Braided River projects in Canterbury: an update of Environment Canterbury supported projects

Braided Rivers Seminar June 2019, Lincoln Univ.
Frances Schmechel, Principal Biodiversity Advisor

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Canterbury Braided River Management

- Background
- Context
- Regional team - project updates

From: Colin O'Donnell

Braided rivers: Biodiversity values

> 80 wetland bird species

> 50 threatened species

Is a 'naturally uncommon' ecosystem type both in New Zealand and the world

Is classified as an 'endangered' ecosystem type in New Zealand (Holdaway *et al.* 2012)

Photos: WMIL and Lauren Buchho

Critically endangered

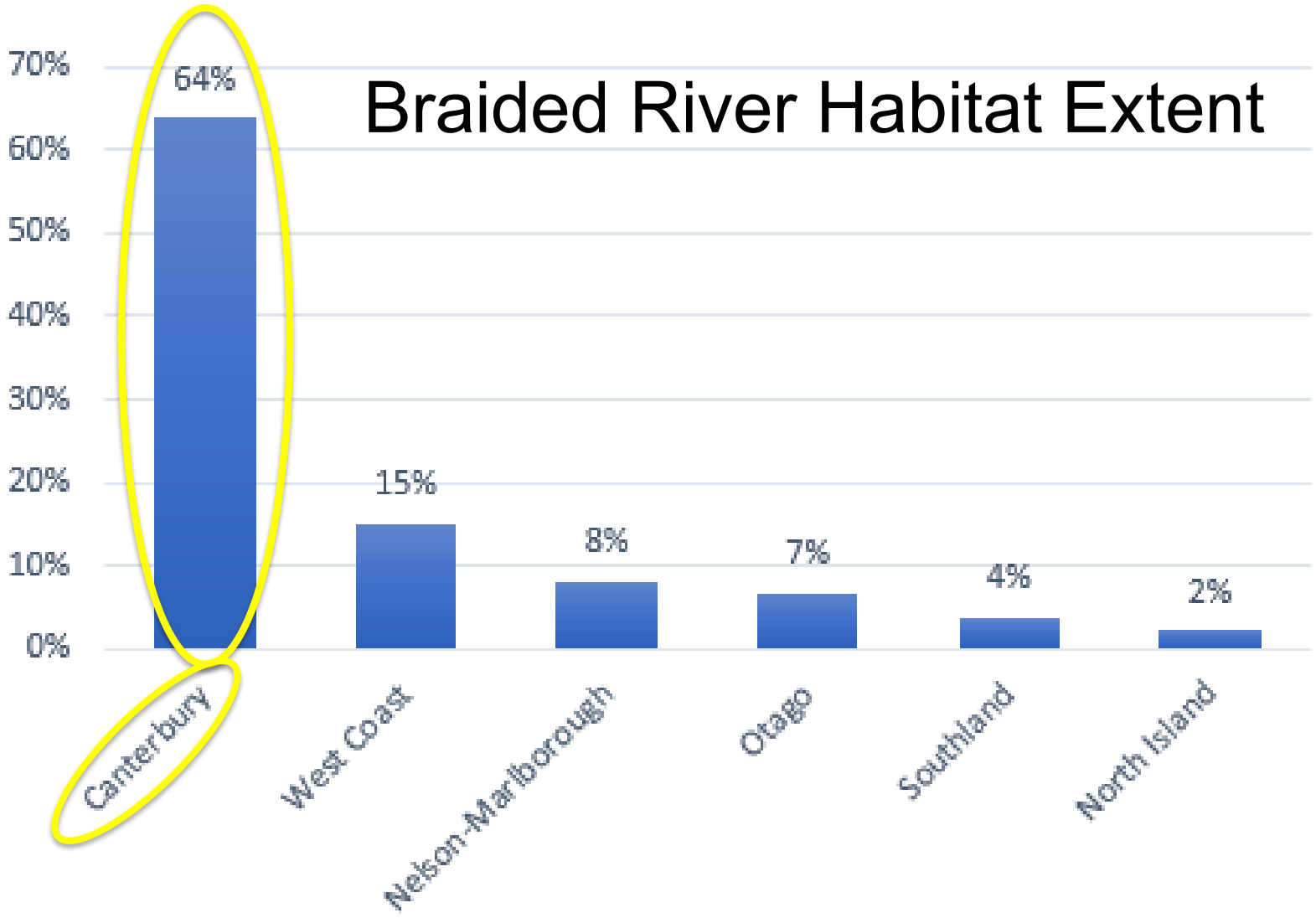
Endangered

Vulnerable

Vulnerable

Declining

A significant Canterbury ecosystem



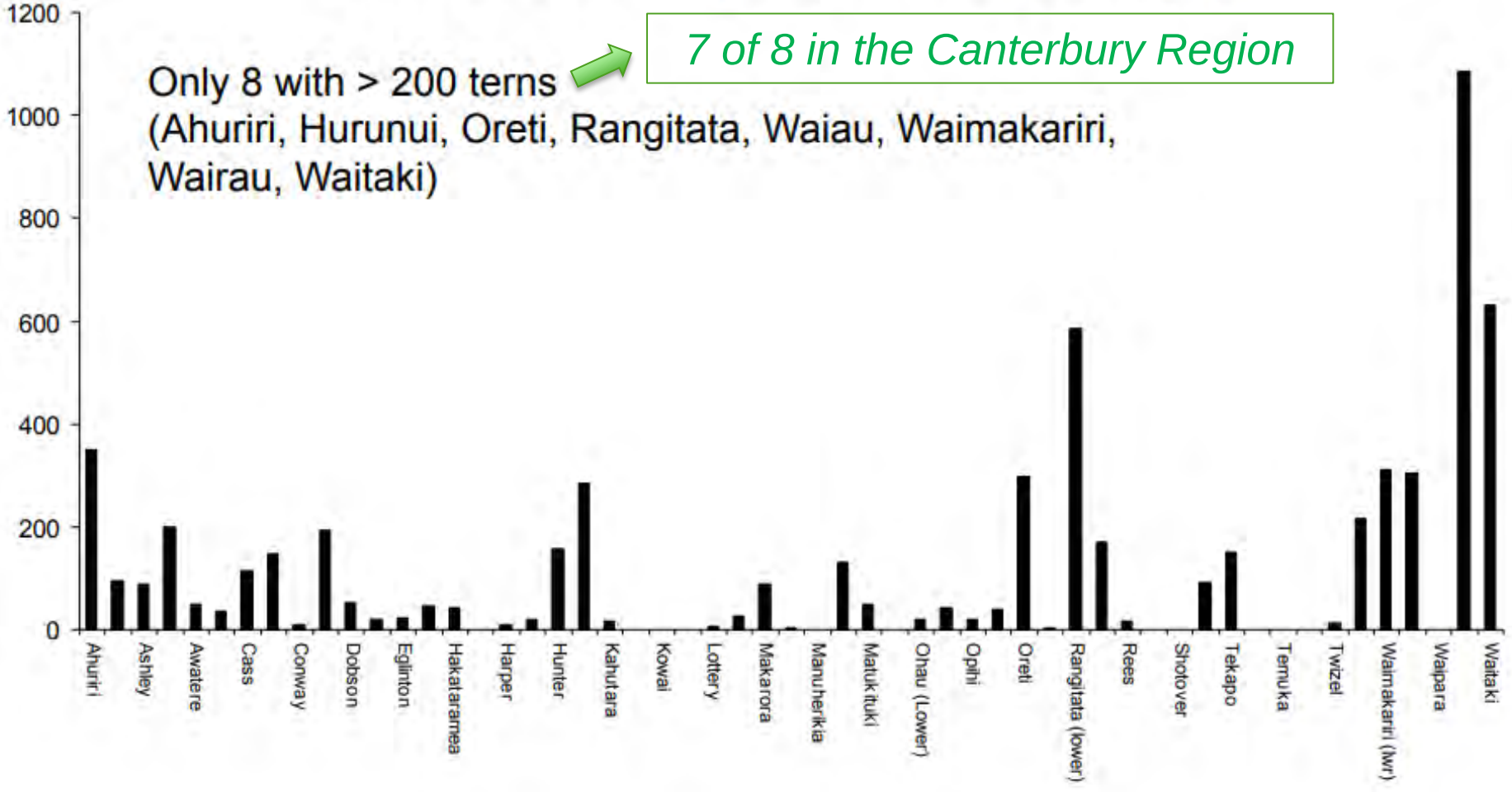
From: O'Donnell, CFJ; Sanders, M; Woolmore, C; Maloney, RF (2016). Management and research priorities for conserving biodiversity on New Zealand's braided rivers. DOC, Wellington.

Importance rankings for native bird rivers from four RiVAS applications

Slide from Ken Hughey, Lincoln University
River Values Assessment System

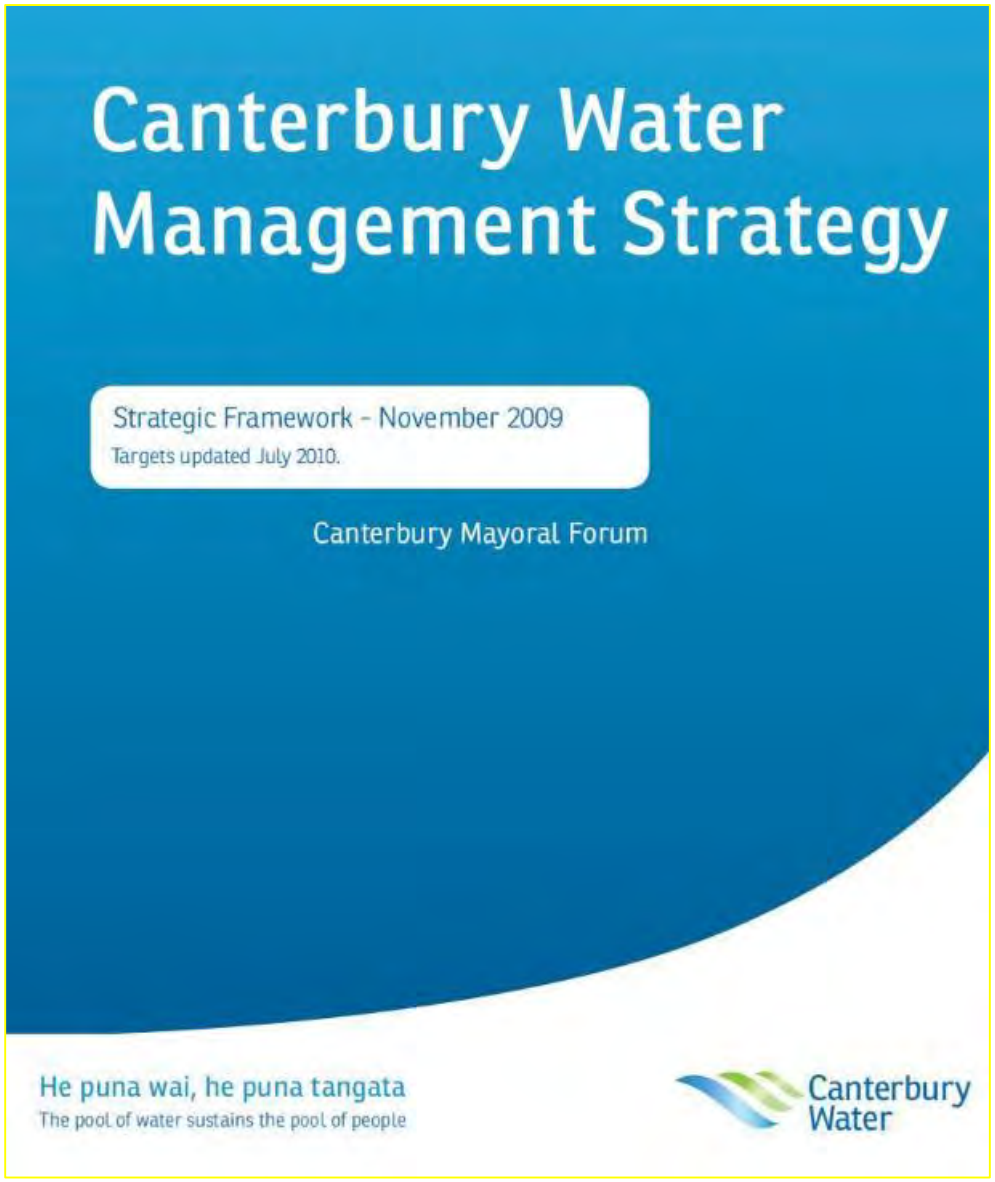
Lincoln University
Te Whare Wānaka o Aoraki
CHRISTCHURCH·NEW ZEALAND
New Zealand's specialist land-based university

Number of black-fronted terns on 55 rivers (Post 1995 counts)



