Rātā Foundation

ENVIRONMENT SECTOR SCAN

March 2023 | Prepared for Rātā Foundation

EMPOWERED TO THRIVE

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people+science

CONTENTS

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Executive Summary

The Rātā Foundation, one of 12 Community Trusts in Aotearoa, provides strategic investment to foster community growth, connection and wellbeing along with supporting environmental initiatives throughout its rohe of Canterbury (Christchurch, Waimakariri, Selwyn, Hurunui), the Chatham Islands, Marlborough (incl. Kaikōura), and Nelson/Tasman.

Rātā Foundation is a signatory of the Community Trusts' Funders Commitment on Climate Action highlights the importance of, and recognition of the acute impact that a changing climate has on the environment and society. The commitment centres on promoting principles and actions to enable a just, equitable transition to a carbon neutral world, while also fostering collaboration, providing leadership and having transparent processes[1]. Funders have developed a Tika Transition Guide to breathe life into a Just Transition for Aotearoa where tikanga Māori and Te Tiriti o Waitangi must sit at the heart of our climate action response.[2] Addressing the changing climate and seeking positive outcomes for the environment and communities is an overarching concern[3].

This report updates the prior Environment Sector Scan (Denyer, 2017) to provide insights primarily to guide investment under its Strategic Environment Pou, and reviews Rātā's current priorities under its responsive and proactive funding programmes. The report summarises environmental and climate trends and changes in best practice and new tools, making connections to climate mitigation and adaption and what to look for in programmes promoting sustainability.

A total of 11 interviews were carried out with land management agency staff, community project/program managers, community trust managers and iwi/iwi liaison leaders to ensure views and experiences across the Rātā rohe and within the philanthropic funding sector were included.

Since the first Environment Sector Scan was written in 2017 much has changed.

- Community-led and iwi-led conservation has become more ambitious with larger and more complex initiatives incorporating a greater socio-cultural focus than previously.
- New sources of funding have spurred further projects include Predator Free 2050, Jobs for Nature, and the Freshwater Improvement Fund.
- Philanthropic investment continues to provide a lifeline to groups and their projects. Technology including drones/UAVs, eDNA kits, remote sensing of water quality continues to evolve, facilitating the collection of a wider range of data, efficiently and with less cost. At the same time, pest trapping tools and methods continue to be upgraded.

[1] https://www.climateactionaotearoa.co.nz/
[2] A Tika Transition is used with permission by its developer Dr Maria Bargh Professor of Politics and Māori Studies, Te Herenga Waka – Victoria University
[3] https://www.climateactionaotearoa.co.nz/

Although there have been no significant changes to environmental health overall in the Rātā rohe, severe climatic events resulting in floods and landslides have occured. Climate now forms the overarching theme given the multiplier effect to ongoing issues such as biodiversity loss. Effects are already being seen and felt across the motu, with a growing understanding of the impacts on our lives and livelihoods. The new National Adaptation Plan underscores the importance of nature-based solutions, many of which are already carried out by community organisations for example, native reforestation. Emerging markets for carbon sequestration in estuarine environments as well as credits for biodiversity protection and enhancement potentially create new incentives for restoration and land retirement along with new income streams to support further conservation activities.

From the literature review and stakeholder insights the following recommendations are made for the Environment Pou Strategic funding:

- Rātā should broaden its grant investment from a focus on biodiversity protection and conservation to include enhancing the resilience of landscapes.
- Rātā should continue to fund projects that contribute to reducing GHG emissions, and take a longterm view invest in projects that include climate adaptation.
- Rātā could work with investment advisors to understand investment opportunities which directly support climate mitigation and adaption as markets mature locally and internationally. For example, the shift to renewables or carbon sequestration.

Rātā should consider strategic partnerships that enable landscape scale climate mitigation and adaptation by:

- Prioritising sites, understanding local conditions and tracking changes (for example, through using spatial planning tools, mātauranga Māori and citizen science) and enable future investment to be focused on impact.
- Enhancing and diversifying ecosystem services at scale (for example, re-wetting drained wetlands to enhance carbon sequestration and landscape flood protection).
- Changing to sustainable land use (for example, reforestation with native flora).
- Building adaptive capacity by supporting community organisations to implement new approaches and ideas, take risks, and experiment that can enhance community resilience to climate change impacts.

For Rātā's current priorities consider wording changes to incorporate climate mitigation and adaption. Suggested wording for priorities:

- Involve people in actions benefiting our natural environment and supporting climate mitigation and adaptation.
- Develop knowledge and skills needed to improve our environment and contribute to climate mitigation and adaptation through Environmental Education (EE) or sustainability programs.

Rātā should add an additional criteria given the technical nature of some nature-based solutions:

- Organisations seeking funding for nature-based solutions for climate adaptation should provide evidence/supporting material where possible on how the proposed activities will enhance landscape resilience under more extreme climate scenarios, and show how they have considered cumulative impact the action could/may have, to avoid any possible negative or unintended consequences resulting from the action.

Rātā's focus on strengthening the environmental non-profit sector could include:

- Develop and strengthen community resilience to climate change impacts by supporting community organisations to implement new approaches and ideas, take risks, and experiment. Resilience is not just weathering changes, it is knowing how to generate the types of opportunities that result in positive, forward-looking changes.
- Strengthen and develop community conservation organisations, for example, by supporting the development of business cases for example, centering on sourcing sustainable funding, the provision of specialist advice for example, to develop a biodiversity credit scheme, and reimbursing professional trustees.
- Foster networks and knowledge-building by supporting community group members to attend and present (in-person) at conferences, symposia, wananga/workshops, and hui. Facilitate the development of community events designed to grow knowledge, share best practice, strengthen communities of practice, and celebrate major milestones.
- Continue to provide funding for technical advice to assist for example, with developing, supervising/conducting new ecological monitoring programs, or reviewing those already in place (particularly for large, complex projects) and specialist services for example, a facilitator for strategic planning or important community events.

- Continue to support staff/organisational professional development such as governance training for trustees; cultural responsiveness, conference attendance, facilitation training for staff, Growsafe certificates and chainsaw handling.
- Support for the collection of evidence to report on organisation/project/programme impact measures.

Across the wider non-profit sector Rātā could:

- Consider including climate change capability building for the wider NGO sector, this could be offering workshops for community-based organisations starting on their sustainability journey to providing entities with large emissions expertise to assist with emissions measurements, adaptation strategies and fit for purpose ways to reduce their emissions.
- Climate mitigation funding Rātā Foundation could do more work on understanding the cost benefit of supporting high emitters to decarbonise and could consider offsetting their contribution to their grantees' emissions.

1. Introduction

The first Environment Sector Scan for the Rātā Foundation was produced in 2017 (Denyer, 2017). The report was designed to provide an overview of current conservation trends, the state of the environment and facilitate environmental funding decision-making by the Rātā Foundation. Now in 2023, it's time for an update.

In the relatively short space of time between reports, global events both social and environmental have indelibly impacted on our lives, where and how we live. Rātā has touchpoints and impacts on the environment and climate across three areas - financial investments, business operations and its community investments. This report provides insights on the latter. It considers how Rātā might guide its community investment under its Strategic Environment Pou. It also looks at Rātā's current priorities under its wider environment funding, connecting climate impact and how to engage pro-sustainability behaviours to protect and enhance our environment.

Along with contextual information listed below, two "What to look for" sections are included. These are framed around nature-based solutions (NBS)[4] to our changing climate and supporting the knowledge and skills people and organisations need to take action on sustainable behaviours.

These sections summarise current best practice and tools and are areas where Rātā could consider either investing directly in and/or supporting capacity building for projects/programs where these are incorporated. In addition, the nature-based approaches and sustainable behaviour change approaches could also be used as prompts for discussions with applicants around shaping proposals.

Contextual information included in this report:

- An overview of the current state of play of community conservation across Aotearoa.
- Environment and climate challenges and socio-cultural impacts in each Rātā region.
- Scientific and technological advances supporting climate change adaptation and biodiversity conservation.
- New climate-centered markets and financial instruments supporting biodiversity conservation.

[4]The spectrum of nature-based solutions (NBS) is extremely broad, but the overarching goal is to help tackle societal challenges

1.1 What does conservation in Aotearoa look like today?

In Aotearoa, community-led conservation has become more and more ambitious. Initiatives have flourished and matured while becoming larger and ever more complex. The breadth of partnerships, scope and nature of mahi undertaken, the growing socio-cultural focus and more sophisticated communication to share journeys and findings, all characterise larger projects. New sources of funding have helped, including Predator Free 2050, Jobs for Nature, and the Freshwater Improvement Fund. These national funding sources have kickstarted new, and turbo-charged existing projects throughout the motu providing work and training opportunities for a cross-section of society, many in regions with low economies. Funding from philanthropic sources including community trusts continues to provide a lifeline to groups and their projects. Rātā, in its rohe[5], has funded innovative, ambitious and collaborative approaches to conservation:

"…Having Rātā come on board with their pūtea …has been a real game changer to… have iwi participate at a more equitable level, compared to the other partners who are paid salaries to do this work… it takes deeper relationships and a bit of courage from those investors to say, actually, I get why this… will pay dividends down the track…" (Study interviewee)

From the government level, a slew of new environmental strategies, policies and acts have been developed for the protection and restoration and sustainable use of biodiversity (for example, Te Mana o te Taiao - Aotearoa New Zealand Biodiversity Strategy 2020[6]) and to better manage freshwater including wetlands (National Policy Statement for Freshwater Management NPS-FM 2020[7]). A National Policy Statement for Indigenous Biodiversity is still in development[8].

Our changing climate has become an increasingly important lens through which to re-evaluate our economy, lifestyles and interactions with the environment, both with the National Adaptation Plan for Climate Change (Ministry for the Environment, 2022) and Emissions Reduction Plan (New Zealand Government, 2022). Underpinning high-level planning and actions, is the proposed overhaul of the Resource Management Act 1991[9]. Over time, the Act has become cumbersome, costly and unable to adequately protect the environment, particularly within a changing climate.

