AGENDA

Orari-Temuka-Opihi-Pareora Water Zone Committee Meeting

Monday, 2 December 2019

Date	**Monday, 2 December 2019**
Time	**1pm**
Location	**Council Chamber, Council Building, King George Place, Timaru**
File Reference	**1300433**

Orari-Temuka-Opihi-Pareora Water Zone Committee

Notice is hereby given that a meeting of the Orari-Temuka-Opihi-Pareora Water Zone Committee will be held in the Council Chamber, Council Building, King George Place, Timaru, on Monday 2 December 2019, at 1pm.

Orari-Temuka-Opihi-Pareora Water Zone Committee Members

Hamish McFarlane (Chairman), Lucy Millar, Luke Reihana, Clr Elizabeth McKenzie, Clr Anne Munro, Clr Barb Gilchrist, Clr Tom O'Connor, Suzanne Eddington, Glen Smith, Phil Driver, John Henry, Herstall Ulrich and Mark Webb

Quorum – no less than 7 members

Order Of Business

1 Apologies and Karakia

2 Identification of Items of Urgent Business

3 Identification of Matters of a Minor Nature

4 Declaration of Conflicts of Interest

5 Chairperson's Report

6 Confirmation of Minutes

6.1 Minutes of the Orari-Temuka-Opihi-Pareora Water Zone Committee Meeting held on 2 September 2019

Author: **Joanne Brownie, Governance Support Officer**

Recommendation

That the Minutes of the Orari-Temuka-Opihi-Pareora Water Zone Committee Meeting held on 2 September 2019 be confirmed as a true and correct record of that meeting.

Attachments

1. **Minutes of the Orari-Temuka-Opihi-Pareora Water Zone Committee Meeting held on 2 September 2019**

MINUTES

Orari-Temuka-Opihi-Pareora Water Zone Committee Meeting

Monday, 2 September 2019

Minutes of the Orari-Temuka-Opihi-Pareora Water Zone Committee Meeting Held in Meeting Room 1, Council Building, King George Place, Timaru on Monday, 2 September 2019 at 2pm

Present: Hamish McFarlane (Chairman), Phil Driver (until 4.20pm), Clr Richard Lyon, Lucy Millar, Clr Anne Munro (until 4.20pm), Lan Pham, Luke Reihana, Glen Smith, Herstall Ulrich (until 3.40pm) and Mark Webb

In Attendance: Lyn Carmichael (ECan Facilitator), Clr Peter Scott (ECan)(until 3.40pm), Kate Doran (ECan Communications), Sandy Bowman (Zone Committee Support Coordinator), Brad Waldon-Gibbons (ECan Tangata Whenua Facilitator), John Benn (Department of Conservation), Tom Henderson, Andrew Mockford (Chief Executive Opuha Water Ltd), Brian Reeves (Zone Delivery Lead), Jason Grant (Federated Farmers), John de Witt

The Chairman welcomed everyone to the meeting and invited those in attendance in the public gallery to introduce themselves.

1 Apologies

Resolution 2019/9

Moved: Mr Mark Webb
Seconded: Mr Phil Driver

That apologies from David Anderson and John Henry be received and accepted.

Carried

2 Confirmation of Minutes

Clause 7.3 Education and Awareness – the meeting was advised that since the 5 August meeting further contact has been made with Josh Earnshaw and the pizza night is being planned. The Committee needs to be continually aware of how to involve youth in the zone activities eg supporting bat habitats. Contact is to continue through the Facilitator and the Youth Engagement Officers in order to keep the momentum going. The aquavan visit will also help with raising the profile.

Clr Scott and Luke Reihana are assisting with organisation for the pizza night.

Clause 7.4 – Issues and concerns raised at the meeting of Zone Committee Chairpersons and Deputy Chairpersons – it was agreed that the new incoming committee following the local government elections should take up the concerns raised at the Zone Committee Chairpersons and Deputy Chairpersons forum on 10 July, and ensure they are not overlooked.

Resolution 2019/10

Moved: Mr Glen Smith
Seconded: Clr Anne Munro

That the Minutes of the Orari-Temuka-Opihi-Pareora Water Zone Committee Meeting held on 5 August 2019 be confirmed as a true and correct record of that meeting.

Carried

3 Identification of Items of Urgent Business

3.1 Conflicts of Interest

The Committee agreed to receive the letter from Forest and Bird, dated 19 August 2019 regarding conflicts of interest on zone committees and the legal proceedings lodged by Forest and Bird, which has resulted in the Auditor General withdrawing the conflicts of interest exemption for zone committee members.

The Committee noted the workshop held prior to the zone committee meeting at which legal advice on the matter was received, informing committee members of the impact of the Auditor General's decision and the need for members to be continually aware of any potential conflicts in matters before the committee.

Phil Driver advised of his potential conflict of interest in that he has been asked to do some work for the Ohau Residents' Association on its water supply.

It was agreed that in light of the Forest and Bird letter and the Auditor General's decision, members review their conflicts of interests and advise of any changes, in order that the register is up to date. Any conflicts can be identified at each meeting, as is the current practice.

Resolution 2019/11

Moved: Mr Hamish McFarlane
Seconded: Clr Richard Lyon

That the letter from Forest and Bird regarding conflicts of interest be received.

Carried

3.2 Pest Management

The future threat of wallabies as a pest was identified, noting that there is reluctance in the community to undertake plantings as wallabies then destroy the new plants. This is holding back plans for both native and exotic plantings. Clr Scott advised that biosecurity and biodiversity groups are being established, with the first meeting to be held shortly. These groups will have a focus on pest management, and there will be liaison with a similar group south of the Waitaki.

The Committee agreed that pest management is to be an agenda item for the November zone committee meeting.

4 Community Forum

Conflict of Interest

Some members of the public gallery expressed their concerns at the conflict of interest decision from the Auditor General, noting that it may result in the exclusion of people who could contribute to robust debate. It could be argued that as the Zone Committee is not a governing body, only having an advisory role, the conflict of interest rules should not apply. It was explained that as the Zone Committee was established as a joint committee of local authorities, the Members Interest Act does apply.

5 Reports

5.1 Recognition for Members Standing in Local Body Elections

The Chairman raised the issue of recognition for members standing at the local authority elections in October. He thanked all members who are standing for the local authority elections, and wished them well.

5.2 Regional Committee Update

Regional Committee representative Phil Driver spoke to the update on the Regional Committee meeting held on 13 August 2019, prepared by Regional Committee Facilitator Lesley Woudberg.

A request was made for clarification on clause 5 of the report which refers to Collective Leadership and the need to make the contribution of district and city councils more transparent. It was agreed that the OTOP facilitator would follow up on this query and provide a response to the next meeting.

It was suggested that the zone committees could possibly utilise the regional committee more, however how to do that effectively may be difficult, with Phil driver reporting that the regional committee was still seeming to have some issues with settling on its purpose.

Phil Driver adivsed that he is unable to attend the next regional committee meeting on 10 September due to a prior commitment. Any other committee member who is able to take his place at the meeting is to contact him.

5.3 Plan Change 7

The Committee considered information on the submission period and engagement for Proposed Plan Change 7 to the Canterbury Land and Water Regional Plan.

The Committee noted that there have been some meetings already that have discussed the Plan Change – meetings involving catchment groups, Federated Farmers, Chamber of Commerce, Opuha Water Ltd.

One query raised by the community is the absence of OEFRAG in the plan change. The Facilitator explained that there may be a role for OEFRAG in the consenting framework but it is not appropriate for an advisory group to have a decision making role in the planning framework. OEFRAG members should be encouraged to make a submission on Plan Change 7, as should every interested party.

The discussion above involved mention of the Opuha Dam and during the brief discussion, Herstall Ulrich declared an interest as a director of OWL and sat back from the meeting table.

Further clarification was sought on the OTOP area being in the red zone, rather than the orange zone. The Facilitator advised that this was a recommendation of the Committee in the ZIPA and has been carried through to the nutrient management framework in the plan. There was discussion that having just one nutrient allocation zone may be positive for some commercial vegetable growers.

Hamish McFarlane then declared at interest in this area of the discussion and stepped back as chairman and withdrew from the meeting table. Deputy Chairperson Herstall Ulrich took the chair.

The Facilitator encouraged everyone to refer to the reports and Frequently Asked Questions on the website when seeking further clarification of points raised.

Hamish McFarlane rejoined the meeting table and resumed the chair.

Further questions on the plan change were raised including the combination process with the Waimakariri Plan Change 2, the assessment of limit settings for high run off areas, mataitai areas and the buffer provided and parameters on wells in the Orari area.

The Chairperson again declared a conflict of interest and withdrew from the table. The Deputy Chairperson took the chair.

The Facilitator clarified factors around flow and allocation, noting that the flow and allocation regimes recommended in the ZIPA for Temuka and Opihi catchments were included unchanged in the proposed plan and that there are no changes to the existing regimes for the Pareora or Orari. It was noted that there is a lot of discussion in the community around wells in the Orari area and the Facilitator suggested people look to the groundwater limit setting report for information, as this report highlights where the wells are.

Comment was made that the public do not necessarily understand the difference between the ZIPA and Plan Change 7and it was agreed that it is important to distinguish the two, and that people understand the difference.

The Committee noted the information on Plan Change 7 and the dates for the Community Engagement on Plan Change 7 in OTOP.

5.4 Zone Facilitator's Report

The Committee considered the Facilitator's report which included information on consultation for the Proposed National Policy Statement for Highly Productive Land, Flow and Allocation for the Pareora River, upcoming events, and progress on issues raised in previous meetings, and recent media coverage.

Clarification was sought on how the national Policy Statement for Freshwater sits within planning and Plan Change 7.

It was proposed that rather than a formal meeting in October, a field trip to the Orari Gorge be organised, possibly including visiting some immediate steps projects, connecting with the Orari River Protection Group and linking with catchment groups.

The Committee supported the organisation of a field trip, as long as sufficient committee members were available to make it worthwhile for all concerned.

Herstall Ulrich retired from the meeting.

5.5 Zone Committee Priorities and Actions

The Committee considered the draft priorities for the ZC work programme through to June 2020, based on previous discussions. Once approved a programme will be formulated for presentation to the November meeting.

Some frustration was conveyed as to the length of time it is taking for the Committee's priorities and work programme to be confirmed. Phil Driver noted that the priority work streams need timeframes and measurable outcomes.

The Committee agreed that areas of biodiversity/mahinga kai, fostering youth engagement and supporting catchment groups are key workstreams. The meeting was reminded that community outcomes generated from the catchment groups and public meetings gave an indication of where people want the Committee to focus its role.

The funding of catchment groups was queried and it was explained that previous support from the Landcare Trust funded early catchment group establishment and now some ECan funding currently supports a Community Engagement Officer. Commitments from industry groups such as Opuha Water Ltd have also played a part. It was queried as to whether this type of involvement (from industry groups) could cause a problem from the changed conflict of interest point of view. The Facilitator will check on this.

An alternative option could be to use the Pareora Catchment Society as an avenue through which catchment groups could apply for funding, or use other such groups in funding applications. It is difficult for the committee to prioritise and plan ahead if there is no funding available for projects. As a joint committee of local authorities, there should be access to some funding in some way.

It was suggested that before the Committee sets its work programme in place it needs to align the priorities with the committee's purpose and principles and to be clear about the things it is planning so that it can then prioritise.

It was agreed that as a next step, Phil Driver will formulate a proposal to a workshop in November to reflect the discussion and the draft programme, setting out the values, principles and actions and including proposed timeframes for each priority.

6 Consideration of Further Urgent Business Item Proposal for Separate Funding Entity

The Chairman raised an urgent business item referring to the significant amount of central government funding granted to the Kaipara Harbour area for a range of activities to improve the area including stock exclusion, biodiversity etc. He suggested that there could be a similar avenue to source central govt funding for the OTOP area, although the Zone Committee cannot be the vehicle for application for such funding.

He suggested a feasibility study be undertaken to set up a legal entity representing those catchment wide groups across the whole zone – this group could apply for funding and manage the funding for catchment groups that do not want to become incorporated societies. A number of smaller projects throughout the zone could then be combined into a consolidated project and involve collaboration between catchment groups, tackling such projects as stock access, plantings, pest management etc. This would provide more support and facilitation to groups that currently do not have enough support, and would enable a focus on tangible outcomes.

Discussion followed on whether the Zone Committee could be the entity on a funding application. Alternatively the Pareora Catchment Society could apply on behalf of the wider catchment, although other catchment groups may not be happy with this option. A third option of an ECan targeted rate was suggested.

There was some debate as to whether the Committee should understand the projects and proposals it wants to tackle before a funding mechanism is explored versus establishing a funding mechanism first in order that the committee is ready to take on projects it has prioritised. Activities such as engagment and education could be undertaken in the meantime, with minimal funding required.

Clr Munro and Phil Driver retired from the meeting.

Canvassing the idea with catchment groups could indicate whether there is support for the proposal to establish a legal entity as a funding mechanism, or if there would be support for alternative avenues such as a targeted rate.

The Chairperson will do some further background investigation and report back to the Committee.

The Meeting closed at 4.35pm.

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Chairperson

7 Reports

7.1 Community Forum

Recommendation

That the Committee considers any issues raised at the public forum.

Purpose of Report

1 To provide an opportunity for members of the public to address the Committee.

Attachments

Nil

7.2 Welcome to new councillor representatives and farewell Clr Lan Pham

Author: Chairman Hamish McFarlane

Recommendation

That the new councillors be welcomed and the Committee farewell Clr Lan Pham.

Purpose of Report

1 The Chairman to welcome new councillor representatives to the Committee and note ECan Councillor Lan Pham's contribution to the Committee during her tenure.

Attachments

Nil

7.3 Roundtable updates from Committee members

Recommendation

That the updates from committee members be noted.

Purpose of Report

Committee members to provide a brief verbal update on activities since the last meeting.

Attachments

Nil

7.4 Zone Delivery Work Programmes and Compliance Update

Author: **Brian Reeves – Zone Delivery Lead**

Recommendation

That the updates be noted.

Purpose of Report

1 Zone Delivery Lead Brian Reeves to provide an update on the Zone Delivery work programmes and compliance.

Attachments

1. **Compliance Monitoring Annual Report 2018/19**
2. **CWMS Fish Screens Update**

Nutrient limits

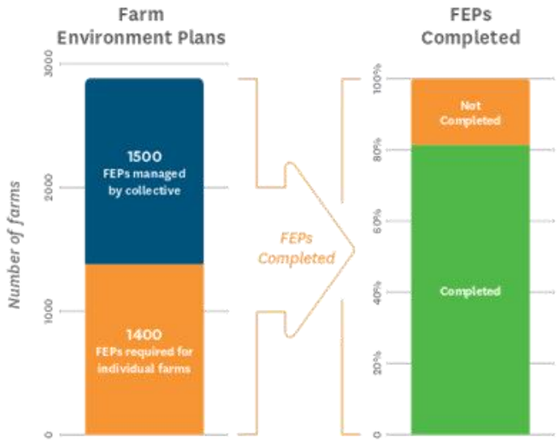
In 2012 strict nitrate pollution limits were imposed on Canterbury farmers (in the Land and Water Regional Plan). Since then even more stringent limits have been introduced in areas with rising nitrate levels (Selwyn district, Ashburton Hinds, and South Coastal Canterbury).

Land users are required to measure and manage nitrate leaching via a consent to farm and an associated Farm Environment Plan (FEP). To ensure farmers are doing what they need to do, there are regular independent farm plan audits which result in a grade: A or B (acceptable); C or D (not acceptable). Those with C or D grades are required to improve and are subject to more frequent compliance visits and audits.

Good Management Practices

There are agreed Good Management Practices around water use efficiency, nutrient management, effluent management, soil management, as well as farm hotspots (waste pits, offal or silage pits) and these are recorded and audited via Farm Environment Plans. These Farm Environment Plans also cover riverside and drain management (erosion and sediment) as well as keeping stock out of waterways, to protect and improve water quality.

Farm Environment Plan progress



Water use compliance monitoring – improved technology:

Over 4500 water takes have installed systems that provide real-time monitoring, via telemetry, meaning our consent holders have gone above and beyond the national requirements for water measuring. We now have 56.8% of water takes providing daily data. We use our water systems to identify likely non-compliances that then need an officer to monitor; but we also use the system to identify all the consents that are likely compliant and therefore do not need an officer to monitor. We call this 'system verified compliance'. System verified compliance is an automated system which checks water use data against specific criteria. This frees up time for our officers to focus on priorities.

Case Study

Hororata farm illegal discharge of sediment

A Hororata dairy farm was convicted and fined $30,000 after illegally discharging effluent onto land in December 2018.

The charge related to discharging a contaminant onto land in circumstances which may result in that contaminant entering groundwater, which is prohibited under the Resource Management Act.

The court heard, in February 2019, that the farm had consent to dispose of effluent to land, but due to a faulty pipe, known about by the farm's owner and manager, an effluent pond on the property overflowed by 80 cubic metres down a hill before the flow was stopped by an effluent dam.

In sentencing the company, Judge Jane Borthwick said the actions taken by the farm manager before the incident were not those of a prudent farmer and were negligent rather than careless.

From a starting point of $40,000, she applied a 25% discount for an early guilty plea, but declined to make any discount for good character.

Environment Canterbury Regional Council
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Compliance monitoring

2018-19 ANNUAL REPORT

Protecting the environment is the top priority

The work to protect and improve Canterbury's rural environment has several parts:

- Set the necessary **nutrient limits** across Canterbury via planning rules
- Promote **Good Management Practices** (GMP) for farmers
- Require **land-use consent to farm** and **independent audit** (for higher risk activities)
- Ensure effective and targeted **consent compliance monitoring** (this report)
- Respond quickly to as many **incident reports** as possible (incident response report).

We want to deal with environmental risks before they turn into incidents and cause damage - let's have a fence at the top of the cliff. This is happening through nutrient limits and the Good Management Programme of continuous improvement on farm.

Monitoring consent compliance and responding to incidents, while necessary and important, are more like the ambulance at the bottom of the cliff. They are needed to fix a problem often after the environmental damage has occurred and stop it happening again.

As long as we have consents with conditions we will continue to monitor them to ensure the activity is compliant. But what consents we monitor and how we monitor is changing. With over 20,000 consents that need monitoring, we are finding smarter ways to do compliance monitoring and smarter ways to identify non-compliance so we can focus our efforts in the right places.

We are more focused on monitoring high-risk consents or those consent holders with poor compliance history. Better technology will improve our ability to monitor activities for compliance without having to do as many physical site visits.

Our focus so far has been on water use compliance monitoring and land use consents to farm.

See inside for our consent compliance results.

See the back page for a case study and the progress farmers are making.

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R19/95

E19/7515

Compliance monitoring

JULY 2018 – JUNE 2019 REPORT

Why this matters

We are working with land managers, individuals and industry to improve compliance to ensure the best long-term environmental results.

Consenting rules

- Resource consents allow people or organisations to do something that may have an effect on the environment, but this comes with conditions to protect the environment.
- It is important consent holders comply with their conditions otherwise they can have a negative impact on the environment.

What the grades mean

(Full compliance) Full compliance with all relevant consent conditions, plan rules, regulations and national environmental standards

(Low Risk Non-Compliance) Compliance with most of the relevant consent conditions, plan rules, regulations and national environmental standards. Carries a low risk of adverse environmental effects.

(Moderate non-compliance) Non-compliance with some of the relevant consent conditions, plan rules, regulations and national environmental standards. Some environmental consequence.

(Significant non-compliance) Non-compliance with many of the relevant consent conditions, plan rules, regulations and national environmental standards. Significant environmental consequence.

How we respond to improve compliance grades

If there is an issue, our first response is to work with individuals and businesses to stop any immediate environmental damage.

We then investigate to determine what actions should be taken, including enforcement.

Education can achieve better outcomes and is valued by consent holders who need help. If education does not get the right results, there are a range of compliance actions as set out below:

Formal written warnings notify of an offence and require action to be taken.

Infringement notices, which include a fine, are issued for more significant breaches.

