of part of the foreshore of the lagoon and Waituna Bar and beach.

These effects are mitigated by the temporary nature of the works as the duration of physical works takes 1-3 days, and once the lagoon is opened it typically closes within months. Notwithstanding these temporary effects, the opening is necessary to protect landscape and natural character values that would be adversely affected in the longer term if an algal bloom were to proliferate, and if fish passage was not enabled.

In addition, natural coastal processes over time will fill in the channel and return the area to a pre-works state. Other mitigating factors include the remoteness of the site and the level of the excavated works being below ground level. Machinery will be

present on site on a temporary basis while excavation works are undertaken but will be removed when works are completed.

The proposed activity will not give rise to any more than minor adverse effects on landscape values or visual amenity and adverse effects are temporary and are necessitated for the protection of lagoon health.

## 9.9 Effects on Surrounding Land Use

There is currently no resource consent in place for an opening regime for the lagoon, and lagoon opening cannot be undertaken as a permitted activity. Therefore, as detailed further in Section 9.1, the receiving environment upon which effects must be assessed is the lagoon as is, where lagoon levels naturally fluctuate and where the water quality varies, based on climate, meteorological, and land use factors. The opening of the lagoon therefore results in lower water and groundwater levels on surrounding land uses, compared to no consent being in place.

However, the maximum threshold levels for lagoon openings are higher at 2.5mASL, than those previously consented at 2.0/2.2mASL. Under the proposed opening regime, water levels are estimated to be above 2.2mASL for approximately 21 days per year, and the lagoon is likely to be opened approximately every two years, with 0.66 openings/year in the first 5 years, decreasing to 0.55 openings/year in years 16–20.

A detailed investigation of the relationship between lagoon water levels and land drainage was previously undertaken by NIWA in 2017, attached at **Appendix M**. The NIWA Investigation used hydrological models, LiDAR elevation data, flow and level monitoring data, in combination with a channel roughness coefficient to simulate a cleared or vegetated channels, to map the extent of land that is inundated or drainage impeded, at different lagoon water levels.

Most of this land, adjacent to Waituna, Moffat and Carran Creek, was purchased through the Whakamana Te Waituna project, and maintaining drainage on this land is not necessary in the long-term. The application will positively affect land use on these sites as the sites were purchased for the long-term purpose of environment restoration and enhancement.

### **Private Land**

In terms of the remaining private land adjacent to the lagoon that was not purchased, water levels up to 2.5mASL will be infrequent, with the hydrological modelling indicating:

- water levels over 2.2 mASL will occur for approximately 21 days/year total, over 1.37 events per year, and of those days,
- water levels over 2.4 mASL will be experienced for approximately 5 days/year total, over approximately 0.67 events per year.

The Southland region is naturally subject to periods of high rainfall that may limit land drainage irrespective of lagoon level. By raising the maximum level to 2.5mASL from the previously consented level of 2.0mASL, it is estimated that the additional area of productive land adjacent to the lagoon that is inundated at this level with a cleared channel and median flow, is 3.5ha, increasing to 3.7ha with a vegetated channel and high flow, as detailed in the Science Advisory Report. This is approximately 0.02% of agricultural land in the catchment, for an average 5 days per year.

The additional area of productive land that would be subject to impeded drainage for an average of 5 days per year with a clear channel and median flow is approximately 27ha, and approximately 28ha with a vegetated channel and high flow. This is approximately 0.15% of agricultural land in the catchment.

In understanding how this varies spatially in the catchment, the Science Advisory Report sets out that *“the area of land affected by direct inundation and impeded drainage is a function of lagoon level, flow rate and plant growth in the creeks. The relative importance of these factors varies spatially with the most downstream parts of the creek strongly affected by lagoon level but further upstream the influence of flow rate and vegetation dominate”*.

Maps of the extent of inundation and drainage impediment under various water levels are provided at **Appendix O**.

The frequency and extent of these changes are assessed as minor in both extent and frequency in the Science Advisory Report. Notwithstanding this, the transitional approach proposed in the application will provide landowners in the lower catchment with time to adapt to these higher lagoon levels as it will provide for more frequent openings in the first 5 years of approximately 0.66 openings/year, and less frequent

openings from years 6-15, before the long-term approach is set at years 16-20 with approximately 0.55 openings/year.

This transitional regime will result in less frequent openings than sought in the LWCA 2021 application of approximately 1.07 openings/year, but is supported in the Science Advisory Report as a positive step forward to enhance the ecosystem health of the lagoon.

### **Roads and Tracks**

When the lagoon water level is at approximately 2.0mASL, Southland District Council estimates that about 300m of road/track is inundated. When the water level is at 2.5mASL this increases slightly to approximately 400m of road/track being inundated. This only limits access to the Department of Conservation track and viewing platform and one of the properties purchased through the Whakamana Te Waituna project, and does not limit access to any other private property.

Maps of the extent of inundation and drainage impediment at and surrounding the Waghorn Road Bridge are provided at **Appendix O**.

An access track to Section 1 Block XIII Oteramika Hundred within Record of Title SL40/214, located on the southern side of Waituna Lagoon between the lagoon and the sea is inundated for a 500m section, when lagoon levels are approximately 2.2mASL, where this track crosses public conservation land. An unformed track exists on the seaward side of the conservation land (on the beach) that provides alternative and legal access.

Adverse effects on road access are therefore considered to be no more than minor.

## **9.10 Effects on Coastal Public Access**

The proposed activity will result in the formation of a temporary channel between the lagoon and coast each time the lagoon is opened. The formation of the channel in the Waituna Bar will impede public access on a temporary basis. However as natural processes close the channel the ability of the public to access the Waituna Bar and beach and travel along it will be reinstated.

Notice of the opening will be on Environment Southland's website and social media

channels. Fish and Game, Southland District Council, and specified landowners will also be notified directly. Therefore, the public and parties with an interest will be made aware of the opening and alerted that public access along the beach during this time will be impeded.

Adverse effects on public access are therefore considered to be no more than minor.

## 9.11 Effects on Recreational Values

The recreational values of Waituna Lagoon include walking, bird watching, trout fishing and duck shooting.

In terms of walking, bird watching, duck shooting, and general recreation, the inundated areas of the Scientific Reserve surrounding the lagoon will be less accessible at higher water levels, noting this natural fluctuation is part of the receiving environment.

This will make access to recreational assets such as tracks, and the private huts, more difficult to access during these times. However, the application will also have positive effects on these values given its purpose to maintain and restore ecological health and cultural values of the lagoon ecosystem, which support these recreational values.

In terms of the recreational trout fishery, the 2-yearly pulse of īnanga that the opening regime will enable will support the trout biomass in the lagoon and creeks.

The opportunity to catch 'sea-run' trout when the lagoon is open will remain, noting that this will be less frequent than past openings, but is balanced by the resistant trout population benefiting from longer closed conditions as set out in the Science Advisory Report. In terms of providing trout habitat, the Science Advisory Report outlines that:

*"The lagoon is highly productive when closed over the summer periods and the available foraging area for trout will be increased. This will likely provide good fishing conditions for anglers targeting trout around the lagoon edge and near tributary inflows.*

*In addition, optimising the lagoon for ecological health will protect the trout population by helping to maintain water quality and clarity. Overall,*

*the impact of an ecologically-focused opening regime should protect and enhance the brown trout population and its fishery values”.*

Actual and potential effects on recreational values are therefore considered to be generally positive.

## 9.12 Effects Summary

Overall, most of the actual and potential effects of the proposed opening regime on the environment are positive. Waituna Lagoon is a Regionally Significant Wetland and Wetland of International Importance. The opening regime seeks to transition to more ecologically optimal water level thresholds to maintain and restore the ecological and cultural values of the lagoon. The regime also provides for mechanisms to lower water levels when the levels become too high and may impact the availability of light for macrophytes, for fish passage, or in response to a poor water quality event. Waipārera is significant to Te Rūnanga o Awarua, and the application will protect the cultural values of the lagoon ecosystem.

Where the actual and potential effects are adverse, they are minor, and most are temporary in duration. During openings, discharges to the CMA will result in a temporary sediment plume, some incidental vegetation removal will occur, there will be some short terms effects on landscape and natural character at the opening, and access will be temporarily restricted to and at the opening. Short sections of road to the Waituna Reserve will be temporarily closed at high water levels, and access for recreation will be temporarily reduced. Whilst less frequent openings will result in less incidental land drainage of productive land, modelled lagoon levels over 2.2mASL are temporary, occurring on average approximately 21 days/year, with approximately 5 days/year over 2.4mASL.