Slide from: C.F.J O'Donnell

CWMS – new resources and focus

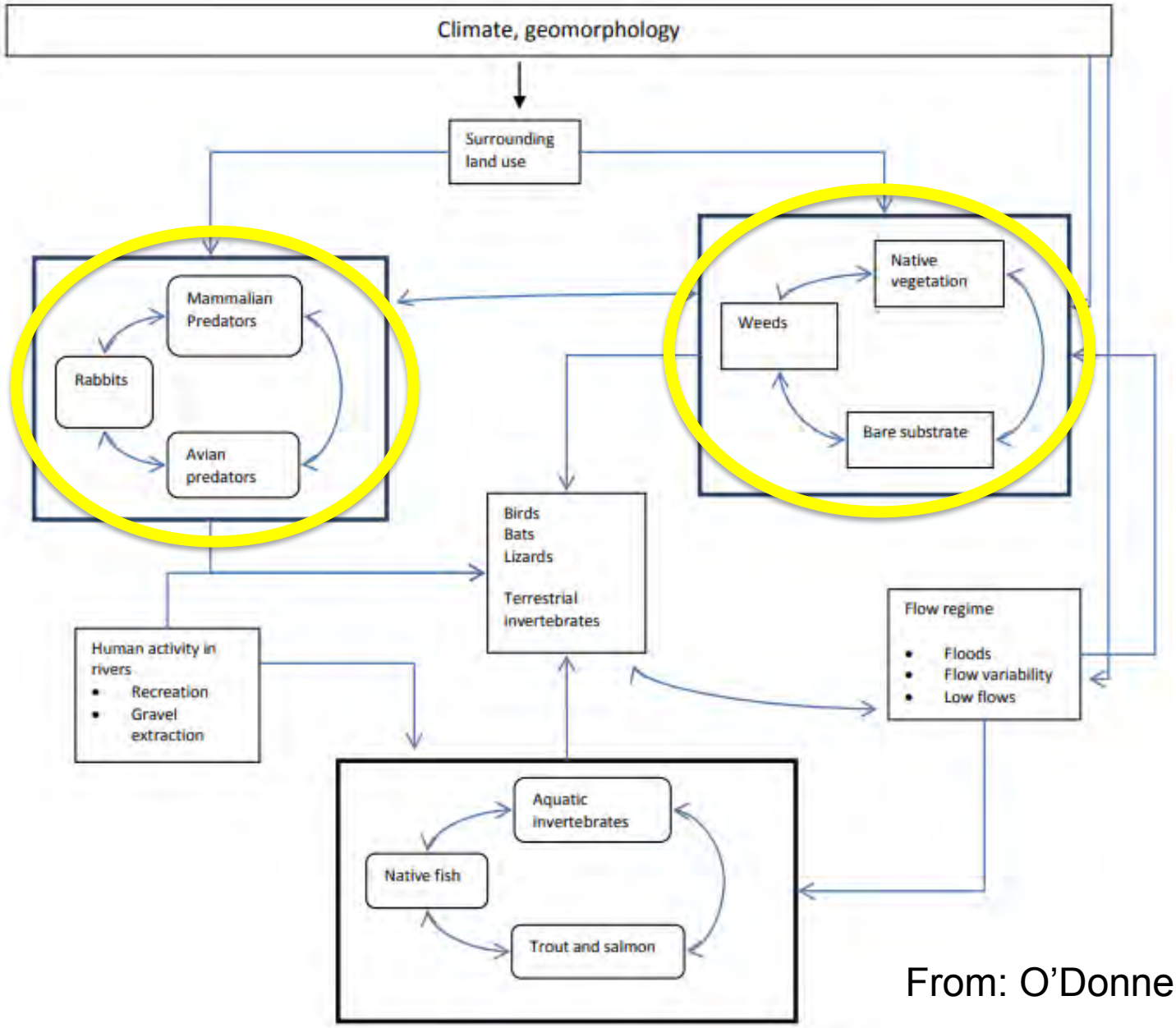


CWMS – direction and resources

Targets – 10 total

- Ecosystem health - correct the decline in freshwater species and ecosystems
- **Braided Rivers - enhanced and protected habitat for indigenous birds (2020) and ecosystems (2040)**

Interacting components in BR ecosystems



From: O'Donnell *et al.* 2016

Slide from: Colin O'Donnell

Weed invasion can result in complete loss of nesting habitat

Slide from: Colin O'Dor

Slide from: Colin O'Donnell

Context – structure/ activities

Structure

- Strategy and planning
- Science
- Communications
- Corporate
- Operations

- Policy and planning
- Strategic direction / work programmes
- Budgets

- Surveys (incl. braided rivers)
- Monitoring
- Investigations
- Reports

Environment Canterbury Regional Council
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Context – ECan structure

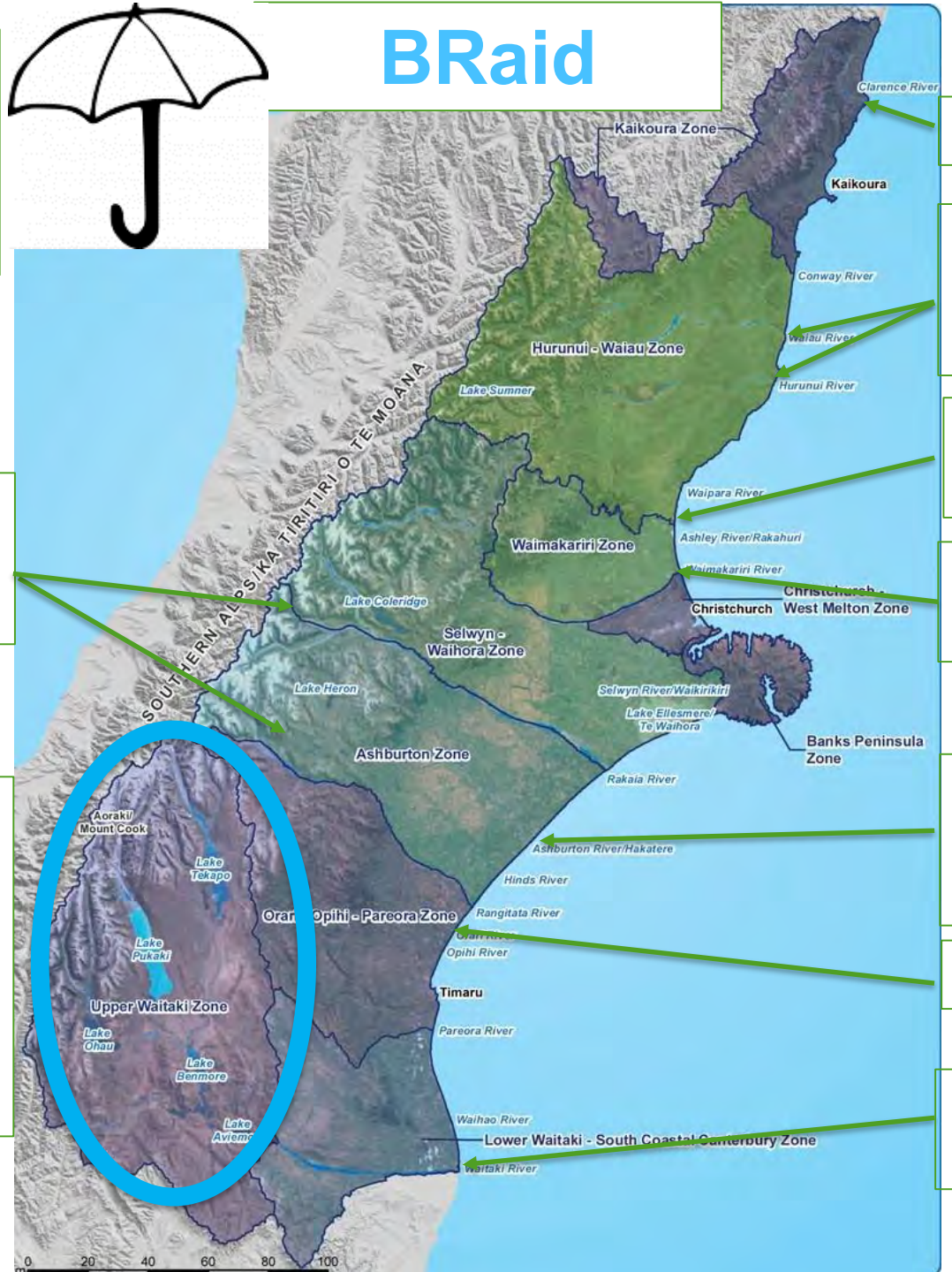
Structure

- Strategy and planning
- Science
- Communications
- Corporate
- **Operations**

- Rivers, Parks, and Survey
  - Reserves and parks
  - Rangers and river engineers
- Zone Delivery
  - Zone programmes
  - Staff (e.g. biodiversity officers)
- **Regional Biodiversity**
  - **Regional programmes**
  - **Staff (e.g. biodiversity advisors)**

