Eco-index®

Guiding Biodiversity Investment

National Science Challenges

NEW ZEALAND'S BIOLOGICAL HERITAGE

Ngā Koiora Tuku Iho

The Eco-index™ programme: a nationwide biodiversity vision and approach to restoration monitoring

Aotearoa New Zealand National Science Challenges

Established in 2014

11 cross-disciplinary, mission-led Challenges

Addressing science-based wicked problems

$680 million Ministry of Business, Employment and Innovation funding over ten years – currently in tranche 2

The Eco-index is a $3.1 million programme running 2020-2024.

A gold sponsor of this conference

NEW ZEALAND'S BIOLOGICAL HERITAGE

Ngā Koiora Tuku Iho

National Science Challenges

Aim:
to protect and manage Aotearoa New Zealand's biodiversity, improve our biosecurity and enhance our resilience to harmful organisms

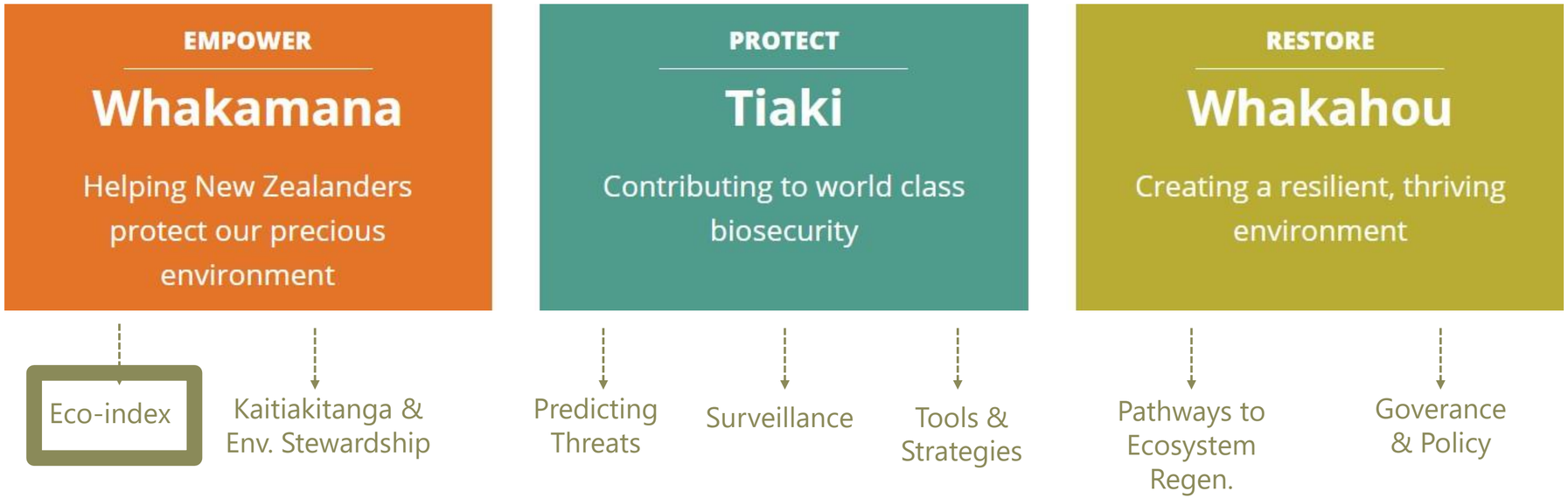
National Science Challenges

New Zealand's Biological Heritage | Ngā Koiora Tuku Iho

NEW ZEALAND'S BIOLOGICAL HERITAGE

Ngā Koiora Tuku Iho

Constituent programmes are grounded in values that embrace Te ao and mātauranga Māori.



This Challenge is hosted through Manaaki Whenua Landcare Research and programmes subcontracted to different research institutions across the motu.

The Eco-index's objective

To link current *investment* in biodiversity with the *impact* on biodiversity across many different land types…

…and to identify the best investment actions for reversing biodiversity decline

Eco-index

Guiding Biodiversity Investment

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Co-lead

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Indicator specialist & environmental economist

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Senior ecologist

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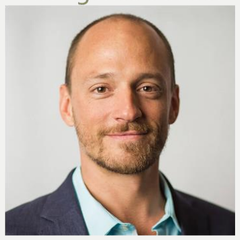
Strategic & Artificial Intelligence advisor



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Data modeller

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Communication & relationships manager

