

NEW ZEALAND'S  
BIOLOGICAL  
HERITAGE

Ngā Koiora  
Tuku Iho

National  
**science**  
Challenges

# New Zealand's Biological Heritage National Science Challenge Ngā Koiora Tuku Iho

STRATEGY

2019–2024







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# Te Mauri o Te Kererū

Tikina ki hea?  
Tikina ki te rangi?  
Tikina ki a Matariki  
Te whetu tapu o te tau  
He tohu i te makuru o te tau kai hau kai  
Tēra ko Ngāwhata ki te tuāpae  
Nau mai te manga tawai ā Rehua

Papā te whatitiri i te ana whakatangi  
Hoki mai te manu ora ki te maunga koia!  
E ko Te Puanui a Tāne  
Hau ko te kahikatea, te pakiaka haere whenua  
Kaua ki Te Houhi, ko Te Kōhai kawa poro kai whenua

Nau mai e manu ki toku tua  
Ka hiko e  
Ka kapo, kapo e, ka kapo, ka kapo  
Ka hiko i te pae o te rangi e  
Aue!

# The Life Essence of the Kererū

Where shall it be retrieved?  
Retrieve it from the heavens  
Retrieve it from Pleiades  
From the sacred star of the year  
That foretells the abundance of this season  
We look upon Ngāwhata (An arm of Orion's belt)  
that rests on the horizon  
And we welcome the resting perch of Rehua (Antares)

The lightning claps in the caves that echoed  
Return o sacred bird to your mountain solace!  
To declare the opening abundance of Tāne  
In the presence of the great trees that walk this land  
No time during the Houhi and the Kōhai that decays  
the flesh

Return o sacred bird unto my shoulder  
Lightning flickers! People clutching!  
They clutch, they clutch  
It flickers in the horizon of the sky.  
Sadness!

*He moteatea mo te kererū  
(A lament about the kererū)*

Composed by Tuawhenua  
kaumātua and rangatahi  
– Te Weu o te Kaitiaki wananga

Challenge Research: Customary  
approaches and practices for optimising  
cultural and ecological resilience  
*(Kia mau tonu ki ngā tapu taonga o  
ngā mātua tūpuna – hold fast to the  
treasures of the ancestors)*

Mr Puke Timoti, Tūhoe Tuawhenua  
Trust; Dr Phil Lyver, Manaaki Whenua



# Our Values

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Mahi whaipanga

Ngākaunui / Uekaha / Ngakau Whakapuke

Whanaungatanga

Manaakitanga

Mana Motuhake / Tino Rangatiratanga

Whakapapa

Kaitiakitanga

Mātauranga

Tohungatanga / Ngā tiketiketanga o te pai

Mahi rangapū

# How We Apply Our Values

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We care about making a difference for Aotearoa

We are passionate and enthusiastic about our work

We work as a family  
We have fun together

We build trust and create a place that others want to be a part of  
We build mana in others around us to enhance the mana of the whole

We recognise and empower sovereignty and autonomy

We recognise interconnections  
We have an intergenerational vision

We enable stewardship of our biological and cultural heritage

We recognise the value of blending traditional and modern knowledge

We apply excellence to everything we do

We work respectfully in partnership



# Why Do We Need a National Science Challenge?

Stewardship of our unique biological heritage is every New Zealander's responsibility.

However, our biological heritage is under threat from invasive organisms and from new pressures emerging in a rapidly changing global environment.

## A complex problem

### We have:

- › Declining biodiversity
- › Increasing pressures on our biosecurity system
- › Changing needs
- › Changing environmental states
- › Changing community aspirations

**Our biological heritage is complex, with threats and issues always changing.**

## We have a system where:

- › The public are not informed enough to take action
- › Tools and strategies are falling behind
- › There are critical knowledge gaps
- › Research, science and innovation are fragmented and disjointed
- › Our capability and capacity to look after biological heritage is diminishing
- › There are poor links between science and action

# There Is No Single Solution

## We need:

- › Diverse individuals and institutions
- › With different roles and skills
- › Working at different stages along a value chain from science to better ecosystem outcomes.

There is no single solution and we need to get better and faster at going from science discovery to impacts – at scale.

We need targeted **discovery science** to characterise and value our biological heritage, understand the things that threaten it, and provide new insights into how future changes will affect it.

Based on these discoveries, we need to apply **new approaches** to intervene to protect our biological heritage and deal with threats.