# 10 Statutory Considerations

## 10.1 Section 104 of the Resource Management Act

Section 104 of the RMA lists the matters that a consent authority must, subject to Part 2, have regard to in determining whether a resource consent application to change



the conditions of a consent should be granted.

Section 104 states:

- (1) When considering an application for a resource consent and any submissions received, the consent authority must, subject to Part 2, have regard to—*
- (a) any actual and potential effects on the environment of allowing the activity; and*
- (ab) any measure proposed or agreed to by the applicant for the purpose of ensuring positive effects on the environment to offset or compensate for any adverse effects on the environment that will or may result from allowing the activity; and*
- (b) any relevant provisions of—*
  - (i) a national environmental standard;*
  - (ii) other regulations;*
  - (iii) a national policy statement;*
  - (iv) a New Zealand coastal policy statement;*
  - (v) a regional policy statement or proposed regional policy statement;*
  - (vi) a plan or proposed plan; and*
- (c) any other matter the consent authority considers relevant and reasonably necessary to determine the application.*

Section 104 of the RMA does not give primacy to any of the matters to which a consent authority is required to have regard. All of the relevant matters are to be given such weight as the consent authority deems appropriate in the circumstances, and all matters listed in s104(1) are subject to Part 2 of the RMA.

In accordance with s104(1)(a), an assessment of actual and potential effects has been undertaken in Section 9 of this report.

In accordance with s104(1)(ab), no measures are proposed to offset or compensate for any adverse effects on the environment.

Adverse effects are addressed via avoidance, remediation and mitigation. An assessment against the matters in s104(1)(b) is provided below.

## 10.1 Relevant Provisions of the Planning Documents

The relevant planning provisions are contained in:

- The New Zealand Coastal Policy Statement 2010 (**'NZCPS'**);
- The National Policy Statement for Freshwater Management;
- The National Policy Statement for Indigenous Biodiversity (**'NPSIB'**);
- The Southland Regional Policy Statement (**'RPS'**);
- The partially operative Southland Water and Land Plan;
- The Regional Coastal Plan;
- Te Tangi a Tauria the Ngai Tahu ki Murihiku Natural Resources and Environmental Iwi Management Plan; and
- The Southland Murihiku Conservation Management Strategy (**'CMS'**).

An assessment of the application against the relevant provisions of the planning documents in accordance with s104(1)(b) of the Act, and other documents in accordance with s104(1)(c) is provided below.

## 10.2 New Zealand Coastal Policy Statement

An assessment of this application against the relevant objectives and policies of the NZCPS has been undertaken in accordance with s104(1)(b)(iv) as Waituna Lagoon is located entirely within the Coastal Environment.

The NZCPS sets out a number of objectives and policies for achieving the purpose of the RMA in relation to the coastal environment of New Zealand. The provisions relevant to the consideration of the application relate to the integrity, form, functioning and resilience of the coastal environment, the Treaty of Waitangi, natural character, natural features and landscape, biological diversity, and other Acts and international obligations. These are assessed below.

### 10.2.1 Integrity, Form, Functioning and Resilience of the Coastal Environment

Objective 1 of the NZCPS seeks to safeguard the integrity, form, functioning and resilience of the coastal environment and sustain its ecosystems, by:

- *"maintaining or enhancing natural biological and physical*

*processes in the coastal environment and recognising their dynamic, complex and interdependent nature;*

- *protecting representative or significant natural ecosystems and sites of biological importance and maintaining the diversity of New Zealand's indigenous coastal flora and fauna; and*
- *maintaining coastal water quality, and enhancing it where it has deteriorated from what would otherwise be its natural condition, with significant adverse effects on ecology and habitat, because of discharges associated with human activity”.*

The proposed opening regime seeks to enhance the natural biological and physical processes of the lagoon and the wider Awarua wetland complex. It seeks to protect the significant natural ecosystems within the lagoon and fringing wetlands, and to maintain and enhance the water quality of the lagoon.

## **10.2.2 Natural Character**

The NZCPS seeks that management of the coastal environment preserves the natural character of the coastal environment and protects natural features and landscape values under Objective 2 through:

- *“Recognising the characteristics and qualities that contribute to natural character, natural features and landscape values and their location and distribution;*
- *identifying those areas where various forms of subdivision, use, and development would be inappropriate and protecting them from such activities; and*
- *Encouraging restoration of the coastal environment”.*

The characteristics and qualities of Waituna Lagoon that contribute to the natural character and landscape values of the Awarua wetland complex and coastal environment are recognised and discussed in the AEE.

The proposed opening regime is to maintain and restore the ecological health and cultural values of the lagoon ecosystem. Although there will be short term changes to

the natural character of the coastal environment at the opening location during each opening event, this will be infrequent, and for the purpose of restoration, consistent with the purpose of Objective 2. The activity is therefore considered appropriate.

With respect to managing the effects of an activity on natural character, the key policy direction is contained in Policy 13(1)(a) and 14 (c)(ii) and (iii) to preserve the natural character of the coastal environment and to protect it from inappropriate use, and avoid adverse effects on outstanding natural coastal landscapes. The application proposes an appropriate use within the coastal environment as it seeks to preserve and restore the coastal natural character of the lagoon, consistent with these policies.

### 10.2.3 Treaty of Waitangi

Objective 3 of the NZCPS seeks that management of the coastal environment take account of the principles of Te Tiriti, recognise the role of tangata whenua as kaitiaki and provide for tangata whenua involvement in management of the coastal environment by:

- *“Recognising the ongoing and enduring relationship of tangata whenua over their lands, rohe and resources;*
- *Promoting meaningful relationships and interactions between tangata whenua and persons exercising functions and powers under the Act;*
- *Incorporating mātauranga Māori into sustainable management practices; and*
- *Recognising and protecting characteristics of the coastal environment that are of special value to tangata whenua”.*

In Policy 2, the NZCPS provides further direction in the context of resource consent applications, with Policy 2(e) directing that the relevant iwi resource management plan be taken into account. In accordance with Policy 2, Te Tangi a Tauira the Ngai Tahu ki Murihiku Natural Resources and Environmental Iwi Management Plan has been assessed and taken into account. The assessment is provided at Section 10.8 of this AEE. The application aligns with the outcomes sought in Te Tangi a Tauira.

The ongoing and enduring relationship of Awarua Rūnanga with the lagoon, whenua and coast is recognised (Policy 2(a)). Awarua Rūnanga are co-applicants working in partnership with DOC and Environment Southland. Kaitiakitanga and the relationship of mana whenua with the lagoon are key drivers of the application (Policy 2(f)).

Mātauranga Māori has informed the development of this application and the preparation of the Science Advisory Report that informs it. The Cultural Values Report outlines the values of the lagoon to Awarua Rūnanga and how the lagoon should be protected, and the report has informed the development of this application.

The application is therefore considered to accord with Objective 3 and Policy 2 of the NZCPS.

#### **10.2.4 Natural Features and Natural Landscapes**

Objective 2 is to protect natural features and landscapes values, and encourages restoration of the coastal environment. Policy 15 seeks to protect natural features and landscapes from inappropriate subdivision use and development by avoiding adverse effects on outstanding features and landscapes and avoiding significant effects, and addressing other effects on other natural features and landscapes.

As outlined in Section 9.8, lagoon openings will have temporary effects on landscape, and natural character values that are mitigated by the temporary nature of the works and proposed conditions of consent. The opening is necessary to protect landscape and natural character values that would be adversely affected in the longer term if an algal bloom were to proliferate, and if fish passage was not enabled.

The application is therefore considered to accord with the natural features and landscapes policies of the NZCPS.

#### **10.2.5 Biodiversity**

As outlined in Objective 1, the NZCPS seeks that the coastal environment be managed to safeguard the integrity, form, functioning and resilience of the coastal environment and sustain its ecosystems, including marine and intertidal areas, estuaries, dunes, and land.

The long-term objective for the opening regime is to maintain and restore the ecological health and cultural values of the lagoon ecosystem. This accords with the

purpose of Objective 1 as:

- The dynamic, complex and interdependent nature of the natural and biological processes of the lagoon has been considered in developing the application;
- The lagoon is home to significant natural ecosystems and site of biological importance, with a diversity of indigenous coastal flora and fauna the application seeks to maintain and restore;
- The application aligns with the direction to maintain and enhance degraded coastal water, as the application seeks to manage poor water quality in the lagoon which is affected by discharges within the catchment. Whilst a discharge to Toetoes Bay will result, the discharge is necessary to protect indigenous biodiversity, and the effect will be temporary.

