

MAKING ROOM

FOR RIVERS

CHOOSE
CLEAN
WATER

TUKUA NGĀ
AWA KIA RERE

Tom Kay

tom@choosecleanwater.org.nz

River flow for Tutaekuri River at Puketapu HBRC Site

Custom Date Range: 13-02-2023 to 15-02-2023

14 Days

30 Days

All

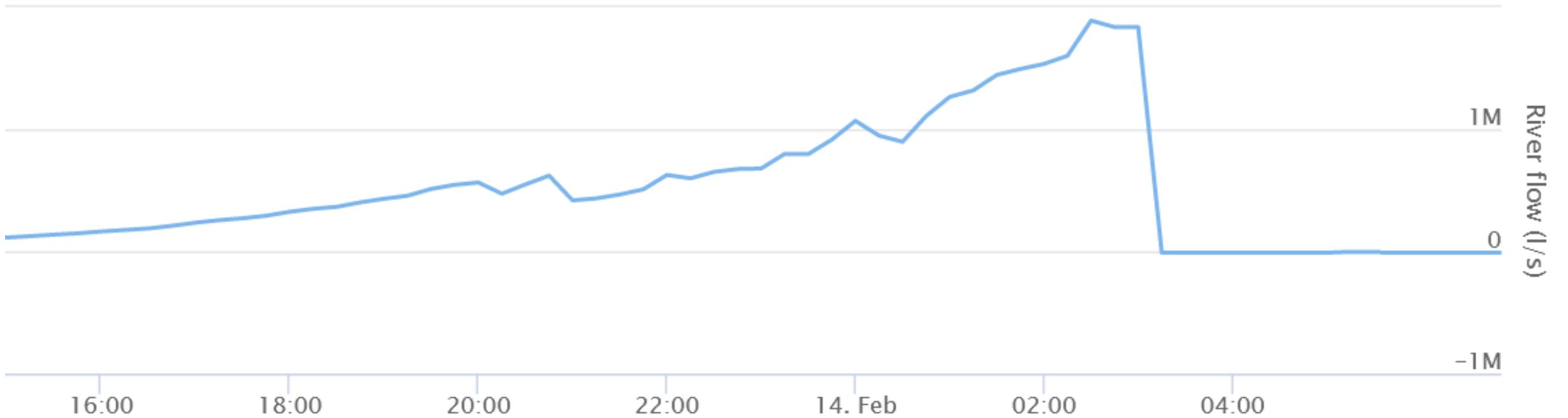




Photo: Steve Dighton



Tutaekuri River

Cyclone Gabrielle

Photo: Steve Dighton





Waiohiki bridge and surrounds are inundated by the Tutaekuri River. (Photo: Getty Images) - <https://thespinoff.co.nz/society/15-02-2023/the-aftermath-of-cyclone-gabrielle-in-pictures>

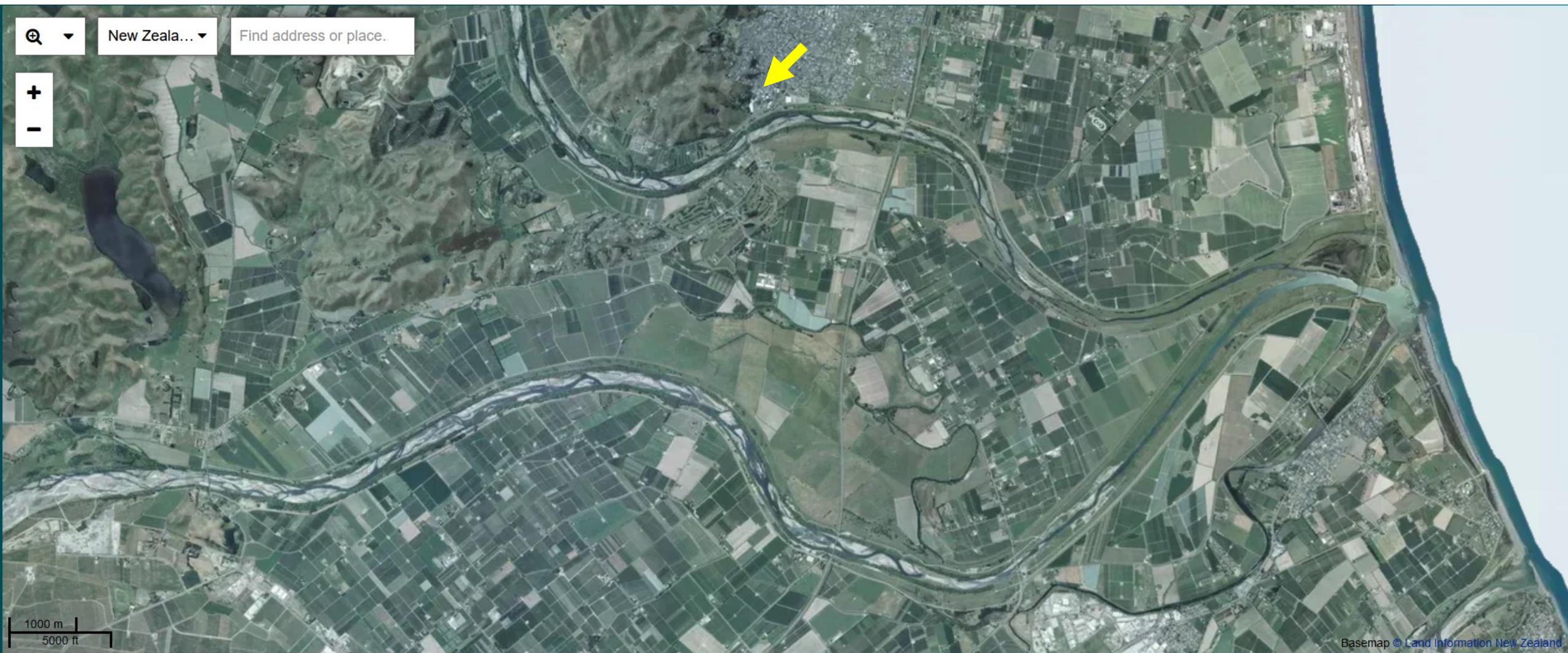


Image: Tom Kay
Tutaekurī River, Redclyffe Bridge

Image: Tom Kay
Puketapu/Dartmoor
Rd area



Pre-Cyclone Gabrielle



Post-Cyclone Gabrielle



Legend

Repair Status

Complete

Stopbank Cyclone Damage Category

- Intact
- Weakened
- Unknown
- Breach



HB Civil Defence Emergency
Management Group

[https://www.facebook.com/
hbemergency/videos](https://www.facebook.com/hbemergency/videos)



▶ 0:08 / 1:07



🌐 Extreme courage, skill and hope on display here! Thank you to Trevor for providing this incredible footage of a daring rescue at Gilligan Road today. Our first responders and partner agencies have been working tirelessly - thank you for what...



Ngaruroro River at Omahu (pre-Cyclone Gabrielle)



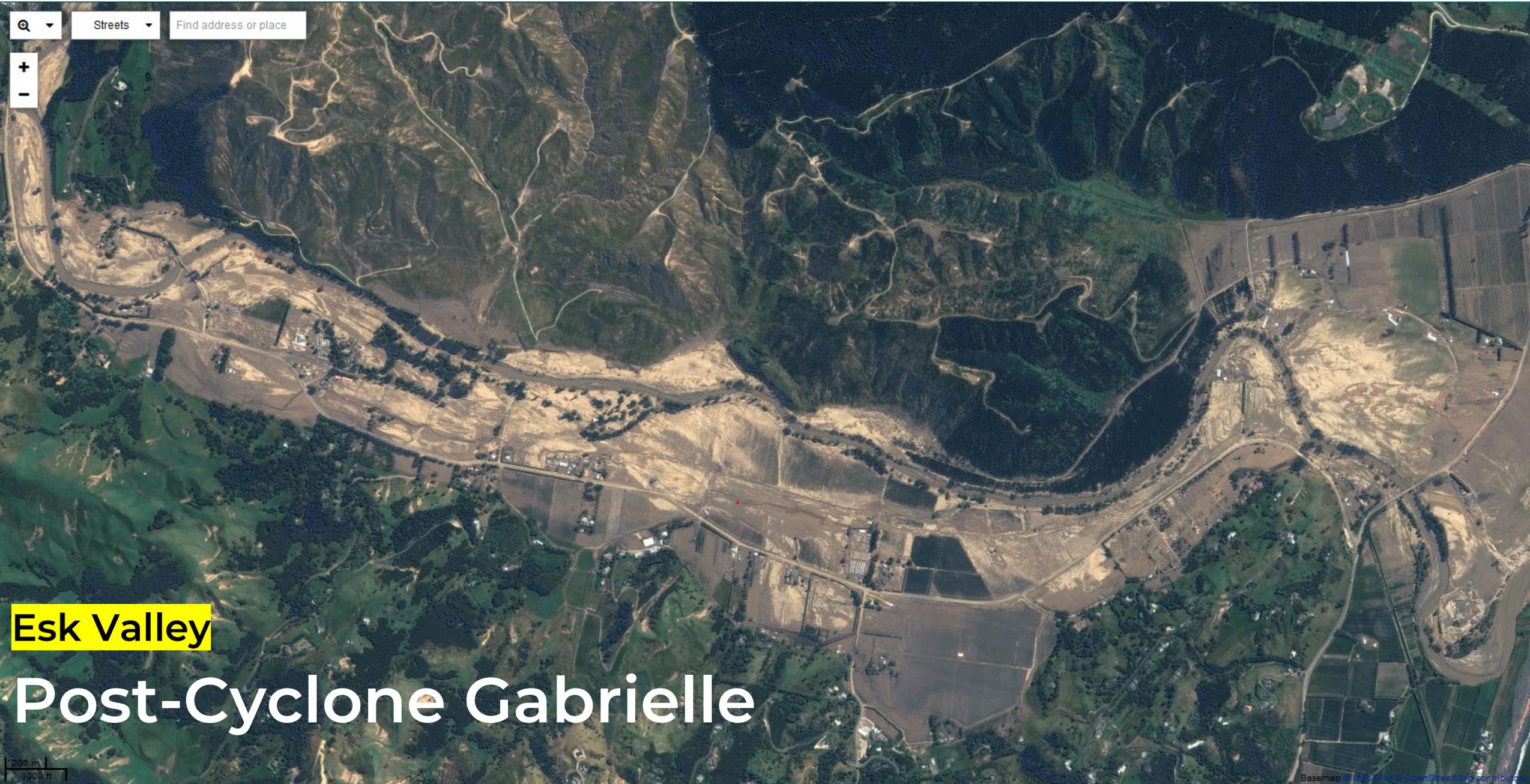
Ngaruroro River at Omahu (post-Cyclone Gabrielle)





Esk Valley

Pre-Cyclone Gabrielle



Esk Valley

Post-Cyclone Gabrielle

200 m
1000 ft

Basemap | Map tiles | OpenStreetMap contributors



Gisborne/ Hawke's Bay hillsides, post-Cyclone Gabrielle



Auckland 2023





Nelson 2022

2022 - Stuff.co.nz
<https://www.stuff.co.nz/environment/climate-news/129669205/liquefaction-threat-final-straw-for-libraris-river-site-climate-group-says>



Ashburton River / Hakatere 2022

May 30, 2021 11:06:48 AM

Taken by:
ECan (Verity Kirstein)

North Branch Ashburton
River looking upstream
(Shearers Rd N in bottom
right of image)

Record ID: C21C/154734

Comments: Time Recorded
by Camera Clock (May have
been corrected)

Westport flood: 450 homes still unlivable or damaged

11:34 am on 14 October 2021

Share this     

Samantha Gee, Nelson Marlborough reporter
✉ samantha.gee@rnz.co.nz

Almost three months after floodwaters ravaged the coastal town of Westport, 140 people remain in temporary accommodation, living in cabins, motels or with friends and family.



A partly-submerged car outside flooded houses on Disraeli St, Westport. Photo: Supplied/NZ Defence Force

<https://www.rnz.co.nz/news/national/453511/westport-flood-450-homes-still-unlivable-or-damaged>

Timaru District floods: Rangitata residents told to evacuate

1:31 pm on 10 December 2019

Share this     

The Timaru District Council has extended its evacuation area around the Rangitata river and is urging people to leave before it is too late.



Photo: Facebook / Timaru District Council

<https://www.rnz.co.nz/news/national/405178/timaru-district-floods-rangitata-residents-told-to-evacuate>



Edgecumbe 2017

2017 - Sky View Photography NZ

More than 100 people still out of homes after Wairoa flooding

12:19 pm on 16 July 2024

Share this



Jimmy Ellingham, Checkpoint reporter

✉ jimmy.ellingham@rnz.co.nz



Steve and Rangitaka Kelly's Ngamotu Road home was flooded in November and again in June. Photo: RNZ / Jimmy Ellingham

Otago floods: Counting the damage - What you need to know

2:59 pm on 5 October 2024

Share this



A sign on Highcliff Road towards the Otago Peninsula warning drivers to take extreme care. Photo: RNZ/Tess Brunton

West Coast: Clean-up, assessments underway after record-breaking deluge

3:54 pm on 10 November 2024

Share this



Emergency Management Minister Mark Mitchell who has been in Westland over the weekend. Photo: Calvin Samuel



1 May 2025

Live: Christchurch declares state of emergency as city experiences fourth wettest day on record

Thousands left without power, but worst of the wind over for Wellington

[New Zealand](#) about 1 hour ago



NEW ZEALAND / WEATHER

Heavy rain falls on Tasman again: 'We're definitely over it'

11:21 pm on 29 July 2025

Share this



Samantha Gee, Nelson Marlborough / Te Taihupo reporter

samantha.gee@rnz.co.nz



June-July 2025

“I have no doubt whatsoever in my mind, across my experience of my life as a climate scientist, that climate change has influenced that event.”