MONIQUE HALL

Research assistant

OLIVIA STEAD

Research assistant

PENNY PAYNE

Social scientist

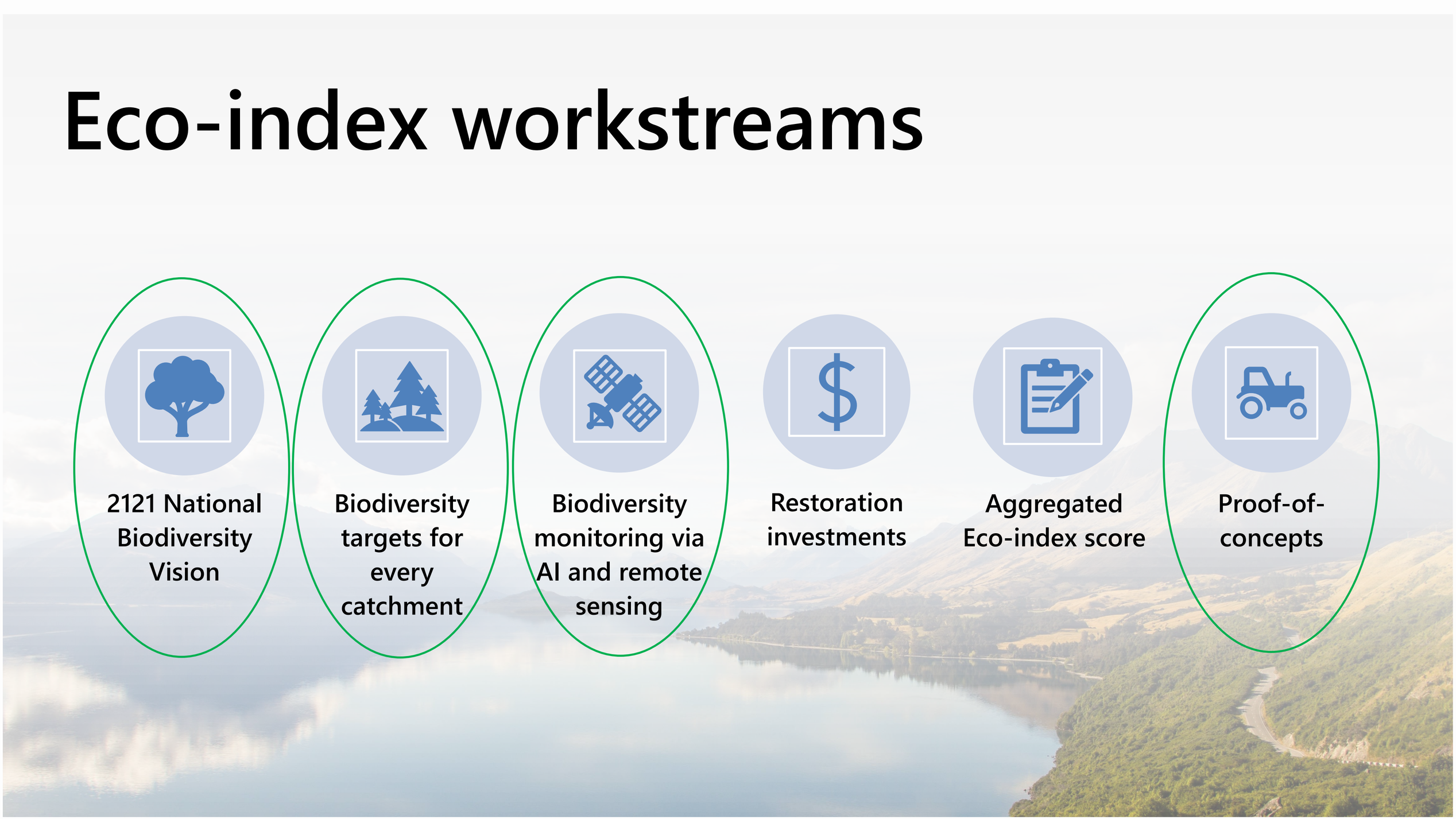
WENDY BOYCE

Social scientist

SAIF KHAN

Postdoc – Data scientist

Eco-index workstreams



2121 National Biodiversity Vision

Biodiversity targets for every catchment

Biodiversity monitoring via AI and remote sensing

Restoration investments

Aggregated Eco-index score

Proof-of-concepts

2121
National Biodiversity Vision

2121 National Biodiversity Vision

Protect – Tiaki

Kia haumaru te mauri o te taiao

Protect native ecosystems from threats

Restore – Whakahou

Kia whakahoki te mauri o te taiao ki te taumata e hiahia ana e tātau

Restore native ecosystems in every catchment to a minimum of 15% of original extent

Connect – Tūhono

Ko te mauri o te taiao te taukaea honohono mai i uta, tae atu ki tai

Connect native ecosystems from mountains to the sea

2121

Kia whakarewa ai tātau i te mauri, kia tae atu ki tōnā taumata

Achieve long term biodiversity targets by taking incremental steps together

Restore – Whakahou

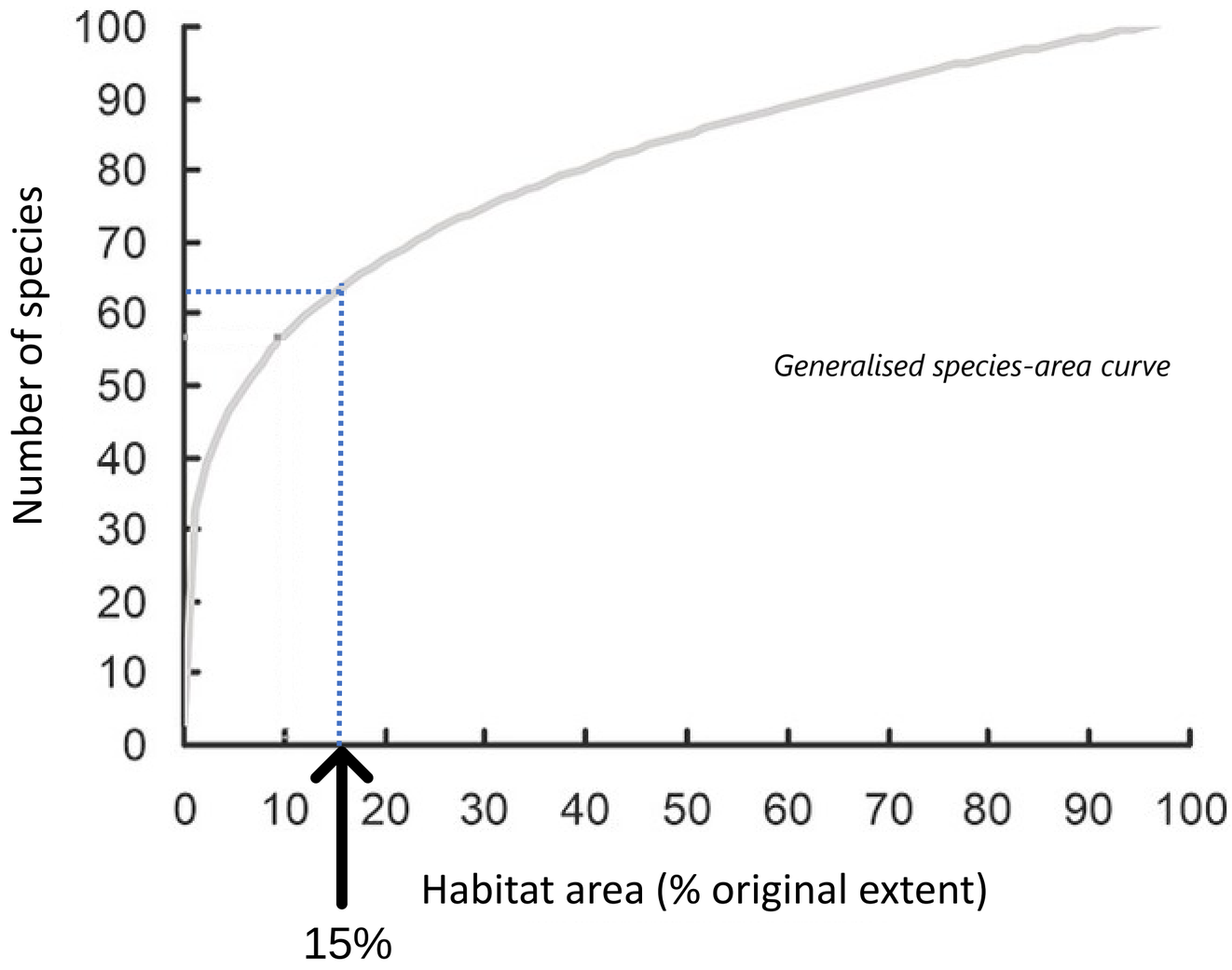
Biodiversity targets for every catchment

