

# Braided river restoration

Can we use gravel  
extraction to address  
multiple threats?

Aparima River project

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# Braided rivers

## Iconic ecosystem

- < 0.9% of New Zealand land area
- High endemism – unique communities
- High proportion of threatened species





# Braided rivers

Iconic but threatened ecosystem

## Rangitata River

1942

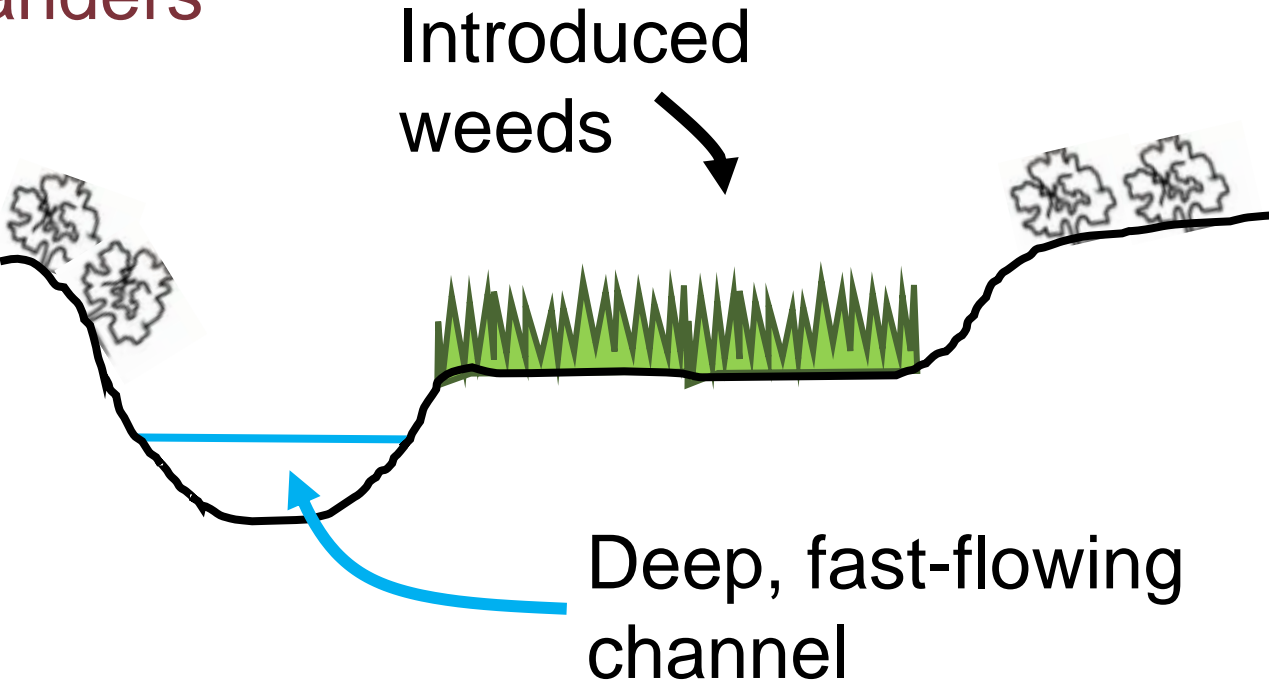
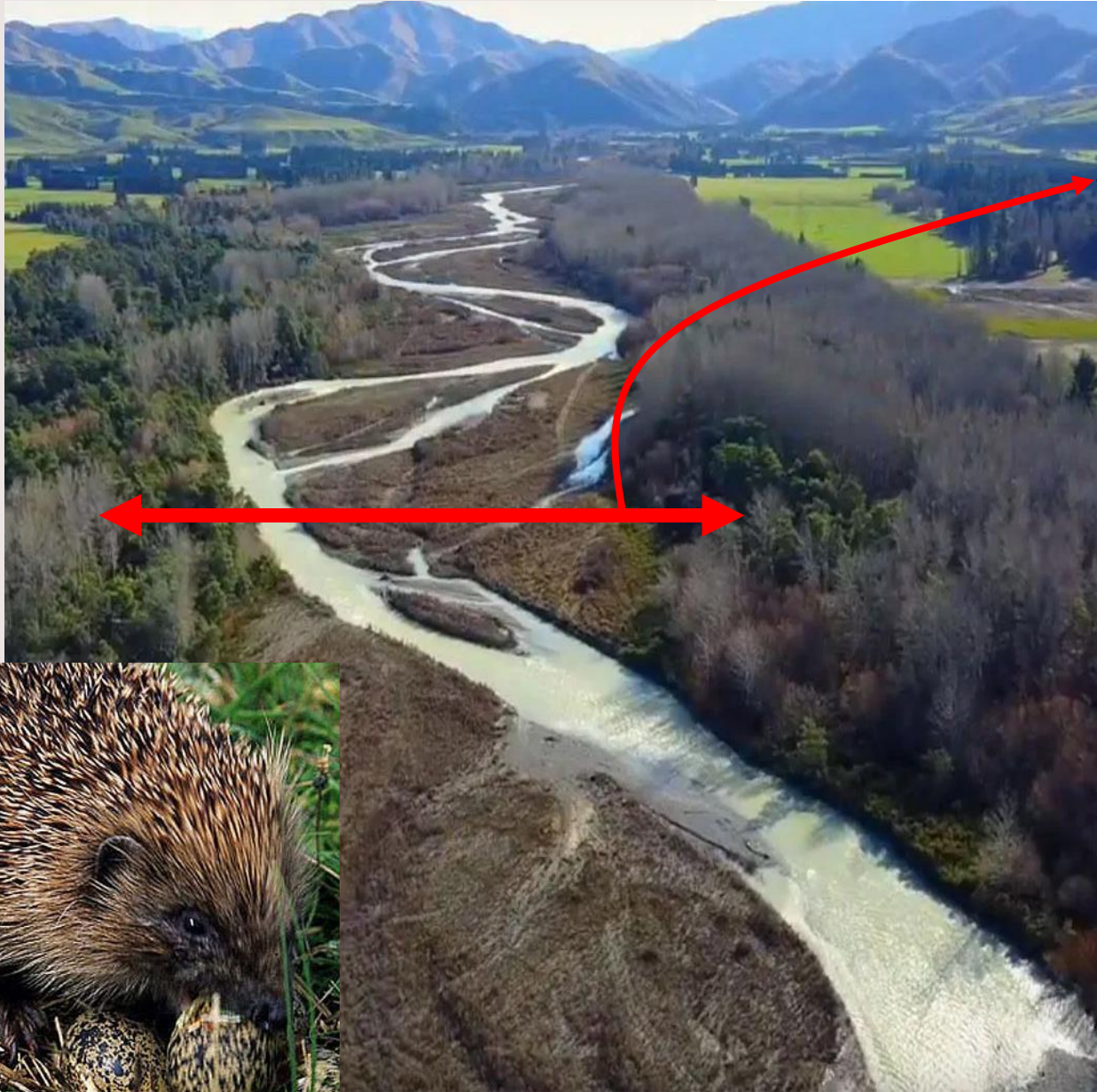
2020