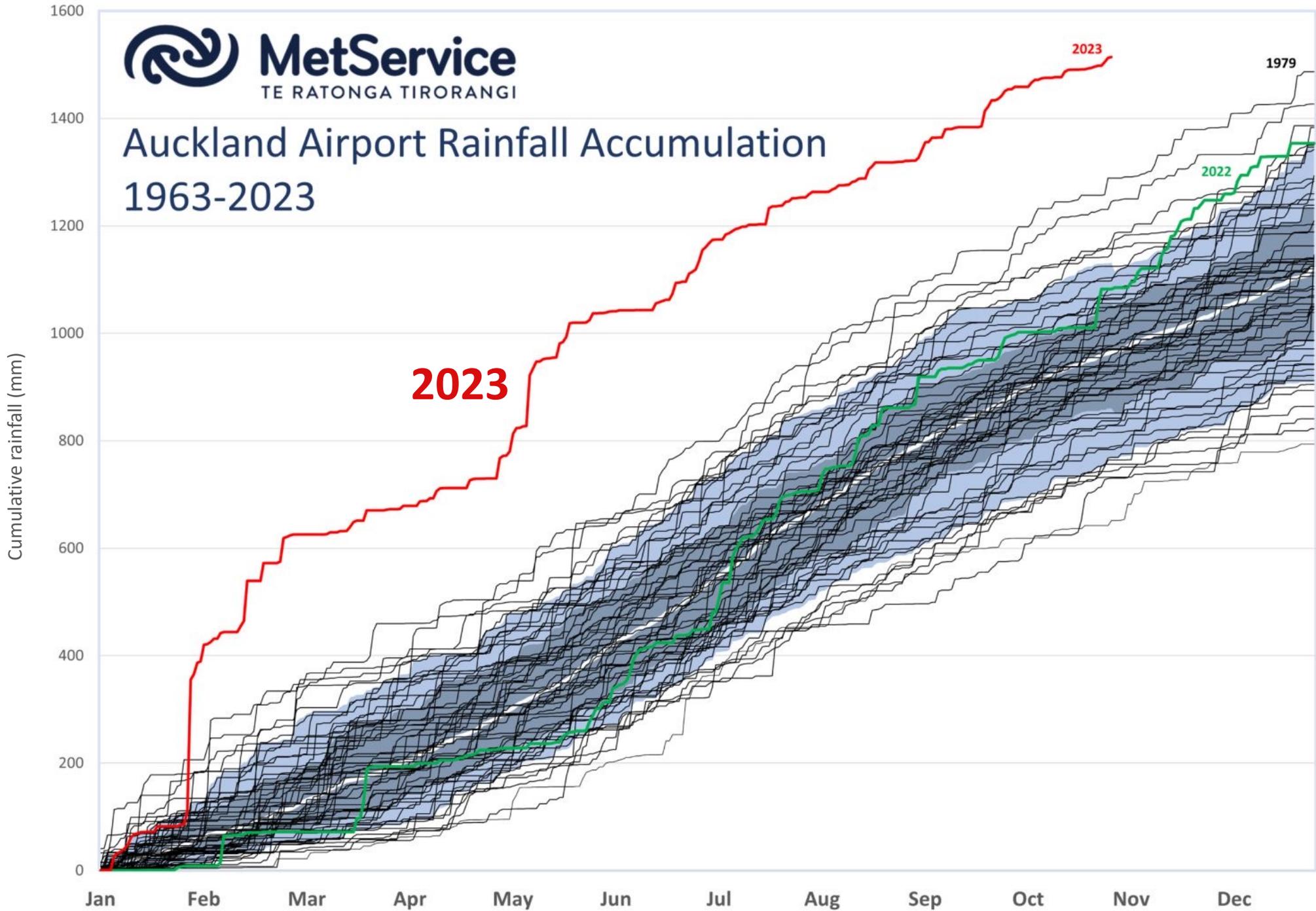
Dr Sam Dean (NIWA principal climate scientist) after Cyclone Gabrielle

“[These events] will become more severe as the planet continues to warm. That will mean... heavier rain, and more problems from... flooding.”

MetService

<https://blog.metservice.com/TropicalCycloneGabrielleSummary>

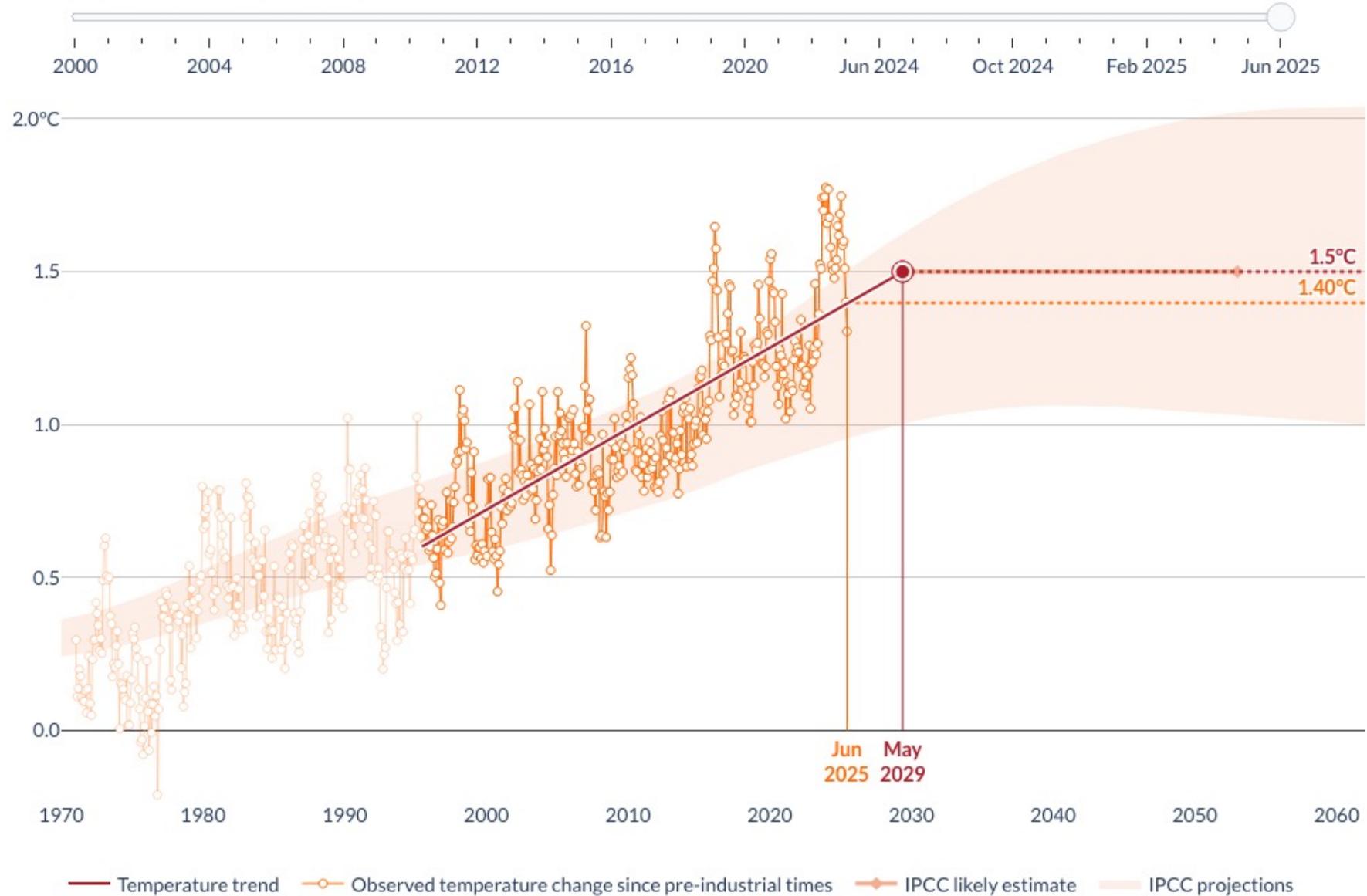
Auckland Airport Rainfall Accumulation 1963-2023



Global warming reached an estimated **1.40°C** in **June 2025**.

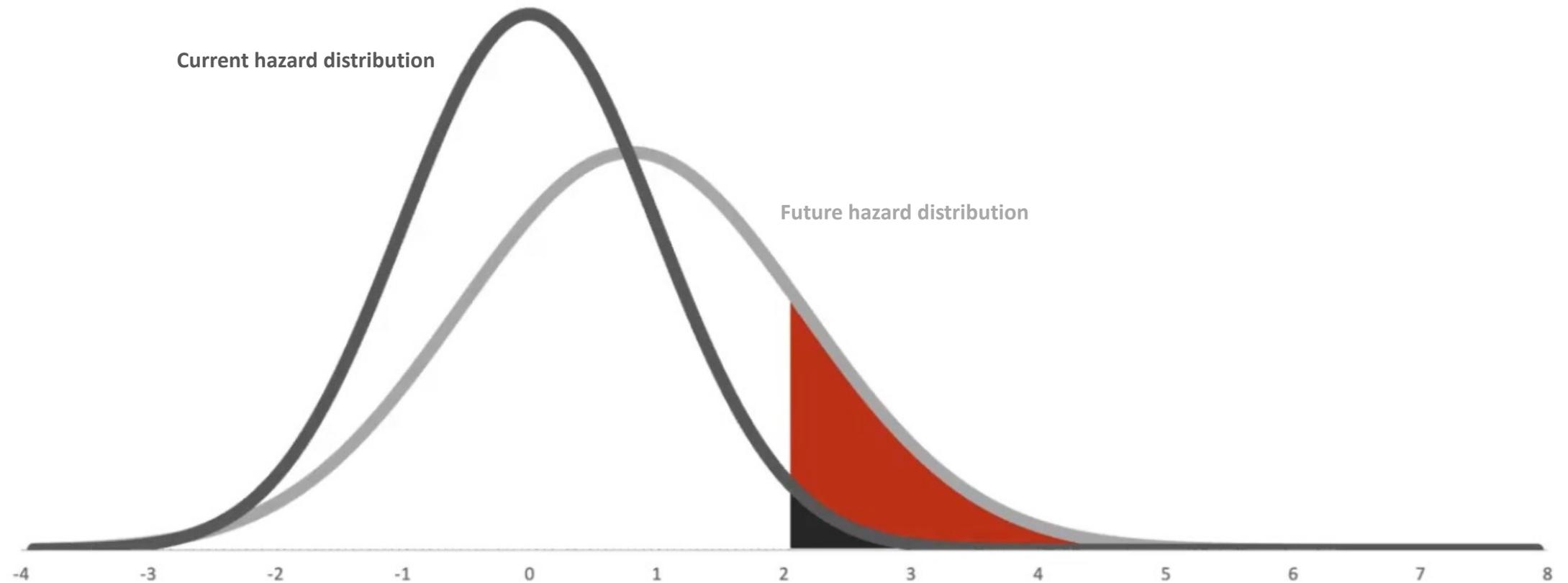
If the 30-year warming trend leading up to then continued, global warming would reach **1.5°C** by **May 2029**.

Extrapolate from: Jun 2025



Climate Change is Shifting Hazard Probabilities

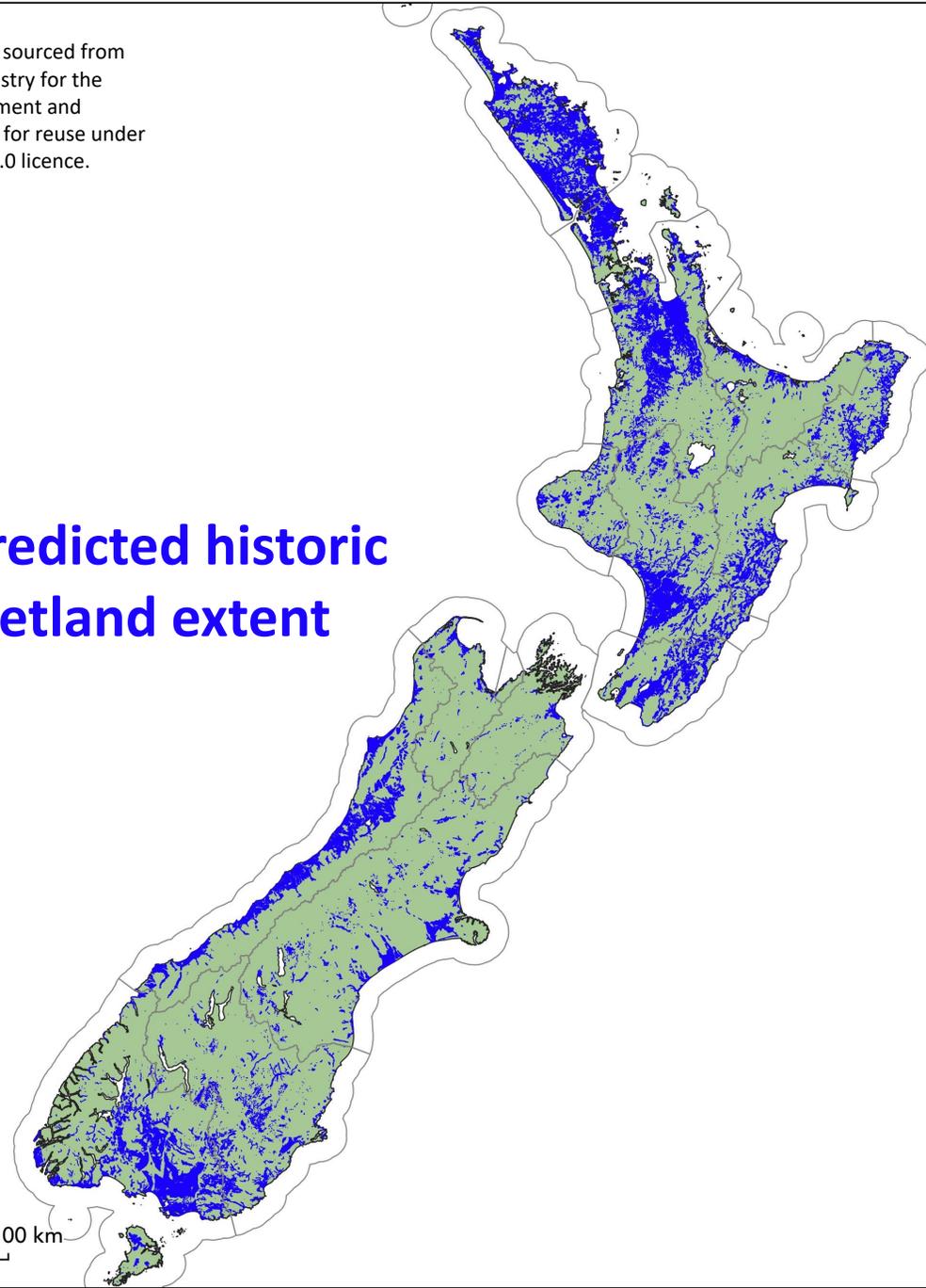
Temperature, Sea Level, Precipitation, Storm Surge...



Imagery sourced from
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Environment and
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the CC 3.0 licence.