The key policy direction regarding biodiversity values is contained in Policy 11 which seeks to avoid adverse effects on specified values, and to avoid significant adverse effects on other coastal environment values. In particular, Policy 11 directs that adverse effects of activities are to be avoided on indigenous taxa that are listed as threatened or at risk, and indigenous ecosystems and vegetation types that are threatened in the coastal environment, or are naturally rare.

The proposed opening regime seeks to protect the habitats and species of the lagoon from potential significant adverse effects associated with poor light at high lagoon levels, poor water quality, algal blooms, and biosecurity incursion. This is the most appropriate course of action to avoid adverse effects on significant ecological values. Any short-term effects associated with each opening activity will be minor and transitory, and necessary to avoid potentially more significant effects if intervention is not undertaken. Similarly, opening the lagoon for fish passage will support biodiversity values consistent with the purpose of Policy 11.

### **10.2.6 Natural Hazards**

As outlined in Objective 5 of the NZCPS coastal hazards should be managed; taking account of climate change by;

- locating new development away from areas prone to such risks;

- considering responses, including managed retreat, for existing development in this situation; and
- protecting or restoring natural defences to coastal hazards.

This application seeks to protect and restore the Waituna Lagoon, which is considered a natural defence to coastal hazards.

Policy 25 seeks to avoid increasing the risk of social, environmental and economic harm from coastal hazards, and that further development does not occur in areas potentially affected by coastal hazards. The Waituna Lagoon will not be developed further and will not increase coastal hazard risk.

Policy 26 seeks to protect, restore or enhance natural defences against coastal hazards including beaches, estuaries, wetlands, intertidal areas, coastal vegetation, dunes and barrier islands. The Waituna lagoon is host to a variety of these natural defences. As the lagoon will be opened at 2.5mASL, natural hazard risks to people or property at higher levels is avoided.

### **10.2.7 Other Acts and Obligations**

Objective 7 requires that the management of the coastal environment recognises and provides for New Zealand's international obligations regarding the Coastal Environment including the CMA. Policy 5 requires that consideration be given to effects on land and waters in the Coastal Environment held or managed under the Conservation Act 1987 and other Acts for conservation and protection purposes.

As areas of lagoon margin are managed as public conservation land administered by DOC as a scientific reserve, and as the lagoon and wider Awarua wetland complex is a Ramsar Site, the applicants have a duty to recognise and provide for the protection purpose of the scientific reserve and Ramsar status.

The objective for opening the Waituna Lagoon to the sea is to maintain and restore the ecological health and cultural values of the lagoon ecosystem. This accords with the purpose of the scientific reserve status under the Reserves Act 1977, and the Ramsar status as part of a wetland of international importance.

### **10.2.8 Conclusion Regarding the Provisions of the NZCPS**

Overall, the activity is not considered to be contrary to the objectives and policies of the NZCPS and is consistent with these provisions as it seeks improve resilience of the

lagoon, prevent water quality degradation, and maintain, protect and restore its ecological health.

## 10.3 National Policy Statement for Freshwater Management

An assessment of this application against the relevant objectives and policies of the NPSFM has been undertaken in accordance with s104(1)(b)(iii). The provisions relevant to the consideration of the application relate to Te Mana o te Wai, integrated management, the protection of wetland values, the protection of indigenous freshwater species and maintaining the health and wellbeing of freshwater bodies, information and monitoring, and the effects management hierarchy.

It is noted that the Resource Management (Freshwater and Other Matters) Amendment Bill (**'Bill'**) proposes to exclude the Te Mana o te Wai hierarchy of obligations within the NPSFM from resource consent application and decision-making processes by precluding—

*resource consent applicants from including an assessment against clause 1.3(5) or 2.1 of the NPSFM 2020 in applications for resource consent:*

*consent authorities from requesting information from consent applicants or commissioning reports on clause 1.3(5) or 2.1 of the NPSFM 2020:*

*consent authorities from having regard to clause 1.3(5) or 2.1 of the NPSFM 2020 when considering resource consent applications<sup>4</sup>.*

The Bill limits this to resource consent applications lodged with a consent authority after commencement. Regional councils will remain obliged to give effect to the hierarchy of obligations through their policy statements and plans; and in resource consent decisions where the consents are lodged before commencement. Therefore, the Te Mana o te Wai hierarchy of obligations apply to this resource consent application, and associated decision making.

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<sup>4</sup> Resource Management (Freshwater and Other Matters) Amendment Bill Explanatory Note



### 10.3.1 Te Mana o te Wai

Clause 2.1 of the NPSFM contains a single overarching objective, as follows:

*“to ensure that natural and physical resources are managed in a way that prioritises:*

*a) first the health and well-being of water bodies and freshwater ecosystems*

*b) second, the health needs of people (such as drinking water)*

*c) third, the ability of people and communities to provide for their social, economic, and cultural wellbeing, now and in the future.”*

This objective is supported by 15 specific policies, and those most relevant to the application are assessed below.

Policy 1 seeks to ensure that freshwater management is undertaken to give effect to Te Mana o te Wai. Part 1.3 provides additional detail as to the fundamental concept that is Te Mana o te Wai, and notes that it encompasses six principles being mana whakahaere, kaitiakitanga, manaakitanga, governance, stewardship, and care and respect. Similarly, Policy 2 seeks to ensure that tangata thenua are actively involved in freshwater management, and that Māori freshwater values are identified and provided for.

The application gives effect to Te Mana o te Wai, and puts the health of the lagoon first, whilst also considering the social and economic needs within the proposed opening regime through a transitional approach. The six principles have guided the preparation of the application and the application accords with the single overarching objective to ensure that the resources of the lagoon are managed in a way that prioritises the health and well-being of the lagoon and its ecosystems.

### 10.3.2 Integrated Management

Policy 3 sets out that freshwater is managed in an integrated way, on a whole of catchment basis, and including effects on the receiving environment. The application is consistent with Policy 3 as it seeks to manage lagoon openings in an integrated way, which considers the impacts on the wider catchment, freshwater, wetland, and

coastal environments. This integrated approach has considered habitat values, fish passage, water quality, cultural values, coastal values, recreation values, and land use in determining the proposed regime.

### 10.3.3 Freshwater and Wetland Values

Policy 6 seeks to avoid the loss of natural inland wetlands, protect their values, and promote their restoration. Policy 9 seeks to protect the habitats of indigenous freshwater species, and Policy 10 seeks to protect the habitat of trout and salmon if consistent with Policy 9.

The application is consistent with Policies 6 and 9 as it seeks to protect the values of the lagoon and its fringing wetlands, and promote its restoration. It also seeks to provide fish passage for indigenous diadromous fish species to migrate between freshwater and marine environments during their lifecycles, and supporting the habitat for tuna/long-fin eel and trout who also migrate, and which rely on īnanga as a food source, consistent with Policy 10.

Policy 5 relates to ensuring that the health and wellbeing of freshwater bodies is maintained, and Policy 12 relates to the achievement of the national target for water quality improvement.

The application is not considered to adversely affect the achievement of the national freshwater quality targets. Nor is it anticipated to result in freshwater water quality degradation given the primary purpose of the opening regime is to maintain and restore the ecological health and cultural values of the lagoon ecosystem, including opening the lagoon if there is a poor water quality event.

### 10.4.4 Information and Monitoring

Policy 13 directs that the condition of water bodies and freshwater ecosystems is systematically monitored overtime. The policy also directs that action is taken where freshwater is degraded, and to reverse deteriorating trends. Policy 14 directs that *"information including monitoring data about the state of water bodies and freshwater ecosystems, and the challenges to their health and well-being, is regularly reported on and published"*.

The application seeks to carry out monitoring on the health of the Waituna Lagoon to

inform the opening regime. Monitoring to date has informed the development of this application and is reported on in the Science Advisory Report. Monitoring data is regularly reported on through the Environment Southland and DOC websites, and on the LAWA website. The water quality of the lagoon is degraded, and without the proposed opening regime in place, the health of the lagoon is at risk of deteriorating further. The application is therefore considered to accord with Policies 13 and 14.