Blue - Long-term and/or community led programs

BRaid



Upper Rangitata and Rakaia Rivers

Project River Recovery and Te Manahuna Aoraki

Clarence River

Waiau & Hurunui Rivers
Zone team led

Ashley/ Rakahuri River

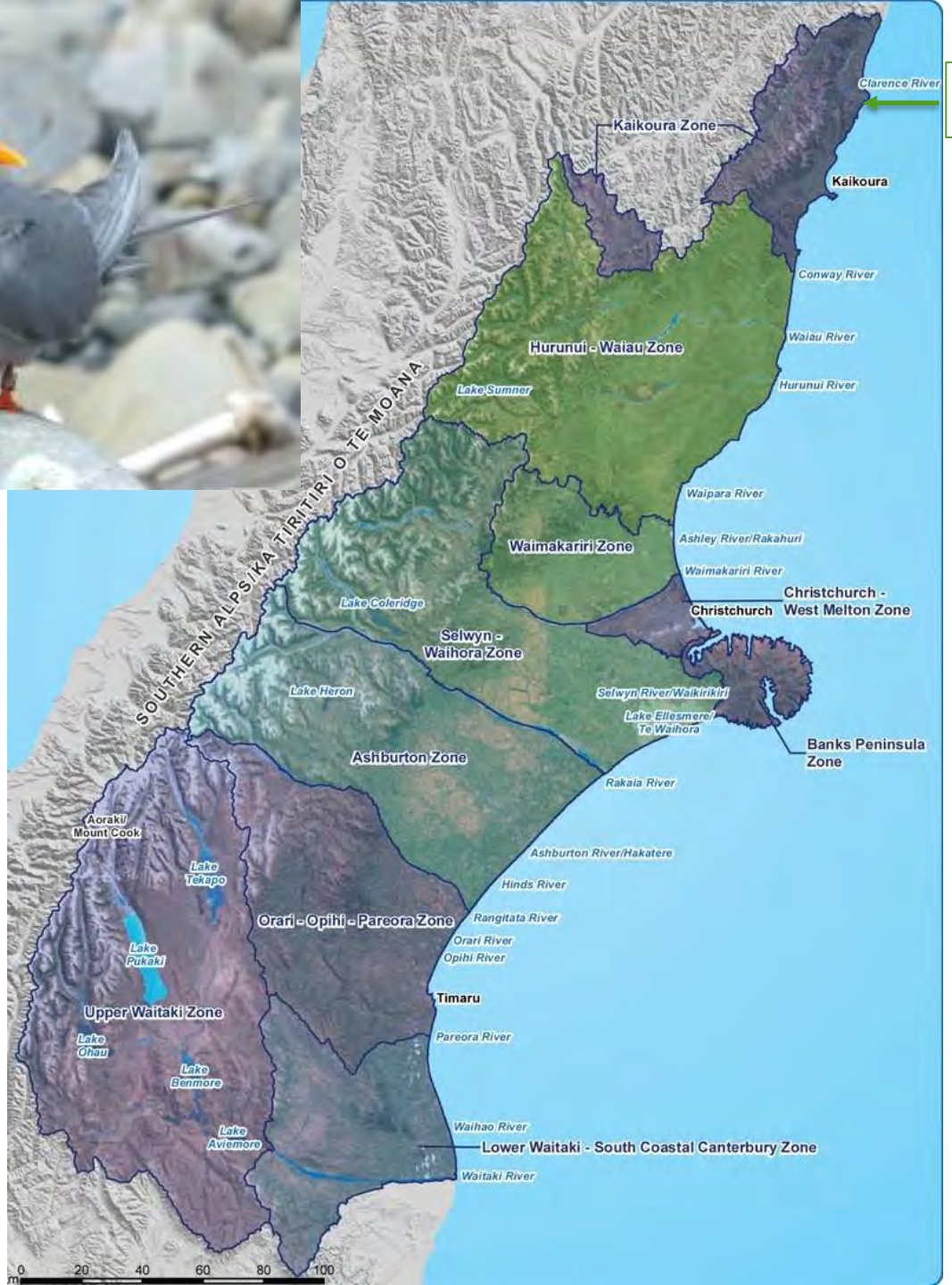
Waimakariri River Parks & Reserves

Ashburton River ECan portion - Zone Team led

Orari River

Lower Waitaki River

Photo credit: Wildlife Management International



Clarence River

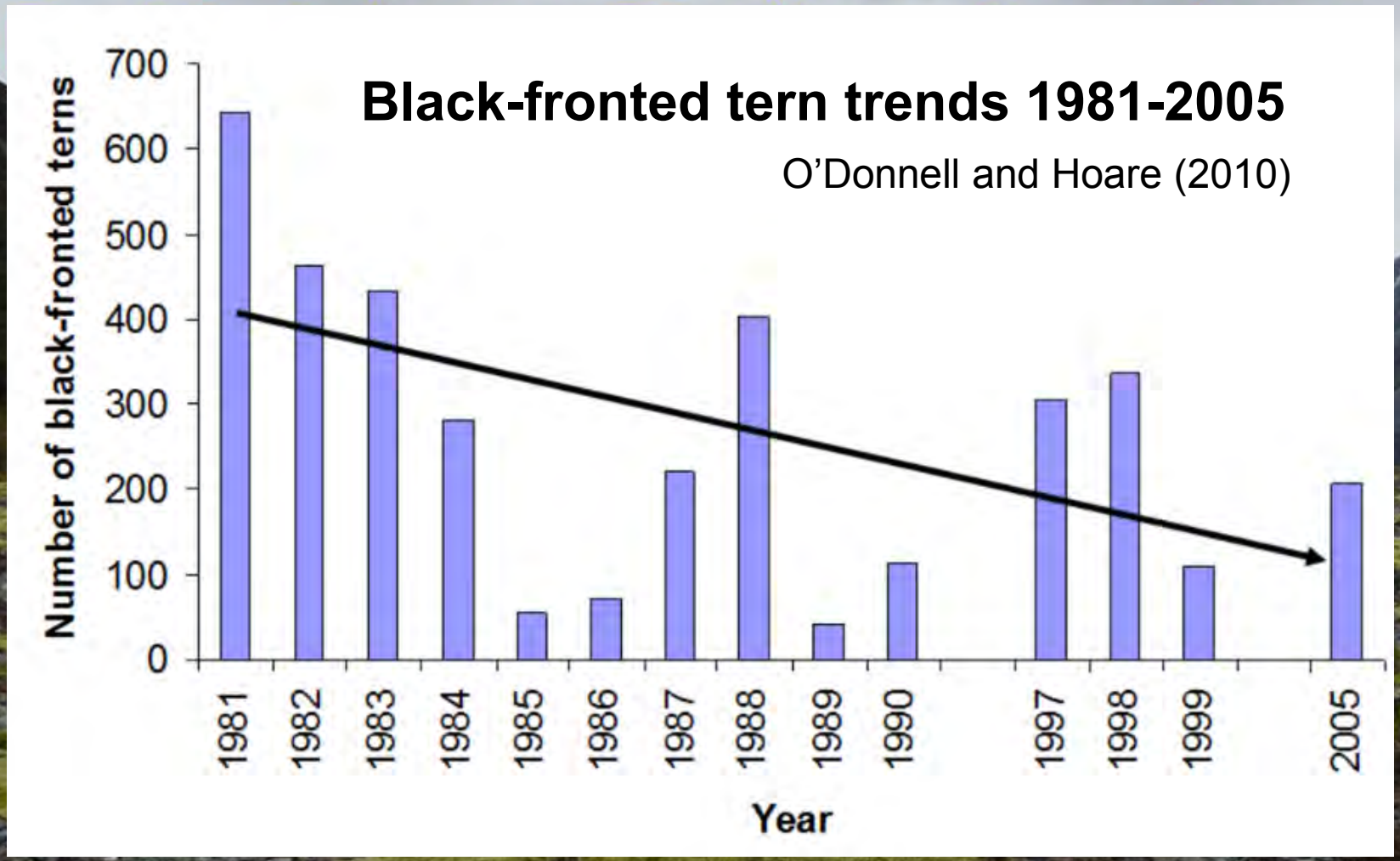
Island enhancement for black-fronted terns

- Channels
- Weed removal
- Predator control

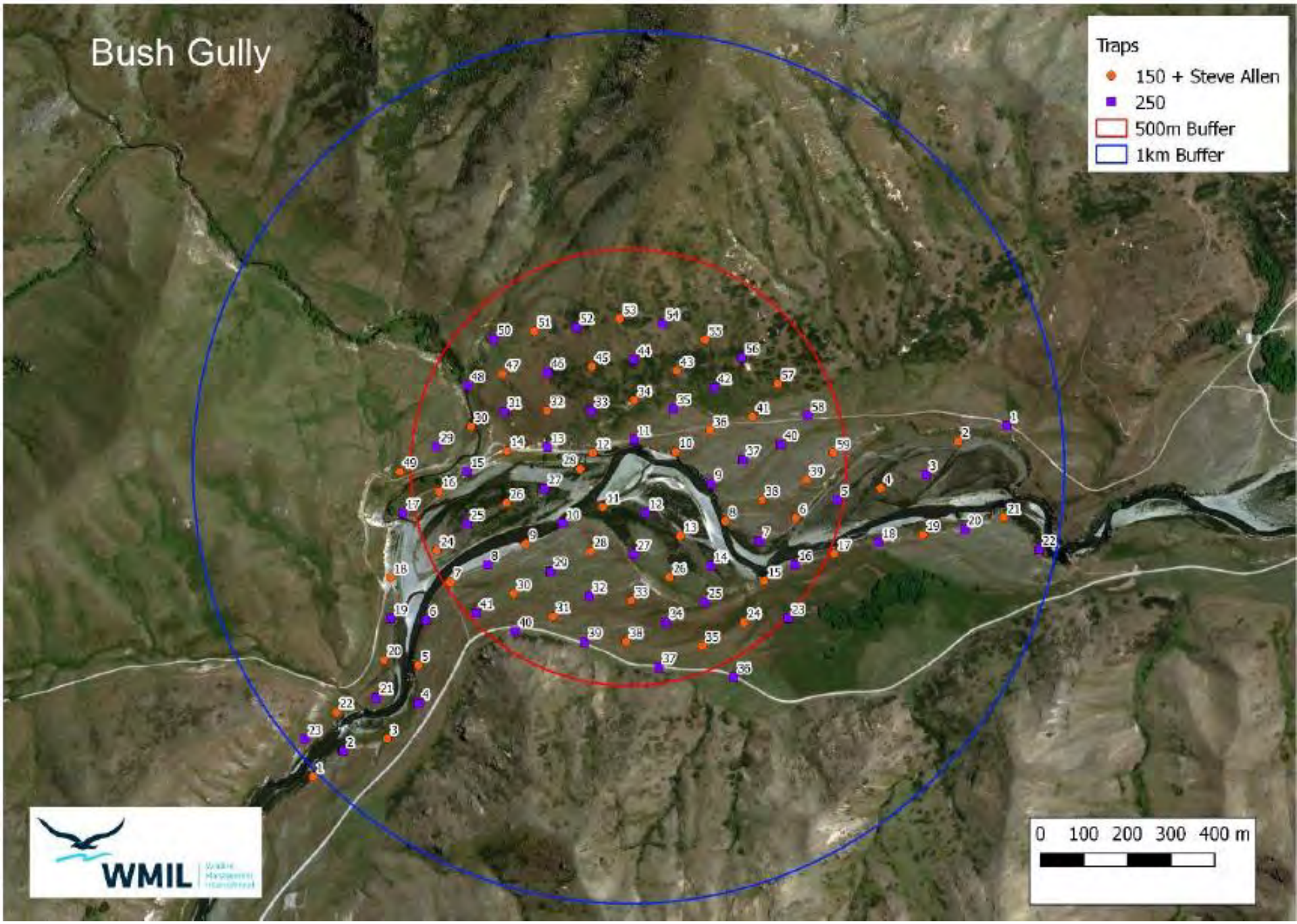
Outcome monitoring (breeding success)

<u>Key partners</u>

- DOC
- Wildlife Management International
- Zone Committee

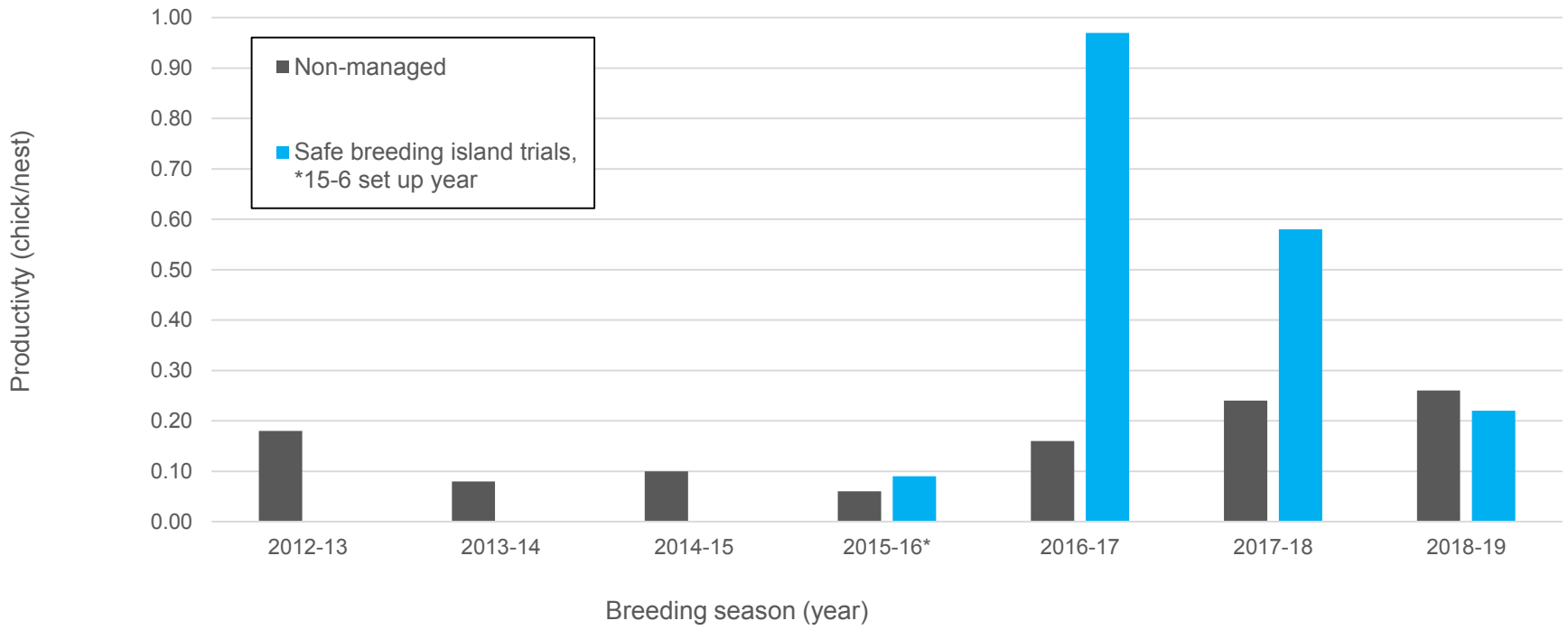

Black-fronted tern trends 1981-2005
O'Donnell and Hoare (2010)
Number of black-fronted terns
700
600
500
400
300
200
100
0
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1997
1998
1999
2005
Year

Clarence River safe breeding island site



Example of the trapping design around the islands

Breeding success of black-fronted terns Upper Clarence River



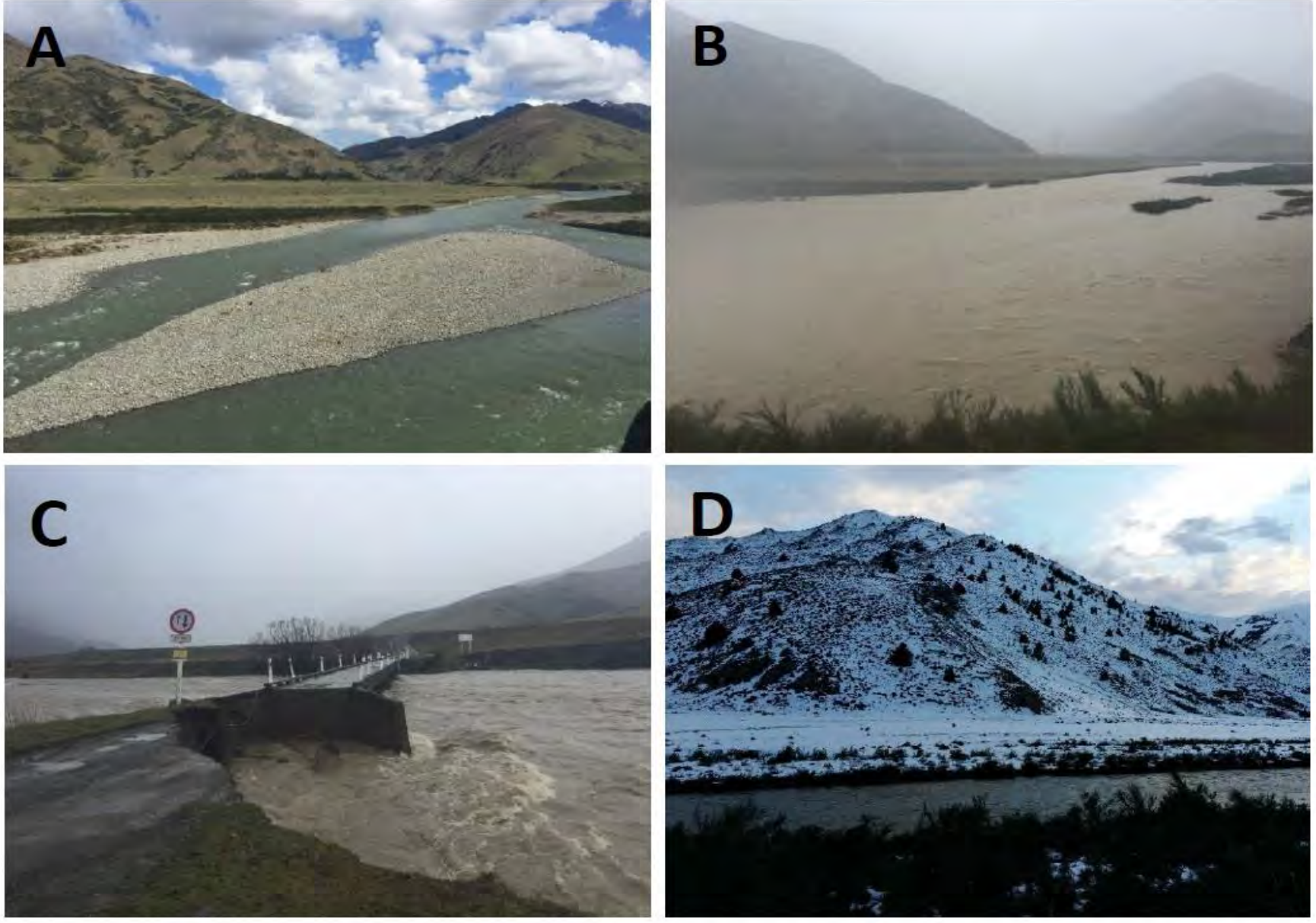


Figure 2: Impacts of weather events on the Clarence during the 2017/2018 season A) Bush Gully treatment colony prior to flooding B) Bush Gully treatment colony during September flood; C) Clarence River bridge at Acheron wash out September; D) Heavy snow up to 1m thick at Swimming Hole site July 2017.