New approaches need to be integrated across knowledge systems and environmental domains. We need **innovators** to put these parts together in new and tangible ways.

New knowledge and technologies will only help if the people who use and conserve our biological heritage find them useful. We need **coaches, translators and communicators** to create practical value from the knowledge and technologies we generate.

We need the right partnerships among researchers, technologists and innovators, Māori, government agencies, industry, and the public to co-design solutions and to **maximise adoption and scale out** of new approaches.

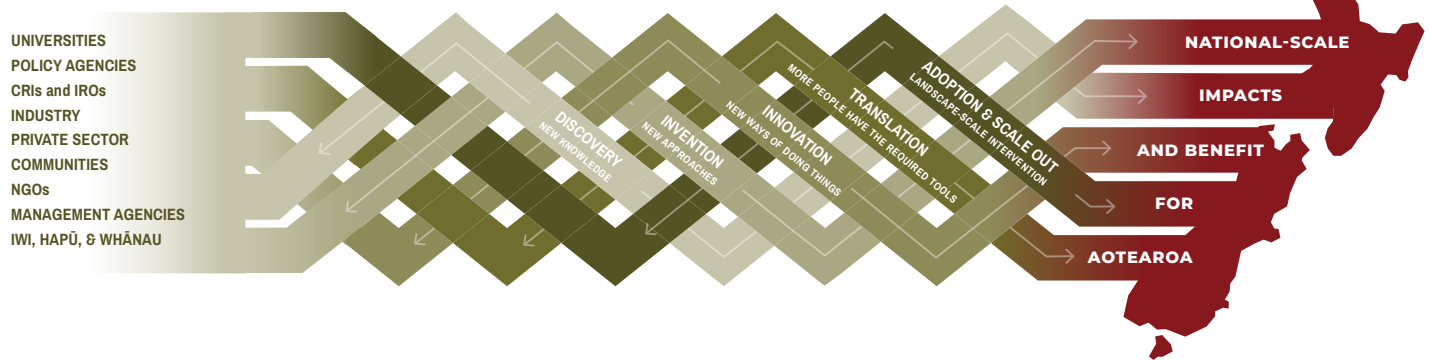
We need science and research to discover, develop and deploy new knowledge in innovative ways.

## This is the essence of a Science Challenge.



# Our Challenge: to Connect and Accelerate

**Our Role:** to convene, prioritise, connect, accelerate, and evaluate success



## Our Approach: Collective Impact

The commitment to a common agenda of a group of important actors from different sectors for solving specific strategic problems that will deliver enduring national benefit.



# Collective Impact

Success of a Science Challenge is measured across 7 Performance Areas

To measure success in delivering our objective, we need a

To measure **performance excellence** we need

## ① Delivery of Our Objective

- ② Science Quality
- ③ Right Teams
- ④ Stakeholder Engagement
- ⑤ Mātauranga Māori
- ⑥ Governance & Management
- ⑦ Public Participation

## Results Framework

The 7 Performance Areas benchmark our **excellence** according to our values

## Clear Line of Sight of Sight

From Discovery Science to Impact

- › Discovery Science
- › New Approaches
- › Innovation
- › Translation
- › Implementation

➔ Strategic Outcome  
➔ Impact

# Our Mission

Reverse the decline of New Zealand's biological heritage, through a national partnership to deliver a step change in research innovation, globally leading technologies and community and sector action

# Our Objective

Protect and manage our biodiversity

Improve our biosecurity

Enhance our resilience to global threats and pressures

# The Impact We Will Make



## Impact 1: Whakamana • Empower

- Bioheritage scorecard
- Environmental stewardship



## Impact 2: Tiaki • Protect

- Predicting current and future threats
- State-of-the-art surveillance
- Novel tools and strategies



## Impact 3: Whakahou • Restore

- Ecosystem interdependencies
- Adaptive governance and policy



# Our Challenge Structure



**Impact 1:  
Whakamana • Empower**

New Zealanders value our biological heritage, understand how it is changing, and are inspired to take action to protect it

**Strategic Outcome 1**

We assess our progress using a biological heritage scorecard for Aotearoa

**Strategic Outcome 2**

We empower New Zealanders to demand and enact environmental stewardship and kaitiakitanga



**Impact 2:  
Tiaki • Protect**

New Zealand's biosecurity system is world class

**Strategic Outcome 3**

We anticipate both emerging & latent biosecurity risks, and avoid new or recurring invasions

