Tārerekautuku Yarrs Lagoon

Te Mahere Whakahaere/Draft Reserve Management Plan

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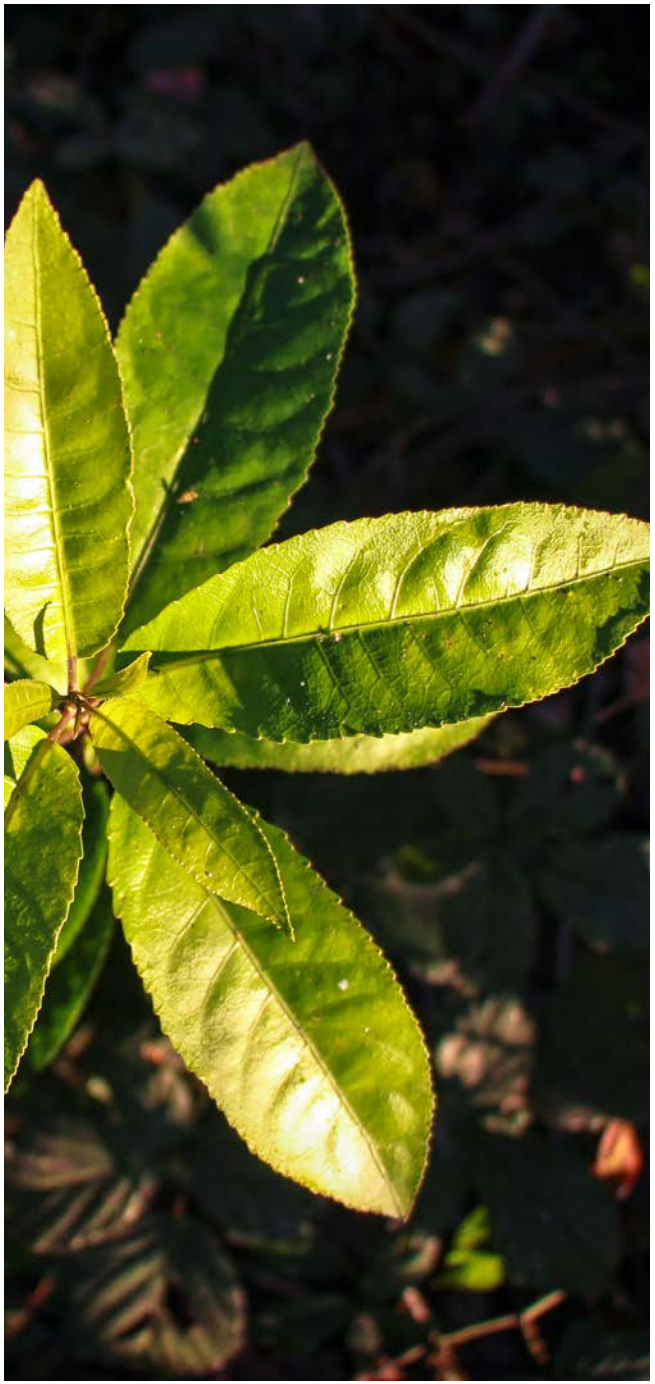
Selwyn DISTRICT COUNCIL

Mihi to be developed by Taumutu Rūnanga



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Special thanks to:

Cr Murray Lemmon
Cr Malcolm Lyall
Mike Bowie
Peter Almond
Sefeti Erasito
Les Wanhalla
Lindsay Barker
Jason Butt
Stephen Espiner
Kerri-Anne Jones
Neville Jones
Robin Smith
Akika Takada
Flora Wang
Denise Ford
Ralph Scott
Murray Tyson
Everard Moorehead
Andrea Gort
Doug Gort
Andrew Causer
Julie Causer
Dave Anderson
Allan Johnston
William McCormick
Julian Twiss
Lou Drage
Stu Sinclair
Tom Weston
Margaret Egan
Lynette Harris

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Boffa Miskell Limited:
Scott Hooson
Craig Pauling
Katie Noakes
Deborah Rowe

Selwyn District Council:
Derek Hayes
Andy Spanton

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Tārerekautuku Yarrs Lagoon is a 76.9 ha site administered by the Selwyn District Council. It is located within the middle reaches of the Ararira/LII River between Lincoln township and Te Waihora Lake Ellesmere.

Tārerekautuku Yarrs Lagoon was formerly an open water wetland surrounded by low-lying swamp and a key mahinga kai (food gathering) site for Ngāi Tahu. Following European settlement, the Ararira catchment, including the Lagoon, was drained for agriculture and the development of townships. Land drainage practices, along with land clearance resulted in the lowering of the water table and the transformation of the open water 'lagoon' to swamp and marsh wetland habitat. The vegetation of the reserve is now dominated by introduced grey and crack willow, along either side of the main stem of the Ararira/LII River, while the surrounding land is almost entirely cultivated paddocks and pasture.

Despite this modification, the reserve is now one of the largest contiguous freshwater wetland habitats remaining in the Low Plains Ecological District. It supports a high diversity of indigenous wetland plant species, provides habitat for nationally at risk and locally uncommon plant, bird and lizard species and supports one of the largest remaining mānuka populations on the Canterbury Plains. It has been identified as a site with high potential for enhancing its ecological, cultural and recreational values.

Recognising the existing, and potential value of Tārerekautuku Yarrs Lagoon, the Council and Living Water[1], identified the need to develop a comprehensive management plan for the reserve to guide its future management. The development of a management plan for Tārerekautuku Yarrs Lagoon Reserve was also identified as an output of the Council's Open Space Strategy. In 2016, Living Water engaged Boffa Miskell Ltd to prepare a scoping report to inform the development of a Reserve Management Plan (management plan, or plan).

The purpose of this management plan is to ensure a strategic approach to the restoration and management of the reserve, through a clear vision, and objectives and policies that are reflective of a common understanding of how the reserve will be managed. It is intended that this plan be considered a living document that may need to be updated from time to time in response to changing circumstances.

To ensure the various interests of all organisations and groups with an interest in Tārerekautuku Yarrs Lagoon have been addressed, the Council has worked closely with the Tārerekautuku Yarrs Lagoon Landcare Group, adjacent landowners, manawhenua, the wider community, the LII Drainage Liaison Committee (LII DLC), Living Water and a number of agencies and other stakeholders during the development of this plan.

1. A partnership between the Department of Conservation (DOC) and the Fonterra Co-operative Group Limited (Fonterra).

1.1. Kaupapa/Purpose

This management plan has been prepared by the Council under the Reserves Act 1977 to assist with the ecological restoration and management of Tārerekautuku Yarrs Lagoon.

The plan is guided by the following vision and objectives:

Tārere wai
Tārere tāngata
Tārere kautuku

The water flows strongly; the people thrive; and the bittern soars high.

The above vision encapsulates the three key inter-dependent elements of water, people and ecology, and the importance of providing for each of these through the management plan in order to achieve the following objectives for Tārerekautuku Yarrs Lagoon Reserve:

Whakahaumanutia ngā koiora reporepo – restoration of indigenous wetland habitat, flora and fauna;

Whakarawea ngā mahi a te rēhia mō ngā tāngata – providing a special place for people to enjoy;

Whakamanahia te mauri o ngā waipuna, ngā repo me ngā arawai – managing and enhancing freshwater springs, wetlands and waterways.

All policies, implementation methods, and actions in this plan are underpinned by the vision and aim to support the achievement of the objectives.

1.2. Te Whakatakotoranga/Plan structure

This management plan is structured as follows:

- Section 1.1 sets out the vision and objectives for the management of the reserve, and the outcomes the plan is seeking to achieve;
- Section 1.3 sets out the steps involved in the development of the plan;
- Section 1.4 (and Appendix 1) outlines the roles and management responsibilities of the stakeholders with an interest in the management of the reserve;
- Section 1.5 (and Appendix 2) provides an overview of the relevant legislative and policy framework context;
- Section 2.0 provides a summary of the background information of relevance to the management of the reserve;
- Section 3.0 summarises the values of Tārerekautuku Yarrs Lagoon Reserve, including its cultural, ecological, hydrological, recreational and educational values;
- Section 4.0 addresses the proposed management approach to the key issues of relevance to the reserve: governance and management, the reserve's status and boundaries; water and hydrology; ecological restoration; willows, other plant pests, animal pests and stock, and recreation and public access;
- Section 5.0 outlines how the management plan will be implemented and includes an action plan that sets out the management priorities for the reserve; and
- Section 6.0 details the mechanisms by which the management plan will be monitored and reviewed.

1.3. Te Whanaketanga/Development of the plan

To guide the preparation of this plan, the Council has worked with adjacent landowners, manawhenua, the wider community, the LII DLC, other stakeholders and agencies through the Tārerekautuku Yarrs Lagoon Landcare Group. The members of the Landcare Group include representatives from:

- Neighbouring landowners;
- Selwyn District Council;
- Te Taumutu Rūnanga;
- Te Rūnanga o Ngāi Tahu
- Department of Conservation (DOC) and the Living Water Partnership;
- Environment Canterbury;
- The LII Drainage Liaison Committee (LII DLC);
- Lincoln University (staff and students);
- Waihora Ellesmere Trust (WET); and
- Lincoln Envirotown Trust (LET).

The plan's development involved background research, site visits and a series of hui to understand, discuss and agree on the key issues and options for the management of the reserve. To develop the plan, Selwyn District Council engaged Boffa Miskell Ltd to manage a process that would satisfy the requirements of the Reserves Act.

Public notification

The formal process commenced on 14 August 2018 with the publication of a notice of intent to prepare a Reserve Management Plan, which was publicly notified for a one month period via Council's website and social media and in local newspapers. The public notice called for written suggestions to inform the development of the plan. Key agencies and stakeholders were also emailed ahead of the public notice to inform and invite them to be involved in the process.

Following the public notice, written suggestions were received from Living Water, a member of the local community and a fisherman. Matters raised in the written suggestions highlighted the areas ecological significance and its importance for passive recreation. Key issues identified were the need for removing the willows, protecting and restoring indigenous wetland vegetation and fauna, improving public access and retaining the feeling of solitude.

Site visits and hui

A series of meetings and site visits were held with the Landcare Group to discuss people's aspirations for the reserve, as well as management issues and opportunities from which the vision, objectives and policies for the plan were developed.

This included the following:

- 13 February 2018 – Initial Public Meeting: To ascertain stakeholder interest in the future management of Tārerekautuku Yarrs Lagoon and to introduce the idea of forming a Landcare Group, to inform the development of this management plan.
- 27 March 2018 – Landcare Group Meeting 1: This meeting provided an outline of the reserve management plan process, the intent to develop a reserve management plan for Tārerekautuku Yarrs Lagoon, and the aspirations and vision for the reserve.
- 24 April 2018 – Landcare Group Meeting 2: This meeting focussed on the reserve's management issues and opportunities.
- Site visits were held on Thursday 14 June and Saturday 16 June 2018. The site visits were open to all those who attended the Landcare Group meetings and provided an opportunity to have informal discussions about the management issues and opportunities at the reserve.

In addition to the above, Council staff have also met separately with neighbouring landowners to inform the development of this management plan

1.4. Tūnga me te Kawenga/roles and management responsibilities

There are numerous individuals, agencies and other stakeholders with an interest in the management of the reserve (Figure 1, below).

More detailed information on the roles and management responsibilities of each of these stakeholders is provided in Appendix 1.

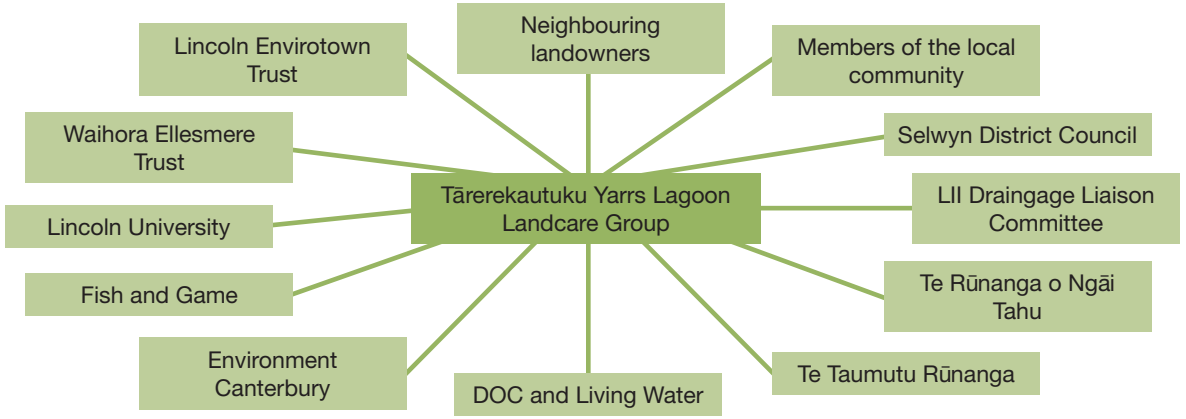

Figure 1: Stakeholders with an interest in the management of the Tārerekautuku Yarrs Lagoon Reserve.

1.5. Tuhinga-ā-ture/Legislative and policy framework

This document is a Reserve Management Plan for Tārerekautuku Yarrs Lagoon. It has been developed to enable the Council and the Tārerekautuku Yarrs Lagoon Landcare Group to undertake the enhancement of indigenous wetland habitat, freshwater springs and waterways, and associated flora and fauna, and to provide for, and encourage appropriate recreational activities.

The Reserves Act, and several other statutes, plans and policy documents have a relationship to this management plan. The key legislation and documents are shown in Figure 2 and listed below. Their relationship to management outcomes for Tārerekautuku Yarrs Lagoon are described in more detail in Appendix 2.

Key legislation

- Reserves Act 1977
- Resource Management Act 1991
- Conservation Act 1986
- Ngāi Tahu Claims Settlement Act 1998 and Deed of Settlement 1997.

Planning documents, strategies and policies

- Te Rūnanga o Ngāi Tahu Freshwater Policy 2001
- Te Taumutu Rūnanga Natural Resource Management Plan 2003
- Mahaanui Iwi Management Plan 2013
- Canterbury Regional Policy Statement 2013
- Canterbury Land and Water Regional Plan
- Canterbury Regional Pest Management Plan 2018–2038
- Selwyn District Plan 2016
- Selwyn District Council Open Spaces Strategy 2015.

Operational plans and bylaws

- Te Waihora Joint Management Plan 2005
- Selwyn District Council Stormwater and Drainage Bylaw 2018
- Canterbury Regional Code of Practice for Defences Against Water and Drainage Schemes 2015.

Figure 2: Key Legislation, Planning Documents, Strategies, Policies, Operational Plans and Bylaws that are of relevance to the Reserve Management Plan.

2.0 Te Horopaki/Context

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This section (Boffa Miskell 2017) provides contextual information on the background and history of Tārerekautuku Yarrs Lagoon.[2]

2.1. Location

Tārerekautuku Yarrs Lagoon is a 76.9 ha site administered by the Council. It is located within the middle reaches of the Ararira/LII River between Lincoln township and Te Waihora/Lake Ellesmere (Figure 3). It lies within a block of land bounded by Goodericks, Englishs, Carters, Yarrs, Pannetts, Powells and Days Roads.

2.2. The reserve's name

Tārerekautuku is the traditional name of Yarrs Lagoon – a former wetland area and waterbody of cultural significance to Ngāi Tahu. The name Tārerekautuku has a number of interpretations, with 'tārere' meaning to flow copiously (potentially referring to the springs and flow of water), while 'kautuku' is one name for the brown bittern, a native bird that inhabits swamps. Bittern now have a conservation status of 'Threatened – Nationally Critical' and are known to inhabit raupō wetlands around Te Waihora.

2.3. History/Heritage

Kōrero Manawhenua/Māori history

Tārerekautuku is known as a key mahinga kai (food gathering) site for Ngāi Tahu.

In 1880, Ngāi Tahu elder Wiremu Te Uki described Tārerekautukuas being 'a village, a place of food production and a proper fortification'. He also listed the following mahinga kai species as being gathered there: tuna (eel), koareare (the edible rhizome of raupō/bullrush), koukoupara (bullies), mawehe (kōaro), pārera (grey duck), pūtakitaki (paradise duck), pākura (pukeko), whio (blue duck), kaaha (shag) and aruhe (bracken fern root) (Taiaroa H.K, 1880).

As well as being an important mahinga kai area, Tārerekautuku Yarrs Lagoon was also the site of a former kāinga or settlement, which linked to a network of other settlements and mahinga kai sites across both Kā Pākihi Whakatekateka o Waitaha/the Canterbury Plains and Te Pātaka o Rākaihautū/Banks Peninsula. This included those along the Ararira/LII, Waikirikiri/Selwyn and Huritini/Halswell Rivers, as well as those around Te Waihora/ Lake Ellesmere. There is also a reference to the area being referred to by Māori as Wakaipa.

Tārerekautuku, (also referred to as 'Springston South' by early European settlers) was one of two key waterbodies within the Ararira/LII catchment. The other, called Makonui or Clay Bar Lagoon, was located further towards Lincoln and was also known as 'Springston North'. Both of these sites were significant to Ngāi Tahu for the mahinga kai species they provided, and for the linkages they provide to the wider network of food gathering and settlement sites noted above. The locality surrounding Tārerekautuku is known as Springston South, which was also called by the Māori name of Wakaipa.

The wider Ararira/LII River catchment is also of cultural significance to Ngāi Tahu. Originally, the Ararira/LII was sourced from a spring near the current township of Lincoln and flowed towards Makonui/Clay Bar Lagoon where it entered an extensive raupō and harakeke wetland that in turn flowed into Tārerekautuku Yarrs Lagoon. From here, the Ararira flowed towards the lake, entering just east of the Waikirikiri/Selwyn river mouth (refer to Figure 4).