Biodiversity targets based on species-area relationship

Restore native ecosystems in every catchment to a minimum of 15% of original extent

Kia whakahoki te mauri o te Taiao ki te taumata e hiahia ana e tātau

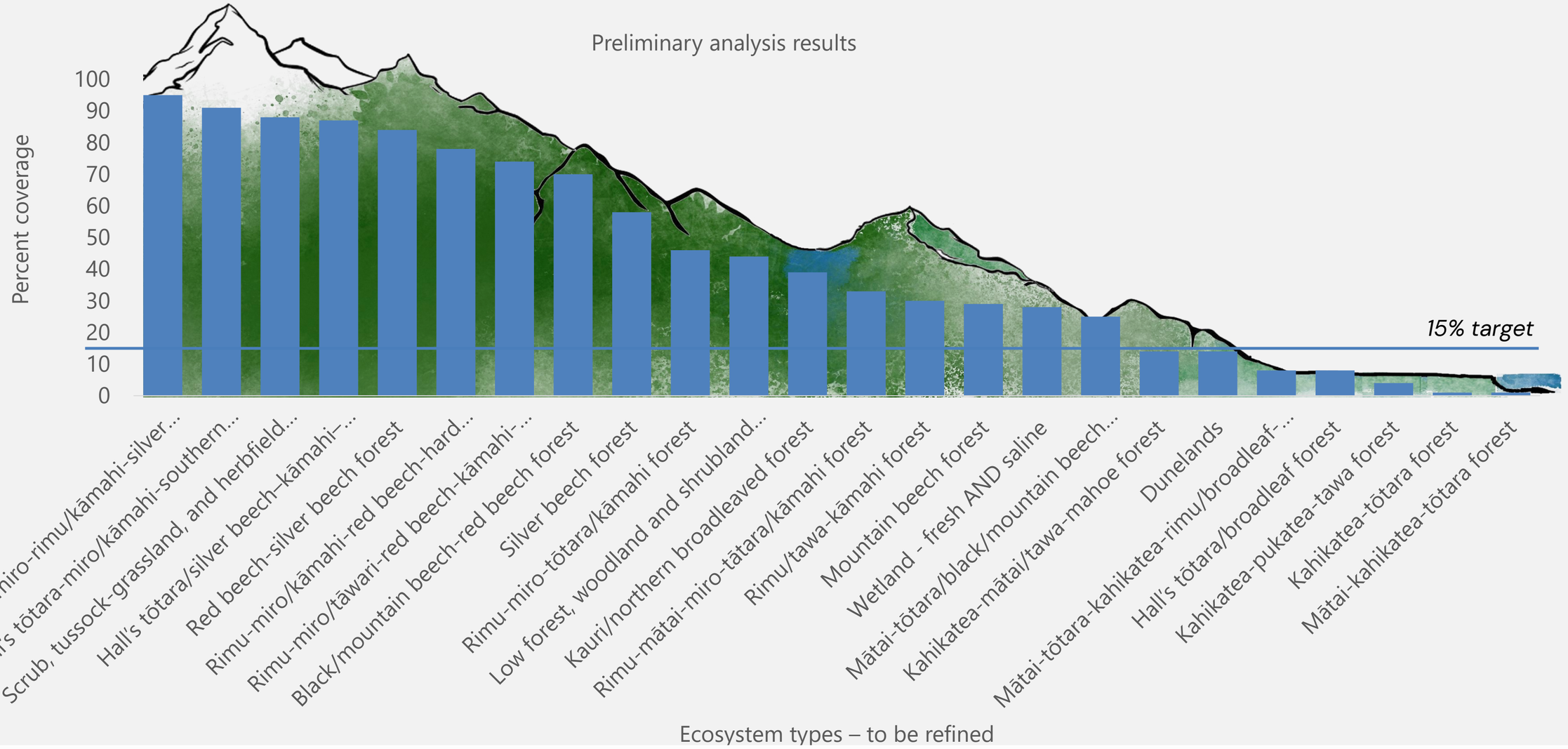
To restore the mauri of the ecosystem to the standard we want