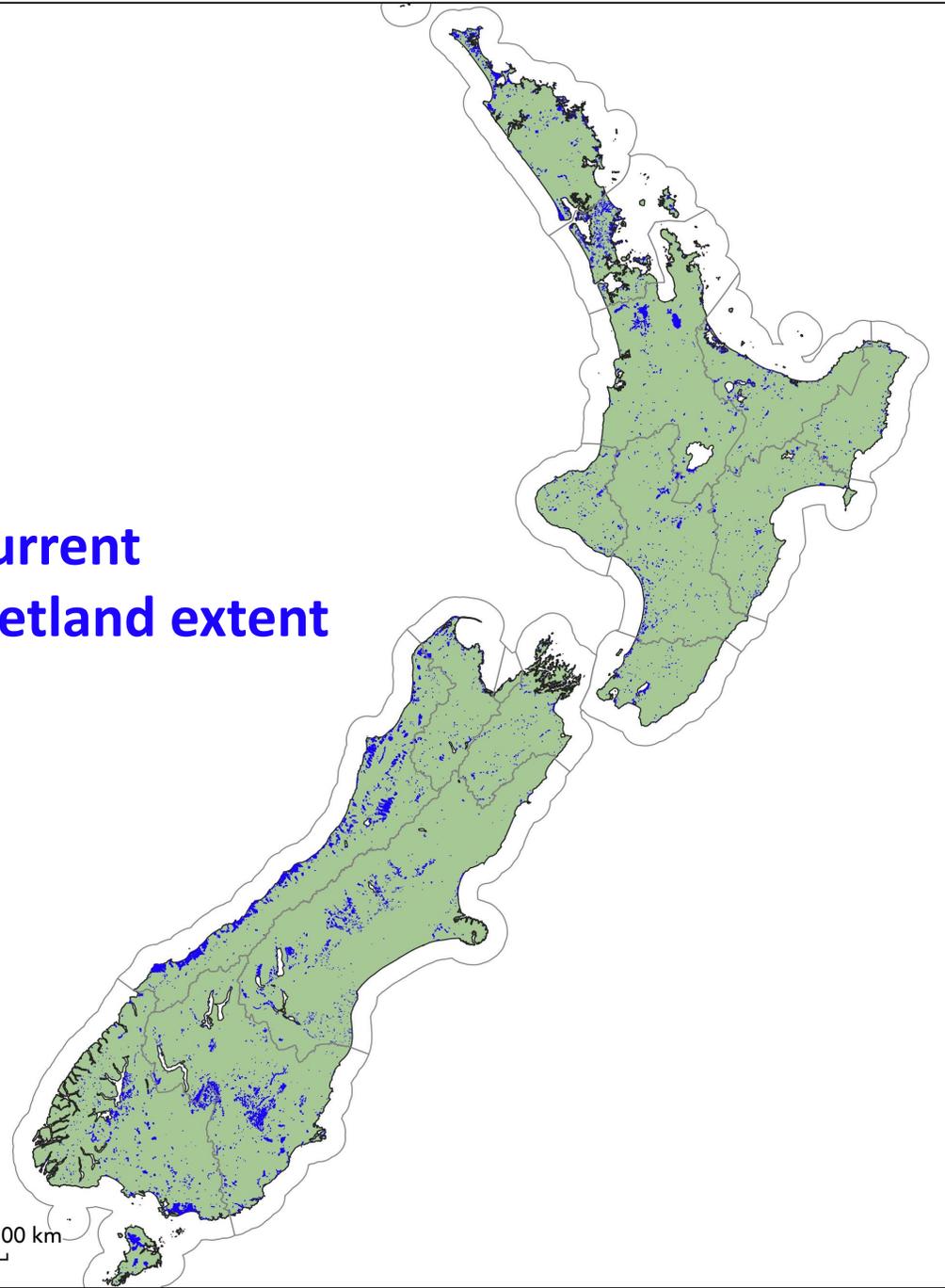
Predicted historic wetland extent

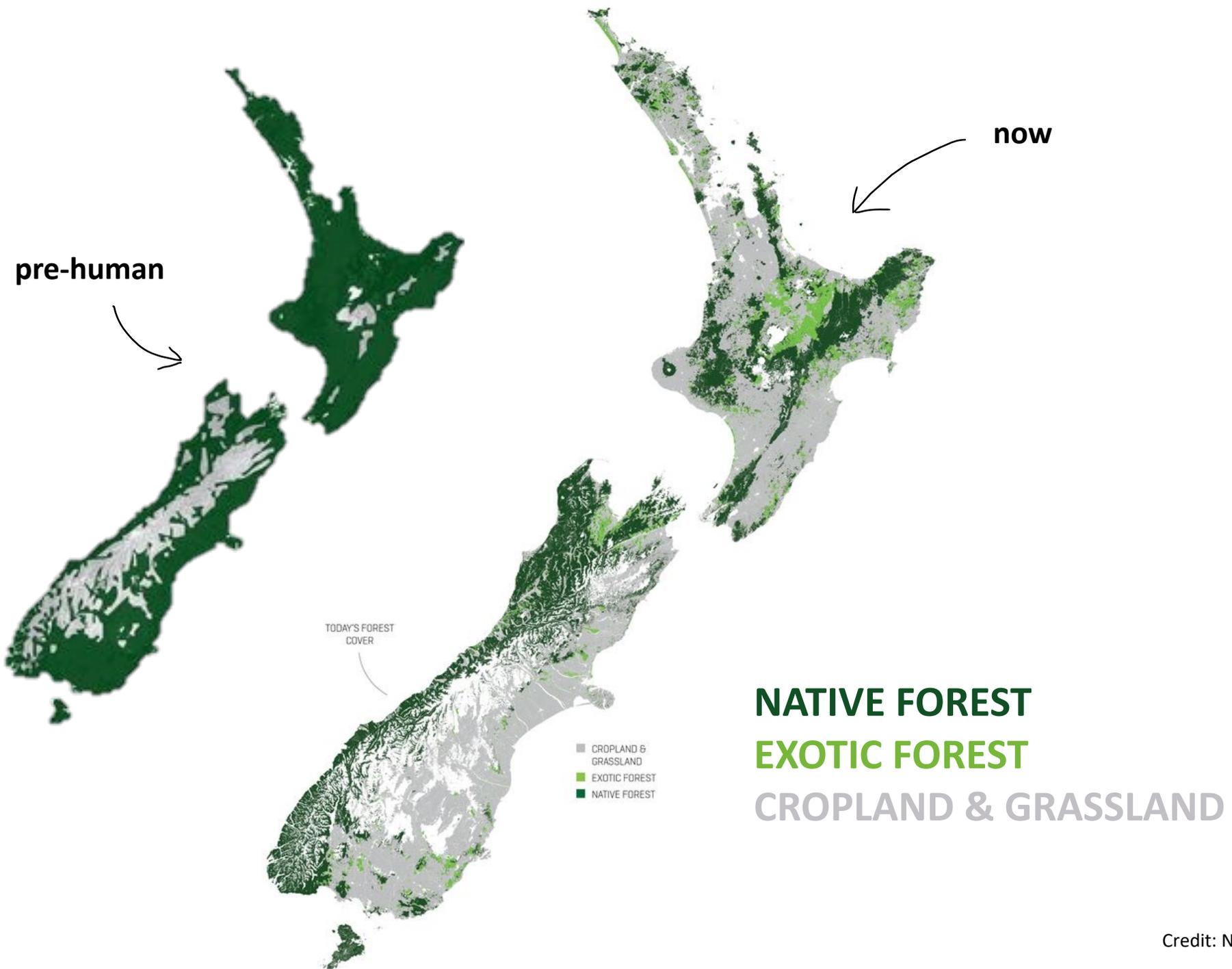
0 100 km



Current wetland extent

0 100 km

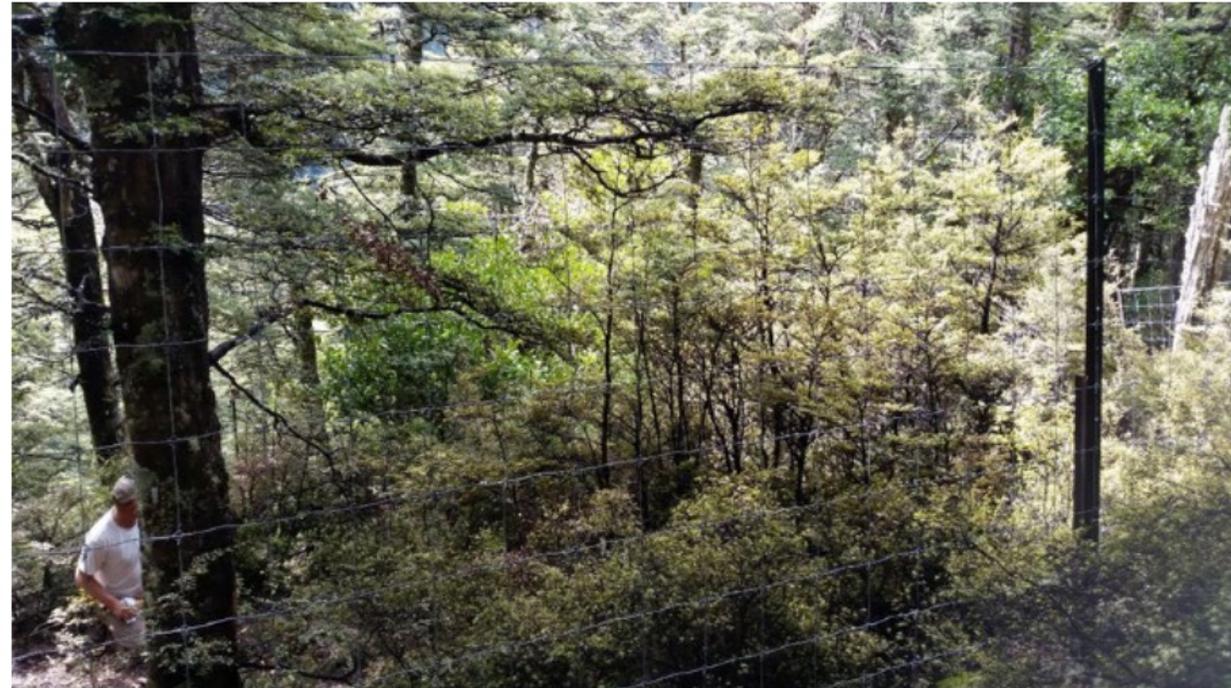




Kaweka Forest Park



deer



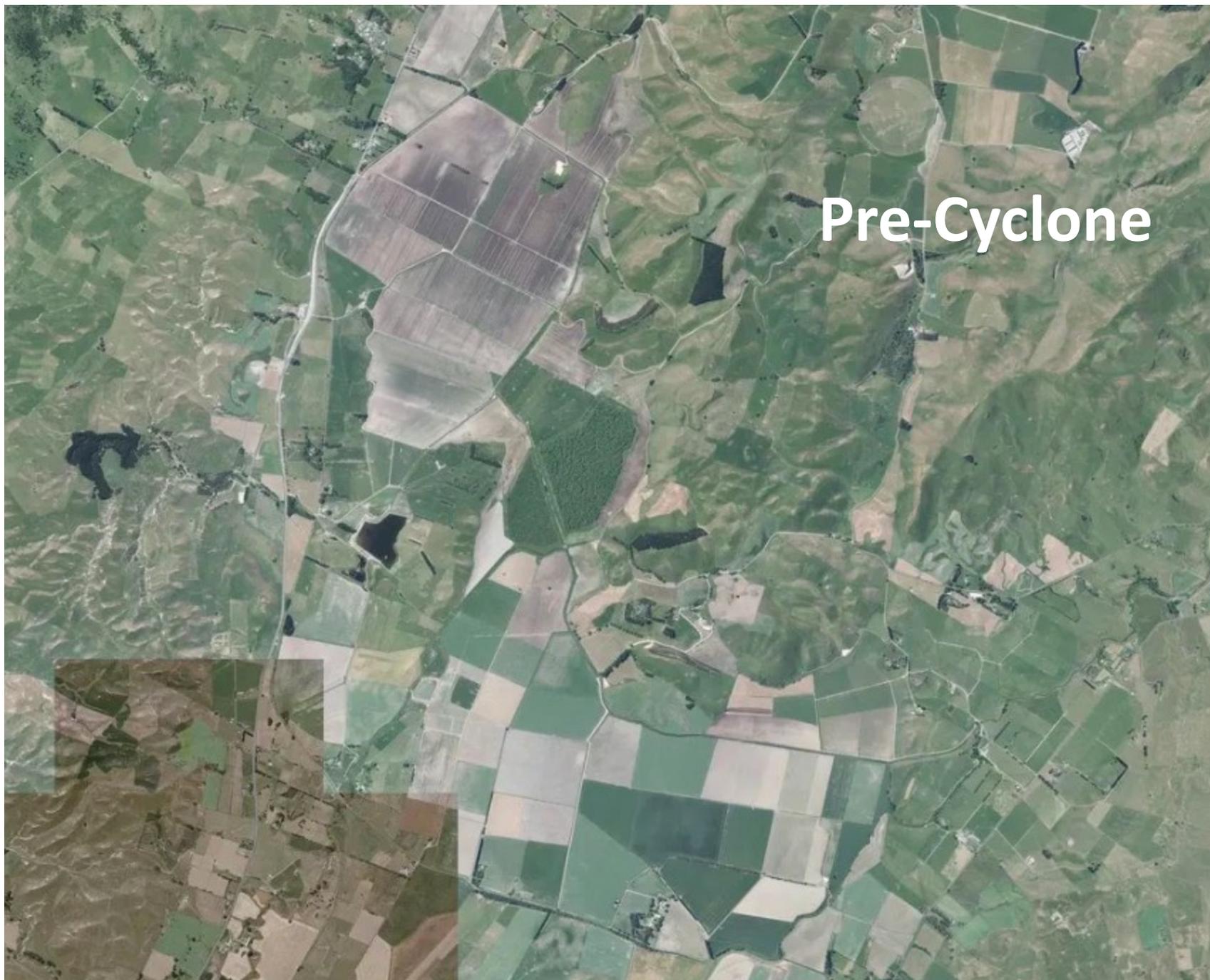
no deer



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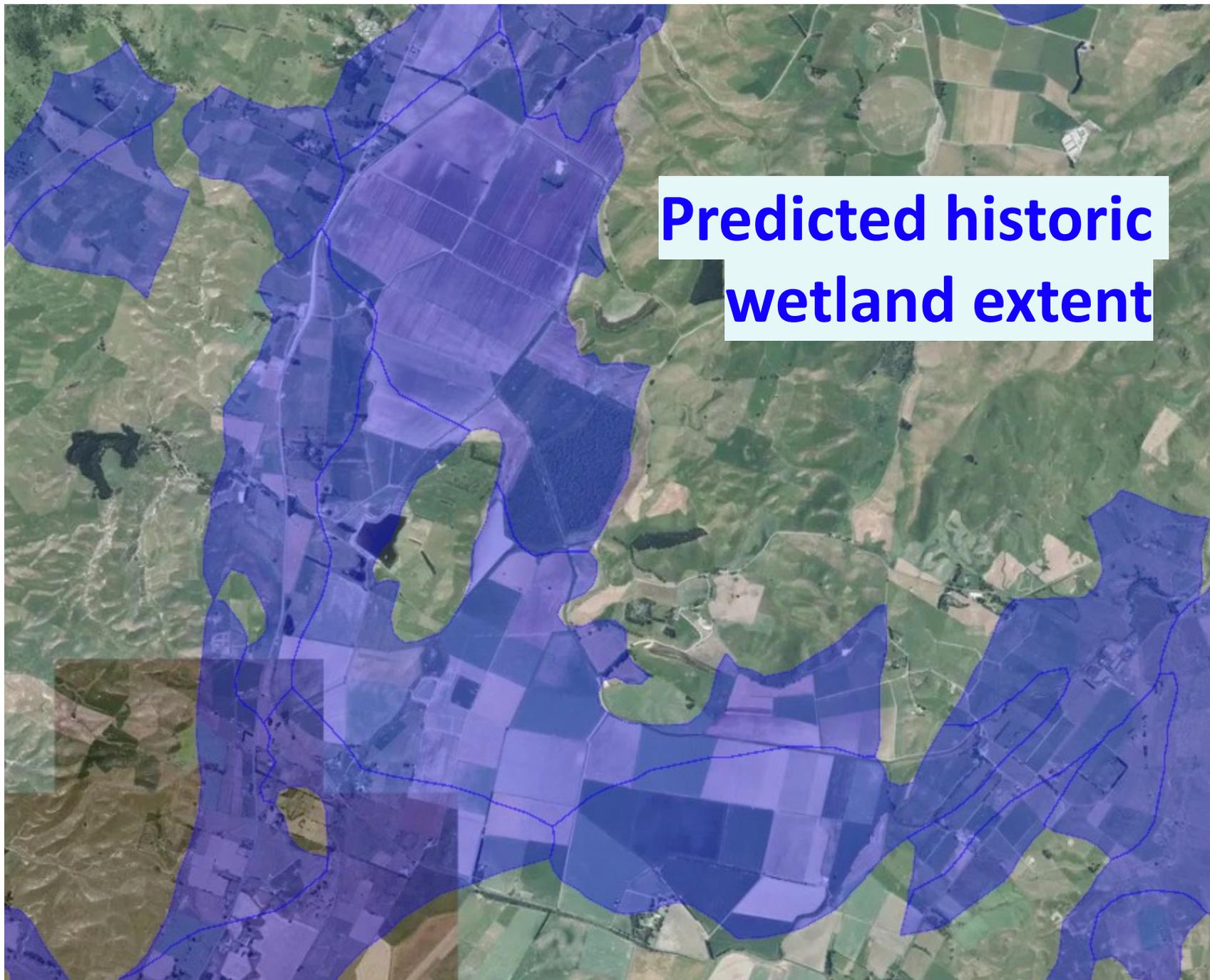


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Pre-Cyclone

Imagery sourced from the Ministry for the Environment and licensed for reuse under the CC 3.0 licence.