2. The Scoping Report can be referred to for more detail.

Figure 3: Location plan

The values of Tārerekautuku and the remaining features of the reserve continue to be significant to local Ngāi Tahu, in particular the local hapū of Ngāi Te Ruahikihiki based at Taumutu. Ngāi Te Ruahikihiki are involved in the ongoing management of the area via Te Taumutu Rūnanga and their relationships with the Selwyn District Council, Environment Canterbury and the Department of Conservation as well as Te Rūnanga o Ngāi Tahu.

European history

Along with much of the Te Waihora/Lake Ellesmere catchment, following the 1848 Crown purchase of Canterbury from Ngāi Tahu, and European settlement of the area from the 1850s, the Ararira catchment, including Tārerekautuku Yarrs Lagoon and its associated wetlands, was drained for agriculture and the development of townships (Taylor, 1996). As a result, most of the indigenous grasslands and shrublands were cleared (Golder Associates 2015).

The construction of the extensive drainage network in the catchment, which aimed to drain the lower lying areas in the catchment for farming, began around the 1850s (Singleton 2014). Mechanical dredging of the Ararira/LII began in the 1940s (Parker and Grove 2013) and has continued to the present day.

Early survey maps (Figure 4) show the Ararira River broken into several parts, with a defined upper portion (called the LI River), flowing into a large harakeke/raupō swamp, and then a lower section (called the LII or No.2 River) flowing into Tārerekautuku Yarrs Lagoon and on to Te Waihora/Lake Ellesmere. Makonui or Clay Bar lagoon is most likely the small waterbody at the end of the L1 or start of the L11 River. The former open water body of Tārerekautuku is clearly seen on these maps, as well as the former upper level of Te Waihora. Information from Council minutes and reported in newspapers from the 1870s, describes how both Tārerekautuku and Makonui were drained and modified as well as the details of the LI and LII drainage scheme, approved in 1945.

Figure 4: 1850 map showing Tārerekautuku Yarrs Lagoon as an open body of water surrounded by wetland. Sourced from the 1850 trigonometrical survey of Christchurch.

Land drainage practices, along with land clearance, have resulted in extensive lowering of the water table and the transformation of Tārerekautuku Yarrs Lagoon from an open water 'lagoon' to a swamp-marsh wetland (Parker and Grove 2013) with a central water channel (the Ararira/LII) through its centre. It is now dominated by willow forest and surrounded by farmland.

2.4. Land status

Tārerekautuku Yarrs Lagoon was originally identified by Ngāi Tahu as a mahinga kai area during the 1879 Smith-Nairn Commission that was established to investigate breaches arising from the 1848 Crown Purchase of Canterbury. Under the purchase, Ngāi Tahu were guaranteed ongoing access to their places of residence and food gathering, but immediately after 1848 issues arose around how this was interpreted and implemented. As part of this, the tribe's claim to the lagoon as a mahinga kai were not upheld, and it was instead later set aside as a sanctuary for native and imported game species in 1904 under the 1880 Animals Protection Act, and then made a formal reserve of 190 acres in 1905.

The reserve was later vested in Council under the Public Reserves and Domains Act 1908, and then under the Springs County Reclamation and Empowering Act 1915 (Appendix 3), which provided powers to:

"to reclaim Parts of a Lagoon, commonly known as Yarr's Lagoon, in the County of Springs, for the Purpose of improving the Flow of the L 1 River through the said Lagoon and the Drainage of the Adjoining Lands."

Reclamation and drainage had been discussed by the Springs County Board as early as 1876.

In 1925 and 1929, Yarrs Lagoon was again declared a sanctuary for native and imported game, this time under the Animals Protection and Game Act 1921 – a status that remained until 1957 when it was revoked under section 14 of the Wildlife Act 1953. Following this, the reserve reverted to local work reserve under the Public Works Act 1908.

The Reserve (RES3706) is now administered by the Council and has been managed as a Local Purpose Reserve under the Reserves Act (1977). However, it appears from communication between DOC and the Council that confirmation of the status of the reserve is not straight forward, as it involves an interpretation of the original gazette notice and specific legislation which isn't unequivocal. The original gazette notice vests the land with the Council, but doesn't say whether it is as a reserve, or a fee simple title.

In August 2018, the Council engaged WSP Opus to investigate the status of Tārerekautuku Yarrs Lagoon. The findings of this investigation concluded that the Tārerekautuku Yarrs Lagoon was indeed held by the Council, but as a local work reserve subject to the Public Works Act 1981.

2.5. Adjoining properties and land-uses

Tārerekautuku Yarrs Lagoon Reserve is predominantly surrounded by privately owned land (Figure 5). There are 14 different private properties that border the reserve[3] (comprised of 16 different land parcels). There are another five land parcels in public ownership including two unformed paper roads, the LII River Conservation Area and two areas of riverbed along the Ararira/LII River (up- and downstream of the reserve).

The land surrounding the reserve is almost entirely cultivated paddocks with pasture used for grazing domestic stock, including dairy cows, beef cattle and sheep. Some of the properties are lifestyle blocks and there are a number of residential dwellings. There are two small wood lots on a property on the north-eastern boundary of the property, and one property on the north-eastern boundary has willow forest that is continuous with the willow within the reserve, as well as two constructed ponds. Willow forest extends onto several other properties in a number of locations around the boundary of the reserve.

3. This includes the three landowners that border the paper road along part of the northern boundary of the reserve.

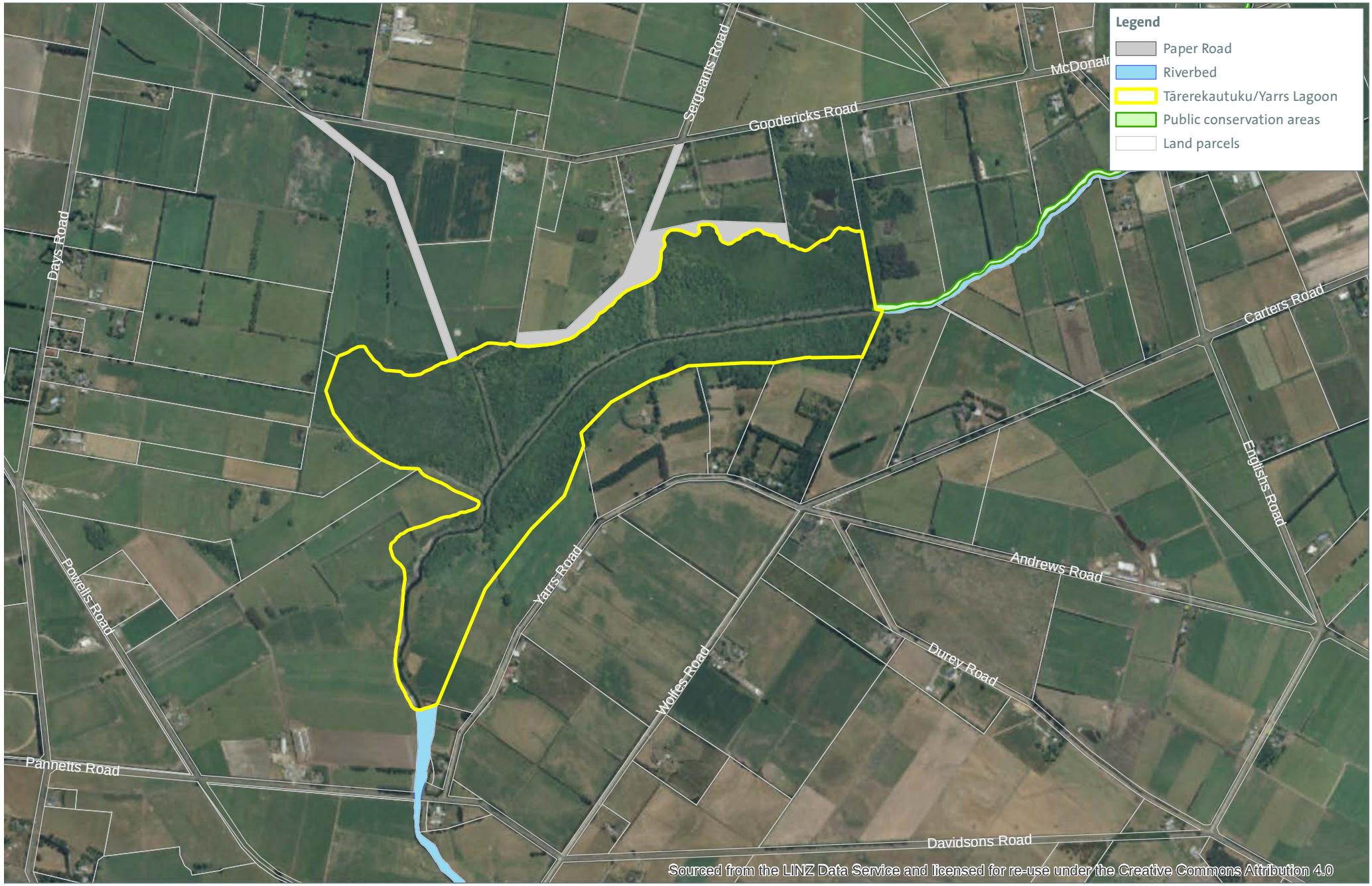

Figure 5: Adjoining landownership and status

3.0 Ngā Uara/Values

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The Scoping Report prepared by Boffa Miskell (Boffa Miskell 2017) provides detailed information on the values of Tārerekautuku Yarrs Lagoon. This section of the management plan provides a summary of the information regarding the values of the reserve that are relevant to its future management. The Scoping Report can be referred to for more detail.

3.1. Manawhenua cultural values

Despite having been drained, Tārerekautuku Yarrs Lagoon, and the current reserve which encapsulates the former lagoon bed, remains significant to Ngāi Tahu manawhenua. The area is known as a key mahinga kai (food gathering) site for Ngāi Tahu.

Through their ongoing environmental work and numerous policies in the Mahaanui Iwi Management Plan, manawhenua advocate for the protection and enhancement of remnant repo (wetlands) and puna (springs). They also support the restoration and development of functioning wetlands, and open waterbodies, that in-turn support mahinga kai values, and that can assist in retaining and treating water within the Te Waihora catchment.

The wider Ararira/LII River catchment, and the entire catchment of Te Waihora are also of high cultural significance to Ngāi Tahu, being the central area of the takiwā of Ngāi Te Ruahikihiki. The Ararira contains numerous mahinga kai and former settlement sites, all of which are part of a network of sites stretching around the lake to the main settlement of Taumutu in the south; up the Ararira and beyond to Tauwharekakahō/Rolleston and further to the Waimakariri and Kaiapoi to the north; across to the Waikirikiri/Selwyn River to the foothills of Kā Tiritiri o te Moana/the Southern Alps; as well as across the Huritini/Halswell River and in to ōtautahi/Christchurch and the key Ngāi Tahu settlements across Te Pātaka o Rākaihautū/Banks Peninsula.

Importantly, the reserve supports a number of surviving indigenous plant, bird and fish species that are taonga to Ngāi Tahu, as well as having the potential to provide for enhanced habitat for these taonga species and facilitating ongoing mahinga kai use. These species are listed in Appendix 4.

3.2. Ecological values

Former vegetation cover

The area of wetland surrounding Tārerekautuku Yarrs Lagoon was once part of a large area of low-lying swamp (approximately 4,000 ha) between the Rakaia and Waimakariri outwash fans (Parker and Grove 2013).

The original (pre-human) vegetation surrounding Tārerekautuku Yarrs Lagoon was likely to have been freshwater wetland vegetation characterised by sedgeland, rushland, raupō reedland, and lowland flax with small-leaved shrubs and kahikatea forest. In the wider area, kahikatea forest probably grew in poorly drained areas with deeper soils, while stable gravels would have supported kanuka forest, kowhai and cabbage tree treeland, matagouri shrubland and silver tussockland. Danthonia grassland is thought to have occupied more recently-deposited gravels (Stevens and Meurk 1996). The 1850 map (Figure 4) shows flax, raupō, toetoe and rushes in the immediate vicinity of the lagoon, with grasses, tussocks and ferns further afield.

Current wetland types and vegetation communities

Much of the present-day wetland is palustrine and riverine swamp, although there are smaller areas of riverine and palustrine marsh. Swamp habitats support willow dominated forest, treeland and scrub while the areas of marsh generally support rushland and wet exotic pasture. Terrestrial (dry) land occurs along the margins of the Ararira/LII River and the larger drains and supports exotic grassland (Parker and Grove 2013).

Introduced crack and grey willow trees dominate the canopy of Tārerekautuku Yarrs Lagoon (Figure 6). However, the reserve supports a range of wetland vegetation types and habitats including crack willow forest and treeland, grey willow forest and treeland, mixed crack willow-grey willow forest, mānuka-grey willow scrub, rushland, wet exotic grassland, terrestrial exotic grassland and open water. These vegetation types are shown in (Figure 8) and described in more detail in the scoping report. A full list of the plant species recorded within the reserve is provided in Appendix 5.

Botanical values

The vegetation communities and botanical values of Tārerekautuku Yarrs Lagoon Reserve are described in detail in Section 3.9 of the Scoping Report (Boffa Miskell 2017).

Tārerekautuku Yarrs Lagoon Reserve is an important habitat for several species that are either nationally, or locally rare. These include:

- Swamp nettle, which has a conservation status of At Risk – Declining (de Lange et al. 2018). The reserve is an important habitat for this species which is restricted to lowland swamps, lakes and river margins.
- Swamp buttercup, which is classified as Data deficient (de Lange et al. 2018).
- One of the largest remaining populations of mānuka on the Canterbury plains (Parker and Grove 2013) (Figure 7).
- Baumea, which is rare in the Canterbury region and close to its southern distributional limit here.
- A number of other species, including sapling matai, kahikatea and other native broad-leaved and hardwood tree species that are uncommon on the Canterbury plains.
- The spike sedge-wīwī-baumea rushlands, which are an uncommon vegetation type in the ecological district and support a number of native wetland species including *Carex flaviformis*, *Viola lyallii*, silverweed, swamp buttercup and centella that are also rare in the ecological district.

The extensive cover of grey and crack willow within the reserve.

The eastern mānuka stand. The mānuka is the darker coloured vegetation.

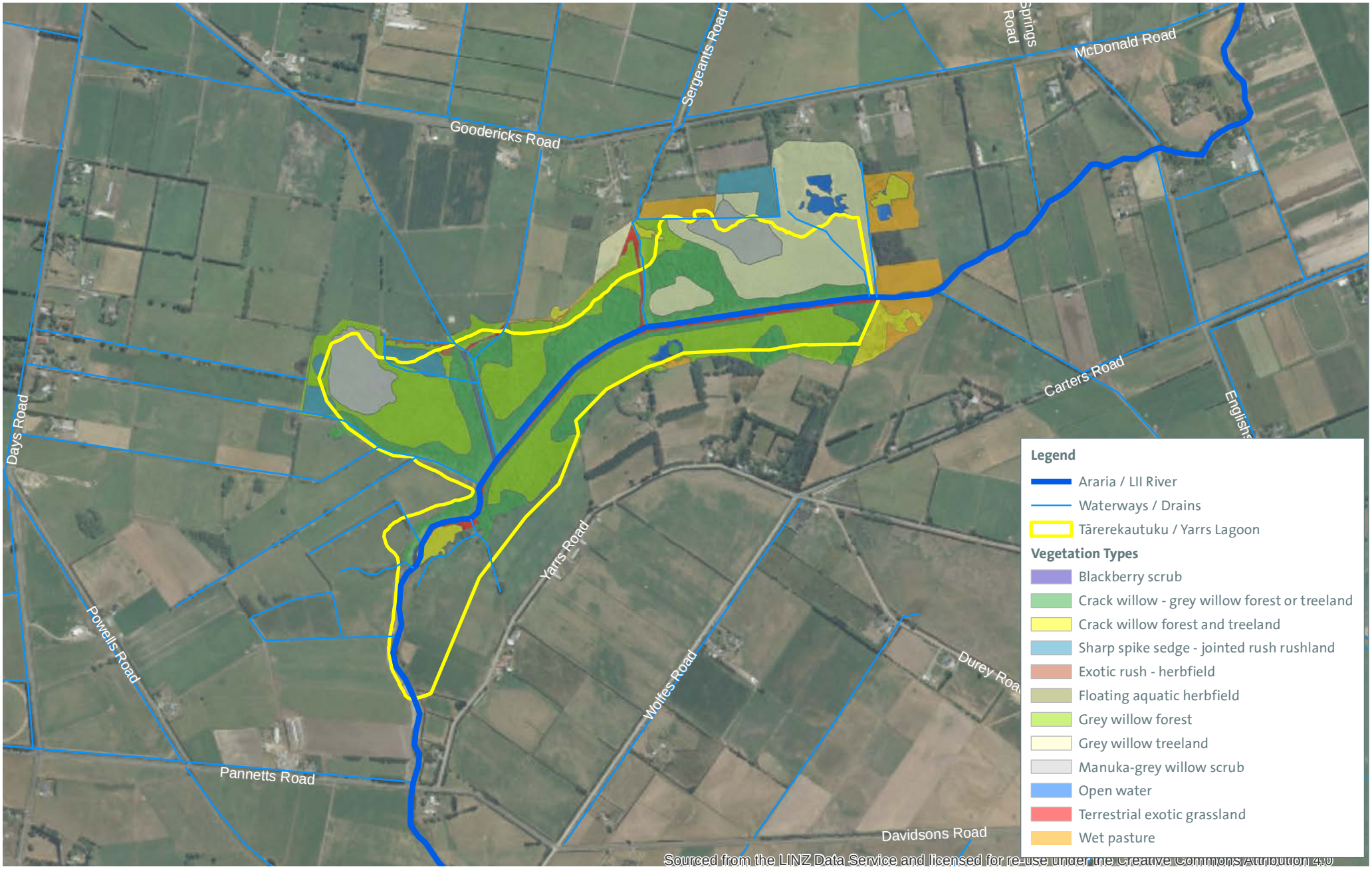


Figure 6: Location and extent of wetland vegetation communities within Tārerekautuku Yarrs Lagoon Reserve. Wetland vegetation classification data sourced from Environment Canterbury.