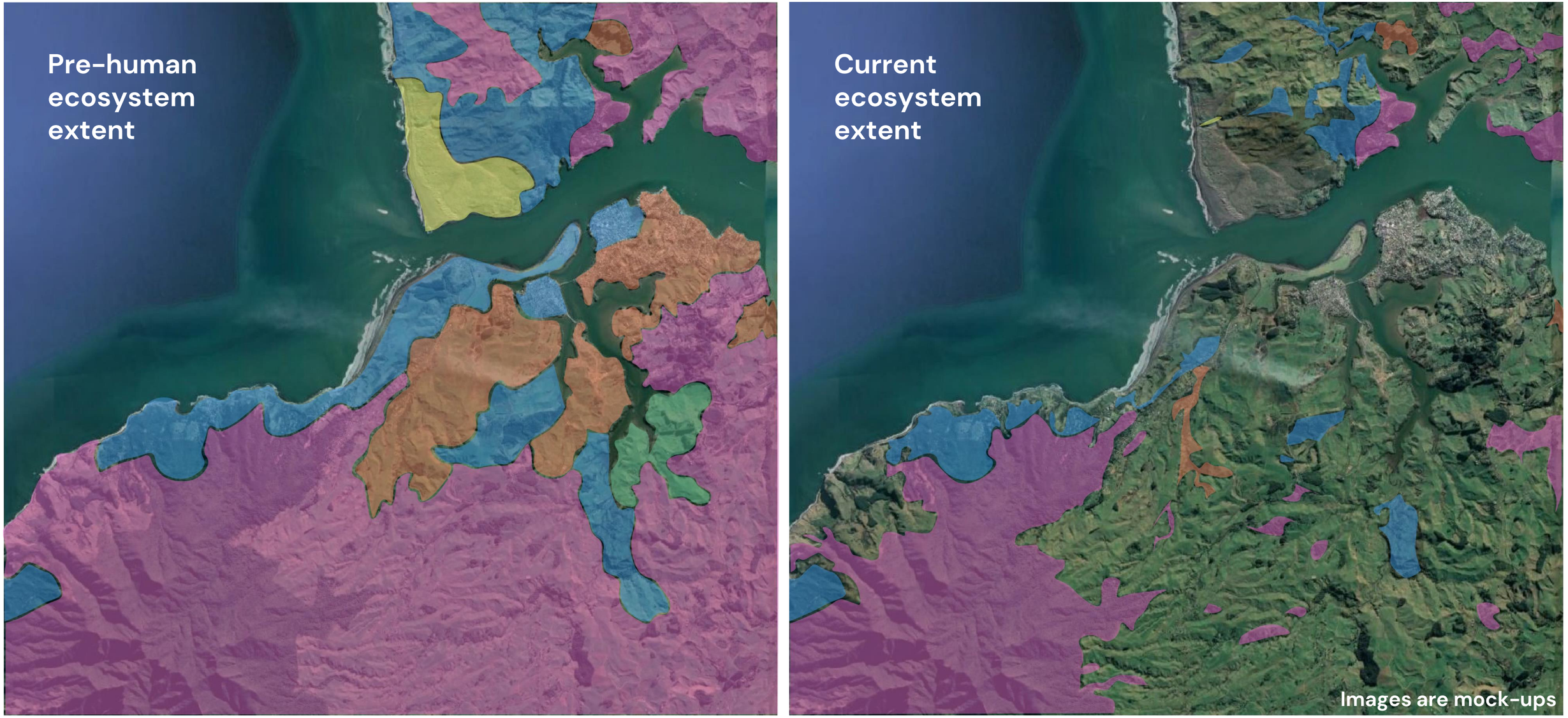


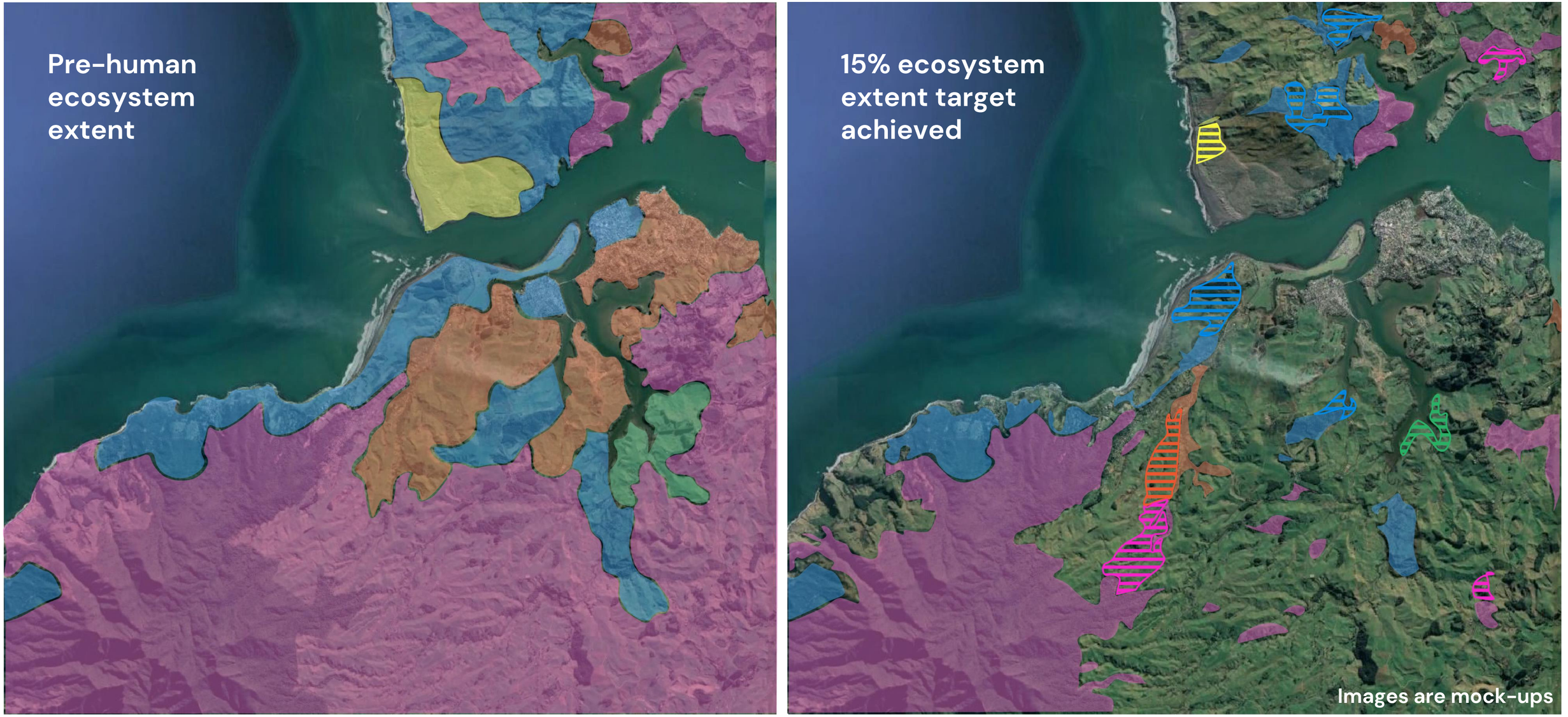
Ecosystem figures will be refined

Restore – Whakahou

15% of every ecosystem in every catchment




Pre-human ecosystem extent
Current ecosystem extent
Images are mock-ups
Rimu/tawa-kāmahi forest
Kahikatea-pukatea-tawa forest