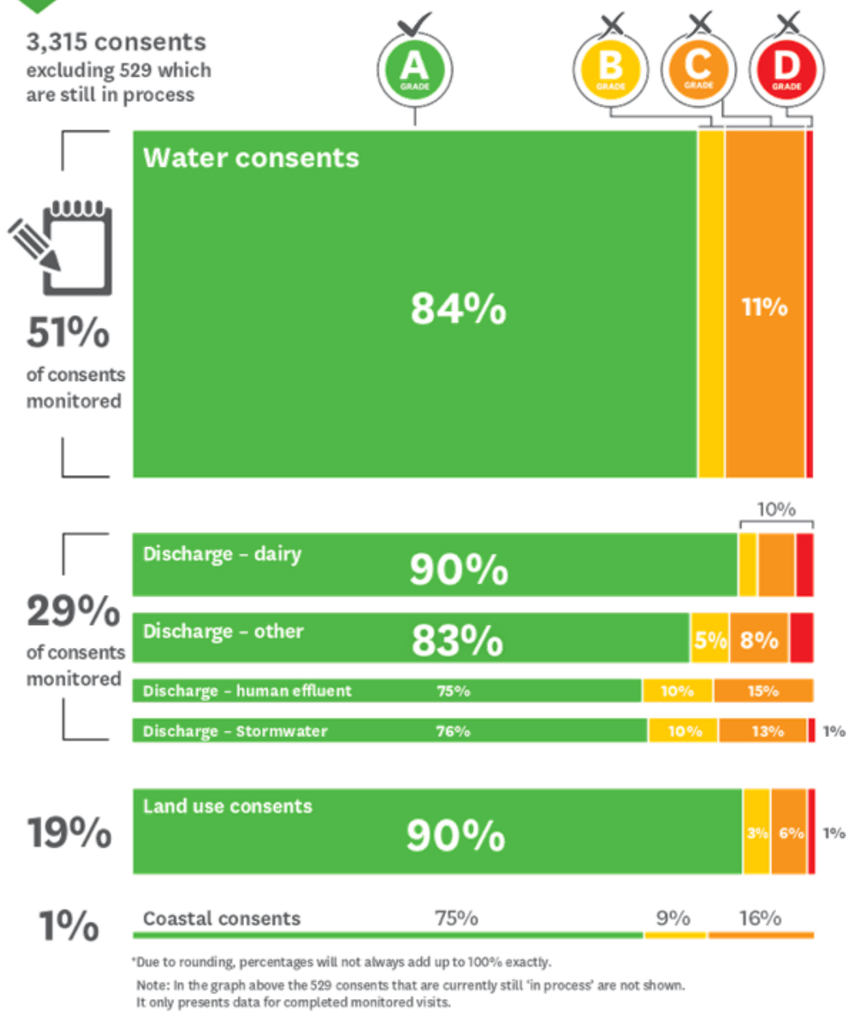
Abatement notices are a formal written direction, requiring certain actions to be taken or to cease within a specified time.

Prosecution is reserved for offences so serious that they warrant proceedings through the courts.

5,242 consents targeted

What we monitored

3,315 consents excluding 529 which are still in process



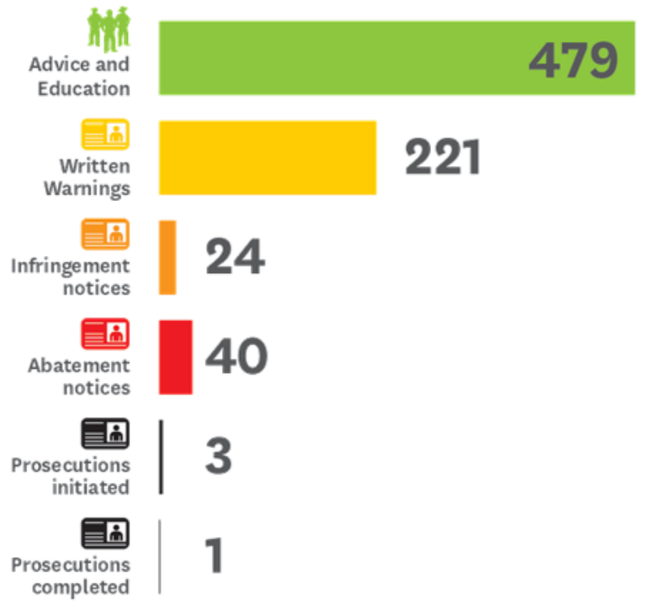
*Due to rounding, percentages will not always add up to 100% exactly.

Note: In the graph above the 529 consents that are currently still 'in process' are not shown. It only presents data for completed monitored visits.

System Verified Compliance

An automated system checks water use data against specific criteria

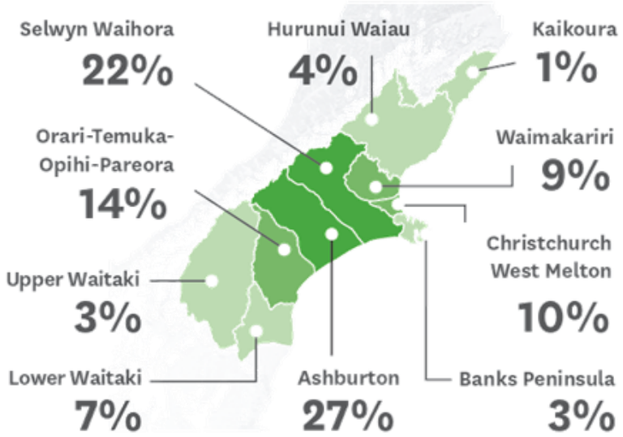
How we responded to improve compliance grades



Note: in addition we responded to 3530 incidents of potential environmental damage (see separate report).

5,362 inspections by zone

Some consents have multiple inspections, these include those with a C or D compliance rating, as well as those identified as high-risk which are subject to more regular monitoring.



3 Focus for 2019/20 and beyond

Following the pilot from the previous year, the 2018-19 programme comprised: we have redesigned our programme. Our approach will now:

1. Define an increased role for industry to develop solutions to issues
2. The development of a five-year programme

The five-year programme will include a catchment-based approach which looks at multiple fish screens on the same surface water source. In this scenario a collaborative approach of just installing one functional fish screen may be a better and more cost-effective solution than multiple screens.

2019-20

- Working towards the creation with industry of an 'Action Planning' process that will see Industry take on a greater role in developing solutions for approval by Environment Canterbury
- Environment Canterbury Action Plan Approval and Monitoring
- Trial New Action Planning Process
- Inspection and Consent Monitoring Report (CMR's)
- Recommence Inspections and Monitoring of Action Plans

2020 onwards

- Inspections of Fish Screens
- Monitoring of Action Plans

> *"The five-year programme will include a catchment-based approach which looks at multiple fish screens on the same surface water source."*

4 In Summary

Following the pilot from the previous year, the 2018-19 programme comprised:

- Focusing on the top 50 takes
- Developing systems and processes

The results of the programme to date will inform a package of improved solutions focusing on a greater role for industry and addressing the complex technical and legal issues highlighted.

The programme for 2019-20 will comprise:

- Addressing all consents in progress – ensuring action plans are in place to address compliance issues
- Defining areas where industry resources can be utilised to resolve issues (instead of Environment Canterbury resources)
- Development of a five-year programme that will address fish screens on over 95% of the consented surface water takes.

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E19/7677

FISH SCREENS UPDATE 2018/19

1 What is this issue?

What are fish screens?

Fish Screens are mechanical structures, usually designed and engineered for a specific surface water take to ensure fish remain in the waterway from where water is being abstracted, without being harmed.

What are the issues?

- There have been requirements for fish screens on surface water takes since 1967, when the Water and Soil Act was enacted.
- These rules were strengthened when the Land and Water Regional Plan (LWRP) introduced new rules for fish screens in 2004. Because these rules have only applied to fish screens consented from 2004, meaning fish screen standards vary – many older screens may be compliant older consent conditions, but of limited effectiveness in protecting fish.
- Installing an effective Fish Screen is complex due to the many variables present at any surface water take. The LWRP, which regulates any new fish screen installation outlines (in Schedule 2) seven factors required for a fish screen to be effective.

2 What has been done to date?

Prior to 2018-19 season

Prior to 2018-19, when a shift to Audited Self-management of land-use consents made resource available for new compliance projects, Environment Canterbury's priority focus had been implementation and compliance of stock in waterways, dairy effluent, high-risk consents and water metering. When resource became available Council added fish screens to the list as the next most important priority, following stakeholder and community feedback. This led to a fish screen pilot programme to inform further work.

Pilot programme

The 2018 pilot programme was informed by a pilot project undertaken in early 2018. It highlighted a higher than anticipated number of issues with fish screen compliance and effectiveness.

The 922 consents with conditions relating to fish screens in Canterbury were prioritised by removing inactive consents and intakes below 10 litres per second (L/s), as takes with greater volume had more environmental impact. Overall, 85% of the water take by volume is via 50 consents, which was a key factor in prioritising fish screen assessments and monitoring from a list of 150 provided to stakeholders for feedback.

As well as stakeholder input, the pilot programme also involved

- continued support and engagement with the Fish Screen Technical Working Group. Environment Canterbury participates in the Fish Screen Technical Working Group separate to the Council's work on fish screen compliance. The FSTWG reports to the CWMS Regional Committee and works on the improvement of technical standards for fish screens.
- As well, a workshop was held with the engineering industry to discuss the Fish Screen Programme of works and constraints faced by the industry in upgrading ineffective and/or non-compliant fish screens.

Progress to date:

- Development of Standard Operating Procedures, including Health and Safety protocols.
- 32 screens were inspected in the pilot study
- 20 of the top 50 screens have been visited and compliance assessments made.
- 10 new screens have been submitted for design review.
- Compliance assessment times have dropped from an initial 80 staff hours per screen to about 10 hours now.

	2017-18	2018-19
Monitoring visits	32	20
In progress	-	49
Compliance achieved	-	3
Design reviews completed (i.e. new fish screen designs to be installed)	-	10

Insights and Learnings

The programme has highlighted several key insights:

a. Screen compliance and effectiveness – and the assessment of it – is technically and legally complex

b. The majority of fish screens visited can be deemed non-compliant.

c. There are significant implications for industry in terms of the scale of upgrades likely to be required, and the related investment required by consent holders

d. There is limited industry skill, knowledge and capacity to design and install improved screens.

Action is therefore focused on addressing these gaps.

More detail of the Fish Screen programme is provided in the table over the page.

DELIVERABLE	DESCRIPTION	PURPOSE	PROGRESS STATUS
Primary Deliverables			
Pilot Screens	Confirm compliance assessments, report status to consent holders and agree to action plan	Compliance monitoring	**Ongoing** Confirmed compliance status of all screens. Report status to consent holder and action plan to follow
Top 50 Screens	Site visits to 50 screens risk-prioritised with input from stakeholders, complete compliance assessments and report status to consent holders	Compliance monitoring	**Ongoing** Finalised Top 50 highest risk screens 20 of these 50 site visits and compliance assessments complete
Industry Engagement	Engage irrigation industry (including consent holders) and associated consultants	Working towards the creation with industry of an 'Action Planning' process that industry will manage	**Ongoing** Workshop undertaken September 2018 Further engagement planned for 2019
Stakeholder Engagement	Engage with stakeholders where appropriate (irrigation schemes, Zone Committees, Irrigation NZ, etc)	To ensure stakeholders interests are considered to maintain their support	**Ongoing** Liaison through Fish Screen Technical Working Group Stakeholder input into prioritising Top 50
Rock bund advice note	Development of a formal Advice Note for consent applications seeking to install rock bund (or similar) fish screens	To date rock bunds have not been able to be reliably tested to ensure effectiveness. The advice note informs applicants of the risk of installing rock bunds and that any new rock bund found to be ineffective may need to be replaced.	**Implemented** Advice note available to Environment Canterbury consenting teams from May 2019
Communications	To communicate project information	To educate and inform industry, stakeholders and the wider public	**Ongoing** External website updated Pilot report published
Associated Deliverables			
Clear Compliance Pathway	Initial scoping process and document followed by legal review	Ensure clear understanding of various consent conditions and the ultimate enforceability	**Implemented** Legal review completed by Wynn Williams July 2019
Standard Operating Procedures	Develop improved site visit operating procedures able to be endorsed by industry and fish screen working party	Robust and confident monitoring procedures and processes.	**Implemented** SOP trial with and endorsed by working party during field visits in September 2018
App Development	Develop apps to assist monitoring for 'open channel' and 'pump' fish screens	Ensure accuracy, consistency and efficiency of monitoring	**Ongoing** Apps developed by inhouse GIS and currently being field tested. Refinement underway
Action Planning	Develop process to ensure a clear, measurable and agreed to pathway to compliance	Achieve consent holder buy in, track and report compliance progress to ensure a fully compliant outcome	**Ongoing** Work commenced designing process for industry to take greater responsibility for presenting solutions to Environment Canterbury for non-compliant fish screens
Moderation Panel	Develop an internal moderation panel to assist in decision making and ensure consistency across monitoring	Support given to officers in making accurate and consistent decisions. Ensures reasonable outcomes from an organisational and customer perspective	**Implemented** Moderation panel process developed October 2018. All screens monitored requiring moderation reviewed by panel
Consolidation of Fish Screens Approach	Develop an approach to promote and encourage the consolidation of multiple fish screens into one screen where these opportunities exist	Allows for larger more technically robust solutions; Most cost-effective for individual consent holders	**Ongoing** Opportunity within pilot identified. Process to realise opportunity underway

7.5 Presentations from Department of Conservation

Author: **John Benn, Department of Conservation**

Recommendation

That the information be received and noted.

Purpose of Report

1 Department of Conservation representative John Benn will present the attached report to the Committee.

Attachments

1. Department of Conservation Presentation

• **ORARI TEMUKA OPIHI PAREORA ZONE COMMITTEE** • AGENDA ITEM NO: 5	• SUBJECT MATTER: • **Department of Conservation work within the OTOP Zone**
• John Benn, Operations Canterbury Water Management Strategy • Duncan Toogood, Operations Manager Raukapuka Area Office • Brad Edwards, River Recovery Ranger	• DATE OF MEETING: 2 December 2019

Action required:

The Zone Committee notes the presentations on DOCs partnership role in the CWMS provided by John Benn and the DOC Works Programme provided by Duncan Toogood and Brad Edwards.

Background

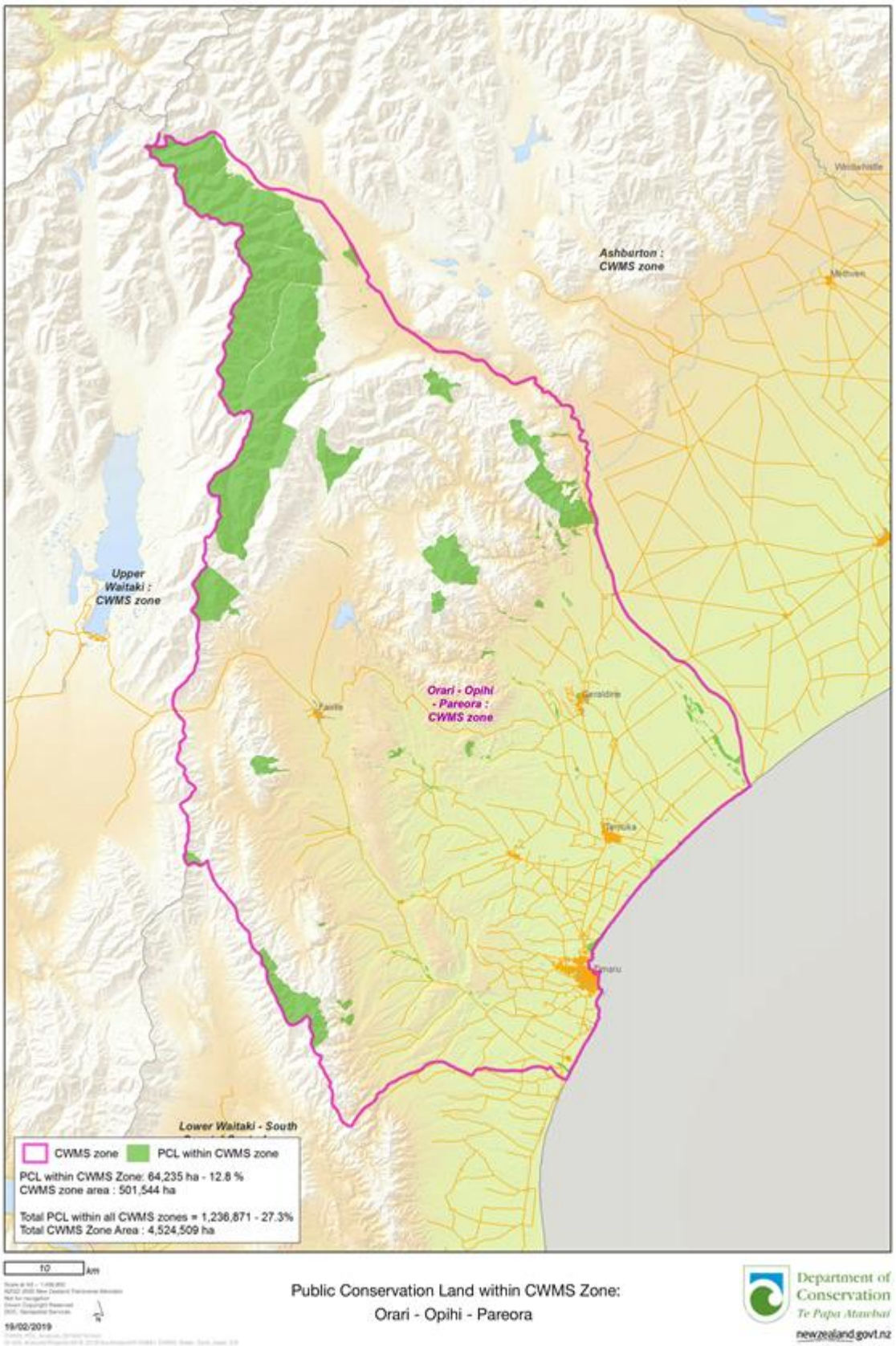
The Department of Conservation (Te Papa Atawhai) is the New Zealand government agency charged with conserving New Zealand's natural and historic heritage.

Our vision is for New Zealand to be the greatest living space on Earth (Kāore he wāhi i tua atu i a Aotearoa, hei wahi noho i te ao).

Our vision means ensuring that New Zealanders gain a wide range of benefits from healthy functioning ecosystems, recreation opportunities, and through living our history.

To do this, we organise our work around five outcomes:

- the diversity of our natural heritage is maintained and restored
- our history is protected and brought to life
- more people participate in recreation
- more people engage with conservation and value its benefits
- conservation gains from more business partnerships.


Ashburton : CWMS zone
Upper Waitaki : CWMS zone
Orari - Opihi - Pareora : CWMS zone
Lower Waitaki - South
Temuka
Timaru
CWMS zone
PCL within CWMS zone
PCL within CWMS Zone: 64,235 ha - 12.8 %
CWMS zone area : 501,544 ha
Total PCL within all CWMS zones = 1,236,871 - 27.3%
Total CWMS Zone Area : 4,524,509 ha
10 km
19/02/2019
Public Conservation Land within CWMS Zone:
Orari - Opihi - Pareora
Department of Conservation
Te Papa Atawbai
newzealand.govt.nz

7.6 Update on Swimming Sites

Author: **Lyn Carmichael, Facilitator**

Recommendation

That the report be noted.

Purpose of Report

1 To consider the attached update on Freshwater Suitability for Recreation.

Attachments

1. Swimming Sites Update

• **ORARI-TEMUKA-OPIHI- PAREORA ZONE COMMITTEE**	• **Agenda item:6**
• **TOPIC: Freshwater Suitability for Recreation Update**	
• **AUTHOR:** Lyn Carmichael (Zone Facilitator)	• **DATE:** 2 December 2019

Summertime is just around the corner, and our students are now on board and have started this summer's swimming beach sampling programme. In the OTOP zone we will be sampling 13 sites on a weekly basis for faecal indicator bacteria (E. coli) and checking for toxic algal growths.

Suitability for Swimming Grades for 2019/20

Revised suitability for swimming grades are now ready for this summer. Each year we recalculate the 'suitability for recreation grading' of our popular swimming sites based on the previous 5 years of data. We follow the Ministries of Health and for the Environment (MoH/MfE) protocols for sampling, responding and grading popular swimming sites.

There are a couple of changes to the grades for sites in the OTOP zone.

