Lower Waitaki Habitat Restoration for Black-Fronted Terns

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Te Papa Atawhai

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

New Zealand Government

Black-fronted tern chicks on the Lower Waitaki. Photo: Jemma Welch

Project Background

Black-fronted terns/Tarapirahoe (*Childonias albostriatus*):

- Nationally endangered and endemic to New Zealand,
- Braided river specialist,
- Primary threats include predation and habitat loss.

(Robertson et al., 2015; Keedwell, 2002, 2005)

Black-fronted tern adult in flight. Photo: Jemma Welch

Project Background

Black-fronted tern management options:

- Localised or landscape scale predator control,
- Vegetation clearance.

(Cruz et al., 2013; Maloney et al., 1999)

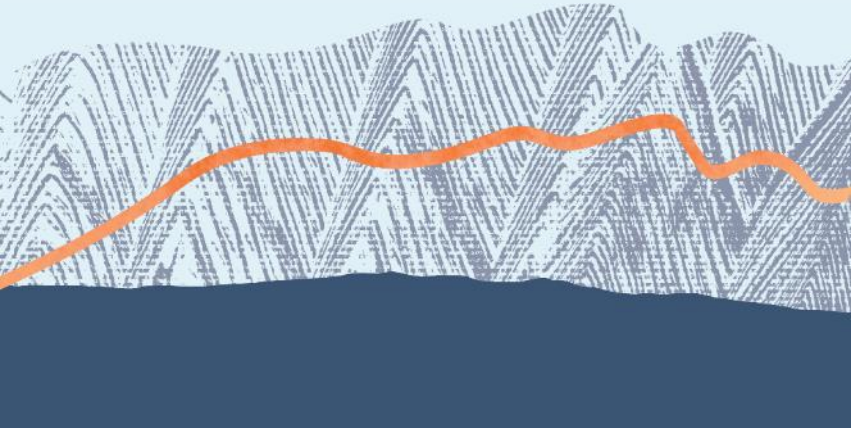
Black-fronted tern adult in flight. Photo: Jemma Welch

Project Background

Braided river islands shown to have fewer mammalian predators than adjacent vegetated islands/riverbanks if:

- Smaller than 3.5ha,
- Clear of exotic vegetation,
- Over 20m from their adjacent vegetated islands/riverbanks and,
- Separated by a channel with a flow higher than $6m^3$/sec.

(Pickerell, 2015)



Project Setup

2016

Set out to investigate whether clearing islands of exotic vegetation created refugia for braided river specialists from mammalian predators

- Seven islands in the Waitaki River cleared of weeds
- Built up to approx. 0.5m above mean water mark

(Schlesselmann et al., 2018)

Before (left) and after (right). Photos: Ann Schlesselmann

Island Maintenance

2017 and 2018

- Island sculpting to further isolate them from riverbanks (2017)
- Follow up weed control (2017, 2018)

(Edwards and Bucholz, 2018; Welch et al., 2019)

Islands Three (top) and Four (bottom) showing the extent of weed cover in the 2018-19 season. Photos: Jemma Welch

Predator Monitoring

2015, 2016 and 2017 Breeding Seasons

Tracking tunnels on vegetated islands and riverbanks (2015 and 2016) and cleared islands (2016 and 2017)

- 2015 and 2016: Possums, mustelids and mice on vegetated islands and riverbanks.
  Cats and hedgehogs on riverbanks.
  Mice on one cleared island.