[5]Canterbury incl. Christchurch, Waimakariri, Selwyn, and Hurunui Districts; Nelson/Tasman; Marlborough incl. Kaikōura District, and Rēkohu/Chatham Islands
[6]https://www.doc.govt.nz/globalassets/documents/conservation/biodiversity/anzbs-2020.pdf
[7]https://environment.govt.nz/publications/national-policy-statement-for-freshwater-management-2020-amended-february-2023/
[8]https://consult.environment.govt.nz/biodiversity/npsib-exposure-draft/
[9]https://www.legislation.govt.nz/act/public/1991/0069/latest/DLM230265.html

Imperatives have also emerged from the business sector with the development of the Post-2020 Global Biodiversity Framework[10]. Recognising that biodiversity and climate change are inextricably linked, the Framework seeks to stop and reverse ongoing biodiversity declines to achieve a nature-positive world by 2030 aligning framework targets with existing climate commitments made by each country. For businesses, this means taking a proactive approach to their culture and operations:

"Companies and financial institutions that fail to act will face not only nature-related physical and systemic risks, but also transition risks due to growing regulatory and societal expectations, and accountability for the biodiversity impacts of their operations, value chains, lending and investments" (World Economic Forum and PWC China, 2022).

1.1.1 A snapshot of conservation trends in 2023

Initiatives have grown from local to sub-regional, regional and pan-regional. Throughout Aoteaora, an increasing number of landscape-scale restoration projects and predator free initiatives are now well established. Rātā Foundation's funding has supported the Kotahitanga mō te Taiao Alliance, an example of partnership/co- governance between iwi and councils located at the top of the South Island and the Department of Conservation. The Alliance aims to see the natural heritage flourishing, having been restored over large areas, including where people live. Community conservation hubs such as the Banks Peninsula Conservation Trust, Tasman Environment Trust and similar initiatives in the North Island for example, Bay Conservation Alliance (Bay of Plenty) and Predator Free Hauraki Coromandel Community Trust provide important points of connection in increasingly layered conservation landscapes, supporting their member/affiliate groups for example, with financial administration and fundraising, project management, design and delivery, group governance, training and educational services (Peters and Denyer, 2021).

Iwi-led initiatives around the motu are thriving. Examples from the Rātā rohe include projects by Ngāti Koata[11] that aim to improve the cultural and ecological 'Mauri of Moawhitu' through reintroducing aquatic habitat for taonga species, and revegetating using indigenous plants with the outcome of enhancing water quality. The project will integrate mātauranga Māori, scientific and cultural health assessment monitoring, provide employment and training for staff, iwi/hapū, and rangatahi, and restore and protect 60 ha of old growth indigenous remnant, home to native bird species (Kakaruwai, Miromiro, Kereru, and Korimako) of significant cultural value for Ngāti Koata. To the south-east of the Rātā rohe, a project led by Te Runanga o Kaikōura - Te Tau Wairehu o Marokura[12], aims to establish and maintain a coastal trap line from the Awatere to the Oaro Rivers, with intensive trapping in predator hot spot areas to protect native birds.

[10] https://www.iucn.org/resources/issues-brief/post-2020-global-biodiversity-framework

[11] https://www.ngatikoata.com/tiaki-taiao/

[12] https://www.marlborough.govt.nz/environment/biodiversity/community-restoration-groups/te-tau-wairehu-o-marokura-predator-control-project

The conservation conversation is shifting. Halting ongoing biodiversity decline has been the central purpose of conservation action in past decades, with a focus on controlling/eradicating a limited suite of predators (rats, mustelids and possums). There are calls for science-based approaches to target other introduced pests such as cats, pigs, goats and deer given their impact on native biota (Leathwick and Byrom, 2023). More recently the impacts of our changing climate on biodiversity and increasing awareness of the importance of natural (blue green) infrastructure in reducing or mitigating climate extremes, put conservation practices in a critical space. Hackwell and Robinson (2021) highlight that controlling mammalian herbivores "…is likely to be one of the most significant and cost-effective options for protecting and enhancing the country's massive stores of natural carbon".

Volunteerism is changing. As a national organisation reliant on a network of self-forming hubs, Forest & Bird Youth[13] engages young people (aged 14-25) to protect and restore wildlife and wild places. Their approach differs to the site-specific focus of well-established Forest & Bird branches (a significantly older demographic) whose activities alongside conservation education and advocacy often involves restoration and enhancement works in local reserves. Instead, the youth network carries out their conservation actions across many different locations, while also strongly engaging in political lobbying and showcasing youth conservation/environmental employment opportunities.

Te Ao Māori increasingly provides a holistic frame of reference for project/programme design and delivery. Mātauranga Māori (environmental knowledge and traditional cultural practice) and western science, both distinctive ways of interpreting and understanding the world have come together, for example, through the development of Cultural Health Indices and scorecards (Crow et al., 2020; Morgan, 2006; Tipa et al., 2006) and in restoration projects (Henwood et al., 2016). Respect and trust are central to embedding the principles of Te Tiriti O Waitangi, in line with understanding that meaningful collaborations and strong partnerships are the only way to achieve long-term, enduring outcomes. Recognising this, Rātā has supported the Kotahitanga mō te Taiao Alliance (located at the top of the South Island), a partnership/co-governance relationship between iwi, councils and the Department of Conservation. The aims of the Alliance are broadscale restoration including where people live so that the natural heritage is flourishing.

New knowledge is being constructed through collaborative research projects engaging science providers and community members. The National Science in Society Strategy 2014–24 prompted investment in fostering research collaborations between communities, businesses and educators to catalyse engagement in science and technology and find novel solutions to issues of importance to the community[14]. Similarly, citizen science involves community members co-designing and implementing scientific studies with science professionals. Activities range widely

[13]https://www.forestandbird.org.nz/our-community/forest-bird-youth test
[14]https://www.mbie.govt.nz/science-and-technology/science-and-innovation/funding-information-and-opportunities/investment-funds/curious-minds/

and include collecting and analysing pest trapping data to improve restoration management; crowdsourcing environmental data using apps such as iNaturalist[15] to document species presence and distribution to spearheading cutting-edge scientific studies to measure the carbon storage capacity of coastal ecosystems[16].

New technology is leading to increased efficiency. Drones, automatic bait dispensers, automatic bat/bird recorders and eDNA kits are some of many new tools and methods that enhance conservation planning and management[17].

The potential for receiving financial benefits from biodiversity restoration is increasing. The terrestrial carbon, marine/blue carbon and biodiversity credit markets are maturing and offer conservation and restoration-focused initiatives new funding streams. The National Wetland Trust[18], for example, is encouraging research into the feasibility of paludiculture in Aotearoa, combining peatland restoration in areas of unsustainable dairying with the with sustainable cultivation of wetland species.

1.1.2 Study methods

This section summarises the methods used to develop this Environment Sector Scan. A literature review was conducted drawing information from a wide range of sources including web pages, media releases, reports and reviewed scientific articles from Aotearoa and internationally. The pace of scientific literature lags far behind the rapid pace of environmental and social change, hence the reliance on material rapidly produced in response to events (for example, media articles) as well as reports designed to facilitate organisational planning for example, for climate change responses. A cross-section of informants was selected by the Rātā Foundation, (some of whom contributed to the previous Environment Sector Scan), mostly based within of the Rātā rohe. A total of 11 semi-structured face to face or phone/zoom interviews took place, each lasting 45-60 minutes. All interviews were documented using transcription software (Otter AI) and key themes aggregated. While feedback from interviewees is incorporated throughout the report, quotes remain anonymous (unless from sources other than interviewees). A list of interviewees is included in the Appendix.

[15] https://inaturalist.nz/
[16] https://www.tet.org.nz/projects/blue-carbon-core-and-restore/
[17] https://predatorfreenz.org/stories-research/latest-research/
[18] https://www.wetlandtrust.org.nz/

1.2 Philanthropy supporting groups, projects and climate change initiatives

Philanthropic sources of funding including the Rātā Foundation continue to provide critical support for initiatives ranging from local community-led projects to large multi-party projects extending across different ecological and political regions. Feedback from interviewees highlighted the strong relationships built up between the Rātā and applicant, the importance of trust and providing funding for basic yet vital services/actions:

"I feel incredibly grateful to the to the funding from Rātā… it's so hard to get that operational funding that just helps keep the team running… and that's not tagged to a whole lot of project deliverables... What we've been able to achieve with a stable team… it's phenomenal…" (Study interviewee)

With climate change mitigation and adaptation firmly on the government's agenda and now more firmly embedded in public consciousness, the development of the community trusts' Funders Commitment on Climate Action highlights the importance of, and recognition of the acute impact that a changing climate has on the environment and society. The commitment centres on promoting principles and actions to enable a just, equitable transition to a carbon neutral world, while also fostering collaboration, providing leadership and having transparent processes[19]. Funders have developed a Tika Transition Guide to breathe life into a Just Transition for Aotearoa where tikanga Māori and Te Tiriti o Waitangi must sit at the heart of our climate action response.[20] Addressing the changing climate and seeking positive outcomes for the environment and communities is an overarching concern[21].

The Funders Climate Playbook commissioned by the combined Community Trusts highlights how funders can promote and support climate action by[22]:

1) **Honouring Te Titiri and Māori aspirations:** Enhance te ao Māori learning; engage deeply with Māori communities and consideration of partnership to govern funding that addresses climate issues and Māori aspirations.
2) **Supporting an equitable transition**: Fund community climate action; create and share intelligence; enhance public/community participation in climate action and amplify marginalised voices.

[19]https://www.climateactionaotearoa.co.nz/
[20]A Tika Transition is used with permission by its developer Dr Maria Bargh Professor of Politics and Māori Studies, Te Herenga Waka – Victoria University
[21]https://www.climateactionaotearoa.co.nz/
[22]https://www.climateactionaotearoa.co.nz/_files/ugd/110eca_63694b6a98b84cf5bff355e66dc0d89a.pdf

3) **Enhancing community preparation:** Ensure communities are informed enough to make decisions about resilience. Community voices are amplified to influence adaptation measures.
4) **Kaitiakitanga and a resilient environment:** Support the creation of new regenerative carbon offset initiatives, develop Environmental Resilience Funds and invest in Climate Resilience initiatives.
5) **Supporting organisations to become carbon neutral:** Funders: show leadership, move towards lower emission investments and create a funder roadmap to reduce emissions. Charities: influence the transition, support those organisations with the highest emissions, cascade learning through networks.