🔍 New Zealand Find address or place

+
-

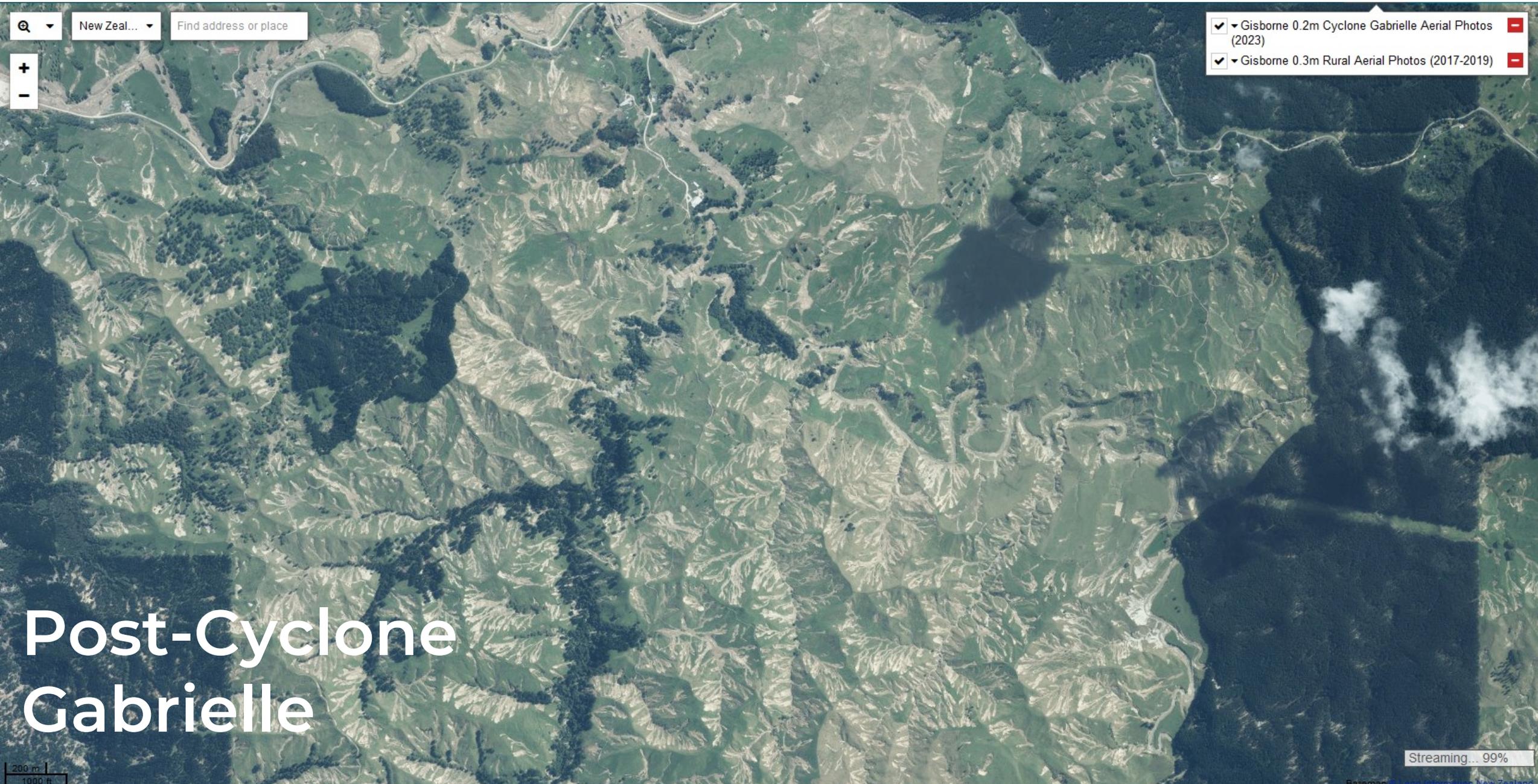
- Gisborne 0.2m Cyclone Gabrielle Aerial Photos (2023)
- Gisborne 0.3m Rural Aerial Photos (2017-2019)

Pre-Cyclone Gabrielle

500 m
1000 ft

Streaming... 99%

Basemap © Land Information New Zealand



🔍 New Zealand Find address or place

- ☑️ Gisborne 0.2m Cyclone Gabrielle Aerial Photos (2023) [Close]
- ☑️ Gisborne 0.3m Rural Aerial Photos (2017-2019) [Close]

Post-Cyclone Gabrielle

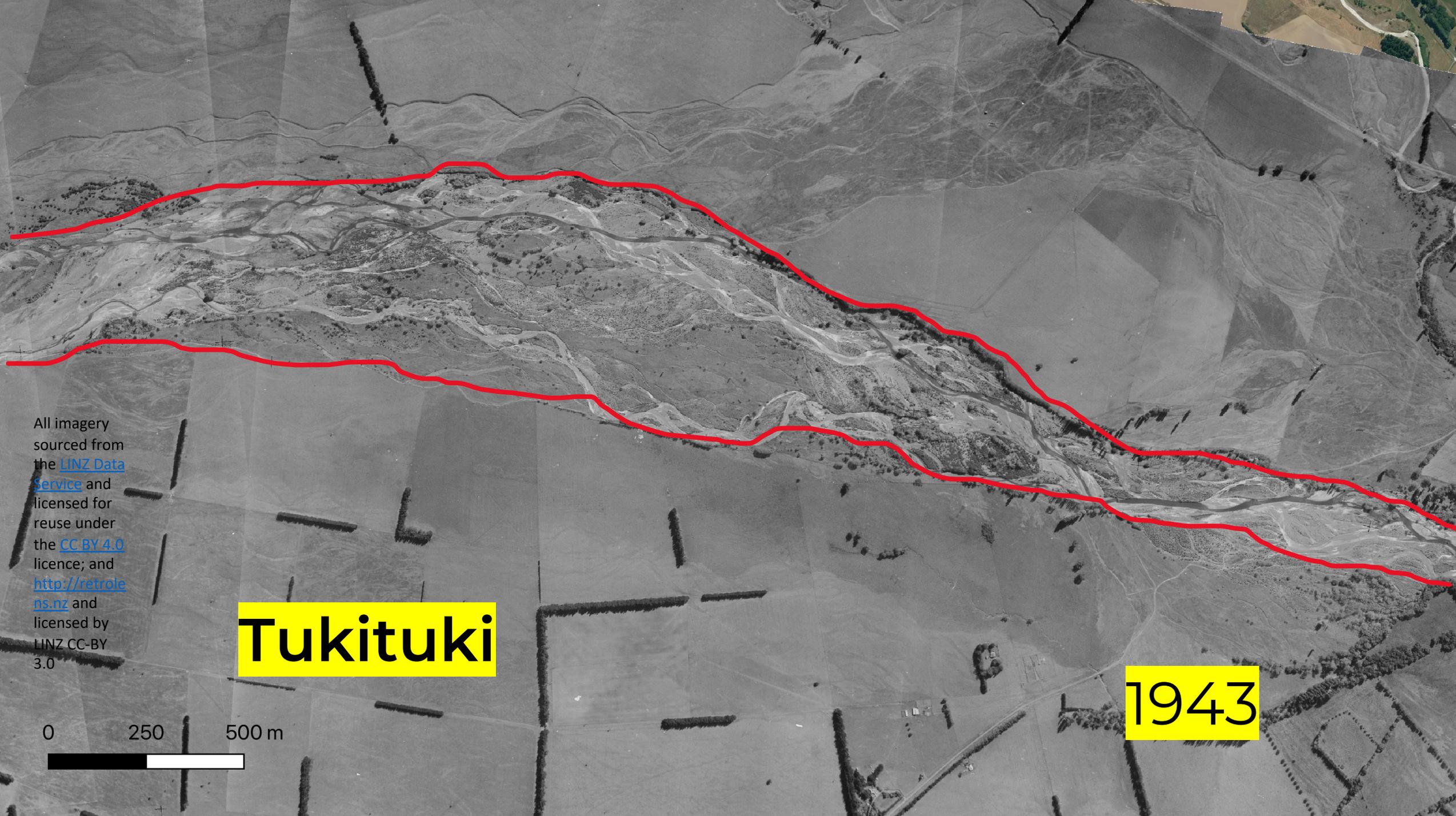
200 m
1000 ft

Streaming... 99%

Basemap © Land Information New Zealand

Image: Tom Kay
Sediment in Tutaekurī River,
Redclyffe Bridge



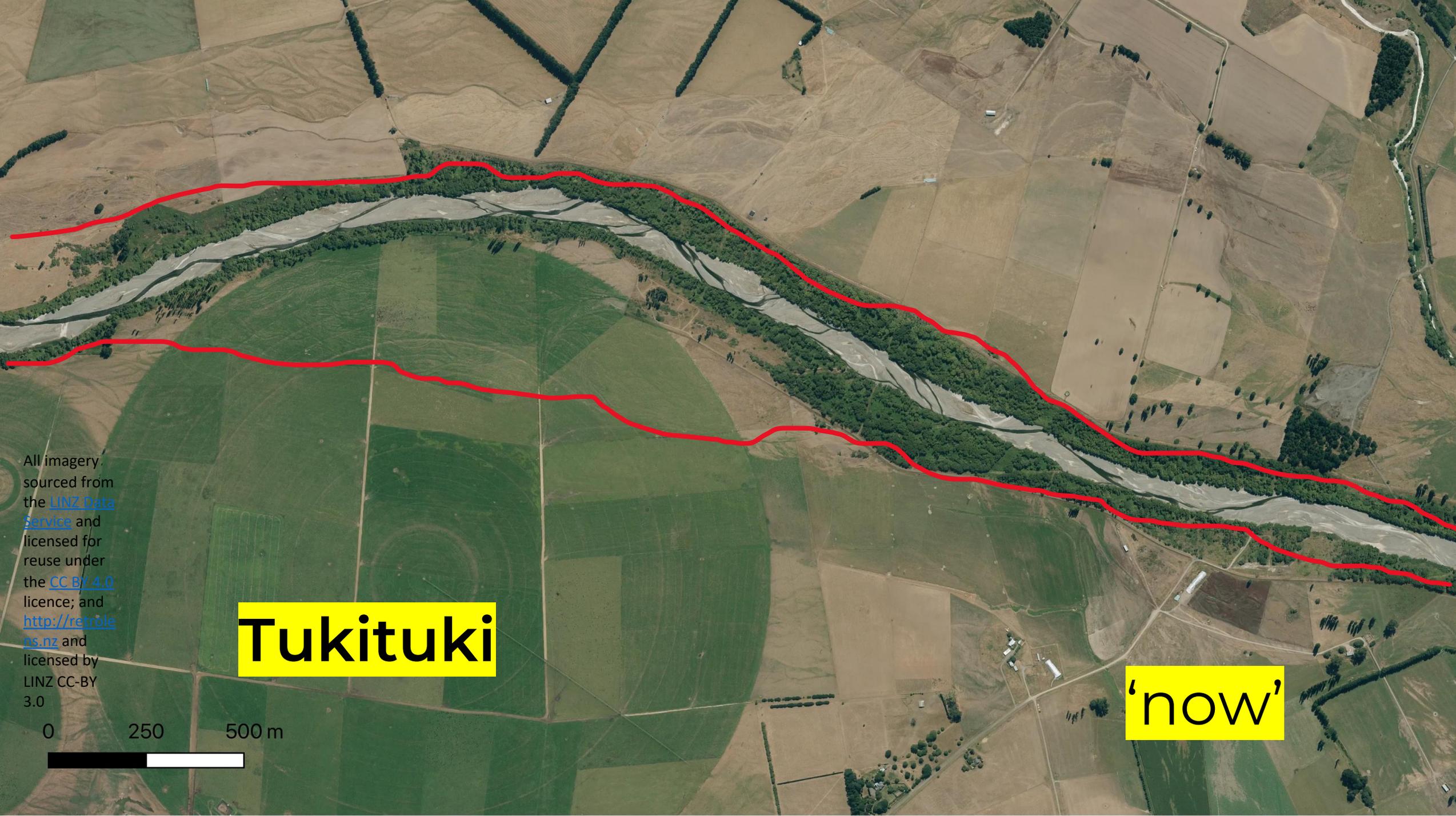


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Tukituki

1943



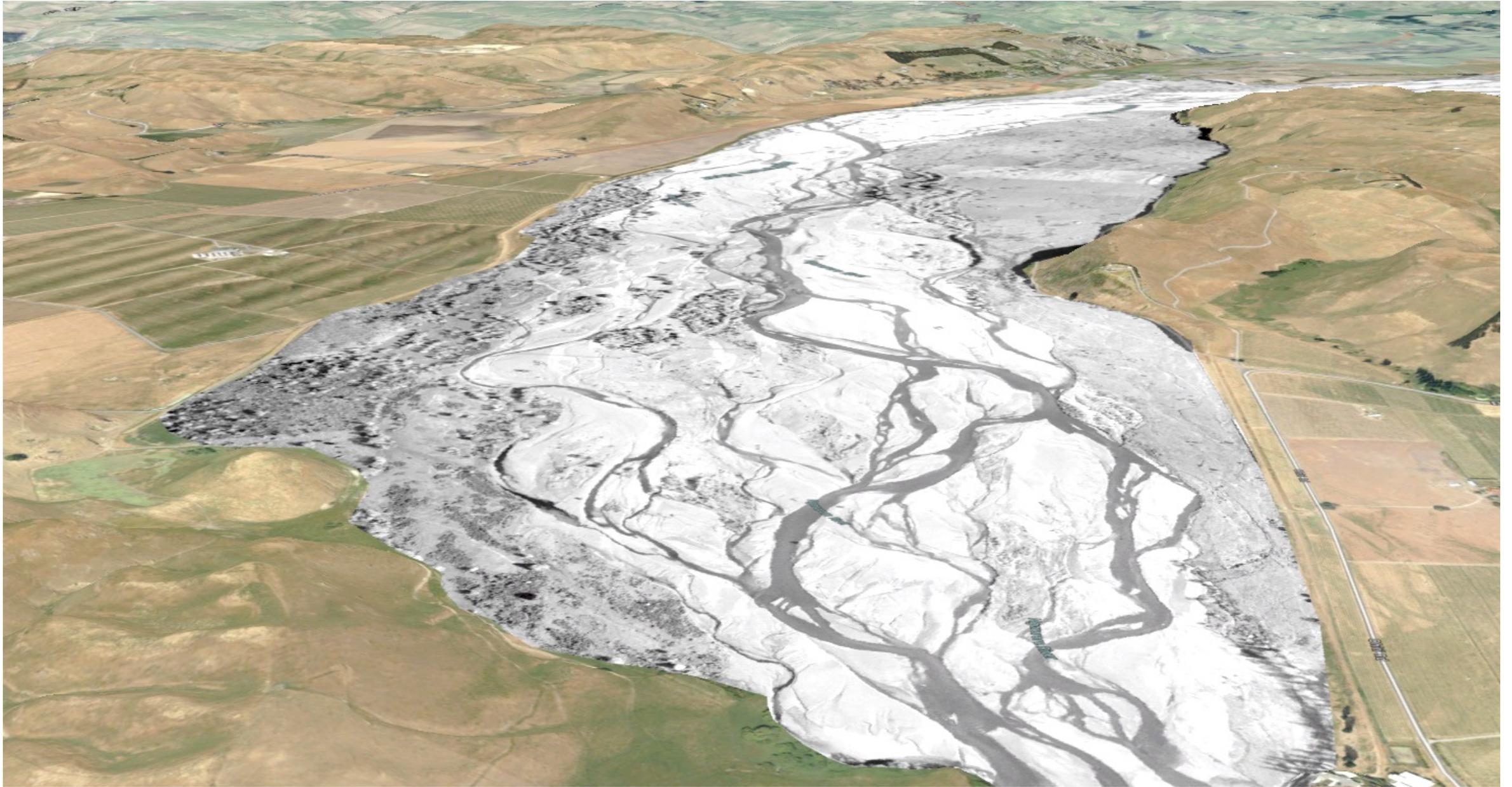


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Tukituki

'now'