Bush Gully site post Sept 2017 floods
Smaller but deeper channels

Breeding success of black-fronted terns Upper Clarence River

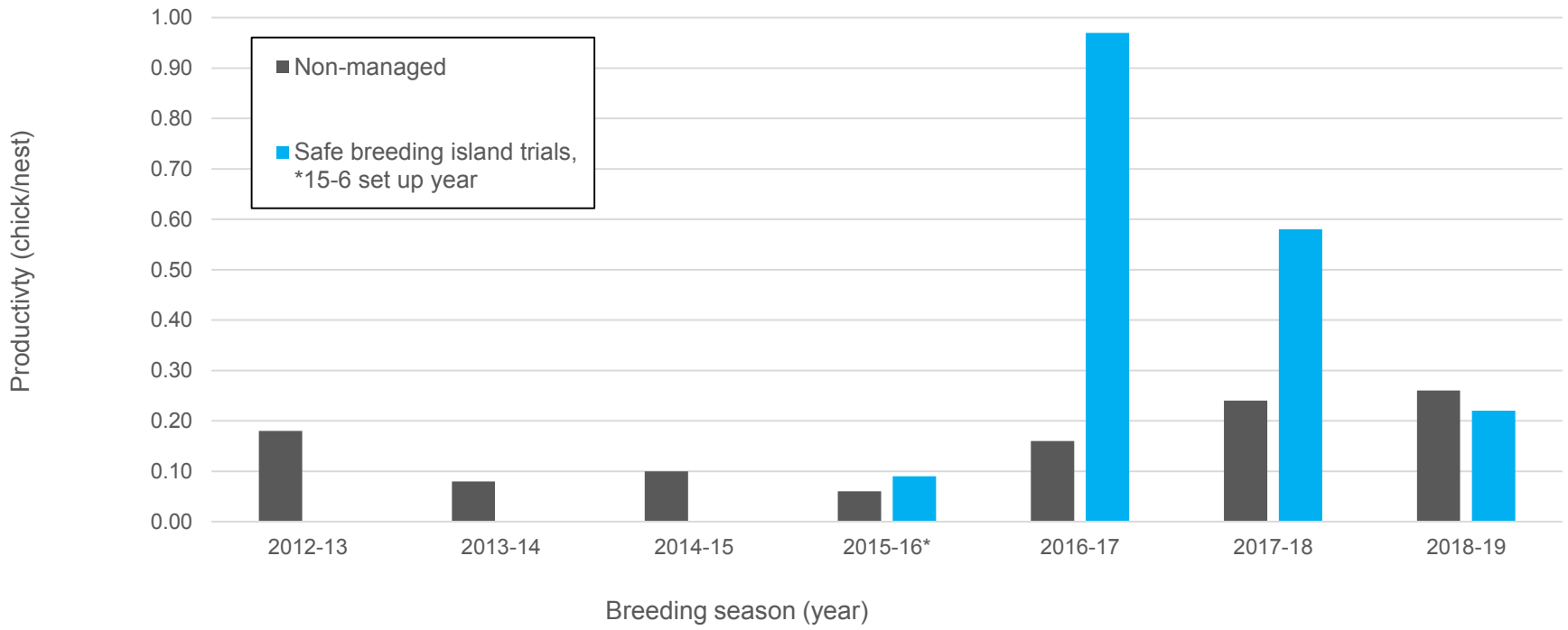
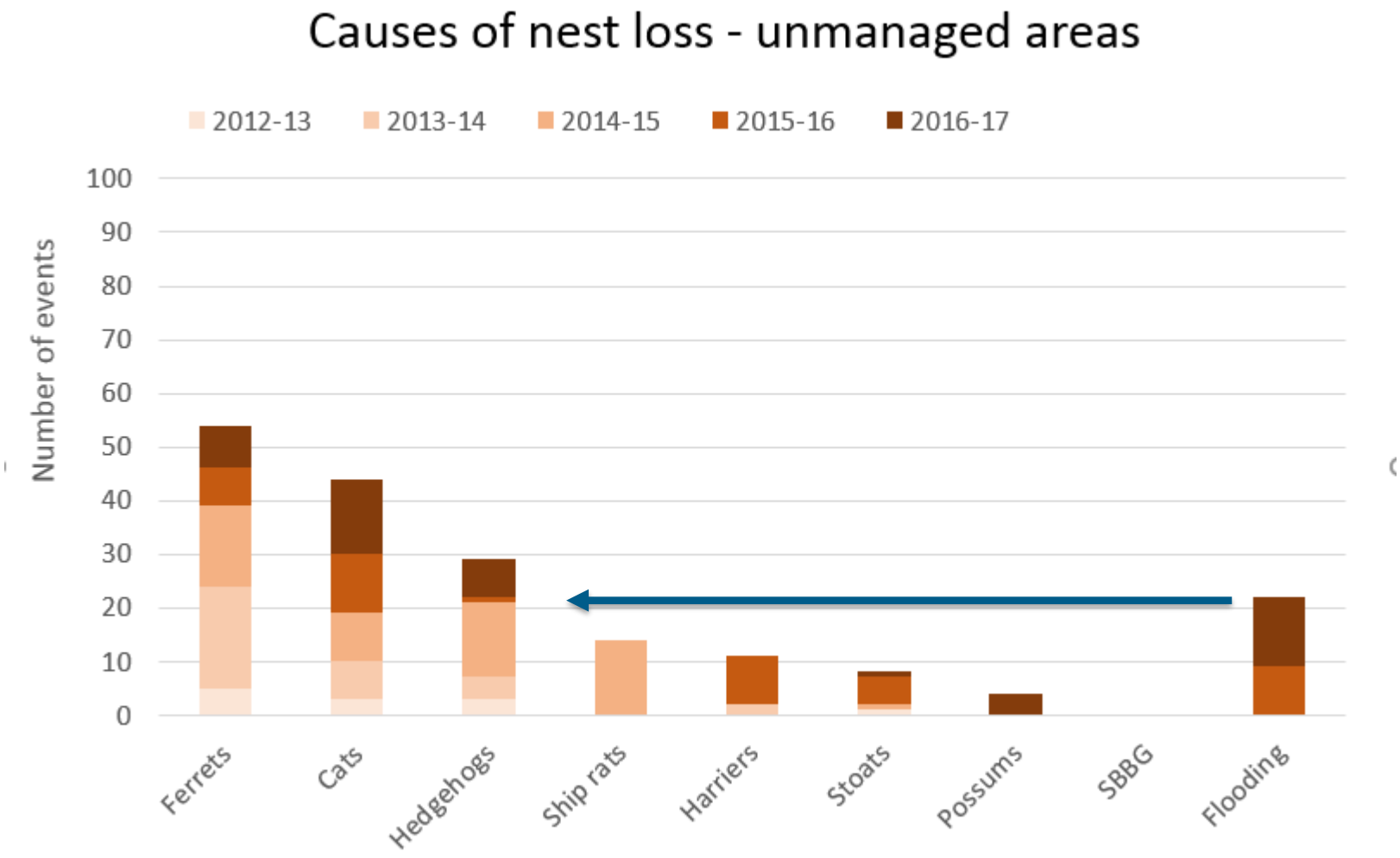
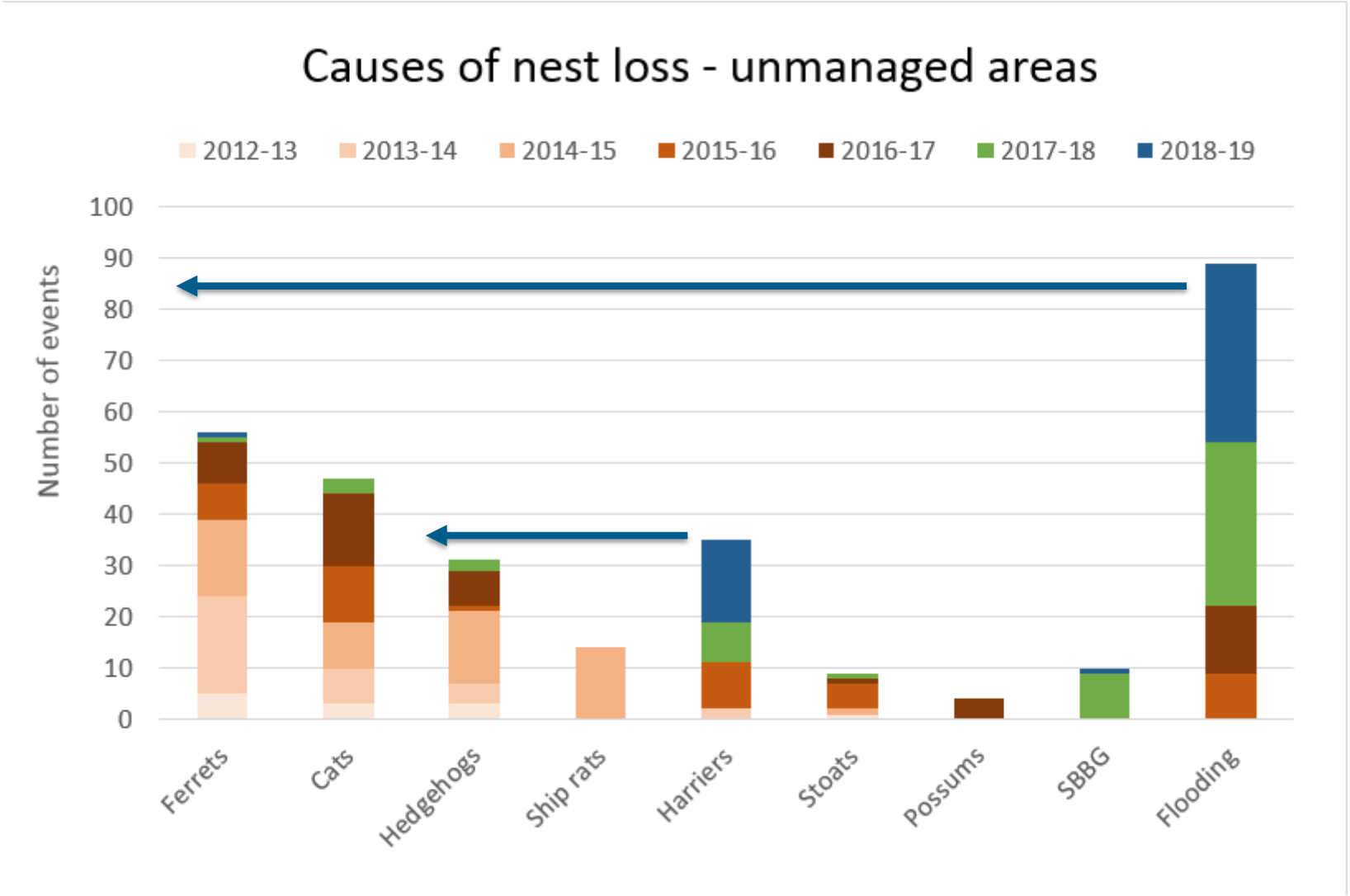


Figure 3: Upper Clarence river flow rates between October and January for this season (2018/2019) compared with last season (2017/2018) showing the high river flows this season. (https://www.ecan.govt.nz/data/riverflow/sitedetails/62105; retrieved 15/01/2019)

Nest loss by season 2012-2017



Predators and variations by season 2012-2019



Work by WMI on techniques to identify birds from a distance

Information on
- Movements
- Survival
- Site fidelity

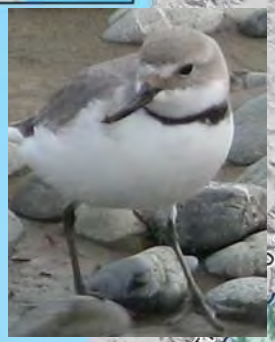
Challenges
- Short legs
- Wash off dye
- Fast moving

Answer: special flags plus cameras


RN

Young terns banded at Clarence project being sighted at the Wairau Lagoons, Marlborough