2. Environment and Climate across the Rātā rohe

"Interactions between climate change and… processes, such as biological invasions and habitat fragmentation, will drive reductions in biodiversity" (Macinnis-Ng et al., 2021).

Nationally, five interconnected pressures across land and sea, urban and rural affect the integrity of our ecosystems (Department of Conservation, 2020a):

1. **Introduced species** including mammalian predators, herbivores, weeds, pathogens, and other organisms both terrestrial and aquatic are proliferating.
2. **Land and sea use** are destroying and fragmenting habitats.
3. **Direct exploitation and harvesting** impacts species populations, distributions, and habitats.
4. **Climate change** will exacerbate existing pressures, particularly for already vulnerable species and ecosystems.
5. **Pollution** including excess nutrients, sediment, biocides, plastics, light and sound negatively affect biodiversity and habitats.

Te Mana o Te Taiao, the Aotearoa New Zealand Biodiversity Strategy (Department of Conservation, 2020b) lays out pathways to protect, restore and sustainably use biodiversity (indigenous biodiversity in particular) over a 30 year period. The focus now is broadened to Climate change and the multiplier effect it has on existing environmental pressures. Of relevance to environmental funders in the Strategy is the pou (pillar) Whakahau - Empowering action. By 2050, goals are:

- Everyone (whānau, hapū, iwi, Māori organisations, NGOs, central and local government, businesses, organisations, industry, and every individual) has the skills, knowledge and capability to be effective.
- Resourcing and support to enable connected, active guardians of nature.
- Collaboration, co-design and partnership are delivering better outcomes.

2.1 Climate projections for Aotearoa

Unprecedented. Extreme. These are now common terms that describe living in today's world. The latest Annual Climate Summary from the National Institute of Water and Atmospheric Research (NIWA) confirmed that 2022 was warmest year in Aotearoa since records began in 1909[23]. As concentrations of greenhouse gas emissions (GHG)[24] increase, by 2040, projected warming for our country could be as low as 0.2°C or as high as 1.7°C. By 2090, projections range from 0.1°C - 4.6°C warmer than today, largely depending on how quickly GHG emissions are reduced globally (Ministry for the Environment, 2018). Although the climate change dialog focuses on temperature, the climate system drivers include rainfall and snowfall intensity and abundance, along with windspeed. In a nutshell, projections over the next century highlight changes in rainfall characterised by stronger seasonality and variability across regions.

Environmental Impacts of Climate Change we are likely to experience more of:

- Food-borne and water-borne diseases (for example, Salmonella).
- The arrival of tropical diseases for example, dengue and Ross River fevers (Wilson et al., 2011).
- Threats to native species from changed distribution of disease vectors.
- Pathogens (fungi and viruses) spreading and affecting crops and native species (for example, kauri dieback, myrtle rust).
- More intense fires, lasting longer and occurring more often.
- Moderately extreme to extreme rainfall events are likely to increase exacerbating flooding and land stability, including outside the traditional winter period.
- Less snowfall leading to increased drought frequency and duration.
- Changes to the range and distribution of species.
- Sea level rise combined with storms and inundation exacerbating coastal erosion and flooding.

[23]itstimecanterbury.co.nz

[24]Gases contributing to the greenhouse effect: CO2, methane, nitrous oxide, hydrochlorofluorocarbons, hydrofluorocarbons, ozone

2.1.1 Māori and climate change

"[The] kind of adaptation that generates public good benefits has to be inclusive to ensure everyone's voices are heard, especially tangata whenua" (Dr. Anita Wreford)[25]

Ngai Tahu have begun planning how best to serve iwi needs and aspirations going forward by developing a climate change strategy[26]. The strategy centres on short (to 2025) and longer term (to 2050) actions for communications, advocacy, and education for iwi members about climate change; to conduct research; restore and enhance the whenua as well as guide investments to secure resources needed for a more resilient future.

In the present, however, many Māori communities continue to be disadvantaged by interconnected issues including environmental degradation, housing, access to public services, social development needs and deprivation[27]. All of these will be exacerbated by climate change with impacts cutting across all dimensions of te ao Māori[28] which include:

- Degraded **mauri** (life force) of ecosystems and taonga species, jeopardising associated mātauranga.
- **Mātauranga Māori** (knowledge) may not be passed onto future generations. This includes centuries-old tohu (environmental indicators) that are observed and relied on being altered. **Te reo me ngā tikanga** (language and customs) and interactions between generations to share the mātauranga can also be reduced.
- Extinction/reduced populations and distributions of **taonga** species for example, tuna (eels), kōura (crayfish) and kākahi (mussels) and loss of physical access to **taonga** species severing ties between whakapapa (lineage or ties) between iwi, hapū, whenua (land) and taonga.
- The ability to act as **kaitiaki** (guardians) over the taonga and engage in **mahinga kai** (food gathering) practices within their rohe (region).
- How whānau practice **manaakitanga,** the responsibility of a host to care for whānau and manuhiri (visitors) through nurturing relationships and by providing shelter, food, and resources.
- Many culturally significant **heritage sites** including marae (meeting places) and urupā (burial grounds) are in low-lying coastal areas increasing their vulnerability to rising seas and storm surges.

[25]https://www.rnz.co.nz/news/on-the-inside/462706/comment-new-zealand-farmers-and-growers-are-already-adapting-tochanging-climate-conditions-just-not-enough
[26]https://ngaitahu.iwi.nz/environment/policy/climate-change-strategy/
[27] https://www.nrc.govt.nz/environment/climate-change/climate-change-in-northland/impacts-of-climate-change-for-maori/
[28]https://environment.govt.nz/facts-and-science/climate-change/how-climate-change-affects-maori/

2.1.2 On the bright side?

Almost all climate impacts are likely to be negative. However, in some parts of Aotearoa, warmer temperatures, a longer growing season combined with fewer frosts may allow native fauna and flora species ranges to be extended, and in a farming context, new crops to grow and pasture to grow faster. The degree to which these benefits could be offset (for example, through prolonged drought, increased flood risk, and greater frequency and intensity of storms) is not known. In some cases, there may be other benefits for native species: in braided river systems, flooding can scour weeds from gravel islands. This occurred in 2021 when the Ashley/Rakahuri River flooded, resulting in better nesting habitat for birds with gravel islands freed of exotic vegetation cover, which provides habitat and shelter for predators[29].

2.2 A snapshot of the Rātā rohe through an environment and climate lens

The following tables provide a summary of generalised regional climate projections, an overview of recent catastrophic events as well as impacts already observed by interviewees (and others). Detailed information on land, water, air and the marine environment are included in the first Rātā Environment Sector Scan (Denyer, 2017). A summary only of available data is presented here, given the paucity of new state of the environment monitoring in the interim.

[29] https://www.odt.co.nz/star-news/star-districts/star-north-canterbury/endangered-birds-benefit-ashleyrakahuri-river-flood

Table 1. Canterbury environment and climate summary

CANTERBURY (Christchurch, Waimakariri, Selwyn and Hurunui Districts)

SPECIAL FEATURES

• Braided rivers • Kaitorete Spit • Sub-montane lakes • Dry eastern lowlands • Ihutai/Avon-Heathcote Estuary • Te Waihora/Lake Ellesmere • Kaikoura ranges • Arthurs Pass National Park • Canterbury mudfish • Banks Peninsula marine mammal sanctuary • Travis and Sanctuary wetlands • Titi/ sooty shearwater on Banks Peninsula

ENVIRONMENT: Ōtautahi/Christchurch

- **Water quality** of the Ihutai/Avon-Heathcote Estuary has improved since 2007 (2020)[30]
- Temperature inversions can lead to poor **air quality** in winter from heating and vehicle emissions (2017)[31]

ENVIRONMENT: Waimakariri, Selwyn and Hurunui Districts

- **Wilding conifers** have spread throughout high country areas and on Banks Peninsular. **Willow, gorse and broom** impact on braided rivers, altering their flows and providing habitat for predators that feed on rare birds (2018)[32]
- **Cyanobacteria blooms** in Canterbury rivers and lakes are common each summer, particularly when the season is particularly hot and dry (2019)[33]
- Around 90% of **indigenous biodiversity** has been lost from lowland and coastal environments (2008)[34]
- Widespread **habitat loss and modification** in the lower reaches of braided rivers due to water abstraction, flood control works, gravel abstraction, decreasing water quality, animal and plant pests (2008)

[30] https://www.ecan.govt.nz/technical-reports/

[31] https://www.ecan.govt.nz/your-region/plans-strategies-and-bylaws/canterbury-air-regional-plan/

[32] https://www.ecan.govt.nz/your-region/plans-strategies-and-bylaws/canterbury-regional-pest-management-plan/ and https://braidedrivers.org/threats/weeds/

[33] https://www.ecan.govt.nz/data/document-library/?ids=3727759

[34] https://www.ecan.govt.nz/your-region/plans-strategies-and-bylaws/canterbury-biodiversity-strategy

CLIMATE PROJECTIONS

Drought: Increased pressure on water resources (especially North Canterbury) resulting from higher temperatures. More frequent and extreme droughts.
Flooding: Increased in some areas, particularly around the lower Avon River in Christchurch. Increased coastal erosion.
Fire: Higher risk for example, Ōtautahi/Christchurch and Kaikōura resulting from strong winds, high temperatures, low humidity and seasonal droughts. Longer fire season.
Biosecurity: Potential increase in the spread of pests and weeds, for example, frost tender banana passionfruit appears to be spreading, and Argentine ants have survived through two winters (previously not thought possible).

CLIMATE EVENTS & OBSERVATIONS

2021: High intensity rain over a prolonged period in eastern Banks Peninsula
2021: Rakahuri/Ashley River floods
2018: Soaring temperatures in and around Christchurch and gusty north-westerly winds contributed to two wildfires.
Two helicopters and five ground crew battled one blaze near Motu-kauati-rahi/Cass Bay, Canterbury.