Birds

At least 26 bird species utilise habitats at Tārerekautuku Yarrs Lagoon and the habitats immediately surrounding it, including 12 indigenous species: kingfisher/kotare, marsh crake/koitareke, New Zealand scaup/pāpango, pūkeko/pākura, South Island pied oystercatcher/tōrea spur-winged plover, swamp harrier/kāhu, welcome swallow/warou and white-faced heron/mātuku. Silvereye and South Island fantail use the scrub and forest habitats within the reserve and other common native species such as grey warbler and bellbird are also likely to be present. Three species have a conservation status of nationally At Risk; marsh crake, South Island pied oystercatcher (both At Risk – Declining) and black shag (At Risk – Naturally Uncommon) (Robertson et al. 2017). A full list of the species recorded within the reserve is provided in Appendix 6. It is envisaged that habitat restoration will see a return of the Australasian Bittern/Matauku (or sometimes referred to as Kautuku), after which Tārerekautuku Yarrs Lagoon has been named.

Lizards

Southern grass skinks, an At Risk – Declining species (Hitchmough et al. 2016) have been found within the reserve (Bowie and Hutson 2016). The only other lizard species likely to occur within the reserve is McCann's skink, which has a conservation status of Not Threatened.

Terrestrial invertebrates

The fauna, including the terrestrial invertebrates, of Tārerekautuku Yarrs Lagoon Reserve was studied by Bowie and Hutson (2016) who used a range of sampling techniques during the summer months of 2016. The terrestrial invertebrate fauna was found to include weevils, beetles, spiders, snails, millipedes, flatworms, earthworms, ants, house flies and cave weta (a comprehensive list of the species recorded are provided in the appendices of Bowie and Hutson's (2016) report).

Eight species of carabid were collected from within the reserve and seven of these were within willow habitats. The discovery of *Megadromus ensyi* is of particular note, if the identification is correct, because this would be the most eastern record for this species. The authors concluded that, despite the dominance of exotic vegetation in the reserve, it still provides habitat for a diverse terrestrial invertebrate community that is typical of wetland habitats.

Freshwater fish

The Ararira/LII River and the waterways within the reserve have not been surveyed, so existing information on the aquatic fauna of the reserve is limited. However, there is information on the freshwater fish in the wider catchment.

The Ararira/LII catchment has a reasonably diverse range of fish fauna with nine native and three introduced species recorded (Golder Associates 2015). Introduced species recorded within the catchment are brown trout, goldfish and rudd. Of the indigenous species, one (pīharau/lamprey) has a conservation status of Threatened – Nationally Vulnerable and three others are classified as At Risk – Declining (Dunn et al. 2018). A list of the species recorded within the Ararira/LII catchment is provided in Appendix 7.

Historically, species such as longfin eel and other mahinga kai species were very abundant in the surrounding catchment. However, due to extensive habitat modification, a large decline in the abundance of these species has been observed (Golder Associates 2015).

It is likely that a range of fish species occur within the reserve's waterways, considering the close proximity to Te Waihora/Lake Ellesmere, the condition of the habitat, and the importance of the Ararira/LII River for maintaining fish populations, particularly longfin eels (Jellyman and Graynoth 2010).

The waterways within the reserve, and in particular the Ararira/LII River, provide an important ecological linkage between Te Waihora/Lake Ellesmere and the waterways in the upper Ararira/LII catchment.

Australasian Bittern/Matuku.

Skinks/Mokomoko found under wooden disc at the rushland site.

Aquatic invertebrates

Information on the aquatic invertebrates of the reserve is scarce. The limited amount of sampling undertaken in the wider catchment to date has found the macroinvertebrate communities to be dominated by pollution tolerant taxa. Sensitive, clean water EPT taxa were either in low abundance or absent.

Golder Associates (2015) found low numbers of waikōura/freshwater crayfish and waikākahi/freshwater mussels in the wider catchment. Both species are classified as nationally At Risk – Declining (Grainger et al. 2018).

Ecological importance

The Canterbury plains is one of the most modified regions in New Zealand. It is estimated that the Low Plains Ecological District (ED), within which Tārerekautuku Yarrs Lagoon is situated, has only 0.5% indigenous vegetation cover. This is reflected in the Threatened Environment Classification. The reserve is on an 'Acutely Threatened' land environment (a land environment where <10% indigenous vegetation cover remains, nationally) (Walker et al. 2015).

In addition, wetlands have been greatly reduced in extent nationally. It is estimated that only 10% of the pre-European extent of inland palustrine wetlands now remain (Ausseil et al. 2011). In the Canterbury region, wetlands have been reduced to 10.6% of their original extent (Ausseil et al. 2008).

Protecting indigenous vegetation on land environments with <20% indigenous vegetation cover and protecting wetlands are two of the Government's four national priorities listed in the Statement of National Priorities for Protecting Rare and Threatened Indigenous Biodiversity on Private Land (DOC and MfE 2007). They are also priorities in the Canterbury Biodiversity Strategy (Environment Canterbury 2008).

Tārerekautuku Yarrs Lagoon is now one of the largest contiguous freshwater wetland habitats remaining within the area of the former Central Plains Swamp (Parker and Grove 2013). Although highly modified by drainage and the invasion of introduced plants, and in particular willow, the wetland is representative of a freshwater swamp and marsh wetland in relation to other freshwater wetlands in the Low Plains ED.

It supports a moderate diversity of wetland and habitat types and a high diversity of indigenous wetland plant species. It provides habitat for one nationally At Risk and one Data Deficient indigenous plant, at least two plants that are uncommon on the Canterbury plains, three nationally At Risk bird species, one nationally At Risk lizard species and an indigenous ground beetle at its eastern distributional limit (if the identification is correct). It also supports one of the largest remaining mānuka populations on the Canterbury plains.

In the context of the Canterbury plains, and the Low Plains ED, Tārerekautuku Yarrs Lagoon is of high ecological value.

Ecological significance

The reserve has been assessed as being a 'significant natural area' using the criteria in Appendix 12 of the Selwyn District Plan (Partridge 2005). The wetland has been assessed against the criteria for determining significant indigenous vegetation and significant habitat of indigenous biodiversity, listed in Appendix 3 of the Canterbury Regional Policy Statement (CRPS) (Environment Canterbury 2013). This assessment is provided in Appendix 5 of the Scoping Report (Boffa Miskell 2017). Under these criteria, the site is ecologically significant because it meets the criteria for representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 3, 4 and 5), diversity and pattern (criteria 7) and ecological context (criteria 8, 9 and 10).

Tumbling beetle (Mordella promiscus) feeding on mānuka flower.

Leaf-vein slug.

3.3. Water and hydrology

Hydrology and drain maintenance

Tārerekautuku Yarrs Lagoon was an area of open water at the time of European settlement – a low point amongst the extensive surrounding swamp that occupied much of the Ararira/LII River catchment. At this time, prior to drainage, the lagoon and surrounding wetland would have played an important role in attenuating flood flows and maintaining water quality.

In the latter part of the nineteenth century, regular opening of Te Waihora/Lake Ellesmere, and consequent reduction in lake level and extent, were accompanied by the construction of an extensive drainage network through the adjoining low-lying land. Mechanical dredging of the Ararira/LII River, which has been carried out since the 1940s, has resulted in a substantial lowering of the water table in the catchment. Because of these historic drainage works and on-going maintenance, the former open water 'lagoon' was transformed into swamp-marsh wetland habitat, while the surrounding former swamp is now developed farm land (Parker and Grove 2013).

Drainage, abstraction of groundwater for agricultural use, modification of inflows and outflows, channelisation and installation of culverts within the wider catchment has substantially modified the natural hydrology of the reserve. This has had, and is continuing to have, an adverse impact on the wetland habitats within the reserve. The hydrology of the reserve is now dominated by the highly channelised Ararira/LII River and the lateral waterways/drains that run through it. The installation of drains has hydrologically disconnected the wetland from the inflowing waterways, and water now largely passes through the reserve and out the downstream end via the Ararira/LII River.

The waterways/drains in the catchment, including within the Reserve (Figure 8), are critical for stormwater conveyance from Lincoln, as well as for land drainage of the nearby properties. They are maintained and managed by the Council, LII DLC and private landowners for the purpose of reducing water levels and improving drainage. Currently, they are at capacity during heavy rain events (J. Skurupey, Surface Water Engineer, SDC pers. comm. 2019). As part of drain maintenance, the LII DLC annually removes macrophytes (aquatic plants) from the three large lateral drains that flow into the northern (true right) side of the reserve using an excavator. Nearer their confluence with the Ararira/LII River, where the gradient levels out, sediment is also removed. A boat with a weed cutter is used to remove macrophytes from the Ararira/LII River and the lower section of the western of the two large lateral drains between late-January and March each year (M. Tyson pers. comm. 2017). In June 2018 the Council Stormwater and Drainage Bylaw came into effect. The objective of this bylaw is to manage stormwater and drainage to protect people, property and the environment.

Water quality

Land-uses in the wider catchment upstream of the reserve are the key determinant of water quality in the waterways within the reserve. Intensive agricultural and urban development have provided both point and non-point source pollution of waterways in the catchment that have reduced water quality (Golder Associates 2015). The tributaries to the Ararira/LII, particularly the smaller drains, show 'hotspots' of elevated nutrients (Golder Associates 2015). There has been no specific water quality monitoring within Tārerekautuku Yarrs Lagoon Reserve, but Environment Canterbury have a long-term monitoring site immediately downstream of the reserve at Pannetts Road. Improving water quality in the Ararira/LII catchment and Te Waihora/Lake Ellesmere is a key objective for many agencies and organisations (eg Selwyn District Council, Environment Canterbury and Living Water).

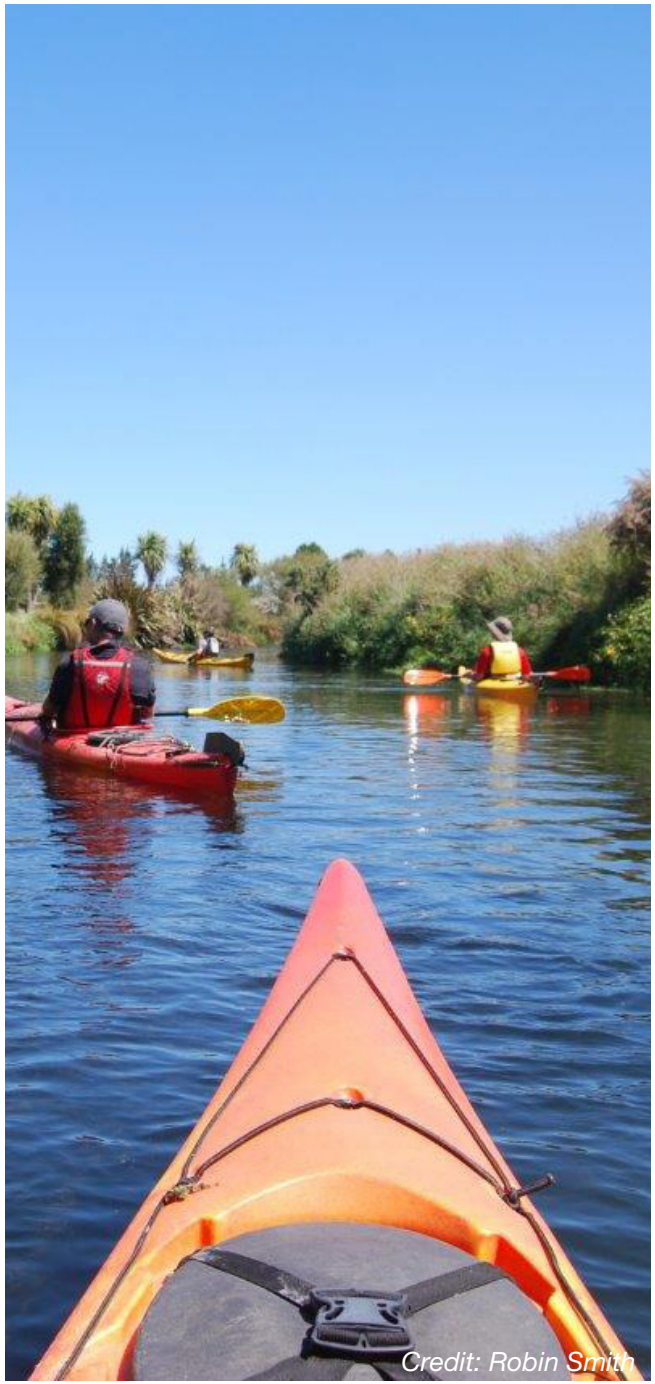
However, the hydrology of the reserve is now dominated by the highly channelized Ararira/LII River and lateral waterways/drains which have hydrologically disconnected the wetland from the waterways that flow through it. In addition, the size of reserve in relation to the flow in the Ararira/LII River and the constraints around not flooding neighbouring properties mean solutions for improving downstream water quality within the reserve are limited and need to be carefully considered.

3.4. Recreation and education

There is very little information available on the current recreational use of the reserve, but it appears to be low, in part due to the current difficulty in gaining access. The reserve is used by gamebird hunters who hunt both the open water of the Ararira/LII River and a man-made duck pond on the true left of the Ararira/LII River. The Ararira/LII River is also used occasionally by fishers and kayakers/paddlers who paddle along the river from time to time.

There is, however, significant potential to increase the current level of recreational usage because the Selwyn district's population is growing rapidly (Espiner et al. 2017), the reserve is in close proximity to significant populations (ie Lincoln, Rolleston and Prebbleton) and there is growing demand for local, and more passive forms of outdoor recreation and natural experiences. In addition to activities such as kayaking, boating and fishing in the Ararira/LII River, the reserve could potentially also provide for walking, picnicking, photography, bird watching and cycling. There are also opportunities to be actively involved in the restoration of the reserve.

While few research projects have been undertaken in the area to date, there are significant opportunities for further research and education within the reserve. The close proximity of several important tertiary institutes, including Lincoln University, means the reserve is relatively accessible to students carrying out research. Student led research, monitoring and planning could play an important role in the future management of the reserve.



Credit: Robin Smith

4.0 Kia Aroraki/Management

4.0 Kia Aroraki/ Management

The policies and methods in this section of the plan are intended to support the achievement of the overarching vision and objectives identified in Section 1.1 and provide strong guidance for decision making by the Tārerekautuku Yarrs Lagoon Reserve Landcare Group (Landcare Group).

Unless stated otherwise, the Landcare Group will be responsible for implementing the methods of this plan. However, the successful implementation of the management plan will require resources to be allocated through the Council funding processes, as well as external sources including relevant agencies.

4.1. Governance and management

Ngā Kaupapa/Polices

4.1.1. Formalise and support the Tārerekautuku Yarrs Lagoon Reserve Landcare Group to guide the implementation of this management plan.

Ngā Ritenga/Methods

4.1.A Adhere to the Terms of Reference, which outline the roles and responsibilities of Council and the Care Group.

4.1.B Undertake a process to identify and select Landcare Group members and have this approved by the Council.

4.1.C Identify potential funding sources and secure funding to implement the actions outlined in this management plan.

4.1.D Consider the development of a wider “Friends of Tārerekautuku” that would actively support the implementation of the management plan.

4.1.E Council will give a commitment to support the Care Group and provide a coordination role in the implementation of the management plan.

Kupu Whakamāhukihuki/Explanation

The success of this management plan will ultimately be dependent on adjacent landowners, the local community and other stakeholders having an invested interest in, and ‘ownership’ of the Reserve. For this reason, it is proposed that a Landcare Group made up of representatives from adjacent landowners, the local community, manawhenua, the LII DLC, the Council and other relevant agencies and stakeholders be established with the purpose of providing direction and co-ordination to implement this management plan. More information on the role of the Landcare Group is provided in Section 5.2.

4.2. Reserve status and boundaries

Ngā Kaupapa/Polices

4.2.1. Ensure the status of the land is appropriate for its proposed purpose and aligns with the objectives and policies of this management plan.

4.2.2. Ensure that land-use activities and development within the reserve are appropriate for its reserve status and do not adversely impact on adjoining land use.

4.2.3. Ensure that the external boundary of the land is clearly defined.

Ngā Ritenga/Methods

4.2.A Classify the land as a reserve under the Reserves Act 1977 and ensure its classification is appropriate to its purpose and the management objectives outlined in this management plan.

4.2.B Clarify the status of adjoining hydro parcels and the DOC-administered land (LII River Conservation Area, conservation unit M36506) on the true right (north) side of the Ararira/LII River between Englishs Road and the eastern boundary of the reserve[4].

4.2.C Commission a survey to define and confirm the external boundary of the reserve.

4.2.D Work with adjacent landowners to ensure the location of the reserve boundary is known and clearly identified.

4.2.E Future plans for development shall endevaour to minimise points of conflict with legitimate neighbouring land uses and activities, by working together with land owners and giving consideration to appropriate design mechanisms or management regimes.

4.2.F Investigate short and long-term options for the management of those parts of the reserve that are currently occupied by adjoining landowners. This could include implementing formal lease documents for those parts of the land that are occupied by adjoining land owners, or other formal agreements, with provisions for future review should the reserve land be needed for an alternative use in future. The present values and potential opportunities for these parcels shall be thoroughly considered before formal arrangements are entered into.

