

“Railway” island, 2km downstream from Rangiora. Largest BBG colony, one of the largest BFT colonies in 20 years. Weeds cleared in 2019.

Aspects of the Weed Problem, Colony Nesting Sites, & Predation In 2019

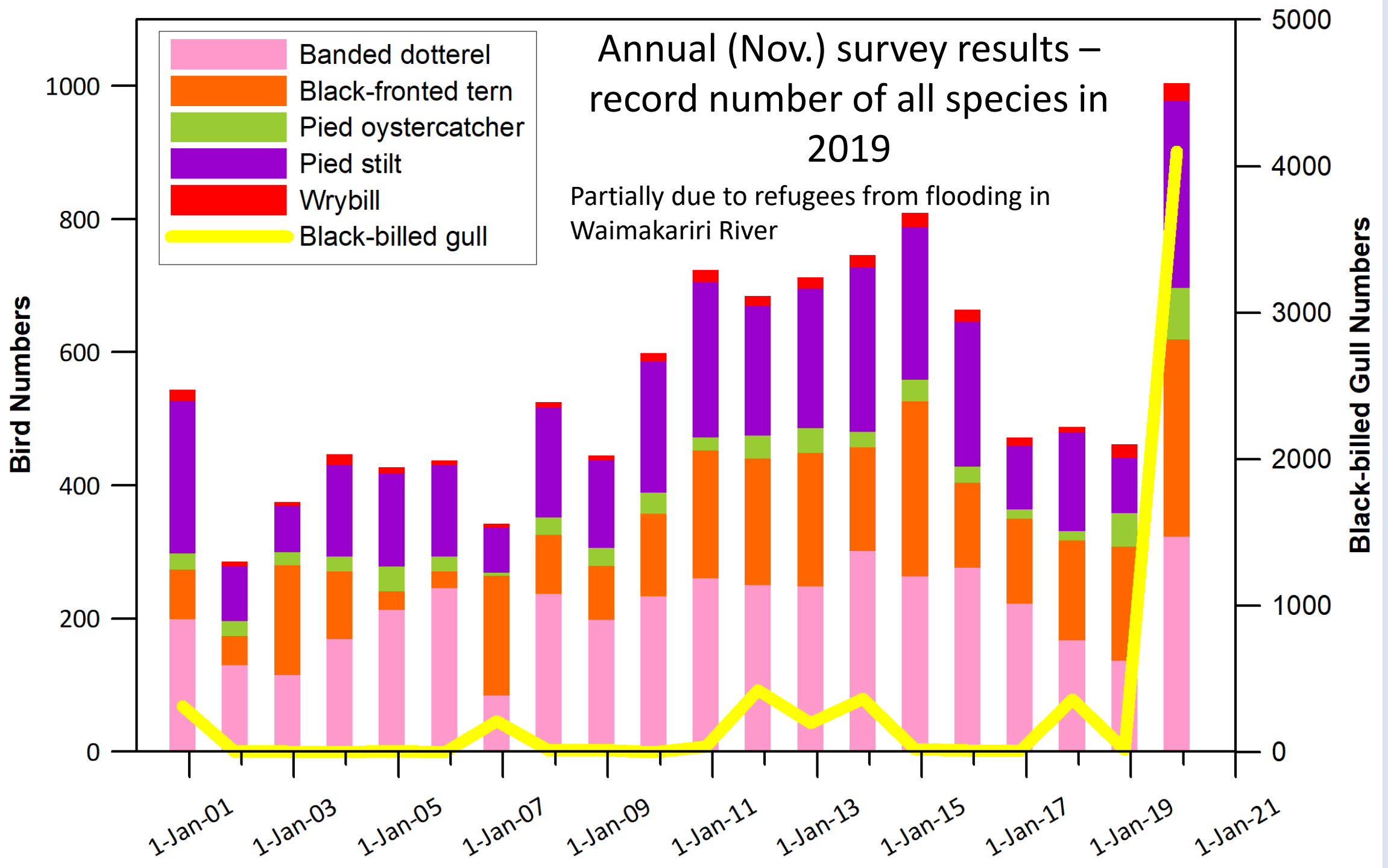
Grant Davey and Nick Ledgard

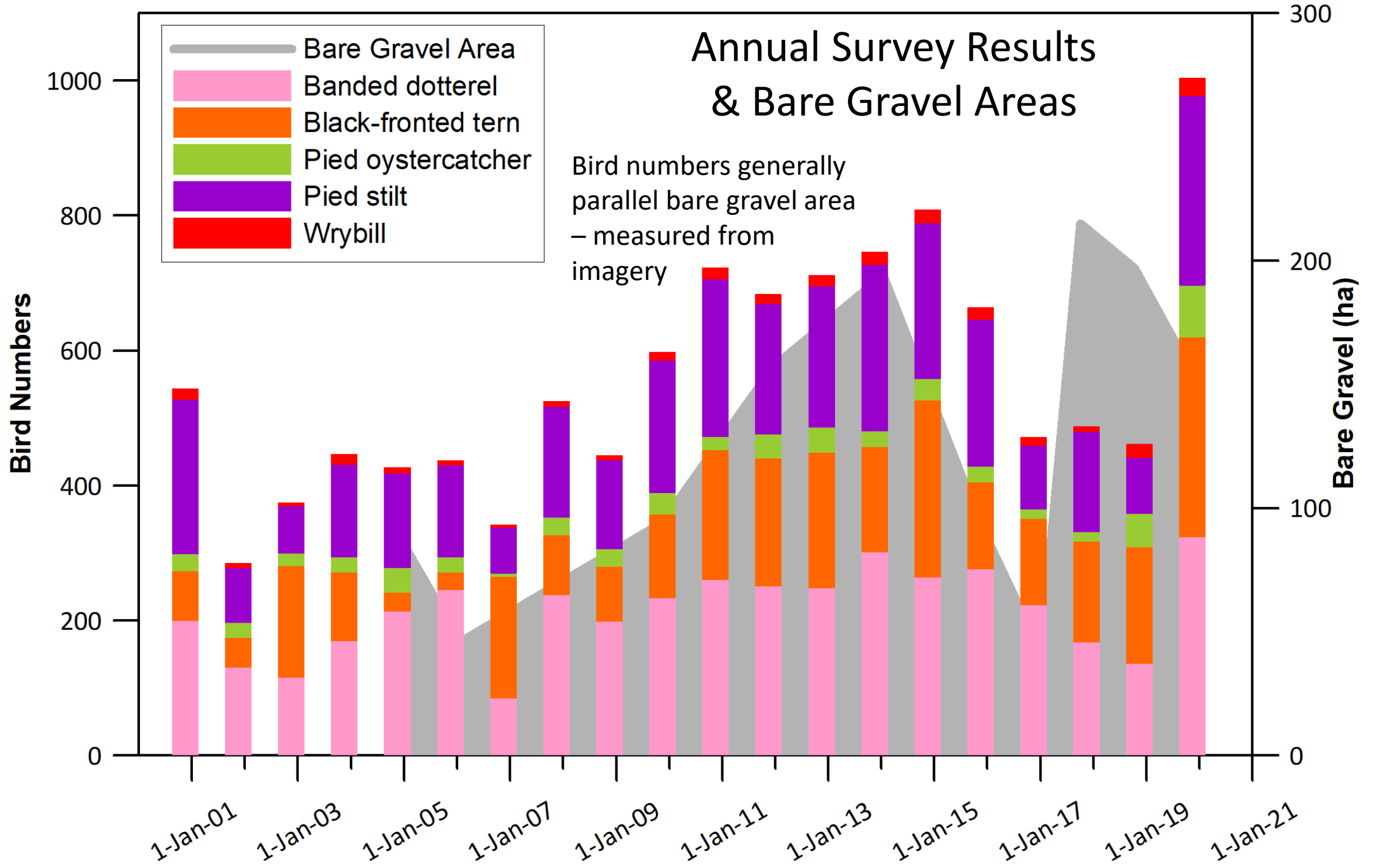
BRaid seminar, July 8, 2020

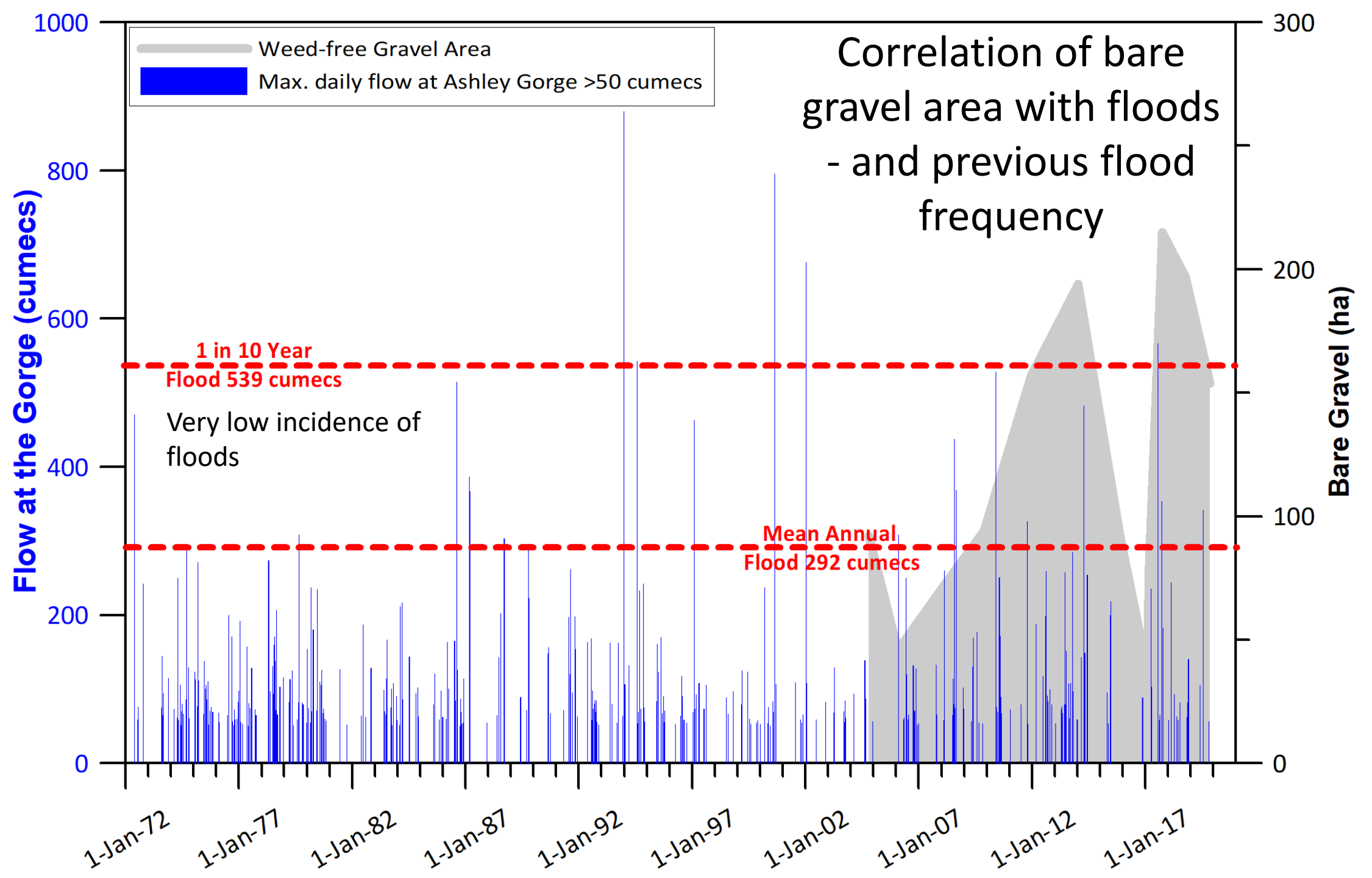
1999 to 2020

Protecting braided river birds
in the lower 20km of the river
– downstream from the
Okuku junction.