Narrowing of  
the braid plain



## Narrow riverbed turns braids into meanders

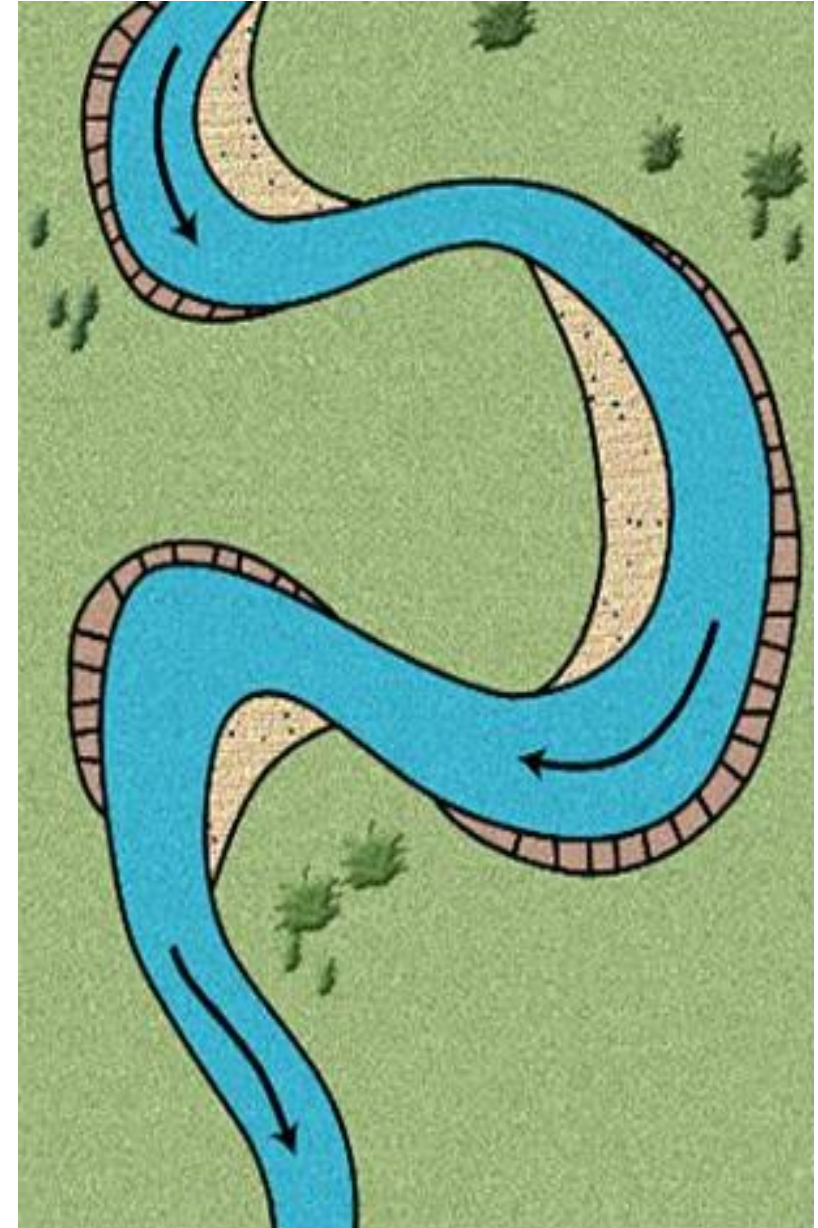
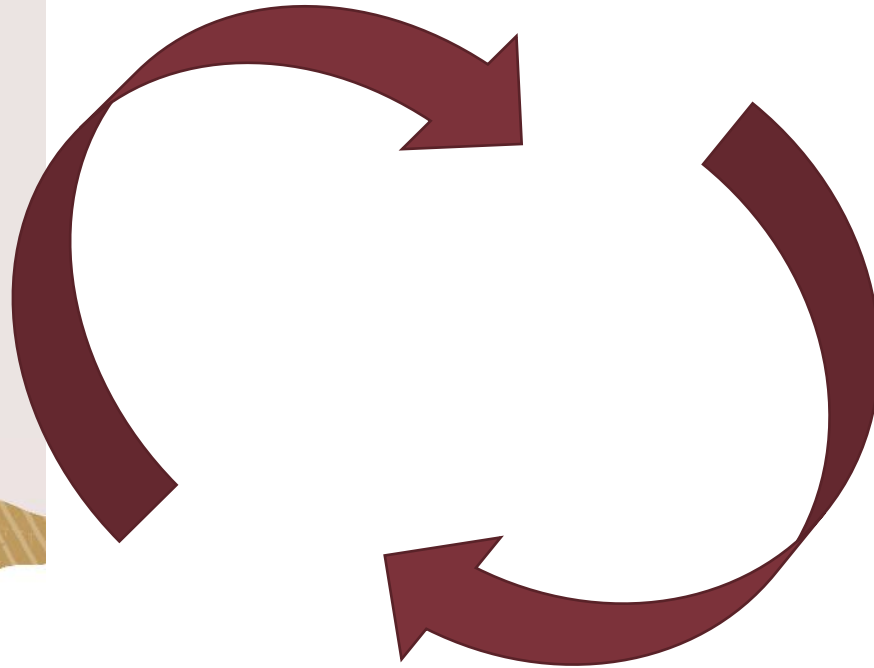
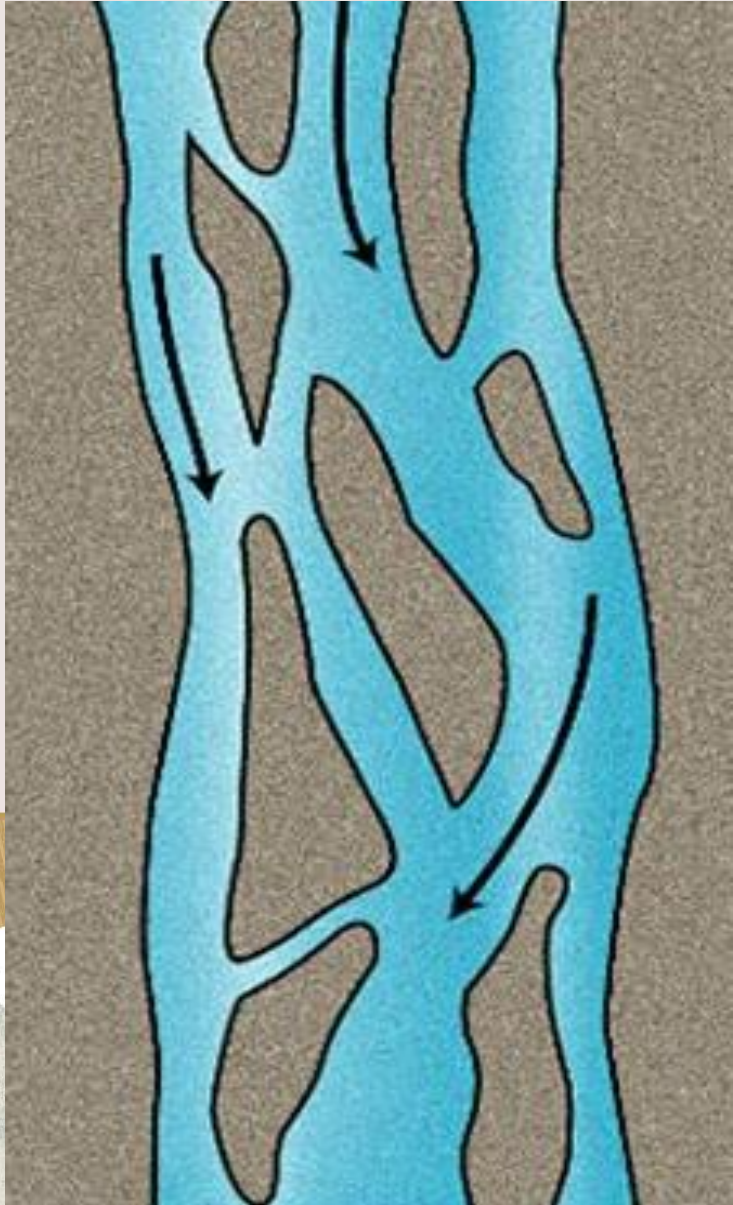


- Ecosystem functions are extinct
- Habitat unsuitable for native, braided-river species
- High densities of introduced predators





From braided to meandering => Is there a way back?