4.2.G Work with adjoining landowners to investigate options for protecting and managing the parts of the wetland and other adjoining areas with high ecological values that are outside the boundary of the reserve.

Kupu Whakamāhukihuki/Explanation

Land status investigations (WSP Opus 2018) have concluded that Tārerekautuku Yarrs Lagoon is held by the Council as a local work subject to the Public Works Act 1981. Classification of the land as a reserve under the Reserves Act 1977 will appropriately acknowledge the values of the land and allow the area to be managed appropriately.

The legal boundaries of the reserve appear to follow the former extent of the open water body of Tārerekautuku Yarrs Lagoon. However, this legal boundary does not follow the boundary of the current extent of the wetland. There are areas where parts of the reserve are cultivated pasture and farmed by adjoining landowners, while in other places the wetland extends outside the reserve boundary. Management of the reserve would benefit from having its external boundaries clearly defined and ensuring adjoining landowners are aware of where the boundaries are.

There are several areas of wetland outside the boundary of the reserve (described in Section 3.5 of the Scoping Report) that have high ecological values. These areas would benefit from more formal protection and the management actions proposed for within the reserve.

4.3. Water and hydrology

Ngā Kaupapa/Policies

4.3.1. Ensure effective water management that provides for the protection and enhancement of water quality and indigenous flora, fauna and habitats alongside the relationship and values of manawhenua and the needs of the local community.

4. Refer to Figure 5.

4.3.2. Recognising the constraints of the wider catchment's hydrology, investigate options for maintaining water levels that are sufficient to support improved cultural and ecological health within the reserve while not adversely affecting neighbouring land and land uses.

4.3.3. Provide for the continuation and maintenance of the Council drainage network but ensure maintenance works use best practice management and do not compromise the cultural, recreational and biodiversity values of the reserve.

4.3.4. Support the implementation of best practice management and land-use activities on surrounding land and in the wider Ararira catchment to contribute to improved water quality and aquatic habitats within the reserve.

4.3.5. Investigate options for restoring open water wetland areas within the reserve to provide habitat for indigenous flora and fauna and for the retention, treatment and improvement of water quantity and quality.

Ngā Ritenga/Methods

4.3.A Work with stakeholders, agencies and the community to improve the cultural and ecological health of Tārerekautuku Yarrs Lagoon through:

- Regional and District Council long term planning processes;
- RMA plan development and resource consent processes;
- Best practice land drainage activities, and associated management and monitoring;
- Joint action and initiatives with Te Rūnanga o Ngāi Tahu, Te Taumutu Rūnanga, DOC, North Canterbury Fish and Game, Environment Canterbury and neighbouring landowners, local residents and community groups; and
- The identification and commissioning of appropriate research and investigations on hydrology and water quality within the reserve and wider catchment.

4.3.B Work with the LII DLC to develop guidelines for land drainage activities that are consistent with the Code of Practice for Defences Against Water and Drainage Schemes (Environment Canterbury 2015) and establish and implement a land drainage improvement programme within the reserve (and wider catchment) to ensure better management practices are implemented for future maintenance of the reserve and the wider drainage network. This may include:

- Ensuring all land drainage works are consistent with the objectives of this management plan, the Ecological Restoration Plan and any other relevant statutory documents.
- Working with the LII DLC to develop an annual work programme for land drainage activities within the reserve;
- Working with landowners to manage connected lateral drains and requiring certain water quality standards to be met[5];
- Excluding stock from open drains, watercourses and wetlands[6], fencing and riparian planting;
- Wetland creation, sediment bunds/traps and other treatment measures within the network (while ensuring that hydrological changes do not adversely affect adjoining properties);
- Undertaking fish salvage following best practice guidelines during waterway/drain maintenance activities (including any dewatering, weed or sediment removal); and
- The reuse of drain sediment and water on surrounding reserve land.

4.3.C Investigate the feasibility of long-term, effective drain maintenance and enhancement solutions that do not require machinery access to be maintained throughout the reserve and that minimise impacts on cultural and biodiversity values.

4.3.D Require the development of mitigation measures (or farm environment plans where applicable) for properties that have a connected drain or waterway. Mitigation measures may include:

- The prevention of direct discharges of contaminants to waterways by providing for best practice effluent disposal;
- Controlling chemical spraying where it may affect mahinga kai values and indigenous flora and fauna, including fish; and
- Providing for the implementation of best practice management for the maintenance of waterways and drains, including preventing stock from accessing waterways, developing sediment traps and treatment bunds, wetlands and other devices, and the planting of waterway margins with suitable indigenous species.

4.3.E Require compliance with the Stormwater and Drainage Bylaw (2018) for properties that have a connected drain or waterway, including development of a Stormwater and Drainage Management Plan where premises have been identified as presenting an unacceptable risk of contamination.

5. Under the Stormwater and Drainage Bylaw (2018).

6. Under the Stormwater and Drainage Bylaw (2018) allowing any stock to enter an open drain or watercourse is prohibited.

4.3.F Investigate the feasibility of improving the hydrological connection between the Ararira/LII River and the wetland areas within the reserve. This could include research and investigations into the feasibility, potential impacts and design of additional open water wetlands within the reserve.

4.3.G If additional open water wetlands are constructed, undertake research and investigations on how these areas might support or improve ecological functioning or processes, such as water quality and habitat for indigenous flora and fauna.

Kupu Whakamāhukihuki/Explanation

The cultural and ecological health of water is an overriding concern for the community that can be improved by best practice management of both catchment land drainage and land use.

Past modification of the natural hydrology of the Ararira/LII River as well as impacts from sedimentation, nutrients and other discharges and contaminations has had a negative effect on water quality and quantity as well as indigenous flora and fauna and mahinga kai.

Effective management of water quantity and quality is critical to improving the health of Tārerekautuku, as well as the wider catchment, including Te Waihora/ Lake Ellesmere. Improvement of water quality will be addressed through RMA planning and consenting processes, as well as through the implementation of the Council Land Drainage Bylaw which aims to ensure the implementation of best management practices for land use and land drainage activities.

Long-term, effective drain maintenance and enhancement solutions that improve water quality and minimise impacts on cultural and biodiversity values should be investigated. These could include riparian planting with indigenous species to provide shade and prevent macrophyte growth, naturalising waterways, installing sediment traps or using alternative drain clearing methods.

Improving the hydrological connection between the wetland and the Ararira/LII River would restore a more natural hydrological regime and improve the ecological functioning of the wetland. While re-connecting the Ararira/LII River to the wetland areas within the reserve should be explored, it will be challenging to implement without causing flooding issues for adjoining landowners. Any effective solutions are likely to be complex and will require hydrological modelling and engineering expertise. The Council would need to work closely with manawhenua, adjacent landowners, Environment Canterbury and the LII DLC if any hydrological changes, including modifications to water levels within the reserve were to be considered.

4.4. Ecological restoration

Ngā Kaupapa/Polices

4.4.1. Prioritise the protection, management and enhancement of existing indigenous vegetation and areas that provide habitat for indigenous fauna.

4.4.2. Ensure that ecological restoration also considers freshwater ecosystems and is integrated with the management and restoration of waterways, and aquatic habitats and aquatic fauna.

4.4.3. Identify, prioritise, plan and undertake restoration activities, including the establishment of kahikatea swamp forest, and other suitable planting that enhances indigenous biodiversity.

4.4.4. Use appropriate, locally sourced indigenous plant species during restoration planting.

4.4.5. Ensure restoration actions minimise adverse effects on the existing values of the Reserve and adjoining properties.

4.4.6. Ensure that restoration planning and actions consider and respond to anticipated long term changes, for example global warming, sea level rise, and potential future hydrological changes.

Ngā Ritenga/Methods

4.4.A Work with suitably qualified experts to develop and implement an Ecological Restoration Plan that identifies the location of existing ecological values, priority areas and actions for restoration, including:

- Willow control and removal using best practice methods;
- Other pest plant control, monitoring and surveillance;
- Animal pest monitoring and control;
- Monitoring/surveys of indigenous fauna;
- Defined areas for restoration planting;
- Appropriate plant species;
- Best practice methods for restoration;
- Indicative timing and costs.

4.4.B Promote the natural regeneration of indigenous vegetation primarily through the control and removal of willow and other weed species (in conjunction with targeted restoration planting).


Credit: Robin Smith


Credit: Robin Smith

4.4 C Plant appropriate, locally sourced, shrub and tree species such as mānuka and kahikatea in areas that will support woody vegetation to assist weed suppression.

4.4.D Investigate the feasibility and appropriateness of re-introducing indigenous flora and fauna.

4.4.E Foster involvement and engagement in the restoration of the Reserve by encouraging members of the Tārerekautuku Yarrs Lagoon Landcare Group and the public to participate in restoration activities and outcome monitoring, and by providing opportunities to educate people about ecological restoration.

Kupu Whakamāhukihuki/Explanation

Ecological restoration has been identified as a key outcome to support the overarching vision for Tārerekautuku Yarrs Lagoon Reserve. Tārerekautuku Yarrs Lagoon was once an area of open water surrounded by an extensive wetland. The original vegetation of the area was likely to have been freshwater wetland vegetation characterised by sedgeland, rushland, raupō reedland, and lowland flax with small-leaved shrubs and kahikatea forest. Land drainage practices, human modification and exotic plants have resulted in substantial changes to the vegetation communities of Tārerekautuku Yarrs Lagoon (and the surrounding land). The reserve is now dominated by grey and crack willow forest and surrounded by farmland.

During consultation there was strong support for returning the reserve to native dominated wetland vegetation with forest in higher drier areas and lower stature sedgeland, rushland, flaxland and raupō reedland in wetter areas. Timeframes for achieving the restoration of kahikatea forest are likely to be 100 – 200 years. Willow and other pest plant control and removal, animal pest control and stock exclusion (referred to in the following sections) are all important components of this ecological restoration.

Global warming, associated sea-level rise and other potential future hydrological changes are likely to alter the hydrology and habitats of the Reserve in the future. Because the ecological restoration of Tārerekautuku Yarrs Lagoon Reserve will be a long-term commitment, it is important that ecological restoration planning considers and responds to these anticipated long-term changes.

4.5. Willow

Ngā Kaupapa/Polices

4.5.1. Remove crack and grey willow from the reserve to allow the restoration of native wetland communities and habitats and improve accessibility.

4.5.2. Maintain areas of high ecological value by continuing to control willows in areas threatened by the spread and growth of willows.

4.5.3. Ensure appropriate willow control methods are used to minimise damage to existing ecological values, including indigenous understorey vegetation.

4.5.4. Prevent the regeneration of crack and grey willow in areas where they have been removed.

4.5.5. Acknowledge the impact that dispersal of grey willow seed from within the reserve has on the wider catchment, including Te Waihora, and undertake appropriate actions to reduce this impact.

Ngā Ritenga/Methods

4.5.A Ensure the Ecological Restoration Plan prioritises willow control as a key component of the ecological restoration of the reserve.

4.5.B Control grey willow within the mānuka stands and indigenous rushland as a matter of priority and, where appropriate, replant suitable native species to support this process.

4.5.C Undertake staged ground control of crack and grey willow focussing first on removing female grey willow and then systematically removing the remaining willows in a staged manner.

4.5.D Improve access to areas where willow control is being undertaken to facilitate the initial control of willows, and the subsequent control of regenerating willow.

4.5.E In areas where willows have been killed or removed, continue to undertake regular surveillance for, and control of, regenerating willow, including grey willow seedlings, (and other pest plant species), as they appear.

4.5.F Work alongside neighbouring land owners to encourage the control of grey willow in the wider area prior to, or at the same time as, control within the reserve to prevent re-invasion.

4.5.G Continue to investigate the effectiveness and appropriateness of alternative, and acceptable options for controlling willows.

4.5.H Liaise with other agencies and community groups undertaking willow control in the catchment, and further afield, to identify opportunities to collaborate and share learnings and ideas.

4.5.I Encourage community participation in willow (and other weed control) within the Reserve as part of wider site restoration.

Kupu Whakamāhukihuki/Explanation

Willows are the most abundant plant pest in the reserve and they are the dominant canopy cover. Both crack willow and grey willow are present. Crack willows are largely distributed along the margins of the Ararira/LII River and the drains within the reserve. Grey willow forest covers a larger area of the reserve and is currently invading the few remaining areas of mānuka scrub and indigenous rushland within the reserve.

Grey willow trees produce many seeds that are widely dispersed by the wind. They grow rapidly and can form vast, dense stands and thickets. Because of the potential for grey willow to spread widely and establish large populations in the wider catchment, including Te Waihora, control of this species within the reserve is a high priority. For the same reason, to prevent re-invasion into the reserve, it is recommended that the control of grey willow in the wider area, including on adjoining properties, is encouraged prior to, or at the same time as, control within the reserve.

Willows are the most serious threat to the ecological values of the reserve and for this reason, willow control is a high priority for the future management of the reserve. Willow control will be very labour intensive, time consuming and costly and will require a long-term commitment with ongoing resourcing and funding.

Future technological developments may provide improved and enhanced methods to control willows and other pest plant species. For this reason, it is recommended that the effectiveness and appropriateness of alternative, and acceptable options for controlling willows continue to be investigated.

Giant Bindweed flower (Calystegia silvatica).

Gorse (Ulex europaeus).

4.6. Other pest plants

Ngā Kaupapa/Polices

4.6.1. Monitor, control and manage existing plant pests in conjunction with willow control.

4.6.2. Undertake pest plant control using appropriate methods that, as far as possible, minimise damage to the ecological values of the reserve.

4.6.3. Prevent the introduction of new pest species.

Ngā Ritenga/Methods

4.6.A Include pest plant control and surveillance in the Ecological Restoration Plan to ensure a well-planned, strategic approach to weed control, surveillance and monitoring.

4.6.B Ensure pest plant monitoring is incorporated into the Ecological Restoration Plan to monitor the success of pest plant control operations, including monitoring the associated response of indigenous vegetation and fauna.

4.6.C Regular surveillance (at least annually) is carried out to identify any new pest plant incursions so these can be controlled before they establish and spread.

Kupu Whakamāhukihuki/Explanation

There are a number of other pest species within the reserve including alder, elder, hawthorn, spindle tree, gorse, Spanish heath, sweet briar, blackberry, ivy and male fern that should be considered for control.

The control of all these weed species should be undertaken in conjunction with willow control. Willow control will open up the existing canopy and increase light levels which will encourage fast growing exotic weed species, many of which have the potential to out-compete indigenous wetland vegetation and/or impede access for restoration work. Their control is likely to be very labour intensive and would need to be well resourced and planned.

There is also the potential for pest plant species that are not already present to become established in the reserve. Some species, such as purple loosestrife and reed canary grass could be a significant concern to the restoration and management of the reserve, as well as for other nearby wetlands, such as Te Waihora/Lake Ellesmere. A small infestation of beggars' ticks has been found in the reserve and poses a similar threat.

4.7. Animal pests and stock

Ngā Kaupapa/Polices

4.7.1. Exclude all domestic stock from the reserve, unless permitted by lease or other formal agreement with the Council.

4.7.2. Control animal pests using appropriate methods.

Ngā Ritenga/Methods

4.7.A Undertake a full survey of the perimeter of the reserve to determine which boundaries require fencing.

4.7.B Once those areas that require fencing have been identified, work with adjacent landowners to ensure that all unfenced sections of the perimeter of the reserve are fenced to exclude domestic stock.

4.7.C Work with adjacent landowners to ensure that all existing perimeter fences are maintained to a standard that will exclude domestic stock.

4.7.D Consider monitoring to confirm the presence and relative abundances of the animal pest species within the reserve to inform decisions around animal pest control.

4.7.E If animal pest control is implemented, include animal pest control and monitoring in the Ecological Restoration Plan to ensure a well-planned, strategic approach to animal pest control and monitoring that aligns with the broader ecological restoration objectives for the reserve.

4.7.F If animal pest control is implemented within the reserve, encourage adjoining landowners to undertake appropriate animal pest management that aligns with the Ecological Restoration Plan and compliments the control work being undertaken within the reserve.

Kupu Whakamāhukihuki/Explanation

Although most of the boundaries between private land and the reserve are fenced, some boundaries are unfenced. Stock, including cattle are currently able to access the reserve in these unfenced locations and are having adverse effects on the ecological values of the wetland.

A range of animal pest species, including feral cats, possums, mustelids (ferrets, stoats and weasels), rats (ship and Norway rats), mice, hedgehogs, hares and rabbits are likely to be present in the reserve, at least from time to time. These introduced animals will be having an ongoing impact on the indigenous vegetation communities and native fauna within the reserve.

Monitoring animal pests would be useful for determining the likely impact these species are having and informing decisions relating to animal pest control. While controlling animal pests to low densities is likely to be beneficial, it will be important to carefully consider what the expected benefits of pest control are likely to be, and whether the cost of achieving this is acceptable. To be successful, an intensive, long-term, ongoing commitment would be required. A wider pest control programme on adjoining properties to reduce animal pest densities around the reserve and provide a buffer would also be beneficial.

4.8. Recreation and public access

Ngā Kaupapa/Polices

4.8.1. Increase public and local community awareness of the reserve.

4.8.2. Provide suitable public access to the reserve.

4.8.3. Create passive recreational activities to the extent that it is compatible with the objectives and policies of this plan.

4.8.4. Enable and provide for mahinga kai.

4.8.5. Manage public access and activities to avoid impacts on the ecological, cultural and landscape values of the reserve.

4.8.6. Manage the uses and activities that occur on the reserve to ensure that the interest of adjoining land owners are not unduly affected.

4.8.7. Ensure recreational structures, facilities, and signage are designed and constructed to enhance visitors' experience, retain the reserve's 'natural' qualities and are sympathetic to the ecological, cultural and landscape values of the reserve, while also taking into consideration the interests of adjoining landowners.