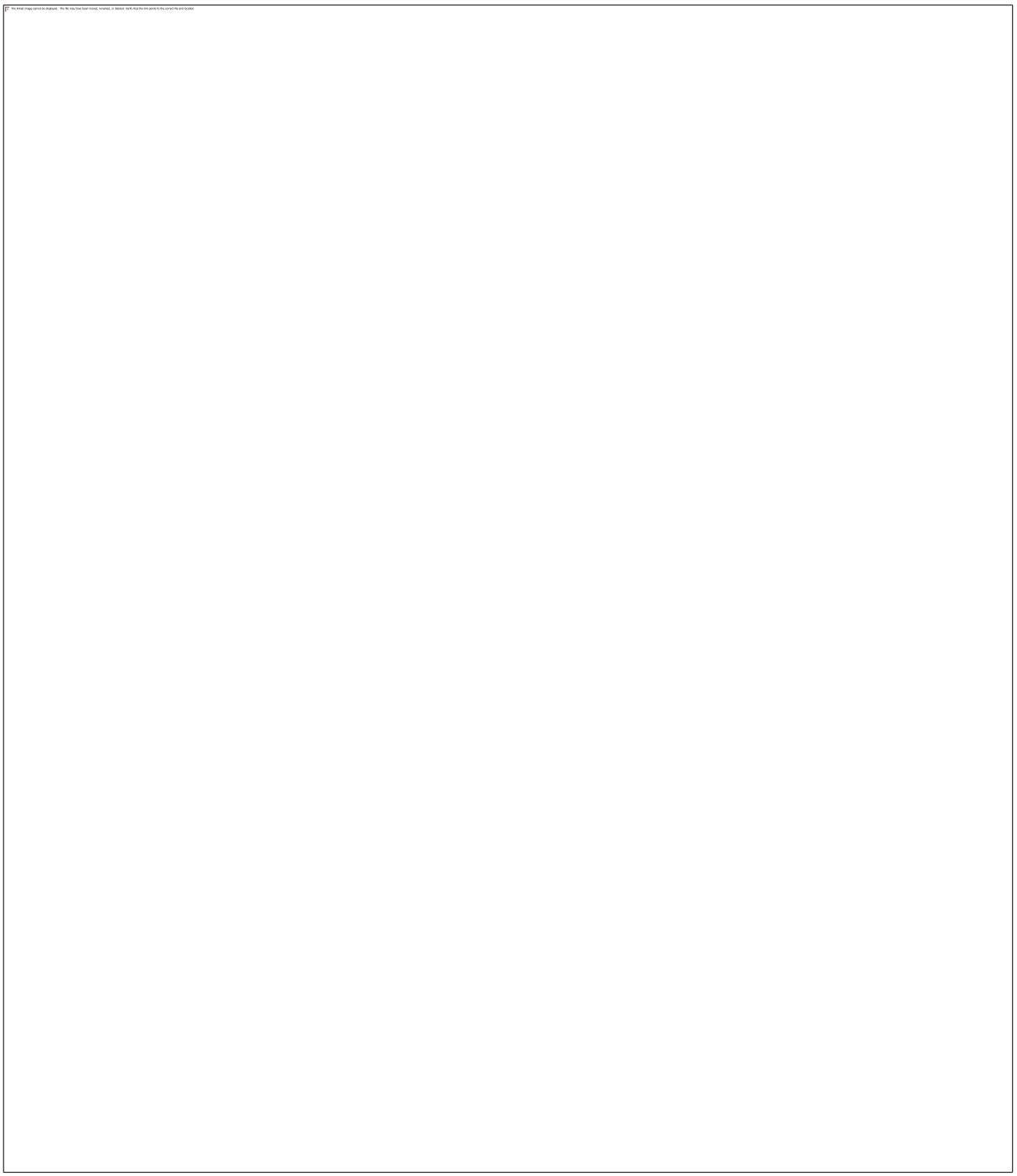
LAWA.org.nz is the go-to source for viewing the weekly results and any health warnings.

West Caroline Bay and Pareora River at Huts have experienced notable changes in swimming water quality as below:

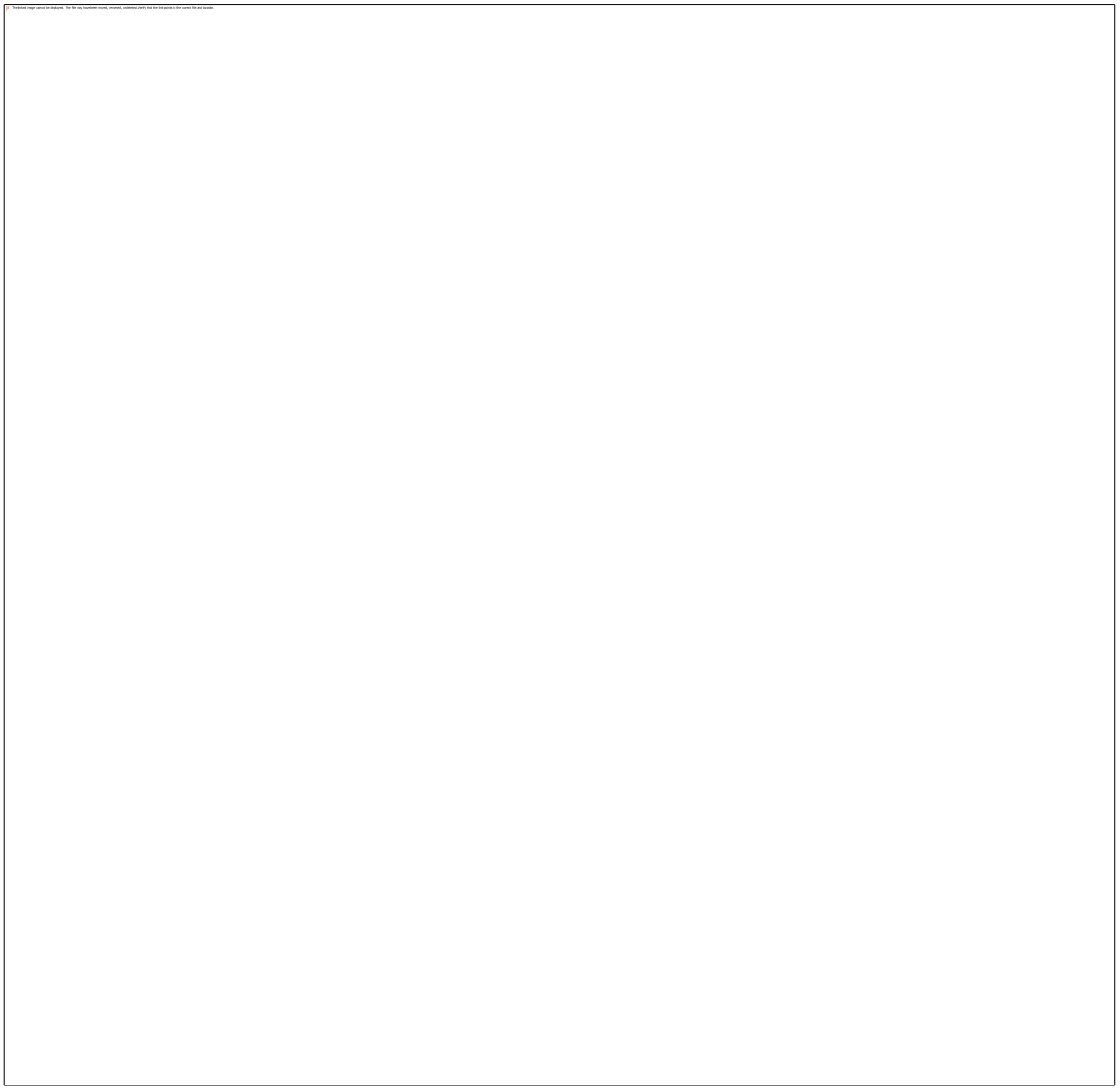
Pareora River at Huts – This site was previously graded as 'fair' but now has a 'poor' suitability for recreation grade. This means that swimming is no longer recommended at the site. ECan will be engaging with the Pareora huts community directly with drop in sessions and letters to advise them of the change in suitability for recreation grade. ECan staff are running some investigations in the Pareora River catchment this summer to identify any obvious sources of the contamination. If the investigation is successful in finding the likely source of the contamination, this finding will be followed up with appropriate solutions. The Pareora River at Evans Crossing (a little further upstream) is still graded as 'fair' but swimming there is not advised up to 48 hours after rainfall.

West Caroline Bay at Virtue Ave – This site is still considered as suitable for swimming, but it is advised to avoid swimming there up to 48 hours after rainfall. Last year saw some significant rainfall events followed by days of very settled, calm weather. It is likely that stormwater contaminated the bay (particularly at the western end where there are a couple of stormwater discharge points) and the bacterial (*E. coli*) contamination remained in the bay due to the very settled weather that followed. Signage at the site will warn the public of times when swimming should be avoided. The middle Caroline Bay site and Yacht Club (opposite end of the bay) are considered suitable for swimming.

Freshwater Suitability for Recreation Grades



Marine Suitability for Recreation Grades



FAQS

Swimming not recommended at Pareora Huts this summer

1. What has happened?

Microbial water quality has degraded in the Pareora River near the Pareora Huts settlement. This means that swimming is not recommended at this site over the 2019/20 summer.

Environment Canterbury's annual revision of the suitability for recreation grading at the Pareora River Huts has changed from 'fair' to 'poor' based on the most recent data (2014-2019). Sites with a grade of 'poor' are considered unsuitable for primary contact recreation due to a high occurrence of bacterial (E. coli) contamination events.

High growths of potentially toxic cyanobacteria on the river bed can also pose a risk to human health. This is monitored weekly over summer and warnings are issued as necessary.

2. What are the health risks to swimmers?
Sites with a grade of 'poor' are considered unsuitable for primary contact recreation e.g. swimming. This is because swimming poses a risk of ingesting water that may be contaminated by disease-causing micro-organisms such as viruses, bacteria and protozoa.

In most cases the ill-health effects from ingesting contaminated water are minor and short-lived. However, there is the potential for more serious diseases such as hepatitis A and salmonella.

3. What about fish caught near this location?
Eating fish from highly contaminated sites should be avoided. If fish are eaten, remove the gut and liver and wash in clean water before cooking.

4. Why has this happened?
Increases in E. coli at the site has resulted from faecal contaminants entering the water nearby or upstream. The exact source of these faecal contaminants is unclear. They may be the result of several sources including run-off from surrounding land-use after heavy rain, sewerage system leakages, or stock access to the waterway.

5. What will happen next?
Environment Canterbury, the Timaru and Waimate District Councils, and Community and Public Health are working together to inform the community of the change in the grading. This includes erecting new signage at the site and directly engaging with the hut owners, recreational fishers and rūnanga.

6. What is being done to fix the problem?
This summer, Environment Canterbury will investigate the contamination sources that have resulted in the change of water quality at the Pareora Huts swimming site. This will likely include undertaking additional water sampling upstream (to determine where contamination is coming from) and faecal source tracking (to determine from what animals the bacteria have originated).

Environment Canterbury will engage landowners in the Pareora catchment to ensure their farming activities are compliant and good management practices are being implemented. The results of the investigation will help shape the best approach for improving water quality at this location.

7. What has the grade been at this site historically?
The swimming water quality in the Pareora River at Pareora Huts was 'fair' for the ten years prior to this change of grade to 'poor'.

8. How long will this warning be in place?
This will depend on the results of future water quality monitoring. The warning will be in place for at least 1 year but could be in place for 2 years or more. This is because the grade takes into account the past five years of water monitoring results.

9. How is the grade calculated?
The recreational water quality monitoring programme follows the national "Microbiological water quality guidelines for marine and freshwater recreational areas" (MfE & MoH, 2003). Cyanobacteria is also monitored using the "New Zealand guidelines for cyanobacteria in recreational fresh waters – interim guidelines" (Ministry for the Environment & Ministry of Health, 2009).

Five years of microbiological monitoring results, as well as a qualitative assessment of contamination risk from the surrounding catchment, contributes to an assessment matrix for determining a site's Suitability for Recreation Grade (SFRG).

Swimming sites are graded on a 5-point scale from 'very poor' to 'very good'. Sites with SFRGs of 'very poor' or 'poor' are considered unsuitable for primary contact recreation. Warning signs that recommend against swimming are erected and managed at these sites by territorial local authorities.

10. Where can I swim instead?

The best source of up-to-date swimming water quality information is on the website www.LAWA.org.nz. The Pareora River at Evans Crossing is located not far upstream and is graded as 'fair'. This site, however, should be avoided for 48 hours after heavy rainfall or when there is any discolouration of the water. Other nearby bathing sites are located at the Opihi, Orari and Hae Hae Te Moana Rivers and have all been graded as 'good'.

11. What about Evan's Crossing?
The Pareora River at Evans Crossing is graded 'Fair' and is generally suitable for swimming. However, it is advised to avoid swimming for at least 48 hours following rainfall. The risk of contamination is higher following rainfall because there is increased runoff of faecal contaminants from surrounding land uses.

12. What does Environment Canterbury think about this?
It isn't unusual to see high bacteria results after heavy rainfall, but we are concerned about the frequency of high contamination events in the Pareora River at Pareora River Huts during dry weather. That's why our science team will be investigating why this might be happening, and our zone team will be working with landowners to ensure they are implementing good management practices.

We will continue to work closely with our colleagues at Community and Public Health and the district councils to monitor the situation closely and if necessary, take further action. We realise this change in water quality is not good news and share the public's concern. We will keep them up-to-date with our progress.

13. What are the key messages to the public?

- It's best not to swim at Pareora Huts this coming year due to increased health risks from poorer water quality
- The highest risk period is after heavy rainfall (for up to 48 hours)
- The reason for why the water quality has decreased is unclear
- Environment Canterbury is doing increased monitoring and research to investigate why microbial water quality has decreased and working with landowners.

14. Who can I talk to about this?

Call Environment Canterbury on 0800 324 636

7.7 Zone Facilitator's Report

Author: **Lyn Carmichael, Facilitator**

Recommendation

That the reports be noted.

Purpose of Report

1 To consider the Zone Facilitator's Report.

Attachments

1. **Facilitator's Report**
2. **Youth Ropu Recruitment Flyer**
3. **Southern Black backed Gull Strategy**

• **ORARI-TEMUKA-OPIHI- PAREORA ZONE COMMITTEE**	• **Agenda item:7**
• **TOPIC: FACILITATORS UPDATE**	
• **AUTHOR:** Lyn Carmichael (Zone Facilitator)	• **DATE:** 2 December 2019

Purpose:

To provide the OTOP zone committee with information on;

- Dates of Zone Committee meetings in 2020
- Upcoming events
- Issues raised in previous meetings
- Media
- Youth Rōpū
- Annual Report

Recommendation:

That the OTOP zone committee;

Notes the Facilitator's report

Report:

1. Dates of Zone Committee Meetings in 2020

The Committee is requested to consider its meeting dates, times and venues for 2020.

Historically the OTOP Zone Committee has met every four weeks throughout out the calendar year, commencing in February. The meetings have generally taken place on the first Monday on the month at different venues throughout the zone.

The Committee is asked to confirm its start time of 1.00pm for meetings. The Committee could decide to adopt a later start time of 3.00pm for formal meetings to allow time for workshops beforehand. The proposed meeting dates for the OTOP Zone Committee in 2020 are:

- 3 February
- 2 March
- 6 April
- 4 May
- 8 June
- 6 July
- 3 August
- 7 September
- 5 October

- 2 November
- 7 December

2. Upcoming Events

DATE	EVENT
• **12 December**	**Washdyke/Waitarokao Working Group Meeting**
• **11-12 February 21 -22 April**	**Treaty of Waitangi Workshops -** 2 days
• **21 - 22 November** • **30 – 31 January** • **13 -14 February** • **5 - 6 March**	• **Noho Marae** – 2 days • 21 - 22 November, Onuku Marae, Akaroa • 30 – 31 January, Takahanga Marae, Kaikoura • 13 -14 February, Wairewa Marae, Little River • 5 - 6 March, Arowhenua Marae, Temuka •

3. Progress on Issues raised in previous meetings

• DATE	• ISSUE	• STATUS
• **2 September**	• ECan Submission on Action for Healthy Waterways	• Can be found here: https://ecan.govt.nz/about-us/your-council/submissions-from-ecan/
• **4 October**	• Can ORRPG be an interested party for consents in the Orari Gorge Area?	• Discussed below •
• **4 October**	• Stock Exclusion above the Gorge	• All farmed cattle, deer and pigs must be excluded from the bed of the river • Follow up on going
• **4 October**	• Consent Reviews	• Follow up ongoing

Can ORRPG be an interested party for consents in the Orari Gorge Area?

A common area of confusion is the difference between people 'interested' in an application or proposed activity, and 'affected' persons. The term 'interested persons or parties' refers to a broader group than 'affected persons', and includes everyone who has an interest in an application, geographic area or issue. An "affected person" (which is a term defined in the RMA) is someone on whom the effects of the proposed activity will be minor or more than minor. Effects on a person (eg, neighbour) may be more than minor BUT overall the environmental effects of the activity may still be minor.If the person has given written approval, they have waived their rights as an affected person.

Interested parties

An interested person or party may be a group or body that has a general interest in an application, but is not deemed to be 'affected' under the RMA. Council has a list of interested parties that are sent an email advising them of specific applications relevant to their particular interest, a courtesy we undertake to ensure those parties are made aware of relevant applications.

An interested party may then send a comment to us, which we use during application processing to determine whether they are an affected person, which gives them certain rights under the RMA.

An interested person or party (like anyone else) is then entitled to make a submission if the application has been publicly notified.

https://www.ecan.govt.nz/get-involved/news-and-events/2018/rma-101-explaining-the-consent-process/

https://www.mfe.govt.nz/publications/fresh-water/everyday-guide-consultation-resource-consent-applicants/everyday-guide

4. Media

Date: 11 November 2019

Orari Gorge Station owners aren't ruling out further protection

Matthew Littlewood

SUPPLIED

Almost 150 hectares of Orari Gorge Station will soon be placed under a QE11 covenant.

More than 150 hectares of private land near Geraldine will soon be placed under a protective covenant - and the owners aren't ruling out protecting even more of it.

The latest proposed Queen Elizabeth II (QEII) protective covenant proposed over the land at Orari Gorge Station, covering about 48ha of land, is the third of its type at the station, and will go some way to help ensuring it will fulfil the Timaru District Council's classification of it as a Significant Natural Heritage Area (SNA).

This means there will soon be about 150 hectares of protected crown covenant land over the 4000ha station.

The land is owned by Robert and Alex Peacock.

READ MORE:

* **South Canterbury residents call for more support for bats**
* **Predator control, wetlands among South Canterbury beneficiaries of $100,000 injection**
* **QEII Trust celebrates its 4000th covenant**

A covenant put in place by the QEII Trust is a partnership between independent charitable organisation, the QEII National Trust and landowners, who work together to protect natural and culturally important sites where native flora and fauna have the potential to regenerate naturally.

Alex Peacock said the process, which had taken about two years, had been an advantage for their farming operations.

"We've got a large amount of bush cover, and keeping stock away from it has helped with our pasture management," she said.

"We would like to protect the bush for future generations to enjoy, so we were more than happy to help out."

Peacock said some of the challenges with fencing were due to the fact that some of the land was on some quite hilly terrain, but they had been lucky to receive funding from Environment Canterbury (ECan), QEII Trust and Timaru District Council towards the first stages of the project.

Through the Orari-Temuka-Opihi-Pareora (Otop) zone committee, ECan has committed about $21,000 towards protective measures for Orari Gorge Station.

Asked whether they would consider putting more of their land into protective covenant, she said "never say never".

"It would depend on what's available and how it works in with the rest of the farm," she said.

"But the important thing is keeping communication with the right organisations."

QEII National Trust South Canterbury regional representative Rob Smith said the protective measures were a win-win for both conservation and farming.

"It's a really significant natural area, there are more than 70 different native species of flora and fauna over it, Smith said.

"You've got a lot of native bush, but also a lot of native birds such as the kererū (wood pigeon) and korimako (bellbird), along with the New Zealand Falcon.

"The landowners have been really cooperative, they see the value in placing these areas under protective covenant which would otherwise not have been used for productive land anyway."

Smith said there would be about 10 landowners who have put part of their land into protective covenant in the Timaru District because of the SNA programme.

"A lot of the protection work can be really basic stuff, such as fencing off parts of the land, and installing predator traps," Smith said.

"We have lost a lot of our natural biodiversity values, so the QEII process is one way we can claw some of it back."

Smith said the funding from ECan's immediate steps programme had also been a boon to protecting covenants.

"It's provided us with funding we otherwise wouldn't have got," he said.

Smith said in the Timaru District, QEII covenants are placed over land areas as small as one hectare and in the case of Kakahu, as large as 350hectares.

"It's a really collaborative effort," Smith said.

- **Stuff**

Tuesday, November 12, 2019 $2.30

The Timaru Herald

And the bird of the year is ... NEWS

Millane murder Accused 'liked to dominate' NEWS

Respects paid on Armistice Day

Al Williams

Two minutes silence was observed in Timaru yesterday to mark 101 years since the signing of the armistice between Germany and the Allied Powers, bringing an end to World War I.