Credit: Mike Shand, Tom Kay



Credit: Mike Shand, Tom Kay

NAPIER

TARADALE
JENNISTOWN
TOWN BOARD
DISTRICT

PAKOWHAI

CLIVE DISTRICT

H.E. WALSH
SURVEYOR-GENERAL
1922



Pt Block 33A WHARERANGI

Pt Block 30

LOT 2
D.P. 4032

Block 26

Blocks 27 & 28

VII
Block 52

VI
OMARUNUI

PIRAU NO 1

RAHUIRUA

WAHAKA

WAIPIROIRO

XI
OHIAKAREWA

LOT 6
D.P. 3328

PT LOT I
D.P. 1505

LOT I
D.P. 2376

XII

TOURAKAMAI

Park Rd Semetary

Block 35

Block 34

Block 33

Block 32

Block 31

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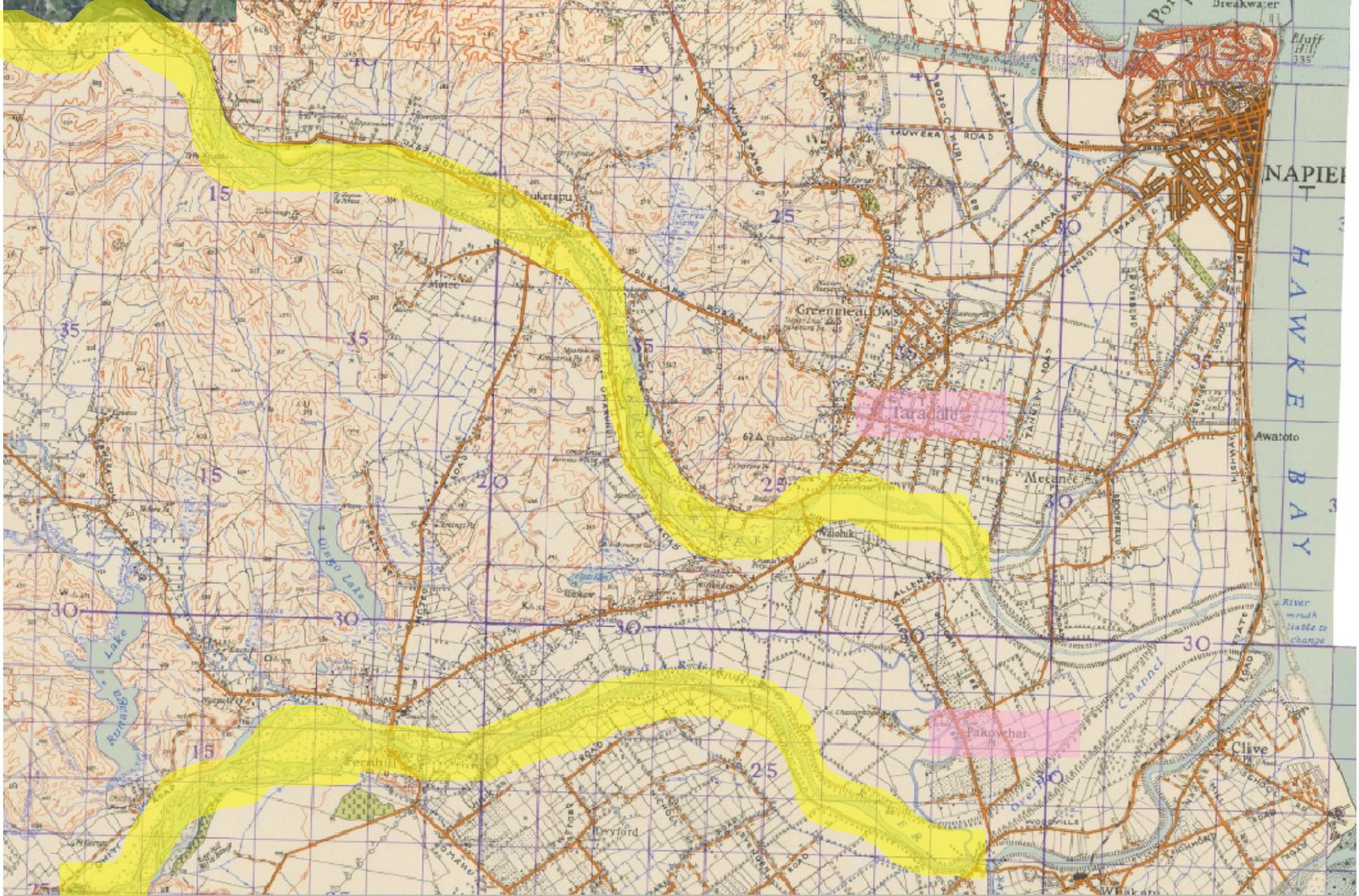
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NAPIER

HAWKE BAY

Taradale

Pakowhai

Channel

Clive

River mouth liable to change

Bluff Hill 135

Awatoto

over 50

25

25

20

15

15

30

30

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Breakwater

TAUWERA ROAD

ROAD

TARADALE ROAD

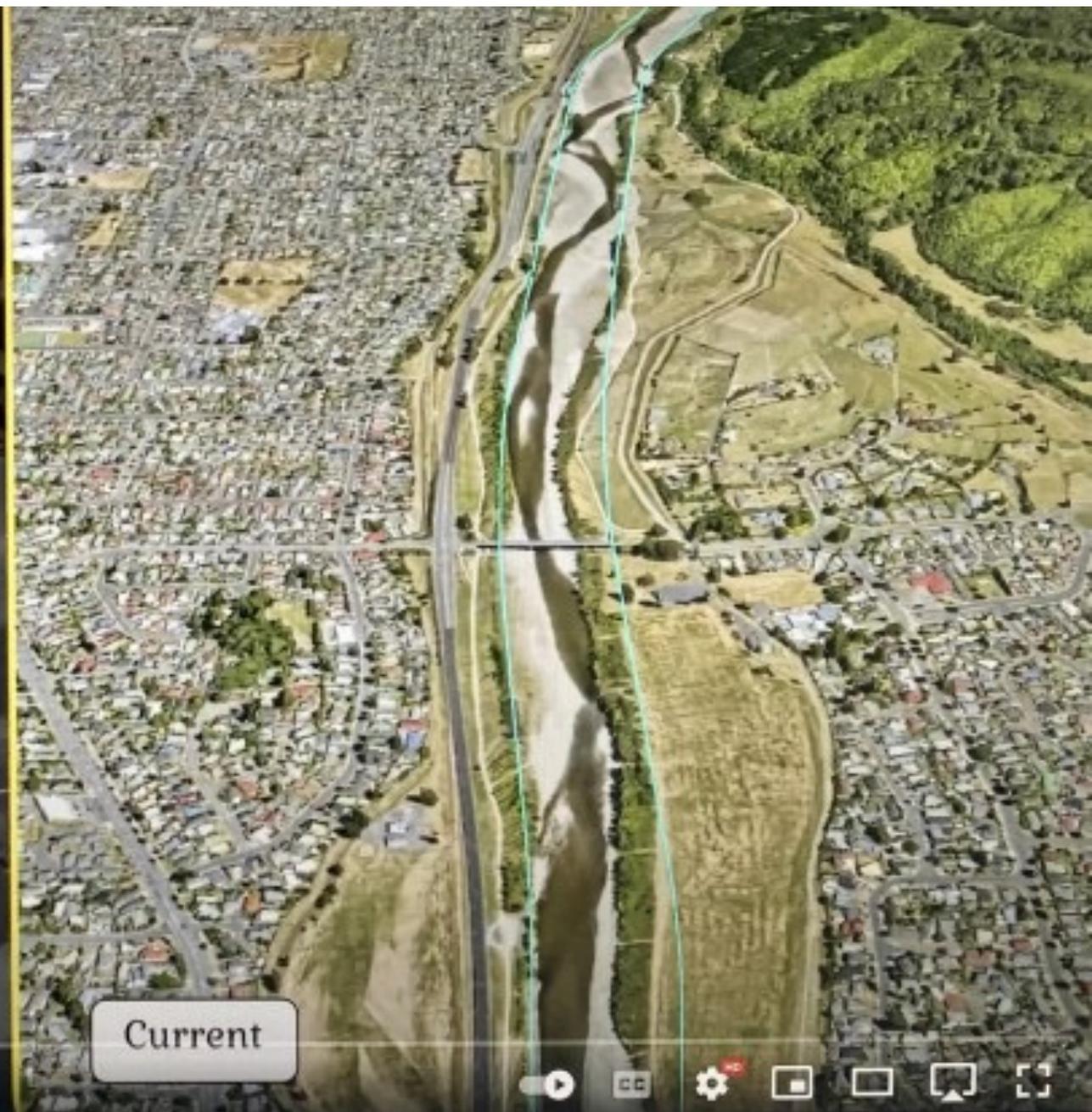


Ruamahanga
1944



**Ruamahanga
now**

Te Awa Kairangi / Hutt





Otaki



Otaki

Kukutauaki Stream

KUKUTAUAKI

awakahia

11038

KAPAKAPA

KAIWARU

RAU.O.TE.RANGI

R

OPOUA

WAIKAWAU

PAHIKAWAU

River Waimea

Waiamea

TUKURAKAU

KAWEWAI

PUKEKAWA

WAIMAHOE

TE HARA

River Waikanae

Waiamea

NEAHURUHURU

TE RERE

KAIWAHEHO

WAIKANAE

PEKA PERA

PA O TOATA

RIHIORANGI

Arapahua

W. 6. 46

KAITIINGA

KAIWAKA

TE UKUI

TE UKUI

OTAIHANGA

TE MANENE

KAIRAKAU

KATANUI

TE UHI

WHARE O TE KOPETE

KENAKENA

Old Course

Maringa tokiwhiri

about 3000 ft. high with

11/11/77



Source: Jon
Tunncliffe, Gary
Brierley, Ian Fuller /
Google Earth

Aerial Photos (Historic)



Find address or place



Aerial Photos (Historic)



Find address or place



**Taipo Stream
Tributary (?)
near Waterhouse
St, Taradale**



Photo – Tom Kay



Photo – Tom Kay



Photo: Tom Kay



Photo: Tom Kay

From 'Freshwater Ecology of Piped Streams in Wellington'