Kauri/taraire-kohekohe-tawa forest
Dunelands
Wetland



Exisiting ecosystem type:

Re-created ecosystem:

Rimu/tawa-kāmahi forest

Kahikatea-pukatea-tawa forest

Kauri/taraire-kohekohe-tawa forest

Dunelands

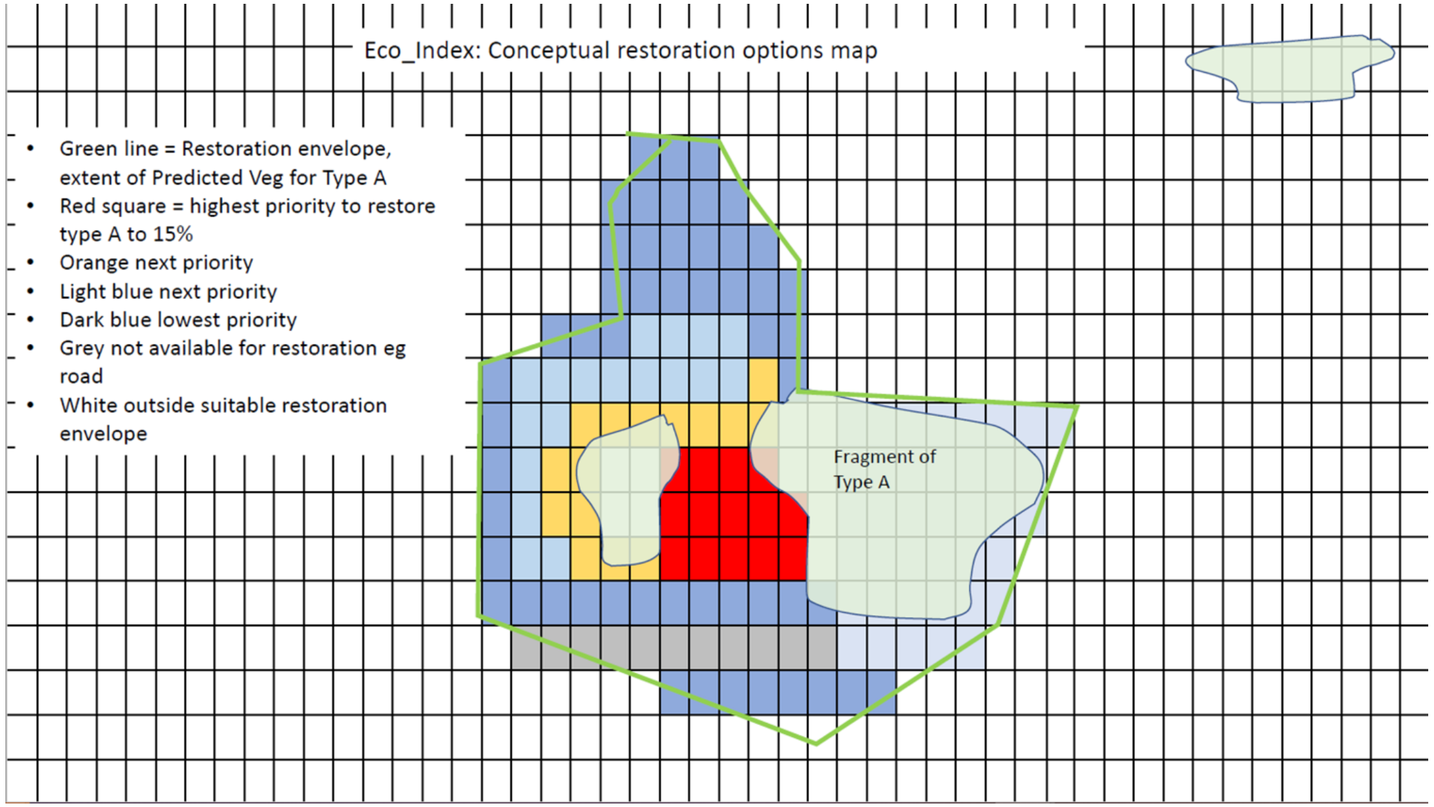
Wetland

Restoration Recommendations: Options – not prescriptions

Based on:

- Locations of under-represented ecosystem types
- Reconstruction potential
- Costs
- Ecological benefits (e.g. acts as a buffer or connection to an existing area)

Mock-up map



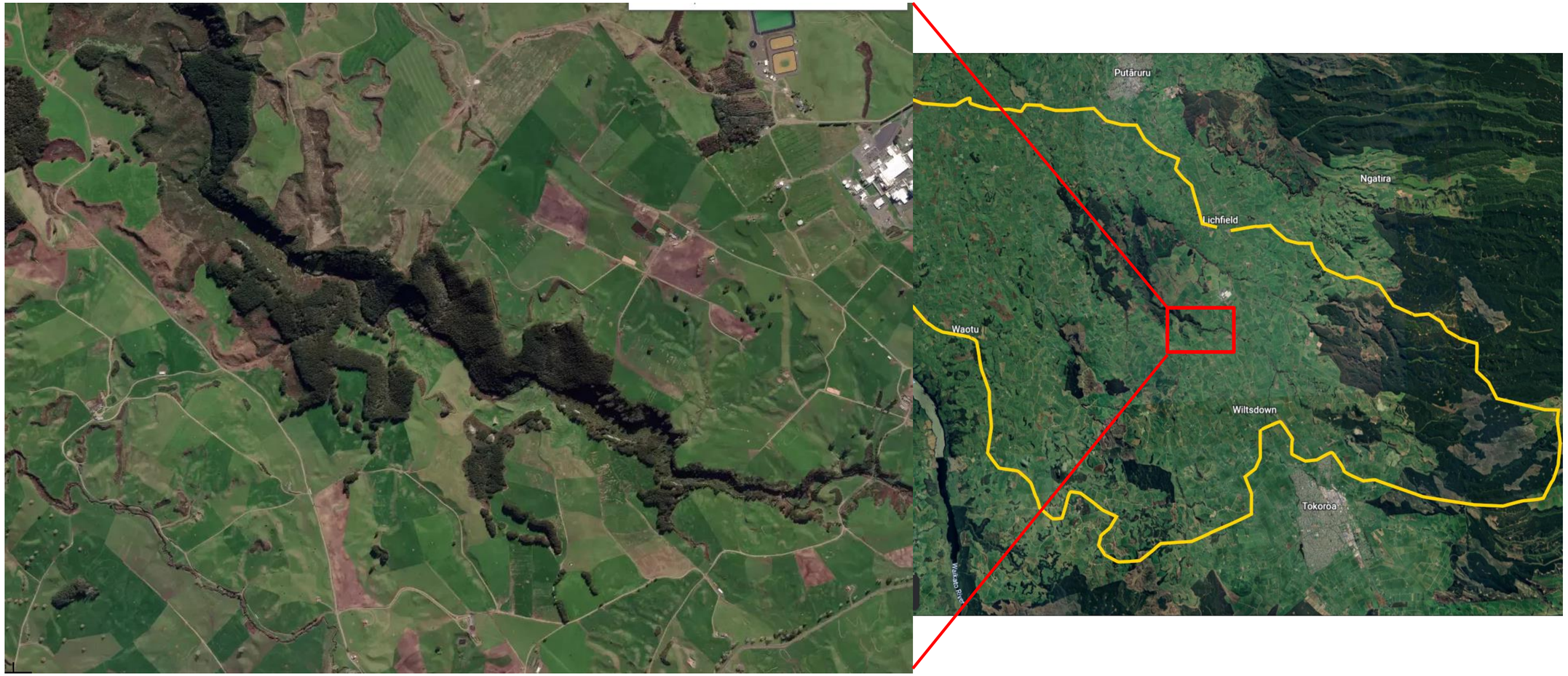
DATATECH Litmus

Manaaki Whenua Landcare Research

Biodiversity monitoring via AI and remote sensing

AI ecosystem restoration detection

Detecting change in ecosystem layers over time will allow quantification of restoration – effort & $$



AI ecosystem restoration detection

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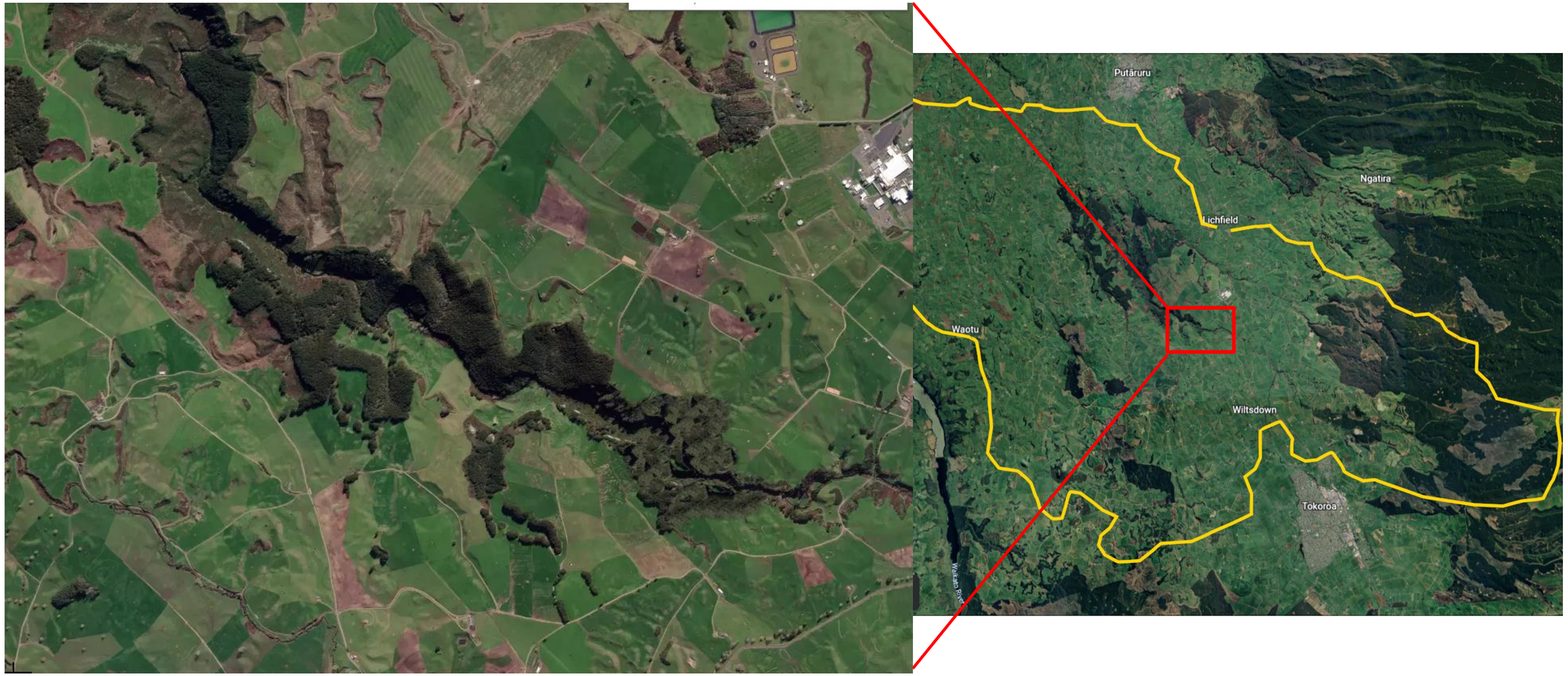