The 11th hour of the 11th day of the 11th month became known as the moment guns fell silent in Europe. It triggered a cacophony of joy around the world.

Officials joined about 30 people paying respects at the Armistice Day memorial service at the World War I memorial on Caroline Bay.

Vietnam veteran Rapa Whiu, led the service, calling for the silence after dedicating the service to the young New Zealanders who left "an echo of eerie stillness, an echo of homes made silent when they did not return".

TURN TO PAGE 3

From left, Bob Metherell, Greg O'Brien and Grant Finlayson at the Armistice Day service at the World War I memorial on Caroline Bay in Timaru yesterday.

Bush area gets special status

Environment Matthew Littlewood

More than 100 hectares of private land near Geraldine will soon be under a protective covenant – and the owners aren't ruling out protecting even more of it.

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This means there will soon be about 500ha of protected Crown covenant land over the 4000ha station.

The land is owned by Robert and Alex Peacock.

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Peacock said the process, which had taken about two years, had been an advantage for their farming operations.

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Peacock said some of the challenges with fencing were due to the quite hilly terrain, but they had been lucky to receive funding from Environment Canterbury, QEII Trust and the district council.

"We have lost a lot of our natural biodiversity values, so the QEII process is one way we can claw some of it back."

Rob Smith

Through the Orari-Temuka-Opihi-Pareora (Otop) zone committee, ECan has committed about $21,000 towards protective measures for the station.

Asked whether they would consider putting more of their land into protective covenant, she said "never say never".

"It would depend on what's available and how it works in with the rest of the farm.

"But the important thing is keeping communication with the right organisations," she said.

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"You've got a lot of native bush, but also a lot of native birds such as the kereru [wood pigeon] and korimako [bellbird], along with the New Zealand Falcon.

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"A lot of the protection work can be really basic stuff, such as fencing off parts of the land, and installing predator traps.

"We have lost a lot of our natural biodiversity values, so the QEII process is one way we can claw some of it back."

5. Applications for the Environment Canterbury Youth Rōpū are now open

Applications are now open for the **Environment Canterbury Youth Rōpū**. The Youth Rōpū is a group for young people **aged 14-24** coordinated by the **Youth Engagement and Education Team at Environment Canterbury Regional Council**. The goal of the Youth Rōpū is to build the relationship between the Regional Council and young people to empower each other to be good kaitiaki of our environment. So far the Youth Rōpū has engaged in meaningful ways with wider youth, staff and Council to bring a youth perspective to

decisions. The next year will be exciting and the Youth Rōpū offers a clear path to engage with decision makers on issues that matter around us. If you're interested in the environment and want to help strengthen the youth voice in Canterbury, apply now! For more about the Youth Rōpū check out their web page.

There are 16 members and we are currently have six vacancies. **Applications close 20 December 2019.**

North Canterbury – two people
North/East Christchurch – one person
South Christchurch – one person
Mid- Canterbury – one person
South Canterbury – one person

Background information

In 2018 a group of young people formed a working group (Youth Participation Platform Working Group or YPPWG) with support from the Environment Canterbury Youth Engagement and Education Team (YEET**)** and funding from Ministry of Youth Development. The goal of this group was to establish a platform for young people and decision makers at Environment Canterbury to work together. This bought to life the aspirations, conversations and ideas that have been developed over the course of two years.

The Youth Rōpū met for the first time in May 2019. The Youth Rōpū is a formalised group of people aged 14-24 who have an interest in the environment, developing their leadership skills and being part of an exciting team of young people that make a difference. The group is made up of 16 people with two mana whenua, and two geographic representatives from the following areas - North Canterbury, Mid Canterbury, South Canterbury, Christchurch North East, Christchurch West, Christchurch South and Christchurch Central.

What is involved?

The Youth Rōpū does not follow a traditional committee structure with a chairperson etc. Instead the Youth Rōpū have adopted a flat leadership structure with four teams set up to deliver on the five priority areas.

- Social media – responsible for planning and running social media activities and posts
- Coordination – responsible for the internal organisation of the EYR
- Events and partnerships – responsible for running and partnering on events and building relationships with relevant groups and organisations
- Consultations and submissions – responsible for strategic involvement with consultations and submissions on key issues relating to Environment Canterbury

The baseline commitment is to attend a face-to-face meeting every six weeks in Christchurch (usually on a Sunday 11am – 4pm), a fortnightly one-hour online meeting and be active in at least one team. This would be a *minimum* time commitment of six hours per month.

Promotion

If this is something that you think would appeal to a young person you know please encourage them to apply. We would also love your help spreading the word. You can do this by:

- Sharing this email
- Sharing the weblink https://bit.ly/2GCWOau
- Sharing the attached flyer
- Share posts from the Youth Engagement and Education team Facebook page
- Follow @youth_4_waitaha on Instagram for updates and share the content

If you have any questions please contact hannah.dunlop@ecan.govt.nz or 0274054895

ARE YOU AGED

14–24

WITH AN INTEREST IN THE ENVIRONMENT?

Join the Environment Canterbury Youth Rōpū

Applications are now open for the Environment Canterbury Youth Rōpū.
The Youth Rōpū is a group for young people aged 14-24 coordinated by the Youth Engagement and Education Team at Environment Canterbury. The goal of the Youth Rōpū is to build the relationship between the Regional Council and young people to empower each other to be good kaitiaki of our environment. So far the Youth Rōpū has engaged in meaningful ways with wider youth, staff and council to bring a youth perspective to decisions. The next year will be exciting and the Youth Rōpū offers a clear path to engage with decision makers on issues that matter around us. If you're interested in the environment and want to help strengthen the youth voice in Canterbury apply now!

We are looking for applicants from these areas:

North Canterbury – 2 people
North/East Christchurch – 1 person
South Christchurch – 1 person
Mid- Canterbury – 1 person
South Canterbury – 1 person

If you aren't sure if you're in one of these areas get in touch with **Hannah.dunlop@ecan.govt.nz**

E19/7709

Apply online

Find out more and apply online
https://bit.ly/2GCWOau

Applications close **20 DECEMBER 2019**

The selection panel will meet in mid-January and successful applicants will be notified in late January

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Canterbury Southern Black-backed Gull/ Karoro management strategy

WMIL Wildlife Management International

Canterbury Southern Black-backed Gull/ Karoro management strategy

Mike Bell and Paula Harborne

Wildlife Management International Ltd
PO Box 607
Blenheim 7240
New Zealand
www.wmil.co.nz

This report was prepared by Wildlife Management International Limited for Environment Canterbury.

September 2019

Citation:

This report should be cited as:

Bell, M.D.; Harborne, P. 2019. Canterbury Southern Black-backed Gull/ Karoro control strategy discussion document. Unpublished Wildlife Management International Technical Report to Environment Canterbury.

Cover image: ©Oscar Thomas, Birds Online

Contents

1. Summary

Southern Black-backed Gull/ Karoro numbers are super abundant in Canterbury, and all evidence indicates that they are likely to be continuing to increase and expand their range. Since European colonisation of New Zealand Southern Black-backed Gull/ Karoro have readily adapted to anthropogenic created habitats and food sources and their numbers and distribution have exploded. Recent research highlights that there is irrefutable proof that Southern Black-backed Gull/ Karoro are having a negative impact on the breeding success of braided river dependent shorebirds. This has led to a number of control operations being undertaken, of planned to be undertaken on rivers throughout Canterbury.

Given their widespread distribution, increasing population and the threat they poise to shorebirds, there is a clear need for a strategy to tackle this issue on a regional scale. Southern Black-backed Gull/ Karoro are increasing and impacting shorebirds on all braided rivers throughout the Canterbury region, this is a regional problem not a site specific one. Throughout all discussions with stakeholders and interest groups there was overwhelming support for the need a regional plan. The present approach to Southern Black-backed Gull/ Karoro control has each operation working independently, with little or no linkages.

As Southern Black-backed Gull/ Karoro present both an immediate and long-term threat to braided river dependent shorebird conservation a multiple control regime strategy is recommended. We make four key recommendations.

1. To protect key shorebird areas on high altitude inland river reaches we recommend a containment control approach, were as Southern Black-backed Gull/ Karoro numbers in upper river reaches already at low densities, these are further reduced and maintained at zero density within the next five years.
2. Within Canterbury there are a number of mammalian predator control projects aimed at improving the breeding success of shorebirds. We recommended that Southern Black-backed Gull/ Karoro control be carried out on all sections of rivers which have a mammalian predator programme.
3. Given their super abundance there is a clear need to manage the numbers of Southern Black-backed Gull/ Karoro in Canterbury to improve the breeding success of braided river dependent shorebirds throughout the entire region. In order to see a regional improvement in braided river dependent shorebird breeding success we recommended a reduction in the Canterbury Southern Black-backed Gull/ Karoro population of 5% per annum over the next 20 years.
4. We also recommend the establishment of a Southern Black-backed Gull/ Karoro management coordinator, and further research into gull movements, habitat use, and land-use management as future control options.

2. Introduction

The Southern Black-backed Gull/ Karoro is widespread and super abundant. It occurs throughout all non-forest habitats in New Zealand, from coastal areas to the high country. Following agricultural development in New Zealand, there has been a population explosion. Southern Black-backed Gull/ Karoro have adapted exceptionally well to modified environments (particularly intensive agriculture), readily utilising agricultural derived foods, fishing waste and landfills as new food sources. The last national population estimate in 2005 estimated that there was a total of over half a million birds (Biswell 2005).

With such abundance this has often seen them considered as a 'nuisance species' posing threats to other native birds, farmers (through predation of livestock and its propensity to carry disease), as well as a potential health threat to humans.

Braided rivers are a natural feature of the South Island, with 64% occurring in Canterbury. Braided rivers in New Zealand support unique communities of plants and animals, many of which are threatened with extinction (O'Donnell et al. 2016). Braided river birds are under threat from a diverse range of sources, including introduced mammalian predators, native avian predators, weed invasion, water abstraction, nitrification, dams, modified flow regimes associated with electricity generation, river protection works, gravel extraction, and human disturbance (O'Donnell et al. 2016).

Increasingly Southern Black-backed Gull/ Karoro have been implicated in the declines in braided river dependent shorebird populations. There is a growing body of evidence highlighting the predatory impacts gulls are having on these shorebirds.

With this in mind, Environment Canterbury has commissioned this report to develop a Southern Black-backed Gull/ Karoro strategy options paper for the Canterbury region. In this report we review the current knowledge of Southern Black-backed Gull/ Karoro biology and assess their threats to shorebirds, along with the other impacts they have on human health. We also review the current management methods being utilised in New Zealand. As part of this review we consulted widely, encouraging input from a diverse range of sectors. This consultation included a number of public meetings along with other specific meetings targeting agencies currently undertaking Southern Black-backed Gull/ Karoro control. Following advice from Environment Canterbury's Tuia team Rūnanga were engaged via Te Paiherenga where we meet to listen to the Rūnanga's values for Karoro and seek their input into the strategy development.

This report summarises the results of this review and is divided into five main sections (numbered in the report 3-7). Section 3 provides an overview of Southern Black-backed Gull/ Karoro biology, habits, population numbers and trends, and the gull's legal status. Section 4 of the report covers the effects and impacts of Southern Black-backed Gull/ Karoro, both on the endemic threatened shorebirds, but also on human health, farming, urban infrastructure and airport safety. Section 5 looks at the current control methods available to control Southern Black-backed Gull/ Karoro. Section 6 then brings these issues back into Canterbury context and investigates the significance of Canterbury's braided rivers, the current status and distribution of Southern Black-backed Gull/ Karoro in the region and why a regional strategy is warranted. Section 7 of the report provides recommended options for the development of a regional strategy for Southern Black-backed Gull/ Karoro in Canterbury.

3. The Southern Black-backed Gull/ Karoro

3.1 Southern Black-backed Gull/ Karoro *Larus dominicanus*

New Zealand status: Unprotected native

Conservation status: Not Threatened

Other common names: Dominican Gull, Kelp Gull (Australia), Black-backed Gull

The Southern Black-backed Gull/ Karoro is one of the country's most abundant, widespread and familiar bird species (Figure 1). The instantly recognisable large adult black and white gulls occur throughout all non-forest habitats in New Zealand, from coastal areas to high country farms. They have adapted exceptionally well to modified environments, especially agricultural land, whilst instantly utilising fishing waste and landfills as new food sources.

A native to New Zealand, the same species (referred to as Dominican, or Kelp Gulls), are found in similar latitudes of the southern hemisphere, including Australia and South America, and their sub-Antarctic offshore islands. Southern Black-backed Gull/ Karoro only became established in Australia in the 1940's, and have rapidly increased in numbers and distribution since the 1960's (Higgins and Davis 1996).

Following agricultural development in New Zealand, there has been a rapid population increase. The current national population has been quoted at over half a million birds (Biswell 2005), but is more likely to be approximately 500,000 individuals. This increase has often seen them considered a 'nuisance species' posing threats to other native birds, farmers (through predation of livestock and its propensity to carry disease), as well as a potential health threat to humans. Recent research has shown that Southern Black-backed Gull/ Karoro have significant impacts on braided river dependent birds; both directly as a major nest predator, but also indirectly by excluding such species from large sections of riverbed.

Figure 1. An adult Southern Black-backed Gull/ Karoro; one of the most widespread and recognisable bird species in New Zealand. Image © Rebecca Bowater FPSNZ www.floraandfauna.co.nz, Birds Online.

3.2 Identification

The Southern Black-backed Gull/ Karoro is New Zealand largest gull, measuring 60cm in length, weighing approximately 1kg with a wing span of 128-142cm. Adults have a white head, neck, underparts and tail, and a black back and upper wings (except for a narrow trailing white edge). They have yellow bills with a red spot at the tip of the lower mandible, pale yellow eyes with an orange outer ring and pale greenish yellow legs (Figure 1). Juveniles look very different, with dark brown plumage, black bills and legs in their first year. Their brown feathers have pale edges giving a mottled grey-brown appearance, which gradually lightens with age and seasonal wear, until they moult into

adult plumage by year four (Higgins and Davis 1996, Heather & Robertson 2005). Males are slightly bigger, however there is no visual difference between the sexes.

3.3 Habitat

In the New Zealand, Southern Back-backed Gull/ Karoro can be found inhabiting a variety of environments including, estuaries, harbours, beaches, rocky shores, riverbeds, farmland, and sparsely over subalpine tussock land. They readily occur in in towns and cities, utilising sports fields, roof tops, landfills and other manmade structures. They rarely venture far out at sea and usually forage within 10 kilometres of the shore. Breeding usually takes place on steep headlands, sea cliffs, sand or shingle spits and many outlying islands, as well as far inland on riverbeds, near lakes and alpine tarns. They are particularly abundant around wharves, sewage outlets, seafood processing plants, braided rivers and inshore fishing boats, scavenging on rubbish, organic waste and fish offal.

3.4 Breeding

Southern Black-backed Gull/ Karoro breed between October and February, in large colonies or in solitary pairs (Miskelly 2013). They are monogamous, with pair bonds continuing from one breeding season to the next. The number of gulls at colonies start building up in late July, with nests constructed almost immediately (mainly by the male). The nests are a bulky collection of dry grass, small sticks, seaweed, feathers and tidal debris, often built in a well-vegetated site on bare sand, rock or mud. The clutch is of 2-3 eggs (69 x 47mm, 80g), which are greyish green with dark brown blotches. Eggs are laid 2-3 days apart and are incubated by both parents for 23-27 days. Parents guard the chicks until fledging age at approximately 7-8 weeks. After fledging, chicks remain with their parents for a couple of months, and juveniles up to 6 months old are seen begging for food (Heather & Robertson 2005).

Southern Black-backed Gull/ Karoro begin to breed from four years old. Annual adult survival is high (93%), with a life expectancy of 14 years but have been known to live up to 28 years (Fordham 1985; Heather & Robertson 1996).

Figure 2. A newly hatched Southern Black-backed Gull/ Karoro chick and egg in nest. Image © Glenda Rees, Birds Online.

A Southern Black-backed Gull/ Karoro juvenile bird begging for food from an adult. It takes four years for birds to transition from the brown juvenile plumage to the black and white adult plumage. Image © Raewyn Adams, Birds Online.

3.5 Diet and Behaviour

The Southern Black-backed Gull/ Karoro prey on and scavenge a wide range of marine and terrestrial carrion, invertebrates, fish, lizards, small mammals, other birds and their eggs and chicks. They are opportunistic, their diet varying with season and surrounding environment depending on the availability of food. They have been recorded killing young lambs and poultry, as well as stealing food from other seabirds such as terns and penguins (Heather & Robertson 2005). The gulls scavenge organic waste from landfills, sewage outlets and farms, as well as fish offal from fishing boats and meat processing factories. Southern Black-backed Gull/ Karoro are able to dive briefly below the water surface to obtain food and have been seen breaking open shells for molluscs by carry it to some height and dropping them onto rocks.

Nest sites and colonies are aggressively defended by the gulls with a long series of strident persistent "ki-och" calls, as well as swooping to ward off an array of predators, including humans. They are conspicuous and generally gregarious, often roosting on rooftops in cities, attracted to food sources provided inadvertently or intentionally by people. Flocks will often follow behind inshore fishing boats or ploughs cultivating farmland. They capable of flying long distances to access food resources, being recorded travelling up to 50km from nesting areas (Fordham 1967; Horton *et al.* 1983) southern black-backed gulls will shift their diets to readily available, anthropogenic foods when possible.

3.6 Population and distribution

Southern Black-backed Gull/ Karoro were recorded in New Zealand during James Cook's voyages in 1770 and 1773 (Biswell 2005), however population numbers were likely to have been relatively small at that time (Oliver 1955). Although there is no detailed account during the very early period of European settlement it is likely that numbers were small at this time, and were perhaps as low as a few thousand birds. With the development of agriculture numbers have rapidly increased and their range expanded (Higgins and Davis 1996).

Since European colonisation of New Zealand Southern Black-backed Gull/ Karoro population numbers have increased rapidly (Oliver 1955, Turbott 1967). Human activities such as the development of ports, meat-processing factories, refuse dumps and farmland, are key drivers to the Southern Black-backed Gull/ Karoro population increase. Between 1961 and 1985 the population more than doubled along the south-west of the North Island (Powlesland & Robertson 1987), some colonies increasing up to 11 times from the 1940s to 1964 (Fordham 1967). The population has increased where human influences are not as marked, such as the Waitaki Basin, where between the 1960s and 1990s Southern Black-backed Gull/ Karoro increased in density and range; likely still driven by human derived food sources (lambs, rabbits and refuse dumps) (Maloney 1999).

Southern Black-backed Gull/ Karoro are widely distributed in New Zealand, existing in over 76% of the map squares surveyed 1999-2004 for the *Atlas of Bird Distribution in New Zealand* (Robertson et al. 2007). On islands off New Zealand, Southern Black-backed Gull/ Karoro can be found breeding on the Chatham, Bounty, Antipodes, The Snares, Campbell and Auckland Islands. The have also been reported breeding as far as the Ross Dependency, Kermadec Islands and Norfolk Islands (Heather & Robertson 2005). Widespread throughout the North and South Islands, there are hundreds of colonies, many exceeding 100 pairs, some even over 1000 pairs. The species is considered as New Zealand's most common gull (Higgins & Davies 1996), and with an estimated population of over half a million, it is referred to as a "super abundant" species (Miskelly 2013).

3.7 Movements and dispersal

Southern Black-backed Gull/ Karoro are capable of long-distance flights, moving around New Zealand, and although unquantified are thought to make trans-Tasman crossings regularly (Williams *et al* 2006).

To study the species dispersal, a total of 3,455 Southern Black-backed Gull/ Karoro chicks were banded between 1959 and 1993 at four Canterbury localities (three being river colonies and one an island

colony). Most birds (96%) dispersed <100km from their banding sight, with 10% of recoveries from >200km (Rowe 2013). With these birds dispersing widely throughout New Zealand, traveling as far as Dipton in Southland (486km) and the Wairarapa in the North Island (282km) (Rowe 2013). Long-distance movements by Southern Black-backed Gull/ Karoro are not uncommon and have been recorded in the past; for example, 1320 km from Makarewa to Auckland (Robertson 1972), 840 km from Mataura River mouth to Masterton (Robertson 1973), and 530 km from Muriwai Beach to the Ruamahanga River in South Wairarapa (Robertson 1964a). Rowe (2013) concluded that the direction and dispersal distances of Southern Black-backed Gull/ Karoro are variable and can occur between the North and South Islands.