The Parade – Dover St



302 The Parade



Miramar Park



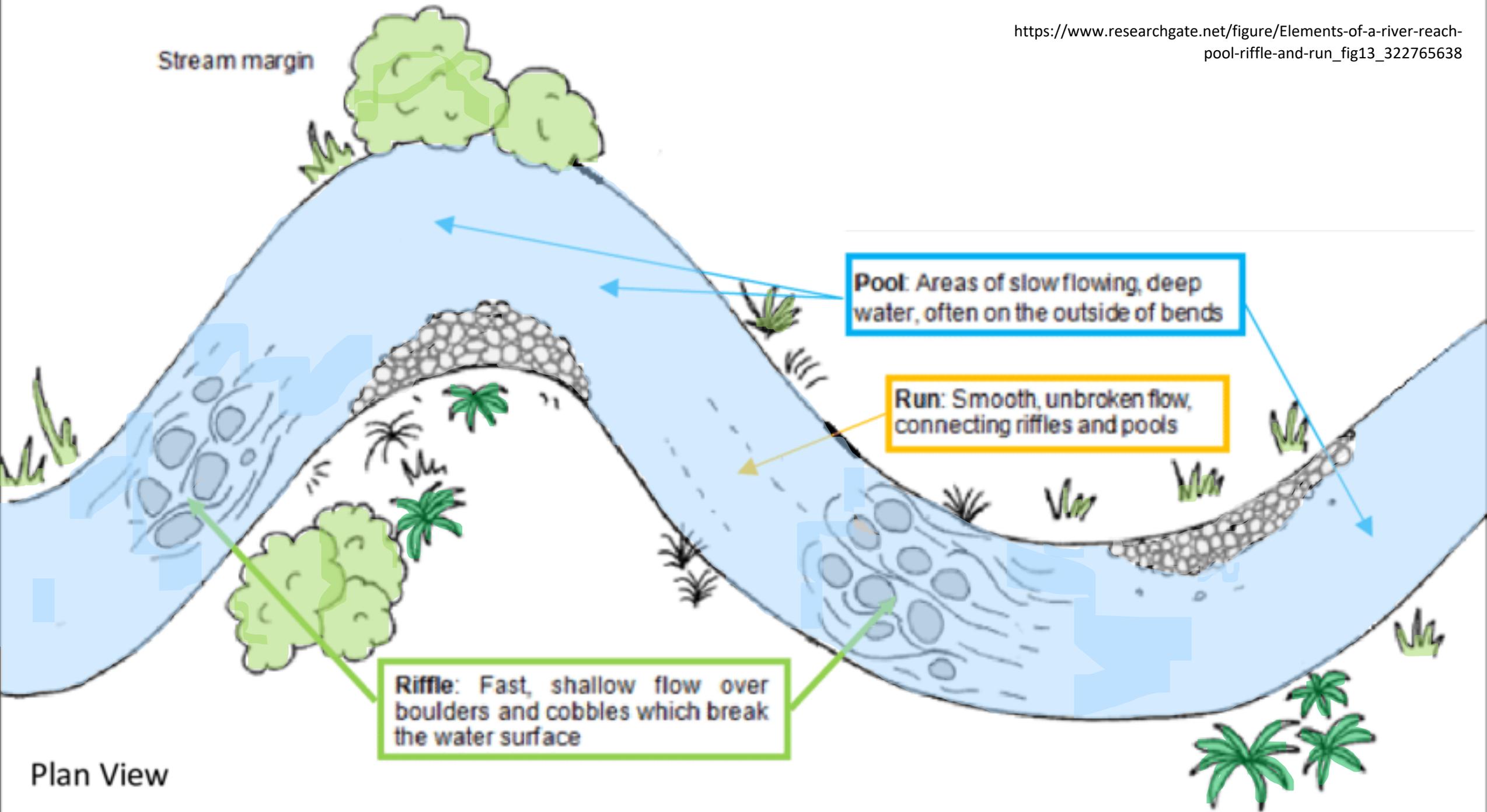
348 The Parade



Waipapa Stream



Miramar - Shops



Stream margin

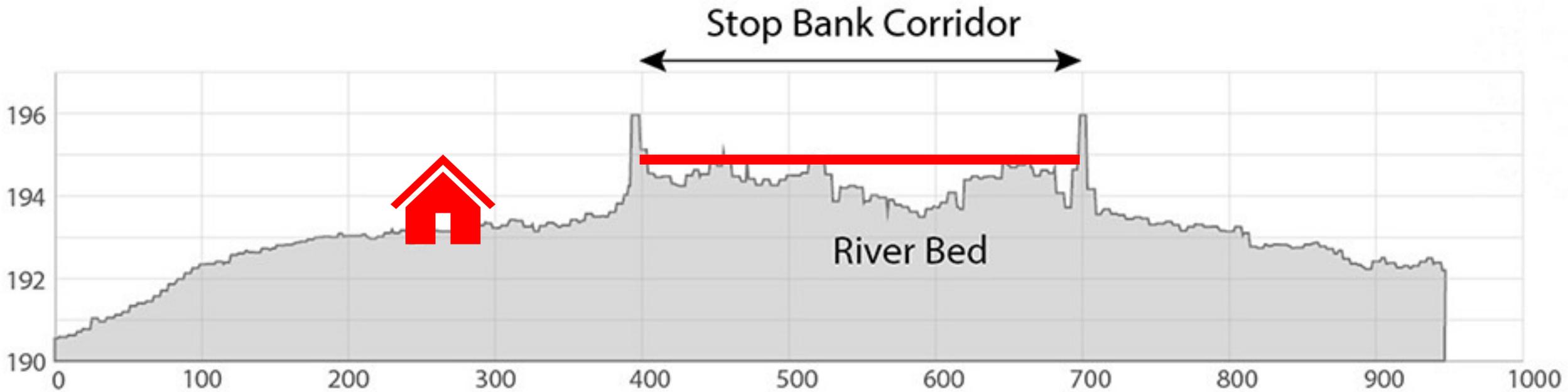
Pool: Areas of slow flowing, deep water, often on the outside of bends

Run: Smooth, unbroken flow, connecting riffles and pools

Riffle: Fast, shallow flow over boulders and cobbles which break the water surface

Plan View

Cross-section: Tukituki River



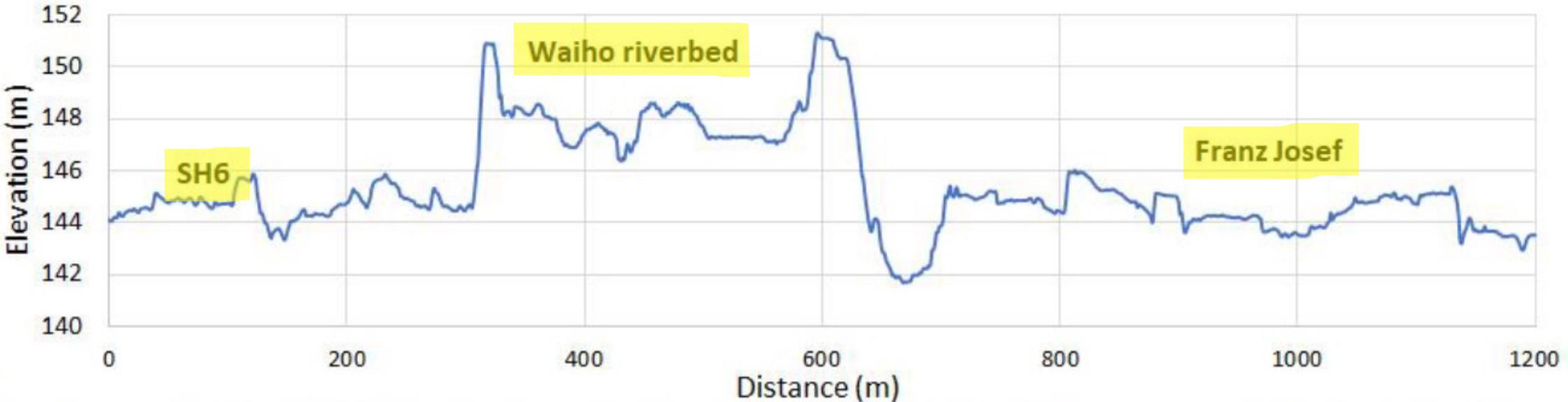
'Reanimating the strangled rivers of Aotearoa New Zealand.'

<https://wires.onlinelibrary.wiley.com/doi/full/10.1002/wat2.1624>

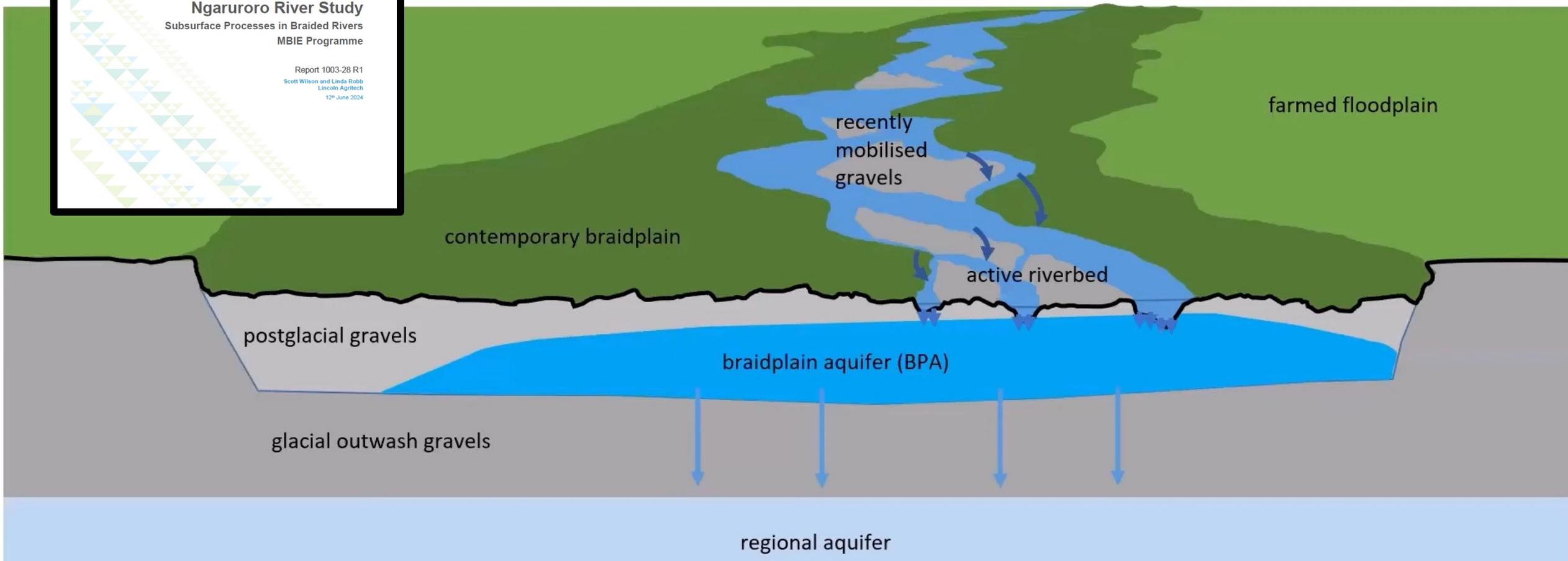
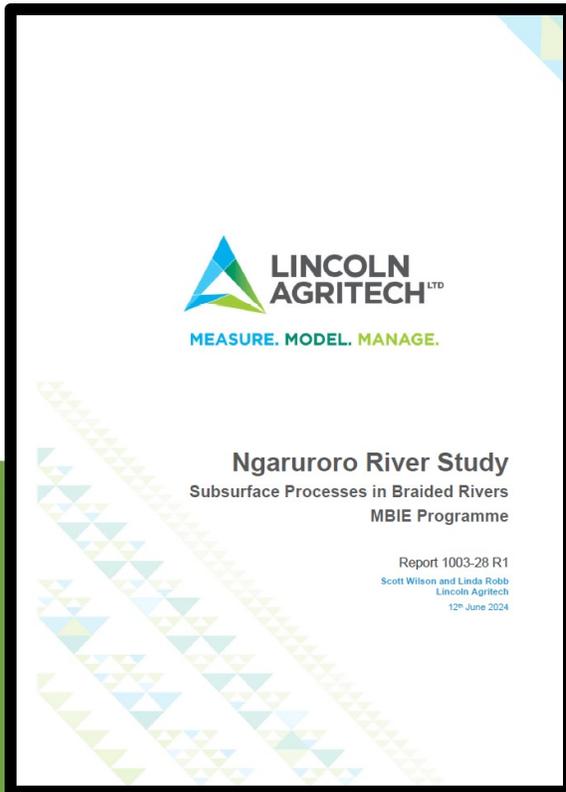
Cross section ———
Stopbanks ———

'Perched' Riverbeds: Waiho / Franz

Waiho River Cross Section - 400m Downstream of the SH6 Bridge



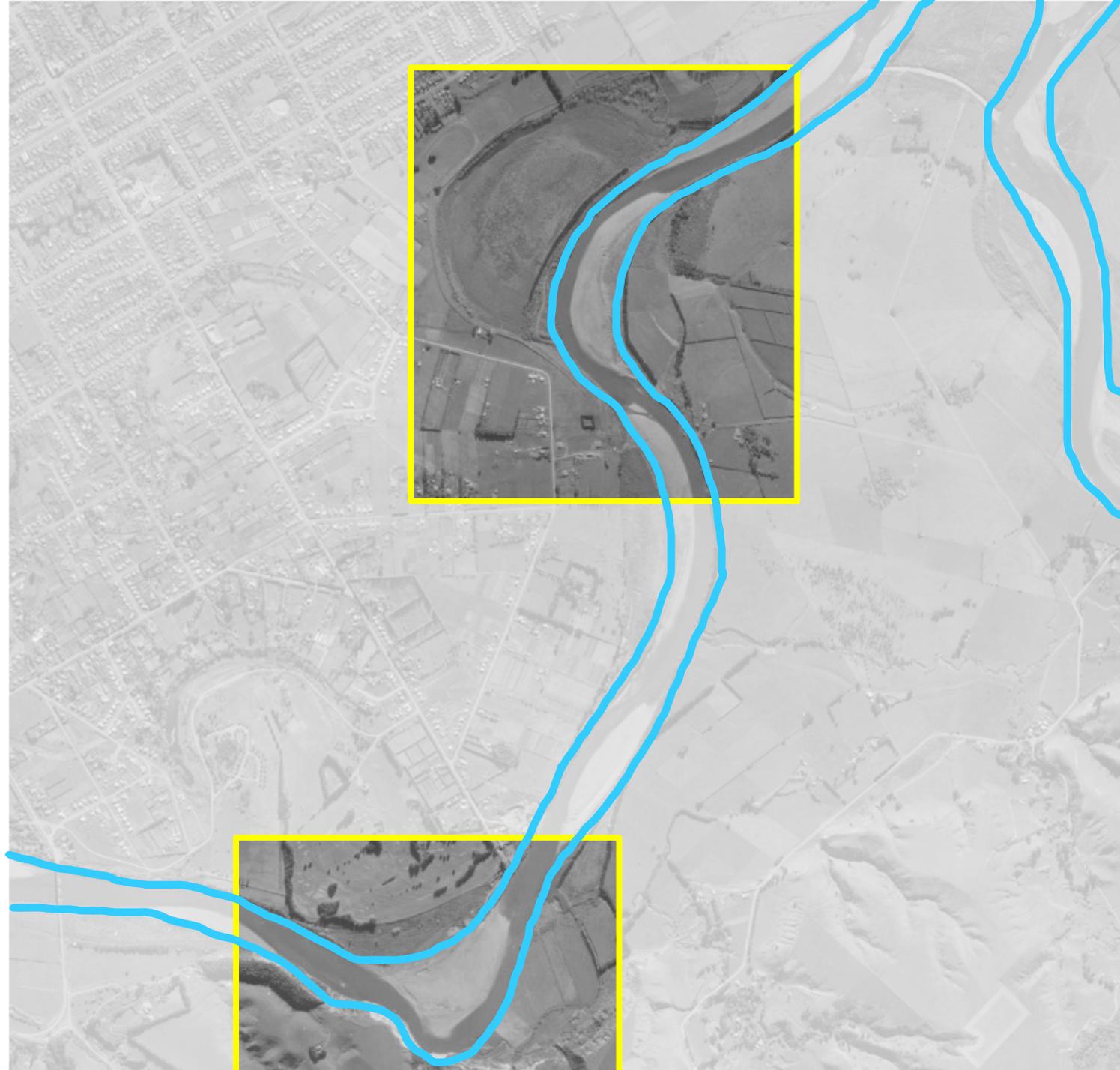
Groundwater Levels & Aquifer Recharge



Palmerston North

Manawatū River

1949



Palmerston North

Manawatū River

2022



Palmerston North, Manawatū River, 1949



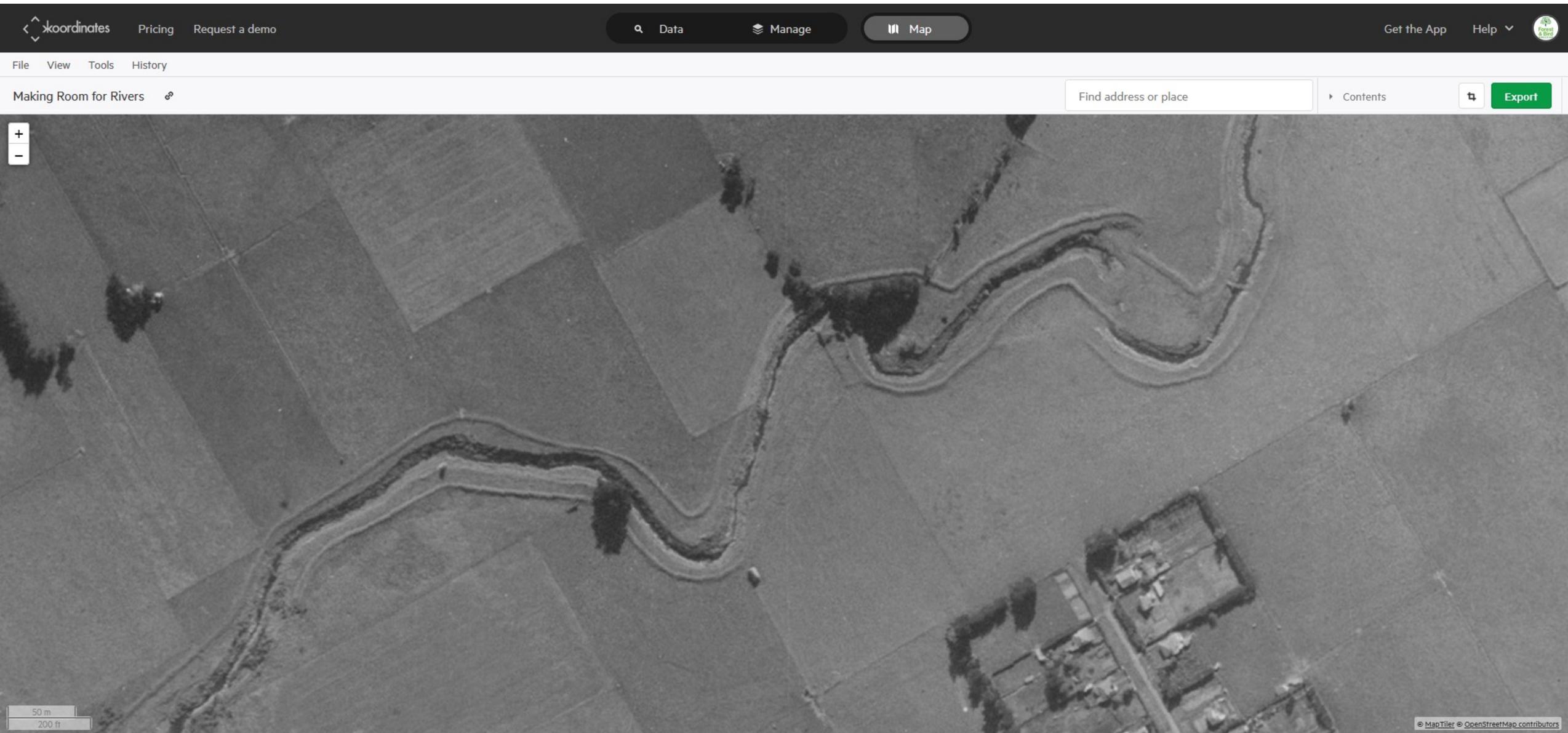
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Orthomosaic by Thomas Kay.