# Aparima River Restoration project 2016-2026



## 1. Who?

- Gravel extractor
- DOC
- Fish & Game
- University of Otago
- Environment Southland
- TAMI

## 2. Where?

- Southland, New Zealand
- Aparima River
- Wreys Bush

## 3. What?

- Habitat restoration
- Birds
- Pests/weeds
- Freshwater values

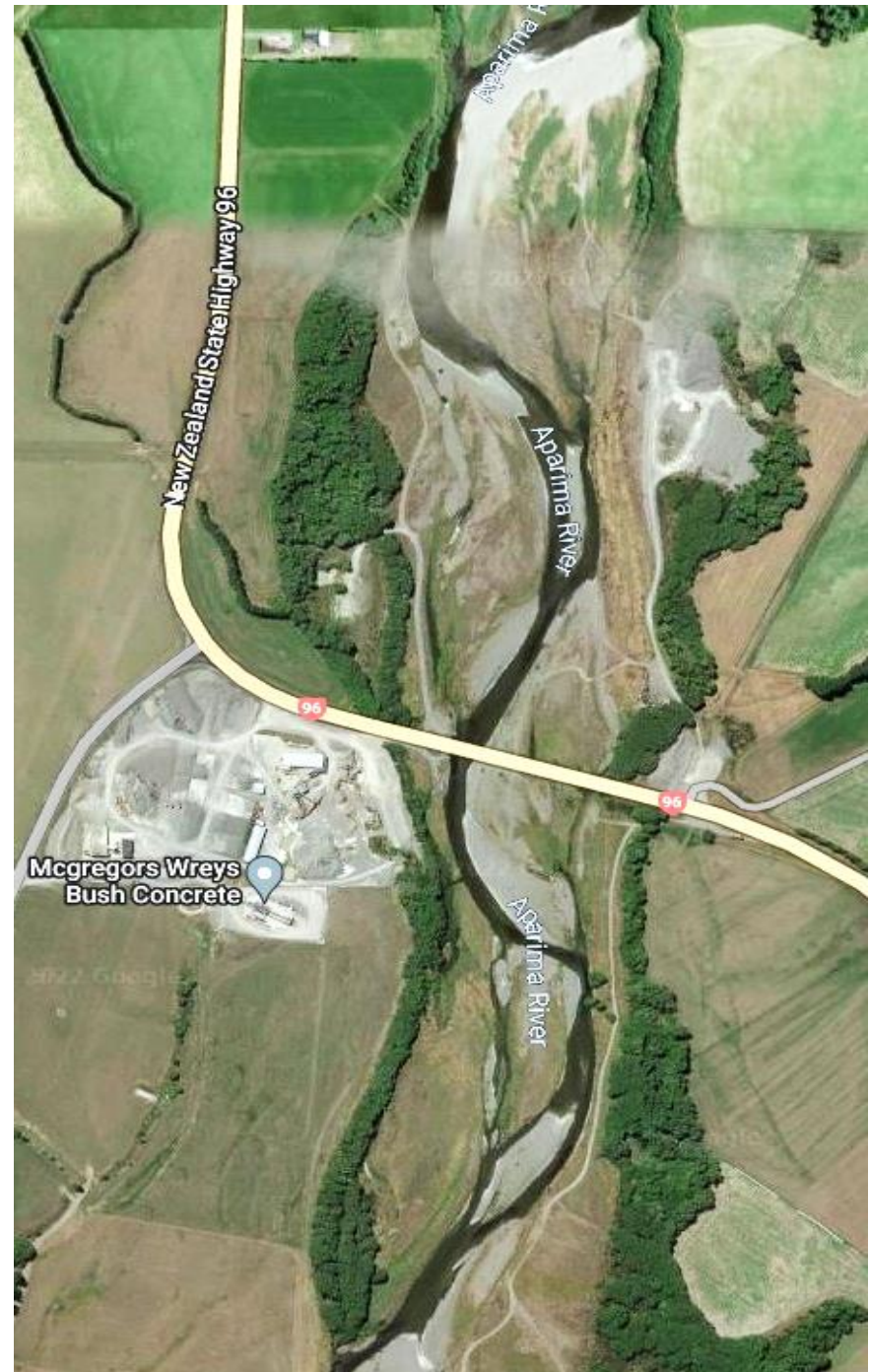






Aparima  
River  
Wreys Bush  
area 1980s

Aparima  
River  
Wreys Bush  
area 2020s





Grant McGregor

Wreys Bush Concrete

# “Tending the flock”

New Zealand Geographic, ISSUE 155, JAN - FEB 2019

**WREYS BUSH**  
CONCRETE



**High Quality Concrete**  
100% Locally owned and operated.

“When you’re a gravel contractor you’re considered to be an environmental disaster”

“So it was just to be seen to be leaving a good footprint behind.”



# “Best” practice for gravel extraction in Southland

- Stay away from the water
- Limit extraction surface
- Dig deep to get gravel volume
- Create “habitat” pond as a mitigation or remediation technique





# Can we do things differently?

Restoration technique:

- Scraping the tops of weed-infested bars
- Lower point bars (extraction)
- Flood water naturally reshapes the gravel according to its own natural laws.