Photo provided by Wildlife Management International



Upper Rangitata and Rakaia Rivers

- Weed control
- Predator control
- Outcome monitoring for wrybill & bft

Key partners

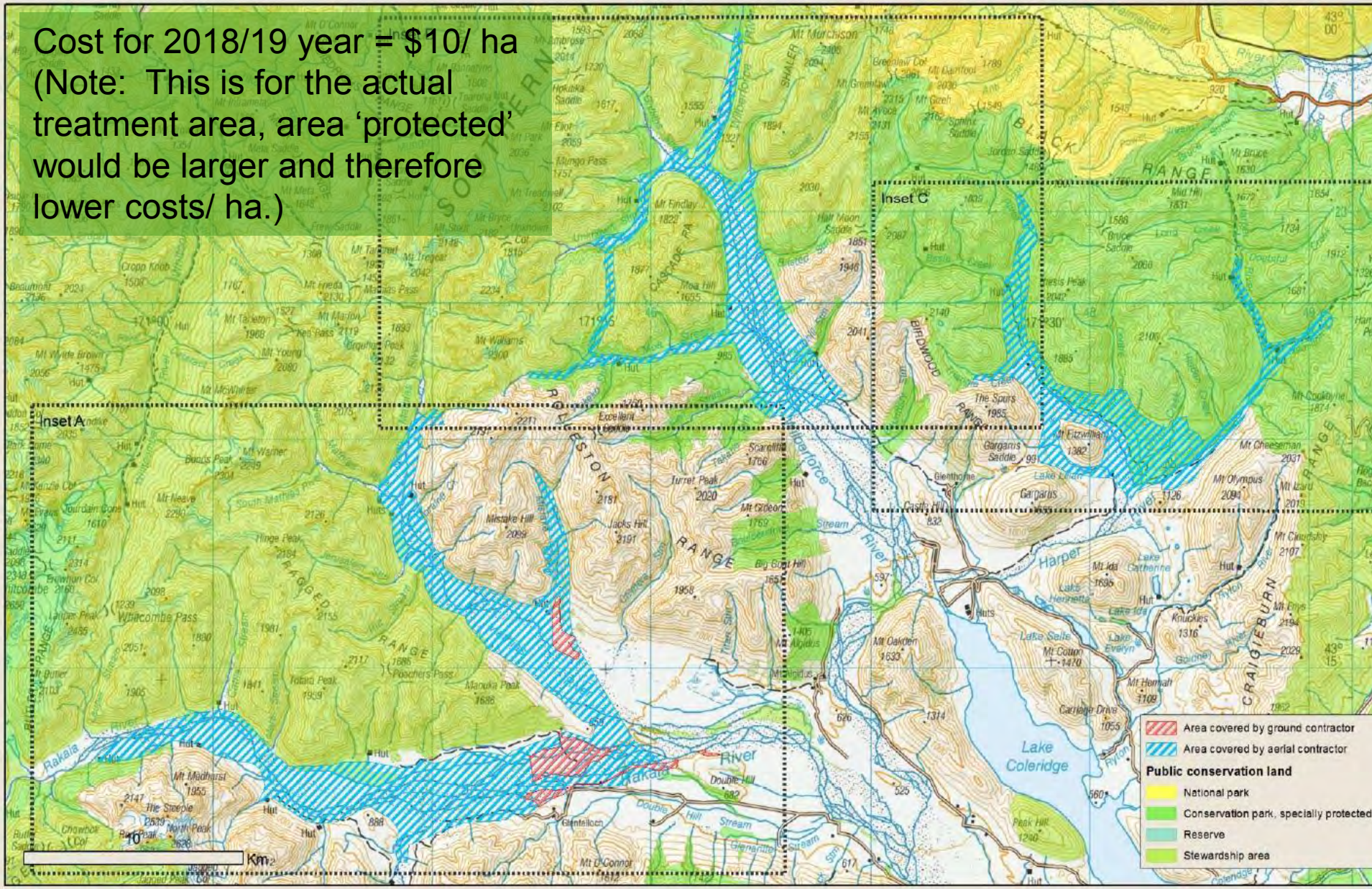
- Landcare groups/ runholders
- Zone & Regional CWMS Committees
- DOC
- LINZ

Upper Rangitata and Rakaia Flagship

The vision – weed free riverbeds


Wilberforce River
Gargarus
Mount Ida
Wilberforce River
Wilberforce River
Lake Selfe
Mount Oakden
Mount Cotton

Lower Harper River looking northeast below area where control work reaches



NZGD 2000 New Zealand Transverse Mercator
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Produced: cschurink on 28/06/2018
DOC, Geospatial Services

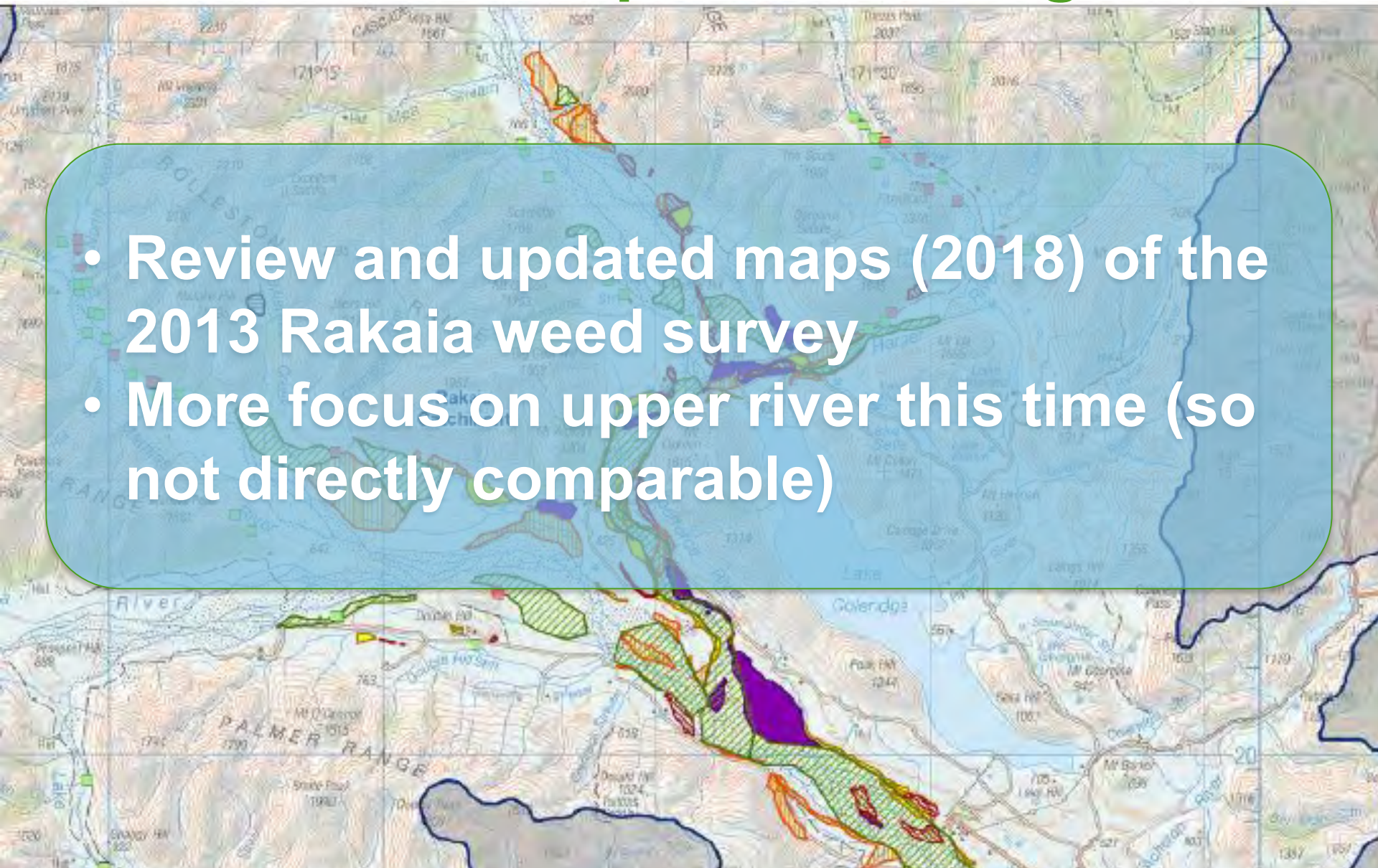
N

Overview - Upper Rakaia River BRFP 2017-2018 Weed Control

Department of Conservation
Te Papa Atawhai
New Zealand Government

File path: Q:\GIS_Analysts\Projects\2017_2018\SouthIsland\R129768_Rangitata_Rakaia_weed_control_maps_CS\Rakaia\Rakaia_overview.mxd

Survey and weed control strategy 2013 one of the maps: broom & gorse

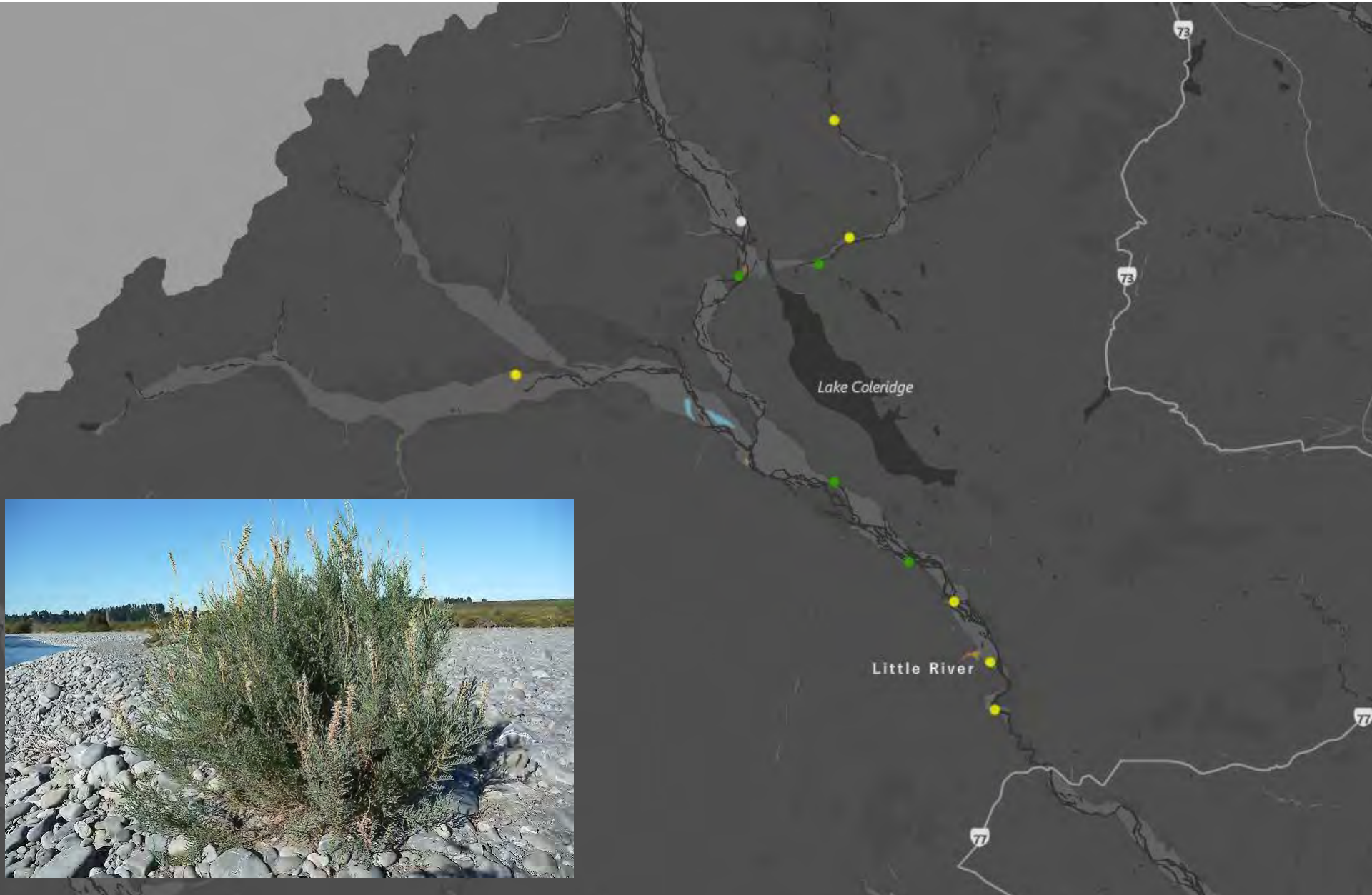


- Review and updated maps (2018) of the 2013 Rakaia weed survey
- More focus on upper river this time (so not directly comparable)