4.8.8. Ensure public access and provision of structures, facilities, and signage is in line with relevant health and safety legislation and best practice.

4.8.9. Ensure recreational structures and facilities do not compromise drain maintenance activities.

4.8.10. Manage gamebird hunting within the reserve under a system of Council authorisation.

4.8.11. Encourage and promote opportunities for research and education.

Ngā Ritenga/Methods

4.8.A Investigate options for formalising suitable public access to the reserve, including determining suitable access points and locations for car parking.

4.8.B Undertake the development of a master plan to investigate and formalise opportunities to develop recreational facilities as determined by current and future anticipated demand. Facilities that could be considered include:

- Accessible car and bike parking;
- Walkways including boardwalks and/or raised pathways to facilitate all season access;
- Bridges/access across waterways;
- Kayak/canoe launching facilities (near vehicle access/parking areas);
- A bird hide;
- Interpretation/information signage;
- Toilet facilities, and;
- Other public amenities as appropriate.

4.8.C Construct walking tracks that provide a well-defined route, and a connection to areas of significance (ecological, visual, or recreational) and where possible, create loop tracks rather than linear 'dead-end' tracks.

4.8.D Investigate opportunities for providing bicycle access and consider long-term linkages such as a 'Lincoln to Lake' cycleway.

4.8.E Consider using management techniques such as signage, interpretation, screening/planting, fencing, gates and speed humps to direct and/or control public access and behaviour and minimise impacts on adjoining landowners.

4.8.F Work with Fish and Game to provide information and access for fishers (but ensuring that access is compatible with the objectives and policies of this plan).

4.8.G Ensure the following types of activities can be controlled under existing Council bylaws:

- Freedom camping;
- Fire lighting (in addition to Rural Fire Authority restrictions);
- Domestic animals (eg dog exercise);
- Use of firearms (other than for gamebird hunting or control, that has been authorised by Council);
- Disturbance and removal of natural materials; and
- Rubbish.

4.8.H Consider restricting public access to the reserve at specific times, (eg gate closures) during the hours of darkness to discourage anti-social behaviour and freedom camping and to avoid adverse effects on the values of the reserve or, if necessary, for safety reasons.

4.8.I Restrict vehicle access within the reserve, except where required as part of restoration and management activities.

4.8.J Identify and minimise any significant health and safety risks to the public, including through good design, location and maintenance of tracks and structures and provision of warning signage, in line with relevant health and safety legislation and associated best practice.

4.8.K Promote opportunities for research within the reserve, and in particular, research relating to the reserve's restoration, as well as its use by the public (recreation monitoring).

4.8.L Discuss research opportunities with partners and agencies who also undertake or have interests in research, including universities, Ngāi Tahu, DOC, Environment Canterbury, WET etc.

4.8.M Consider educational opportunities for school groups and the public during the development of recreational facilities.

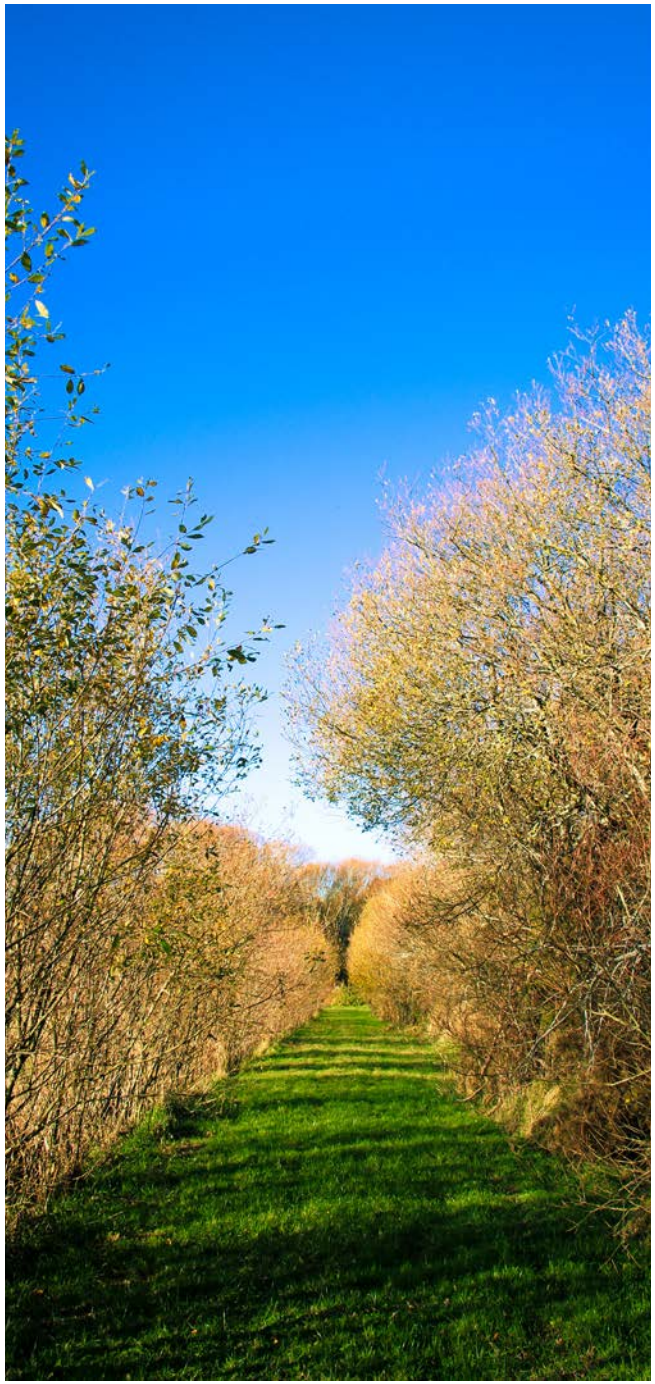
Kupu Whakamāhukihuki/explanation

Recreational use of the reserve is currently low, largely due to lack of knowledge that the reserve exists and the difficulty of access. However, the district's population is growing rapidly, the reserve is in close proximity to several township populations and there is growing demand for more passive forms of localised outdoor recreation and natural experiences. In addition to existing recreational uses the reserve could provide for a range of other passive recreational activities including walking, picnicking, photography, bird watching and cycling.

Increasing visitor use, and the desire to encourage passive forms of recreation, as well as aspirations for the protection and enjoyment of biodiversity, mean that gamebird hunting in the reserve will generally not be permitted. It is also noted that suitable gamebird hunting opportunities exist on public land at other locations nearby. Exceptions to this would include where a licence or use agreement has been granted by the Council to allow hunting from a permanent hunting stand or mai mai only, or where it is necessary to undertake periodic control of some gamebird populations for management purposes.

Gamebird hunting is a popular activity on several private properties adjoining the reserve and it is the intention of this plan to acknowledge these existing use rights and to, as far as practicable, direct and/or control public access within the reserve to minimise conflicts with this activity.

While few research projects have been undertaken within the reserve to date, there are opportunities for further research and education within the reserve. The proximity of Lincoln University in particular, means the reserve is relatively accessible to students carrying out tertiary research. If access to the reserve is improved and walking paths are constructed, there is also the potential to provide appropriate and related educational opportunities for school groups and the public.



5.0 Whakatinana/Implementation

5.0 Whakatinana/Implementation

The implementation of this plan will occur progressively over its life, considering priorities, support, resourcing, and funding requirements. Initial implementation priorities include:

- Formalise and support the Tārerekautuku Yarrs Lagoon Reserve Landcare Group to guide the implementation of this management plan;
- Identify potential funding sources and secure funding to implement this management plan;
- Completion of the reserve classification and external boundary survey;
- Continuing willow control in priority areas;
- Develop and implement an Ecological Restoration Plan;
- Develop and implement a reserve masterplan to guide the development of recreational facilities, initially focussing on parking, access and walking tracks.

5.1. Action plan

The following action plan identifies the immediate, short, medium and long-term priorities for the reserve as well as lead agency/responsibility.

The following abbreviations have been used in the Lead Responsibility column of the Action Plan:

- LG = Tārerekautuku Yarrs Lagoon Landcare Group
- LW = Living Water (Note: the Living Water – DOC/Fonterra partnership is scheduled to conclude in 2023)
- SDC = Selwyn District Council

Actions have been categorised by, and are presented in the order of the following timeframes:

- Immediate = Start immediately (or continue);
- Short-term = Within 1 year of the implementation of the management plan;
- Medium-term = 2 – 5 years of the implementation of the management plan; and
- Long-term = 3 years of the implementation of the management plan and beyond

Where actions are ongoing, this is indicated in brackets.

Immediate actions

Management Issue	Actions	Lead Responsibility
Reserve Status and Boundaries	· Complete the reserve classification process.	SDC
Willows	· Continue to control grey willow within the mānuka stands and indigenous rushland as a matter of priority, and other areas with high ecological values (ongoing).	LW/SDC
	· In areas where willows have been killed or removed, continue to control regenerating willow (ongoing).	LW/SDC/LG

Short-term actions

Management Issue	Actions	Lead Responsibility
Governance	· Develop a Terms of Reference for, and establish, a Landcare Group.	SDC/LG
	· Identify potential funding sources and secure funding to implement this management plan.	SDC/LG
	· Consider the development of a wider “Friends of Tārerekautuku” to actively support the implementation of this management plan.	SDC/LG
Reserve Status and Boundaries	· Survey and confirm the external boundary of the reserve and work with adjacent landowners to ensure the location of the Reserve boundary is known and clearly identified.	SDC
	· Clarify the status of the DOC-administered land on the true right (north) side of the Ararira/LII River above the eastern boundary of the Reserve.	SDC/DOC
Ecological Restoration	· Develop an Ecological Restoration Plan for the Reserve including but not limited to: willow control, pest plant control, restoration planting, restoration of freshwater ecosystems, pest animal control and monitoring, indigenous fauna surveys and monitoring.	SDC/LG
	· Undertake under planting of kahikatea and/or other appropriate locally sourced indigenous tree species in appropriate areas and restoration planting where willows have been removed (ongoing).	LW/SDC/LG
Animal Pests and Stock	· Undertake a full survey of the perimeter of the reserve to determine which boundaries require fencing, or fence maintenance to make fences stock-proof.	SDC/LG
Recreation and Public Access	· Develop a master plan for the reserve that identifies options for formalising suitable public access to the reserve and developing recreational facilities in line with this management plan.	SDC/LG
	· Work with universities, agencies and the community to identify research and/or monitoring opportunities and promote opportunities for research within the reserve (ongoing).	SDC/LG
	· Construct initial access and walking tracks (to improve access for ecological restoration activities and the development of recreational facilities) and suitable car and bike parking.	SDC/LG
Water and Hydrology	· Identify and commission appropriate research and investigations on the hydrology and water quality within the reserve and wider catchment.	SDC/LG/LW

Medium-term actions

Management Issue	Actions	Lead Responsibility
Reserve Status and Boundaries	· Investigate options for the management of those parts of the reserve that are currently occupied by adjoining landowners.	SDC
Water and Hydrology	· Undertake research and investigations into the feasibility, potential impacts and design of additional open water wetlands within the reserve.	SDC/LG
	· Work with the LII DLC to develop guidelines for land drainage activities and establish and implement a land drainage improvement programme within the reserve (and wider catchment) to ensure better management practices are implemented for future maintenance of the reserve and the wider drainage network.	LII DLC/SDC/LG
	· Work with property owners that have a connected drain or waterway to develop mitigation measures (or farm environment plans where applicable) and where required ensure compliance with the Stormwater and Drainage Bylaw (2018).	SDC
Willows	· Commence/undertake staged ground control of crack and grey willow in line with the approach and methods in the Ecological Restoration Plan (ongoing).	LG
	· Work with landowners to control grey willow in the wider area prior to, or at the same time as, control within the reserve to prevent re-invasion (ongoing).	LW/SDC/LG
Other Pest Plants	· Control other pest plants prior, to and during willow control (ongoing).	LG
	· Carry out regular surveillance to identify and control new pest plant incursions at least annually once willow and pest plant control commences (ongoing).	LG
Animal Pests and Stock	· Work with adjacent landowners to ensure that all unfenced sections of the perimeter of the reserve are fenced to exclude domestic stock.	SDC/LG
	· Work with adjacent landowners to ensure that all existing perimeter fences are maintained to a standard that will exclude domestic stock (ongoing).	SDC/LG
	· Undertake animal pest monitoring to confirm the presence and relative abundances of the animal pest species within the reserve	SDC/LG
	· Based on the findings of the animal pest monitoring, determine whether animal pest control would be beneficial to protect the values within the reserve, what methods of control are most appropriate and effective.	SDC/LG
Ecological Restoration	· Continue to undertake restoration initiatives as guided by the restoration plan in tandem with ongoing willow control work.	SDC/LG

Long-term actions

Management Issue	Actions	Lead Responsibility
Reserve Status and Boundaries	· Work with adjoining landowners to investigate options for protecting and managing the parts of the wetland and other adjoining areas with high ecological values that are outside the boundary of the reserve.	SDC
Ecological Restoration	· Undertake restoration planting and in-stream ecological actions in appropriate areas, including following willow control to supress weed growth.	SDC/LG
	· Investigate the feasibility and appropriateness of re-introducing indigenous flora and fauna.	SDC/LG
Willows	· Continue to investigate the effectiveness and appropriateness of alternative, and acceptable options for controlling willows (ongoing).	
Water and Hydrology	· Investigate the feasibility of long-term, effective drain maintenance and ecosystem enhancement solutions that do not require machinery access to be maintained within the reserve and that minimise impacts on biodiversity values.	SDC/LG
	· Work with landowners, agencies and other stakeholders to improve water quality and quantity in the catchment through regional and district Council long term and annual planning processes, RMA plan development and resource consent processes and joint action and initiatives.	LG
Recreation and Public Access	· Develop recreational facilities in line with this management plan.	SDC/LG
	· Consider educational opportunities for school groups and the public during the development of recreational facilities.	SDC/LG

5.2. Care Group

The success of this management plan will ultimately be dependent on the local community/stakeholders having an invested interest and 'ownership' of the reserve. For this reason, it is proposed that a Landcare Group made up of representatives from neighbouring landowners, the Council, local community, manawhenua, the LII DLC, Lincoln University and other relevant agencies and stakeholders (see Section 1.4) be established with the purpose of providing direction and co-ordination to implement this management plan.

The group will have the following roles:

· Identify and confirm sources of funding for proposed work;

· Determine management, monitoring and research priorities and actions;

· Seek expert advice and input as appropriate;

· Confirm the annual work programme for each year and across multiple years;

· Review ongoing progress in completing the annual work programme and other initiatives;

· Receive and consider information, including monitoring and research outcomes;

· Review the effectiveness of the current management plan policies and methods.

Other parties may be co-opted and/or invited to support the committee such as staff and representatives from other agencies, consultants, researchers, neighbouring landowners and the wider community as and when required.

5.3. Annual work programme

An annual work programme to co-ordinate the management and restoration of Tārerekautuku will be developed and updated each year and be approved by the Landcare Group.

The annual work programme will:

- Identify the annual priorities, scope, timing, and methods for controlling animal and plant pest risks (as guided by the Ecological Restoration Plan);
- Identify restoration actions, including the scope and timing for providing fencing, planting, signage and recreational facilities for the coming year;
- Indicate the resourcing and funding requirements and sources for undertaking management actions;
- Identify arrangements for informing and working with stakeholders, adjacent landowners and the community in implementing the programme;
- Identify methods to manage health and safety risks in undertaking management actions.

To facilitate the development and implementation of the work programme, the Council may organise regular hīkoi/hui, inviting relevant stakeholders and agencies. The hīkoi/hui will provide an opportunity to monitor and celebrate what has been achieved as well as consider ideas for improvements as well as new projects. It will also be an opportunity to assign tasks and set timeframes for work programmes as well as being able to discuss, identify and agree on potential joint projects and alignment with external agencies and stakeholders.

6.0 Aromatawai/Plan Review

6.1. Monitoring

The success of the implementation of this management plan is to be reviewed against the actions and timeframes in the Action Plan (Section 5.1). This review is to be undertaken annually by the Landcare Group. It is recommended that this review occur at the time the Annual Work Programme is being reviewed and updated.

More specific monitoring for detecting changes in ecological integrity and ecosystem health, and for measuring the effectiveness of the proposed management actions detailed in this plan (eg outcome monitoring) that should also be considered include:

- Monitoring the response of indigenous vegetation, eg using photopoints (a relatively simple long-term, low-level method of monitoring change in vegetation structure, composition and health);
- Monitoring the success of pest plant control;
- Monitoring the survival of restoration planting;
- Animal pest monitoring using tracking tunnels to understand the relative abundances of introduced mammalian predators;
- Formal monitoring of birds, eg 5-minute bird counts (following standard 5-minute bird count protocol);
- Specific surveys for crake and Australasian bittern, using national monitoring protocols;
- Surveys of freshwater fish in the waterways within the Reserve;
- A baseline survey of aquatic habitat conditions to enable monitoring of post-restoration conditions; and
- Surveys of visitors/recreational users.

Details of the methods and frequency of monitoring relating to the ecological restoration of the reserve should be included in the Ecological Management Plan.

The Landcare Group should encourage universities and university students to undertake research and monitoring within the reserve, and in particular, research relating to the success of the ecological restoration projects.

Monitoring should be designed and set up in collaboration with appropriate experts. However, monitoring methods that can be undertaken reliably and safely by the Landcare Group members, adjoining landowners, manawhenua and other volunteers should be promoted to encourage the local community to take ‘ownership’ of the management of the reserve and measure change over time.