OBSERVATIONS

Interviewees highlighted expanding growing seasons combined with range expansion (for example, into the high country) for weeds such as grey willow (Salix cinerea); coastal squeeze, with waves overtopping dunes resulting in inundation and coastal erosion as well as creating groundwater pressure, which, by nature creates flooding. Other issues raised included ongoing droughts impacting water storage and the ability to retain flows in waterways.

Table 2. Rēkohu/Chatham Is environment and climate summary

RĒKOHU/CHATHAM ISLANDS

SPECIAL FEATURES

Extensive peatlands • Coastal lagoons • Te Whanga Lagoon and Lake Wharemanu • Rich marine mammal diversity • Many endemic species/subspecies (including tāiko/ tchaik, parea, black robin, Forbes parakeet, Chatham's mudfish) • Free of mustelids • c.40 offshore islands, many with near pristine habitat • Moriori tree and rock carvings

ENVIRONMENT

- **Freshwater quality** is good and capable of sustaining aquatic ecosystems, with fish life generally abundant. Most lakes are in a steady state (2018)[35]
- Predator Free 2050 feasibility study underway to eradicate **possums, feral cats and rats**[36]
- There may be a significant risk to some **seabird species** of entanglements in set nets, with significant risk to seabird populations (some considered threatened or endangered) in interactions with offshore trawlers[37]
- Up to up to 20% of the Islands' **endemic species** (including Chatham Island forget-menot/kopakopa/kopukapuka, tāiko/tchaik' and black robin) are threatened with extinction due to widespread forest clearance, wetland drainage, habitat fragmentation and predation[38].
- **Forest cover** is rare in northern and central Rēkohu/Chatham Is and the north of Pitt Island (2020)[39]
- High number of areas protected under **Nga Whenua Rahui and Forest Heritage** when compared to mainland Aotearoa (2020) and two-thirds of landowners have entered into conservation commitments (2020)
- Uncontrolled **grazing of stock** has degraded coastal vegetation (incl. pingao and endemic herbs), allowing exotic marram grass to dominate. This has reduced habitat for the endangered Chatham Island oystercatcher (2020)

[35]https://www.cic.govt.nz/assets/CIC/Documents/Chatham-Islands-Water-Quality-Summary-2018.pdf
[36]https://pf2050.co.nz/project/chatham-islands/
[37]https://fs.fish.govt.nz/Page.aspx?pk=116&dk=602
[38]https://www.cic.govt.nz/assets/Chatham-Islands-Council-Biosecurity-Strategy.pdf
[39]https://www.cic.govt.nz/assets/CIC/Documents/Chatham-Islands-Resource-Management-Document-Operative-Version-2020- FINAL-WEB.pdf

CLIMATE[40]

Drought: Increasing periods of drought[41] creating issues for islanders not connected to mains or council water supplies[42].

Flooding: More heavy rainfall and extreme rainfall events will increase the risk of flooding on the islands for example, raising water levels in Te Whanga lagoon after heavy rainfall could increase the risk of surface flooding of nearby roads. Increased risk to coastal roads and infrastructure from coastal erosion and inundation, increased storminess and sea-level rise. Rainfall has already increased by 10% over the last century (Mullan et al., 2005).

Biosecurity: Warmer, wetter conditions could increase the spread of pests and weeds.

RECENT CLIMATE EVENTS & OBSERVATIONS

2023: Although Cyclone Gabrielle did not have a significant impact on Rēkohu, anecdotal evidence suggests: "We never used to get tropical cyclones, but we do now. There's not a lot we can do about it other than tighten down the hatches and stay home till it's passed" [43]

[40] https://environment.govt.nz/facts-and-science/climate-change/impacts-of-climate-change-per-region/projections-chathamislands/

[41] https://www.beehive.govt.nz/release/government-supports-chatham-islands-resilience

[42] https://www.rnz.co.nz/news/political/479479/government-announces-water-safety-scheme-for-chatham-islands

[43] https://www.stuff.co.nz/national/300807689/chatham-islands-hope-worst-of-cyclone-gabrielles-weather-has-passed

Table 3. Marlborough environment and climate summary

MARLBOROUGH (incl. Kaikōura District)

SPECIAL FEATURES

Red Hills mineral belt • Richmond range • Marlborough Sounds islands • Tuatara • Biodiversity hotspot with local endemic species incl. rock daisy, pink broom, NZ lilac, and gecko and other threatened subspecies including Hector's dolphin, tuatara and long-tailed bat • Wairau River • Molesworth dryland ecosystem

ENVIRONMENT

- The last two surviving colonies of **Hutton's Shearwater** breed in Kaikōura along with 30 other indigenous bird species (2023)[44]
- **Wilding conifers** spreading into dune areas in Kaikōura and continuing to spread in Marlborough (2015)[45]
- Increased incidence of **low flows** in major river systems in Marlborough (2015)
- **Reduced nitrogen** concentrations in rivers, incl. the Ōpaoa, Omaka and Taylor Rivers, but **increased E. coli** concentrations in the Flaxbourne and Taylor Rivers (2015)
- Since 2012 Marlborough has experienced a succession of **dry summer seasons** with the lowest annual rates of rainfall ever measured (2015)
- Increasing threat of illegal introductions of pest species such as **wallabies** in Marlborough given the suitability of habitat[46]

[44] https://www.kaikoura.govt.nz/our-district/environment/

[45] https://www.marlborough.govt.nz/environment/rivers-and-wetlands/state-of-the-environment-reporting/state-of-theenvironment-report-2015

[46] https://www.stuff.co.nz/national/80020499/roadkill-of-an-australian-kind-found-in-marlborough

CLIMATE PROJECTIONS[47]

Drought: By 2090, drought events could more than double compared to 1995. Water shortages along with increased demand for irrigation and increased risk of wildfires are likely to occur. Droughts are expected to increase in frequency and intensity.

Flooding: Increased storminess and sea-level rise resulting in coastal erosion and flooding is likely to impact on coastal roads and infrastructure.

Biosecurity: Warmer winters may change pest and disease regimes for all fruit crops. Fungi and viruses affecting crops may penetrate further into part of the region where they are currently excluded by lower temperatures.

RECENT EVENTS

2022: State of Local Emergency with the largest flood on record for the Rai River (estimated as a 60-year event). Highway 6 and SH 63 were closed with damage due to flooding and slips cutting off communities in Canvastown and Rai Valley from Marlborough and Nelson. Access in and out of the Marlborough Sounds was also adversely affected[48]. It was described as “The biggest recovery ever faced” in the Marlborough Region[49].

2018: Ex- cyclones Gita and Fehi cut off access to Kaikoūra[50] and caused flooding in Marlborough (for example, Wairau Valley)[51]

2016: Kaikōura earthquake resulted in large-scale landslides, rockfalls, surface fault rupture, and coastal uplift[52].

[47]https://www.mpi.govt.nz/dmsdocument/27037-Effects-and-impacts-Nelson-and-Marlborough-Regional-summary

[48]https://www.marlborough.govt.nz/civil-defence-emergency-management/august-storm-event-2022

[49]https://www.rnz.co.nz/news/national/473604/marlborough-and-nelson-flooding-long-complex-recovery-ahead

[50]https://www.stuff.co.nz/national/101630678/excyclone-gita-packed-a-punch-leaving-kaikura-drenched

[51]https://www.stuff.co.nz/national/101626947/slips-and-trees-down-as-excyclone-gita-floods-parts-of-marlborough

[52]https://www.learningfromearthquakes.org/images/Activities/Travel_Study/2019_Travel_Study/Final_Report_Natural_Environme nt.pdf

Table 4. Nelson/Tasman environment and climate summary

NELSON/TASMAN

SPECIAL FEATURES

Onetahua/Farewell Spit Ramsar site • Karst/limestone features • National and Regional Parks • Alpine lakes • Brook Waimarama Fenced Sanctuary • Specialised species in mineral and limestone belts • Boulder banks • Sites of international importance for shorebirds (for example, Motueka Sandspit and Waimea Inlet) • Rich history of human settlement and use

ENVIRONMENT: Nelson[53]:

- Half of Nelson is covered in **native vegetation**
- 33% of Nelson land area is protected as **public land** by Council or DOC
- Approximately 900ha area under **predator control** by 12 community groups (2018)
- Native species listed as **threatened/at risk**: 73 plants, 56 invertebrate, 37 bird, 9 freshwater fish, 6 reptile (2018)
- 62 terrestrial, aquatic and marine pests that can cause significant damage to the region's natural environments and primary industries
- **Freshwater and marine water quality** is impacted by nutrient inputs, sediment, or pollutants
- from the urban environment (2018)

ENVIRONMENT: Tasman[54]:

- 20 subspecies of **native fish**, 16 of which migrate to and from the sea to complete their life cycle. 12 are at risk/nationally vulnerable (2018)
- **Nutrient enrichment** is not causing significant estuary degradation in most areas (2018)
- Less than 1% of original extent of **alluvial forests** remain in the Nelson/Tasman region – making this one of the most depleted ecosystems in the region overall (Sky Davies pers. comm)
- Good or very good **river water** ecosystem health at 60% of the sites, highest in streams draining mountain terrain and hill country, but poor in small lowland streams where there is intensive development (2010 – 2015)

[53] https://www.nelson.govt.nz/assets/Environment/Downloads/Environmental-monitoring/state-of-the-environment/State-of-theEnvironment-Report-2018.pdf

[54] https://www.tasman.govt.nz/my-council/key-documents/more/environment-reserves-and-open-space/environmentalmonitoring-reports/

CLIMATE PROJECTIONS[55]

Drought: By 2090, the time spent in drought ranges from minimal change through to more than double. More frequent droughts are likely to lead to water shortages and an increased demand for irrigation.

Flooding: Stormwater systems may be overwhelmed more often owing to heavy rainfall events which could lead to surface flooding. River flooding and hill country erosion events may also become more frequent. Increased storminess and sea-level rise resulting in coastal erosion and flooding is likely to affect coastal roads and infrastructure.