Weed clearing was done in 11 of the 16 years starting 2004 – but mixed success with nesting

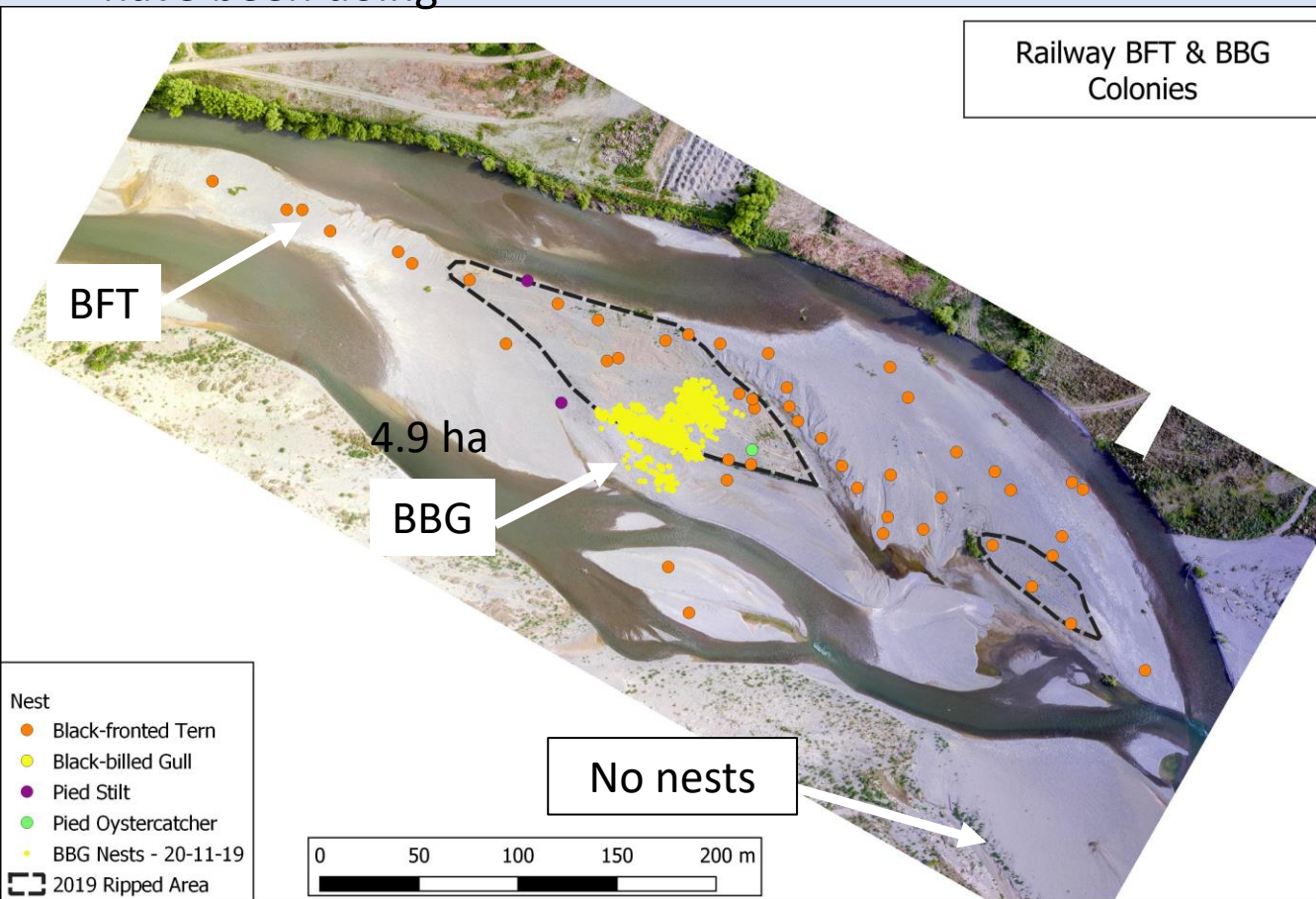
Weeds are a major threat to the braided river birds of the Ashley River. We are still learning how to deal with them, to tackle this problem effectively we need to better understand:

1. The geomorphological sites the birds prefer to nest in;
2. the substrates the birds prefer to nest on;
3. the erosional and depositional processes of the river – which are constantly changing the nesting habitat.
4. Weed species and their seeding and growth (not me)

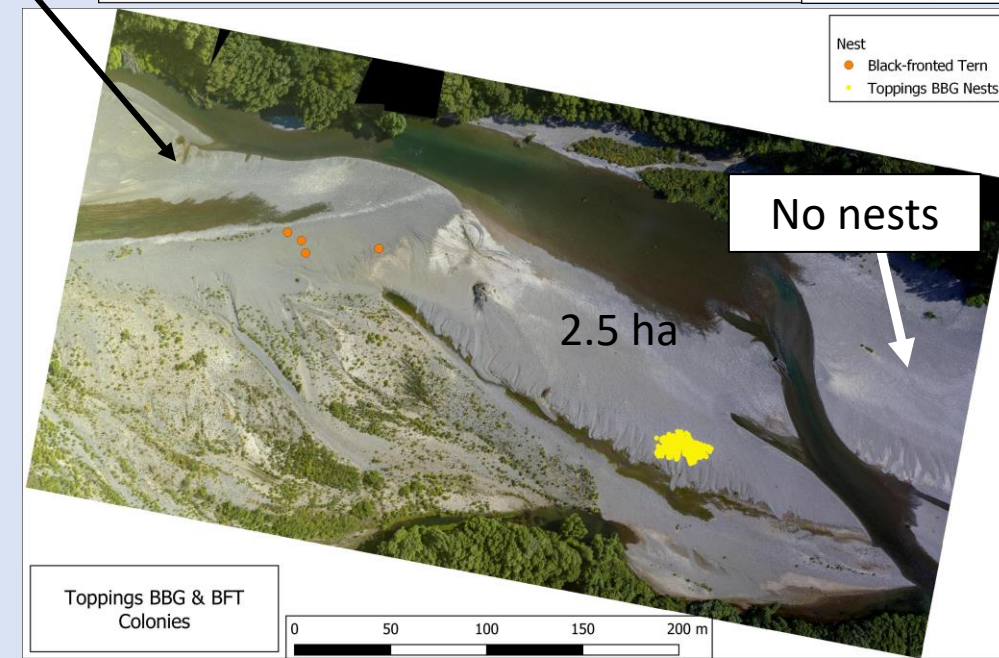
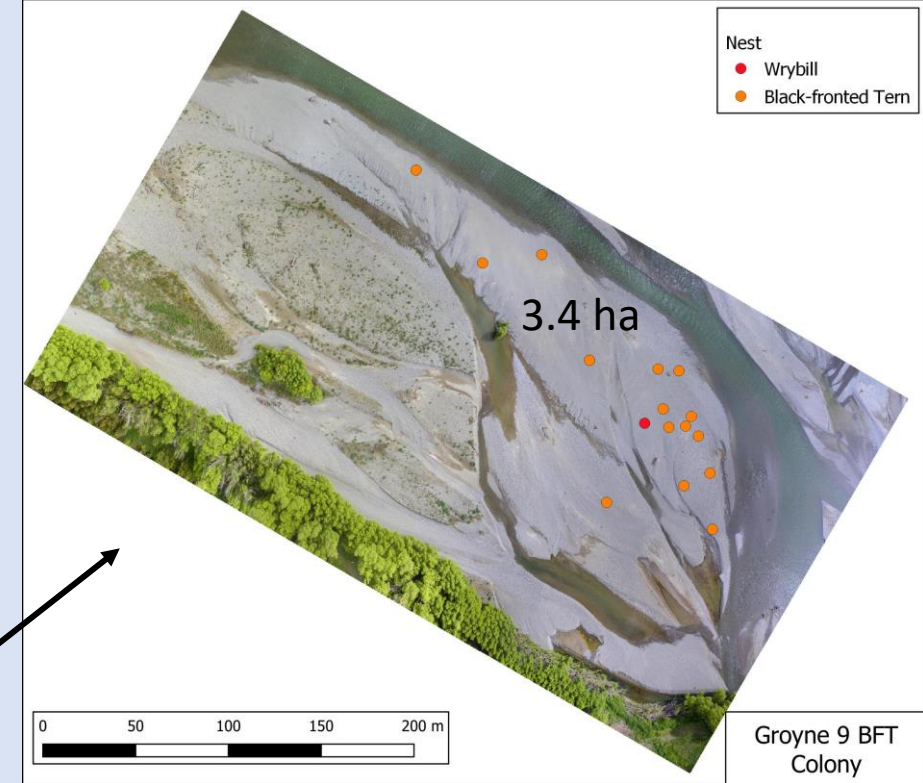
We can't afford to clear all the weeds so must target our efforts properly.

Geomorphology - three largest 2019 colonies

- Best nesting sites on remarkably similar (weed-free) situations – on large islands or effective islands. Sites are long and narrow.
- Recently deposited or scoured-off gravel – at more dynamic river bends
- Greatest distance of nest from water – 50m, most $\ll 30\text{m}$
- **Only 2 of 86 BFT nests not on islands!**
- These are obviously the type of sites we need to clear – and generally have been doing



Weeds
not
cleared
in 2019



How are the nesting sites made and how long do they last?