**Strategic Outcome 4**

We have state-of-the-art biosecurity surveillance systems

**Strategic Outcome 5**

We deploy novel tools, technologies & strategies for control or eradication of biotic threats



**Impact 3:  
Whakahou • Restore**

New Zealand's natural and production ecosystems are resilient and thriving

**Strategic Outcome 6**

We quantify social-ecological linkages for use in managing, protecting and restoring land and water ecosystems

**Strategic Outcome 7**

We enable people to build biological heritage resilience with the right policy and governance instruments

# Our Strategic Outcomes

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## Scope

Challenge investment intended to **focus cohesive effort** around a shared common problem, with clear pathway to Impact(s)

Strategic Outcomes are **large, cohesive, interconnected portfolios** from across the innovation ecosystem (not research projects)

Each Strategic Outcome is **scaleable** with **critical mass** through **aligned research** and operational expertise

## Operating Principles

Within each Strategic Outcome, Challenge investment is targeted to critical **leverage points** along the innovation pathway

Our investment focuses on both **knowledge gaps** and **building interconnections** across research teams and organisations

Relative balance of investment **tailored** to suit each Strategic Outcome

Each Strategic Outcome **leverages international expertise** and **extra investment** in research and innovation

Strategic Outcomes **co-designed** by Māori, communities, industry and agencies

Innovative models of **co-leadership, mentoring and career pathways** for researchers and natural resource managers/kaitiaki



# Challenge Parties

The BioHeritage Challenge is hosted by Manaaki Whenua – Landcare Research and is supported by the Ministry of Business, Innovation and Employment.



Manaaki Whenua  
Landcare Research



Department of  
Conservation  
*Te Papa Atawhai*



# Our Stakeholders

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Challenge investment is **focused on stakeholder priorities**.

**Co-design** is a cornerstone of the way we work. Our priorities were co-designed with a wide range of stakeholders and end users.

Involvement and commitment from stakeholders and end users is **vital to constructing 'right teams'** to deliver impact.

Challenge-targeted investment is aimed at key leverage points to **accelerate adoption and uptake**.

We **invest in skill sets and roles** that complement and enhance operational expertise held in stakeholder organisations **to drive adoption and scale out**.

# Sector Strategies & Plans

We convene, connect and coordinate relevant research expertise to address science priorities across conservation and production sectors, including:

- › Iwi and hapū environmental plans
- › The Conservation & Environment Science Roadmap
- › The Primary Sector Science Roadmap
- › Biosecurity 2025 Science Plan (Ministry for Primary Industries)
- › The New Zealand Biodiversity Strategy (Department of Conservation)
- › Predator Free 2050 Limited Science Strategy
- › Plant- and animal-based industries and industry bodies
- › Regional Councils' Biosecurity & Biodiversity priorities
- › The Ministry for the Environment's Science Strategy
- › Threatened Species Strategy (Department of Conservation)
- › Our Fresh Water 2017 (Ministry for the Environment)

# How 4.7 Million New Zealanders will take part

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## Our promise

We engage New Zealanders and inspire them to take action to protect our biological heritage.

We aim to enhance the mana of our Challenge Parties and to communicate the unique role of the Challenge in telling their stories – science to inspire the nation.

We strive for thought leadership on difficult topics, and to move public conversations forward.

With our partners, we demonstrate tangible progress towards impacts to give New Zealanders a sense of reward for enacting positive change.

Our investment in social research is linked to our measures of success in re-connecting New Zealanders with our biological heritage, accelerating capacity for environmental stewardship.

### In a nutshell

As the voice for New Zealand's biological heritage, the Challenge is in a **unique and privileged** position.

We bring science teams and citizens together and **overcome institutional barriers** to move **difficult conversations** forward.

Through a combination of science and outreach we are ready to **inspire** New Zealanders and tell the **stories** that need to be told.





# Our Māori Strategy

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We take a proactive role in **partnership** with Māori researchers and communities

We create opportunities for **emerging Māori leaders** and explore **co-leadership** models

We seek to **build capacity amongst non-Māori researchers and end users** to enable them to work confidently in partnership with tangata whenua

We invest in **Kaupapa Māori** and **Māori-led** research

**Co-design** is a cornerstone of the way we work

We partner with other entities seeking to **build Māori capability and capacity** across the New Zealand innovation system

We **enrich** our research and innovation investments by blending **Mātauranga Māori** with contemporary research methods





# Our International Strategy

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We take a **strategic and focused approach** to identify, develop & foster priority international collaborations

Our Investments:

- › Help us deliver our **Challenge Objective**
- › **Leverage** international capability & resources
- › Enhance **science excellence**
- › Contribute to **global** research efforts
- › Build NZ **profile** internationally

Investment in international collaborations enable **growth in scale and impact** in areas of strategic importance to Aotearoa



# Our Science Excellence

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## In a nutshell

A **step change** is required in science and research in Aotearoa if we are to deliver greater impact.