Fire: Increased risk of wildfire owing to decreased rainfall.

Biosecurity: Pests including mosquitoes, blowflies, ants, wasps, and jellyfish will become more widespread in the region due to warmer temperature. Pathogenic fungi and viruses may also spread into previously colder areas.

RECENT CLIMATE EVENTS

2022: Severe flooding across Marlborough and Tasman Districts[30].

2021: Heavy rainfall caused the Motueka River to burst its banks with State highways in the region closed due to flooding, rockfalls, mud, and debris[56].

2019: Fire following prolonged drought was the largest recorded in Aotearoa since 1955 and resulted in a local State of Emergency. Wakefield (pop. 3,000) was evacuated, 2400ha burnt and livestock lost[57].

2018: Storm surges from Ex- cyclone Fehi coincided with a king tide, laying parts of the Nelson and Tasman coastline to waste, damaging heritage buildings and structures. The event was later used as a benchmark for sea level rise projections[58]. Cyclone Gita followed shortly afterwards causing further damage.

OBSERVATIONS

Interviewees highlighted flood-borne forestry slash and sedimentation issues in coastal areas, collapsed shellfish beds initially resulting from overexploitation, but with recolonization hampered because of excess sediment being resuspended through trawling action. Observations also included landslides scouring out of sub-catchments during storm and associated flood events.

[55]https://www.mpi.govt.nz/dmsdocument/27037-Effects-and-impacts-Nelson-and-Marlborough-Regional-summary

[56]https://www.theprow.org.nz/events/nelson-and-tasman-floods/#.Y_xM6XZBzSI 57 https://en.wikipedia.org/wiki/2019_Nelson_fires#cite_note-12

[57]https://en.wikipedia.org/wiki/2019_Nelson_fires#cite_note-12

[58]https://www.rnz.co.nz/national/programmes/checkpoint/audio/2018705790/cyclone-fehi-used-as-benchmark-for-sea-level-rise-projections

3. Making restoration smarter with new tools and technologies

New tools and technological advances have created major efficiency gains for conservation. As the cost of these tools decreases, both the capture and sharing of novel information can be democratised – they're no longer only available to large organisations that have the budgets and the expertise to deploy them. The following list highlights a potential range of investment opportunities for Rātā.

- Firstly, groups/community organisations can be guided toward using more efficient approaches such as prioritising which sites to restore, managing their sites as well as collecting environmental data.
- Secondly, direct investment could be considered for example, to purchase software licenses, hardware such as drones, and cover costs for eDNA kits and data analysis.

Priority sites for restoration can be identified through online tools:

The **Eco-Index**[59] is being developed with support from the Biological Heritage National Science Challenge. The 100- year target is to reconstruct and restore 15 percent of every ecosystem type per catchment, connected by wildlife corridors. The Eco-Index will be an open-source digital dashboard that will clearly map the highest priority areas[60] (heat maps) to maintain, restore and reconstruct natural ecosystems throughout Aotearoa. It will also determine the financial investment required per property/catchment/region/industry to reach the goals, and track progress at a range of scales by harvesting remotely sensed and crowd-sourced data in real time. Incorporating projected sea level rise and climate data to refine datasets will provide futureproofed ecosystem restoration guidance.

Drones/UAVs can be used in many different ways:

- Distributing bait for pest control operations and herbicide to manage weeds (SCION, 2022a)
- High precision herbicide application
- Accessing and inventorying difficult to access land
- Seed distribution for native forestry restoration[61]

[59] https://eco-index.nz/

[60] Incorporating priorities to maximise representativeness, diversity, resilience, ecosystem service and other ecological values, along with opportunity and activity cost to restore every 10x10 m square of land in the country (K Denyer, pers comm. 8/3/23)

[61] https://www.envicotech.co.nz/technology

- Environmental monitoring (for example, aerial photopoints, conducting a seabird census[62])
- High resolution 2D and 3D mapping
- Thermal imaging for locating cryptic species (for example, bitterns in wetlands), pests and native species
- Spectral imaging for measuring species health (for example, identifying sick vs. healthy trees[63])
- Marketing and promotion by enabling funders and the public to view and connect with sites

eDNA can provide a snapshot of site biodiversity:

Environmental DNA (eDNA) testing enables the public to collect samples easily and efficiently on site using a low-cost kit. A multispecies test provides presence/absence data on native and exotic fish, birds, mammals, reptiles, amphibians, plants, fungi as well as micro-organisms found in the sample. This provides organisations with a snapshot in time and can help for example, with designing pest control interventions as well prioritising species for reintroduction[64].

Data can be collected in real-time:

Water health can be measured remotely in real time across rivers, lakes, streams and groundwater networks using a floating module[65] housing sensors that captures data across a range of variables (for example, temperature and turbidity).

Artificial Intelligence and Machine Learning can dramatically speed data analysis:

An overview of developments in Aotearoa include:

- Flora and fauna pest species can be identified[66] using fixed thermal cameras both in areas of known infestations or to investigate suspected incursions. AI and machine learning tools can

[62]https://predatorfreenz.org/research/drone-technology-census/
[63]https://www.nature.org/en-us/about-us/where-we-work/united-states/colorado/stories-in-colorado/colorado-drones-forconservation-feature/
[64]https://www.wilderlab.co.nz/ and for community applications see: https://www.epa.govt.nz/community-involvement/openwaters-aotearoa/
[65]https://riverwatchsolutions.com/
[66]https://www.boffamiskell.co.nz/news-and-insights/article.php?v=you-need-to-know-thermal-imaging-applications-in-biosecurity

- assist with the image sorting process, quantifying the type and number of pests of a given species[67]
- Automatic acoustic recorders generate vast amounts of data. To avoid the time-consuming task of manual analysis, tools have been developed to automate the process[68]
- Using periodic sound recordings of birdsong volumes and changes in levels over time to provide a measure of restoration and/or pest management effectiveness[69]
- The ability to recognise patterns on critically endangered Archey's frogs so that individuals can be identified[70]
- AI tools applied to high resolution satellite and aerial imagery to better understand biodiversity state and trends. Algorithms are currently being developed (2023) that will result in open-source tools[71]

The challenge of lowering emissions for community-led environmental initiatives

Arguably, adopting a low-emissions approach for the community conservation sector is difficult to achieve given focus on dispersed volunteer labour in the field and the small scale of the organisations themselves (see Trust Waikato, 2021). For one of the interviewees in this study, the nature of their restoration and conservation mahi may also pose practical and logistical constraints:

"We've… purchased electric chainsaws, and then realised they're just not fit for purpose… for the field work that our staff do, actually having equipment that meets our health and safety requirements and ensures that they can deliver in their particular task –it's quite challenging to find gear that's robust enough…"

[67]https://www.ecan.govt.nz/get-involved/news-and-events/2023/using-artificial-intelligence-to-identify-pest-plants/

[68]https://predatorfreenz.org/research/avianz-open-source-software/

[69]https://www.2040.co.nz/collections/cacophonometer-bird-monitoring

[70]https://www.wildlife.ai/projects/pepeketua-id/

[71]https://eco-index.nz/artificial-intelligence-tools

4. Addressing Climate Change: From Mitigation to Adaptation

"…storm events are getting increasingly worse… our challenges will increase, but I think our learning will increase as well. And so, we want to be able to set things up as best we can within the time that we have and with the knowledge that we hold to pass it on to the next generation…" (Study interviewee)

Bold, decisive and ambitious action is needed.
There are two approaches to addressing climate change: mitigation and adaptation. Mitigation relies on reducing emissions of, and stabilising levels of heat-trapping greenhouse gases (GHG) in the atmosphere, that is, the burning of fossil fuels for electricity, heat, or transport. Another mitigation measure is to enhance the "sinks" that naturally store carbon. These include soils in wetlands (particularly peat soils as found on Rēkohu/Chatham Islands) on land and in estuaries which store (blue) carbon in the form of soil organic matter, chemical compounds, and minerals. Plants also remove carbon dioxide from the atmosphere and store it in their tissues, while the ocean serves as a giant carbon sink, with microscopic marine algae and bacteria, absorbing as much atmospheric carbon as all the plants and trees on land combined[72].

4.1 Rewarding carbon sequestration

In Aotearoa, conditions are favourable for carbon sequestration: the generally low altitudes and benign climate promotes year-round growth of evergreen plants (Campbell, et al., 2014, Goodrich, et al., 2017). To date, Aotearoa has relied heavily on plantation forestry to sequester carbon to meet international obligations, while being slow to reduce gross emissions (Yule, 2022).

4.1.1 Terrestrial carbon

The Emissions Trading Scheme (ETS) is designed to incentivise investment in carbon sequestration, and promotes the planting of new forests and older forests to be replaced if they are ever cut down[73]. Planting exotic monocultures (particularly pine, Pinus radiata) under the ETS is a

[72]https://www.clientearth.org/
[73]https://www.mpi.govt.nz/forestry/forestry-in-the-emissions-trading-scheme/about-forestry-in-the-emissions-trading-scheme/

widespread practice in Aotearoa – it is straightforward and extremely cost-effective given the low cost of seedlings, ease of planting and rapid growth rates[74].

However, there is increasing urgency to facilitate investment in planting native and mixed species forests, while also considering how other ecosystems such as wetlands also sequester carbon, contribute a range of ecosystem services and provide valuable cultural resources.

Though considered a nature-based solution to climate change, there are major drawbacks to planting pines: there are environmental impacts (for example, erosion, slash build-up in river systems and along coastlines, and potentially causing devastating effects as experienced in Hawkes Bay and Tairāwhiti during Cyclone Gabrielle), effects on rural communities (that is, the change in social dynamics and infrastructure associated with farming to exotic forestry) and the shorter-term nature of economic gain associated with the c.30year harvest regimes in plantation settings. In highly erosion-prone areas such as Tairāwhiti, scientists have begun to call for replacement of short-rotation pine with indigenous forests[75].