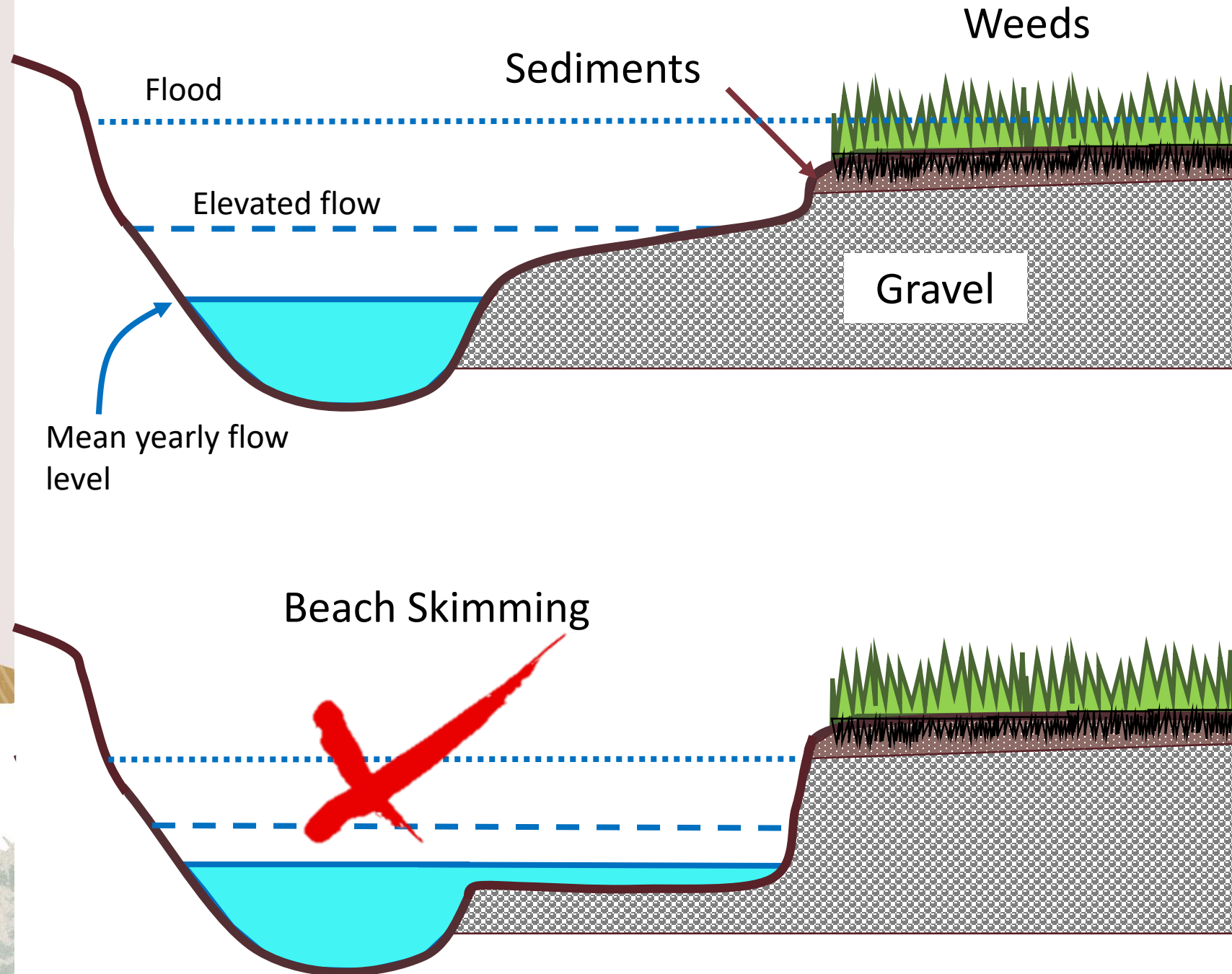




We are scrapping  
the top of  
aggraded gravel  
banks/bars...

... **NOT** beach-  
skimming

Same, same...  
But actually very  
different



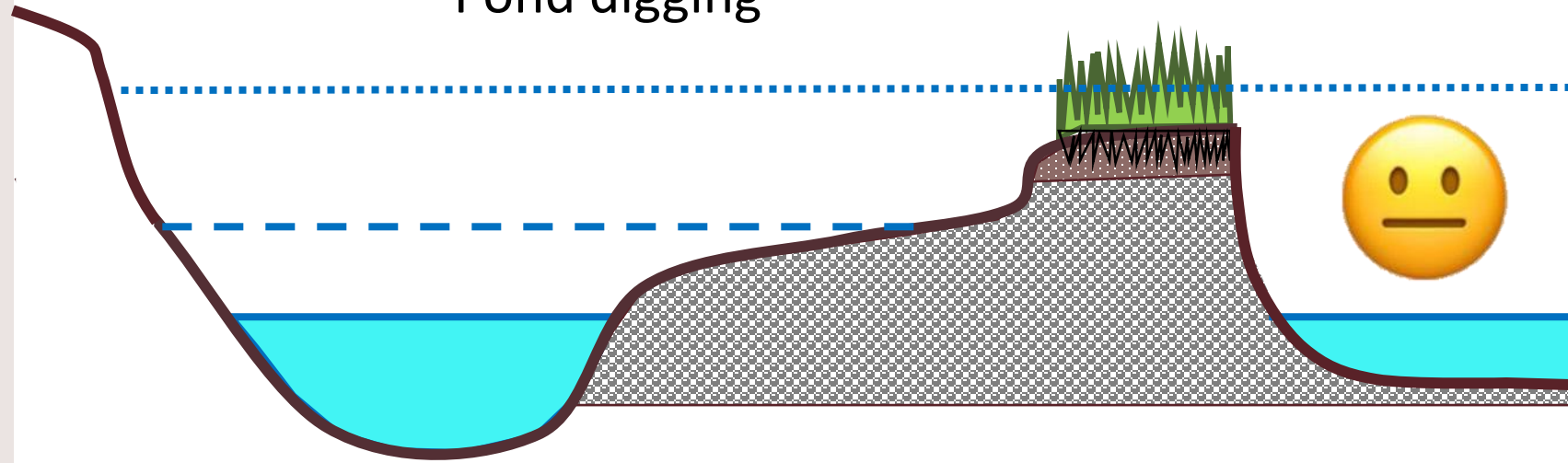


We are scrapping  
the top of  
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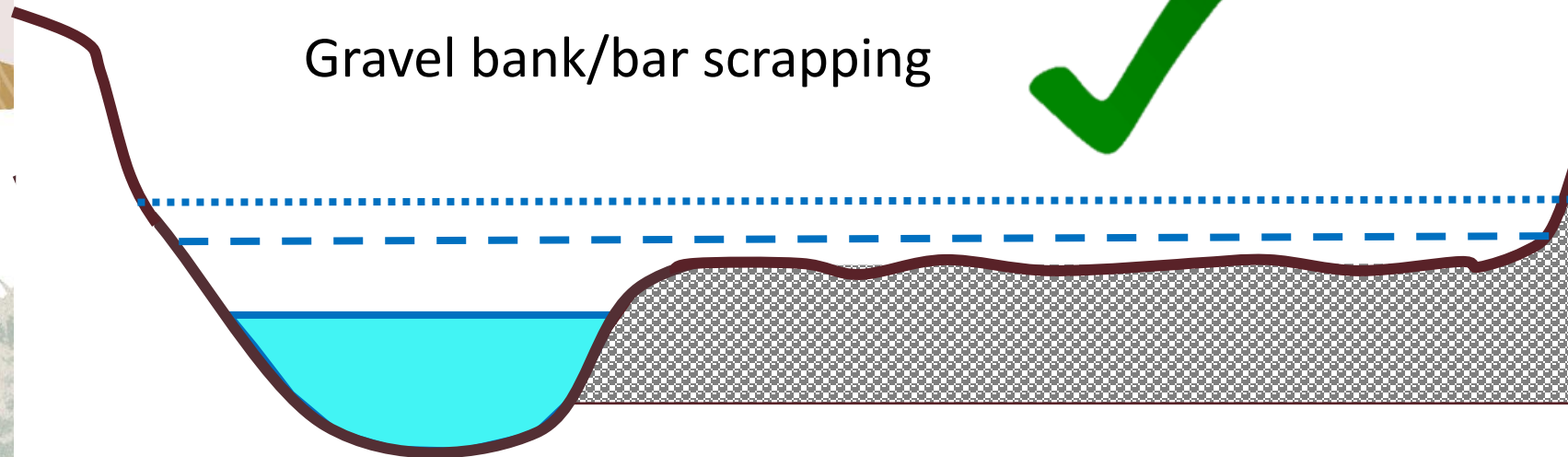
Same, same...