### 10.3.5 The Effects Management Hierarchy

Regulation 39(7) of the NESFW requires applications under that regulation to be assessed in accordance with the effects management hierarchy, applying clause 3.22(3) of the NPSFM.

The effects management hierarchy is an approach to managing the adverse effects of an activity on the extent or values of a wetland (including cumulative effects and loss of potential value) that requires that:

*“(a) adverse effects are avoided where practicable; then*

*(b) where adverse effects cannot be avoided, they are minimised where practicable; then*

*(c) where adverse effects cannot be minimised, they are remedied where practicable; then*

*(d) where more than minor residual adverse effects cannot be avoided, minimised, or remedied, aquatic offsetting is provided where possible; then*

*(e) if aquatic offsetting of more than minor residual adverse effects is not possible, aquatic compensation is provided; then*

*(f) if aquatic compensation is not appropriate, the activity itself is avoided”.*

The application is considered to accord with the effects management hierarchy. The proposed opening regime seeks to avoid adverse effects on the natural wetland values of Waituna Lagoon and to maintain and restore ecological health and cultural values of the lagoon ecosystem.

As outlined in the AEE in Section 9, not all adverse effects can be avoided and there

will be minor and short-term effects. These effects will be minimised when they can't be avoided. None of these effects are considered to be more than minor, and none of them are effects that can be addressed by aquatic offsetting or compensation as they do not relate to freshwater biodiversity values.

### **10.3.6 Conclusion Regarding the Provisions of the NPSFM**

Overall, the activity is consistent with, and not contrary to the objectives and policies of the NPSFM. It gives effect to Te Mana o te Wai, putting the health of the lagoon at the forefront, and seeks to protect freshwater, wetland and biodiversity values, consistent with the maintenance and restoration purpose of the NPSFM.

## **10.4 National Policy Statement for Indigenous Biodiversity**

An assessment of this application against the relevant objectives and policies of the NPSFM has been undertaken in accordance with s104(1)(b)(iii). The objective of the NPSIB is to maintain indigenous biodiversity so there is at least no overall loss, achieved through protection and restoration, and recognising mana of tangata whenua as kaitiaki, and people and communities as stewards of indigenous biodiversity amongst other things.

### **10.4.1 Tangata Whenua**

Policy 1 seeks that indigenous biodiversity is managed in a way that gives effect to the decision-making principles of the NPSIB and takes into account the principles Te Tiriti. Policy 2 enables tangata whenua to exercise kaitiakitanga, identify and protect taonga species, and actively participate in decision making. The decision-making principles inform the implementation of the NPSIB and are outlined below:

*“(a) prioritise the mauri, intrinsic value and wellbeing of indigenous biodiversity:*

*(b) take into account the principles of the Treaty of Waitangi (Te Tiriti o Waitangi):*

*(c) recognise the bond between tangata whenua and indigenous*

*biodiversity based on whakapapa relationships:*

*(d) recognise the obligation and responsibility of care that tangata whenua have as kaitiaki of indigenous biodiversity.*

*(e) recognise the role of people and communities (including landowners) as stewards of indigenous biodiversity.*

*(f) enable the application of te ao Māori and mātauranga Māori.*

*(g) form strong and effective partnerships with tangata whenua”.*

The proposed opening regime gives effect to these principles. The application takes the form of a partnership where Awarua Rūnanga is a co-applicant.

The application prioritises the mauri, intrinsic value, and wellbeing of the indigenous biodiversity of Waituna Lagoon. The application takes into account the principles of Te Tiriti, including those of partnership, protection and participation, recognises the bond of Awarua Rūnanga and Waipārera based on whakapapa.

The obligation and responsibility of care Awarua Rūnanga have as kaitiaki is recognised, and this responsibility is shared with DOC and Environment Southland as stewards of indigenous biodiversity. Te ao Māori and mātauranga Māori has informed the development of this application and the preparation of the Science Advisory Report that supports it.

## **10.4.2 Precautionary Approach and Resilience**

Policies 3 and 4 adopt a precautionary approach to adverse effects and seek to manage biodiversity to promote resilience to the effects of climate change.

The application takes a precautionary approach as it seeks to reduce the adverse effects resulting from a history of artificial lagoon openings, and nutrient and sediment inputs, by only opening the lagoon to the sea where necessary to protect its ecological and cultural values. The application seeks to promote resilience to the effects of climate change by building in climate change as a consideration in the proposed consent review condition.

## **10.4.3 Significant Natural Areas**

Policies 6 to 9 seek to protect indigenous biodiversity within and outside SNAs. The area is not specifically mapped in the RPS or District Plan, but the significant ecological values of the lagoon are set out in Section 5 of this AEE. Policy 7 requires that SNAs are protected by avoiding or managing adverse effects from new subdivision use and development, and Policy 8 directs that biodiversity values outside SNAs are recognised and provided for.

The proposed opening regime seeks to protect the habitats and species of the lagoon from potential significant adverse effects of poor water quality, from a history of more frequent lagoon openings for land drainage purpose, and to provide for fish passage. This is the most appropriate course of action to avoid adverse effects on significant ecological values and to achieve a healthy functioning state for the lagoon. The application will also support highly mobile fauna as the lagoon supports a number of migratory bird species.

#### **10.4.4 Restoration of Indigenous Biodiversity**

Policy 13 outlines that the “*restoration of indigenous biodiversity is promoted and provided for*”. This application is for a new lagoon opening regime to maintain and restore the ecological health and cultural values of the lagoon ecosystem, and the application is therefore consistent with the restoration purpose of Policy 13.

#### **10.4.5 Conclusion Regarding the Provisions of the NPSIB**

Overall, the activity is consistent with and not contrary to the objectives and policies of the NPSIB as it gives effect to the decision-making principals of the NPSIB, adopts a precautionary approach to biodiversity protection, and to protect and restore the lagoon to achieve a healthier functioning state.

### **10.5 Regional Policy Statement**

An assessment of this application against the relevant objectives and policies of the RPS has been undertaken in accordance with s104(1)(b)(v). The provisions of the RPS relevant to the application relate to tangata whenua, water, biodiversity, coast, natural features and landscapes, and historic heritage.

#### **10.5.1 Tangata Whenua**

Within Chapter 3: Tangata Whenua, Objective TW.1 seeks that the principles of Te Tiriti are taken into account through effective partnerships, Objective TW3 seeks that mauri and wairua are sustained or improved when degraded, and Objective TW.4 seeks that wāhi taonga and sites of significance are appropriately managed and protected.

The associated policies implement these objectives by encouraging active partnerships and seeking that Te Tiriti and the values of mana whenua are recognised and provided for in resource management decision making.

The application is prepared in partnership with Awarua Rūnanga and the purpose of the proposed opening regime is to maintain and restore the ecological health and cultural values of the lagoon ecosystem. Integral to this is that the mauri and wairua of the lagoon environment is sustained, and that as a significant site to mana whenua the lagoon is protected. The application partners have a shared goal in restoring the lagoon, protecting it from algal blooms that threaten its health, and enabling fish passage to maintain its biodiversity values.

## 10.5.2 Water Quality and Beds of Lakes

Within Chapter 4 Water, Part A: Water Quality, Objective WQUAL.2 seeks to halt the decline, and improve water quality in coastal lagoons and wetlands in accordance with freshwater the objectives of the NPSFM, and Objective WQUAL.3 – seeks to maintain the quality of water where it is in its natural state. The associated policies seek to implement these objectives by identifying and protecting regionally significant wetlands and outstanding freshwater bodies.

Specifically relevant to Waituna Lagoon, Policy WQUAL.4 seeks to:

*“Enhance the water quality of the Awarua Wetland by ensuring that discharges of contaminants and land use activities both individually and on a cumulative basis have no more than minor adverse effects on the significant characteristics and water quality of the Awarua Wetland.*

### **Explanation/Principal Reasons**

*This policy sets the overall threshold for managing activities within the Awarua Wetland. Awarua Wetland is recognised for its international significance under the Convention on Wetlands of International*

*Importance (also known as the Ramsar Convention) and is currently degraded as a result of deteriorating water quality. In order to protect the values of this wetland water quality should be enhanced. This will occur through the FMU process under the NPS-FM. The Ramsar Convention designation includes a map and geographic coordinates specifying the boundary of the Awarua Wetland”.*

The objective of the opening regime is to maintain and restore the ecological health and cultural values of the lagoon ecosystem. The proposed opening regime seeks to halt decline and improve water quality, by opening when it is necessary to address poor water quality as a result of the cumulative adverse effects of contaminant discharges and land use activities within the catchment. Lagoon opening is a key tool to disrupt algal blooms and other poor water quality events. The application also seeks to reduce the frequency of openings to protect the lagoon ecosystem by opening at higher threshold levels than consented previously.