4.1.2 Blue carbon and coastal resilience

Until recently, coastal restoration has mostly centred on creating and maintaining habitat for marine and coastal fringe species along with buffering coastlines from weather events. Blue carbon initiatives now provide another means to restore and potentially expand these environments using the sale of blue carbon and/or resilience credits. To better understand the amount of blue carbon stored in coastal wetlands, the Tasman Environmental Trust initiated a pilot study “core and restore” in the Waimea Inlet sediments and in seagrass meadows at Onetahua/ Farewell Spit[76]. The study was carried out with technical support from the Cawthron Institute and Beca as well as support from local iwi.

In general, blue carbon initiatives centre on restoring and protecting coastal ecosystems to reduce GHG emissions. In these settings, activities to enhance GHG removal include re-wetting (for example, blocking drainage channels and installing weirs to maintain water levels), revegetation, or preventing a site from being degraded in the first place.

[74]https://www.rnz.co.nz/news/in-depth/399192/green-rush-will-pines-really-save-the-planet
[75]https://www.stuff.co.nz/environment/climate-news/300814466/we-planted-pine-in-response-to-cyclone-bola-it-is-now-time-toinvest-in-natives
[76]https://www.tet.org.nz/tet-projects/blue-carbon/core-restore-project/

A feasibility study by Weaver et al. (2022), investigated how a market could be created through selling carbon and/or resilience credits to enable restoration at scale and to financially self-sustaining:

"There is a real opportunity for tidal salt marsh restoration blue carbon projects in Aotearoa New Zealand. There are challenges associated with structuring financing and investment arrangements, but these are no different from any commercial venture" (Weaver et al., 2022)

Three sites in Nelson/Tasman and Marlborough were identified in the study, each potentially benefitting from investment in blue carbon or resilience credits:

- Onetahua/Farewell Spit, c.1,500 ha seagrass restoration and conservation.
- Waimeha Inlet, c.3,440 ha salt marsh and seagrass conservation and restoration.
- Wairau Lagoon and estuary, c.1,980 ha salt marsh conservation.

4.2 Rewarding biodiversity and restoration gains

"You might say nowadays, marginal farmland has become a piece of environmental infrastructure that is incredibly valuable in a climate changed world" (Study interviewee)

"…that wetland that used to always be the pain in the proverbial and flood the paddock, all of a sudden, starts to become a really valuable asset that's offsetting the emissions from say, their farming activity" (Study interviewee)

In recent years, the limitations of the carbon investment market have spurred innovative approaches to rewarding restoration initiatives that simultaneously benefit biodiversity, provide more for communities while also protecting erosion-prone areas. Community-led initiatives include Banks Peninsula Conservation Trust[77] an iwi-private land partnership centring on native reforestation also on Banks Peninsula[78] and Sanctuary Mountain[79] in the North Island. Investigations are also taking place to better understand the potential for blue carbon to support the restoration of estuaries.

[77] https://www.bpct.org.nz/

[78] https://www.stuff.co.nz/pou-tiaki/131207488/banks-peninsula-farmland-to-return-to-native-forest-bringing-carbon-creditincome-and-healing-for-mana-whenua

[79] https://www.sanctuarymountain.co.nz/home

Moving from tools for individuals, farms and organisations to measure their carbon footprint (for example, Tōitu Envirocare[80]) are platforms that seek to connect investors with those restoring the environment. An emerging player is Toha[81], currently launching a series of networked marketplaces. Environmental outcomes of "regenerative" action projects (for example, carbon sequestered, waterways protected, or biodiversity enhanced) can be registered as "Claims" on the NZ Climate Innovation market for businesses, government and organisations to invest in. Additionally, Toha have designed a way to reliably measure and prove regenerative outcomes. Another market centres on farm-based regenerative practices for sheep, beef and dairy, and native plant regeneration on farms and on whenua Māori [82].

Banks Peninsula Conservation Trust: Donating to grow biodiversity

BPCT have developed a native podocarp (long-lived trees such as totara, kahikatea or matai) planting program that facilitates individuals to offset their carbon footprint. Using an online platform, their own carbon footprint is measured and the number of trees provided along with the time scale needed to offset their footprint. A donation can then be made through the web platform to purchase the required number of trees. The trees are carefully monitored until they are at least five years old and maintained at least twice a year.

The system centres on donations rather than formalised credits, described by BPCTs General Manager as:

"A good example of getting an opportunity for the community beyond the immediate landowners to engage through donations… to this program and our guarantee is that those products are planted somewhere that's legally protected in perpetuity. So they will never be cut down".

[80]https://www.toitu.co.nz/

[81]https://nzcim.toha.nz/

[82]https://www.calmthefarm.nz/nzclimateinnovationmarket

Sanctuary Mountain Maungatautari and the EKOS Sustainable Development Units Programme

Sanctuary Mountain Maungatautari is a mainland ecological island, and like many larger community trusts relies on multiple funding streams (incl. contestable sources, philanthropy, donations, local and central government partnerships, ecotourism and educational activity income). Newly minted biodiversity units purchased by Profile Group Limited will fund the conservation management of 83 ha at Sanctuary Mountain for the 2022 financial year, described by the Trust's CEO as providing an opportunity "…to raise funds in a market environment from businesses that want to embed biodiversity into their value chains."

Funding from Trust Waikato, the Wel Energy Trust, and the D.V Bryant Trust enabled the development of the Ekos 'Sustainable Development Units Programme' which made the transaction possible.

4.3 Adapting to climate change

"…the practice of using previous data sets and extrapolating forward is a bit of a maladaptive practice, we almost have to take a risk management approach instead, questioning, what is the risk if we don't carry out these measures?" (Study interviewee)

The arrival of back-to-back ex-tropical cyclones (Hale and Gabrielle) to the North Island in February 2023 while this report was being prepared, has brought fresh urgency to climate adaptation discussions. Instead of asking "What would that look like?", the questions now centre on "How rapidly can we adapt and who will pay?".

With rainfall up to 400mm, wind gusts of 130-140km/h and waves as high as 11 metres[83] devastating areas already vulnerable to flooding and coastal erosion and tragically taking lives, attention has also turned to poor forestry practices, inappropriate residential development on unstable land, the limitations of hard engineering solutions such as stop banks (and the false sense of security they can provide), along with unanticipated effects on areas previously thought to be "safe" (for example, the coastal community of Muriwai in Auckland).

[83] https://blog.metservice.com/TropicalCycloneGabrielleSummary

Bigger picture adaption options put forward that are more suited to central government funding include major infrastructure redesigns for example, creating “sponge cities” and “sponge suburbs”, developing micro-grid power systems and moving entire at-risk communities (managed retreat) along with fasttracking fit-for-purpose legislation and systems enabling adaptation to happen at pace.

4.3.1 Nature-based solutions

As part of multiple approaches needed for Aotearoa to build greater resilience to more variable and extreme climate impacts, the Government proposes to “Prioritise nature-based solutions to adapt to climate change and deliver other socio economic and environmental benefits, embed nature-based solutions in transport policies and identify options to increase their integration into urban form” (New Zealand Government, 2022). Nature-based solutions can help buffer climate change impacts, slow further warming, while enhancing biodiversity and securing ecosystem services (for example, the flood protection, sediment retention and nutrient cycling that healthy wetlands provide). Community environmental organisations already carry out a wide range of restoration works which sit under the umbrella of nature-based solutions.

“…these… landscapes are also providing a disproportion amount of sediment and nutrient into those sensitive [marine] receiving environments …How do we… protect what we've got there… improve connectivity and resilience… as well as provide for broader nature-based solutions [for] sediment and nutrient and flood attenuation…?” (Study interviewee)

What are nature-based and natural climate solutions? (summarised from Seddon et al., 2020)

The spectrum of nature-based solutions (NBS) is extremely broad, but the overarching goal is to help tackle societal challenges by working with and enhancing nature. Natural climate solutions, a more recent term, refers to conservation and management activities that reduce greenhouse gas (GHG) emissions from ecosystems (for example, protecting peatlands from exploitation) while enhancing ecosystems' capacity to store carbon. An overview of NBS approaches includes protecting and restoring natural ecosystems such as forests, estuaries and freshwater wetlands to creating new or hybrid systems (for example, urban parks and buildings with living walls/vertical gardens which contribute to cooling, help manage stormwater and provide societal benefits for mental health and physical wellbeing).

NBS can support biodiversity and enhance ecological resilience (for example, by protecting and restoring natural ecosystems with native species) that also uphold cultural values and contribute to societal wellbeing. Alternately, NBS can provide minimal biodiversity values (for example, by planting exotic monocultures), which creates climatically less resilient environments with potential losses to ecosystem services (for example, carbon storage and erosion control).

4.4 What to look for: Nature-based solutions principles and best practice

The following sections provide a set of considerations for reviewing application content, or alternately for suggesting to applicants to consider as part of their projects/program design and implementation. Opportunities are outlined where "direct" funding (for example, to underpin conservation actions) or "enabling" funding that supports organisations (for example, capacity building).

4.4.1 Prioritising sites, understanding local conditions and tracking changes

Tools and approaches

- **Spatial planning** is a critical component for guiding investment, to encourage restoration and reconstruction in the highest priority locations. Spatial mapping can identify the land areas which will provide the greatest returns for carbon sequestration, biodiversity enhancement, water quality improvement and reduce sediment discharge. Kotahitanga mō te Taiao Alliance has commissioned The Nature Conservancy to undertake such mapping for Te Tau Ihu (the top of the South Island) drawing on the diversity of spatial data sources that is available in the region. Rātā Foundation has contributed to the Project to enable iwi to include sites of cultural significance and areas for cultural benefit.