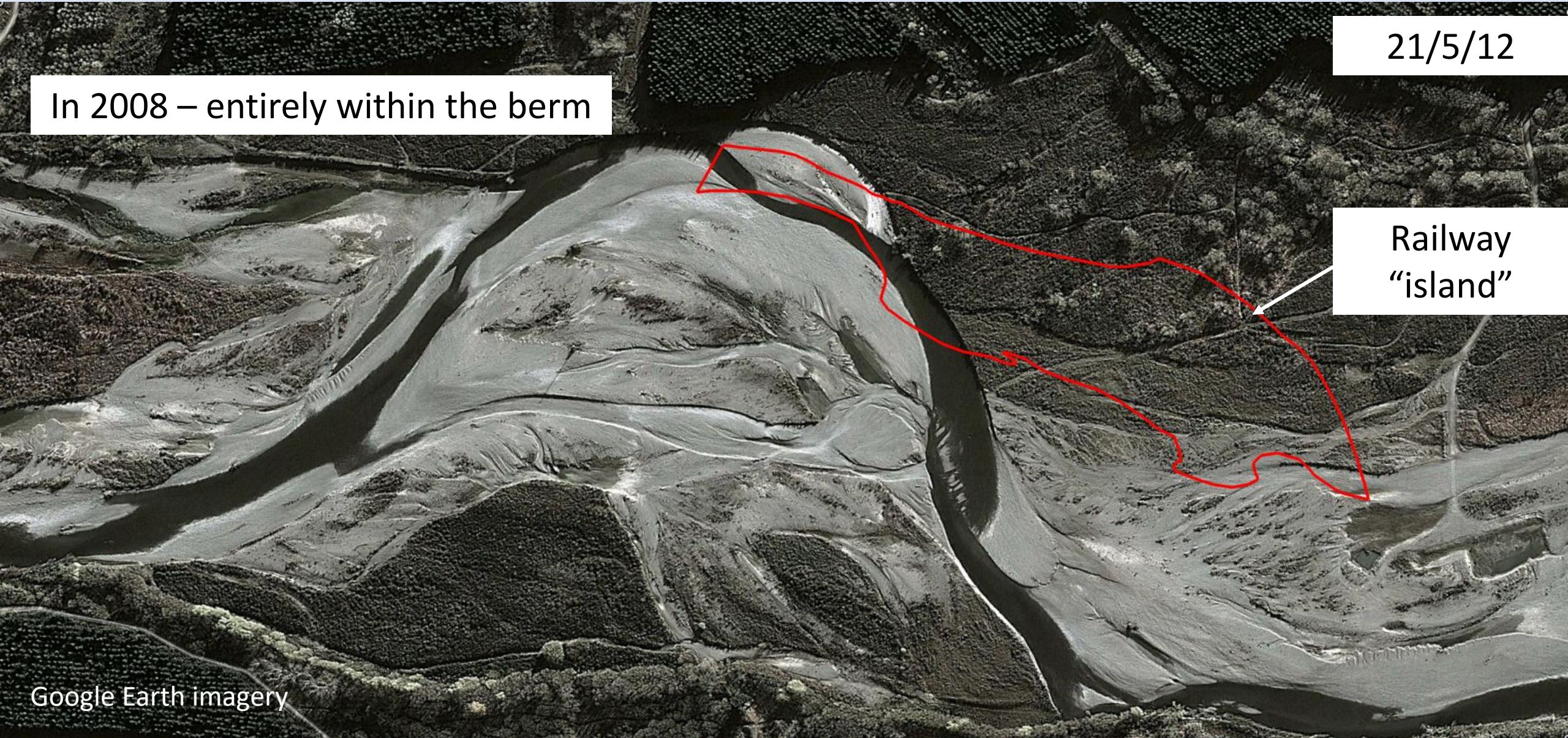
21/5/12

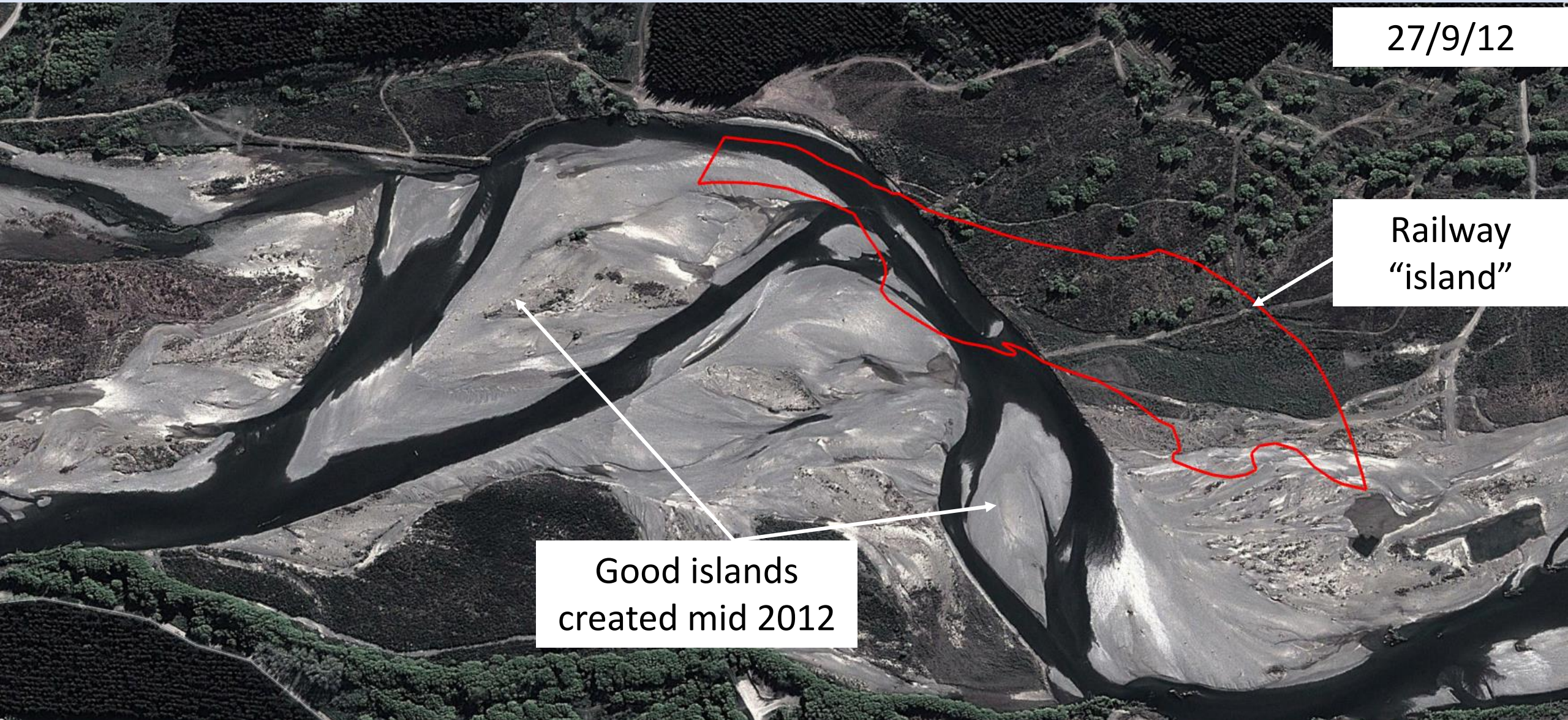
In 2008 – entirely within the berm

Railway
“island”

Google Earth imagery

Railway island history - 1





27/9/12

Railway
"island"

Good islands
created mid 2012

1/8/14

Railway
"island"

Islands gone in 2
years

30/11/17

Railway
"island"



Island has current shape. But becoming sandier from smaller floods

- All 2019 colonies were on sites created by the July 2017 (1 in 10 year flood) or by the July 2019 (mean annual flood event). It was not a matter of flood waters just clearing weeds – they constructed new bars and islands for the birds to nest on
- The river environment is extremely dynamic, we can't expect to clear weeds at a site for several years, use up the seed pool and have a long-lasting nesting area. We can't expect birds to be nesting in the same sites year after year – because those sites may not be there