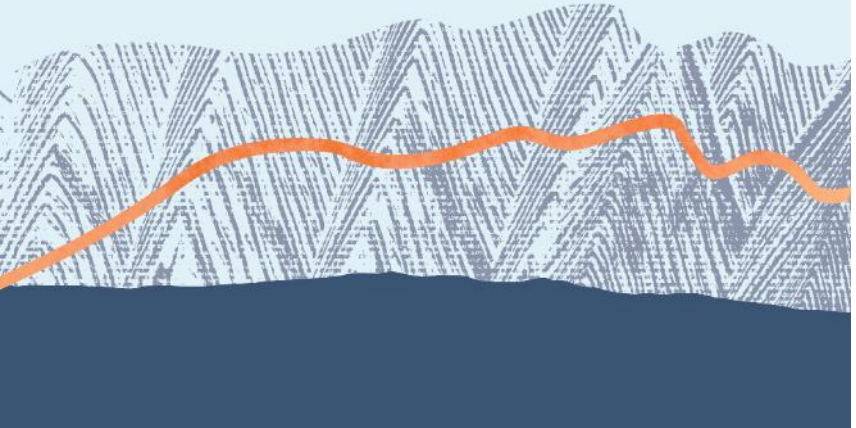
- 2017: Mustelids on two islands (confirmed as predators on additional two).

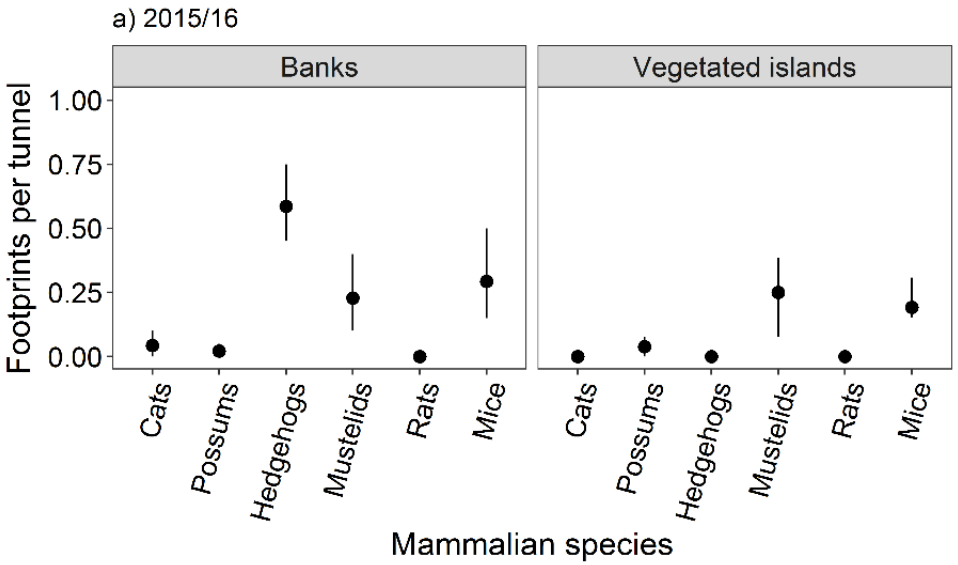
(Schlesselmann et al., 2018; Edwards and Bucholz, 2018)