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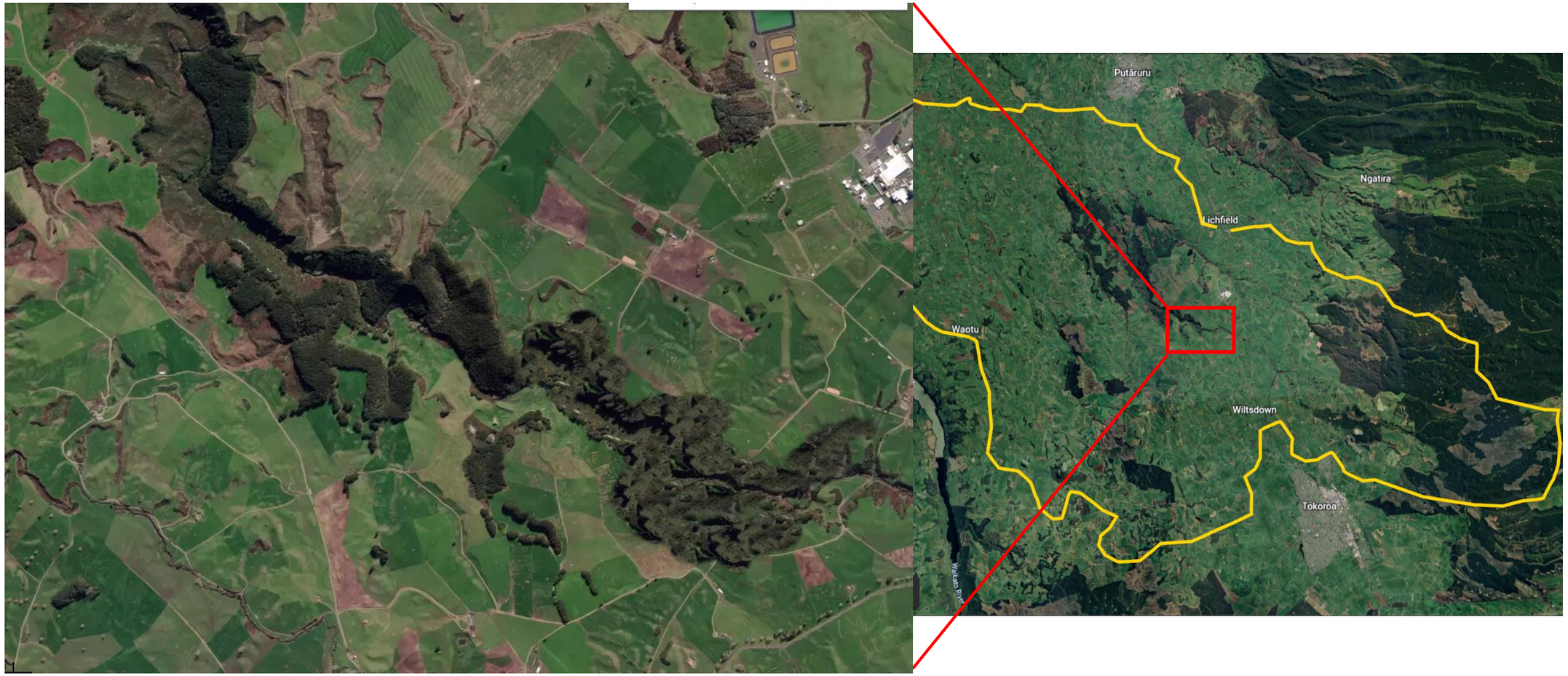