6.2. Plan review

This management plan is effective from XX XXXX 201X and has been prepared as a ‘living document’ to be kept under continuous review to respond to changes in the planning and policy framework, local environment, improved methodologies or management priorities. It is however, envisaged that the plan will be comprehensively reviewed at least every 10 years (ie by XX XXXX 202X).

Kohika Kōrero/References

7.0 Kohika Kōrero/References

Ausseil A-G.E., Chadderton W.L., Gerbeaux P., Stephens R.T., Leathwick J.R. 2011. Applying systematic conservation planning principles to palustrine and inland saline wetlands of New Zealand. *Freshwater Biology* 56: 142–161.

Ausseil, A-G., Gerbeaux, P., Chadderton, W.L., Stephens, T., Brown, D., and Leathwick, J. (2008). *Wetland ecosystems of national importance for biodiversity: Criteria, methods and candidate list of nationally important inland wetlands.* Landcare Research Contract Report: LC0708/158. 174pp.

Boffa Miskell Limited 2017. *Tārerekautuku/Yarrs Lagoon: Te Mahere Whakahaere/Reserve Management Plan.* Report prepared by Boffa Miskell Limited for Selwyn District Council.

Bowie, M and Hutson, 2016. Yarrs Flat Wildlife Reserve and Yarrs Lagoon: An assessment of fauna present to guide future restoration and conservation of native species. *Lincoln University Wildlife Management Report No. 58.*

de Lange, P.J., Rolfe, J.R., Barkla, J.W., Courtney, S.P., Champion, P.D., Perrie, L.R., Beadel, S.M., Ford, K.A., Breitwieser, I., Schonberger, I., Hindmarsh-Walls, R., Heenan, P.B., Ladley, K. (2018). Conservation status of New Zealand indigenous vascular plants, 2017. *New Zealand Threat Classification Series 22.* Department of Conservation, Wellington. 82 p.

Department of Conservation and Ministry for the Environment. 2007. P*rotecting our Places: Information about the Statement of National Priorities for Protecting Rare and Threatened Biodiversity on Private Land.* Ministry for the Environment, Wellington.

Department of Conservation 2016. CMS Conservation Management Strategy, Canterbury (Waitaha) 2016.

Dunn, N.R., Allibone, R.M., Closs, G.P., Crow, S.K., David, B.O., Goodman, J.M., Griffiths, M., Jack, D.C., Ling, N.; Waters, J.M., Rolfe, J.R. (2018) Conservation status of New Zealand freshwater fishes, 2017. *New Zealand Threat Classification Series 24.* Department of Conservation, Wellington. 11 p

Environment Canterbury. 2008. *A Biodiversity Strategy for the Canterbury Region.* Report Number RO8/13. 85 p.

Environment Canterbury 2013. *Canterbury Regional Policy Statement 2013.*

Environment Canterbury 2015a. Canterbury Regional Code of Practice for Defences Against Water and Drainage Schemes. Prepared July 2015.

Environment Canterbury 2015b. *Canterbury Land and Water Regional Plan.*

Environment Canterbury 2018. *Canterbury Regional Pest Management Plan 2018-38.*

Espiner, S., Stewart, E., Lizamore, C. 2017. Recreation Demand Study: *Te Waihora/Lake Ellesmere.* A report prepared for the Department of Conservation - Te Papa Atawhai. Lincoln University.

Golder Associates Ltd, 2015. *Ararira/LII Catchment: Hydrology, Ecology and Water Quality.* Report prepared for The Department of Conservation/Fonterra Living Water Partnership

Grainger, N., Harding, J., Drinan, T., Collier, K., Smith, B., Death, R., Makan, T., Rolfe, J. (2018) Conservation status of New Zealand freshwater invertebrates, 2018. *New Zealand Threat Classification Series 28.* Department of Conservation, Wellington. 25 p.

Hitchmough, R., Barr, B., Lettink, M., Monks, J., Reardon, J., Tocher, M., van Winkel, D., Rolfe, J. (2016). Conservation status of New Zealand reptiles, 2015. *New Zealand Threat Classification Series 17.* Department of Conservation, Wellington. 14 p.

Jellyman, D., Graynoth, E. 2010. *The Importance of Tributary Streams of Te Waihora/Lake Ellesmere in Maintaining Populations of Longfin Eels.* NIWA report prepared for Environment Canterbury.

Ngāi Tūāhuriri Rūnanga Te Hapū o Ngāti Wheke (Rāpaki) Te Rūnanga o Koukourārata ōnuku Rūnanga Wairewa Rūnanga Te Taumutu Rūnanga 2013. *Mahaanui Iwi Management Plan 2013.*

Parker, M., Grove, P. 2013. Tārerekautuku (Yarrs Lagoon): *Wetland Condition, Threats and Significance Assessment.* Environment Canterbury unpublished report.

Partridge, T. 2005. *An Assessment of Biodiversity Values on Land Owned by Selwyn District Council, on the Canterbury Plains.* CECS Contract Report: CECS05/12 prepared for Selwyn District Council, November 2005. 26 p.

Robertson, H.A., Baird, K., Dowding, J.E., Elliott, G.P., Hitchmough, R.A., Miskelly, C.M., McArthur, N., O'Donnell, C.F.J., Sagar, P.M., Scofield, R.P., Taylor, G.A. (2017). Conservation status of New Zealand birds, 2016. *New Zealand Threat Classification Series 19.* Department of Conservation, Wellington. 23 p.

Selwyn District Council. 2015. Open Spaces Strategy.

Singleton, G. 2014. *Ellesmere the Jewel in the Canterbury Crown.* Selwyn District Council, Rolleston.

Steven J.C., Meurk C.D. 1996. Low and High Plains Ecological Districts, Plains Ecological Region, Canterbury. *Protected Natural Areas Survey Report (Draft Report).* Department of Conservation and Landcare Research.

Taiaroa H.K. 1880. Hand written manuscript.

Taylor K.J.W. 1996. *The Natural Resources of Lake Ellesmere (Te Waihora) and its Catchment.* Canterbury Regional Council. 322p.

Te Rūnanga o Ngāi Tahu 2001. *Te Rūnanga o Ngāi Tahu Freshwater Policy.*

Te Rūnanga o Ngāi Tahu and DOC 2005. *Te Waihora Joint Management Plan/Mahere Tukutahi o Te Waihora.*

Walker, S.; Cieraad, E.; Barringer, J. 2015. *The Threatened Environment Classification for New Zealand 2012: a guide for users.* Landcare Research, New Zealand Ltd, Dunedin.

WSP Opus (2018) *Tārerekautuku/Yarr's Lagoon - Land Status Investigation.* Letter to Derek Hayes, SDC dated 5 October 2018.

Āpitihanga/Appendices

Appendix 1: Tūnga me te Kawenga/Roles and management responsibilities

This appendix provides more detailed information on the roles and management responsibilities of each of the stakeholders that comprise the Tārerekautuku Yarrs Lagoon Landcare Group. The group is facilitated by the Council and comprised of individuals and agencies with an interest in the management of the reserve.

Tārerekautuku Yarrs Lagoon Landcare Group

The Tārerekautuku Yarrs Lagoon Landcare Group was established by the Council during the development of this management plan. The group is facilitated by the Council and comprised of key the personnel/stakeholders with an interest in the management of the reserve including:

- Neighbouring landowners;
- Members of the local community;
- Council councillors and staff;
- LII Drainage Committee;
- Te Rūnanga o Ngāi Tahu and Te Taumutu Rūnanga;
- Lincoln University; and
- Agency staff (WET, LET, DOC and Living Water, Environment Canterbury, and Fish and Game).

It is proposed that members of this group will play an integral role in the implementation of this plan and be actively involved in the restoration and future management of the reserve.

Neighbouring landowners

Tārerekautuku Yarrs Lagoon Reserve is predominantly surrounded by privately owned land. Almost all of the surrounding land is in cultivated paddocks with pasture used for grazing dairy cows, beef cattle and sheep. Some of the properties are lifestyle blocks and there are several residential dwellings near the reserve.

Many of the adjoining landowners have a strong interest in the future of the reserve and have had input into the development of this management plan through attendance at meetings and workshops. The Council recognise the important role landowners will have in the implementation of this plan. Through involvement with the Tārerekautuku Yarrs Lagoon Landcare Group, it is hoped that adjoining landowners will continue to play an active role in the restoration and future management of the reserve.

Selwyn District Council

The Council is the administering body of the Tārerekautuku Yarrs Lagoon Reserve. As the administering body of the reserve, under the Reserves Act 1977, the Council is required to develop a reserve management plan (depending on the classification of the reserve) that provides a management and policy framework to: "Provide for and ensure the use, enjoyment, maintenance, protection and preservation… and, … the development, as appropriate, of the reserve for the purposes for which it is classified." (Reserves Act 1977 Section 41(3)).

The Council also has statutory and regulatory obligations under the Resource Management Act 1991 (RMA) for the management of the effects of the use, development and protection of land and associated natural and physical resources of its district. The principal method that the Council uses to fulfil its responsibilities under the RMA is through the development and implementation of the Selwyn District Plan. Further details about the zoning and other notations that apply to the Tārerekautuku Yarrs Lagoon Reserve are set out later in this document.

The Council is also a member of the Te Waihora Co-Governance Group alongside Te Rūnanga o Ngāi Tahu, Environment Canterbury and DOC .

LII Drainage Liaison Committee (LII DLC)

Another function of the Council is the management and maintenance of drainage networks throughout the Selwyn district in conjunction with a number of specially rated drainage districts and their committees. The Ararira/LII is one of 10 classified land drainage districts. Members of the LII DLC have been involved in the development of this plan and have a key interest in the management of Tārerekautuku Yarrs Lagoon.

Te Taumutu Rūnanga

Te Taumutu Rūnanga is one of the 18 Papatipu Rūnanga of Ngāi Tahu whose takiwā centres on Taumutu and the waters of Te Waihora and its adjoining lands. The people of Taumutu hold traditional associations with Tārerekautuku and are therefore a key partner for the Council in the management and restoration of the lagoon, as well as the wider Ararira catchment.

Te Taumutu Rūnanga serves to represent the people who descend from the Ngāi Tahu tīpuna Te Ruahikihiki and his son Moki (II) who settled at Taumutu in the seventeenth century – collectively known as Ngāi Te Ruahikihiki ki Taumutu. The rūnanga is committed to the restoration of the lagoon and the enhancement of cultural values associated with the Tārerekautuku, including its significance as a mahinga kai. The rūnanga work with other Papatipu Rūnanga in the mid-Canterbury area on resource management matters through Mahaanui Kura Taiao Ltd and are guided in this work by the Mahaanui Iwi Management Plan.

Te Taumutu Rūnanga have an established and ongoing working relationship with the Council, including having a representative on the Tārerekautuku Landcare Group, as well as having members on the Te Waihora Co-Governance group and the Te Mana Ararira Living Water Advisory Group.

Te Rūnanga o Ngāi Tahu

Te Rūnanga o Ngāi Tahu is the mandated iwi authority established by Ngāi Tahu Whānui under Section 6 of the Te Rūnanga o Ngāi Tahu Act 1996 to protect the beneficial interests of all members of Ngāi Tahu Whānui, including the interests of the Papatipu Rūnanga of those members.

Te Rūnanga o Ngāi Tahu is governed by elected representatives from each of the 18 Papatipu Rūnanga and support the aspirations of these rūnanga, including Te Taumutu Rūnanga, in relation to environmental and resource management, and the restoration and enhancement of culturally significant sites and values, particularly mahinga kai.

Te Rūnanga o Ngāi Tahu is the legal owner of the Te Waihora lakebed and a key partner in the Te Waihora Co-Governance Group and the Whakaora Te Waihora programme. They also jointly administer the Te Waihora Joint Management Plan in partnership with DOC.

Department of Conservation

DOC is responsible under the Conservation Act 1987 and the Wildlife Act 1953 for the management of protected species and ecosystems, providing for public enjoyment of public conservation lands, conserving historic resources in protected areas, and promoting the conservation of natural and historic resources generally.

The LII River Conservation Area adjoins the reserve on the true right (north) side of the Ararira/LII River between Englishs Road and the eastern boundary of the reserve.

Living Water and Te Mana Ararira

Living Water is a ten-year partnership (2013 – 2023) between DOC and Fonterra. Its focus is to work with local communities, dairy farmers, iwi/hapū and other stakeholders to implement game changing and scalable solutions that demonstrate a different way of dairy farming in healthy freshwater environments.

The Ararira/LII catchment is one of five programme sites across New Zealand where Living Water is working. In 2017, the Council and Living Water signed a Memorandum of Understanding (MoU) with respect to the delivery of collaborative biodiversity projects within the Ararira/LII catchment. The MoU shows a commitment to work together on activities and initiatives within the catchment, including; the protection and enhancement of aquatic and terrestrial biodiversity; and to encourage people to engage and reconnect with the catchment and lake (Te Waihora/Ellesmere). One of the priorities identified under the Living Water partnership is the restoration of wetland habitat within Tārerekautuku Yarrs Lagoon.

Te Mana Ararira is an advisory committee established by Living Water in conjunction with Te Taumutu Rūnanga to guide the Living Water Programme in relation to the integration and incorporation of manawhenua values. The committee also involves representatives from Fish and Game, Environment Canterbury and the Council.

Canterbury Regional Council

The Canterbury Regional Council (Environment Canterbury/Environment Canterbury) is responsible under the RMA for the integrated management of the natural and physical resources of the Canterbury Region[7]. Of particular relevance to the context of this management plan, those responsibilities include:

- Controlling the use of land for the purpose of the maintenance and enhancement of the quality of water[8];
- Controlling the use of land for the purpose of the maintenance of the quantity of water[9]; and
- The establishment, implementation, and review of objectives, policies and methods for maintaining native biodiversity[10].

Environment Canterbury achieves these RMA responsibilities through its Regional Policy Statement (RPS), Canterbury Air Regional Plan, Canterbury Land and Water Regional Plan, and its Regional Coastal Plan. Environment Canterbury also administers a series of regional catchment plans which relate to water management.

Waihora Ellesmere Trust

The Waihora Ellesmere Trust (WET) is a community organisation dedicated to the improvement of the health and biodiversity of Te Waihora/Lake Ellesmere and its catchment. The location of Tārerekautuku Yarrs Lagoon within the wider Te Waihora catchment, and the proximity and connection between Tārerekautuku Yarrs Lagoon and Te Waihora make WET an important stakeholder in the context of this Management Plan. WET's objectives are closely aligned with the vison and objectives for Tārerekautuku Yarrs Lagoon.

Lincoln Envirotown Trust

Lincoln Envirotown Trust (LET) is a charitable trust dedicated to fostering sustainable communities in the Selwyn district. LET works to educate, support, research and promote sustainability, by working with the community, for the community in partnership with other organisations. Of particular relevance to the context of this management plan, LET's goals include:

- Promoting long term environmental sustainability in the Lincoln area;
- Educating about and raising awareness of environmental sustainability issues;
- Providing opportunities for local schools to be involved in projects and initiatives; and
- Providing 'outdoor classrooms' for local school children.

North Canterbury Fish and Game Council

Fish and Game Council functions, as set out in section 26Q of the Conservation Act 1987, are to manage, maintain and enhance the sports fish and game resources in the recreational interests of anglers and hunters. The North Canterbury Fish and Game Council has this statutory responsibility at Tārerekautuku Yarrs Lagoon. Game species at Tārerekautuku Yarrs Lagoon include various duck species, pukeko, black swan, and pheasant. Brown trout are also present in the LII/Ararira River.

7. RMA s30(1)(a)
8. RMA s30(1)(c)(ii)
9. RMA s30(1)(c)(iii)
10. RMA s30(1)(ga)

Appendix 2: Tuhinga-ā-ture/Legislative and policy framework

The Reserves Act, and several other statutes, plans and policy documents have a relationship to this management plan. The key legislation and documents, and their relationship/relevance to this management plan are outlined below.

Reserves Act 1977

The purpose of the Reserves Act 1977 (the Reserves Act) is to make provision for the acquisition, control, management, maintenance, preservation, development and use of land, and to make provision for public access to the coastline and the countryside. There are a range of possible classifications of reserves under the Reserves Act.

Resource Management Act

The RMA is the principal piece of legislation that sets out how New Zealand's environment should be managed and is based on the overarching principle of sustainable management. Part 2 of the RMA sets out the purpose and principles of the RMA. Other parts of the statute describe the functions and responsibilities of local government under the RMA, as well as the tools that are used to deliver those functions.

There are some provisions in the RMA which relate to the Reserves Act, but they are principally to enable the joint processing of applications to exchange reserve land under section 15AA of the Reserves Act along with plan change requests and resource consents.

Section 6 of the RMA sets out matters of national importance that shall be recognised and provided for by all persons exercising functions and powers under the RMA. These matters of national importance include the preservation of the natural character of wetlands, lakes and rivers and their margins;[11] the protection of areas of significant native vegetation and significant habitats of native fauna;[12] the maintenance and enhancement of public access to and along lakes and rivers;[13] and the relationship of Māori and their culture and traditions with their ancestral lands, water, sites, wāhi tapu and other taonga.[14]

Section 7 of the RMA sets out the other matters that shall be given particular regard to by all persons exercising functions and powers under the RMA. These matters include kaitiakitanga;[15] the ethic of stewardship;[16] the maintenance and enhancement of amenity values and the quality of the environment;[17] and the intrinsic values of ecosystems.[18] Section 8 requires that all persons exercising functions and powers under the RMA shall take into account the principles of Te Tiriti o Waitangi/the Treaty of Waitangi.