Tracking tunnel with bird prints. Photos: Jemma Welch

Predator Monitoring

2015, 2016 and 2017 Breeding Seasons





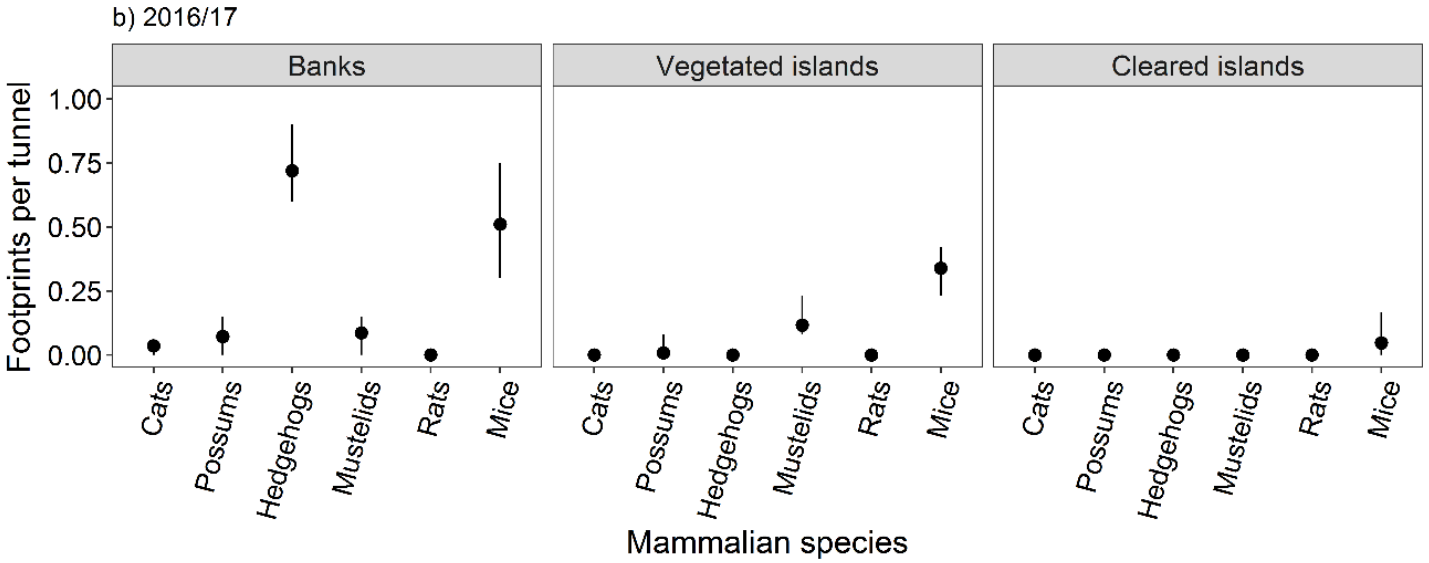


Figure 2 from Schlesselmann et al., 2018. Mean tracking rates (footprints per tunnel, circle) and minimum and maximum tracking rates (lines) per time period of mammalian predators during the black-fronted tern breeding season of a) 2015/2016 and b) 2016/2017 on the lower Waitaki River. Banks refer to 20 tunnels in four transects operated for 70 days on the southern and northern banks of the lower Waitaki River. Vegetated islands refer to tracking tunnels operated on 13 vegetated islands for 60 days and 64 days in 2015/16 and 2016/17, respectively. Cleared islands refers to tracking tunnels operated on seven cleared islands for 59 days.

Predator Monitoring

2018 Breeding Season

3-5 tracking tunnels on each island

- Checked weekly Oct-Dec
- Mustelids tracked on island one
- Mice tracked on island five

(Welch et al., 2019)

Tracking tunnel with bird prints. Photos: Jemma Welch

Nest Monitoring

2015-2018 Breeding Seasons

Nests monitored every 7-14 days by jetboat or on foot:

2015

- Vegetated islands

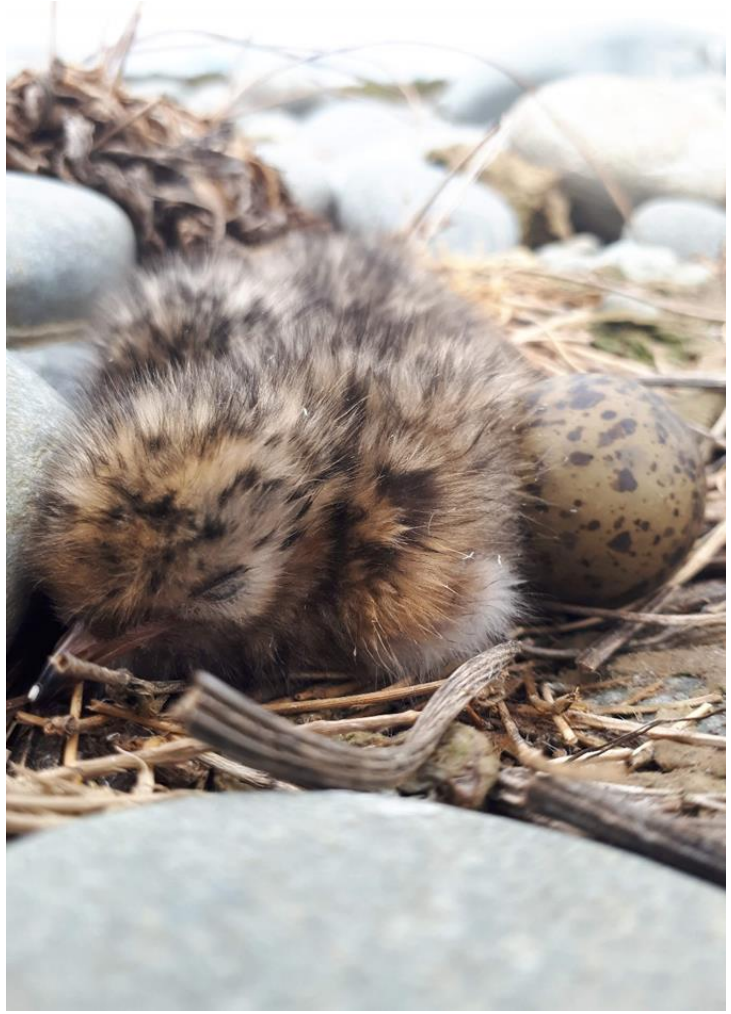
2016

- Vegetated and cleared islands
  Camera monitoring

2017 and 2018

- Cleared islands
  Camera monitoring (2017)

(Schlesselmann et al., 2018; Edwards and Bucholz, 2018; Welch et al., 2019)



Black-fronted tern chicks on the Lower Waitaki. Photo: Jemma Welch

Nest Monitoring

2015-2018 Breeding Seasons

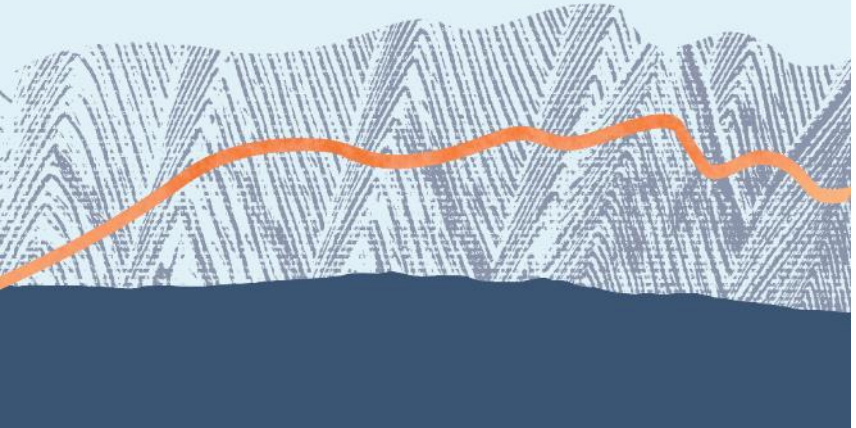


Table showing islands nested, number of nests, hatching success rates and, causes of nest failures for black-fronted terns breeding on cleared islands in the Lower Waitaki River between 2015 and 2018. (Data from: Schlesselmann et al., 2018; Edwards and Bucholz 2018; Welch et al., 2019).

	2015	2016	2017	2018
Islands nested				
Total nests monitored				
Nests hatched >1 egg				
Nests failed				
Unknown outcome				
Of failed nests:				
Predated				
Flooded				
Deserted				
Infertile/DDI/Died Hatching				

Whodunnit? Black-fronted tern nest predation. Photo: Jemma Welch

Nest Predators

2016-2018 Breeding Seasons

2016

- Of predated nests: 63% SBBaG predation, 3% mustelid, 3% BBiG and 31% unknown predator.