Poorly sorted coarse gravel – 85%

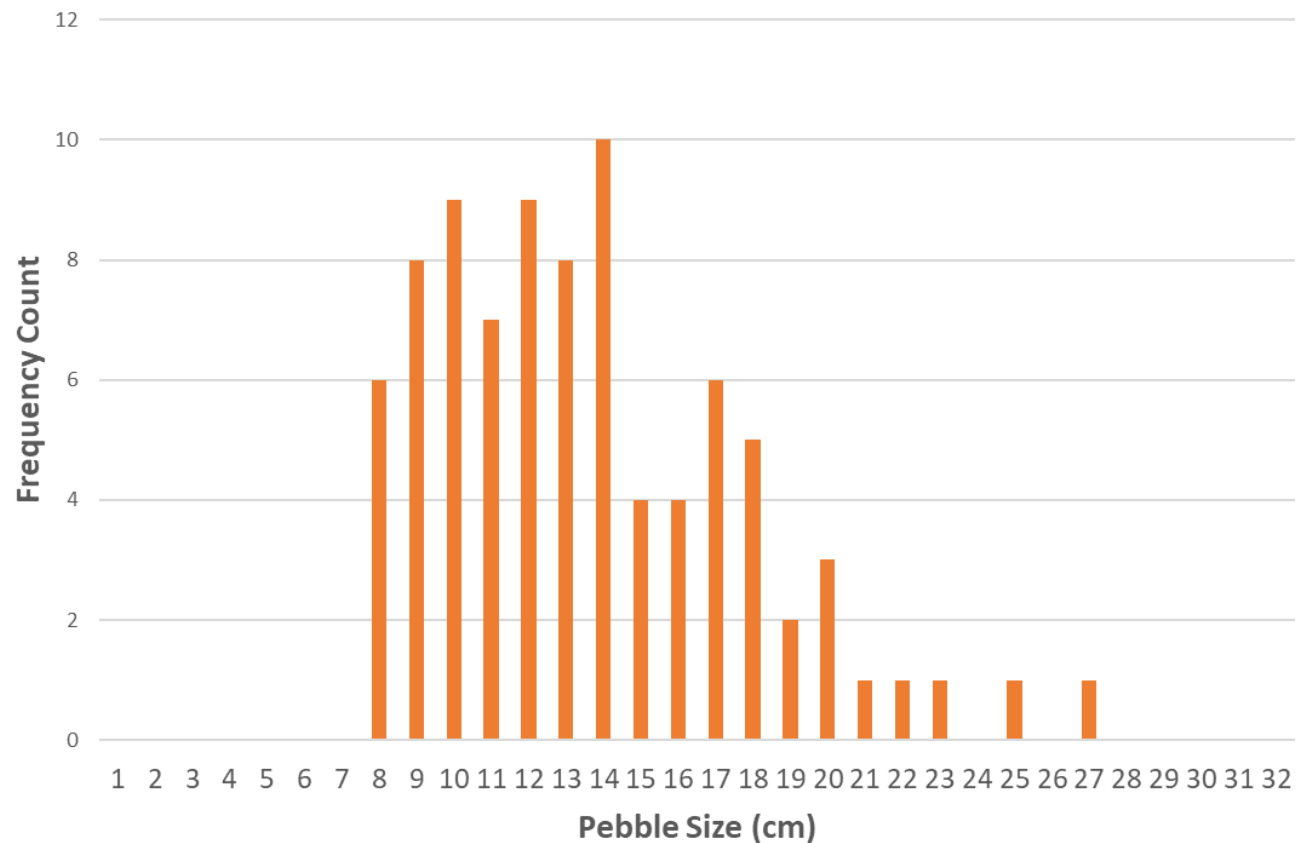


Sandy coarse gravel – 15%



**BFT Nesting
Substrate**
(from 86 nests
in 7 colonies –
2019 season)

Maximum pebble size within 10cm of BFT Nest - All Nests 2019



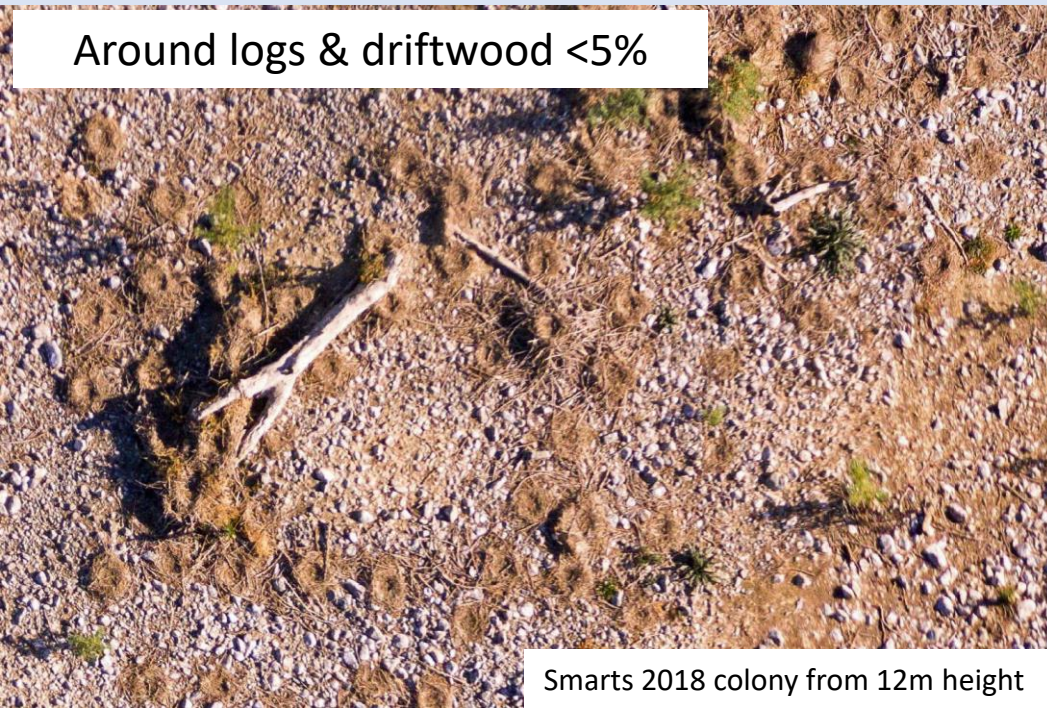
Optimal nesting substrate is weed-free, uncompacted, poorly sorted coarse gravel with scattered large pebbles at least 8cm in max dimension (but more often 10 – 14cm) – with space between them to fit a nest and bird where pebbles are \leq to egg size

Poorly sorted coarse gravel >95%



Toppings 2019 colony from 12m height

Around logs & driftwood <5%



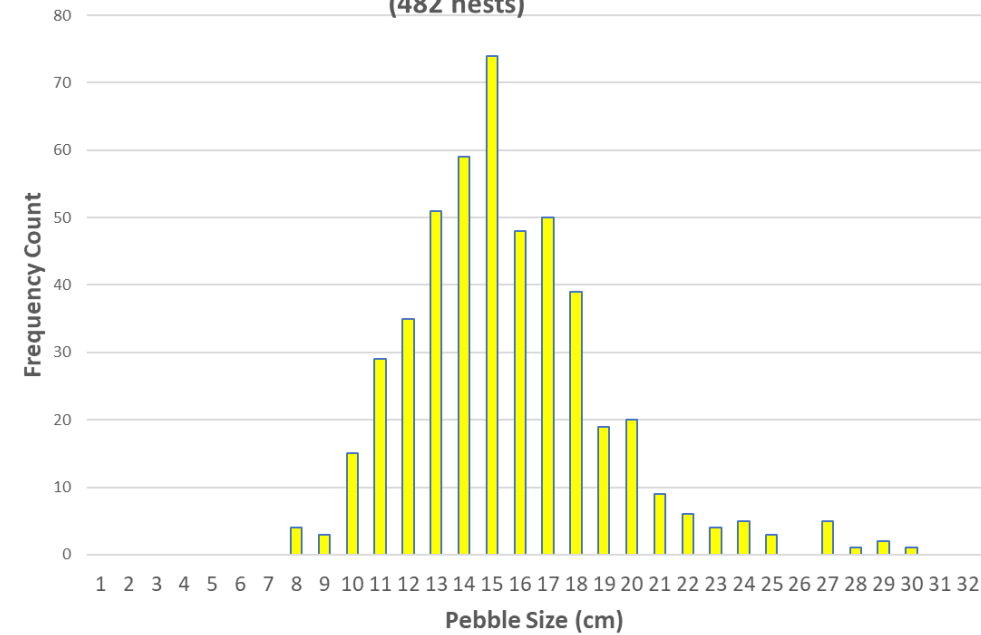
Smarts 2018 colony from 12m height

BBG Nesting Substrate

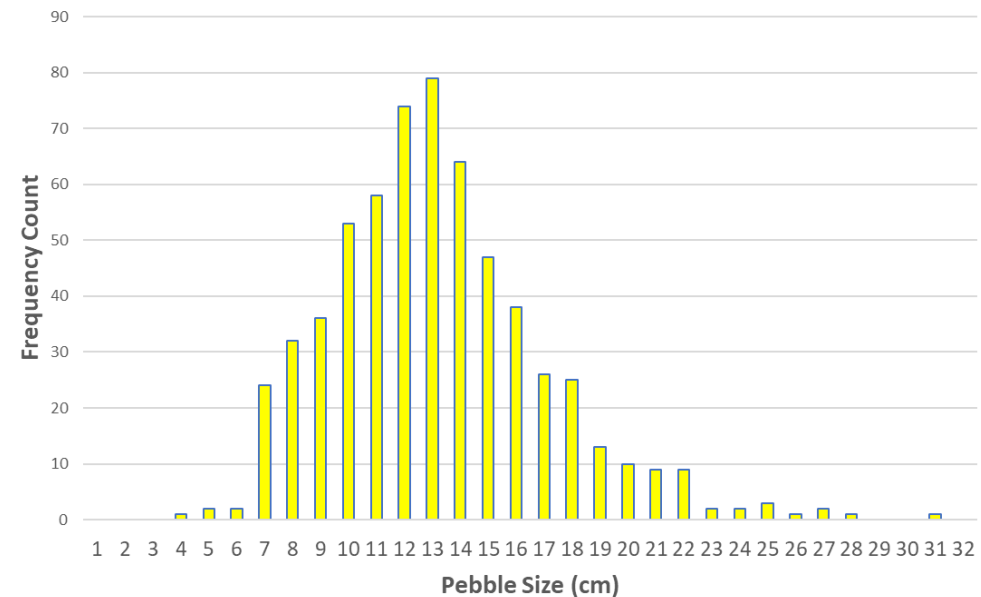
Optimal nesting substrate has scattered large pebbles generally at least 8cm in max dimension - but more often >12cm

More weed-tolerant than BFT and also nest next to logs

Maximum pebble size within 25cm of BBG Nest - Toppings 2019 (482 nests)



Maximum pebble size within 25cm of BBG Nest - Smarts 2018 (614 nests)



Dairy farm - 2016



BBG alternative
nesting sites – they are
not always predictable

Site chosen due to poor committee-based decision
making

Small fresh - 2019

Very successful site chosen because of
weed-clogged Ashley River



Wrybill nest – always like this?



Pied stilt nest



Other Species Nesting Substrate

SIPO nest



Other species – commonly like this

Banded dotterel nests



Banded dotterel nest





Black-fronted tern

Birds nest in this type of
gravel to be more
concealed and perhaps
to shelter against the
wind