But actually very  
different

Pond digging



Gravel bank/bar scrapping

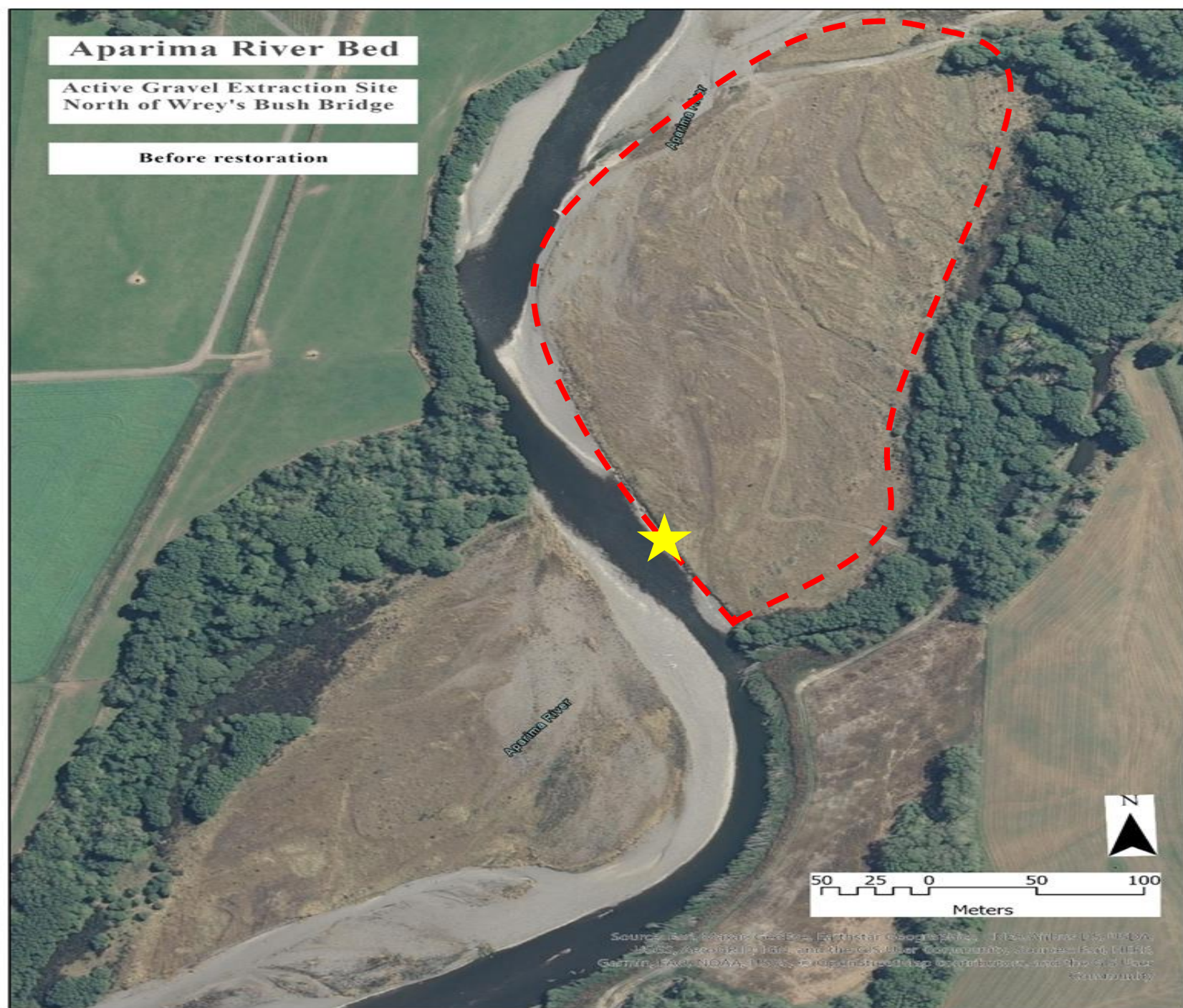




## It's a braided river, reborn

# Aerial mapping 2016

- Before gravel extraction
- Weed covered gravel banks
- High and stable
- Single, deep, fast channel









# Congratulations!

It's a braided river, reborn

Aerial mapping 2018

- Active gravel extraction
- Weeds being removed
- Wider, shallower, channel
- Wider gravel beds





# Congratulations!

It's a braided river, reborn

Aerial mapping 2020

- End of extraction
- Weeds removed
- Braided riverbed
- Wide gravel beds, islands

Striking difference  
before-after but  
also between  
techniques!





# Aparima River



Multiple sites where that approach is applicable...



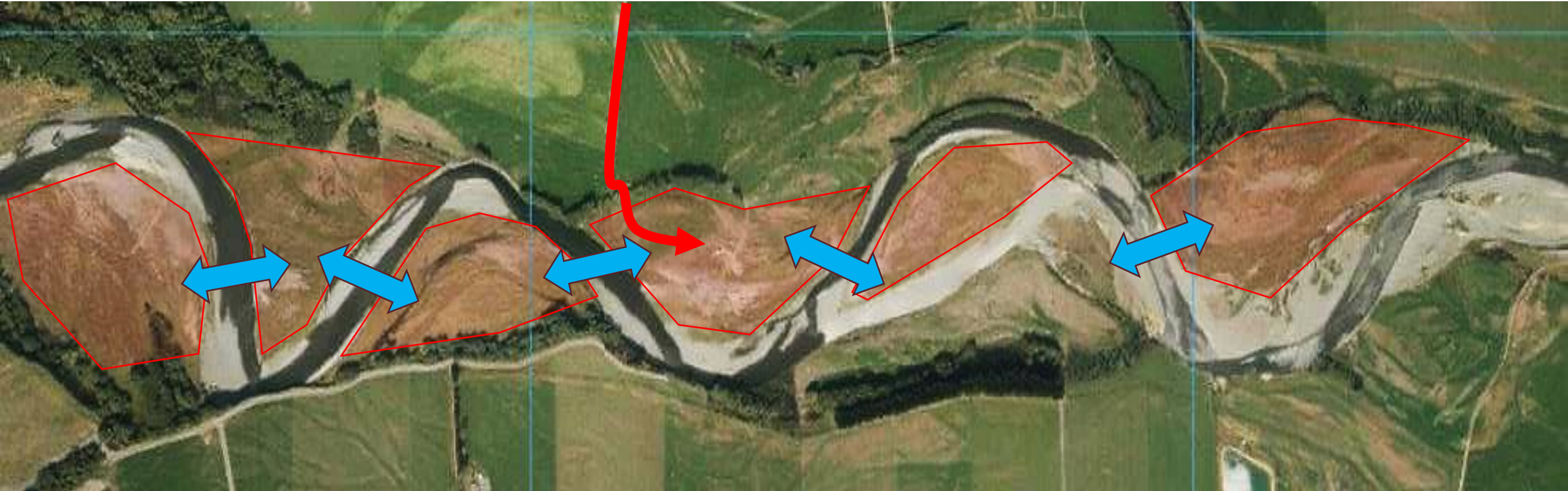
# Difficult conversations coming...



Currently: one access point = one site (point bar)  
More sites = more access points = costly issues



# Difficult conversations coming, Southland context...



When and under what conditions do we allow river crossing? => Curious to hear what Canterbury does!



# Congratulations!

It's a braided river, reborn

Aerial mapping 2020

- End of extraction
- Weeds removed
- Braided riverbed
- Wide gravel beds, islands