Daily movements of Southern Black-backed Gull/ Karoro are less well-known, although they have been known to fly up to 50km between feeding, roosting and nesting areas (Fordham 1967; Horton *et al*. 1983). In the 1970s, the diurnal dispersal of large gulls such as great black-backed gulls (*Larus marinus*) were observed in England. Flight paths appeared to follow topographical features such as river valleys, likely because feeding sites were coincidently associated with them (Horton *et al* 1983). Feeding sites included landfills, agricultural land and playing fields which gulls would arrive at shortly after first light. Other gulls arrived as late as mid-morning presumably after spending time at other sites and departed in the late afternoon back towards the roost. Pre-roosts assemblies were often formed at refuse tips closer to the roost (Horton *et al* 1983).

Similarly, Oliver (1973) found a correlation between the predominant flight paths Southern Black-backed Gull/ Karoro from colonies on Rangitoto Island to the location of eight open refuse tips in the coastal margins of Auckland. All of these refuse tips were within 50km of the Rangitoto colonies so were readily accessible to southern black-backed gulls for daily foraging trips. An aerial survey in 1965 counted 12,236 Southern Black-backed Gull/ Karoro in the Wellington area, 5977 (48.8%) of which located at or near refuse tips or meat works (Fordham 1968). This creates a clumped distribution and shows Southern Black-backed Gull/ Karoro flock to major 'artificial' feeding sites during the day.

3.8 Legal status of Southern Black-backed gull

The Wildlife Act 1953 is the legislation which provides protection to New Zealand wildlife. Essentially all wildlife in New Zealand is absolutely protected unless it is specified on one of five Schedules (Schedules 1 through 5).

Southern Black-backed Gull/ Karoro is listed on Schedule 5 of the Wildlife Act 1953, which means under Section 7 (Certain wildlife not protected) they are not protected. As such Southern Black-backed Gull/ Karoro are considered an unprotected species, and it is legal for any person to kill or be in possession of Southern Black-backed Gull/ Karoro.

Although Southern Black-backed Gull/ Karoro are unprotected, other legislation covering animal ill-treatment ensure that although the killing of Southern Black-backed Gull/ Karoro is legal, it must be carried out in a humane manner. Further there is legislation which covers the use of vertebrate toxic agents which prescribe the use of any toxin used in the control of Southern Black-backed Gull/ Karoro.

3.9 Tangata Whenua

Ngāi Tahu are the Kaitiaki of the southern islands of New Zealand – Te Waipounamu. In 1998 Ngāi Tahu settled their Treaty claims with the crown, and confirmed their place as Kaitiaki of Te Waipounamu.

Ngāi Tahu considered Southern Black-backed Gull/ Karoro as a Taonga species and it was listed on the Crown's Settlement Deed. Through this Settlement the Crown acknowledged Ngāi Tahu has a special relationship with a number of bird, plant and marine mammal species; and this includes Southern Black-backed Gull/ Karoro. The settlement further states that those responsible for the management of these species are required to consult with and have particular regard to Ngāi Tahu views about any management proposals.

Southern Black-backed Gull/ Karoro eggs and chicks were a traditional food source for Ngāi Tahu, and Mahinga Kai was used in the Crown's Settlement Deed. Mahinga Kai refers to Ngāi Tahu interests in traditional food and other natural resources and the places where those resources are obtained. Ngāi Tahu remain interested in the ability to harvest Southern Black-backed Gull/ Karoro eggs and chicks.

4. Effects and impacts of Southern Black-backed Gull/ Karoro

Southern Black-backed Gull/ Karoro abundance especially in urban environments has caused many conflicts with people, including the transmission of pathogens through contamination of water sources, hazards to aircrafts, damage to buildings from nesting material and defecation, along with causing a general nuisance. Increasingly they are also being identified as a major conservation issue, proving to be a significant predator of threatened endemic bird species.

4.1 Native birds

Southern Black-backed Gull/ Karoro have negative impacts on threatened and protected native bird species in New Zealand. They are known to harass other sea and shore birds, attempting to breed in the same place, as well as prey on their eggs and chicks. Previous studies in New Zealand have shown that Southern Black-backed Gull/ Karoro have preyed upon the following species;

White-fronted Tern (Williams 1963)
Australasian Gannet (Robertson 1964b)
Black-fronted Tern (Steffens *et al.* 2012; Bell *et al.* 2018)
New Zealand Dotterel (Willis *et al.* 2003)
Black Stilt (Brown and Keedwell 1998)
Black Swan (Miers and Williams 1969)
Black-billed Gull (Thierry *et al.* 2016; Bell and Harborne, in prep)
Banded Dotterel (BRAID website)
Wrybill (BRAID website, Biswell 2005)
Variable Oystercatcher (Moorhouse 2017)
Paradise Shelduck (Biswell 2005)
Shore Plover (Miskelly 2013)
Fairy Tern (Miskelly 2013)

Other species have also been observed being harassed by Southern Black-backed Gull/ Karoro and it is likely that they are being preyed upon For example takahe chicks have been seen to cower in the remote Murchison Mountains when the gulls fly overhead (Biswell 2005).

Southern Black-backed Gull/ Karoro are a significant predator to braided river dependant birds particularly black-fronted terns and black-billed gulls, whose colonies have been known to completely collapse due to on-going Southern Black-backed Gull/ Karoro predation. A recent study monitoring Black-fronted Tern on the Waitaki River, Canterbury, used remote cameras to film predation events (such as by mammalian predators) and concluded that Southern Black-backed Gull/ Karoro were the primary predator, responsible for 62.5% of the predation events (Schlesselmann, 2018). Predation by Southern Black-backed Gull/ Karoro took place throughout daylight hours and although black-fronted terns were often filmed bombarding the intruder, they were unable to deter the much larger species (Schlesselmann, Pers. Comm.). Similar black-fronted tern monitoring projects carried out in 2011 and 2017, filmed numerous predation events by Southern Black-backed Gull/ Karoro on the Wairau, Clarence and Acheron Rivers (Steffens 2011; Bell *et al.* 2018).

Southern Black-backed Gull/ Karoro predation can be severe, and cause total nesting failure at colonies of other braided river dependent species. In the late 1980s, Southern Black-backed Gull/ Karoro were observed predating eggs from a white-fronted tern colony wiping out 180 nests and as well as a colony of approximately 50 red-billed gulls on shell banks near Bowentown (Biswell 2005). Bell and Harborne (in prep) observed Southern Black-backed Gull/ Karoro harassing Black-billed Gull colonies on the Wairau and Clarence Rivers, grabbing chicks and predating eggs. Using time lapse photography, Southern Black-backed Gull/ Karoro were filmed taking chicks throughout daylight hours as well as during the night resulting in no chicks surviving to fledging (See case study below). A Black-billed Gull colony of 1,500 adults located on the Waimakariri River, failed due to pressure by

surrounding Southern Black-backed Gull/ Karoro colonies, who were observed entering the Black-billed Gull colony repeatedly eating eggs (Thierry *et al*. 2016).

The issue of Southern Black-backed Gull/ Karoro preying on other bird species has also been observed in other parts of the world. Southern Black-backed Gull/ Karoro have been recorded in Argentina preying on the eggs and the young of cormorants, penguins, terns, Black Oystercatchers and Southern Giant Petrels (Yorio *et al.* 1998). Among the species affected, terns appear to be particularly vulnerable to gull predation, and in several studies has resulted in the loss of nest contents and the abandonment of the breeding area (by individuals as well as by the entire colony) (Yorio and Quintana 1997).

Figure 3. Southern Black-backed Gull/ Karoro predating a Black-fronted Tern nest on the Upper Clarence River. Image © Wildlife Management International Limited

Southern Black-backed Gull/ Karoro predating a chick from a Black-billed Gull colony on the Wairau River. Image © Wildlife Management International Limited

Case study: Southern black-backed gulls at Black-billed gull colonies

Using time lapse photography, Wildlife Management International Limited (WMIL) identified predators at Black-billed Gull colonies and identified Southern Black-backed Gull/ Karoro is the most significant predator (Bell and Harborne, in prep).

The Black-billed Gull is a small endemic gull, largely restricted to the braided rivers of the eastern South Island and is listed as 'Nationally Critical' by the New Zealand Threat Classification System (Robertson *et al.* 2017). To determine productivity and threats facing the species, WMIL carried out a camera study in the 2014/2015 and 2015/16 breeding seasons at the Clarence River mouth, as well as on the Wairau River in the 2016/17 and 2017/18 breeding seasons.

Video evidence showed that Southern Black-backed Gull/ Karoro appeared to target the Black-billed Gull colonies following chick hatching. Southern Black-backed Gull/ Karoro surrounded the colonies during early incubation but little predation by gulls were recorded (Mischler and Bell 2016). As chicks started to hatch, gull predation increased rapidly, suggesting that Southern Black-backed Gull/ Karoro were selectively predating Black-billed Gull chicks, not eggs (Table A).

Table A. Predators caught on camera during day-time hours at Black-billed Gull colonies on the Clarence and Wairau Rivers. Disturbance by predators are shown per month, and any disturbance that could not be identified is labelled as unknown. SBBG = Southern Black-backed Gull/ Karoro, Harrier = Swamp Harrier.

			Predator present (hours)			Predator present (%)		
Colony	Date	Total hours filmed	SBBG	Harrier	Unknown	SBBG	Harrier	Unknown
Clarence	Nov 2014	108.1	0.12	1.06	0.70	0.1%	1.0%	0.7%
	Dec 2014	132.3	42.61	0.08	0.87	32.2%	0.6%	0.7%
Clarence	Nov 2015	183.7	0.10	0.18	0.20	0.1%	0.1%	0.1%
	Dec 2015	395.9	0.10	1.05	0.87	0.1%	0.3%	0.2%
	Jan 2016	172.8	16.81	1.13	0.45	9.7%	0.7%	0.3%
Upper Wairau	Nov 2016	257.5	42.37	0.00	0.35	16.5%	0.0%	0.1%
Mid Wairau	Nov 2016	277.0	0.12	0.00	0.05	0.1%	0.0%	0.1%
	Dec 2016	327.8	10.08	0.00	0.12	3.1%	0.0%	0.1%
Lower Wairau	Nov 2017	325.8	3.60	0.05	0.38	1.1%	0.1%	0.1%

Southern Black-backed Gull/ Karoro were recorded harassing colonies throughout the day, but a significant amount of predation from gulls was also occurring at night (Figure A). Predation pressure from Southern Black-backed Gull/ Karoro caused complete breeding failure at the Clarence colony in 2014/15 and at one of the Wairau River colonies (Mid-Wairau colony) in the 2016/17 breeding season (Bell and Harborne, in prep).

Figure A. *Southern Black-backed Gull/ Karoro predating Black-billed Gull colonies on the Wairau River, although most predation occurred during the day, predation also occurred at night. In the lower image predation was recorded at 2.04 AM.*

4.2 Public health

Adapting well to modified environments, Southern Black-backed Gull/ Karoro population numbers have rapidly increased in New Zealand taking to feeding at landfills, sewage outlets, meat processing factories and farmland (Figure 3). Foraging through urban and organic waste in their hundreds creates a public health issue, as they have been shown to carry pathogenic organisms (McDiarmid 1962). Due to their opportunistic and gregarious nature, gulls are known to be important vectors for pathogens (e.g. *Salmonella*). So although they may not be the casual source, they act as efficient dispersal agents (Hatch 1996).

Southern Black backed Gull/ Karoro have been reported to carry anthropogenically derived enteric bacteria such as *Campylobacter* spp., *Salomonella* spp. and *Esherichia coli* (Fenlon 1981; Quessey and Messier 1992; Nelson *et al.*, 2008; More *et al.,* 2017) which are considered the most common causes of food-borne zoonotic. As Southern Black-backed Gull/ Karoro can travel long distances, they can effectively spread these diseases via faecal contamination of pasture and surface waters used for drinking, recreation or irrigation (Reed *et al.* 2003).

The relationship for the transmission of diseases from gulls to humans can prove difficult, however international studies suggests that gulls such as the Southern Black-backed Gull/ Karoro are important vectors (Belant 1997). Monaghan *et al.* (1985) describes the occurrence of *Salmonella* spp. in gulls (*Larus* spp.) in England, determining a substantial positive correlation between the incident of salmonellosis in the human population and the proportion of gulls tested carrying salmonellae in that urban area. In Scotland, gull faeces in public water supplies has been specified as the most credible source for disease transmission (Jones *et al.* 1978). In a second Scottish study, gull faeces contamination of water supplies was the cause of 26 occurrences of human and animal salmonellosis (Reilly *et al.* 1981). Nelson *et al.* (2008) compared populations of *Escherichia coli* among gulls (*Larus* spp.) to wastewater and landfills in the US. Using ribotyping, a genotypical bacteria source tracking method, it was determined that gulls obtain faecal bacteria from wastewater and rubbish, which they may transport to recreational beaches and waters (Nelson *et al.* 2008).

Pathogens like *Salmonella* spp. have a high survival rate in aquatic environments and if water sources are contaminated by Southern Black-backed Gull/ Karoro droppings it is both an economic and public health concern (Winfiel and Groisman, 2003).

Figure 4. Southern Black-backed Gull/ Karoro scavenging as a digger spreads and buries rubbish at the Oamaru Rubbish Tip. Gulls have adapted ready to food sources such as refuse stations and from these can spread pathogens to surround rural land and urban centres. Image © Rob Morris

Southern Black-backed Gull/ Karoro have rapidly adapted to agricultural development of New Zealand. From the earliest creation of pastoral farming, gulls expanded their range to exploit this new food resource. Southern Black-backed Gull/ Karoro are now a significant element of the avifauna on farmland, and are especially abundant in areas of intensive agriculture. As such, this has often put gulls in conflict with farmers as their impacts affect farming operations.

Southern Black-backed Gull/ Karoro are often considered a pest on farmland, where some attack cast ewes and new born lambs. In areas of high gull concentrations, this can often result in significant loses of lambs in some seasons. As such most sheep farmers consider Southern Black-backed Gull/ Karoro a pest.

Salmonella Brandenburg is a disease that has caused widespread abortions and deaths in pregnant ewes since 1996 around Canterbury, Otago and Southland. In 1998, the causative organism also spread to cattle herds, leading to diarrhoea, dysentery and deaths in both adults and calves, as well as abortions in adult cattle (Clark 2001). This disease has caused major financial losses and is an important occupational hazard, with several farmers, farm workers and veterinary practitioners having contracted the disease (Clark 2000). Principal factors involved in the local spread of the disease is environmental contamination from a high number of organisms excreted by affected animals, as well as by faecal excretion of the bacteria by Southern Black-backed Gull/ Karoro.

Southern Black-backed Gull/ Karoro are known to scavenge on aborted sheep foetuses and membranes, which have high concentrations of *Salmonella* Brandenburg. The Ministry of Agriculture and Forestry funded a project to determine the likely role the gulls have, as farmers were quick to observe and hold them responsible for the local spread of the disease (Clark 2001). In September 1999, up to 25 million *Salmonella* Brandenburg organisms per gram of intestinal contents were verified in Southern Black-backed Gull/ Karoro on affected farms, as well as on non-affected neighbouring farms (Clark *et al.* 1999). Their faeces can contaminate grazing land and pollute sources of stock water (Johnston *et al.* 1979, Fenlon 1981). They have the ability to spread the disease to other farms during abortion season, when travelling long distances to feed. The infection is highly unlikely to be carried from one season to another and does not affect the Southern Black-backed Gull/ Karoro clinically.

4.3 Urban infrastructure

Southern Black-backed Gull/ Karoro are seen in many places around New Zealand as a nuisance, especially by nesting on rooftops. They can cause structural damage to buildings from nesting material and defecation, obstruct roof drainage systems with debris, defecate on nearby vehicles, and disturb the inhabitants of buildings due to noise. Roof-nesting by Southern Black-backed Gull/ Karoro typically occurs during rapid growth of colonies on natural sites in surrounding areas and is successful due to their exploitation of anthropogenic food (Belant 1997). They are observed nesting on top of buildings and on ledges mainly in coastal towns which can have an affect businesses and home owners.

Porirua business owners located between the Spicer landfill and the harbour, have complained to the City Council about southern black-backed gulls dropping waste onto their roofs, such as animal parts, bones and condoms (Nicoll 2017). Southern black-backed gulls have become a financial nuisance in urban areas harassing maintenance personnel. One business has had to remove staff members from their top storey due to southern black-backed gull excrement on the rooftop causing a horrid smell and maggots to drop down inside from the ceiling (O'Neil 2013).

This issue is also observed in other parts of the world, where gulls (*Larus spp.*) are colonising on buildings and other man-made structures such as bridges, jetties, pipelines and in 1993 an oil platform in the Irish Sea. Surveys in 1976 and 1994 in Britain and Ireland have determined that gulls *(Larus spp.)* nesting on urban infrastructure have increased in terms of breeding pairs (Herring Gulls by 10% per annum; Lesser Black-backed Gulls by 17% per annum) as well as by the number the number of sites colonised (Herring gulls by 5% per annum; Lesser black-backed gulls by 13% per annum) (Raven and Coulson 1997). Due to the disturbances that nesting gulls cause, the spread of gulls into urban areas is a matter of growing concern for Britain and Ireland, as well as elsewhere in Europe, North America and other parts of the world.

4.4 Airstrike risk

In many airports around the world, bird strike can pose a great risk to aircrafts. In New Zealand, Southern Black-backed Gull/ Karoro are considered one of the most hazardous bird species for aircrafts due to their comparatively large size, abundance and that they are often observed at between 1000 and 3000 feet above ground level (Robertson 1992; Avisure 2016). Airports can be in close proximity to cities, farmland, landfills and coastal environments where Southern Black-backed Gull/ Karoro are commonly found feeding. When the gulls are feeding they may cross the flight path of an aircraft and are at risk of getting sucked into the engine, causing damage to the plane.

At the Christchurch Airport, there have been 38 strikes by Southern Black-backed Gull/ Karoro, including one damaging one between 1993 and 2005. An additional 57 strikes including four damaging ones have been by unidentified gulls and is suspected a large proportion of these is likely by Southern Black-backed Gull/ Karoro. During a two and a-half-year period in the 1990s, 74 birds were hit at Wellington Airport, as well as 362 recorded near-misses. Of these 63% were recorded Southern Black-backed Gull/ Karoro (Hutching 2006). A number of airports around New Zealand such as Wellington Airport have monitoring and control action plans in place for Southern Black-backed Gull/ Karoro at airfields.

5. Southern Black-backed Gull/ Karoro Control Methods

With their threats to human health and welfare, and their impacts on threatened wildlife Southern Black-backed Gull/ Karoro have been the target of control operations for more than 60 years (Caithness 1968). A range of management techniques have been employed in New Zealand.

5.1 Alpha Chloralose

Alpha Chloralose is a narcotic, often used to sedate and capture wildlife (Gregory and Wilkins, 1997), however due to its strong toxic effect on avian species it is now frequently used as a control method in New Zealand. The oral toxin induces birds first into a state of dissociation, before they become motionless and sleepy, and then usually die in a sleeping position by hypothermia. Some try to make an effort to fly and recover their equilibrium, however when the drug is administered at a high dosage death will follow relatively quickly with minimal disturbance. This method of control is regarded as a humane form of poisoning.

Alpha Chloralose poisoning has been widely used as a control method to reduce the number of nesting Southern Black-backed Gull/ Karoro in New Zealand. Prior to a poisoning operation monitoring is carried out to determine the area, size and distribution of a gull colony, the surrounding land use, and to estimate the timing of egg-laying. Southern Black-backed Gull/ Karoro are targeted during the peak nesting period, when the gulls are sitting on eggs and the first chicks are hatching. During this time the parent gulls' instincts keep them in close proximity to their nests, which therefore will help reduce the spread of gulls after poisoned. Performing a poisoning operation during the time of peak incubation will reduce the number of chicks needing to be humanely disposed of, as well reduce the risk of by-kill. Non-target species such as other braided river birds are less likely to enter Southern Black-backed Gull/ Karoro colonies during incubation time (see case study below).

To achieve the best results when using Alpha Chloralose, pre-feeding is a crucial to condition the gulls to the same type of bait that is going to be used to carry the toxin. Pre-feeding should be carried out 3-5 days immediately before the Alpha Chloralose baits are laid out, so that the gulls become accustomed to human presence and readily eat the toxic baits when they are laid out. The same carrier in a non-toxic form should be used during the pre-feeding, so the gulls are less likely to be deterred when it comes to the laying of toxic baits.