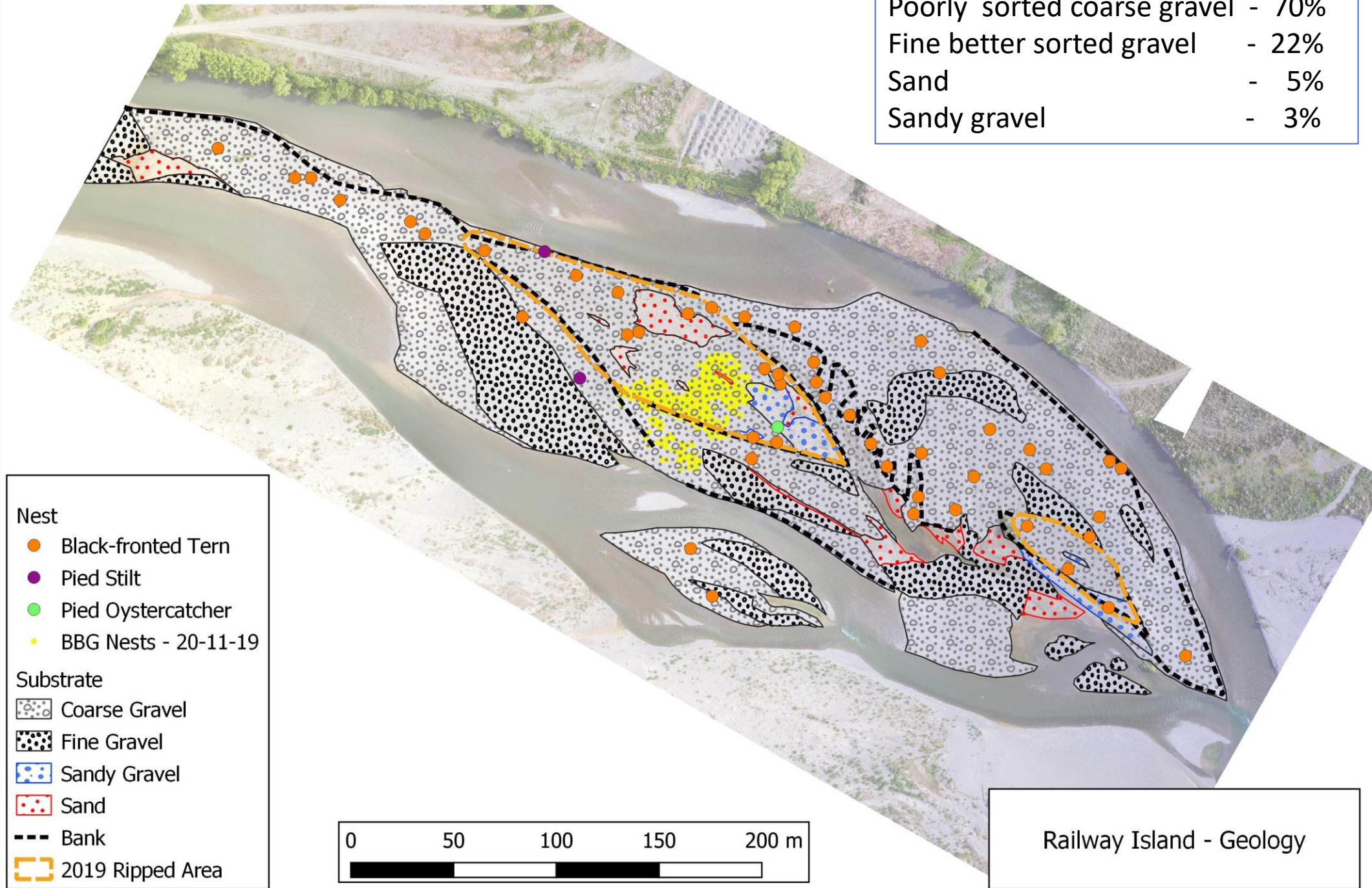
Wrybill

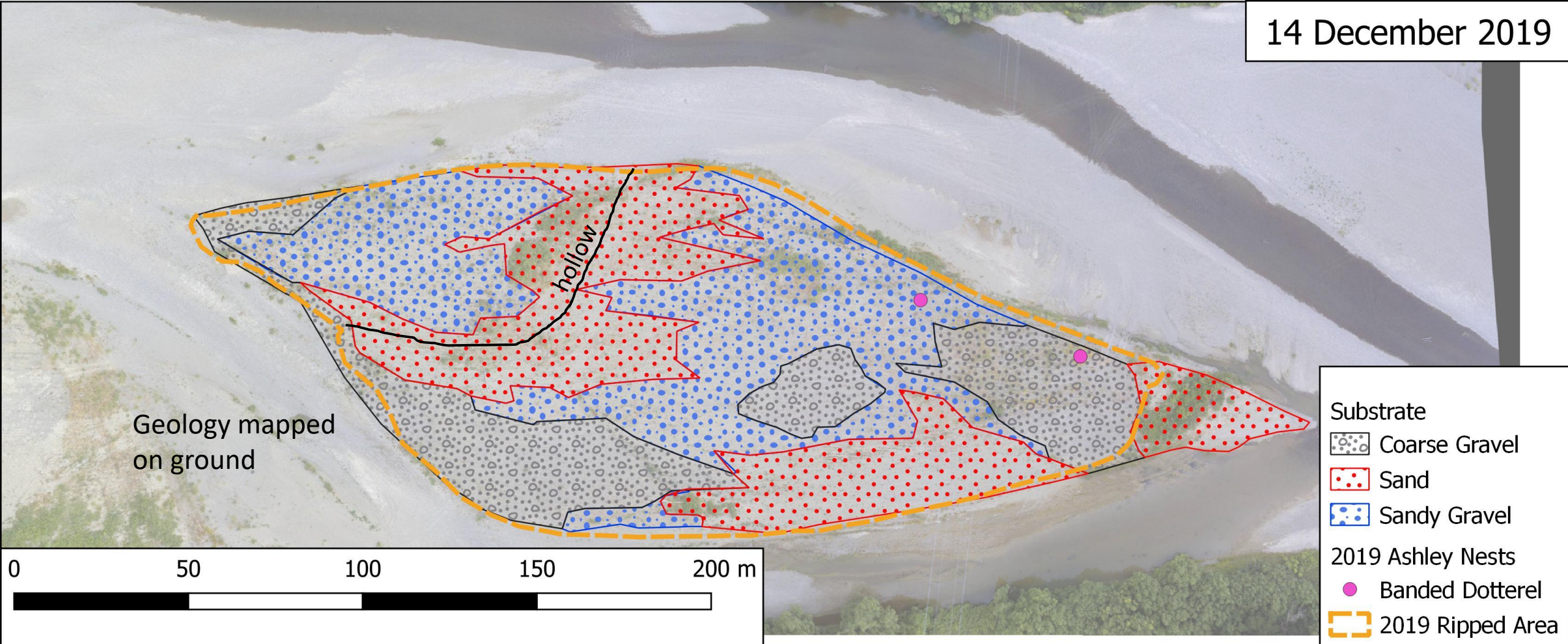


2019 Railway Colony Geology

Poorly sorted coarse gravel is the most abundant substrate on the river – but not the only one. At this site there were 4 mappable lithologies.

We got this right, many birds nested here!



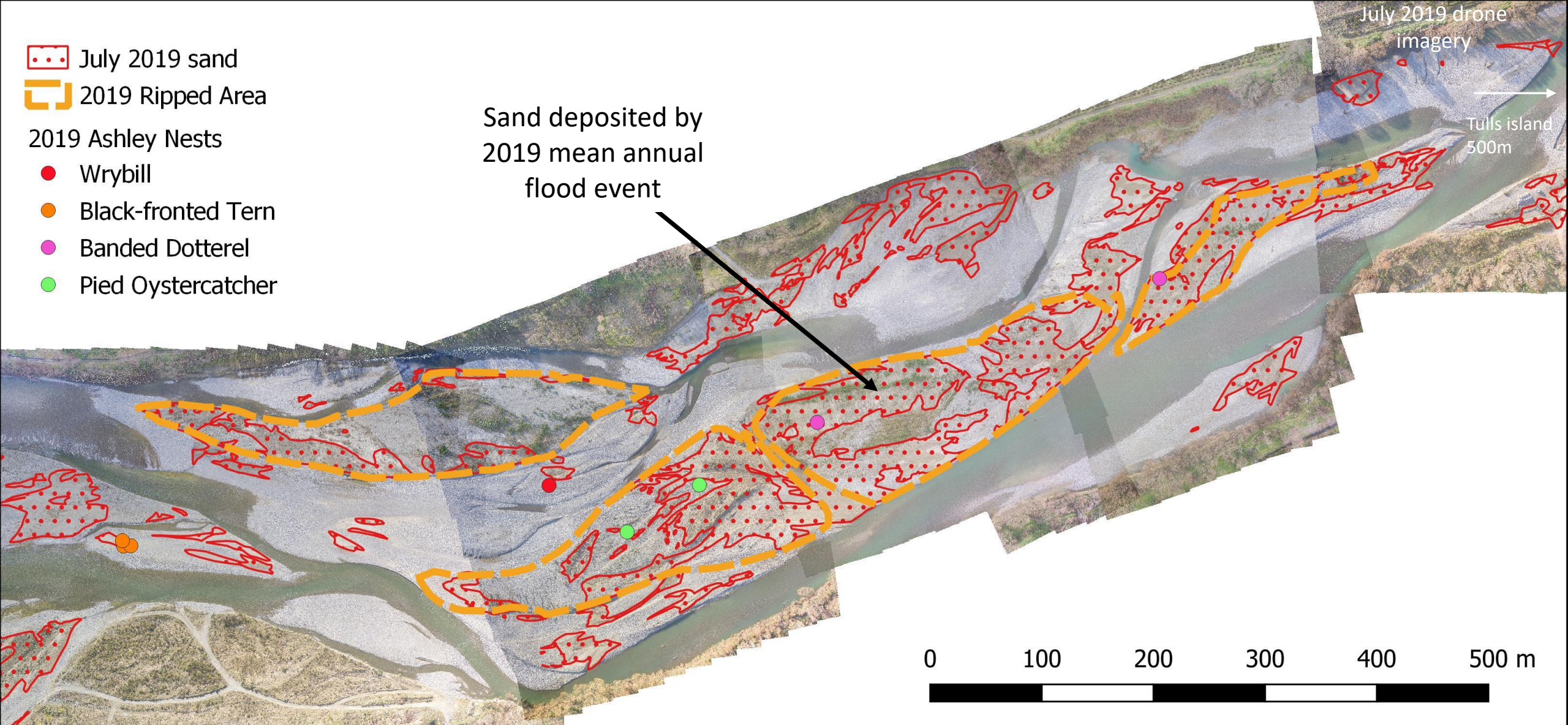


2019 Tulls Island Geology

Right geomorphology wrong substrate – too much sand

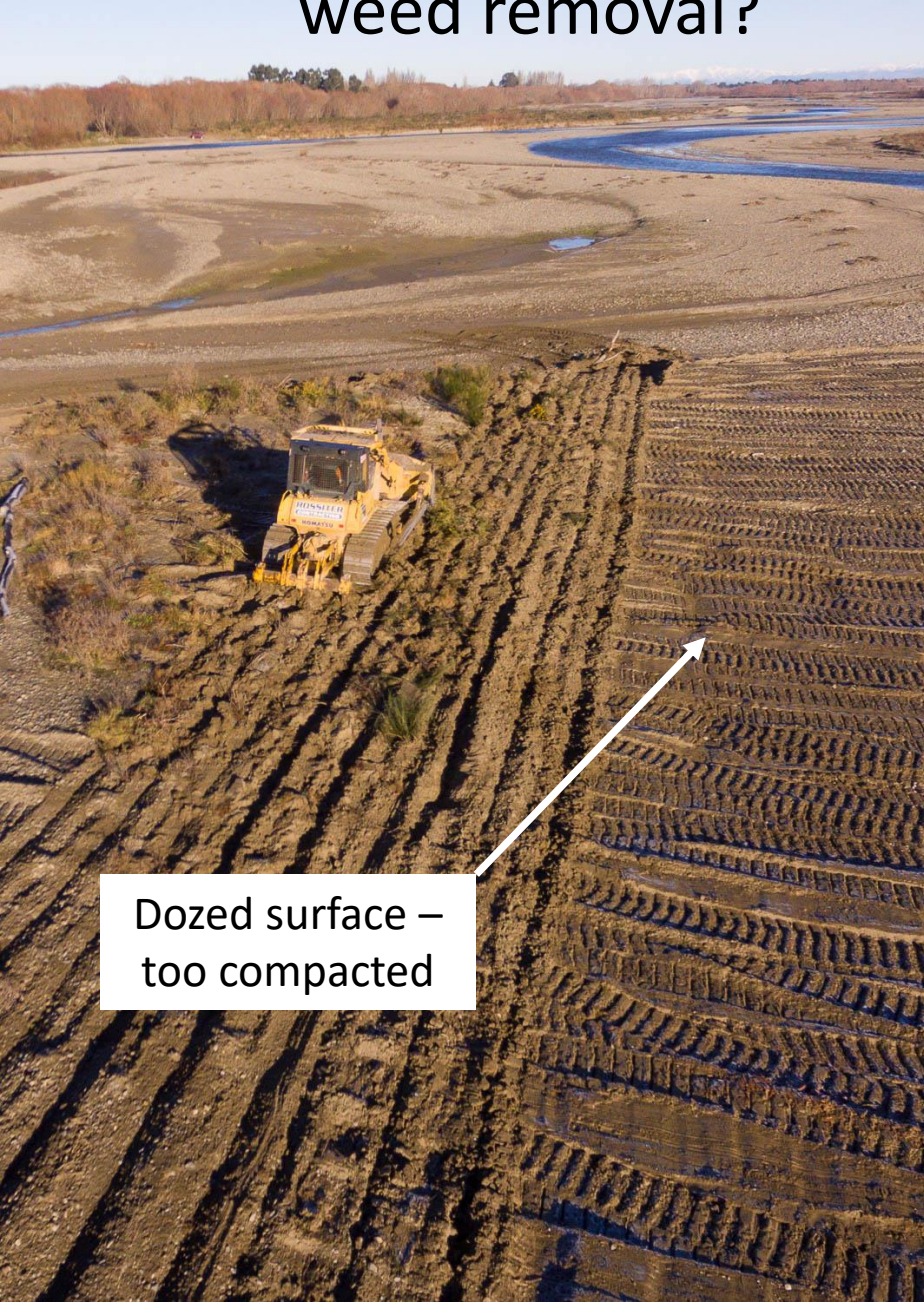
Cleared of weeds twice, little nesting success

Poorly sorted coarse gravel	- 26%
Sand	- 35%
Sandy gravel	- 39%



Sand is being deposited on flat-topped high islands. The flat tops will mean slower water movement – leading to sand deposition. This effect is magnified by weeds, depressions and ridges on the islands further trapping the sand

What is the best method for weed removal?