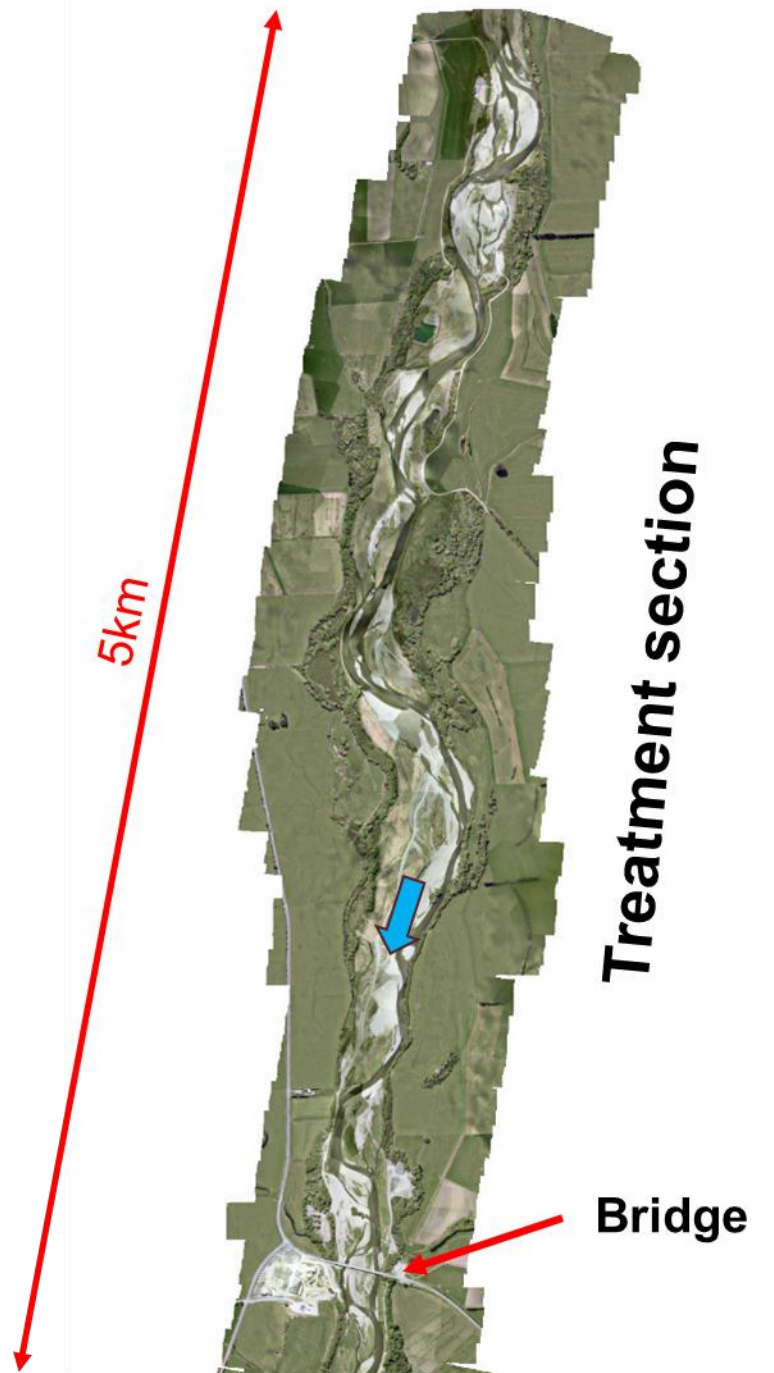


## Values??



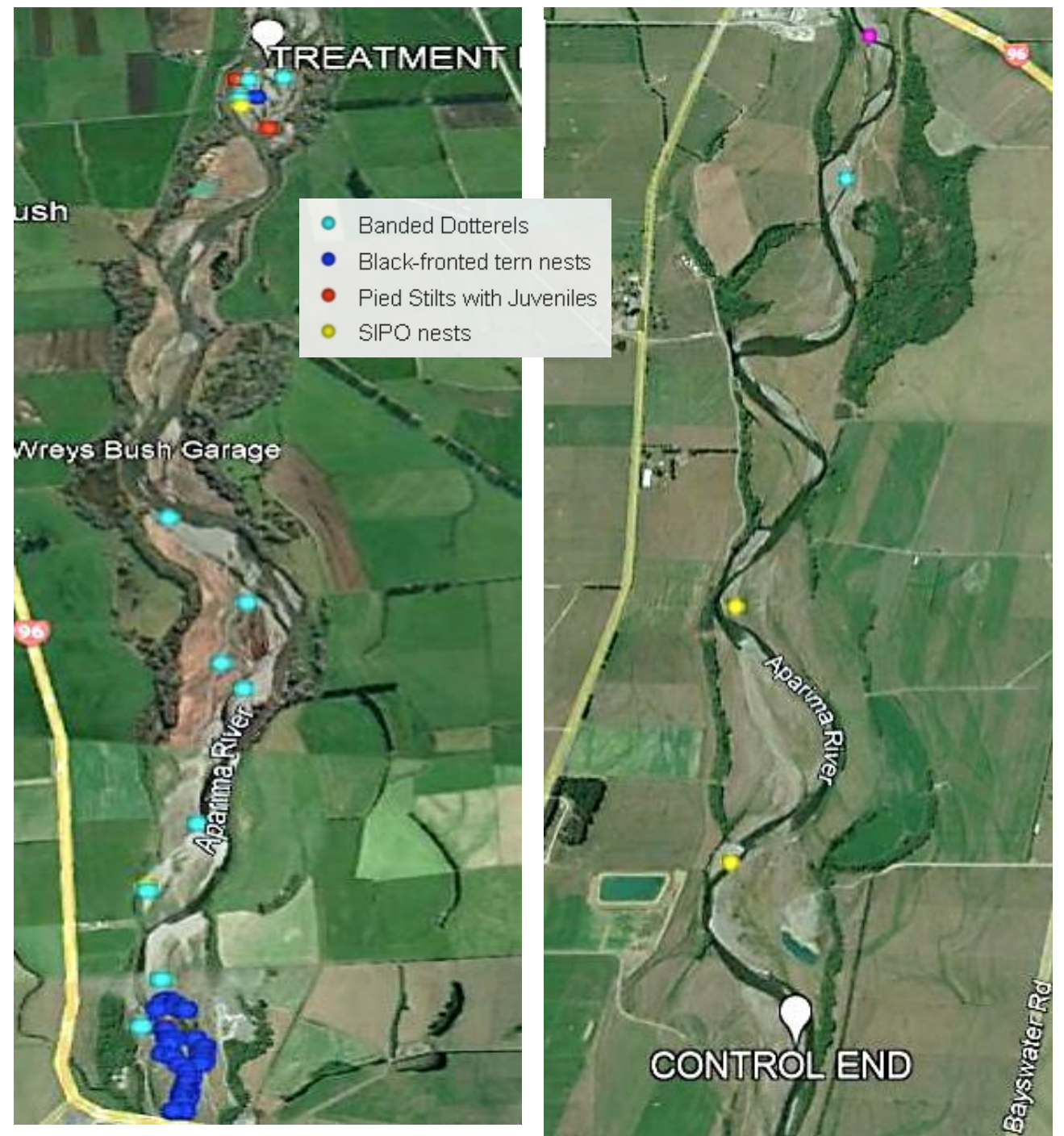
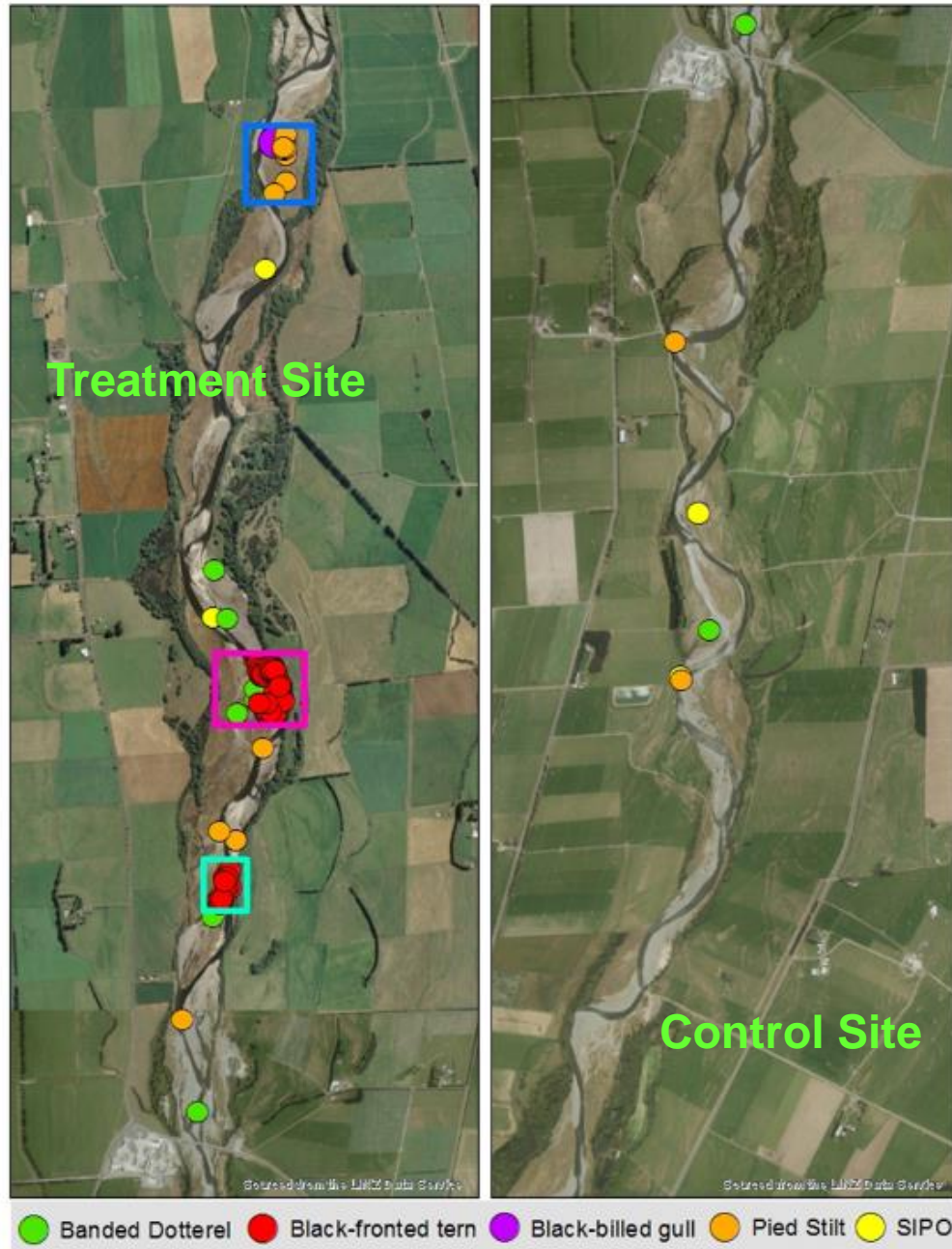