Part 4 of the RMA sets out the functions, powers and duties of local authorities (regional councils and territorial authorities). Regional councils are responsible for the establishment, implementation, and review of objectives, policies and methods to achieve integrated management of the natural and physical resources of the region.[19] This includes matters relating to soil conservation; water quality and quantity; natural hazards; contaminated land; the management of the Coastal Marine Area (CMA); and the control of the taking, use, damming and diversion of water. The policy statements and plans that Environment Canterbury administers that are of particular relevance to Tārerekautuku Yarrs Lagoon are addressed below.

Territorial authorities are also responsible for the establishment, implementation and review of objectives, policies and methods to achieved integrated management of the natural and physical resources of the district.[20] This includes a focus on matters that relate to natural hazards; the maintenance of native biological diversity; noise; the surface water in rivers and lakes; and subdivision and land use. An overview of the District Plan and the specific provisions of relevance to Tārerekautuku Yarrs Lagoon is set out later in this document.

Conservation Act 1987

While not within the boundaries of the Reserve, the Ararira/LII River is identified as a drainage reserve and identified for conservation purposes under section 62(1) of the Conservation Act 1987 (the Conservation Act). Section 62(1) of the Conservation Act states that certain land that was State forest land or Crown land prior to the commencement of the Act, and meets other criteria set out in section 62(1) shall be deemed to be held for conservation purposes.

The Waitaha/Canterbury Conservation Management Strategy (CMS) contains an inventory of public conservation land and waters. Map 7.15 identifies the conservation area referred to above along the LII River (notation 2799125). It is described as a stewardship area under section 25 of the Conservation Act, with an area of 1.19ha.

The CMS also:

- Identifies ecosystem and habitat types in Canterbury (Appendix 2).
- Priority ecosystem units on public conservation lands and waters (Appendix 4).
- Identifies threatened and at-risk native flora and fauna (Appendix 5).
- Identifies threats or pests and wild animals (Appendix 6).
- Nationally iconic species (Appendix 7).
- Significant geological features, landforms and landscapes.

11. RMA s 6(a)
12. RMA s(6(c)
13. RMA s6(d)
14. RMA s 6(e)
15. RMA s 7(a)
16. RMA s 7(aa)
17. RMA ss 7(c) and (f)
18. RMA s7(d)
19. RMA s 30(1)
20. RMA s 31(1)

Ngāi Tahu Claims Settlement Act 1998 and Deed of Settlement 1997

The Ngāi Tahu Claims Settlement Act (NTCSA) gives effect to the Ngāi Tahu Deed of Settlement for the Ngāi Tahu land claims. A key part of the NTCSA was the vesting of the bed of Te Waihora in Te Rūnanga o Ngāi Tahu and the subsequent development of the Te Waihora Joint Management Plan between Ngāi Tahu and the DOC. As noted in the previous section, Te Rūnanga o Ngāi Tahu are partners with Environment Canterbury, the Council, Christchurch City Council and the DOC in the Te Waihora Co-Governance arrangements and Whakaora Te Waihora programme, which serves to recognise the various traditional and contemporary values and statutory roles and relationships, including lakebed ownership, involved in the management of Te Waihora and its catchment, and work towards enhancing these.

Te Rūnanga o Ngāi Tahu Freshwater Policy 2001

The Te Rūnanga o Ngāi Tahu Freshwater Policy (2001) outlines tribal environmental outcomes for freshwater and the means by which Ngāi Tahu is seeking to work with resource management agencies to achieve these outcomes. The policy sets out the principles that should govern the formulation of water policies and plans, including recognition of the rights, values and interests of Ngāi Tahu in freshwater, and in particular, the taonga status ascribed to freshwater.

The policy then sets out a number of matters to be addressed such as integrated management, the identification of Ngāi Tahu values and uses associated with freshwater resources, in-stream water flows, freshwater fisheries habitats and participation of Ngāi Tahu in freshwater management.

The policy also sets out a number of strategies including prohibiting some activities because of their unacceptable adverse effects, education of resource users, formulation of policy provisions and information and training for resource management staff and the general public. There are also objectives, policies and strategies that relate to mauri that encompasses both water quality and quantity, mahinga kai, and kaitiakitanga.

The vision, objectives, policies and methods set out in this management plan are considered to be broadly consistent with the Te Rūnanga o Ngāi Tahu Freshwater Policy, as collectively they seek to ensure:

- Protection is afforded to waters that are of spiritual significance to Ngāi Tahu.
- Restoration and protection of the mauri of freshwater resources, including by ensuring the availability of sufficient qualities of water, and maintaining appropriate water quality.
- Healthy mahinga kai populations and habitats are restored and maintained.
- Collaborative management initiatives enabling the participation of Ngāi Tahu in freshwater management.

Te Taumutu Rūnanga Natural Resource Management Plan 2003

This plan sets out Ngāi Te Ruahikihiki ki Taumutu values and policies regarding natural resource management in the Taumutu takiwā. As for any iwi management plan, local authorities have statutory obligations to take into account the plan in preparing or changing regional policy statements and plans, and district plans. The plan's policies seek to ensure that:

- Springs, wetlands and waterways are protected, enhanced and/or restored to support mahinga kai and provide ecosystem services.
- Spread of willow, gorse and other weeds is controlled, and that restoration with indigenous plant species is undertaken.
- Agricultural activity includes a buffer of at least 20m around any wetland or waterway.
- No stock access to wetland areas.
- No discharge of contaminants or chemicals to any wetland/waterway.

Mahaanui Iwi Management Plan 2013

The Mahaanui Iwi Management Plan sets out the statement of objectives, issues and policies for natural resource and environmental management in the collective takiwā of the six Ngāi Tahu Papatipu Rūnanga located in central Canterbury area. Local authorities have statutory obligations to take into account the plan in preparing or changing regional policy statements and plans, and district plans. Of particular relevance, Policy TW 6.5 specifically identifies a series of sites and places within the Te Waihora catchment for which improvements in the health of, and access to, are sought, including Yarrs Lagoon.[21] In addition Policy WM13.2 seeks to protect, restore and enhance remaining wetlands by supporting initiatives to restore wetlands.[22]

Other objectives and policies in the Iwi Management Plan that have particular relevance to Tārerekautuku Yarrs Lagoon include provisions that seek to improve the quality and quantity of water resources, and in particular to enable Ngāi Tahu and the wider community to participate in mahinga kai and food gathering activities without risks to human health;[23] and that wetlands are recognised and protected as wāhi taonga that provide important cultural and environmental benefits and their restoration is promoted.[24]

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21. Mahaanui Iwi Management Plan, Policy TW6.5

22. Mahaanui Iwi Management Plan, Section 5.3 Objective 6 and Policies WM6.19 and WM13.1

23. Mahaanui Iwi Management Plan, Section 5.3, Objective 2 and Policy WM6.2

24. Mahaanui Iwi Management Plan

Canterbury Regional Policy Statement 2013

The Canterbury Regional Policy Statement (CRPS) provides an overview of the resource management issues of the Canterbury region and policies and methods to achieve integrated management of the natural and physical resources to achieve the purpose of the RMA. All regional and district plans are required to implement the regional policy statement.

The CRPS addresses a range of matters, including issues of resource management significance to Ngāi Tahu; fresh water; ecosystems and native biodiversity; the beds of rivers and lakes and their riparian margins; and natural hazards.

Chapter 2 of the CRPS addresses issues of significance to Ngāi Tahu and includes a summary of outcomes desired by Ngāi Tahu. Of particular relevance to Tārerekautuku Yarrs Lagoon, these outcomes include the restoration of riparian areas; the protection, restoration and enhancement of native riparian vegetation to provide habitat for taonga species; the protection and enhancement of native flora and fauna; the enhancement of degraded wetlands and the protection of existing wetlands; maintaining vital, healthy mahinga kai populations; and the protection of native fish habitat.[25]

Issues, objectives and policies that relate to fresh water management are set out in Chapter 7 of the CRPS. At a very high level, these provisions seek to sustainably manage fresh water resources;[26] and protect the intrinsic value of waterbodies and their riparian zones.[27]

Chapter 9 of the CRPS addresses issues relating to introduced and native ecosystems and native biodiversity, including the impact of plant and animal pests. It particularly addresses wetlands as important ecosystems. The provisions seek to halt the decline of Canterbury's ecosystems and native biodiversity;[28] enhance and restore ecosystems and native biodiversity;[29] and protect significant native vegetation and habitats.[30]

Canterbury Land and Water Regional Plan

The Canterbury Land and Water Regional Plan (CLWRP) assists Environment Canterbury to carry out its functions under the RMA in managing land and water resources in the region. It includes objectives, policies, and rules which control activities affecting the quantity and quality of water resources in implementing the CRPS. It provides the basis for determining when resource consents are required, and the assessment of consent applications, and sets out these matters on a sub-regional area basis. Tārerekautuku Yarrs Lagoon is in the Selwyn – Te Waihora sub-region.

The CLWRP identifies Te Waihora Cultural Landscape/Values Management Area, which consists of a 'lake area' (Te Waihora/Lake Ellesmere) and 'river zones'. The 'river zones' are areas 20m either side of a series of rivers, including the LII River/Ararira. The purpose of establishing this cultural landscape/values area is to recognise the nature, concentration, networks and significance to Ngāi Tahu of the sites and values in the Area; and to provide for the relationship of Ngāi Tahu with Te Waihora/Lake Ellesmere.[31] The CLWRP seeks to manage this Area as one integrated freshwater mahinga kai system with outstanding values; protect mahinga kai, wāhi tapu and wāhi taonga; restore the health of Te Waihora/Lake Ellesmere; and recognise the cultural and ecological sensitivity of the area to discharges of contaminants and the taking and use of fresh water.[32]

Other policies and provisions manage land uses to improve water quality, catchment and flow restoration and the sustainable use of water and improved flows.

Canterbury Regional Pest Management Plan 2018- 2038

The Regional Pest Management Plan (RPMP) provides a framework for the efficient and effective management or eradication of specified animals and plants in the Canterbury Region under the Biosecurity Act 1993. The RPMP includes rules which place obligations on land owners to control specified animal and plant pests. Territorial authorities, including the Council, are required to control pests on land that they occupy, in accordance with the rules of the RPMP, and to meet the costs of doing so.

A small number of plants and animals within the reserve are classified as pests under the RPMP. Pests for which sustained control programmes are to be implemented are gorse and rabbits. Possums, which under the RPMP are to be managed under site-led programmes, are also present.

Selwyn District Plan 2016

The Selwyn District Plan 2016 (District Plan) was made operative on 3 May 2016. The District Plan identifies Tārerekautuku Yarrs Lagoon in the Rural Zone – Outer Plains. It is also identified as being within the Lake Ellesmere Flood Area.

The District Plan contains rules that manage a range of activities in the rural zone of the Selwyn district, including earthworks, native vegetation clearance, tree planting, buildings, signs and notice boards, and subdivision (which might be of particular relevance to the ongoing management of the reserve).

25. CRPS Table 2.1
26. CRPS Objective 7.2.1
27. CRPS Objective 7.2.3
28. CRPS Objective 9.2.1
29. CRPS Objective 9.2.2
30. CRPS Objective 9.2.3
31. CLWRP Policy 11.4.3
32. CLWRP Policy 11.4.4

An overview of the potentially relevant provisions of the District Plan to the ongoing management of Tārerekautuku Yarrs Lagoon is set out in Appendix 1. It is important to note that this is an overview only, and specific tailored planning advice should be sought prior to undertaking any works.

By way of overview:

- The earthworks provisions would be of particular relevance to inform whether or not any resource consents would be required for any restoration, enhancement, or construction activities within the reserve.
- There are no protected trees identified within Tārerekautuku Yarrs Lagoon on the planning maps at the time of the preparation of this management plan, and nor is the lagoon specifically identified as a mahinga kai site.
- If any structures are proposed as part of the ongoing management of the reserve, then a detailed review of the provisions that relate to buildings will be required in order to ascertain whether any resource consents are required.
- The provisions that relate to roading may be of relevance to the ongoing management of the reserve if parking areas associated with recreation access to the reserve are proposed to be provided and/or vehicle access to the reserve from the adjoining road network is proposed.
- Similarly, the provisions that relate to utilities may be of relevance if any utility services are proposed within the reserve.
- The signs provisions may be of relevance if any directional signage that meets the definitions of either 'sign'[33] or 'noticeboard'[34] are proposed. The provisions in Part C4 manage the location, size, design, height and number of signs and noticeboards.
- If any hazardous substances are used in relation to the ongoing management of the reserve (eg for pest plant control), the provisions of Part C7 may be relevant.
- Other provisions in the District Plan manage activities such as the clearance of native vegetation, activities on the surface of waterbodies, and establish limitations on vehicle movements, which may be of relevance.
- The Scoping Report (Boffa Miskell 2017) identified that the legal boundaries of the Reserve appear to follow the former extent of the open water body of Tārerekautuku Yarrs Lagoon, but does not follow the boundary of the current extent of the wetland. In addition, there are areas where parts of the reserve are cultivated pasture farmed by adjoining landowners, while other parts of the wetland are outside the boundary of the reserve.

If rationalisation of the reserve boundary is contemplated, this may require consent as a controlled activity for the adjustment of these boundaries under clause 10.12 of Part C10 of the Rural Volume of the District Plan, provided that the standards listed in that clause are met. If those standards are not met, the boundary adjustment would require consent as a non-complying activity.

Selwyn District Open Spaces Strategy

The Open Spaces Strategy sets the direction for the provision of an open space network that will meet the district's needs for the next 30 years, taking into consideration existing Council provision and levels of service, as well as other providers of open space in the district. It emphasises the role of open space as an integral part of the district's aesthetic, social, ecological, cultural and economic life.

The overall vision for the strategy is 'a well-connected, sustainable, network of open spaces across the district that reflect the needs and aspirations of the district's residents and visitors, and protects and enhances the district's biodiversity.'[35] This purpose is supported by a number of theme based goals that respond to community and stakeholder aspirations.[36] Key goals of the strategy relevant to this management plan, include:

- Using open space as a mechanism for enhancing and protecting the district's biodiversity.
- Providing for preservation of natural landscapes, indigenous ecological systems, and cultural features.
- Encouraging tangata whenua to express kaitiakitanga, by effectively and proactively applying Ngāi Tahu values and policies to open space provision and management.
- Encouraging partnerships with other agencies in terms of open space provision and function, including fostering partnerships with tangata whenua.

The strategy sets out actions that will be undertaken by the Council and other agencies in delivering on those goals. The strategy includes a specific action to enhance and preserve Yarrs Lagoon as a biodiversity and wilderness setting, including establishment of a working party to oversee restoration, ensuring a robust process for future management, and ensure appropriate protection of the site.[37]

33. A sign is defined in the District Plan as "any device or structure which is visible from any public space and is used to: identify any site or building; provide directions or information; or promote any goods, services, or forthcoming event. A sign does not include any window display, or any property identification signs which do not exceed an area of 0.2 m2 (including rural numbers, dairy company numbers, street/ road numbers/property names and property owners' names as long as those property identifiers do not include any advertising)."

34. A 'noticeboard' is defined in the District Plan as "a structure or device upon which notices can be placed or attached that are of community interest, which are intended to be read by people stopping at the noticeboard rather than by people passing by."

35. Selwyn District Council Open Space Strategy, Section 3, page 8.

36. Selwyn District Council Open Space Strategy, Section 7, page 17.

37. Selwyn District Council Open Space Strategy, Section 8, page 38.

Te Waihora Joint Management Plan 2005

This plan was developed by Te Rūnanga o Ngāi Tahu and the Department of Conservation as a result of the Ngāi Tahu Claims Settlement Act to guide the management of both the Ngāi Tahu Lakebed of Te Waihora and the adjoining conservation lands administered by the department.

The plan contains long-term objectives and detailed policies and methods for effective integrated management of the Joint Management Area for mahinga kai, conservation and other values in a way that enhances the enjoyment of the wetland for all New Zealanders.

The plan also advocates for the overall rejuvenation of the lake and its catchment and contains polices that oppose the discharge of contaminants into water; encourages the protection, enhancement and restoration and indigenous biodiversity, including wetlands; as well as managing recreational and commercial activities.

Selwyn District Council Stormwater and Drainage Bylaw 2018

The objective of the Council Stormwater and Drainage Bylaw ('the bylaw') is to manage stormwater and drainage to protect people, property and the environment. The bylaw came into effect on 1 June 2018. It applies to both the public and private stormwater and land drainage systems in the district.

The bylaw seeks to:[38]

- Manage the development and maintenance of the stormwater and drainage network
- Prevent interference with the stormwater and drainage network
- Manage the entry of contaminants into the stormwater and drainage network
- Prevent the unauthorised use of land, structures or infrastructure related to the stormwater and drainage network.

Activities that are managed by the bylaw include the use, construction or alteration of the stormwater and drainage network; and discharges to and obstructions of the stormwater and drainage network.

Connections to the stormwater and drainage network:

All connections to the stormwater and drainage network require approval by the Council. In making its decision on proposed connections, the Council will consider (among other matters) the extent to which the proposed connection is within an area serviced by public stormwater and drainage systems; whether there is sufficient capacity in the network; and whether any treatment measures are required.[39]

In circumstances where the Council considers that a premises presents an unacceptable risk of contamination to the public stormwater and drainage network, the Council may require the applicant to prepare a Stormwater and Drainage Management Plan. The purpose of the Stormwater and Drainage Management Plan is to set out all potential sources of contamination on the site and the effectiveness of methods to prevent those contaminants from entering the stormwater and drainage network. Owners, occupiers and managers of premises that are subject to an approved Stormwater and Drainage Management Plan are required to comply with the requirements of these plans, as well as any conditions the Council imposes as part of its approval to connect a premises to the stormwater and drainage network.[40]

Other activities managed by the bylaw

The bylaw includes a range of other activities that require approval (restricted activities) and prohibits certain activities. The following are some of the activities that are prohibited:[41]

- Actions that are likely to cause damage to any part of the stormwater and drainage network, or is likely to impact on water quality (including allowing any stock to enter an open drain or watercourse);
- Plant or allow to grow any tree or vegetation in or near any drain to the extent that it causes an obstruction to the public stormwater network; and
- Breach conditions of an approved Stormwater and Drainage Management Plan.