We define '**excellence**' in ways that are unique to our Challenge.

Major research, science and technology **breakthroughs** will be needed to achieve impact.

Our framework provides **unique opportunities** for such breakthroughs to occur – at any stage along the value chain pathway.



## How We Measure Excellence

**Traditional metrics** of science excellence apply to our research in combination with other measures of success.

We **integrate traditional and modern knowledge** to achieve sustainable outcomes for Aotearoa.

**Interdisciplinary research** spanning traditional boundaries – across institutions, sectors and environmental domains – is another metric of excellence.

Our investments are **independently peer-reviewed** by our International Science Advisory Panel and/or others with relevant expertise.

We strive for excellence across the **7 Performance Areas** of a Science Challenge.

# The Right Teams: Impact-focused

Teams with the **right mix of skills and roles** across the system are the **best teams** to deliver impact

We **co-invest** with other Science Challenges, Centres of Research Excellence, private sector investors, and research consortia: to drive collective impact

We mentor and build capability in **future leaders**, whatever their skills, roles and backgrounds

We target investment to **inter- and trans-disciplinary research at the boundaries** between disciplines, sectors and organisations

We respectfully include **traditional knowledge holders** and **end users** in **co-design from the beginning**

## The Skill Sets We Will Need across the innovation system

### Discovery Science

Conceptual and theoretical ('blue skies') researchers

### New approaches

Interdisciplinary researchers

### Innovation

Project managers

Facilitators

Interdisciplinary researchers

### Translation

Knowledge brokers

Storytellers

Coaches

### Implementation

End user operational expertise:

agencies, industry and NGOs

citizen scientists & kaitiaki

MĀTAURANGA MĀORI



# Our Leadership

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## Our Governance

- › Skills-based governance
- › Succession planning responds to evolving perspectives and skills requirements

## Our Science Leadership

- › Conceptual and strategic leadership
- › Succession planning to respond to evolving needs
- › Māori Manager and Kaihautū embedded in the leadership team
- › Pathways for Māori and early-career researchers to take leadership roles

## Our Management Support

- › Project management
- › Communications and outreach
- › Facilitation and coordination
- › Contracts management
- › Operations management
- › Executive assistance





# Our Aspirations

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To promote **coordinated and collaborative** discovery science, technology development, innovation and implementation

To provide a **safe, open and inclusive** operating space for individuals and organisations

To foster more **integrated approaches** to complex problems

To achieve **economies of scale** aimed at increasing efficiency and flexibility for researchers

To promote competition focused on **capability and skill sets**, not on competitive funding rounds

To **reduce silos** among disciplines and organisations

To leave a **legacy** in the science system for Aotearoa: stimulating and supporting longer-term **strategic science planning**



# What Will Success Look Like For Us? In 2024



## Impact 1: Whakamana • Empower

New Zealanders value our biological heritage, understand how it is changing, and are inspired to take action to protect it

### Our success measure:

A majority of New Zealanders value our biological heritage & are enabled to actively contribute to positive change



## Impact 2: Tiaki • Protect

New Zealand's biosecurity system is world class

### Our success measure:

New Zealand's biosecurity system is fit for purpose



## Impact 3: Whakahou • Restore

New Zealand's natural and production ecosystems are resilient and thriving

### Our success measure:

We understand social and ecological linkages in natural and production ecosystems, and will be designing technical, policy and governance frameworks to ensure our ecosystems are resilient to current & future threats

## Our Legacy

Known priority threats to New Zealand's biological heritage have been removed or mitigated, emerging risks and threats can be better predicted, and our ecosystems are resilient to future changes.

Our science & innovation system has capability and capacity for making strategic, long-term, impact-oriented progress on sustaining and restoring New Zealand's biological heritage; is more inclusive, diverse and collaborative; respectful of expertise from a diversity of knowledge holders; and proud of the legacy it leaves to future New Zealanders.





New Zealand's Biological Heritage  
**National Science Challenge**

[www.biologicalheritage.nz](http://www.biologicalheritage.nz)