This application is one tool to reduce these cumulative effects on the significant characteristics and water quality of the Awarua Wetland, noting Plan Change Tuatahi is to be notified in the future to set limits, targets and methods to implement this policy. The application therefore accords with Objectives WQUAL.2, WQUAL.4 and Policy WQUAL.4.

Also within Chapter 4 Water, Part C: Beds of Lakes and Rivers, Objective BRL.1 outlines that the significant values of lakes and rivers are maintained and enhanced, and that public access is maintained and enhanced to ensure a level of public access appropriate to the values of the area. The policies that implement these objectives are BRL.1 regarding the management of effects on values and physical processes, and BRL.4 regarding public access, and BRL.5 which seeks to *“recognise the social, economic and cultural benefits that may be derived from the use, development or protection of river and lake beds”*.

The application accords with these objectives and policies as it seeks to maintain and enhance the significant values of the lagoon. Although public access at the opening location will be restricted when the lagoon is open to the sea, this is short term and the level of access is considered appropriate, as it accords with the purpose of Objective BRL.1 to maintain and enhance significant lake values.



### 10.5.3 Biodiversity

Within Chapter 6: Biodiversity, Objective BIO.2 seeks to maintain indigenous biodiversity in Southland and protect areas of significant indigenous vegetation and significant habitats of indigenous fauna.

Objective BIO.3 seeks to enhance the condition of indigenous biodiversity in Southland, with emphasis on those areas most at risk to further loss or degradation. The policies that implement these objectives set out to manage a full range of indigenous habitats and ecosystems to achieve a healthy functioning state, and to ensure viable and diverse populations of native species are maintained.

The proposed opening regime seeks to protect the habitats and species of the lagoon from potential significant adverse effects of poor water quality, and from a history of more frequent lagoon openings for land drainage purposes. This is the most appropriate course of action to avoid adverse effects on significant ecological values and to achieve a healthy functioning state for the lagoon. Similarly, opening the lagoon for fish passage will support biodiversity values consistent with the RPS biodiversity policies.

### 10.5.4 Coast

Within Chapter 7: Coast, Objective COAST.2 seeks that use and development in the coastal environment is provided for where appropriate, while managing the adverse effects of those activities, and Objective COAST.3 seeks that coastal water quality and ecosystems are maintained or enhanced. The policies seek to avoid adverse effects on areas of outstanding natural features and landscapes, and/or outstanding natural character, to avoid, remedy or mitigate adverse effects of land-based and marine activities on coastal water quality and its ecosystems.

The proposed opening regime will manage the adverse water quality effects from high nutrient loads coming from the catchment and seeks to maintain and restore ecological health. Although each opening will result in a visible plume in coastal water, this will be short-term, typically lasting no more than a few months, and will dissipate once the lagoon naturally closes.

This is also the most appropriate course of action to avoid adverse effects on

significant coastal natural character and landscape values as although there are some short-term minor effects associated with lagoon openings, without the proposed opening regime in place, the health of the lagoon is at risk of deteriorating further. Similarly, opening the lagoon will support coastal natural character values consistent with the coast policies.

### **10.5.5 Natural Hazards**

Within Chapter 8, Natural Hazards, Objective NH.1 directs that natural hazard risk is understood and avoided, remedied or mitigated, resulting in communities becoming more resilient and Policy NH.5 directs that development within areas of significant risk to natural hazards are avoided. The purpose of Policy NH.8 is to protect, recreate or enhance natural features and landforms that provide protection from natural hazards. The purpose of this application is to restore and enhance the Waituna Lagoon which is a natural feature that is a natural defence that protects from natural hazards. As the lagoon will be opened at 2.5mASL, natural hazard risks to people or property at higher levels is avoided.

### **10.5.6 Natural Features and Landscapes**

Within Chapter 10: Natural Features and Landscapes, Objective LNF.1 directs that outstanding natural features and landscapes are identified and protected. Policy LNF.1 directs these are identified and assessed, in addition to this Policy LNF.1 directs these are managed where they are of cultural significance to tangata whenua. Policy LNF.4 directs their protection from inappropriate subdivision, use and development.

As outlined in Section 9.8, lagoon openings will have temporary effects on landscape, and natural character values that are mitigated by the temporary nature of the works. The opening is necessary to protect landscape and natural character values that would be adversely affected in the longer term if an algal bloom were to proliferate, and if fish passage was not enabled. The application is therefore considered to accord with the natural features and landscapes objectives and policies.

### **10.5.7 Historic Heritage**

Within Chapter 14: Historic Heritage, Objective HH.1 and the associated policies seek to identify and protect historic heritage, and avoid, mitigate and, where appropriate, remedy adverse effects on historic heritage values from inappropriate subdivision,

use and development.

There are no archaeological sites identified as being located on the Waituna Bar where the openings will be undertaken at Walker's Bay. However, there is still the possibility of unrecorded archaeological sites being present. The risk of adverse effects on unrecorded archaeology is mitigated by a proposed accidental discovery condition which must be followed. With accidental discovery protocols in place, any undiscovered historic heritage will be protected in accordance with these provisions.

### **10.5.8 Conclusion Regarding the Provisions of the RPS**

Overall, the activity is consistent with, and not contrary to the objectives and policies of the RPS. The principals of Te Tiriti, mana whenua partnership, and the values of mana whenua are recognised and provided for, the application seeks to protect water quality, the bed of the lagoon, and historic heritage, and to protect the biodiversity values and coastal natural character values of the lagoon.

## **10.6 Partially Operative Southland Water & Land Plan**

An assessment of this application against the relevant objectives and policies of the Proposed Land and Water Plan has been undertaken in accordance with s104(1)(b)(vi). The provisions of the SWLP relevant to the consideration of the application relate to sustainable management, tangata whenua values, water quality and quantity, and indigenous biodiversity and taonga species.

In applying the SWLP, the Interpretation statement that accompanies the objectives, requires that all persons exercising functions and powers under it and all persons who use, develop or protect resources to which this Plan applies, in this case the co-applicants, shall recognise that:

*“(i) Objectives 1 and 2 are fundamental to this plan, providing an overarching statement on the management of water and land, and all objectives are to be read together and considered in that context; and*

*(ii) The plan embodies ki uta ki tai and upholds Te Mana o Te Wai and they are at the forefront of all discussions and decisions about water and land;*

*(iii) The Policies in this plan must be interpreted and applied in a manner that implements the Objectives”.*

As outlined in Section 3 of this AEE, Objectives 1 and 2 have guided the preparation of this application and the application accords with them. A more detailed assessment of these objectives, and the other applicable objectives and policies, as guided by this interpretation statement is provided below.

### **10.6.1 Sustainable Management**

Objective 1 sets out that *‘land and water and associated ecosystems are sustainably managed as integrated natural resources, recognising the connectivity between surface water and groundwater, and between freshwater, land and the coast’.*

Objective 2 requires that *“the mauri of water provides for te hauora o te taiao (health and mauri of the environment), te hauora o te wai (health and mauri of the waterbody) and te hauora o te tangata (health and mauri of the people)”.* The SWLP includes various relevant policies to implement these objectives.

The proposed activity provides for te hauora o te taiao, te hauora o te wai and te hauora o te tangata, and recognises the connectivity between freshwater, the land and coast. The application takes an integrated management approach to lagoon openings, which has considered the impacts on the values for the wider catchment, freshwater, wetland, and coastal environments in determining the thresholds for opening.

As outlined earlier in the AEE, the mauri of the wai and the mauri of Waipārera has diminished over time, and implementing the proposed opening regime seeks to improve the mauri of the wai that many taonga species rely on.

This application is one tool to address the cumulative effects on Waituna Lagoon in order to restore for te hauora o te taiao, te hauora o te wai, and te hauora o te tangata. The other actions being undertaken are outlined earlier in Section 1.3 of this report. Plan Change Tuatahi is to be notified in the future to set limits, targets and methods to implement these objectives. The application is therefore considered to accord with Objectives 1 and 2.