# Bird monitoring





# The birds are back and nesting



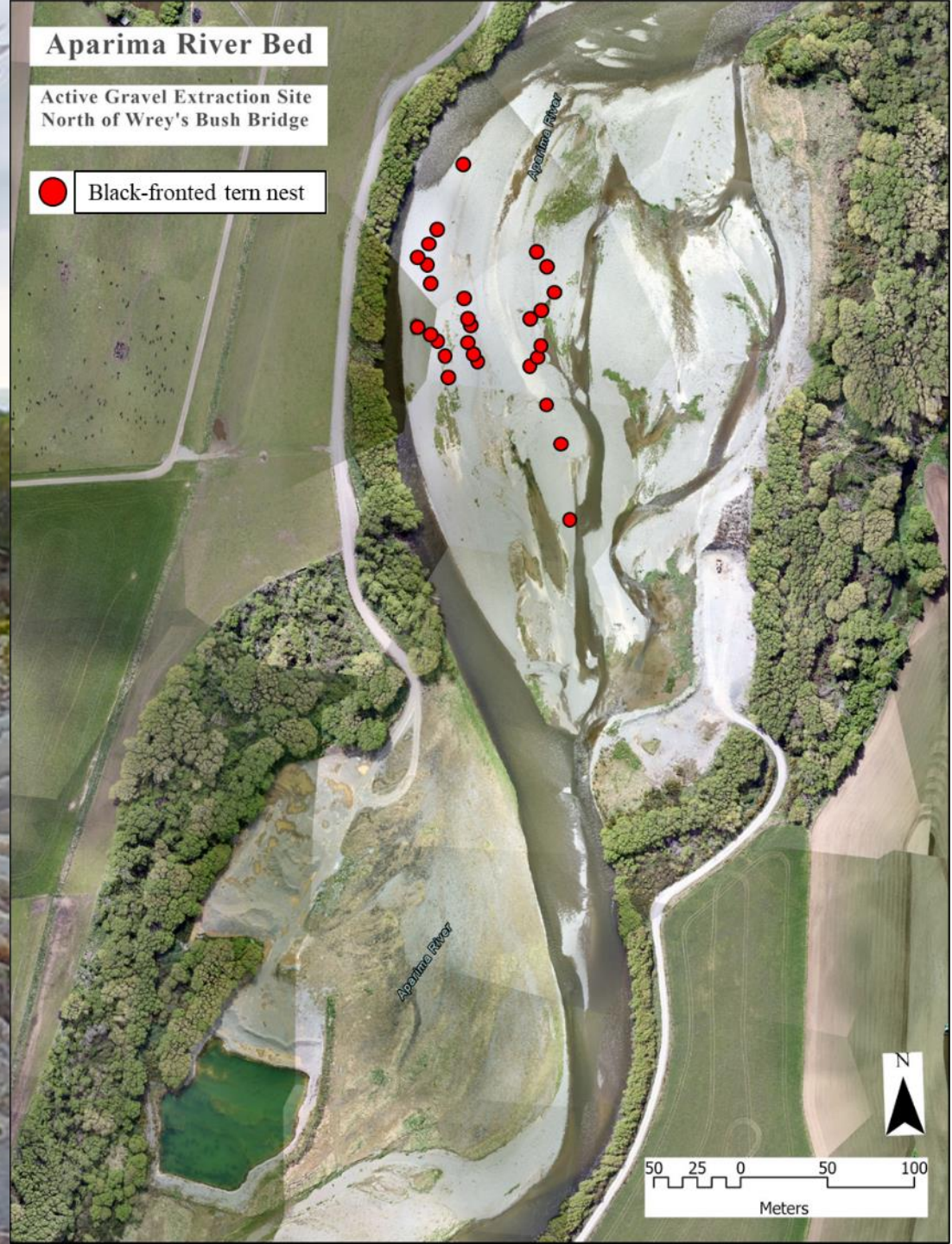


The birds are  
back and  
nesting

2020-2021 season

28 BFT nest  
established early  
in the season

All on the site  
restored by Grant





# Aparima Breeding Season 2021-22

Restored Site (Upper Treatment Site) Nest Locations

TREATMENT END

Aparima River

## Legend

- Banded Dotterels
- Black-fronted tern nests
- Pied Stilts with Juveniles
- SIPO nests