Toxic baits should be laid during calm weather, as windy conditions may blow poisoned gulls away from the colony before dying, making the recovery of carcasses laborious. As Alpha Chloralose is more effective at lower temperatures, toxic baits should ideally be laid out as close to dusk or daylight as possible. Weather can become a limitation to Alpha Chloralose operations, as a minimum 5-day good weather gap is essential. Another limitation to this control method is that it can become very labour intensive, especially during the recovery and disposal of the gull carcasses for large colonies.

Prior to carrying out an Alpha Chloralose poisoning, the appropriate approvals and Approved Handler Test Certificates are needed for the operation and poison handling. The adjacent land owners to the control site should be notified prior, in case any poisoned Southern Black-backed Gull/ Karoro do advance outside the target colony area. Appropriate signage must be established at all major access locations prior to the Alpha Chloralose operation and should remain until all toxic baits and poisoned gulls are retrieved.

The use of Alpha Chloralose sometimes raises the concerns of members of the public, and some operations have encountered some resistance of its use. Information about Alpha Chloralose and the need to control Southern Black-backed Gull/ Karoro, are not well known by the public, and this can create unease. Currently most Alpha Chloralose operations have been small scale (<1,000 birds) and localised, without the need for wide-scale public notification. In a larger scale Alpha Chloralose operation planned across 30km of the Hurunui River in December 2018, wider neighbouring landowner consultation required significantly more consultation to resolve issues (land owner access,

the use of toxins in the environment, and the safe disposal of bodies) and ensure the operation was approved.

Case study: Waiau Toa/ Clarence River mouth Southern Black-backed/Karoro control

At the Waiau Toa/ Clarence River mouth a mixed colony of Black-billed Gull, Red-billed Gull and White-fronted Tern have been studied since the 2012 breeding seasons. Monitoring has shown that Black-billed Gull breeding success has been extremely low. Video evidence showed Southern Black-backed Gull/ Karoro continuously entering the colony taking chicks, causing complete breeding failure in the 2014/15 and 2015/16 seasons (Mischler and Bell 2016).

In order to improve breeding success Environment Canterbury and the Department of Conservation contracted Wildlife Management International Limited (WMIL) to control a nearby Southern Black-backed Gull/ Karoro colony.

In preparation for the operation all nests we located and mapped. A total of 350 nests were identified. As egg laying was protracted at this colony, egg pricking was undertaken for two weeks to ensure all birds remain incubating, and no chicks hatched prior to the toxin operation.

Figure A. WMIL staff member carrying out egg pricking at the Waiau Toa/ Clarence River southern black-backed gull colony prior to the Alpha Chloralose operation, November 2017

Figure B. The distribution of Southern Black-backed Gull/ Karoro nests at the Waiau Toa/ Clarence River mouth as mapped during planning of the control operation.

Gull control was carried out using an Alpha Chloralose operation, prior to commencing this, the appropriate permissions were gained. Including landowner and neighbouring landowner consent. Warning signs were displayed at points of entry to the operational area (Figure C), and these remained in place until one month after the operation (Figure D).

Pre-feeding using non-toxic baits started on 17 November and continued until the toxic operation on 21 November (4 days pre-feeding). Each nest had 9-10 baits scattered around the rim, pre-feeding continued until the gulls were keyed in to the baits.

On 21 November non-toxic baits were replaced with toxic baits containing 10% Alpha Chloralose. These were presented to birds in the same way, with 9-10 baits at each nest. Baiting started at the top end of the colony with a team of seven spread out across the colony, ensuring baits were spread throughout the colony in a timely manner. The gulls formed a feeding frenzy immediately after the first toxic baits were laid out, and all the baits were readily consumed.

As Alpha Chloralose is fast acting, poisoned Southern Black-backed Gull/ Karoro were collected two hours after the operation. With a second sweep through the area the following morning. A total of 600 gulls were collected immediately, and a further 50 the following morning (Bell, 2018). All gull carcases were disposed of at the Blenheim Landfill in accordance with their biological waste disposal protocols.

Following the operation, a maximum count of 55 adult Southern Black-backed Gull/ Karoro were recorded within the colony area, with the operation being regarded as successful, with a resulting 90 – 95% reduction in gulls (Bell, 2018).

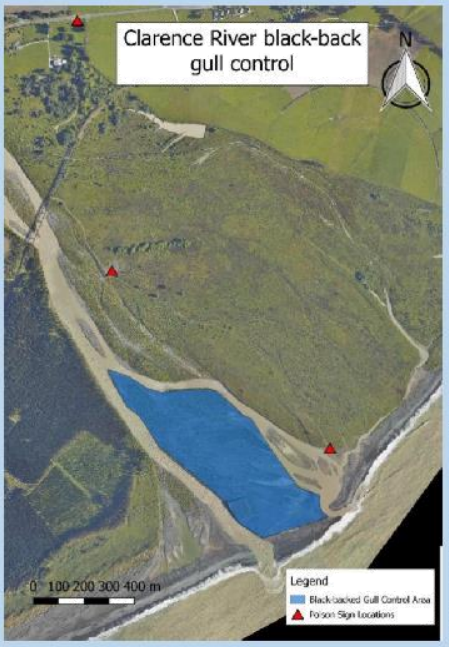
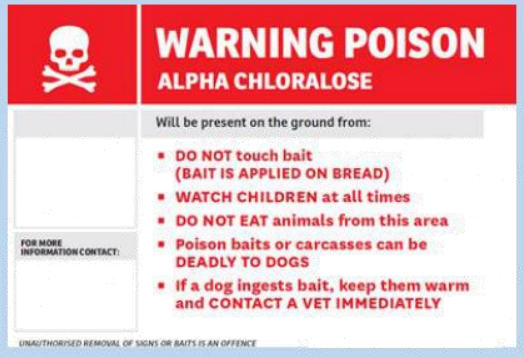


Figure C. Southern Black-backed Gull/ Karoro control area and locations of warning signs erected at normal points of entry to the Waiau Toa/ Clarence River mouth.

Figure D. Example of warning sign erected at normal points of entry to the Waiau Toa/ Clarence River mouth.



5.2 Shooting

Shooting has been a control method for the used to systematically reduce Southern Black-backed Gull/ Karoro numbers. The methods has some advantages over other methods as it is not critically weather dependant nor reliant on a large number of workers.

Prior to a shooting operation, monitoring needs to be carried out at the operational area to determine the activity (i.e. feeding zones, nest sites etc.), the stage of nesting, and to estimate the number of gulls present. Operations should be timed for the height of egg-laying, when the gulls are sitting on eggs or when the first chicks are hatching. During this period the parent gulls are most protective, their instincts keeping them in close proximity to the nest site, making for the most productive time of shooting. Carrying out shooting operations before large numbers of chicks are present reduces the number of chicks needing to be humanely disposed of.

Several methods can be undertaken during a shooting operation to draw gulls to the shooter, especially when nests are scattered over a large area. An approach can be to pre-feed at the site and (i.e. rabbit carcases) to attract gulls into a known feeding zone. Using dead gulls to create curiosity is a method proved successful in previous operations, by throwing them into the air and propping them up with wire to act as decoys. Another approach is to move in and around the riverbed and re-enter the nesting site, to trigger new outbreaks of activity giving the opportunity to target gulls.

Shooting has less potential risk to non-target species, as the shooter identifies each gull shot. Further, shooting requires no specific permissions or consents, other than operators having a valid firearms licence. Shooting has been commonly used as a follow up to toxin operations, and is likely most efficient in smaller colonies (<500 pairs).

However, shooting can cause gulls to disperse from the control area, and it appears that birds can become gun shy both over a few days of the control period, but also over successive years of control, which reduces the efficiency of shooting.

A range of different shooting methods have been utilised:-

5.2.1 Sniping

This technique is proficient for targeting gulls that are sitting/nesting at ranges of up to 250 metres. It is especially useful when targeting individual gull's occurring in separate feeding locations or post control operation of colonies. Limitations encountered include strong winds, heavy rain and that the gulls can be reluctant to land for long periods of time when other dead gulls are present on the ground.

5.2.2 Shotgun shooting

This is an efficient technique for undertaking multiple shots at gulls in flight, and has proven to be effective at reduce numbers in breeding colonies. All gulls provoked that come into range when the shooter enters the nesting area have the opportunity to be shot. Throwing a dead gull into the air and moving in and out of the colony, can attract curious gulls closer, which were not previously in shooting range. The limitation to using a shotgun is the difficulty of shooting fast flying gulls and the shooter needs to be an experienced wing shooter to ensure the operation is achieved effectivity.

5.2.3 Aerial shooting

Aerial shooting is a developing and evolving method to control Southern Black-backed Gull/ Karoro numbers, and has been used effectively in the Mackenzie Basin. It has evolved from ground shooting as gulls appeared to becoming wary following repeated ground shooting operations. Aerial shooting is effective for small scattered colonies as the operator can cover large distances in a short period of time. The use of both experienced pilots, and shooters, is paramount in ensuring a successful control operation. The location of non-target species needs to be assessed prior to operations, due to the risk of disturbance to their colonies and breeding activity.

5.3 Sterilisation of eggs

To control Southern Black-backed Gull/ Karoro sterilisation of eggs can be employed to reduce productivity. The reduction of productivity by egg sterilisation will led to long term population declines, however this method is a long term control as it can take decades to see significant population reduction.

A considerable amount of care must be taken to keep eggs and nests intact while undertaking egg sterilisation. As this will help to prevent adult gulls to recognise their eggs are no longer viable and lay replacement clutches. Therefore reducing the need for repeated treatments per nest.

Egg sterilisation is labour intensive and requires frequent visits to the breeding colony to achieve effective control. The method is often seen by the public as more humane and preferable to other lethal control methods targeting adult birds.

There is a series of procedures can be done to treat eggs so that they do not hatch -

5.3.1 Egg puncturing

Egg puncturing is carried out by striking a heavy-gauge needle into the egg shell and membrane. The piercing can be performed by hand or done by embedding the needle onto a long stick. This will effectively sterilize it by affecting the water balance inside killing the developing embryo. Incubating gulls can sometimes recognise eggs that have been treated by puncturing, causing them to be rejected and subsequent relaying to occur (Corkhill 1970).

5.3.2 Egg shaking

Egg Shaking is carried out by vigorously shaking eggs by hand to disrupt the internal membranes. Eggs need to be shaken until internal fluids can be heard sloshing around inside. This sterilising process can be time consuming for sizeable colonies. Again some re-laying following desertion has been observed, but not to the same extent as egg puncturing (Corkhill 1970).

5.3.3 Egg pricking

Hypodermic injecting eggs with a preservative (such as formalin), is a common technique used to control gull numbers. A needle is first used to prick a small hole in the eggshell, before using a syringe to inject 5 ml of formalin (10 %) into the egg, then sealing the hole with nail polish. This both kills the developing embryo and preserves the egg. This method reduces the number of birds which recognise that their eggs have failed, so birds continue to incubate. Reducing the number of birds that abandon nests and relay.

5.3.4 Egg oiling (dipping)

Egg oiling is a sterilising treatment used to kill the embryo, while keeping the egg still intact. It involves completely coating the egg in a thin film of non-toxic mineral oil (such as paraffin oil) or vegetable oil. By dipping the egg in oil, it prevents gases from moving through the eggshell, therefore suffocating the embryo. As with egg pricking, oiling seems to cause less abandonment and re-laying.

5.4 Other possible control methods

Although not currently in use, other control methods, or modifications of existing methods could be investigated for Southern Black-backed Gull/ Karoro control such as the below.

5.1 DRC-1339 (Starlicide)

DRC-1339, commercially known as Starlicide, is an oral toxicant currently registered in New Zealand to control rooks (*Corvus frugilegus*) and starlings (*Sturnus vulgaris)*. It has been successfully used as an avicide elsewhere in the world to control blackbirds, pigeons, crows, ravens, magpies and gulls (USDA 2001). It is used in the United States to control nesting Herring Gulls, Greater Black-backed Gulls

around coastal areas, where high gulls' populations are negatively impacting less abundant colonial water birds (Solman 1994).

DRC-1339 can be applied in a variety of baits including bread, walnuts, oats, maize, brown beetles and more recently macaroni (Nelson 1994). Pre-feeding is essential to achieve the most effective results, as it keys in the target species to the baits. Non-toxic baits should be in the same form and laid out in the exact fashion as the baits containing DRC-1339. The compound is a slow acting avicide and takes up to 24 hours to be completely metabolized by the target species. Once in the bloodstream it starts to weaken the birds' liver and body functions. This causes necrosis of the birds' kidneys and circulatory impairment, leading to a non-violent death from uremic poisoning and congestion of major organs.

DRC-1339 would however need to be registered to use as a control method for Southern Black-backed Gull/ Karoro in New Zealand.

5.4.2 Non-breeding season control

Most Southern Black-backed Gull/ Karoro control operations have targeted gulls at the breeding colonies during the breeding season, historically when gulls are incubating eggs before chicks start hatching. As such this leaves a small window for the control operation. Issues with weather or other operation problems can therefore impact the operation and cause delays. Control targeting gulls outside of the breeding season may minimise risks to non-target species and reduce animal welfare concerns.

Control operations outside of the breeding season will mean that there is no risk of chicks being present. Removing any animal welfare concerns around the difficulty of locating all chicks for humane euthanasia following a control operation. Further, non-breeding season control may be able to be done in farmland, reducing the risks to non-target species, especially aquatic species also present on braided rivers (i.e. eels).

As such further investigation into undertaking control at other times of the season or in foraging areas away from colonies should be investigated.

5.4.2.1 Landfill control

The control of Southern Black-backed Gull/ Karoro at landfills and other refuse sites has been employed in New Zealand, including Alpha Chloralose operations and shooting. There is a greater risk to non-target species especially in toxin operations as other species are present at landfills.

5.4.2.2 Shoulder season control

Southern Black-backed Gull/ Karoro start occupying colonies as early as August, and there would be the opportunity to undertake control operations during this pre-breeding period. Although currently few operations have targeted this period, this would greatly increase the time available to undertake control at breeding colonies, especially valuable when multiple colonies on a river or district are being controlled.

5.4.2.3 Off river farmland winter control

Currently most control operations are carried at breeding colonies or at landfills and refuse sites. Within rural areas Southern Black-backed Gull/ Karoro numbers often build up on farmland during the non-breeding season. Control operations could target these winter aggregations of birds. However, any control operation would need to ensure that there is no risk to non-target species. In particular Black-billed Gull and Red-billed Gull often also form winter flocks on farmland, especially near the coast.

6. Canterbury

6.1 Braided rivers in Canterbury

Braided rivers are a natural feature of the South Island. They are rivers, which over at least part of their reach have multiple, mobile channels that flow across a gravel flood plan (Gray and Harding 2007). Braided rivers in New Zealand support unique communities of plants and animals, many of which are threatened with extinction (O'Donnell et al. 2016).

Braided river birds are under threat from a diverse range of sources, including introduced mammalian predators, native avian predators, weed invasion, water abstraction, nitrification, dams, modified flow regimes associated with electricity generation, river protection works, gravel extraction, and human disturbance (O'Donnell et al. 2016).

Braided rivers are found throughout the country, covering a land area of over 250,000ha, although this total represents only 0.9% of the country's total land area (O'Donnell et al 2016). All but 2% occurring in the South Island, with Canterbury having 64% of New Zealand's braided rivers.

6.2 The status of braided river dependent shorebirds in Canterbury

A number of endemic braided river birds have their stronghold in Canterbury, with a significant proportion of the New Zealand population breeding in Canterbury. The National population and Canterbury population for six key endemic shorebirds are listed in Table 1 below. Both national and Canterbury estimates are derived from multiple sources and expert opinion. This highlights that Canterbury holds a significant proportion of the population of many braided river dependent shorebird, especially Black Stilt, Wrybill and South Island Pied Oystercatcher.

Table 1. Conservation status (national threat ranking), national population estimate and trend, and estimated Canterbury population for endemic braided river dependent shorebird species.

Species	National threat ranking	Estimated National population	National trend	Estimated Canterbury population
South Island Pied Oystercatcher	Declining	50,000	Declining	70%
Black Stilt	Nationally Critical	130	Increasing under intensive conservation management	100%
Banded Dotterel	Nationally Vulnerable	50,000	Declining	50%
Wrybill	Nationally Vulnerable	5,000	Declining	95%
Black-billed Gull	Nationally Endangered	75,000	Declining	35%
Black-fronted tern	Nationally Endangered	7,000	Declining	60%

Using Ornithological Society of New Zealand bird atlas data Walker and Monks (2017) highlighted significant range declines in wading birds, terns and gulls in South Island braided rivers between 1969-79 and 1999-2004. There was a contraction of the breeding range on the South Island from a relatively wide distribution of inland squares to a narrow inland distribution centred on the Mackenzie Basin. They concluded that loss of habitat due to intensive land use and predation contributed to declines in braided river shorebirds, which become less widespread across inland South Island.

The Department of Conservation maintain a database of bird counts on braided rivers across Canterbury. These are a combination of river surveys carried out by the Department, Environment Canterbury and other community conservation groups. Mapping the last decade's results from these counts confirms the results of Walker and Monks (2017). Black Stilt, Wrybill, Banded Dotterel and South Island Pied Oystercatcher all have the most significant populations in the upper river reaches (WMIL unpublished data).

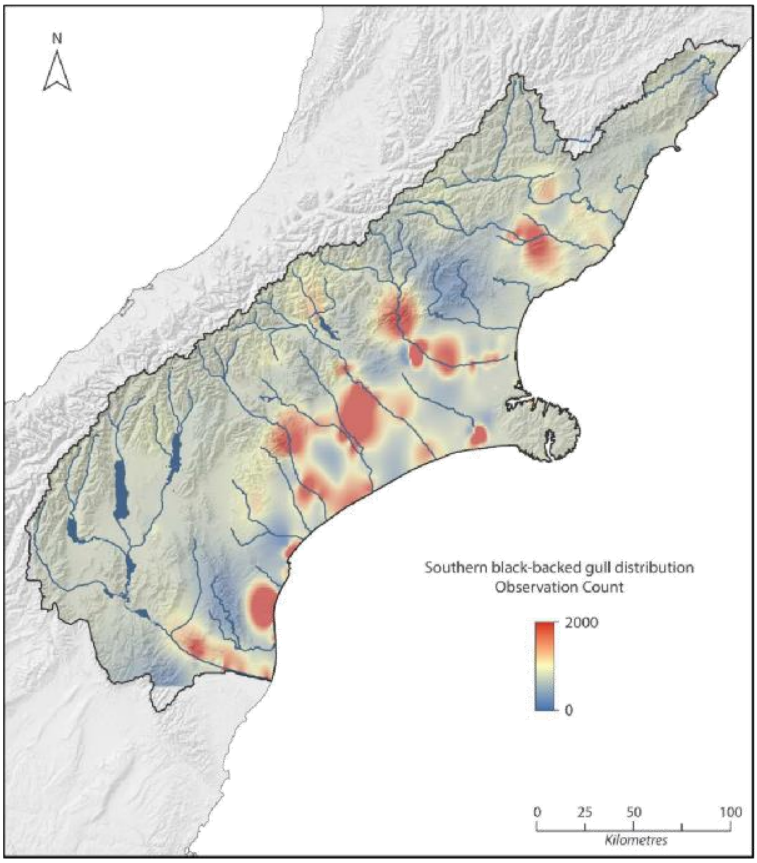
6.3 Southern Black-backed Gull in Canterbury

6.3.1 Population numbers and distribution

The Southern Black-backed Gull/ Karoro population in Canterbury is extremely large, with an estimated 35,000 breeding pairs. Allowing for pre-breeding birds (all birds <4 years old) the estimated total population of Southern Black-backed Gull/ Karoro in Canterbury is 105,000 individuals.

This population is not evenly distributed across the entire region. Using data from the citizen science bird recording database eBird the distribution of Southern Black-backed Gull/ Karoro in Canterbury was mapped (Figure 5). Mapping all gull observation highlights that gull numbers are greater in low lying areas within 60km of the coast; with braided rivers being focal points for the population, from which birds dispersing to forage across adjacent farmland. Intensive agriculture in the low lying areas has allowed Southern Black-backed Gull/ Karoro numbers to explode to current levels.

Figure 5. Distribution and density of Southern Black-backed Gull/ Karoro in Canterbury mapped using data from eBird.