### **10.6.2 Tangata Whenua Values**

Objective 4 sets out that *“tangata whenua values and interests are identified and reflected in the management of freshwater and associated ecosystem”*. Associated policies 1-3 enable papatipu rūnanga to effectively undertake their kaitiaki responsibilities, take account of iwi management plans and cultural indicators of health, and require the management of activities that adversely affect taonga species.

Awarua Rūnanga is a co-applicant and partner to the application and their values and interests are reflected in the application and its purpose to maintain and restore the ecological health and cultural values of the lagoon ecosystem. The application partners have a shared kaitiaki and stewardship responsibility to restore the lagoon, protect it from poor water quality that threatens its health, and enable fish passage to maintain its biodiversity values.

Te Tangi a Tauira the Ngai Tahu ki Murihiku Natural Resources and Environmental Iwi Management Plan has been taken into account, and cultural values and indicators of health have informed the Science Advisory Report and the opening thresholds for the lagoon.

### 10.6.3 Wai

Directly relevant to this application, Objective 6 sets out that:

*“Water quality in each freshwater body, coastal lagoon and estuary will be:*

*(a) maintained where the water quality is not degraded; and*

*(b) improved where the water quality is degraded by human activities”.*

Objectives 9/9A seek that the quantity of water in surface water bodies is managed so that:

*“(a) the life-supporting capacity and aquatic ecosystem health, the values of outstanding natural features and landscapes, the natural character and the historic heritage values of waterbodies and their margins are safeguarded;*

*(b) there is integration with the freshwater quality objectives (including*

*the safeguarding of human health for recreation; and*

*(c) provided that (a) and (b) are met, surface water is sustainably managed in accordance with Appendix K to support the reasonable needs of people and communities to provide for their economic, social and cultural wellbeing”.*

The application is consistent with Objective 6 as the opening regime seeks to improve water quality where water quality is degraded by human activities. As outlined earlier in this assessment, this is one of a number of available tools to address degraded water quality in the lagoon from catchment activities to restore for te hauora o te taiao, te hauora o te wai, and te hauora o te tangata.

Other work to address poor water quality in the lagoon and catchment is underway, and Plan Change Tuatahi is to be notified in the future to set limits, targets and methods to implement these objectives. There is no single measure to address this issue, however it is essential to disrupt algal blooms and poor water quality events when they occur and to transition lagoon opening to a more ecologically optimal opening regime over time.

The application also accords with Objective 9/9A as although opening the lagoon will temporarily reduce lagoon levels during each opening, the opening seeks to protect life-supporting capacity and aquatic ecosystem health, the values of outstanding natural features and landscapes, and the natural character values of the lagoon and its margins.

The application site is within the Waituna Freshwater Management Unit and part of the application site is identified as being within the Oxidising Physiographic Zone. Policy 10 for the oxidising physiographic zone is for land use activities and seeks to:

*“avoid, as a first priority, risk to water quality from contaminants, and where avoidance is impractical, requiring risk to water quality from contaminants to be minimised”.*

Waituna Lagoon does not meet the existing water quality standards for ‘Lowland/Coastal lakes and Wetlands’ in Appendix E of the SWLP, and therefore Policy 15A does not apply. Discharges to the lagoon from opening it will comprise of coastal water from the CMA. Policy 15B seeks that where existing water quality does not meet

the above standards, water quality will be maintained and improved by a variety of measures for new point source discharges, new discharges to land, groundwater, or diffuse discharges to freshwater. This policy is not directly relevant to the application as it does not seek any discharge activities other than the discharge of lagoon water to the CMA, and coastal water to the lagoon, incidental to lagoon opening. However, it does seek to manage the effects of discharges in the catchment on ecological and cultural values of the lagoon.

Freshwater values, limits, targets and methods have not yet been developed for the FMU, and these will be notified through Plan Change Tuatahi, so there are no further FMU specific provisions at this stage.

Key to the application, Policies 32 and 33 are directive. Policy 32 is to protect significant indigenous vegetation and significant habitats of indigenous fauna and maintain indigenous biodiversity associated with natural wetlands. Policy 32 prevents the reduction in area, function and quality of natural wetlands, including through drainage, discharges and vegetation removal. The purpose of this application accords with these policies.

Policy 34 recognises the importance of wetlands and indigenous biodiversity, particularly their potential of improve water quality, and encourages their maintenance and restoration, which accords with this application.

Although high contaminant loads from the catchment have not been avoided, the application is consistent with Policy 15B as opening for poor water quality events seeks to avoid as a first priority risks to water quality in the lagoon from these contaminants. Any effects associated with coastal sediments and saltwater entering the lagoon are minor and temporary and an unavoidable result of the lagoon opening. The application is consistent with the above provisions as the application supports the maintenance and improvement of water quality in the long term.

#### **10.6.4 Biodiversity and Taonga Species**

Objective 14 seeks that the range and diversity of indigenous ecosystems and habitats and their life-supporting capacity are maintained or enhanced, and Objective 15 seeks that taonga species and related habitats, are recognised and provided for.

Policy 28 requires that amongst other things bed disturbance is managed so that

adverse effects are avoided remedied or mitigated on water quality and quantity, habitats, ecosystems and fish passage, and biodiversity. Policy 32 seeks to *“Protect significant indigenous vegetation and significant habitats of indigenous fauna associated with natural wetlands, lakes and rivers and their margin”*.

The range and diversity of indigenous ecosystems and habitats, taonga species, and their life-supporting capacity are to be maintained or enhanced by the proposed opening regime. The regime seeks to reduce the frequency of openings whilst providing for fish passage, addressing issues created by poor light at high lagoon levels, poor water quality, algal blooms, and biosecurity incursion.

Bed disturbance is necessary for lagoon opening in order to protect these values, and lagoon openings cannot occur without it. By opening the lagoon at Walker’s Bay, bed disturbance is minimised as the disturbance of macrophyte beds and fringing vegetation is less than in other locations more sensitive to openings. The application is therefore considered to be consistent with the above provisions and significant indigenous vegetation and significant habitats of indigenous fauna will be protected.

### **10.6.5 Conclusion Regarding the Provisions of the SWLP**

Overall, the activity is consistent with, and not contrary to the objectives and policies of the SWLP. The application seeks to protect water quality, and to protect biodiversity values. It has been prepared in partnership with Awarua Rūnanga and the application partners have a shared kaitiaki responsibility to protect the ecological and cultural health of the lagoon.

## **10.7 Regional Coastal Plan**

An assessment of this application against the relevant objectives and policies of the Regional Coastal Plan has been undertaken in accordance with s104(1)(b)(vi). The provisions of the Coastal Plan relevant to the consideration of the application relate to the management of adverse effects on the coastal environment, the protection of significant values, tangata whenua values, and the seabed and foreshore.

### **10.7.1 Management of Effects**

Objective 4.1.2 and Policy 4.1.1 aim to identify and protect significant conservation values, and Policy 5.1.1 adopts the New Zealand Coastal Policy Statement policies.



Objective and Policy 4.7.1 seek to avoid, remedy or mitigate cumulative adverse effects, and Policy 4.3.2 seeks to manage the frequency, duration and regularity of activities to avoid, remedy or mitigate adverse effects.

Waituna Lagoon has a number of significant conservation values. The application seeks to avoid remedy and mitigate the cumulative adverse effects of land use intensification and water quality degradation affecting the lagoon. No cumulative adverse effects associated with more frequent or regular lagoon openings are anticipated. The opening regime seeks a lower opening frequency than that previously consented for the first 5 years of consent, and seeks to reduce opening frequency further over the 20 year term sought.

## 10.7.2 Protection of Significant Values

Objective 5.1.1 seeks to preserve the natural character of the coastal marine area and Objective 5.2.1 seeks to protect outstanding natural features and landscapes from the adverse effects of use and development. Objective 5.4.1.1 seeks to protect areas of significant indigenous vegetation and significant habitats of indigenous fauna, and Objective 5.4.1.2 seeks to protect the intrinsic values of ecosystems.

In implementing these objectives, Policy 5.4.1.1 seeks to avoid significant adverse effects of disturbance to areas of significant indigenous vegetation or significant habitats of indigenous fauna. Policy 6.1.4 seeks to protect the cumulative habitat values of Southlands estuaries - which explicitly includes Waituna Lagoon.