Certain relevant restricted activities include:[42]

- Altering public drains (eg by widening, deepening, diverting or infilling);
- Constructing structures in or over a drain or watercourse that is part of the public stormwater and drainage system; and
- Undertake activities that may affect the stability of the bank of an open drain including spraying or stripping vegetation.

38. Selwyn District Council Stormwater and Drainage Bylaw 2018, Section 3

39. n 1, Section 5.2

40. n 1, Section 5.8(d)

41. n 1, Section 6.1

42. n 1, Section 6.2

Canterbury Regional Code of Practice for Defences Against Water and Drainage Schemes 2015

Environment Canterbury's Code of Practice for Defences Against Water and Drainage Schemes sets out the standards and guidelines to direct local authorities and network utility operators when undertaking works within river and lakebeds to install, maintain, use, or remove defences against water and for drainage network maintenance activities.

The objective of the plan is: 'To avoid, remedy, or mitigate any adverse effects on the environment associated with the installation, maintenance, use and removal of defences against water and drainage scheme maintenance while enabling the efficient and effective operation, ongoing maintenance, repair, development and upgrading of infrastructure.'[43] This objective is supported by a number of key principles which guide these activities within rivers and lake beds.[44] The principles of particular relevance to this management plan are:

- Appropriate measures, including minimising instream works, avoiding sediment deposition, and avoiding or mitigating effects on fish passage are put in place to avoid, remedy, or mitigate adverse effects
- Environmental enhancement opportunities are considered, and where practicable, incorporated
- Cultural values shall be considered with regard to waterway management
- Appropriate construction and accidental discovery procedures are adopted to avoid, remedy, and mitigate adverse effects on cultural sites
- Waterway and riparian amenity and recreational values are maintained
- There is no reduction of flood capacity, increase in erosion risk, or destabilisation of river alignment
- Riverbed levels are unchanged or conform with design requirements
- Flood and erosion protection infrastructure is not weakened.

These principles are implemented through a range of standards and guidelines, covering a range of activities. This includes requirements for drain clearance and maintenance, chemical control of weeds, enhancement planting, tree removal, pest control, and maintenance and enhancement of habitat.

43. Canterbury Regional Code of Practice for Defences Against Water and Drainage Schemes, page 5.

44. Canterbury Regional Code of Practice for Defences Against Water and Drainage Schemes, page 6.

Appendix 3: Springs County Reclamation and Empowering Act 1915

Springs County Council Reclamation and Empowering Act 1915

Local Act 1915 No 15
Date of assent 12 October 1915

Contents

An Act empowering the Springs County Council to reclaim Parts of a Lagoon, commonly known as Yarr's Lagoon, in the County of Springs, for the Purpose of improving the Flow of the L 1 River through the said Lagoon and the Drainage of the Adjoining Lands.

BE IT ENACTED by the General Assembly of New Zealand in Parliament assembled, and by the authority of the same, as follows:—

1 Short Title
This Act may be cited as the Springs County Council Reclamation and Empowering Act 1915.

2 Council empowered to reclaim parts of lagoon
The Springs County Council (hereinafter referred to as the Council) is hereby authorized to undertake such works as may be necessary for the reclamation of any part of the area of land described in the Schedule hereto, being a lagoon through which the river known as L 1 River flows, for the purpose of improving the flow of the said river through the said lagoon and the drainage of the adjoining lands.

3 Works to be deemed a public work
All such works shall be deemed to be included within the definition of a public work within the meaning of the Public Works Act 1908; and the Council may take any parts of the said area of land as may, in the opinion of the Council, be necessary for the construction of such works.

4 Compensation for land or water taken for purposes of works

(1.) The owners of and all other persons having any less estate or interest in any land or water taken or used by the Council for the purposes of this Act, or damaged or injuriously affected by the construction of any works by the Council for the purposes of this Act, shall be entitled to compensation in respect thereof from the Council.

(2.) All claims for compensation shall be made in writing to the Council within twelve months from the time when such claim arose, and no claim for compensation shall be allowed unless made within that period.

(3.) The amount of compensation shall, unless the parties agree thereon, be ascertained in the manner provided by the Public Works Act 1908, and the provisions of that Act shall accordingly apply.

5 Land reclaimed to be deemed to be vested in Council, and Council may lease same
All such part or parts of the said area of land as may at any time be taken, reclaimed, or drained, or partially reclaimed or drained, shall be deemed to be vested in the Council, with power to grant leases of the same or any part thereof, at

such rents, and for such terms, and on such conditions as the Council thinks fit.

Schedule

ALL that area in the Canterbury Land District, containing 178 acres, more or less, being Reserve No 3706, and known as Yarr's Lagoon, Block XII, Leeston Survey District: bounded towards the north by Rural Section 10070, a road-line, Rural Section 10470, a road-line, and Rural Section 20389; towards the east by Rural Section 11388, a drain reserve, the L 1 Creek, and Rural Section 7390; towards the south-east and south by Rural Sections 4761, 6699, 7707, and the No 2 Creek; and towards the west by Rural Sections 9932, 10621, and 11102.

Appendix 4: Taonga species

Taonga plant and bird species, as listed in Schedule 97 of the Ngāi Tahu Claims Settlement Act (1998), recorded at Tārerekautuku Yarrs Lagoon.

Common name	Scientific name
Plants	
Karamu	*Coprosma robusta*
Kahikatea	*Dacrycarpus dacrydioides*
Broadleaf	*Griselinia littoralis*
Mānuka	*Leptospermum scoparium*
Red matipo	*Myrsine australis*
Lemonwood	*Pittosporum eugenioides*
Kohuhu	*Pittosporum tenuifolium*
Glen Murray tussock	*Carex flagellifera*
Cabbage tree	*Cordyline australis*
Lowland flax	*Phormium tenax*
Bracken	*Pteridium esculentum*
Birds	
Australasian shoveler	*Anas rhynchotis*
Black shag	*Phalacrocoraxcarbo novaehollandiae*
Grey teal	*Anas gracilis*
Grey warbler	*Gerygone igata*
Kingfisher	*Todiramphus sanctus*
South Island fantail	*Rhipidura fuliginosa*

Appendix 5: Plant species lists

Plant species recorded at Tārerekautuku Yarrs Lagoon. Listed by growth form and then alphabetically by scientific name.

Indigenous species

Scientific name	Common name
Trees and shrubs	
Coprosma crassifolia	
Coprosma propinqua	Mingimingi
Coprosma robusta	Karamu
Coprosma virescens	
Coprosma xcunninghamii	
Dacrycarpus dacrydioides	Kahikatea
Griselinia littoralis	Broadleaf
Leptospermum scoparium	Mānuka
Melicytus ramiflorus	Mahoe
Myrsine australis	Red matipo
Pittosporum eugenioides	Lemonwood
Pittosporum tenuifolium	Kohuhu
Prumnopitys taxifolia	Matai
Climbers	
Muehlenbeckia australis	Pohuehue
Muehlenbeckia complexa	Small-leaved pohuehue
Forbs	
Centella uniflora	Centella
Hydrocotyle novae-zeelandaie	
Hypericum pusillum	
Lemna disperma	Duckweed
Potentilla anserinifolia	Silver weed
Ranunculus glabrifolius	Waoriki
Ranunculus macropus	Swamp buttercup
Senecio glomeratus	Fireweed
Senecio minimus	Fireweed
Urtica perconfusa	Swamp nettle
Viola cunninghamii	Mountain violet
Viola lyallii	Violet

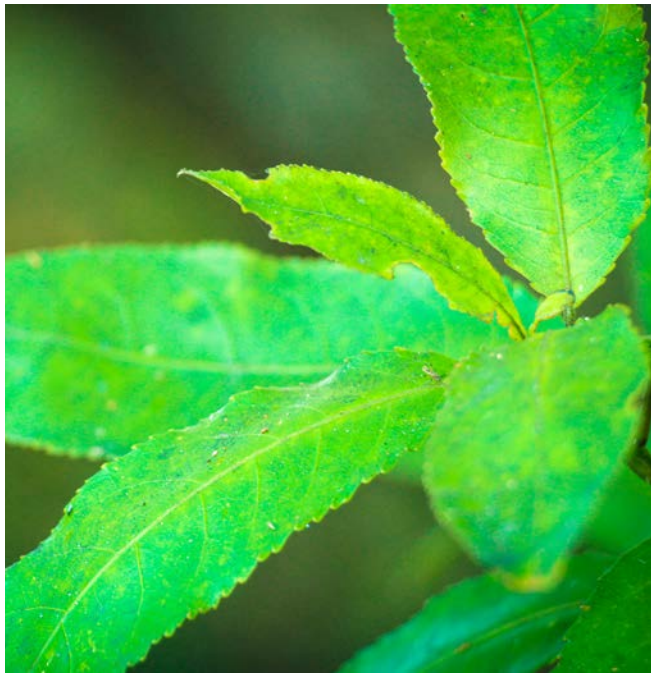
Scientific name	Common name
Monocots	
Apodasmia similis	Oioi
Astelia fragrans	Bush lily
Carex coriacea	Cutty grass
Carex flagellifera	Glen Murray tussock
Carex flaviformis	Yellow sedge
Carex geminata	Cutty grass
Carex maorica	Māori sedge
Carex secta	Purei
Carex sinclairii	Sinclair's sedge
Carex virgata	Swamp sedge
Cordyline australis	Cabbage tree
Eleocharis acuta	Sharp spike sedge
Isolepis distigmatosa	
Isolepis prolifer	
Isolepis reticularis	
Juncus edgariae	Wiwi
Juncus planifolius	Grass-leaved rush
Lepidosperma australe	Square sedge
Machaerina rubiginosa	Baumea
Phormium tenax	Lowland flax
Potomageton cheesemani	Red pondweed
Schoenus moschata	
Schoenus pauciflorus	Bog rush
Triglochin striata	Triglochin
Typha orientalis	Raupō
Orchids	
Microtis unifolia	Onion-leaved orchid

Scientific name	Common name
Ferns	
Asplenium appendiculatum	Ground spleenwort
Asplenium flabellifolium	Necklace fern
Asplenium flaccidum	Drooping spleenwort
Asplenium gracillimum	
Azolla rubra	Red azolla
Blechnum minus	Swamp kiokio
Blechnum penna-marina	Little hard fern
Blechnum procerum	Small kiokio
Histiopteris incisa	Water fern
Hypolepis ambigua	Pig fern
Microsorum pustulatum	Hounds tongue fern
Polystichum vestitum	Punui
Pteridium esculentum	Bracken

Exotic species

Scientific name	Common name
Trees and shrubs	
Alnus glutinosa	Alder
Crataegus monogyna	Hawthorn
Erica lusitanica	Spanish heath
Euonymus europaeus	Spindle tree
Rosa rubiginosa	Sweet briar
Salix cinerea	Grey willow
Salix fragilis	Crack willow
Sambucus nigra	Elder
Ulex europaeus	Gorse
Climbers	
Hedera helix	Ivy

Scientific name	Common name
Forbs	
Calystegia silvatica	Convolvulus
Cardamine sp.	
Cirsium arvense	Californian thistle
Elodea canadensis	Canadian pondweed
Lotus pedunculatus	Lotus
*Mentha x piperita**	Mint
Erythranthe guttata	Monkey musk
Myosotis laxa subsp. caespitosa	Water forget-me-not
Nasturtium officinale	Watercress
Persicaria hydropiper	Water pepper
Potamopogon cripus	Curly pondweed
Prunella vulgaris	Selfheal
Ranunculus repens	Buttercup
Rorippa sylvestris	Creeping yellow cress
Rubus fruticosus	Blackberry
Rumex crispus	Curled dock
Rumex obtusifolius	Broad-leaved dock
Solanum dulcamara	Bittersweet
Trifolium pratense	Red clover
Trifolium repens	White clover
Monocots	
Agrostis stolonifera	Creeping bent
Carex demissa	Yellow sedge
Dactylis glomerata	Cocksfoot
Holcus lanatus	Yorkshire fog
Juncus articulatus	Jointed rush
Juncus effusus	Soft rush
Schedonorus arundinaceus	Tall fescue
Ferns	
Dryopteris filix-mas	Male fern



Appendix 6: Bird species lists

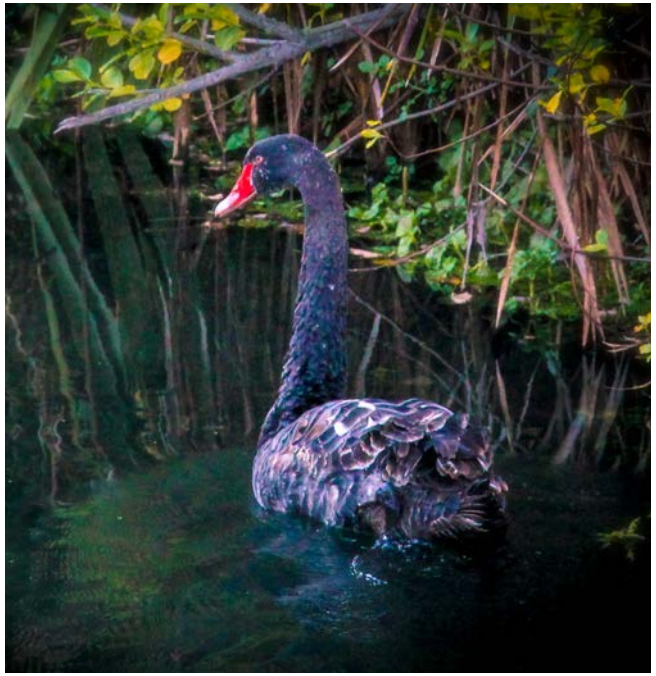
Indigenous birds recorded at Tārerekautuku Yarrs Lagoon during this study, by Bowie and Hutson (2016) and Parker and Grove (2013). Sorted alphabetically by common name.

Indigenous species

Common name	Scientific name
Australasian shoveler/tataa	*Anas rhynchotis*
Black shag[45]/kawau	*Phalacrocorax carbo novaehollandiae*
Grey teal/tete	*Anas gracilis*
Grey warbler/riroriro	*Gerygone igata*
Kingfisher/kotare	*Todiramphus sanctus*
Marsh crake[46]/koitareke	*Porzana pusilla*
New Zealand scaup/ pāpango	*Aythya novaeseelandiae*
Pūkeko/pākura	*Porphyrio melanotus*
Silvereye/tauhou	*Zosterops lateralis*
South Island fantail/ pīwaiwaka	*Rhipidura fuliginosa*
South Island pied oystercatcher/tōrea	*Haematopus finschi*
Spur-winged plover	*Vanellus miles*
Swamp harrier/kāhu	*Circus approximans*
Welcome swallow/warou	*Hirundo neoxena neoxena*
White-faced heron/mātuku	*Egretta novaehollandiae*

Exotic species

Common name	Common name
Australian magpie	*Gymnorhina tibicen*
Blackbird	*Turdus merula*
Chaffinch	*Fringilla coelebs*
Common pheasant	*Phasianus colchicus*
Dunnock	*Prunella modularis*
Goldfinch	*Carduelis carduelis*
Greenfinch	*Carduelis chloris*
House sparrow	*Passer domesticus*
Mallard	*Anas platyrhynchos*
Mute swan	*Cygnus olor*
Redpoll	*Carduelis flammea*
Song thrush	*Turdus philomelos*
Starling	*Sturnus vulgaris*
Yellowhammer	*Emberiza citrinella*



45. Bowie and Hutson (2016) recorded an un-identified shag. A black shag was recorded within the reserve in the Ararira/LII River during our site visit.

46. A marsh crake was observed by Bowie and Hutson (2016) along the vehicle track between Goodericks Rd and the reserve. Although this sighting was outside the reserve, it is very likely this species (which has a conservation status of At Risk – Declining) also occupies suitable habitat within the reserve.

Appendix 7: Fish species lists

Fish species recorded in the wider Ararira/LII River catchment. Sorted alphabetically by common name. Source: Golder Associates (2015).

Indigenous species

Common name	Scientific name	Threat classification[47]
Black flounder/pātiki mohoao	*Rhombosolea retiaria*	Not threatened
Common bully/toitoi	*Gobiomorphus cotidianus*	Not threatened
Common smelt/paraki	*Retropinna retropinna*	Not threatened
Inanga/īnaka	*Galaxias maculatus*	At risk – declining
Lamprey/piharau	*Geotria australis*	Threatened – nationally vulnerable
Longfin eel/tuna	*Anguilla dieffenbachii*	At risk–declining
Shortfin eel/tuna	*Anguilla australis*	Not threatened
Torrentfish/pānako	*Cheimarrichthys fosteri*	At risk – declining
Upland bully/kokopara	*Gobiomorphus breviceps*	Not threatened

Exotic species

Common name	Scientific name	Threat classification[47]
Brown trout	*Salmo trutta*	Introduced and naturalised
Goldfish	*Carassius auratus*	Introduced and naturalised
Rudd	*Scardinius erythrophthalmus*	Introduced and naturalised

Credit: Don Jellyman (NIWA)

47. Dunn et al. (2018)

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Prepared by:

Deborah Rowe
Principal/Senior Planner
Boffa Miskell Limited

Scott Hooson
Principal/Senior Ecologist
Boffa Miskell Limited

Reviewed by:

Craig Pauling
Principal/Kaiarataki Te Hīhiri
Boffa Miskell Limited

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Selwyn District Council
PO Box 90
Rolleston 7643
NEW ZEALAND