Palmerston North, Manawatū River, 2022



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Orthomosaic by Thomas Kay.

Mangaone, Palmerston North, 1949



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Mangaone, Palmerston North, 2022

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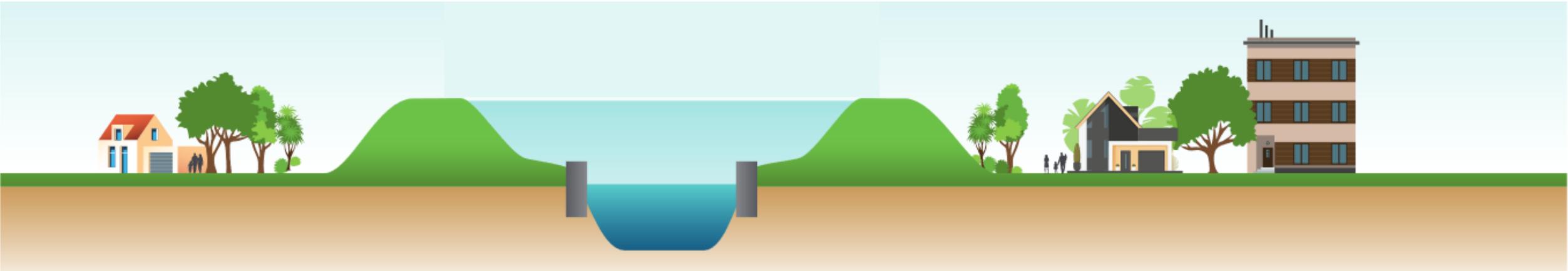


50 m
200 ft

© MapTiler © OpenStreetMap contributors

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From: Tukua Ngā Awa Kia Rere / Making Room for Rivers, Forest & Bird





The Square,
Palmerston North

Hokowhitu Lagoon



Manawatū River (LiDAR)

Existing flood protection 'unsustainable', warns Horizons chairperson

Manawatu reporter · 13:46, Apr 10 2023

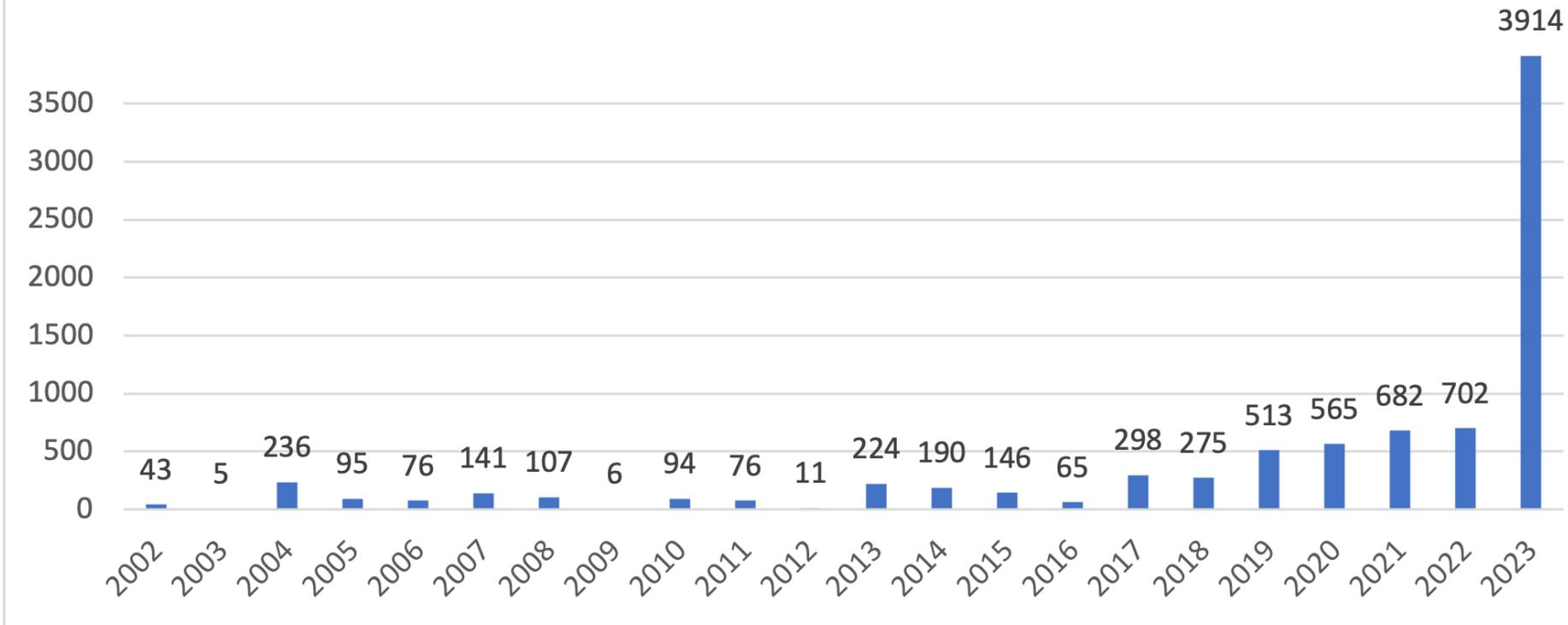


DAVID UNWIN/STUFF

Cyclone Gabrielle changed the landscape surrounding the Pohangina River.

<https://www.stuff.co.nz/manawatu-standard/news/300850095/existing-flood-protection-unsustainable-warns-horizons-chairperson>

Insurance payouts for weather-related damage, New Zealand NZ\$m, inflation adjusted to 2023



“The 2004 floods in the lower North Island were exceptionally bad. So bad that the insured damage for the entire year was not exceeded until 2017, McLachlan says. “Since then it has been exceeded every year. The total for 2023 exceeds that for the previous 14 years.”

“Treasury has put the cost of asset damage from the Auckland floods and Cyclone Gabrielle at between **\$9 billion and \$14.5 billion.”**

Jo Dighton rescues a
chicken from the
floodwaters during
Cyclone Gabrielle.
Hawke's Bay 14/02/23
Credit Steve Dighton



Received: 3 February 2022

Revised: 24 October 2022

Accepted: 5 November 2022

DOI: 10.1002/wat2.1624

FOCUS ARTICLE



WILEY

Reanimating the strangled rivers of Aotearoa New Zealand

Gary J. Brierley¹  | **Daniel Hikuroa**²  | **Ian C. Fuller**³  |
Jon Tunncliffe¹  | **Kristiann Allen**⁴  | **James Brasington**⁵  |
Heide Friedrich⁶  | **Jo Hoyle**⁷  | **Richard Measures**⁷ 

“working against nature does not work”

**“[we] may inadvertently be
manufacturing future disasters”**

"moving out of harm's way saves lives"

Parliamentary Commissioner
for the Environment

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copy 2.

**INQUIRY INTO FLOOD
MITIGATION MEASURES FOLLOWING
CYCLONE BOLA**

“...extensive deforestation... has led to... greatly accelerated, widespread, severe erosion...”

“draining of wetlands has intensified flooding problems in many areas...”

“...unwise intensive development behind stopbanks has often been encouraged”

Report of the Hawke's Bay Independent Flood Review

July 2024



HAWKE'S BAY
INDEPENDENT
FLOOD REVIEW
Pae Matawai Parawhenua

“...since the flood event there has been a widespread desire to build new stopbanks... However, lessons must be learnt from the fact that the flood completely overwhelmed the stopbanks..”

“...there were relatively new housing developments in areas of known flood risk [suggesting] that lessons from the past have not been learnt and development has been allowed in high-hazard areas.”

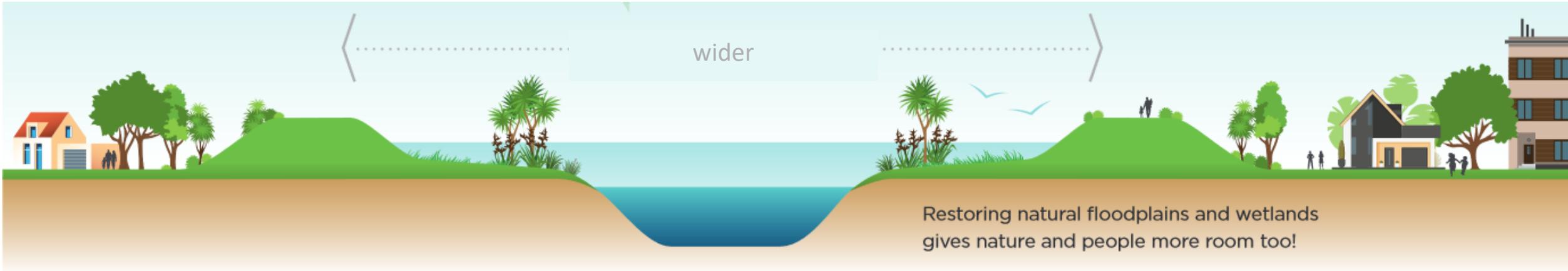
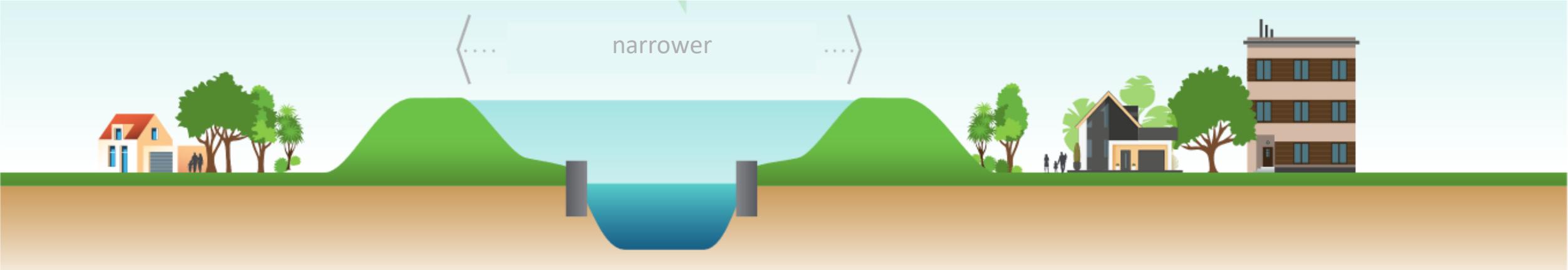
Report of the Hawke's Bay Independent Flood Review

July 2024



HAWKE'S BAY
INDEPENDENT
FLOOD REVIEW
Pae Matawai Parawhenua

“...need to re-imagine legacy systems so they are fit for purpose and reflect the evolving best practice of “Making Room for the River””



Mayor supports 'Making Space for Water'

Te Auaunga /Oakley creek, Wesley
27 January 2023



Te Auaunga /Oakley creek, Wesley
31 January 2023



4 days later



Home / New Zealand

Auckland flood relief: Council, Government to unveil \$1 billion+ package to buy out hundreds of homes

By [Bernard Orsman](#)
24 Aug, 2023 05:00 AM ⌚ 5 mins to read

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From [Leigh Steckler, Auckland Council](#) – Making Space for Water - <https://www.resilientrivers.nz/webinar-recordings>

<https://www.nzherald.co.nz/nz/auckland-council-and-government-set-to-unveil-1-billion-plus-package-to-buy-out-700-homes-and-meet-other-storm-related-costs/73AUQGKWWFFW7BN2LGK5VLACRI/>