2017

- Predominantly SBBaG predation
  Mustelid predation on 4 of 5 islands

2018

- 4 of 5 islands SBBaG predation likely
  1 of 5 islands mustelid predation likely

(Schlesselmann et al., 2018; Edwards and Bucholz, 2018; Welch et al., 2019)

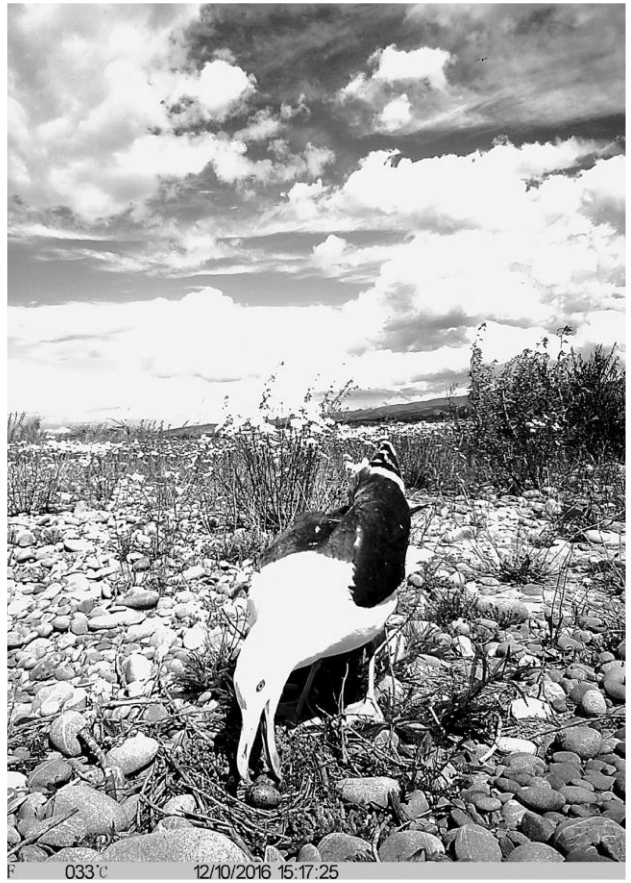
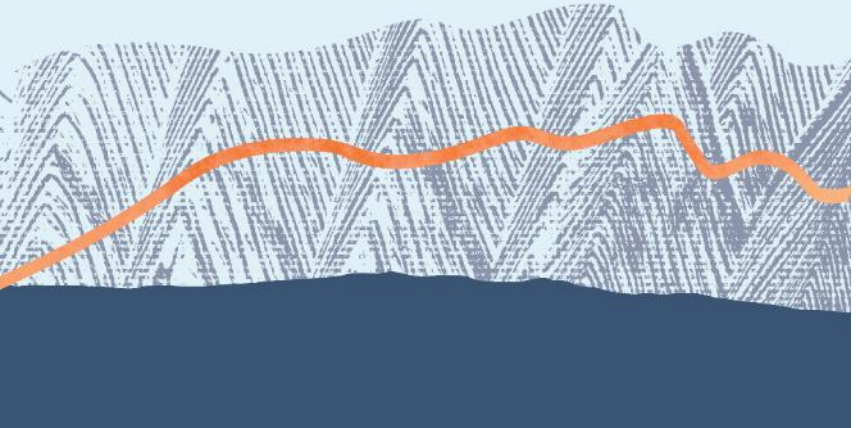
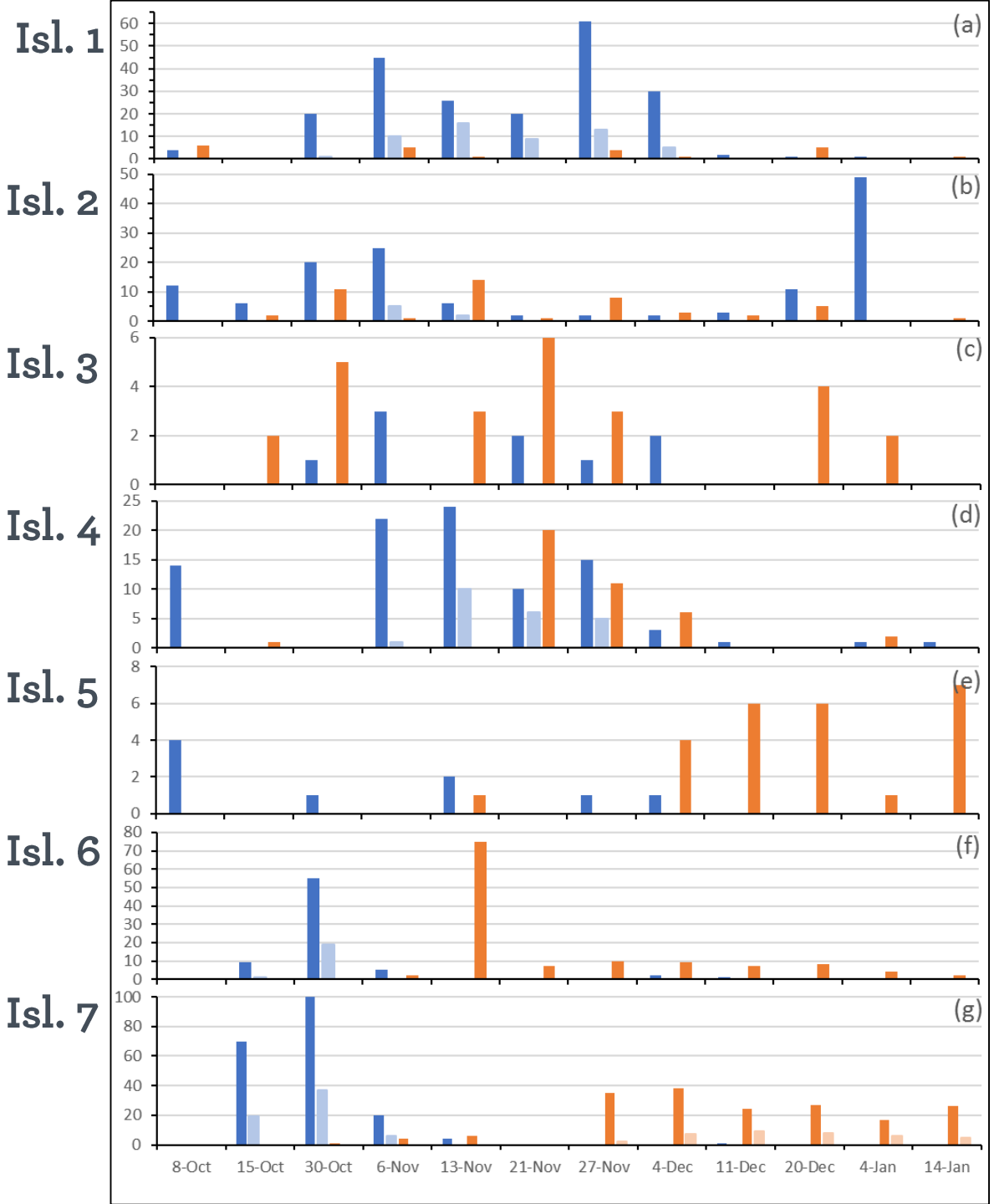


Figure 4 from Schlesselmann et al.: Southern black-backed gull captured on remote camera preying upon a black-fronted tern nest on the lower Waitaki River in 2016/17.

Island Usage

2018 Breeding Season





Changes in black-fronted tern adult numbers (■) and nest numbers (■) with southern black-backed gull adult numbers (■) and nest numbers (■) throughout the 2018-19 breeding season

Future Directions

At least 4 colonies ranging from 30 to >500 birds. Need to reduce black-backed gull numbers to assess the actual impact of mammalian predators.

Acknowledgements

Brad Edwards arranged weed control this season which was funded by ECan and carried out by Heliventures NZ Ltd. Brett Dan and Ronald Clearwater from Braided River Jetboating provided island transport for outcome monitoring throughout the season. Ann Schlesselmann provided background information and second opinions and Richard Maloney supported this season's monitoring.

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