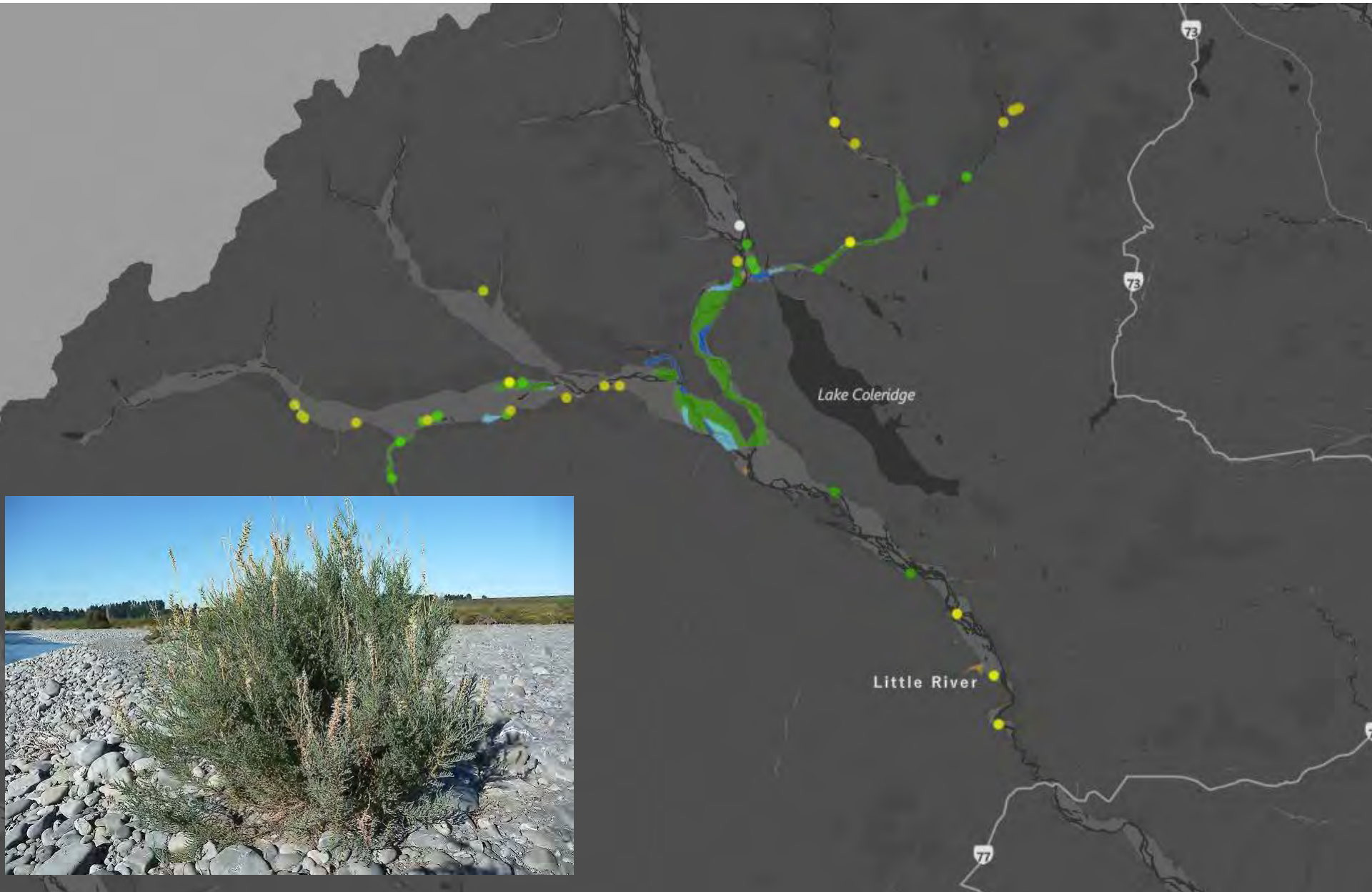
Russell lupin (still almost none in U Rakaia)

Only one population of buddleia

False tamarisk 2013



False tamarisk 2018



CLARENCE/WAIAU TOA CATCHMENT

RIVERBED WEED CONTROL STRATEGY

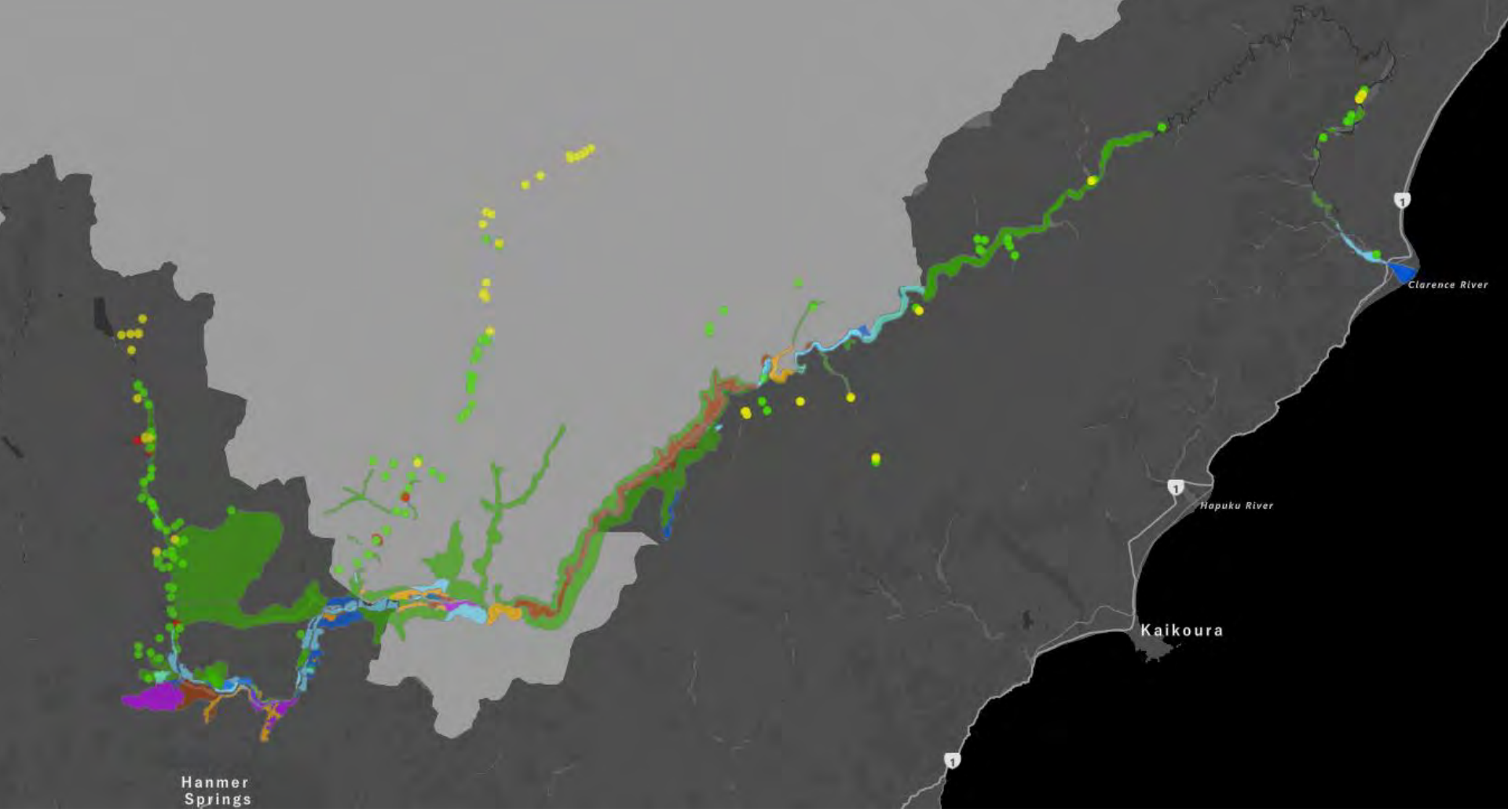
A report prepared for
Environment Canterbury
Christchurch

Mike Harding
Environmental Consultant
macharding@outlook.com

June 2019

Clarence River weed strategy and survey

- Zone-led programme (Kaikoura, Jess Hill)
- Two years to complete field work (huge area)
- Entire Clarence River
- Maps will be available on-line in near future



Broom & Gorse - Clarence River (including the Acheron)

Yellow Tree Lupin - Clarence River

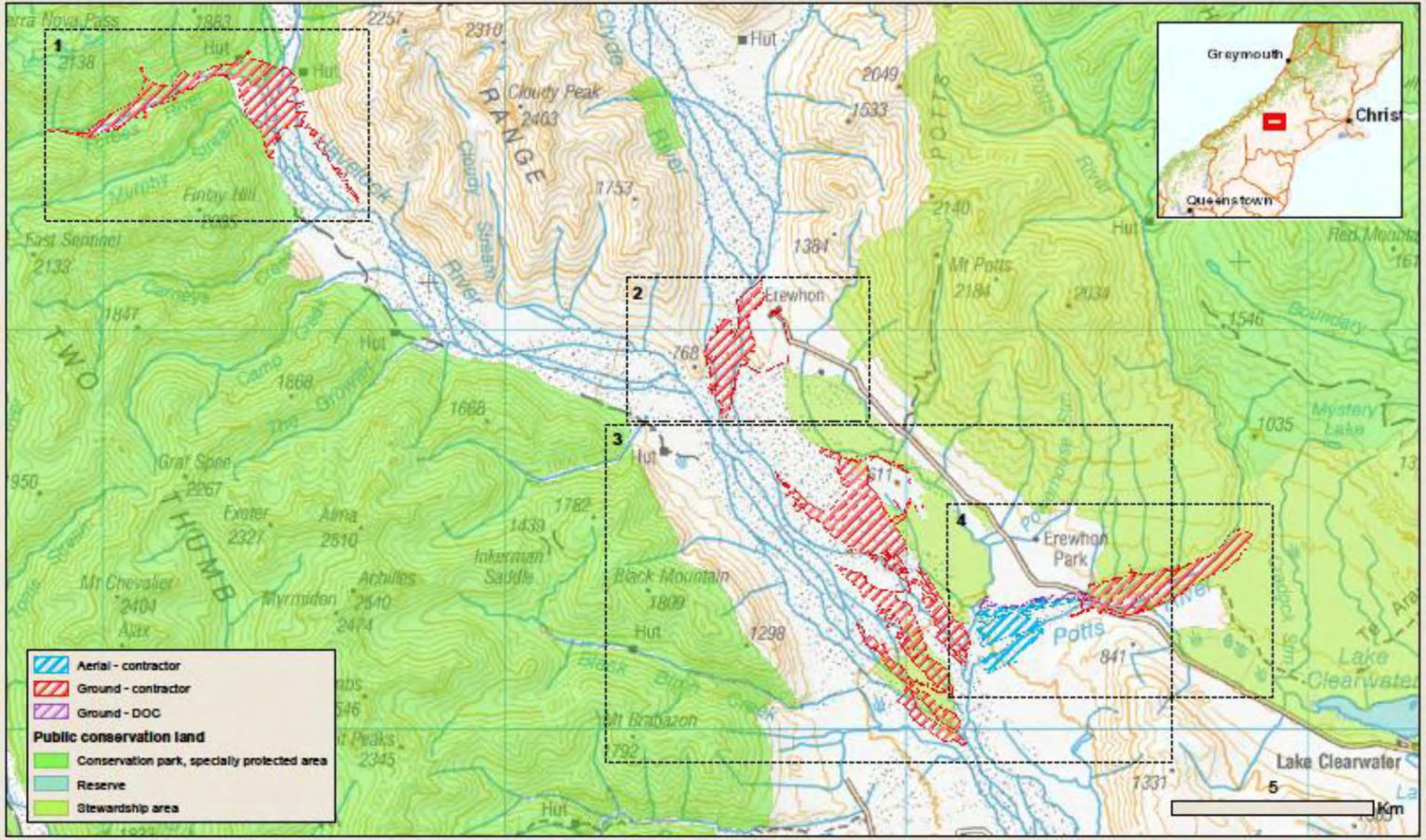
Buddleia - Clarence River

Grey Willow - Clarence River

False Tamarisk - Clarence River

Russell lupin - Clarence River

Alder - Clarence River



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Produced: cschurink on 4/04/2018
DOC, Geospatial Services

Upper Rangitata River BRFP 2017-2018
Overview of Weed Control

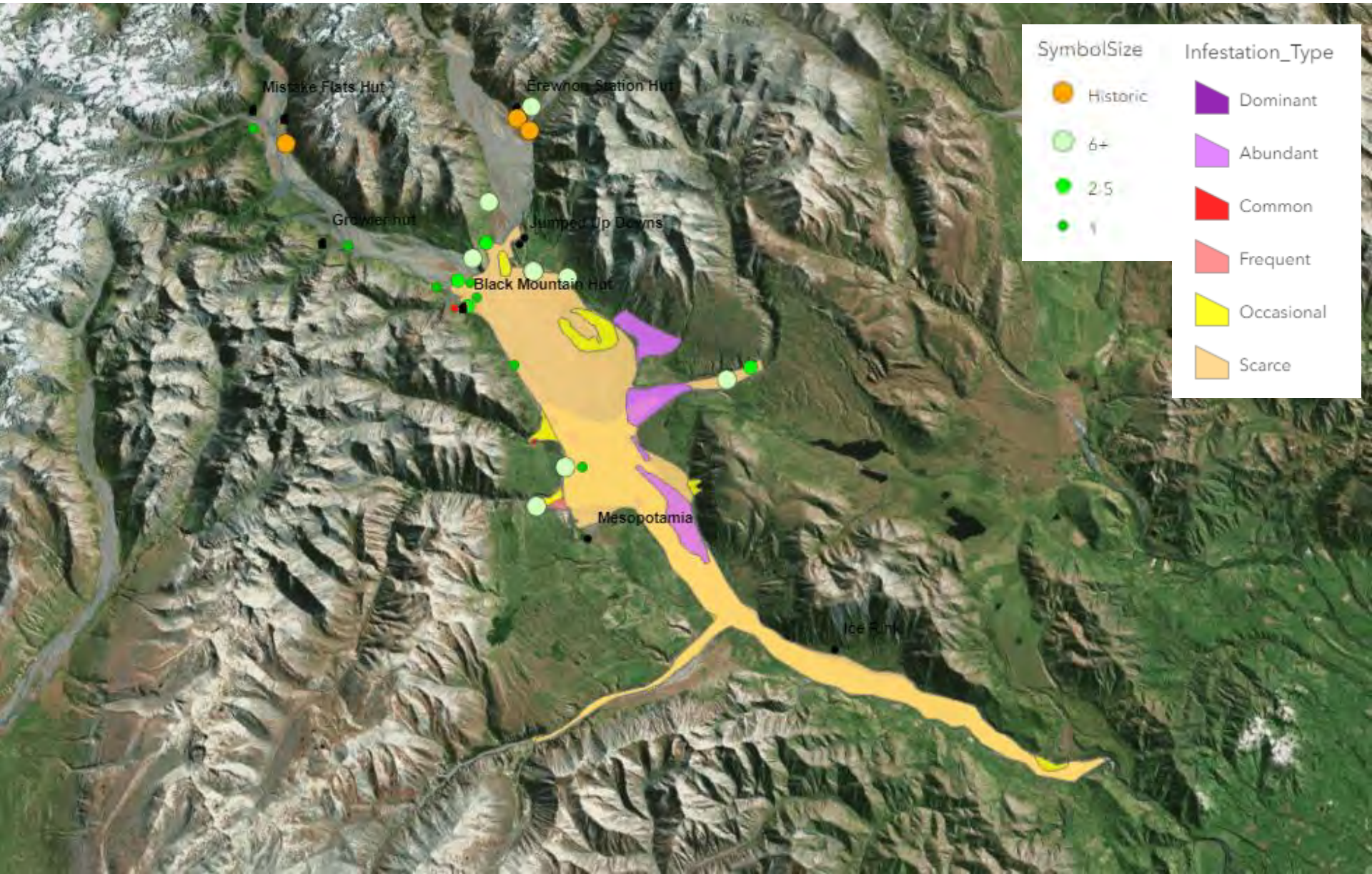
Department of Conservation
Te Papa Atawhai

Pre and post control in the lower Potts River looking up the valley with the Rangitata in the background.