"…thinking more about …resilient and healthy communities, as well as resilient and healthy ecosystems …we'd like to put some more thought and energy into linking up in a more deliberate way with the health sector and mental health providers…" (Study interviewee)

- Diverse projects around Aotearoa have embraced a whole systems approach, **Ki uta ki tai**, literally from the mountains to the sea. This recognises the need to position landscape-level interactions, interconnectivity and interdependencies as central to project design and delivery in order to restore the mauri/health, socio-cultural and ecological values associated with the area.
- Both **mātauranga Māori and citizen science** play important roles in stakeholder co-learning processes and knowledge creation for example, by establishing baselines for ecosystem health, creating inventories of native and exotic species, documenting change and quantifying project/program outputs and outcomes. Embedded within mātauranga Māori are culturally specific tohu/environmental indicators for mauri/ecosystem health that may differ from iwi to iwi and to those used in western science. However, there are also many synergies, illustrated by the development of monitoring kits for tangata whenua which bring together both indigenous and western science approaches (see Tipa et al., 2006).
- Incorporating specifications for **SMART output/outcome** criteria to strengthen environmental/climate project design and delivery that is, specific, measurable, achievable, relevant and time-bound (see Jones and Kirk, 2018). These criteria provide a robust approach to determining project efficacy.

4.4.2 Enhancing and diversifying ecosystem services

"We can't plant our way out of it. It's not going to happen" (Study interviewee)

Strengthening resilience

- **Biodiversity corridors** provide stepping stones or safe routes for species to disperse and forage along. Halos or **buffer zones** surround or lie adjacent to high-value biodiversity zones to facilitate species dispersal and protect natural areas from external pressures. They include planted riparian zones and reforested strips to protect against edge effects on existing habitats, and areas with intensive trapping networks.
- **Reducing fire impacts by planting the right species.** Prior to human settlement the frequency of fires was generally low across most of New Zealand (with the exception of wetlands[84]). Since then, the fire regime across Aotearoa NZ has been "rescaled" with fires becoming more frequent and 84 Manuka, mature harakeke, and Tī kouka are all highly flammable (Fogarty, 2001; Johnson, 2005) 22 covering larger areas (Perry et al., 2014). Climate change is likely to increase the fire risk in some areas with some native species and exotics that commonly plague restoration projects (for example, gorse, pines, wattles, and hakea) being highly flammable (Wyse et al., 2016). **Green firebreaks** with native species known to have low flammability could be a planting strategy to protect areas of native species/vulnerable ecosystems (SCION, 2022b).
- **Controlling/eradicating animal pests.** Predator Free 2050 currently only targets rats, mustelids and possums. However, there is overwhelming evidence of how other introduced species including cats, pigs, goats and deer damage our native biota across a wide range of ecosystem types. At the same time, controlling or eradicating introduced herbivores such as goats and deer also protects carbon stores in flora (Hackwell and Robinson, 2021; Leathwick and Byrom, 2023).
- **Rewetting drained peat lands** restores their ability to store carbon and absorb excess water in flood events (Campbell et al., 2014; Goodrich et al., 2017).
- Creating **sponge cities[85]** where permeable surfaces that can absorb rainwater are incorporated into urban design. These surfaces take the form of green spaces such as parks, green rooves, rain gardens, specialised surfaces (for example, permeable paving made from porous materials or spaced to allow water absorption between pavers) and reservoir/wetlands areas such as Travis Swamp and Styx Mill Conservation Reserve in Christchurch. Some of

[84]Manuka, mature harakeke, and Tī kouka are all highly flammable (Fogarty, 2001; Johnson, 2005)

[85]https://thespinoff.co.nz/science/31-01-2023/stormwater-reform-wont-be-enough-we-need-a-sponge-city-to-avoidfuture-disasters

these nature-based approaches in urban settings have wider benefits: producing shade, supporting human health and wellbeing, and creating habitat for wildlife.

Erosion protection

- **Fast tracking native regeneration.** The current cost of broad-scale afforestation with woody native species is c.$20-30,000/ha (c.f. c.1800/ha for pine[86]). A new method could reduce costs by 30-50% by replicating the natural regeneration process in areas including steep erosion-prone slopes and riparian margins. Best practices include weed and pest control before planting a mix of forestrygrade native coloniser species at lower than traditional restoration planting densities[87].
- **Non-planting approaches** include removing the exotic vegetation cover for example, by scraping, burning or applying herbicide (Lambie and Marden, 2020; Peart and Woodhouse, 2021). Natural reseeding relies, for example, on a nearby seed source to aid bird and wind dispersal, or a seed bank in the soil and the availability of moisture at the right time. A grass-selective herbicide may be used to facilitate regeneration as well as plant releasing and weed removal.
- **Creating seed islands** is a hybrid approach centering on intensively planting a small area of the desirable native tree and shrub species. Over time, seeds will be produced that can be wind/bird distributed – a project currently being trialed in marginal open hill country in selected sites across the motu[88]. This approach has been used to revegetate peat bogs in the Waikato with a locally endemic species of rush (Clarkson et al., 2017).

Managing stormwater and flooding

- Enhancing and creating wetlands. Restoring ecological functions to wetlands typically includes managing water levels, controlling plant and animal pests and replanting areas with native species. Over the last two decades, significant research has been carried out on how best to design new wetlands (or replace wetlands that had been removed) primarily to manage pollutants to catchments and beyond for example, alongside motorways/roadways and on the farm (Peters, 2022a, 2022b). A wider design brief for example, to absorb and slowly release excess water from storm events could be incorporated based on updated local climate

[86] https://www.newsroom.co.nz/the-right-trees-in-the-right-place
[87] https://www.farmersweekly.co.nz/technology/timata-a-better-cheaper-way-to-plant-natives-takes-root/
[88] https://www.treesthatcount.co.nz/blog/2023/january/planting-the-seed-to-regenerate-aotearoas-native-trees/

modelling. However, enhancing existing wetlands through restoration (and enlargement where possible) could be a more costeffective option.

Moderating urban heat waves and heat island effects

- **Urban greening initiatives** are designed to create shade, deflect radiation from the sun and release moisture into the atmosphere. Simple, small-scale approaches include planting trees along with optimising their configurations and spatial distribution and installing green roofs and vertical gardens. Pale heat reflecting colours, photovoltaic canopies and reflective roofs have also been put forward (Fadhil et al., 2023). Larger, more complex initiatives centre on integrating blue-green urban infrastructure (see sponge cities).

Protection from coastal hazards and sea level rise

- **Designing restoration for sea level rise.** Aotearoa NZ can expect to see c.0.6m sea level rise if emissions targets are met and up to 1.2m if they are not. Coastal sites for example, the Waimea Inlet (Nelson/Tasman) a large (3462ha), shallow, well-flushed tidal lagoon, are vulnerable to cyclones and storms. Major flooding in the wake of Cyclone Fehi (2018) combined with a high tide prompted a shift in species for restoration planting to salt tolerant species much further inland than had been planted previously[89].

4.4.3 Changing to sustainable landuse

- **Paludiculture** is a form of agriculture in wetland areas. Instead of drainage to support oft unsustainable land uses, paludiculture centres on sustainably harvesting wetland species. In Aotearoa, suitable species are harakeke and raupō which could create new eco-friendly products for example, for insulation. Paludiculture on peat soils also preserves carbon stores, provides a buffering function for surrounding lands, absorbs and processes pollution (for example, excess nutrients from farmland) and soaks up excess water during heavy rainfall events. The agricultural method also considers biodiversity values by timing harvests to minimise impacts on native fauna (for example, wetland bird breeding times)[90].
- Although the **blue carbon market** is in its infancy, there is potential to restore marginal land in lowlying coastal farms in estuarine settings/sheltered areas back to thriving wetland habitats (for example, mangrove, tidal marsh/saltmarsh and seagrass-dominated ecosystems). As the new market matures, selling blue carbon credits could make it economically viable for landowners to consider restoration in lieu of ongoing farming (Weaver et al., 2022).

[89]https://www.stuff.co.nz/environment/climate-news/127435508/blue-carbon-sites-could-limit-retreat-from-coast-groups-say
[90]https://www.nzgeo.com/stories/the-waikato-peatlands/

- Transitioning from **pine to mixed and/or native permanent forests**, or permanent forests with selective harvesting practices is being increasingly discussed following recent widespread storm events that have destroyed large swathes of pine forest, caused catastrophic erosion and landslides and left lowlands and beaches covered in forest slash. Best practices for native regeneration are well-established across a range of landscapes in Aotearoa (Tane's Tree Trust, 2011) which are continually being refined as further experimentation and measurements takes place.

"The biggest opportunity right now [for philanthropic funders]… is in topping up the cost between exotic and native forestry for carbon sequestration. I see that as the low hanging fruit..." (Study interviewee)

4.4.4 Building adaptive capacity

- **Develop and strengthen community resilience** to climate change impacts by supporting community organisations to implement new approaches and ideas, take risks, and experiment. Resilience is not just weathering changes, it is knowing how to generate the types of opportunities that result in positive, forward-looking changes[91]. The Rātā Environment Good Practice Guideline[92] summarises approaches that support the learning and development of community and non-profit organisations.

[91] https://www.preventionweb.net/news/building-communities-adaptive-capacity-what-can-we-learn-development

[92] https://ratafoundation.org.nz/media/nq1cjots/environment_good-practice-guidelines.pdf

5. Communities and sustainable environmental behaviour

"Raising awareness on its own rarely leads to changed hearts and minds, let alone desired environmental outcomes – knowledge simply doesn't equate to action" (Rare and The Behavioural Insights Team, 2019)

Implementing projects/programs that include aforementioned nature-based solutions in the previous section relies on the provision of specialist knowledge, targeted communication, and knowledgeable stakeholders that are engaged and empowered to participate. Education and awareness are a cornerstone of any successful initiative. However, encouraging pro-sustainability behaviour means understanding the drivers and barriers that shape how people act. Traditional approaches to changing the behaviour of groups and the public are through legislation, the market, providing tangible incentives, and through communication and education programs. According to Allen (2021), each can be significantly refined by adding behavioural approaches which sit above and beyond individual values, beliefs, and attitudes. He adds:

"…if we don't understand some of the key determinants underlying behaviour – then it is hard to know what it takes to change it… Our choice-[making is] emotional; we are embedded in social and cultural networks; and are influenced by the context of decisions and the way choices are presented. (Will Allen)

5.1 What to look for: Environmental Education/sustainability programmes - principles and best practice

The following best practices and strategies are drawn from a wide variety of literature and websites[93] on programme design for Environmental Education, sustainability behaviours and conservation outcomes (Rare and The Behavioural Insights Team, 2019; Rau et al., 2022;

[93] https://learningforsustainability.net/behaviour-change/

Robinson et al., 2020). Combined, they provide a set of considerations for reviewing application content.