Braided rivers in Canterbury hold a significant proportion of the breeding Southern Black-backed Gull/ Karoro population. A November 2016 aerial survey of most of the braided rivers in Canterbury recorded over 150 Southern Black-backed Gull/ Karoro colonies (Figure 6). Gull colonies were not evenly distributed, with a higher proportion of both colonies and breeding pairs found nearer the coast. Mean colony size within 50km of the coast was significantly larger (mean 185 pairs, T-test p=0.0029) than colonies >50km from the coast (mean 74 pairs) (Figure 7).

Figure 6. Location and size of Southern Black-backed Gull/ Karoro colonies on Canterbury Braided Rivers in November 2016.

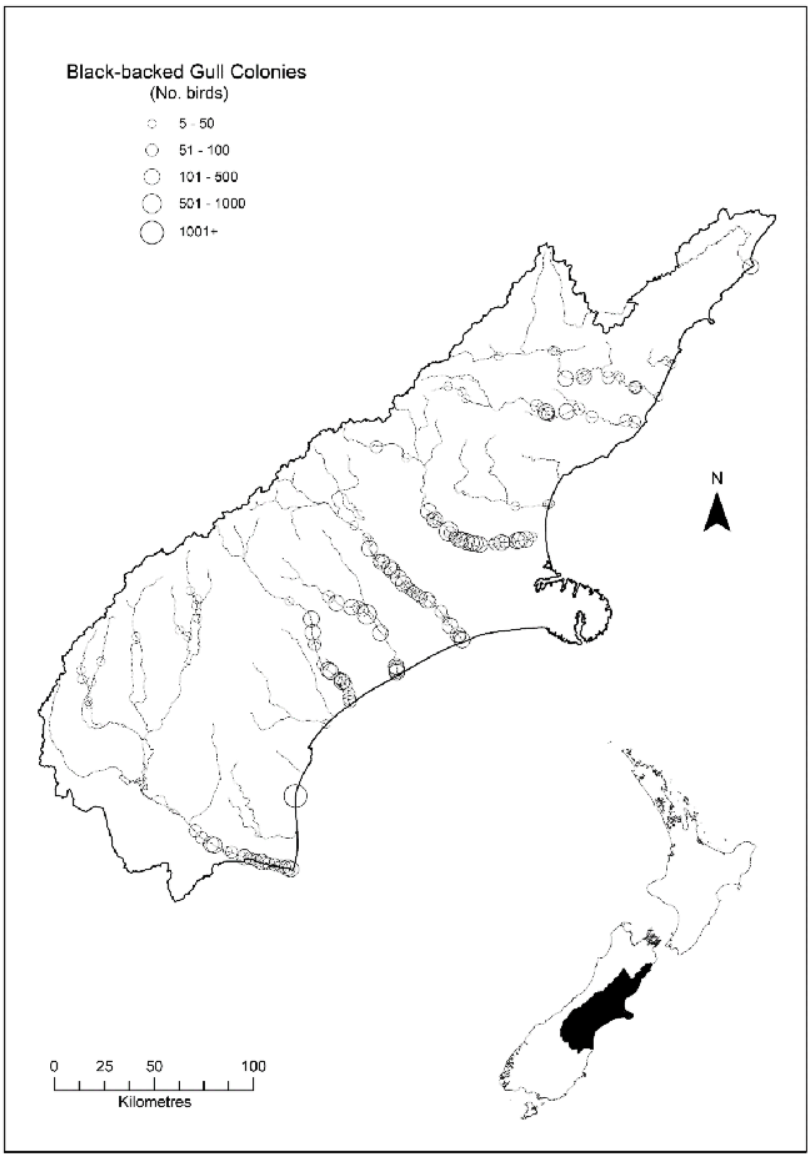
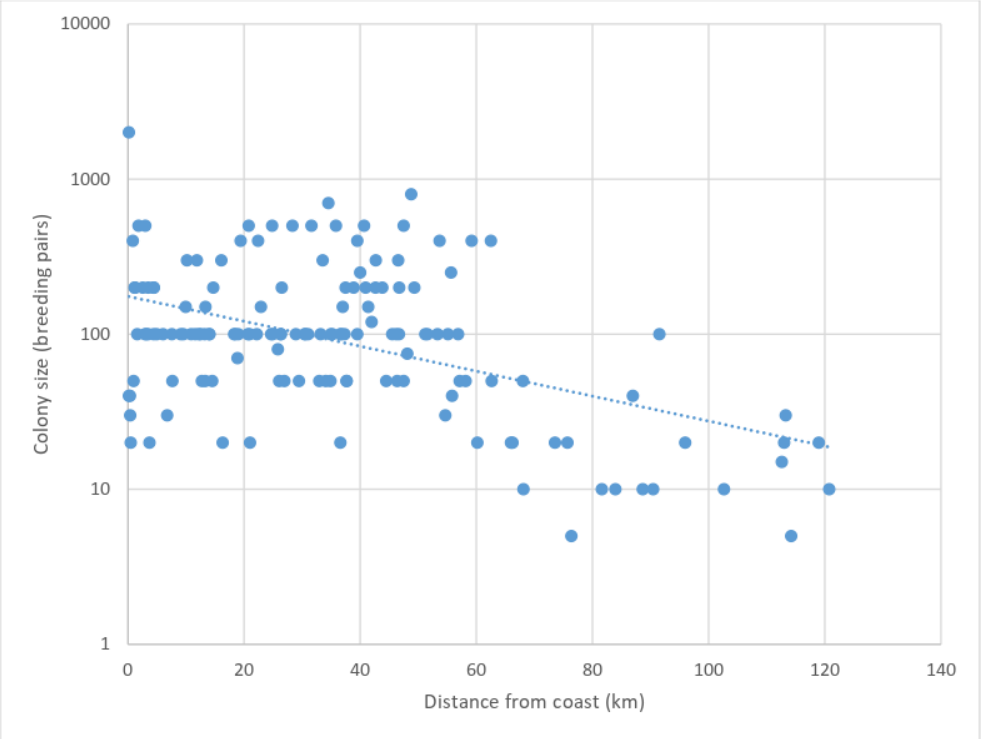


Figure 7. Size of Southern Black-backed Gull/ Karoro colonies in relation to distance from the coast.



The population of Southern Black-backed Gull/ Karoro in Canterbury is certainly continuing to increase, with marked increases seen on many of the regions braided rivers. Although there is no specific data, from anecdotal evidence it appears that breeding success of colonies on braided rivers is very high. This high breeding success is likely continuing to drive population increases and enable the Canterbury Southern Black-backed Gull/ Karoro population to continue to increase.

6.3.2 Effects of Southern Black-backed Gull/ Karoro on Canterbury's shorebirds

Southern Black-backed Gull/ Karoro are known to be impacting on shorebirds in Canterbury. Almost all braided river shorebird projects on several rivers throughout the region have recorded predation by Southern Black-backed Gull/ Karoro.

With the super abundant size of the population, and their widespread distribution across the region focused on braided rivers Southern Black-backed Gull/ Karoro are impacting on shorebird populations on nearly every river. Further, it is likely that these gulls are also impacting on shorebirds in other habitats in Canterbury (see case study below).

Case study: Burwood Landfill closure and impacts on Charlesworth Wetland

Burwood Landfill is located northeast of Christchurch City and covers approximately 87 hectares. From July 1984, the landfill ran as the primary refuse disposal facility for Christchurch, with approximately 230,000 tonnes of waste internment each year (AECOM 2016). The unlined waste disposal facility attracted a large number of Southern Black-backed Gull/ Karoro daily until it closed in June 2005. The Burwood Landfill's closure largely altered the distribution and foraging behaviour of Christchurch's Southern Black-backed Gull/ Karoro, which had negative impacts on a number of local river and wetland birds.

In 1985, the population of the Southern Black-backed Gull/ Karoro on the Waimakariri River was estimated at approximately 10,000 (Avisure 2016). Following the closure of the landfill the local population reduced significantly on the Waimakariri to less than half this number, with river flood events and control efforts also contributing to this decline. Numbers of Southern Black-backed Gull/ Karoro present at the landfill plummeted from 2500-3500 to 0-10, and many of these gulls relocated to nearby coastal estuaries (A. Crossland pers comm) and likely to farmland to the north of the city.

Christchurch's estuaries and wetlands then saw a substantial increase in predation by Southern Black-backed Gull/ Karoro on other bird species. Mallard and Scaup ducklings, Pied Stilt chicks and small native gulls' eggs and chicks were observed preyed on by Southern Black-backed Gull/ Karoro This increase heavily suppressed the breeding success of these targeted species in areas such as the Avon-Heathcote estuary, Bexley Wetland, Brooklands Lagoon, Charlesworth Wetland and Bromley oxidation ponds.

A mixed colony of Red-billed Gull and Black-billed Gull at Charlesworth Wetland failed due to Southern Black-backed Gull/ Karoro predation in the 2015/16 breeding season. Southern Black-backed Gull/ Karoro from a nearby colony of approximately 20 were observed harassing the mixed colony taking chicks over several weeks. Many Pied Stilt chicks at Charlesworth Wetland were also observed being predated during this period. The on-going pressure from Southern Black-backed Gull/ Karoro resulted in Red-billed Gull and Black-billed Gull abandoning the site, and not returning in the following breeding seasons. Currently Charlesworth Wetland is home to a colony of more than 30 Southern Black-backed Gull/ Karoro which have displaced the mixed colony, with very few other wetland bird species breeding there.

Figure A. Southern Black-backed Gull/ Karoro breeding at Charlesworth Wetland.

Image and information from Christchurch City Council (A Crossland Pers. Comm.)

6.3.3 Current Southern Black-backed Gull/ Karoro control operations

The Department of Conservation, Environment Canterbury, Christchurch International Airport and a number of community conservation groups are currently undertaking or proposing Southern Black-backed Gull/ Karoro control operations on braided rivers throughout Canterbury for conservation purposes. The majority of these operations are to protect braided river dependent birds, with Christchurch International Airport undertaking control to reduce bird strike risk to aircraft.

Current or planned (with funding already in place) control operations are occurring on the Clarence River, Waiau river, Hurunui River, Waimakiriri river, Ashburton River, Rangitata River, Lower Waitaki River and rivers in the Mackenzie Basin.

Although there are some connections between many of these projects, at present these control operations are operated independently of each other, with no regional coordination. Further, there is no forum for the sharing of results and dissemination of learnings from control operations.

6.3.4 Cost of Southern Black-backed Gull/ Karoro control operations

The current costs of Southern Black-backed Gull/ Karoro control operations were reviewed, although this review was limited by the available data on the cost of Southern Black-backed Gull/ Karoro operations. Data was only available for 16 operations; 4 Alpha Chloralose operations, 2 ground shooting operations and 10 aerial shooting operations.

From these 16 operations the average cost was $52.8/ gull killed. However for most operations the figures provided were only operational costs, and did not include the planning (including the permissions process) phase of the operation. As such this figure does not reflect the true cost of the operation, and we estimate that the true cost is $62/ gull culled.

7. Southern Black-backed Gull/ Karoro Management Strategy options or recommendations for Canterbury Region

Southern Black-backed Gull/ Karoro numbers are super abundant in Canterbury, and all evidence indicates that they are likely to be continuing to increase and expand their range. Linked to this there is irrefutable proof that Southern Black-backed Gull/ Karoro are having a negative impact on the breeding success of braided river dependent shorebirds. This has led to a number of control operations being undertaken, of planned to be undertaken this season.

Given their widespread distribution, increasing population and the threat they pose to shorebirds, there is a clear need for a strategy to tackle this issue on a regional scale. Southern Black-backed Gull/ Karoro are increasing and impacting shorebirds on all braided rivers throughout the region, this is a regional problem not a site specific one. Throughout all discussions with stakeholders and interest groups there was overwhelming support for the need a regional plan. The present approach to Southern Black-backed Gull/ Karoro control has each operation working independently of each other, with little or no linkages.

Their current numbers, and rate of population increase are entirely derived from anthropogenic improvements in food supply. Southern Black-backed Gull/ Karoro have readily adapted to an agricultural landscape and endless food supply from poor waste management practises.

The increasing Southern Black-backed Gull/ Karoro populations are having significant negative impacts on braided river dependent shorebird populations and are likely to be one of the key drivers in decreasing population trends in threatened shorebirds. Furthermore, burgeoning populations of Southern Black-backed Gull/ Karoro are having harmful effects on human health and public safety.

Because of these impacts, currently a range of organisations are undertaking Southern Black-backed Gull/ Karoro control operations throughout Canterbury. These programmes are happening independently of each other, with no co-ordination and little communication between practitioners.

There is a clear need to develop a regional strategy to address the issues of a super abundant and increasing Southern Black-backed Gull/ Karoro population in Canterbury.

There is irrefutable proof that Southern Black-backed Gull/ Karoro are having a negative impact on braided river dependent shorebirds, and with increasing populations this is likely to exert even more pressure on shorebird populations.

Southern Black-backed Gull/ Karoro have clearly adapted well to increased food supplies from human sources, and their populations have exploded well beyond natural levels. It is their adaption to human induced change which has created an imbalance, with now super abundant Southern Black-backed Gull/ Karoro predating other shorebird species that have significantly smaller, and declining populations.

Therefore, there is a clear need to undertake some form of population control within Canterbury. With a large, increasing population spread over a wide geographical area a multi option strategy is required. There is a need to protect current shorebird values without further population declines, whilst working towards a regional reduction in Southern Black-backed Gull/ Karoro numbers, which would lead to large scale benefits to braided river dependent shorebirds.

7.1 Land use

Southern Black-backed Gull/ Karoro numbers in Canterbury are not evenly distributed, with significantly greater numbers in low lying coastal areas (See figure 5 and 6). This distribution is almost entire driven by high intensity agriculture throughout this area. This land use has provided gulls with

an abundant food source and enable their population numbers to explode. Furthermore poor waste management practises at landfills have added to this, helping to drive population growth.

Land use needs to be taken into consideration when developing a Canterbury-wide strategy. With Southern Black-backed Gull/ Karoro having high breeding success and population growth in low lying areas, any control regime may be compromised. A significant part of public opposition to gull control is that gulls have managed to adapt well to human induced change, and that the problem is entirely human caused. There are increasing calls for better land and waste management that will readdress these issue into the future, so the need for lethal control options are not required in the future.

Although intensive agriculture will remain as the primary land use in all low lying areas, efforts should be made to develop ways that this land use will no longer be able to support such high populations and even enable long term reductions in gull numbers. Pivotal to this will be ensuring that waste management practises are improved, especially at landfills and offal disposal. Through their regulatory powers Environment Canterbury should ensure that all future resource consents take into consideration the potential food sources for Southern Black-backed Gull/ Karoro and ways to minimise its availability.

Land use change in upper river reaches is potentially the single biggest threat to Canterbury's shorebird populations. Any increases in intensive agricultural in the high country are likely to see increased immigration and/or an improvement in breeding success for Southern Black-backed Gull/ Karoro, leading to significant population increases. Left unchecked this will almost certainly cause further declines in threatened shorebird populations in these areas.

Environment Canterbury should take into account the impacts of Southern Black-backed Gull/ Karoro on braided river bird breeding habitat when considering resource consents related to high country land-use. This would also be consistent with the Canterbury Management Strategy braided river goals and targets for protecting braided river bird breeding habitat.

7.2 Southern Black-backed Gull/ Karoro control options

With an estimated regional population of 105,000 individuals, spread across the entire region Southern Black-backed Gull/ Karoro control presents some significant challenges. However, to ensure that the conservation status of braided river dependent shorebirds does not continue to decline, gull control in key shorebird areas is needed immediately (in conjunction with other conservation efforts). Over the long term, to improvement braided river habitats for shorebirds throughout the region, a long-term reduction in Southern Black-backed Gull/ Karoro numbers regionally wide is also needed.

The timescales, conservation outcomes, and costs of these two goals are different; but both are linked. Long term the most effective solution is a reduction in Southern Black-backed Gull/ Karoro numbers regionally. Gull control in high value shorebird areas will require ongoing management due to reinvasion; as such regional shorebird conservation status will only be significantly improved by restoring braided rivers throughout the region, including significant reductions in Southern Black-backed Gull/ Karoro numbers throughout Canterbury.

We recommend undertaking three Southern Black-backed Gull/ Karoro control approaches in Canterbury.

7.2.1 Containment control; high country rivers (short to medium term)

The current distribution of Southern Black-backed Gull/ Karoro in Canterbury is not even, with numbers on the inland rivers significantly fewer than on lower river stretches (see section above). In addition, braided river dependent shore bird numbers are higher in these inland rivers. Both Walker

and Monks (2017) and an analysis of DOC held river survey data have highlighted that shorebirds in the eastern South Island have retracted to higher altitude inland river reaches.

We recommend a containment control approach, were Southern Black-backed Gull/ Karoro numbers in upper river reaches are reduced to zero density. Ongoing management would be needed to ensure that these river reaches are not re-colonised by Southern Black-backed Gull/ Karoro. This control regime should be initiated immediately to protect shorebirds, and continue for five years to remove Southern Black-backed Gull/ Karoro from upper reaches. Following this control period ongoing follow up control to prevent gulls re-establishing should be carried out annually.

This approach would require the control of an estimated 3,000 birds and would see control operations focused on key shorebird breeding habitat. This approach would likely to be more socially acceptable as it would require the culling of fewer birds and is more values focused.

A containment approach would see key shorebird habitats protected and enable a more sustainable control regime. Currently Southern Black-backed Gull/ Karoro numbers are highest in areas of intensive agricultural and population centres (low lying coastal areas). With effectively an unlimited food supply, gull numbers are continuing to expand. Therefore, any control carried out in these areas may be less effective as high breeding success means culled birds are rapidly replaced. The control of gulls in upper reaches where the surround farmland is less intensively managed is likely to be more successful. These areas are currently supporting significantly fewer gulls with a more limited food supply, making it likely that gulls can be removed from these areas long term with less management.

A containment approach would require ongoing management to maintain gulls at zero density. Although currently not well understood, there would almost certainly be some immigration into the containment area from the lower river reaches. Based on current estimates of gull control operations a containment approach would be estimated to cost $186,000 over 5 years ($37,200 per annum). However, given the isolated nature of some of the upper river reaches, these costs may be an underestimate. In addition, after initial control, there would be ongoing regular costs to maintain zero densities of gulls.

7.2.2 Values-based (site led); individual river control programmes (short to medium term)

Canterbury has significant populations of braided river dependent shorebirds and currently there are a number of mammalian predator control projects operating in Canterbury aimed at improving the breeding success of these shorebirds. There is a range of projects, with a number of project leaders; including the Department of Conservation, Environment Canterbury and Community Conservation Groups.

Although a review of these projects was outside the scope of this project, most appear to have be initiated because of the high shorebird values occurring on that river. It is recommended that Southern Black-backed Gull/ Karoro control be carried out in conjunction with mammalian predator control on rivers sections deemed of high value.

As pointed out by O'Donnell et al (2016) predator control projects on braided rivers must target the entire predator guild, including native avian predators. Any mammalian predator control project should also incorporate Southern Black-backed Gull/ Karoro control. Existing projects which do not include Southern Black-backed Gull/ Karoro control should immediately incorporate this, and all future projects should include Southern Black-backed Gull/ Karoro control during their development, planning and fund sourcing.

This approach would again require localised community engagement and support, and as long as the values of the river warranted gull control, should be socially acceptable. To ensure ongoing community support control operations must be well planned and implemented, ensuring that non-target risks (especially to domestic pets) are minimised.

Individual values-based control operations would require additional funding to current (or planned) mammalian predator control projects. Control operation cost would vary between rivers depending on the number of gulls. Depending on the size of the Southern Black-backed Gull/ Karoro population on each river section tentative costs are $50,000 - $220,000 for each river in Canterbury. As each project would be working independently, it is likely (especially in projects on lower river reaches) that ongoing immigration from surrounding rivers would require ongoing maintenance.

7.2.3 Regional wide population reduction (long term)

Given their super abundance there is a clear need to manage the numbers of Southern Black-backed Gull/ Karoro in Canterbury to improve the breeding success of braided river dependent shorebirds. Current population numbers are far in excess of pre-human levels and to help achieve a marked improvement in shore bird breeding success across the entire Canterbury region, significant reductions in the regional Southern Black-backed Gull/ Karoro populations are needed.

Southern Black-backed Gull/ Karoro numbers have exploded due to human derived food sources, so regional wide control will need to be coupled with improved land use practises (see above). This would see gull numbers stabilising at a more natural, pre-human level. Regional wide control would reduce predation pressure on shore birds, increase breeding habitat available, and eliminate harassment, hopefully leading to improved breeding success. Further, regional wide control provides a more sustainable long term solution as it reduces reinvasion

In order to help see a regional improvement in braided river dependent shorebird breeding success we recommend a reduction of the Canterbury Southern Black-backed Gull/ Karoro population by 5% per annum over the next 20 years. Over time this would mean reducing numbers to approximately 2,000 breeding pairs, and would require the culling of an estimated 101,000 birds.