Dozed surface –
too compacted

Graded surface – too compacted



Tractor-mounted ripper (Cresslands Contracting) –
effectively clears lupin and doesn't compact
surfaces



- We need to clear islands that have the poorly sorted coarse gravel substrate that the birds prefer to nest on.
- Floods, especially smaller ones, while creating good nesting sites in some places, ruin them in others. Large rejuvenating floods are required to not only clear weeds, but to clear sand.
- Clearing of light weeds such as lupin must avoid compaction and minimize furrowing – which traps more sand.

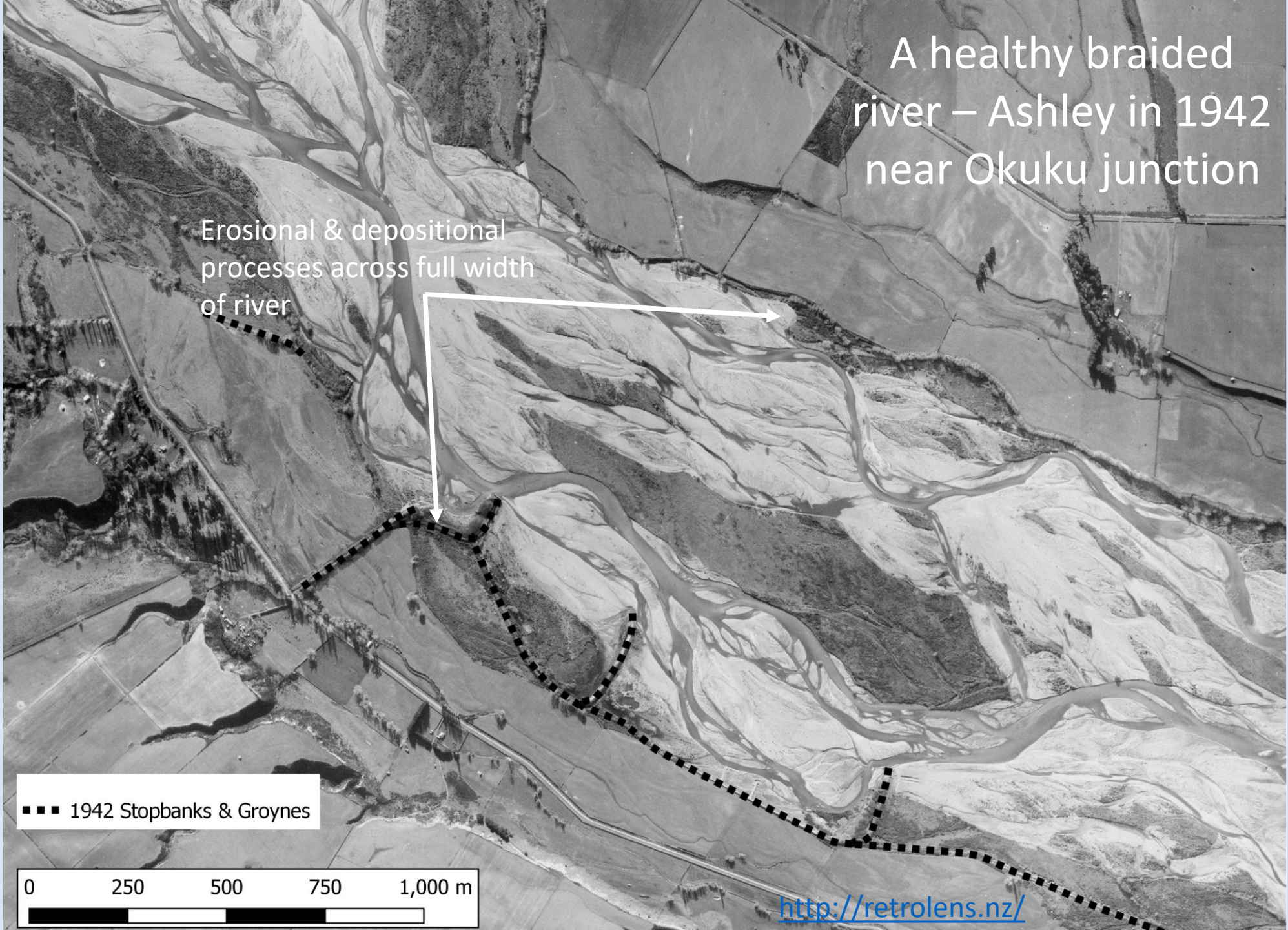
A healthy braided river – Ashley in 1942
near Okuku junction

Erosional & depositional
processes across full width
of river

■■■ 1942 Stopbanks & Groynes

0 250 500 750 1,000 m

<http://retrolens.nz/>



Same area, recent image. The river is now barely braided

Narrower, deeper more erosive river – leading to more channelization

Trees, and measures to protect them, prevent erosion of the berm – permanently narrowing the river and reducing sediment supply. The river needs room to move, or it gets strangled

Gorse and broom covered islands channelize the river and can cause erosion of necessary flood protection structures

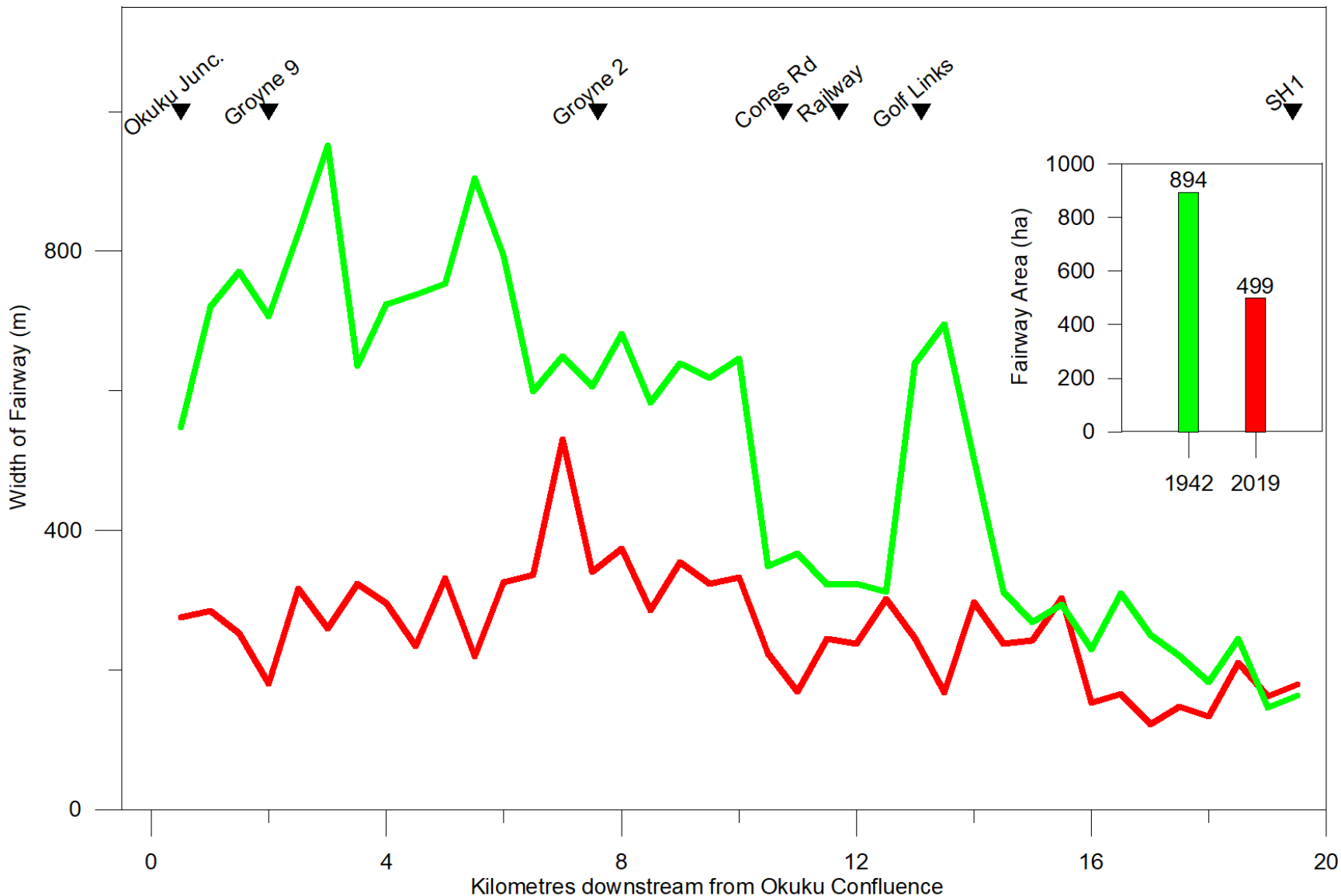
Gorse and broom needs to be removed from islands, and the river encouraged to run through them

■■■ 1942 Stopbanks & Groynes

0 250 500 750 1,000 m



Width of Fairway, 0.5 km intervals downstream from Okuku Junction - 1942 and today



Area of fairway is little over half of what it was in 1942 – with a similar frequency and size of floods now and then. Fairway area has shrunk over the years – and is continuing to do so. In 50 years are we going to have a braided river?