The policy most relevant to the consideration of the application is:

### ***Policy 7.4.2.2 - The status of the Waituna Lagoon***

*“Recognise the status of the Waituna Lagoon as a major part of the Waituna Wetlands Scientific Reserve when considering its opening for the purpose of relieving adjoining land and infrastructure from the adverse effects of inundation.*

*Explanation - The Waituna Wetland is of international importance as a wildlife habitat, and the lagoon itself has been rated as "outstanding" in the "Wetlands of National Importance to Fisheries" database. However, when the mouth blocks, the lagoon gradually fills with water and can impact upon farmland,*

*public roads and bridges. It is necessary, therefore, to develop means of overcoming these adverse effects. In the past, this has been achieved by implementing a regime for the opening of the lagoon. In considering whether opening should occur impacts upon the wildlife and indigenous vegetation values of the wetland need to be taken into account”.*

The status of the lagoon as a major component of the wider Awarua Wetland complex and as a nationally and internationally significant area for biodiversity is understood. The purpose of the opening regime to maintain and restore the ecological health and cultural values of the lagoon ecosystem seeks to recognise its importance. It is acknowledged that lowering the levels of the lagoon will also lower the levels of water within the fringing wetlands and wetlands of the wider Awarua Wetland complex. However the lowering of water levels is temporary, and the purpose is to protect and restore the lagoon, rather than for land drainage.

Therefore, the application seeks to protect the intrinsic values of ecosystems, and to protect these significant areas and values, consistent with the objectives. No significant adverse effects are anticipated, and the effects of the activity are positive for the health of the lagoon.

### **10.7.3 Tangata Whenua Values**

Objective 5.6.1 seeks to recognise and provide for the cultural, spiritual and traditional values and uses of Ngai Tahu, Policy 5.6.1 seeks that regard be had to kaitiakitanga, and Policy 5.6.4 seeks to protect the characteristics of the CMA of special value to tangata whenua.

The cultural spiritual and traditional values of Ngai Tahu and Awarua Rūnanga are recognised and provided for. Regard is had to kaitiakitanga, as Awarua Rūnanga are a partner to the application, and the application seeks to protect the ecological and cultural values of the lagoon. The characteristics of the CMA within Toetoes Bay are of value to Awarua Rūnanga, and although there will be temporary discharges of lagoon water into coastal water, adverse effects are considered to be minor, acceptable and short-term.

### **10.7.4 Seabed and Foreshore**

Objective 10.1.1 seeks to avoid, remedy, or mitigate the adverse effects of disturbance

to the seabed or foreshore. Policies 10.1.3 seeks to avoid, remedy, or mitigate the impacts of excavation and drainage activities on the environment. Policy 10.1.4 seeks to avoid, remedy, or mitigate adverse effects of the construction of artificial watercourses including drains in the coastal marine area. Policy 10.1.5 provides for excavation which has minor effects on the foreshore and seabed. Policy 10.1.6 promotes appropriate practices associated with drainage works.

As outlined in the assessment of effects in Section 9, adverse effects associated with the disturbance of the CMA during each opening event will be short term as it will be allowed to naturally close, and adverse effects will be no more than minor. The proposed conditions will put appropriate practices in place to manage these effects.

### **10.7.5 Conclusion Regarding the Provisions of the Regional Coastal Plan**

Overall, the activity is consistent with, and not contrary to the objectives and policies of the Regional Coastal Plan. Adverse effects will be appropriately managed, the opening regime is necessary for the protection of lagoon values, consistent with the principal of kaitiakitanga, and the values of mana whenua are recognised, provided for and protected.

## **10.8 Te Tangi a Taurira**

Section 104(1)(c) of the Act requires that regard be had to any other matter the consent authority considers relevant and reasonably necessary to determine the application. An assessment of this application against the relevant provisions of Te Tangi a Taurira the Ngai Tahu ki Murihiku Natural Resources and Environmental Iwi Management Plan has been undertaken in accordance with section 104(1)(C) below.

Section 3.6 Te Ākau Tai Tonga – Southland’s Coastal Environment seeks to ensure consistency with the policies as outlined in the New Zealand Coastal Policy Statement, with respect to protection, development and use of Southland’s coastal environment.

As assessed in Section 10.3 above, the application is consistent with the provisions of the NZCPS and seeks to protect the coastal environment of the Waituna Lagoon from water quality degradation that would adversely affect ecological and cultural values.

Policy 3.6.2.1 requires *“that all decisions related to coastal land use and development*

*activities within Southland's coastal environment recognise and give effect to the spiritual and historical association of Ngāi Tahu ki Murihiku within the coastal environment".*

This application is prepared in partnership with Awarua Rūnanga and cultural values, including spiritual and historical associations with the lagoon and coastal environment, have informed the preparation of the application.

Policy 3.6.2.8 requires that an assessment of environmental effects includes an assessment of the cultural effects and potential cumulative effects on the natural character of the coastal environment.

Adverse effects on natural character are assessed above and although there will be short term disturbance to the lagoon, Waituna Bar and the CMA during each opening, the activity will protect the long-term natural character values of the coastal environment by protecting the lagoon from water quality degradation and algal bloom, from poor light at high water levels, and protecting migratory species.

Policy 3.6.7 regarding coastal water quality encourages agencies and developers to adopt best practice when undertaking coastal protection so as to avoid any unnecessary discharge to coastal waters.

As a co-applicant to the resource consent application, Awarua Rūnanga have worked in partnership with DOC and Environment Southland on the application, and are supportive of opening the lagoon in accordance with the application purpose. As the proposed opening regime is to maintain and restore the ecological health and cultural values of the lagoon ecosystem, discharges to coastal water during lagoon openings are necessary to protect ecological and cultural values, and accord with the intent of this policy.

Policy 3.6.13.1 seeks to avoid coastal activities that may disturb or have a detrimental impact on areas of significant vegetation and habitats.

Although opening the lagoon will result in short term disturbance at the opening site, the activity will have positive effects on significant vegetation and habitats. Opening to protect ecosystem health is consistent with this policy, and opening for fish passage will enable the passage of indigenous migratory species, necessary to sustain and protect the biodiversity of the lagoon.

Policy 3.7.1.7 regarding the retention of natural vegetation, habitat and fauna, seeks to encourage continued joint management arrangements and programmes between Ngāi Tahu ki Murihiku and other agencies with respect to vegetation clearance, restoration and enhancement.

As this application has been prepared as a partnership between Awarua Rūnanga, DOC, and Environment Southland, and seeks an opening regime to maintain and restore the ecological health and cultural values of the lagoon ecosystem, the proposal is consistent with the above policy.

## 10.9 Southland Murihiku Conservation Management Strategy

Section 104(1)(c) of the Act requires that regard be had to any other matter the consent authority considers relevant and reasonably necessary to determine the application. The CMS describes the conservation values present in Southland, and provides a vision, policies and outcomes to be achieved on public conservation land.

The CMS identifies the Waituna Wetlands Scientific Reserve with the Awarua Place, with the description in Section 2.8 referring to the pressures and values of Waituna Lagoon:

*“There are a number of pressures on this internationally significant wetland complex, largely as a result of human modification and intensification of agriculture within the catchment. This is of particular concern around the Waituna Lagoon, where sediment and nutrient inputs are increasing algal growth and impacting on the aquatic indigenous plant communities, as well as degrading water quality....*

*The Waituna Lagoon is a highly valued component of the Awarua wetland complex and is home to a number of threatened and at risk indigenous species, such as the Nationally Vulnerable Pygmy clubrush, the Declining tufted hair grass and swamp nettle, and the Naturally Uncommon native musk, as well as important beds of the aquatic plants *Ruppia megacarpa* and *R. polycarpa*. The name ‘Waituna’ means ‘water of eels’, which highlights the value of the lagoon both as a mahinga kai/moana gathering site and as indigenous fish habitat.... Furthermore,*

*Waituna Lagoon is an important brown trout fishery in Southland Murihiku.*

*The Waituna Lagoon is opened periodically to the sea, resulting in dynamic switches between freshwater and estuarine environments, which constantly change and influence the aquatic communities found within the lagoon. It is an important interface and link between the coastal environment and the freshwater network of streams and channels. It is essential that the Department works with Ngāi Tahu and the community, particularly adjoining landowners and relevant agencies, to ensure the protection and use of this Place”.*

Policy 2.8.1 seeks to manage the Awarua Wetland of International Importance to maintain the criteria for which it was nominated under the Ramsar Convention and New Zealand’s obligations under the Convention. Policy 2.8.2 seeks to protect the Awarua wetland complex and the water quality of the Waituna Lagoon, by working with Ngāi Tahu, landowners, the community and other agencies.