This approach would require significant community engagement to ensure support. Current Southern Black-backed Gull/ Karoro control operations can generate some negative feedback, and require careful management to enable them to be carried out successfully. To date all of these control operations have been small scale (single colony focused) that don't require public notification. With more widespread control across entire river systems or districts this would require a higher level notification. Moving to a regional control strategy would require a significant increase in the level of community engagement and consultation.

A regional wide control strategy would require significant funding. A review of the costs of current control operations indicates that the current cost is $62/per gull controlled. As such a tentative cost for regional wide Southern Black-backed Gull/ Karoro control over the next 20 years would be in excess of $6.3 million ($310,000 per annum). However, as this approach works in combination with the short term objectives above, there would be cost efficiencies with coordination of control regimes.

7.3 Control coordination

Currently there are a number of Southern Black-backed Gull/ Karoro control operations occurring throughout Canterbury, from the Mackenzie Basin to the Clarence River Mouth.

However, as discussed, current Southern Black-backed Gull/ Karoro control operations are currently being undertaken with no coordination. In order to deliver a regional Southern Black-backed Gull/ Karoro strategy there is a clear need for a Regional Coordinator.

At present there is no central depository for information and advice on undertaking Southern Black-backed Gull/ Karoro control, and each project is essentially learning as they go. During meetings with agencies undertaking Southern Black-backed Gull/ Karoro control there was a clear message that a centralised system with regional coordination was the best way forward.

The role of a Regional Coordinator would be to provide specialist advice; including:

- Provide advice during operation planning. This should include site visits to determine the best control method to utilise.
- Provide advice and material to assist the advocacy campaign around control operations to assist public engagement.
- Collate data and summarise control programmes outcomes to centralise information.
- Maintain and update Standard Operating Practises to incorporate latest learnings.
- Guide research needs and report findings to control practitioners.
- Assist and coordinate with Mahinga Kai

7.4 Technical control method plan

Throughout Canterbury there is a number of control operations being carried out which are utilising a range of control methods. Alpha Chloralose and shooting are the main methods used, with some egg sterilisation also occurring (often in conjunction with other control methods). Currently each agency maintains their own best practise or standard operating procedures.

In discussions with control operators throughout Canterbury, there was a clear message that together with a regional strategy there is a need for a single best practise guidelines for Southern Black-backed Gull/ Karoro control, and that these need to be updated.

There is a need for a review of control methods, both in relation to operational procedures, but also effectiveness, and then an update to guidelines and standard operating processes for control operations.

In particular there is a need to review the use of Alpha Chloralose, and especially the permissions requirements for its use. Alpha Chloralose is the most commonly used method to Southern Black-backed Gull/ Karoro, but there is a number of differences and inconsistencies in its use throughout Canterbury. In particular there was a desire for the application process required for approval to be used to be streamlined for Department of Conservation operations.

There was widespread agreement that there is a need for a more detailed technical control methods document, and that the current best practise document currently isn't providing the information needed when planning an operation. Currently there is no guidance on selecting which control method to employ, and the current Department of Conservation approvals process is cumbersome. We strongly recommend the development of a single best practise guide for Southern Black-backed Gull/ Karoro control. This document should include a decision making process for selecting control methodology, and best practise guidelines for each control method.

7.5 Research

The development of regional strategy options/ recommendations or this report has been hampered by the lack of knowledge in several key areas. Making informed decisions on the best approach has been challenging. Filling these information gaps is a key recommendation of this report or paper, and we identify several significant research requirements.

7.5.1 Southern Black-backed Gull/ Karoro foraging behaviour

Little is known about the daily foraging behaviour and range of Southern Black-backed Gull/ Karoro. With no in-depth studies undertaken in New Zealand, foraging range has just been estimated up to 50km, but there has been no detailed studies to investigate this.

Likewise, the ecology and behaviour of gulls on braided rivers have not been studied. Gulls use rivers for breeding, foraging, roosting and when transiting between sites throughout the year, however,

there is no knowledge on how gulls utilise both the river, and surrounding environments (farmland or urban centres). As such there is no measure how this relates to the impacts on braided river dependent shorebirds.

Research into the foraging behaviour and range of Southern Black-backed Gull/ Karoro on braided rivers is recommended. A GPS tracking study Southern Black-backed Gull/ Karoro should be undertaken to determine the foraging regime of gulls. In particular this study should aim to investigate how Southern Black-backed Gull/ Karoro are using the braided river and other adjacent habitats.

7.5.2 Effectiveness of control methods

A range of control methods have been employed to reduce Southern Black-backed Gull/ Karoro numbers at colonies. At present the majority of these control operations have worked independently from each other.

In order to assess the effectiveness (including cost effectiveness) a monitoring component should be incorporated into all control programmes. Ensure standardised recording so that different operations can be compared and evaluated. This should include standardised recording of number of birds targeted, control methods, results (number of cull gulls collected) and detailed costings of the operation.

Results of operations and learnings should be made available to others, and a forum established to link such practitioners (see above section relating to control coordination).

7.5.3 Immigration rates and direction post control

Southern Black-backed Gull are known to disperse some distance from natal colonies (Rowe 2013). However, despite multiple Southern Black-backed Gull/ Karoro control operations occurring in Canterbury, there has been no study looking at immigrating post control.

With significant Southern Black-backed Gull/ Karoro populations on many Canterbury rivers, there is no knowledge of the effects of removing colonies, and the immigration rate of birds into these colonies. Does removal of breeding birds create a “sink” where immigrating birds immediately fill vacated territories?

Inland rivers have fewer Southern Black-backed Gull/ Karoro, and one recommendation is to potentially treat these as containment areas. However immigration rates may need to be determined to better understand how to maintain these areas gull free.

Research into the immigration rates of Southern Black-backed Gull/ Karoro into control areas is recommended. To achieve this would require a large-scale, long-term banding project in colonies nearby current or planned control operations. Again, this would require coordination at a regional scale, (see above section relating to coordination).

7.6 Tangata Whenua – Mahinga Kai

Southern Black-backed Gull/ Karoro eggs and chicks have been a traditional food of Ngāi Tahu, and there is a number or Hapu that have expressed interest in resuming the collection of eggs and chicks for a food source.

Under current legislation there is nothing preventing the collection of eggs or chicks now, as Southern Black-backed Gull/ Karoro are an unprotected species.

The removal of eggs and chicks as Mana Kai is unlikely to provide a significant reduction in population numbers. However, it could form a part of a long term management programme aimed at reducing population growth, and/or immigration into control areas. The targeted collecting of eggs and chicks from specific colonies, or regions could help reduce overall breeding success and limit population growth.

The resumption of use of Southern Black-backed Gull/ Karoro eggs for Mana Kai is recommended, and should be encouraged. In order to promote this, greater communication of the location and size of Southern Black-backed Gull/ Karoro colonies should occur between Environment Canterbury and Tangata Whenua. Potentially the Te Paiherenga forum is the best platform for this to occur. Ideally, harvesting would be structured to manage colonies and help lead to reduced numbers over time.

7.7 Public perception

Although there is a growing body of evidence which highlights the negative impacts Southern Black-backed Gull/ Karoro on braided river dependent shorebirds, this is not well known by the wider public.

There needs to be greater emphasis by braided river managers to ensure that the results of their work are disseminated to the wider public – not just the conservation movement. There are numerous platforms that can be utilised for this. The aim should be to ensure that this includes mainstream media to be sure a wide reach is achieved.

In addition to the impacts of Southern Black-backed Gull/ Karoro, further work to educate the public on the reasons for their control is warranted. Currently many control operations have some level of resistance from the public, either concerns over the need to control gulls, or the methods employed. As more gull control is undertaken, it is likely that these issues are only going to increase. A specific campaign to engage the public about the conservation concerns and need to control Southern Black-backed Gull/ Karoro is recommended.

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9. References

AECOM. 2016. Permanent disposal of earthquake waste at the Burwood Recourse Recovery Park (Site B) – Water Quality Report. Retrieved from http://files.ecan.govt.nz/public/consent-projects/burwood/Appendix_B_-_Water_Quality_Report.PDF

Avisure. 2016. Christchurch International Airport Ltd Off-Airport Bird Hazard Management Plan. Report to CIAL.

Belant, J.L. 1997. Gulls in urban environments: landscape-level management to reduce conflict. *Landscape and urban planning 38:* 245-258.

Bell, M.D. 2018. Waiau Toa/ Clarence River mouth black-billed gull outcome monitoring 2016-2018. Unpublished Wildlife Management International Technical Report to the Department of Conservation and Environment Canterbury.

Bell, M., McArthur, N., and Harborne, P. 2018. Clarence River black-fronted tern restoration project – 2017/2018 operational report. Client report prepared for the Department of Conservation. Wildlife Management International Ltd, Blenheim.

Bell, M., and Harborne, P in prep. 2018. The identification of predators at black-billed gull *(Larus bulleri)* colonies using time lapse photography.

Biswell, S.F. 2005. Southern black-backed gulls. *New Zealand Geographic 73*: pp 46-61.

Brown, K.; Keedwell, R. 1998. Alphachloralose control operations at southern black backed gull colonies in the Tekapo and Ahuriri Valleys. Canterbury Conservancy Technical Report Series Number 7, Department of Conservation, Twizel.

Clark, G.; Fenwick, S.; Boxall, N.; Swanney, S.; Nicol, C. 1999: *Salmonella* Brandenburg abortions in sheep, pathogenesis and pathology. *Society of sheep & beef cattle veterinarians, New Zealand veterinary association annual seminar 29:* 12-22.

Clark, G. 2000. Spread of *Salmonella* Brandenburg organisms in sheep yards. MAF Policy project report.

Clark, R.G. 2001. Black-backed gulls (*Larus dominicanus*) and their role in the spread of *Salmonella* Brandenburg. *Proceedings of the New Zealand Society of Animal Production 61:* 71-73

Corkhill, P. (1970) Effect of egg puncturing on limiting chick production in Herring Gulls. *Bird Study* 17: 340-342.

Fenlon, D.R. 1981: Seagulls (*Larus spp.*) as vectors of salmonellae: an investigation into the range of serotypes and numbers of salmonellae in gull faeces. *Journal of hygiene (Cambridge) 86:* 195-202.

Fordham, R.A. 1964. Breeding biology of the southern black-backed gull. II: Incubation and the chick stage. *Notornis 11:* 110–126.

Fordham, R. A. 1967. History and status of the Dominican gull in Wellington. *Notornis 14:* 144-153.

Fordham, R.A. 1968. Dispersion and dispersal of the Dominican gull in Wellington, New Zealand. *New Zealand Ecological Society 15:* 40-50.

Fordham, R.A. 1985. Dominican gull. *In: Readers Digest complete book of New Zealand birds*. Sydney: Readers Digest. 231 p.

Hatch, J.J., 1996. Threats to public health from gulls (Laridae). *J. Environ. Health Res. 6,* 5-16.

Heather, B.D. & Robertson, H.A. 1996. *Field guide to the birds of New Zealand.* Auckland: Viking. 432 p.

Heather, B.D. & Robertson, H.A. 2005. *The field guide to the birds of New Zealand.* Penguin Books, Auckland. pp 122, 123, 332-334.

Higgins, P.J.; Davies, S.J.J.F. (*Eds*). 1996. *Handbook of Australian, New Zealand and Antarctic birds. Volume 3: Snipe to pigeons*. Melbourne: Oxford University Press.

Horton, N., Brough. T.; Rochard, J.B.A. 1983. The importance of refuse tips to gulls wintering in an inland area of south-east England. *Journal of Applied Ecology 20*: 751-765.

Galbraith, M. 2015. Changes in the breeding status of the southern black-backed gull (Larus dominicanus) colonies on Rangitoto Island, Hauraki Gulf, New Zealand. *Notornis 62:* 192-201.

Hutching, G. 2006. Gulls, terns and skuas. Te Ara – the Encyclopedia of New Zealand. http://www.TeAra.govt.nz/en/photograph/6124/controlling-gulls-near-airports (accessed 26 June 2018)

Johnston, W.S.; MacLachlan, G.K.; Hopkins, G.F. 1979: The possible involvement of seagulls (Larus sp) in the transmission of Salmonella in dairy cattle. *Veterinary record 105:* 526-527.

Jones, F., Smith, P., Watson, D.C., 1978. Pollution of a water supply catchment by breeding gulls and the potential environmental health implications. *J. Inst. Water Eng. Sci. 32*, 469- 482.

Maloney, R. F. 1999. Bird populations in nine braided rivers of the Upper Waitaki Basin, South Island, New Zealand: changes after 30 years. *Notornis 46:* 243-256.

McDiarmid, A. 1962. Diseases of free-living wild animals. *Agric. Stud 57*: 8-28, Food & Agriculture Organization, Rome.

Miers, K.H and Williams, M., 1969. Nesting of the black swan at Lake Ellesmere, New Zealand. *Wildfowl, 20*(20), pp. 23-32.

Mischler, C.P.; Bell, M.D. 2016. Waiau Toa/ Clarence River Black-billed Gull Management. Unpublished technical report by Wildlife Management International Ltd to Environment Canterbury.

Miskelly, C.M. 2013. Southern black-backed gull. *In*: Miskelly, C.M. (ed.) *New Zealand Birds Online*: www.nzbirdsonline.org.nz

Monaghan, P., Shedden, C.B., Fricker, CR., Girdwood, R.W.A., 1985. *Salmonella* carriage by herring gulls in the Clyde area of Scotland in relation to their feeding ecology. *J. Appl. Ecol. 22*, 669-680.

Moorhouse, R. 2017. Results of Nelson Nature, Environmental Monitoring – Coastal Habitats – Shorebird Survey – October 2016 to January 2017.

More, E.; Ayats, T.; Ryan, P.G.; Naicker, P.R.; Keddy, K.H.; Gaglio, D.; Witteveen, M.; Cerda-Cuellar, M. 2007. Seabirds (*Laridae*) as a source of *Campylobacter* spp., *Salmonella* spp. and antimicrobial resistance in South Africa. *Environmental Microbiology 19 (10):* 4164 – 4176

Nelson, P. C. 1994. Bird control in New Zealand using Alpha-chloralose and DRC-1339. *Proceedings of the Sixteenth Vertebrate Pest Conference 40:* 259 - 264

Nelson, M., Jones, S. H., Edwards, J.C., Ellis, C. 2008. Characterization of Escherichia *coli* populations from gulls, landfill trash, and wasterwater using ribotyping. *Diseases of Aquatic Organisms 81*: 53-63.

Nicoll, J. 2017. Porirua tip-goer claims gull left 'like wounded solider' after being shot. *Retrieved from* https://www.stuff.co.nz/environment/93361252/porirua-tipgoer-claims-gull-left-like-wounded-soldier-after-being-shot

O'Donnell, C.F.J.; Sanders, M.; Woolmore, C.; Maloney, R.F. 2016. Management and research priorities for conserving biodiversity on New Zealand's braided rivers. Department of Conservation, Wellington New Zealand, 46p.

Oliver, W.R.B. 1955. *New Zealand birds*. Wellington: A.H. & A.W. Reed.

Oliver, R. 1973. *Studies of the breeding biology of the southern black-backed gull on Rangitoto Island.* MSc thesis, University of Auckland, New Zealand.

O'Neil, A. 2013. Seagulls threatening businesses http://www.stuff.co.nz/dominion-post/news/local-papers/kapi-mana-news/9254759/Seagulls-threatening-businesses?rm=m

Powlesland, R.G.; Robertson, H.A. 1987. Changes in gull numbers over 25 years and notes on other birds of the Otaki-Ohau coast. *Notornis 34:* 327-338.

Quessey, S., Messier, S. 1992. Prevalence of *Salmonella* spp., *Campylobacter* spp. and *Listeria* spp. in ring-billed gulls (*Larus delawarensis*). J. Wildl. Dis. 28, 526 - 531.

Raven, S.J and Coulson, J.C. 1997. The distribution and abundance of Larus gulls nesting on buildings in Britain and Ireland. *Bird Study, 44:* pp 13-34.

Reed, K.D., Meece, J.K., and Henkel, J.S. (2003) Birds, Migration and Emerging Zoonoses: West Nile Virus, Lyme Disease, Influenza A and Enteropathogens. *Clin Med Res 1*: 5–12.

Reilly, W.G., Forbes, G.I., Paterson, G.M., Sharp, J.C.M., 1981. Human and animal salmonellosis in Scotland associated with environmental contamination, 1973-1979. *Vet. Rec. 108*, 553-555.

Robertson, C.J.R. 1964a. 14th annual report of the New Zealand bird banding scheme for the year ended 31st March 1964. Dominion Museum, Wellington. P24.

Robertson, C.J.R. 1964b. Observations on black-backed gull predation at the Cape Kidnappers gannetries 1959-1963. Notornis 10: 393-403.

Robertson, C.J.R. 1972. Preliminary report on bird banding in New Zealand 1964-1971. *Notornis 19:* 61-73.

Robertson, C.J.R. 1973. Preliminary report on bird banding in New Zealand 1971-1972. *Notornis 20:* 59-70.

Robertson, C.J.R.; Hyvőnen, P.; Fraser, M.J.; Pickard, C.R. 2007. *The atlas of bird distribution in New Zealand 1999-2004.* Wellington: Ornithological Society of New Zealand Inc.

Robertson, H.A. 1992. Trends in the numbers and distribution of coastal birds in Wellington Harbour. *Notornis* 39(4): 263-289.

Rowe, K.R. 2013 Dispersal of southern black-backed gulls (*Larus dominicanus dominicanus*) banded in Canterbury, New Zealand, 1959-1993. *Notornis 60:* 134-142

Schlesselmann, A.V., O'Donnell, C.F.J., Monks, J.M., Robertson, B.C. 2018. Clearing islands as refugia for black-fronted tern (*Chlidonias albostriatus*) breeding colonies in braided rivers. New Zealand Journal of Ecology

Solman, V.E.F. 1994. Gulls. The Handbook: Prevention and control of wildlife damage. *62.*

Steffens K.E, Sanders M.D, Gleeson D.M, Pullen K.M, Stowe C.J 2012. Identification of predators at black-fronted tern *Chlidonias albostriatus* nests, using mtDNA analysis and digital video recorders. New Zealand Journal of Ecology 36: 48–55.

Thierry, A., Dutton, P. and Popenhagen, C. 2016. Waimakariri River Regional Park Black-billed Gull Management 2015-2016 Breeding Season. Unpublished report, Keystone Ecology and Environment Canterbury Report.

Turbott, E.G. 1969. Roof nesting of black-backed gulls. *Notornis 16*: 187-9.

USDA. 2001. DRC-1339 (Starlicide). USDA National Wildlife Research Centre – Staff Publications. *740. Retrieved from* http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1735&context=icwdm_usdanwrc

Williams, M.J. 1963. Predatory habits of the black-backed gull. *Notornis 10:* 239-240.

Williams, M., Gummer, H., Powlesland, R., Robertson, H., and Taylor, G. 2006. Migration and movements of birds to New Zealand and surrounding seas. Department of Conservation, Wellington, New Zealand.

Wills, D.E.; Murray, J.; Powlesland, R.G. 2003. Impact of management on the breeding success of the northern New Zealand dotterel (Charadrius obscurus aquilonius) on Matakana Island, Bay of Plenty. Notornis 50: 1-10.

Winfiel, M.D., and Groisman, E.A. (2003) Role of Nonhost Environments in the Lifestyles of Salmonella and E. coli. *App Environ Microbial 69*: 3687–3694.

Yorio, P and Quintana F. 1997. Predation by Kelp Gulls *Larus dominicanus* at a mixed-species colony of Royal Tern Sterna maxima and Cayenne Terns *eurygnatha* in Patagonia. IBIS 139: 536-541.

Yorio, P.; Bertellotti, M.; Gandini, P.; Frere, E. 1998. Kelp gulls *Larus Dominicanus* breeding on the argentine coast: population status and relationship with coastal management and conservation. *Marine Ornithology 26:* 11-18.

7.8 Other Business

Recommendation

That the Committee note any matters for promoting in the media.

Purpose of Report

1 Roundtable discussion

2 Reflection on matters discussed for media story

Attachments

Nil

8 Consideration of Urgent Business Items

9 Consideration of Minor Nature Matters

10 Closing Summary and Karakia