Railway & Golf Links Sites (field trip locations)

What can be done to mitigate problems

Recent berm protection works

Rip lupin – part of 30 ha programme funded by ECan

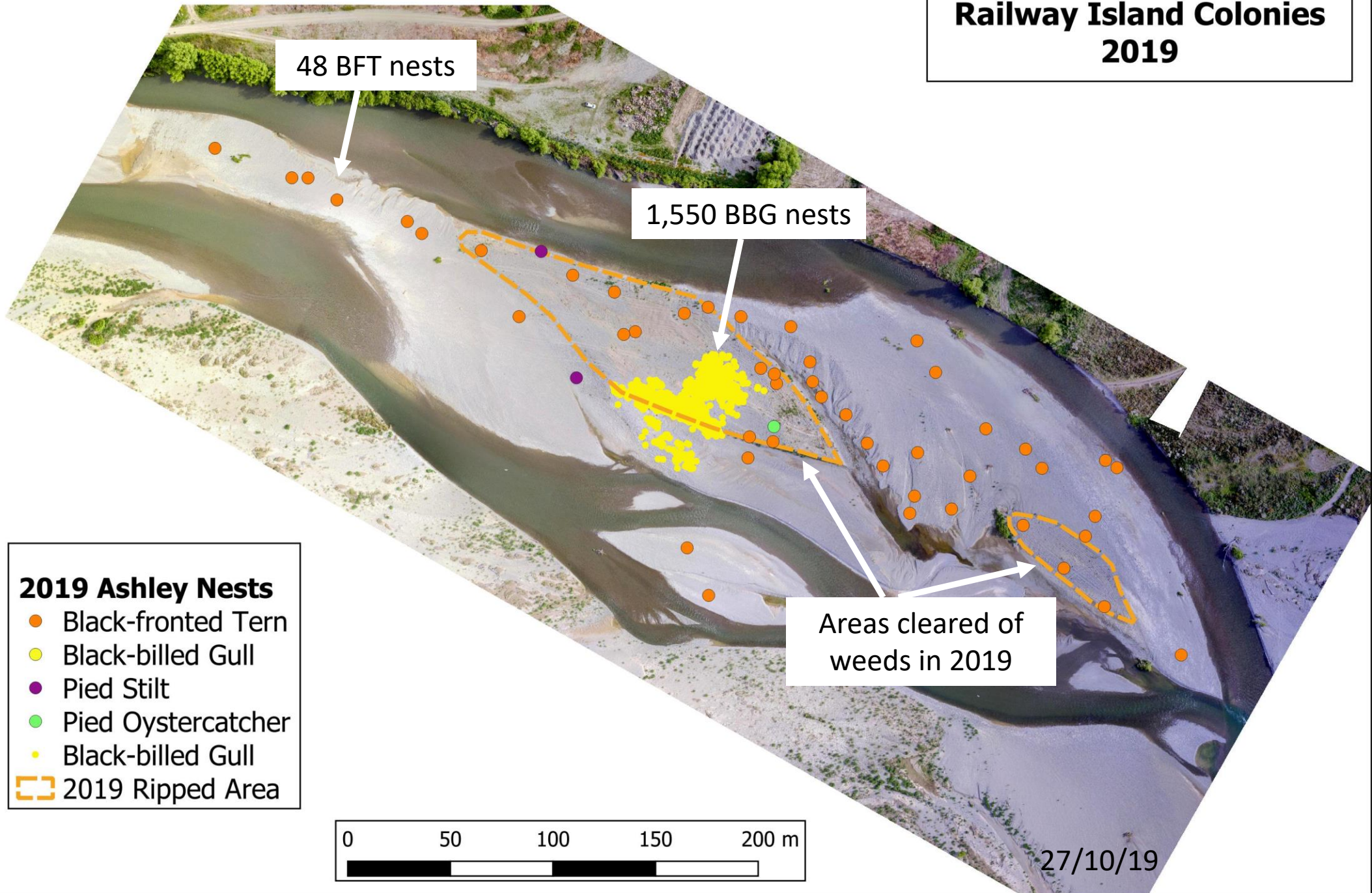
2020 photos from ECan funded drone

Targeted gravel extraction

Remove gorse, broom & trees



Railway Island Colonies 2019



BFT Colony



4/11/19 – the colony was a dangerous place to be

Traps for colony areas – cheaper and lighter weight with DoC 150 traps in coreflute boxes



8/11/19

8/11/19 - eggs from all the eastern BFT nests (approx. 27) robbed by Norway rats inside 4 days

Predators Trapped - 2004 - 2020

Hedgehogs Cats Stoats Weasels Ferrets Rats Ship Rats Norway Rats

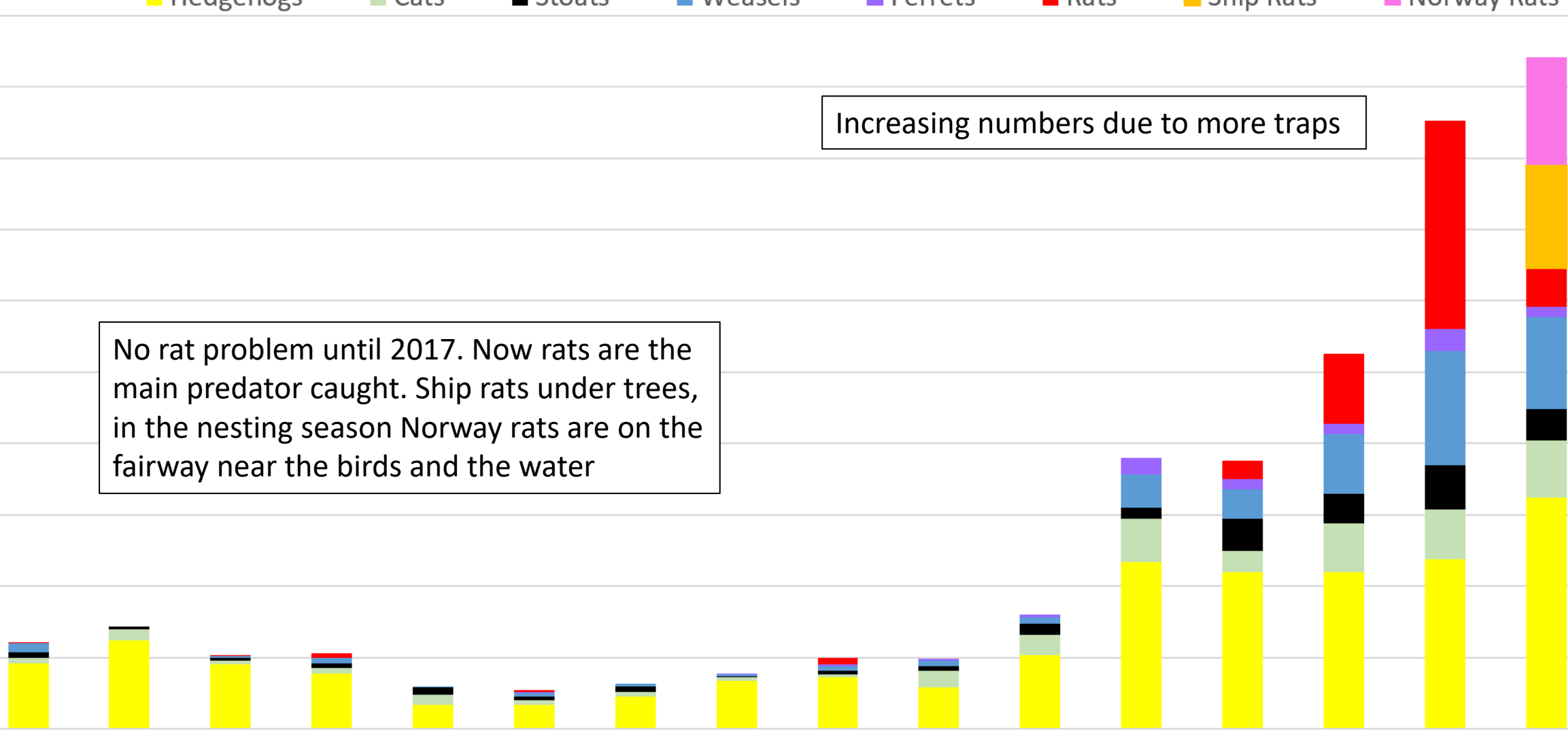
Increasing numbers due to more traps

No rat problem until 2017. Now rats are the main predator caught. Ship rats under trees, in the nesting season Norway rats are on the fairway near the birds and the water