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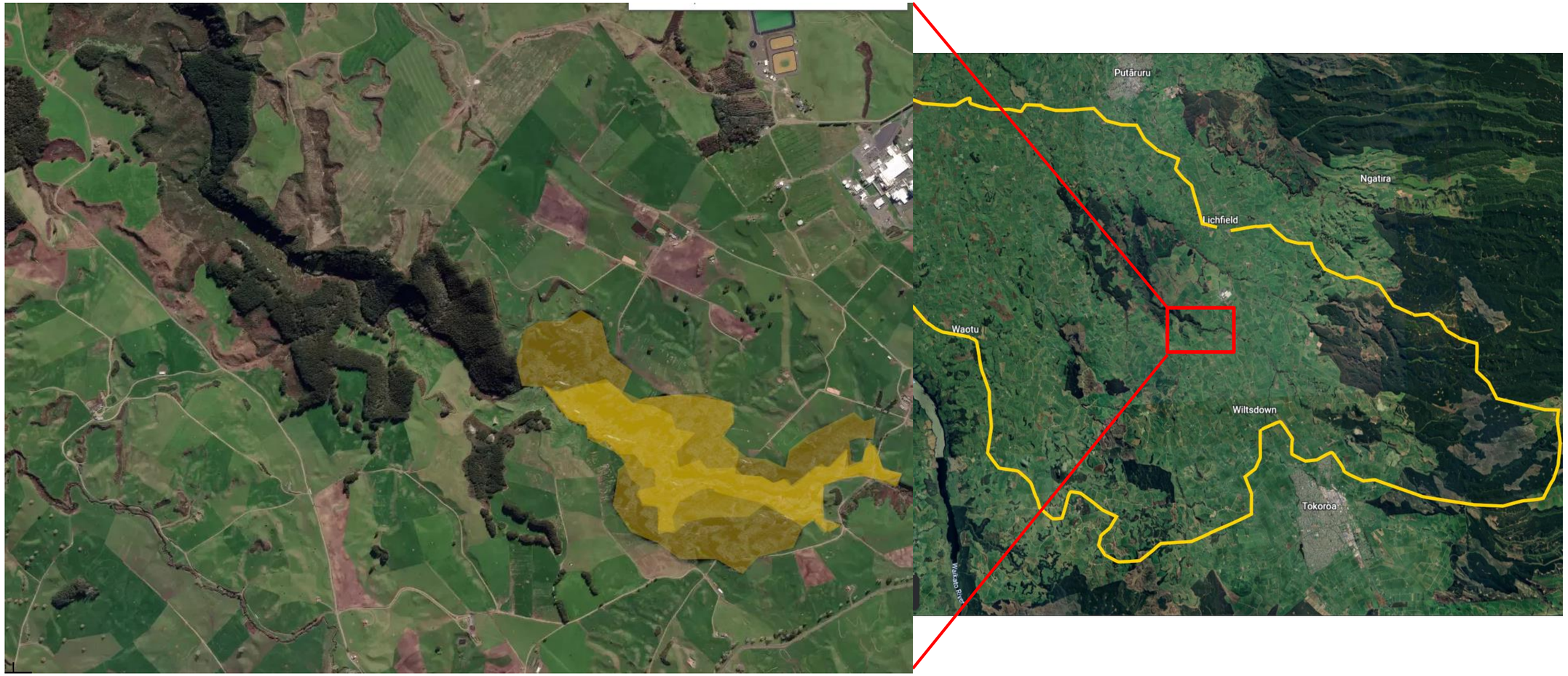


AI Alliance for Biodiversity

The Eco-index has fostered formation of this group.

An informal, regular, online gathering of data scientists and anyone interested in using AI approaches for biodiversity monitoring in Aotearoa.

A place to swap algorithms, ideas, and network!

To learn more or join this group, email:

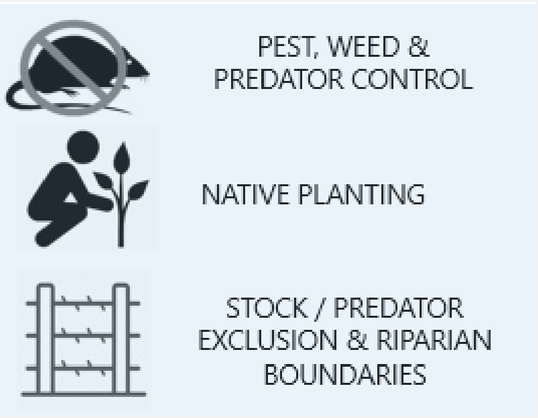
kwallace@waikato.ac.nz

Biodiversity investment and impact analysis

Biodiversity INVESTMENT indicators

Eco-index®
Guiding Biodiversity Investment

Biodiversity IMPACT indicators



Proof-of-concept partnerships

Proving our concepts – with enthusiastic partners

NEW ZEALAND MERINO™

DairyNZ

Te Urunga o Kea
Te Arawa Climate Change Working Group

THE a2 MILK COMPANY® a2 FEEL THE DIFFERENCE

Pokaiwhenua
CATCHMENT GROUP

Environment Canterbury
Regional Council
Kaunihera Taiao ki Waitaha

Te Rūnanga o NGĀI TAHU

+ OTHERS

Our growing network

National Science Challenges — New Zealand's Biological Heritage — Ngā Koiora Tuku Iho

Fonterra

Te Arawa Lakes Trust

Department of Conservation — Te Papa Atawhai

Rongowai

The a2 Milk Company — a2 — Feel the Difference

New Zealand Merino

Environment Canterbury Regional Council — Kaunihera Taiao ki Waitaha

Waikato Regional Council — Te Kaunihera ā Rohe o Waikato

GRI

planet.

Ministry for the Environment — Manatū Mō Te Taiao

TAIAO — Time-Evolving Data Science and Artificial Intelligence for Advanced Open Environmental Science

Stockholm University — Stockholm Resilience Centre

Pokaiwhenua Catchment Group

Te Rarawa

Manaaki Whenua Landcare Research

Te Rūnanga o Ngāi Tahu

forum NEW ZEALAND

DairyNZ

Te Ipu o te Mahara Artificial Intelligence Institute — The University of Waikato

Stats NZ — Tatauranga Aotearoa

Jobs for Nature | Mahi mō te Taiao — Department of Conservation Te Papa Atawhai

AI Alliance for Biodiversity

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Ngā Koiora Tuku Iho

National Science Challenges

Ngā mihi

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