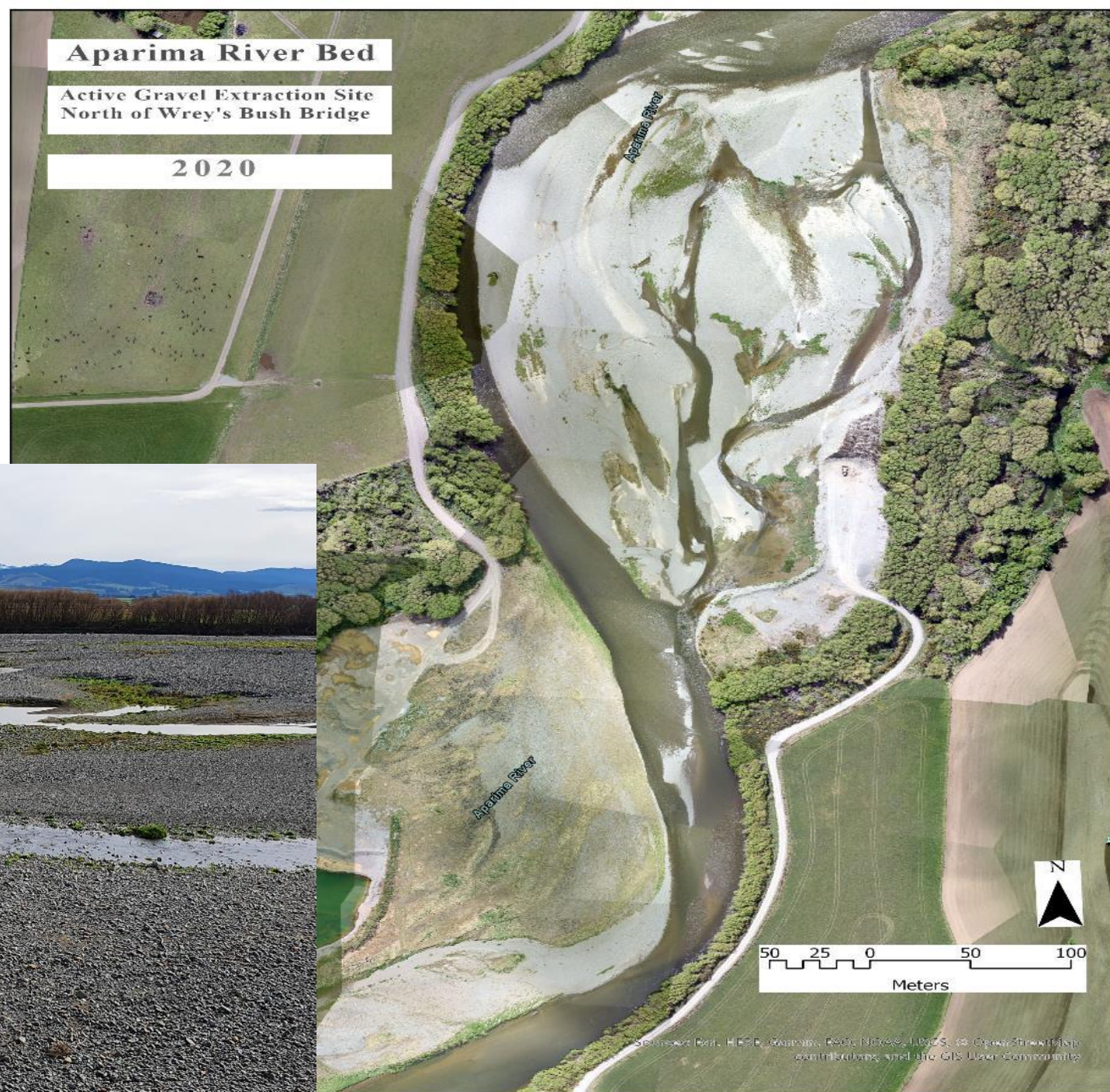




# Project's halfway mark...

# What have we learned?

# It works, but...





What have we  
learned?

It works, but...

June-July 2020



April 2021



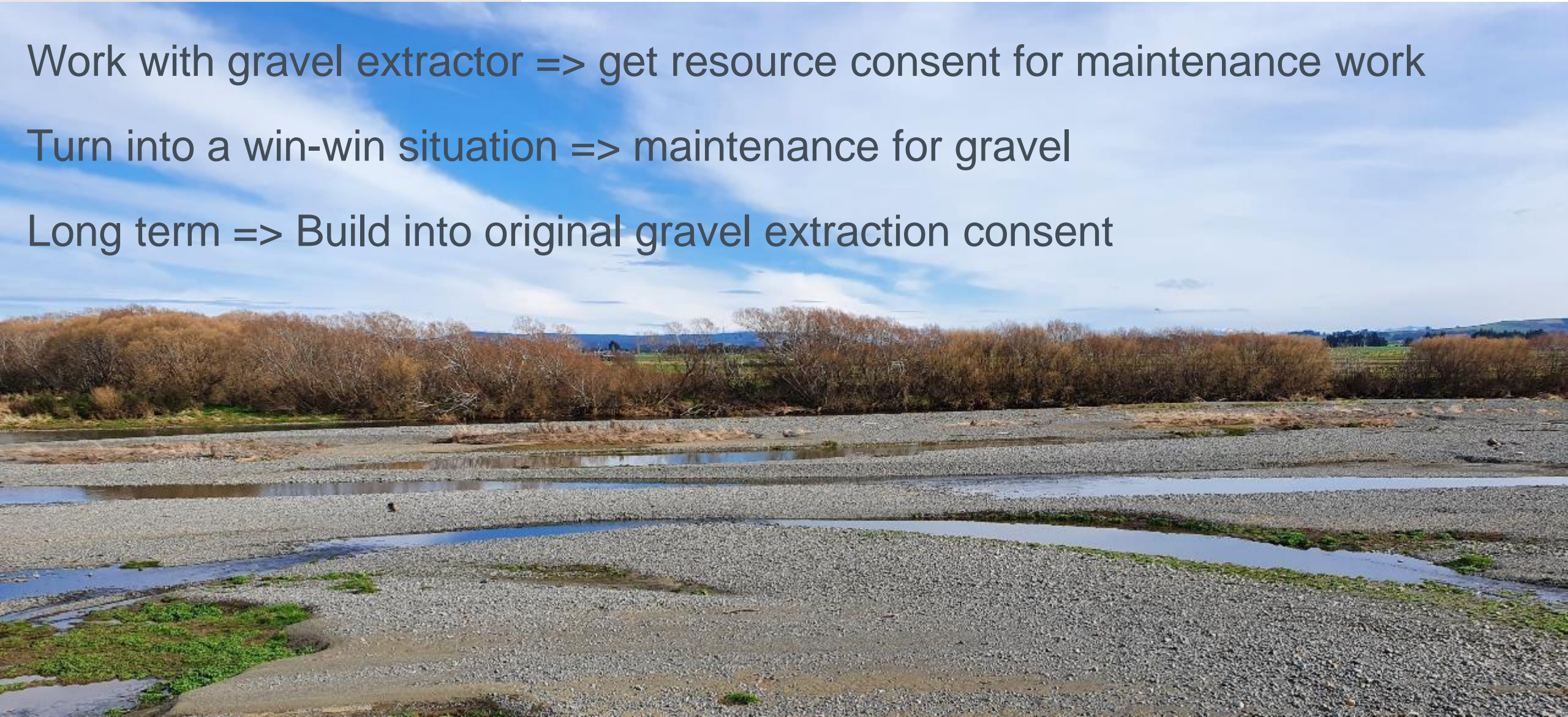


# How do we maintain the river clear of weeds?

Work with gravel extractor => get resource consent for maintenance work

Turn into a win-win situation => maintenance for gravel

Long term => Build into original gravel extraction consent





## Predators/pests



01/30/2022 01:12:06



12/11/2021 23:13:30



02/04/2022 15:36:01





☾ 10/20/2020



☾ 10/20/2020 19°C



☾ 10/22/2021 11:20PM





# Unforeseen consequences of the restoration work

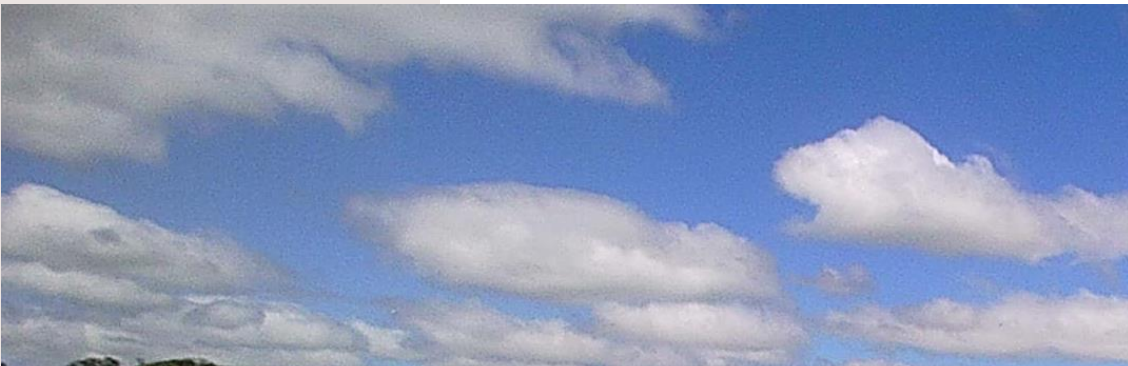
It attracts humans!





# Summary

Some good –  
some bad...





# 2022 - 2026

## Next steps

- ▶ Protect the birds => Trapping network
- ▶ Trial maintenance through resource consent
- ▶ Make it work for everyone!