The application has been prepared as a partnership between Awarua Rūnunga, DOC and Environment Southland, is supported by Ngāi Tahu, and engagement has occurred and will continue to occur with landowners via the LWCA and with other parties. The application accords with these policies and the outcomes to be achieved in the CMS for the lagoon and Awarua Wetland Complex.

## **10.10 Conclusion Regarding the Assessment of Statutory Provisions**

Overall, the application is considered to be consistent with, and not contrary to the provisions of the NZCPS, NPSFM, NPSIB, RPS, SWLP, Coastal Plan, Te Tangi a Tauria, and the CMS:

- In accordance with s104(1)(b)(iii) and (iv), the application is consistent with and not contrary to the NPSFM, NZCPS and NPSIB as it seeks to prevent further water quality degradation, protect its ecological health and intrinsic values, and its landscape and natural character values. It meets the purpose of Te Mana o te Wai, and the purpose of maintenance and restoration under the NPSFM.

- In accordance with s104(1)(b)(v) and (vi), the application is consistent with and not contrary to the provisions of the RPS, SWLP and the Coastal Plan for the same reasons.
- In accordance with s104(1)(c), regard is had to Te Tangi a Tauria the Ngai Tahu ki Murihiku Natural Resources and Environmental Iwi Management, and the CMS. Awarua Rūnanga is a partner to the application, and the applicants have a shared interest and duty as kaitiaki to protect the ecological and cultural health of the lagoon, consistent with its status as a Ramsar Site and Scientific Reserve. The co-applicants have engaged, and will continue to engage with those with an interest in the application and lagoon.

## 11 Discharges to Land and Water

Under section 107 of the RMA, the consent authority must not grant a discharge permit allowing the discharge of a contaminant into water, or a discharge of a contaminant into land in circumstances that may result in that contaminant entering water, if, after reasonable mixing, the contaminant discharged is likely to give rise to all or any of the following effects in the receiving waters:

- The production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
- Any conspicuous change in the colour or visual clarity;
- Any emission of objectionable odour;
- The rendering of fresh water unsuitable for consumption by farm animals;
- Any significant adverse effects on aquatic life.

As outlined in the AEE, other than a short period where the plume will be visible, the adverse effects described Section 107 are not anticipated to occur as a result of the proposed activity. The proposed openings will result in the discharge of water from a coastal lagoon into the sea. This will cause a visibly discoloured plume initially as the lagoon is opened and drainage of lagoon water occurs.

This effect is temporary and once the lagoon level stabilises, fresh water from the Waituna catchment will flow through, mixing with coastal water, and discharge into Toetoes Bay through the opening. It may still cause a visible plume, but it should not

persist beyond reasonable mixing, will not result in any significant effects on aquatic life or other CMA values, and will dissipate once the lagoon naturally closes. Effects on aquatic life within the lagoon as a result will be positive.

Adverse effects on coastal water quality are therefore considered to be temporary and no more than minor.

## 12 Section 104D

The application is a non-complying activity. Accordingly, an assessment in terms of section 104D of the RMA is required, whereby a consent authority may grant a resource consent for a non-complying activity only if it is satisfied that either:

- a) the adverse effects of the activity on the environment will be minor; or
- b) the activity will not be contrary to the objectives and policies of the relevant plan and proposed plan.

As concluded in Section 9 above, the effects of the opening regime are largely positive, with adverse effects being minor and temporary in duration. Section 10 above, concludes that the proposal is not contrary to the relevant objectives and policies of the statutory documents. Accordingly, the proposal meets both limbs of s104D and is eligible for approval.

## 13 Part 2 Resource Management Act

The Court of Appeal decision in *R J Davidson Family Trust v Marlborough District Council* has influenced the way in which Part 2 should be assessed. In circumstances where an RMA Plan has been “*prepared having regard to Part 2 and with a coherent set of policies designed to achieve clear environmental outcomes*” the Court envisaged that “*the result of a genuine process that has regard to those policies in accordance with s104(1) should be to implement those policies*”. Reference to Part 2 would not add anything, and “*could not justify an outcome contrary to the thrust of the*



*policies*". The majority of planning documents, against which this application is assessed, have been prepared with a coherent set of policies designed to achieve clear environmental outcomes.

However, for completeness, an assessment of the application against Part 2 is provided below.

The purpose of the RMA is to promote the sustainable management of natural and physical resources. The RMA defines "sustainable management" as:

*"...managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural wellbeing and for their health and safety while –*

- a) Sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and*
- b) Safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and*
- c) Avoiding, remedying, or mitigating any adverse effects of activities on the environment".*

Part 2 provides further direction on the matters of national importance (s6), other matters (s7), and the principles of Te Tiriti (s8):

- In accordance with s6(a), the natural character of the coastal environment and lagoon will be preserved as although there will be some short-term disruption to the CMA, beach, and to lagoon levels, the openings are to protect submerged plants from poor light at high water levels, to respond to poor water quality events, and to provide fish passage, which would otherwise adversely affect natural character values without intervention;
- In accordance with s6(b), outstanding natural feature and landscape values will be protected. Although there will be some short-term disruption to the CMA, beach, and to lagoon levels, the application protects outstanding landscape values for the same reasons as in 6(a) above;

- In accordance with s6(c), the proposed opening regime is necessary to protect significant indigenous vegetation and significant habitats of indigenous flora and fauna. Opening the lagoon to protect submerged plants from poor light at high water levels, to respond to poor water quality events, and to provide fish passage will support and protect biodiversity values;
- In accordance with s(e), the relationship of Māori and their culture and traditions with their ancestral lands, water, sites, wāhi tapu, and other taonga has been recognised and provided for. As a co-applicant, Awarua Rūnanga support the application, and the lagoon opening will protect cultural values including taonga species;
- In accordance with s7(a) kaitiakitanga, and the ethic of stewardship with s7(aa), the opening regime has regard to kaitiakitanga by enabling the applicants to exercise guardianship for the protection of ecological and cultural values;
- In accordance with s7(d), the proposal has particular regard to the intrinsic values of ecosystems as opening the lagoon to the sea will improve water quality for the protection of ecological values, and to provide fish passage;
- In accordance with s7(f), the proposal will have regard to the quality of the environment as transitioning to a more ecologically optimal regime over time whilst opening the lagoon to the sea to improve light for submerged plants, for water quality and to provide fish passage, will improve the environmental quality of a nationally and internationally significant lagoon with deteriorating health; and
- In accordance with s8, the applicant's approach to the preparation of the application is consistent with the principles of the Te Tiriti, including those of partnership, protection and participation.

Overall, the proposal is considered to be consistent with the sustainable management purpose and principles of Part 2 of the RMA. It seeks to protect natural character and landscapes, significant indigenous biodiversity, and the relationship of Māori and their culture and traditions with their ancestral lands, water and taonga. The proposal is in accordance with the ethic of kaitiakitanga, recognises and provides for the intrinsic values of the lagoon, has regard to environmental quality and the partnership, protection and participation principles of Te Tiriti.

# 14 Conclusion

The resource consents sought on behalf of Awarua Rūnanga, DOC, and Environment Southland will enable the periodic opening of the Waituna Lagoon to maintain and restore the ecological health and cultural values of the lagoon ecosystem.

A history of lagoon openings and nutrient and sediment inputs associated with land use in the catchment have affected the lagoon's ecology and water quality. The application seeks to transition the management of water levels within the lagoon to a more ecologically optimal opening regime over a 20-year term.

The proposal utilises a combination of water level, ecological, and fish passage triggers and thresholds to guide lagoon openings. The proposal takes an integrated management approach, informed by scientific analysis of water quality, submerged plants, and indigenous species values, and an understanding and application of cultural values, coastal values, recreation values, and land use values.

This application is in accordance with Te Mana o te Wai, and is wetland restoration and maintenance under the NPSFM; and contributes to the restoration of te hauora o te taiao, te hauora o te wai, and te hauora o te tangata as required by the SWLP.

The application will have positive effects on the mauri and health of the wai and lagoon, and adverse effects are considered to be minor and temporary in duration.

The application is consistent with and not contrary to the relevant provisions of the NZCPS, NPSIB, NPSFM, RPS and SWLP, along with Te Tangi a Taurira and the CMS. The application is also considered to be consistent with the sustainable management purpose of Part 2 of the RMA.

In addition to the consultation undertaken to date, given public interest in the application, full public notification is requested. This will enable anyone with an interest in the application to submit their views.