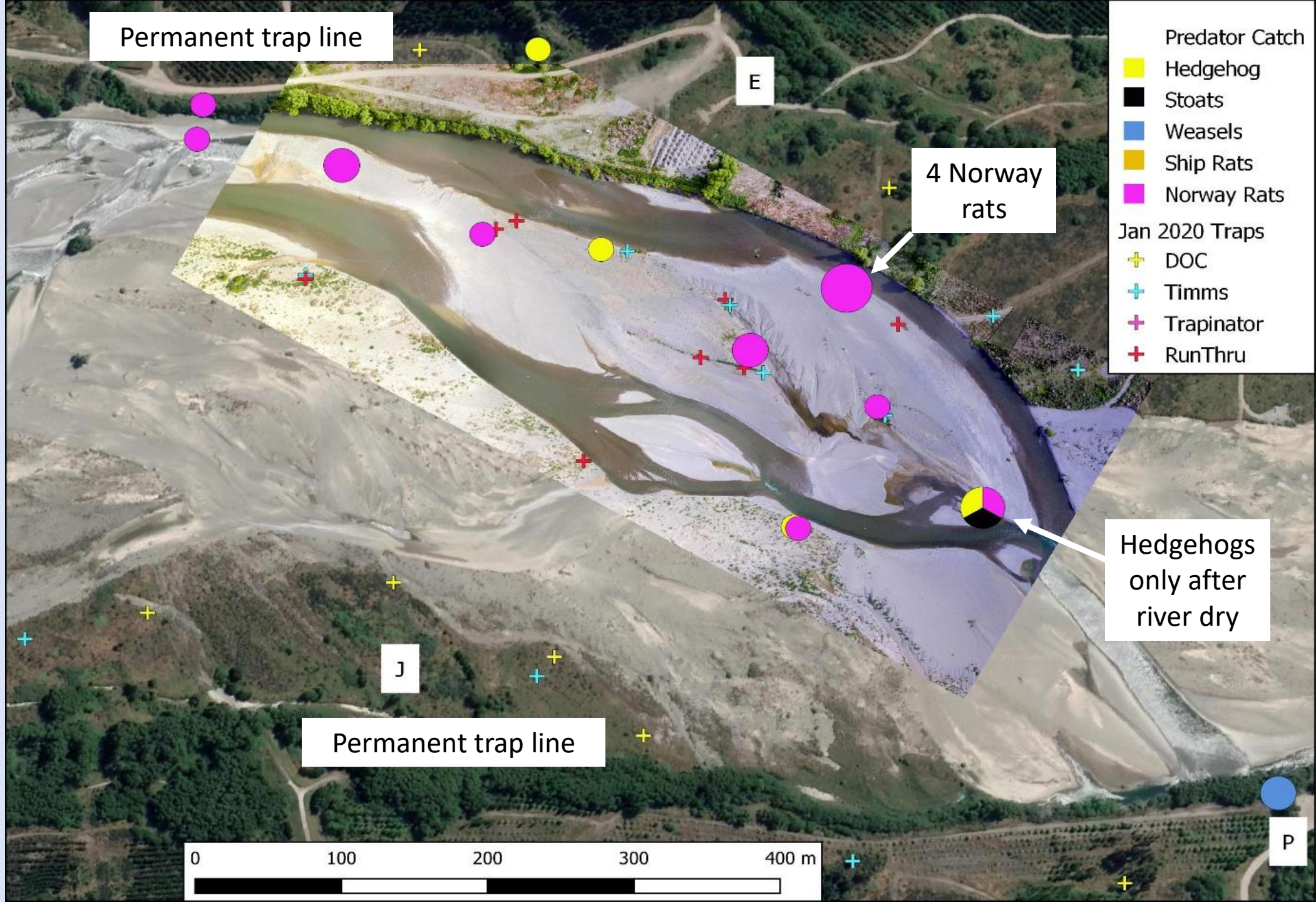
Predators Trapped & Trap Numbers

500
450
400
350
300
250
200
150
100
50
0

Aug 04 - Feb 05
Aug 05 - Feb 06
Aug 06 - Feb 07
Aug 07 - Feb 08
Aug 08 - Feb 09
Aug 09 - Feb 10
Aug 10 - Feb 11
Aug 11 - Feb 12
Aug 12 - Feb 13
Aug 13 - Jul 14
Aug 14 - Jul 15
Aug 15 - Jul 16
Aug 16 - Jul 17
Aug 17 - Jul 18
Aug 18 - Jul 19
Aug 19 - Jun 20



In the nesting season no Norway rats were caught on the berm, 15 were caught close to the colonies





BFT Outcome -

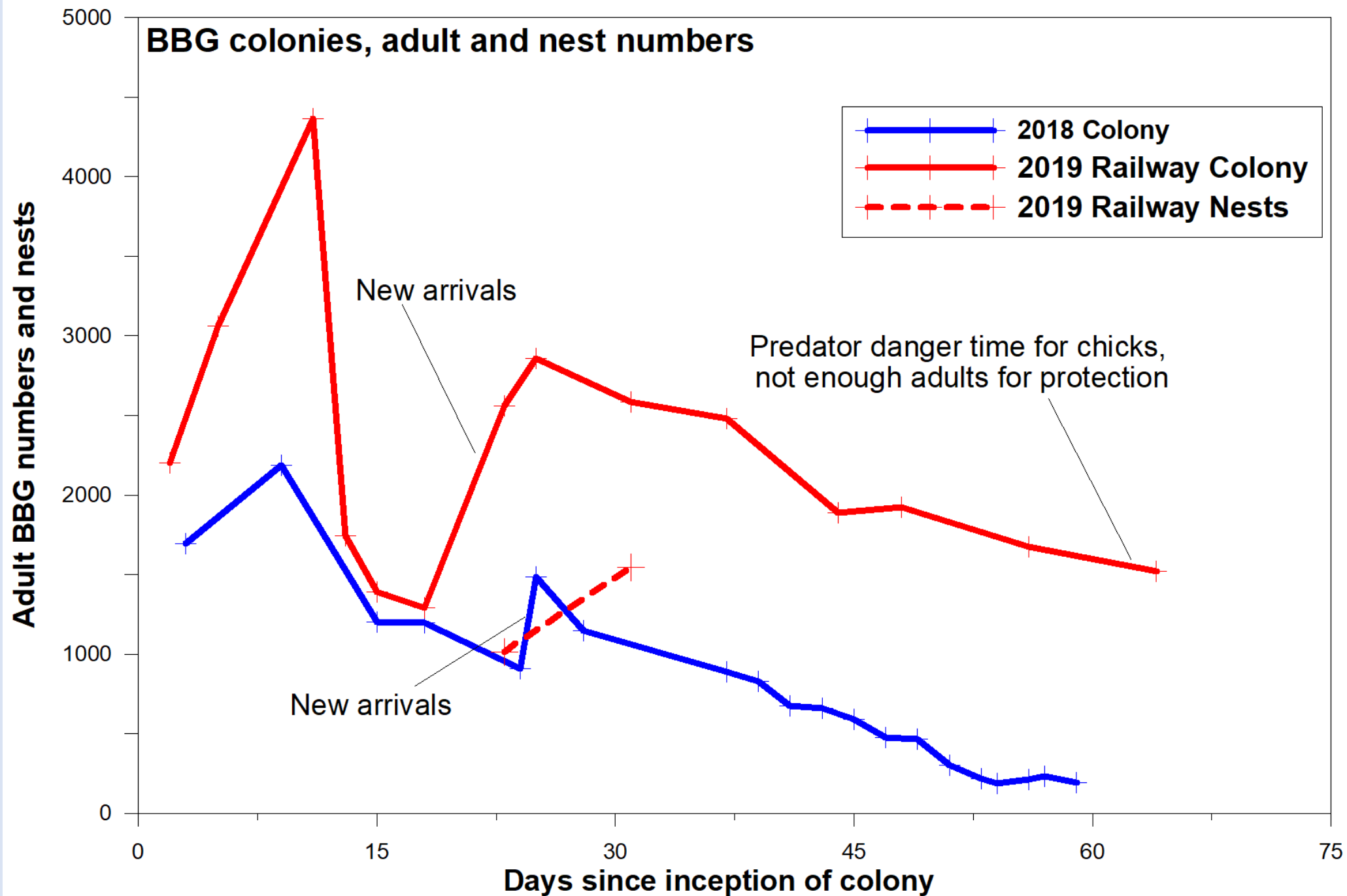
Only one tern chick bigger than these seen - no fledglings. **The entire colony appears to have been wiped out by Norway rats**

This species is most at risk on the Ashley – with very poor fledgling success along the river

BBG
numbers
from
inception of
colony

Bird counts
from 50m
altitude
drone
photos.

Nest counts
from 25m
altitude



10/1/20

Rat kill





Rat kill
close
to
colony

Stoat kill,
some
distance
from
colony



Harrier Predation



Harrier kill



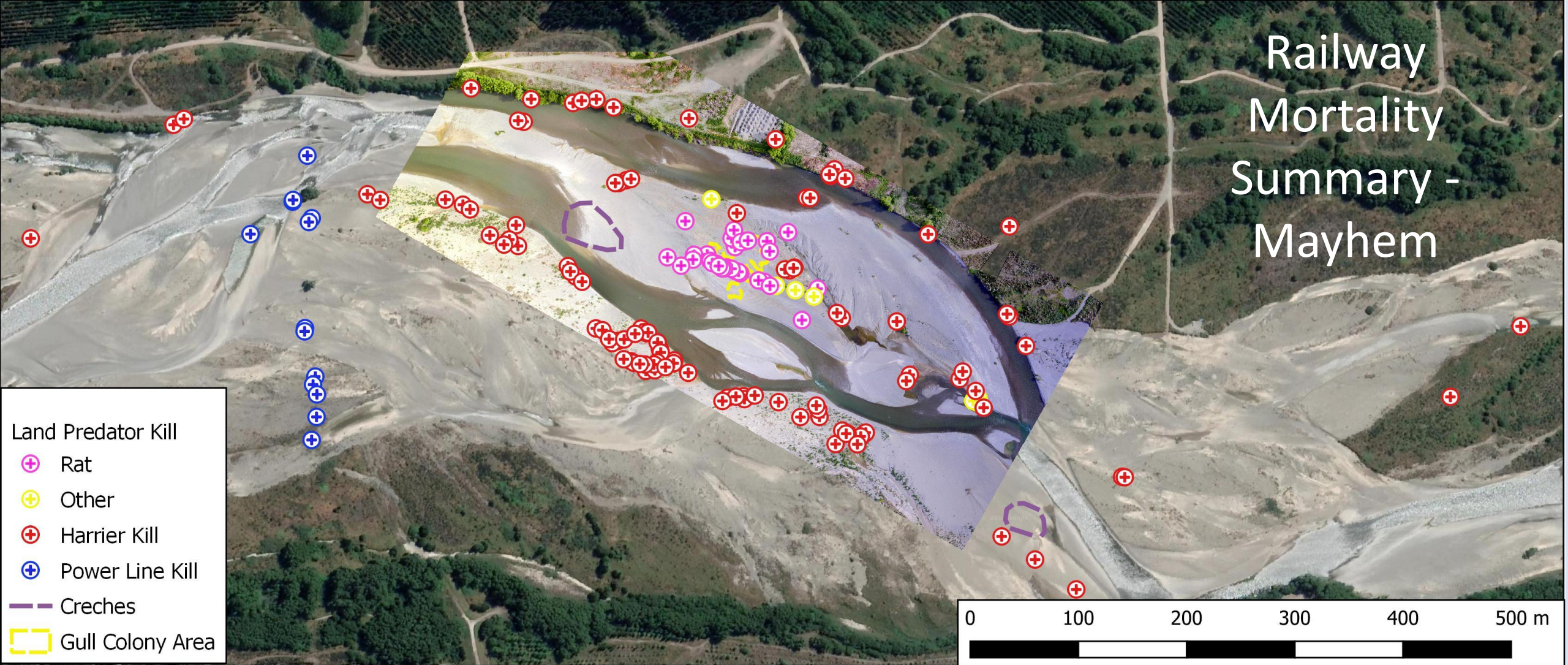


Powerline kill



Natural deaths

Railway Mortality Summary - Mayhem



BBG Mortality

- Norway rats	- 106
- Harriers	- 116
- Stoats	- 8
- Power lines	- 12 adults, 1 fledgling (9 more elsewhere)
- Natural	- 91

Approximately
700 fledged
from 1547 nests

Toppings Colony - Mortality Summary

Toppings Colonies, Traps & Predation

BFT colony

19303

19304

19302

19305

19301

19306

19307

31 natural deaths

BBG colony 485 nests

2019 Ashley Nests

- Black-fronted Tern
- Toppings BBG Nests

Traps Dec 2019

- + DOC
- + Timms
- + Trapinator
- + RunThru
- + Harrier Kill



Summary

- Weeds on the fairway are the most important short to mid term issue – but they must be cleared where birds want to nest.
- Narrowing of the fairway area with tree planting, measures to protect the trees, and gorse and broom covered islands may be the most serious long-term issue. Are we going to have a braided river in 50 years?
- Norway rats were last season the most important non-natural predator. They are extremely difficult to handle.
- The Ashley River can act as a refuge for birds flooded from the larger rivers – survey results from all rivers must be combined to get accurate trends in numbers.