Upper Rangitata River

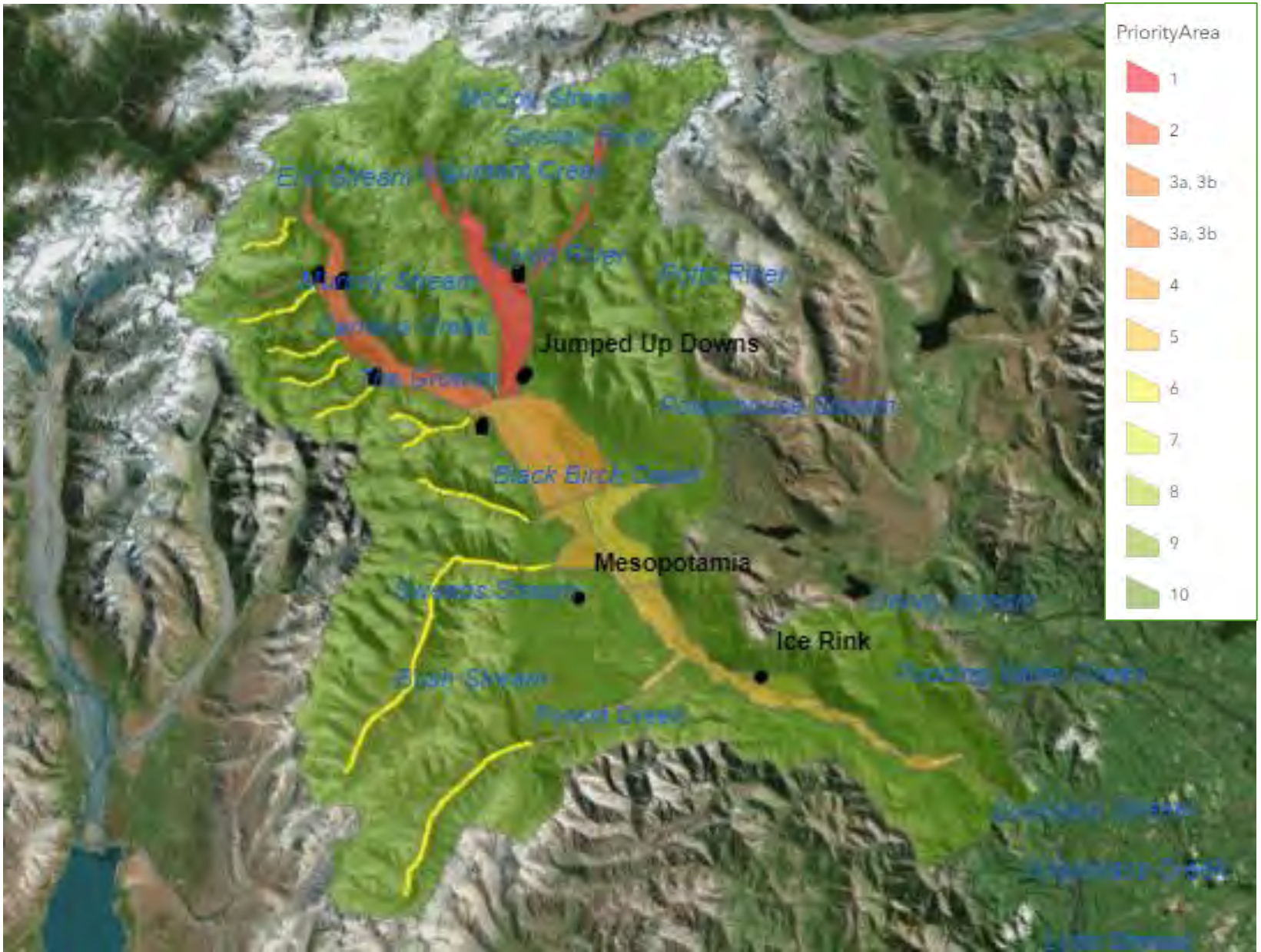
- Weed control action plan
- Survey of weeds
- Led by Upper Rangitata Gorge Landcare Group (council support)
- 3D map viewer upper Rangitata

Broom and gorse



Russell lupin

Priority areas

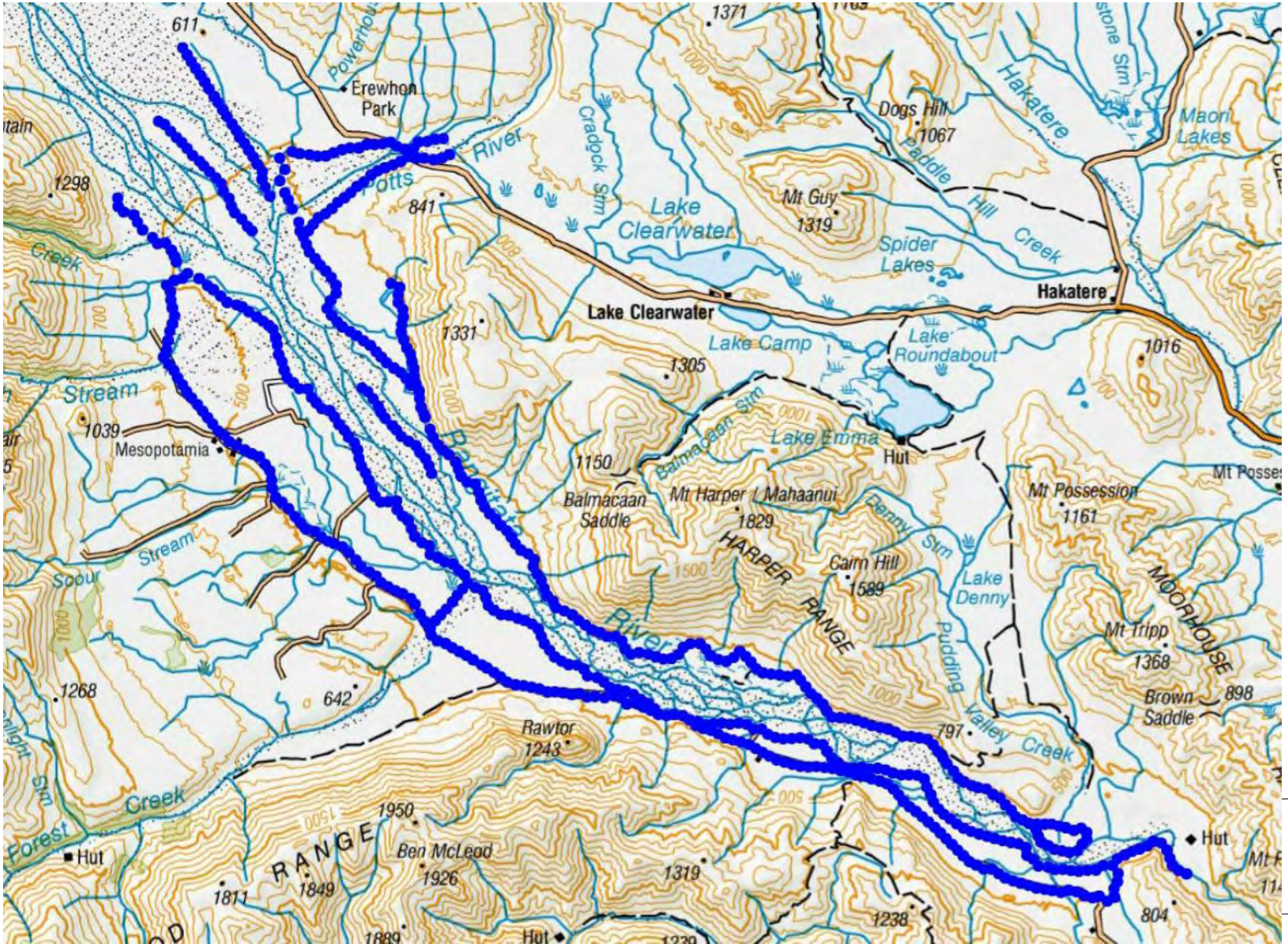


Adult tern landing on nest upper Rangitata (photo via monitoring camera – DOC)

Predator control upper Rangitata

- Key target species – wrybill and black-fronted tern

Predator control Rangitata



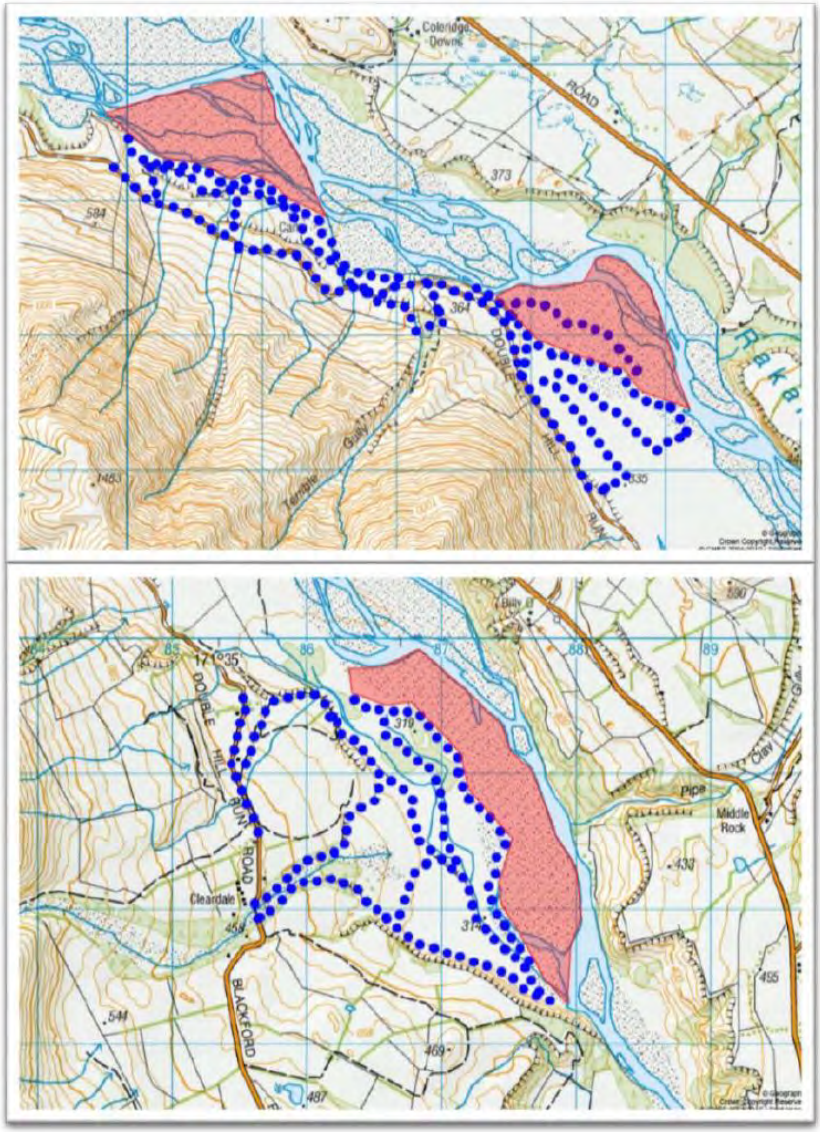
U. Rangitata – 4th season

- Wrybill – 27 nests
  - Hatching success 0.93
  - Fledging success 0.48-0.58
- BFT - 68 nests
  - Hatching success 0.09
  - Fledging success 0
- Flooding had a significant impact this season

- Trapped:
  - hedgehogs (1360),
  - rats (291),
  - mustelids (204),
  - cats (143)

Photo: Lauren Buchholz

Rakaia predator control



U. Rakaia – 2nd season

- Wrybill – 33 nests
  - Hatching success 0.42
  - Fledging success 0.17-0.33
- BFT - 34 nests
  - Hatching success 0.21 (PC*), 0.30 (NPC)
  - Fledging success 0 (both)
- Flooding had a significant impact this season

- Trapped:
  - hedgehogs (235),
  - rats (85),
  - mustelids (74),
  - cats (45)
- Also aerial predators controlled

* PC – predator control, NPC – no predator control

Robust grasshopper project - now in Phase 2. Habitat trials, translocations and developing monitoring techniques

Many thanks to:

Tara Murray, Tammy Steeves, Carol Burke, Richard Maloney and DOC Twizel staff

Department of Conservation
Environment Canterbury
Forest and Bird, *JS Watson Trust, Stocker Scholarship*
NZFGW Canterbury Branch, *Sadie Balkind Award*
University of Canterbury, *Doctoral Scholarship*

And everyone else who has helped along the way!