**Te Wai
Takamori o
Te Awa
Kairangi**

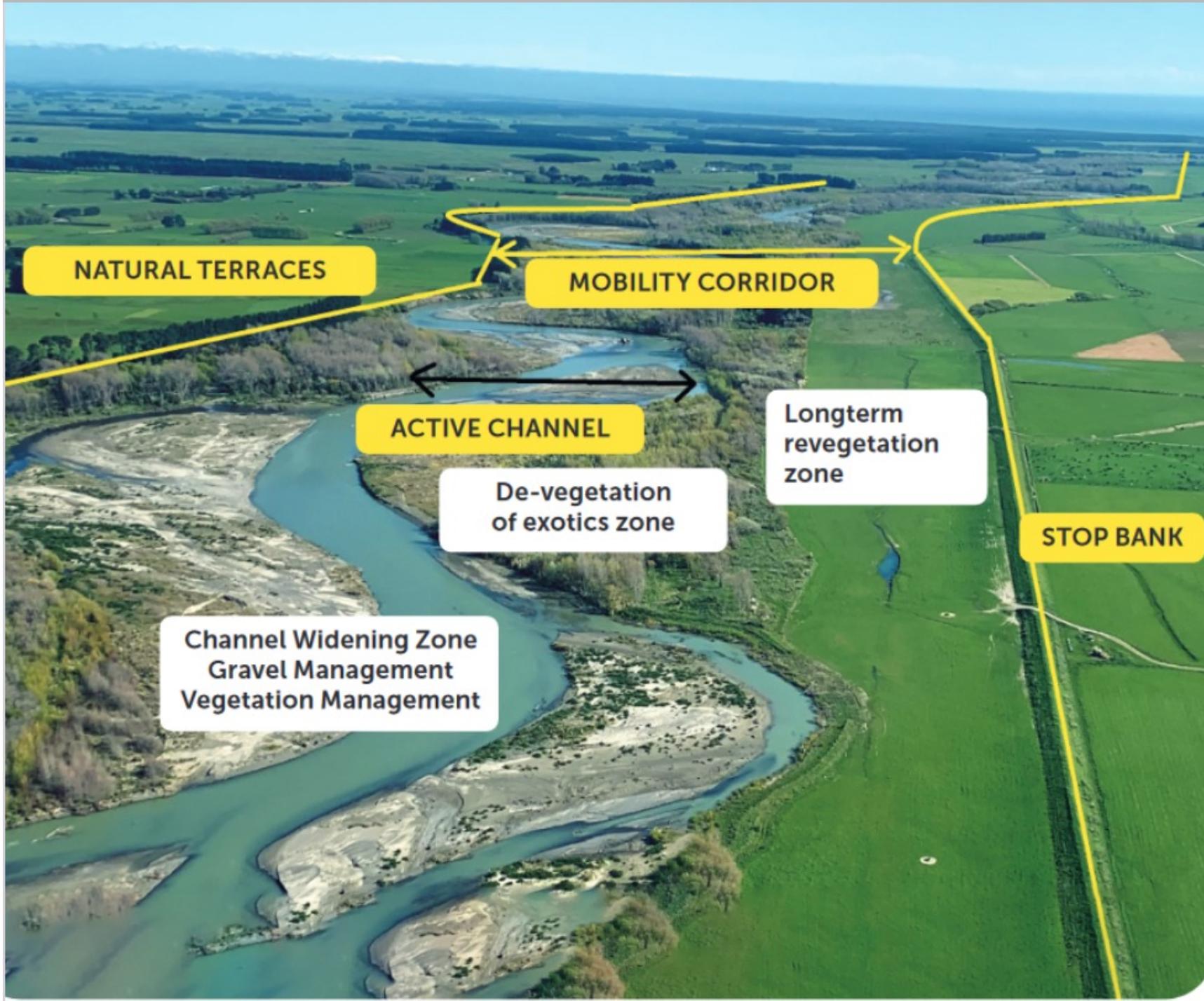
Lower Hutt



**Te Wai
Takamori o
Te Awa
Kairangi**

Lower Hutt





Auckland Council reveals new proposal for Takapuna Golf Course

11:35 am on 7 July 2025

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Auckland Council's rendering of a proposal for Takapuna Golf Course. Photo: AUCKLAND COUNCIL

<https://www.rnz.co.nz/news/national/566169/auckland-council-reveals-new-proposal-for-takapuna-golf-course>

River Isar, Munich





**Urutau, ka taurikura:
Kia tū pakari a Aotearoa
i ngā huringa āhuarangi**
**Adapt and thrive: Building a
climate-resilient New Zealand**

AOTEAROA NEW ZEALAND'S
FIRST NATIONAL ADAPTATION PLAN



Responding to a changing climate

The Government's
climate strategy



Te Kāwanatanga o Aotearoa
New Zealand Government

IN DEPTH

1415 new homes consented on Auckland flood plains in the year since flooding disaster

8:31 am on 26 January 2024

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Kate Newton, Senior Journalist, In Depth

[@katnewtonnz](#)

Discussion document

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Freshwater



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3



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Fast-track Approvals Act 2024

If you need more information about this Act, please contact the administering agency: **Ministry for the Environment**

- Version updated on 17 July 2025 to make an editorial change to clause 5 of Schedule 5.

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Versions and amendments

Secondary legislation

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Version as at 30 May 2025



Fast-track Approvals Act 2024

Public Act 2024 No 56

Date of assent 23 December 2024

Commencement see section 2

Note

The Parliamentary Counsel Office has made editorial and format changes to this version using the powers under [subpart 2](#) of Part 3 of the Legislation Act 2019.

Note 4 at the end of this version provides a list of the amendments included in it.

This Act is administered by the Ministry for the Environment.

COMMENT

Going it alone – how not to prepare for climate change

This week's climate adaptation report ruling out property buyouts is one of the most philosophically misguided, morally questionable, administratively inept, and politically naïve documents seen in years, says Professor Jonathan Boston



by **Jonathan Boston** 11/07/2025

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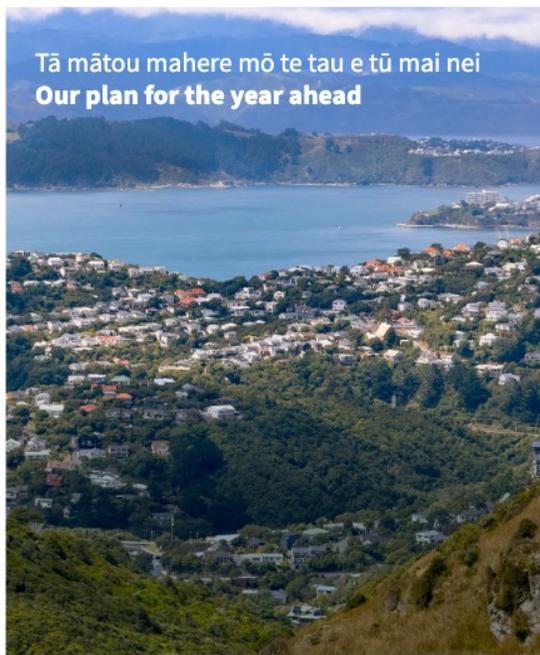


KO TE PAE TAWHITI LONG TERM PLAN

TE PANE MATUA TAIAO
GREATER WELLINGTON
2024-34



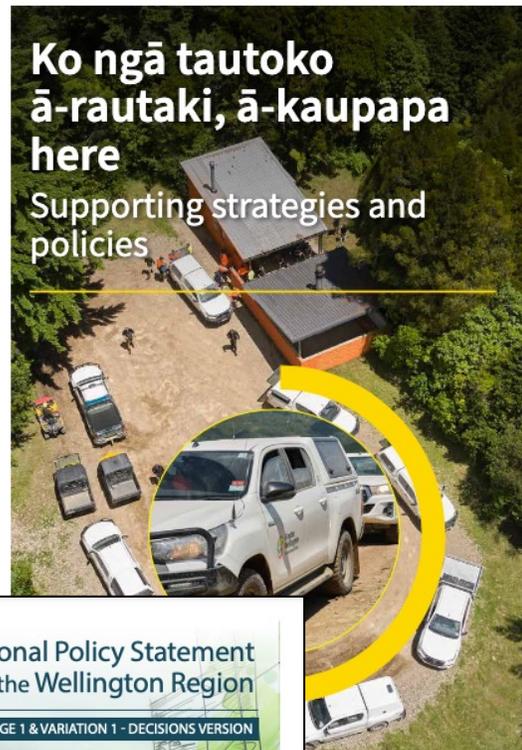
Tā mātou mahere mō te tau e tū mai nei
Our plan for the year ahead



TE PANE MATUA TAIAO
GREATER WELLINGTON

**Pūrongo ā Tau 2025/26
Annual Plan 2025/26**

Ko ngā tautoko
ā-rautaki, ā-kaupapa
here
Supporting strategies and
policies



Regional Policy Statement
for the Wellington Region

PROPOSED CHANGE 1 & VARIATION 1 - DECISIONS VERSION



Te Tikanga Taiao o Te Upoko o Te Ika a Maui
Natural Resources Plan
for the Wellington Region



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Rangitata / Rakitata

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1937

“A possible effect of climate change is that cyclones of some form could pass close to New Zealand with increasing frequency. It may be that in retrospect the Bola storm will not be regarded as such an extreme event.”

“In the interests of future generations... government cannot allow the... nation’s floodplain land to be unwisely used.

Reanimating the strangled rivers of Aotearoa New Zealand

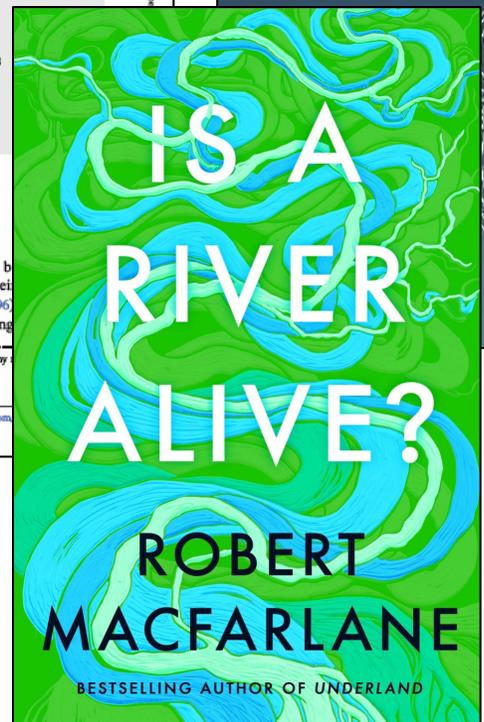
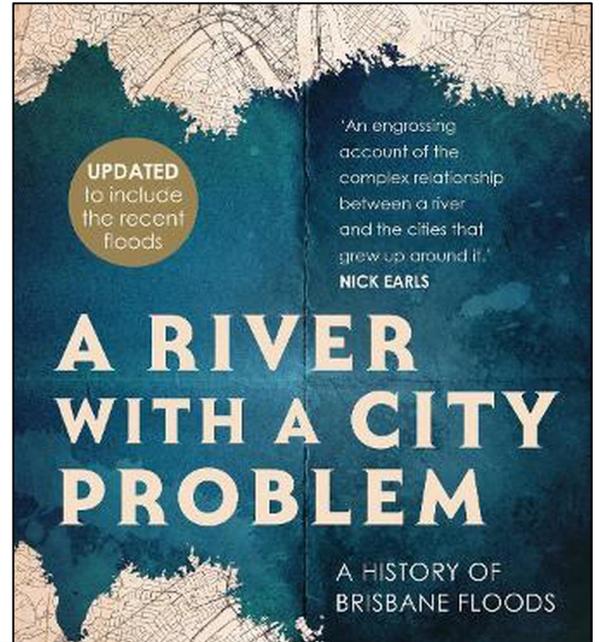
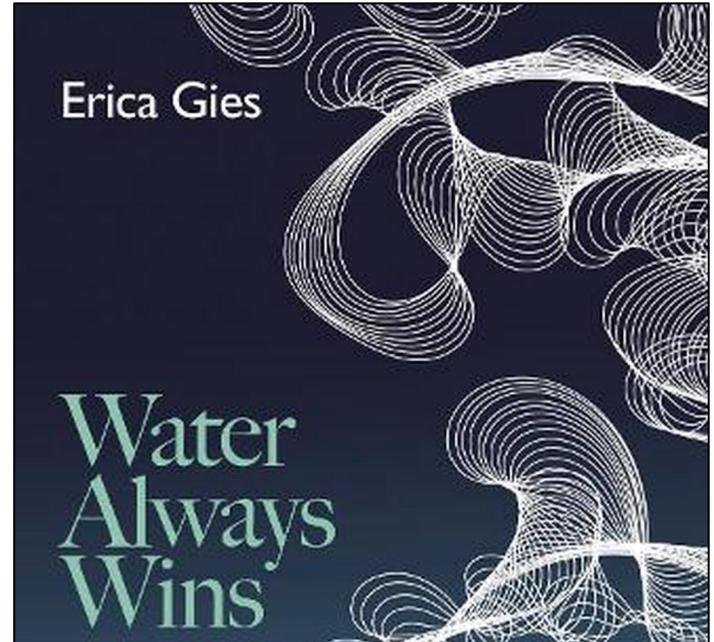
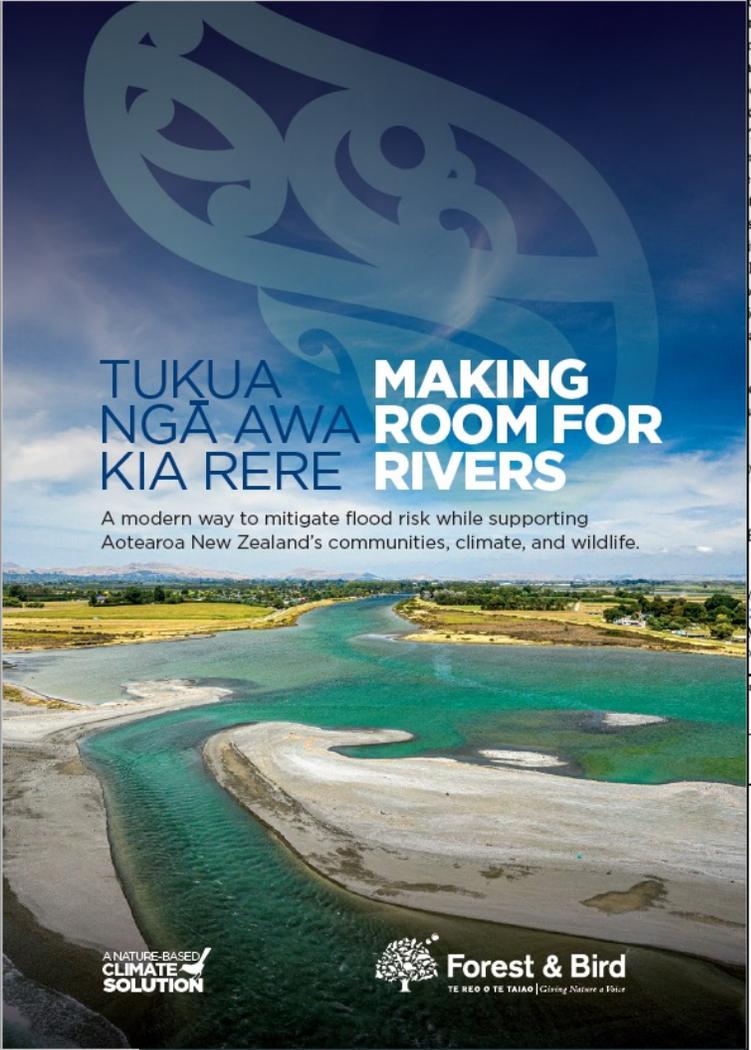
Gary J. Brierley¹ | Daniel Hikuroa² | Ian C. Fuller³ |
Jon Tunnicliffe¹ | Kristiann Allen⁴ | James Brasington⁵ |
Heide Friedrich⁶ | Jo Hoyle⁷ | Richard Measures⁷

¹School of Environment, University of Auckland, Auckland, New Zealand

Abstract

Artificially confined (strangled) intensified land use in riparianised land use in riparianising the functionality of rivers and associated socio-cultural relations and risk by promoting developability to adapt to changing conditions. To date, uptake of space-to-side interventions such as shortcomings is yet the fact that such practices of river restoration are indivisible, assert Māori rights alongside riparianity as a foundational driver for uptake of physical prioritization framework-to-move interventions in riparianity, and evolutionary trajectories.

2022 John Wiley & Sons Ltd. *Water*, 14(12), e1634. <https://doi.org/10.1002/wat2.1634>



RNZ News Life Radio Podcasts Series Te Ao Māori Pacific IndoNZ 中文

From **In Depth Special Projects**, 8:00 am on 2 December 2024

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Kate Newton, Senior Journalist, In Depth
[@katnewtonnz](#)

Room for the river

By Kate Newton

Since the 1950s, the Ngaruroro River in Hawke's Bay has been steadily and deliberately restricted to a channel half its former width. As the likelihood of extreme flooding increases, is it time to re-imagine its future?