Department of Conservation *Te Papa Atawbai*

Environment Canterbury Regional Council *Kaunihera Taiao ki Waitaha*

Forest & Bird TE REO O TE TAIAO | *Giving Nature a Voice*

N·Z·F·G·W

UC UNIVERSITY OF CANTERBURY *Te Whare Wānanga o Waitaha*

Island enhancement guide
River Engineering led

Department of Conservation
Te Papa Atawhai

Environment Canterbury Regional Council

A quick guide to creating bird nesting islands

Island support

Social Attractants
In some rivers where there is relatively high abundance of nesting habitat available, birds may not chose to use the created island. Or they may just need some help to get the ball rolling. Consider the use of social attractants (decoys, audio) to encourage target colonial species to use the islands.

Predator Control
Predator control for the island and surrounding area is key to aiding nesting and fledging success of the island. While the island site selection and the ability to maintain good separation to the mainland will help reduce predator numbers for some guilds, trapping on the island and in the surrounding berm areas should be considered. Also consider management of other prey species, such as rabbits, which may attract predators to the island if they have other prey available in the area.

Black-backed gulls have been found to be a major predator player in island success, and island isolation and trapping is ineffective at their control. Black-back gull control is also recommended where needed.

Useful Links

www.braid.org.nz
www.doc.govt.nz
http://braid.org.nz/seminar-2017
http://braid.org.nz/wp-content/uploads/2016/08/birds.jpg

Thanks to DOC and presenters at the BRaid 2017 seminar for the information used in this guidance.

Monitoring Success

Once the island has been established, it is recommended that ongoing monitoring is carried out to demonstrate changes in bird use and occupation of the island. Monitoring success can identify the need for extra action such as extra predator or weed control and can support additional island creation in the future.

Contact your local DOC office or Biodiversity Officer for advice.

Planning permissions

The Land and Water Regional Plan sets out rules for activities in river beds. Activities associated with island creation include vegetation clearance (mechanical or chemical), disturbing river bed material, and braid diversions. The relevant rules are 5.163 (vegetation removal), 5.136 (general bed disturbance), 5.22 (agrichemical use).

Please also be aware of additional sub-regional plan rules which may apply, including for the Waimakariri River which is covered by a separate plan.

A resource consent is required to create bird islands, if the work area is in a listed Salmon Spawning (Schedule 17) river or a High Naturalness waterway (sections 6-15) or if work in flowing water is needed.

Some existing gravel extraction consents have conditions which enable habitat enhancement work such as nesting islands to be created. Similarly, the River Engineering team can assist with authorising the activity through Environment Canterbury's Code of Practices and existing resource consents.

For more information on these permissions contact us on gravel@ecan.govt.nz

Environment Canterbury Regional Council

creating bird nesting islands

e birds, and they need some help! Creating islands in the river where birds can like the wrybill, black billed gull and black fronted terns

nd characteristics

o create around 50cm – 1m freeboard rmal" flow level. Consider frequency and ds, and factor that into the amount of eded. Use local knowledge to help ical river flow behaviour.

rch has found the smaller the island, the rs will be present (both resident and mal island size to account for colony educing predator presence is around 1-3.5 x 2.5ha for smaller rivers). Bigger islands , but the volume of flow in braids e island from the mainland (>6m3/sec), e mainland (>20m) and maintaining low d cover become important factors.

erally, the island should mimic what rs in the river. The island should be 2-5 han it is wide.

etween islands – if you are creating a nds, create them a reasonable distance art. Having them spread out reduces eeding habitat surrounding the island.

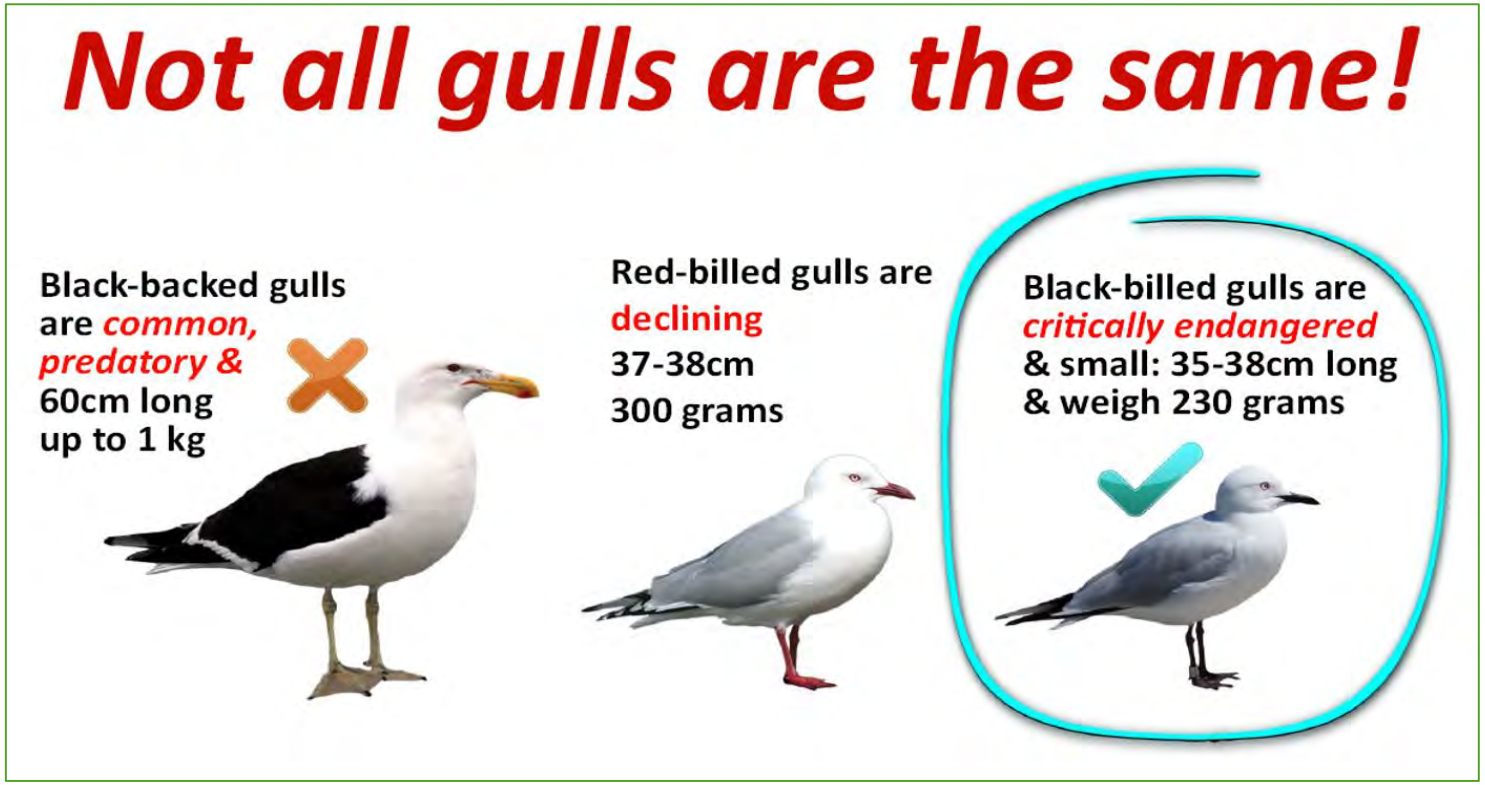
nds need to be completely weed free as ve the most success. Any weedy patches redators. Mechanically scrape away any ver well before the nesting season, and spray if needed immediately prior to the n. Do not spray into water, or over nesting

Island maintenance

Once the island has been created, keep an eye out for any maintenance needed to keep it functional.

- Monitor the islands to check for weed invasions, manage regrowth with targeted herbicide spraying or mechanical clearance.
- Reshape of gravel post floods to restore freeboard
- Dredge braids around the island to keep a good depth of flow.

Underway – a southern black-backed gull (SBBG) strategy options paper

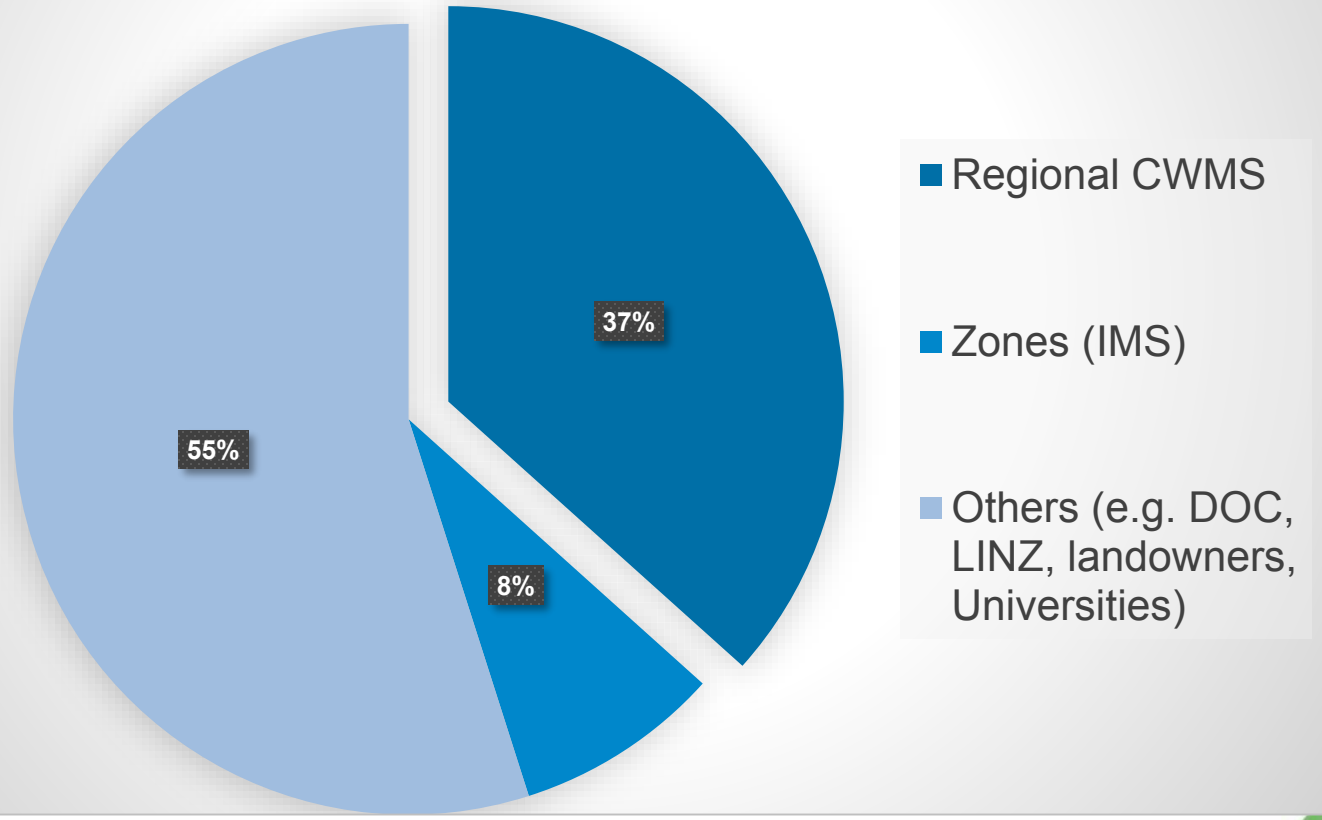


Graphic provided by BRaid

Other species

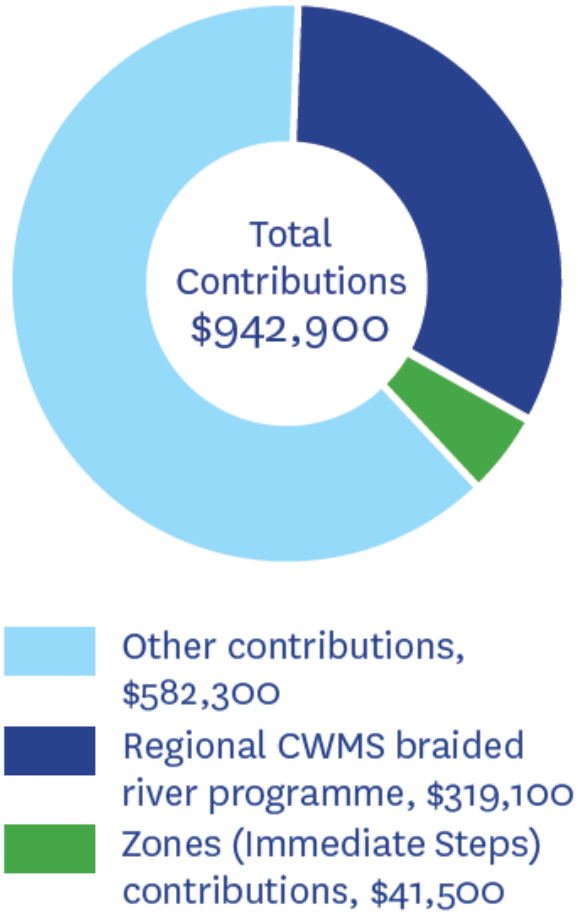
BRaid website - http://braid.org.nz/

Regional projects - funding more than matched from other sources



Collaboration

- UC example
  - $29,000 invested
  - Additional $108,500 from other sources
- ECan funds about 1/3rd
- Many key collaborators



Upper Rangitata Weed Control 2016/2017

Date Printed: 24 April 2017