5.1.1 Trusted research and design methods

- A key principle is **two-way communication**, rather than just from expert to audience that is, experts on tap, not on top.
- **Pilot studies or preliminary research** to better understand contextual factors, challenge and test assumptions, and gain insights into the target community/communities.
- **Stakeholder mapping and analysis** identifies those either affected by or who have an interest in the environmental/sustainability issue or programme.
- **Engage or partner** with iwi/mana whenua if your programme is drawing on mātauranga Māori.
- **Co-design** workshops with supportive members of the target audience helps plan projects and shape details of project/programme strategy, methods used and messaging. The process facilitates drawing in the perspectives and creativity of the target audience.
- The **Theory of Change** underpinning the project/programme builds the strategies that will drive progress toward desired goals and outcomes. The model describes the assumptions made about how the change will happen.

5.1.2 Employing people power

- Bringing in **credible experts**, that are knowledgeable in the desired subject area(s) and are trusted and/or well-known by the target community.
- Engaging **community champions, role models, buddies and mentors** while **fostering networks or alliances** are all approaches that help to lower fear associated with change, strengthen community cohesion and reinforce social norms. **Peer-peer discussions** are often best at informal events and can centre on participants for example, sharing their perspectives, talking about challenges they have faced and overcome, and celebrating progress.
- **Immersive learning** in the environment alongside people helps build skills and confidence to take the action.
- **Keep it simple** reduce the mental and physical effort people need to make as much as possible, making decision-making both simple and rapid as possible.
- **Show positive action** through stories and images that depict similar people carrying out the action and enjoying it to inspire others while showing how the action is done.

5.1.3 Measuring gains and communicating progress

- **Monitoring progress** can help individuals and organisations to understand the impact of their actions and help sustain behaviour change.
- **Positive feedback** can be used to reinforce the action taken (for example, turning off appliances when not in use) and achieving a specific outcome (for example, saving energy).

6. Recommendations supporting Rātā's Strategic Environment Pou

6.1 The changing investment landscape

A landscape is where nature, culture, economics, and history collide. There are many lenses through which to see and experience the landscapes of Aotearoa and consequently how value is assigned to them. From an ecological standpoint, the Department of Conservation use their own framework to assess significant indigenous vegetation or a significant habitat of indigenous fauna[94] to manage their estate, while Councils use criteria from the RMA. However, with climate change and enhancing the resilience of landscapes now also a critical component of the conservation, restoration and protection paradigm, prioritising areas and associated projects for future investment now needs to be more broadly considered.

Recommendation Rātā should broaden its grant investment from a focus on biodiversity protection and conservation to include enhancing the resilience of landscapes.

Recommendation Rātā should continue to fund projects that contribute to reducing GHG emissions, and take a long-term view invest in projects that include climate adaptation.

Understanding developing carbon markets at an organisational level and the ability to impact GHG reduction may be most meaningful for Rātā in its investment space. However, there may also be opportunities to accelerate changes in investment markets.

Recommendation Rātā could work with an investment advisor to understand investment opportunities which directly support climate mitigation and adaption as markets mature locally and internationally. For example, the shift to renewables or carbon sequestration.

6.1.1 Climate considerations

Broadening the lens of community conservation and restoration to incorporate climate change means strengthening the focus on nature-based solutions and the multiple benefits provided to the environment and to society. As a philanthropic organisation, Rātā are in a position to remain agile

[94] Areas/habitats where protection contributes to maintaining indigenous biological diversity at the Ecological District level

and responsive to community groups seeking funding for potentially novel adaptation and mitigation approaches to climate change.

- Consider a **climate resilience category** that facilitates seeking funding to enhance and restore areas that have either been damaged through storm impacts or are in areas vulnerable to climate impacts. Applicants would need to provide evidence that they have considered the impact of their proposed actions to **avoid downstream effects** for example in the choice of species planted or for socially oriented projects, that proposed actions seek to remove the threat of further **embedding serious inequality.**
- Consider co-funding **pilot** or **small-scale studies** to facilitate stronger community involvement in learning and produce data that supports more effective restoration. An example may be a series of local trials to determine the best methods for planting specific estuarine species for a project designed to enhance coastal resilience. Criteria for funding should include technical support from recognised science providers in the form of mentoring, funding and/or pro bono contributions.
- **Spatial mapping and planning** can guide investment while also providing a visual platform for non-experts to easily engage with.
- Consider including **climate change capability building** for the wider NGO sector, this could be offering workshops for community-based organisations starting on their sustainability journey to providing entities with large emissions expertise to assist with emissions measurements, adaptation strategies and fit for purpose ways to reduce their emissions.
- **Climate mitigation funding** Rātā Foundation could do more work on understanding the cost benefit of supporting high emitters to decarbonise and could **consider offsetting** their contribution to their grantees' emissions.

6.1.2 Iwi partnerships, strategic collaborations, engagement and building momentum

- **Collaborative partnerships** that prioritise sites, understand local conditions and track changes (for example, through using spatial planning tools, mātauranga Māori and citizen science) and enable future investment to be focused on impact.
- **Enhancing and diversifying ecosystem services** at scale (for example, re-wetting drained wetlands to enhance carbon sequestration and landscape flood protection).
- Changing to **sustainable landuse** (for example, reforestation with native flora).

- Support community organisations to join **early blue-sky discussions** to develop new initiatives and to challenge thinking across different sectors such as healthcare and recreation.

6.1.3 Build capability to increase the effectiveness of environmental community organisations

- **Strengthen and develop community conservation organisations,** for example, by supporting the development of business cases for example, centering on sourcing sustainable funding, the provision of specialist advice for example, to develop a biodiversity credit scheme, and reimbursing professional trustees.
- **Foster networks and knowledge-building** by supporting community group members to attend and present (in-person) at conferences, symposia, wananga/workshops and hui. Facilitate the development of community events designed to grow knowledge, share best practice, strengthen communities of practice, and celebrate major milestones.
- Continue to provide funding for **technical advice** to assist for example, with developing, supervising/conducting new ecological monitoring programmes or reviewing those already in place (particularly for large, complex projects) and specialist services for example, a facilitator for strategic planning or important community events.
- Continue to support staff/organisational **professional development** such as governance training for trustees; cultural responsiveness, conference attendance, facilitation training for staff, Growsafe certificates and chainsaw handling.
- Support for the collection of **evidence** to report on organisation/project/programme impact measures.

Across the wider non-profit sector Rātā could:

- Consider including climate change capability building for the wider NGO sector, this could be offering workshops for community-based organisations starting on their sustainability journey to providing entities with large emissions expertise to assist with emissions measurements, adaptation strategies and fit for purpose ways to reduce their emissions.
- Climate mitigation funding Rata foundation could do more work on understanding the cost benefit of supporting high emitters to decarbonise and could consider offsetting their contribution to their grantees' emissions

6.2 Rātā Foundation's current funding priorities

Rātā Foundation's current environmental priorities acknowledges the important role played by communities in enhancing our natural environment and reducing adverse environmental impacts for future generations.

The current priorities are:

- Involve people in actions benefiting our natural environment.
- Develop knowledge and skills through Environmental Education (EE) or sustainability programs resulting in positive environmental change.

While these priorities are still relevant, as discussed above climate mitigation and adaptation are now critical priorities for society and the environment.

Rātā could update the wording on its priorities to better reflect this:

1. Involve people in actions benefiting our natural environment and supporting climate mitigation and adaptation.

2. Develop knowledge and skills need to improve our environment and contribute to climate mitigation and adaptation through Environmental Education (EE) or sustainability programmes.

As well as their general criteria, Rātā has additional criteria and document requirements for environmental projects given their technical nature.

The current additional criteria are:

1. Environmental Education and sustainability programmes should demonstrate how they follow best practice or are evidence based, and have been evaluated in the last twelve months or demonstrate a plan for evaluation.
2. Organisations seeking funding for biodiversity projects should be focused on ecosystems in threatened environments, or that are severely depleted or under-protected, or key habitats for threatened or regionally endemic species, or areas of high ecological value that are subject to significant threats.

3. In line with biodiversity best practice, projects will be reviewed for priority actions (in this order: legal protection e.g. through covenant; physical protection e.g. pest/livestock control; habitat restoration or enhancement; habitat re-creation/reconstruction).
4. Where planting is a component of the project, the organisation needs to demonstrate they will use locally eco-sourced indigenous plants (if applicable).

Rātā should add a further additional criteria relevant to climate projects:

Organisations seeking funding for nature-based solutions for climate adaptation should provide evidence/supporting material where possible on how the proposed activities will enhance landscape resilience under more extreme climate scenarios, and show how they have considered cumulative impact the action could/may have, to avoid any possible negative or unintended consequences resulting from the action.

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8. Appendices

8.1 Interviewees

Claire Pattison
Principal Advisor - Air Quality, Transport and Urban Development, Environment Canterbury

Dave Johnston
General Manager, Ngati Kuia Trust and Co-Chair Kotahitanga mō te Taiao Alliance

David Perenara-O'Connell
Acting Director of the Operations Group and Director Te Pou Herenga, Environment Canterbury

Erik van Eyndhoven
Associate Director of Conservation, The Nature Conservancy

Frances Schmechel
Principal Biodiversity Advisor, Environment Canterbury

Jason Butt
Principal Biodiversity Advisor – Wetlands, Environment Canterbury

Lisa Hickling
Research and Evaluation Manager/Kaitiakitanga Lead, Bay Trust

Maree Burnett
General Manager, Banks Peninsular Conservation Trust

Martin Rodd
Chief Advisor Strategic Partnerships, Department Of Conservation

Sky Davies
Manager, Tasman Environment Trust

Linn Araboglos
Chief Executive, Wellington Community Trust

8.2 Rāta funding priorities: Criteria[95]

- Environmental Education and sustainability programmes should demonstrate how they follow best practice or are evidence based, and have been evaluated in the last twelve months or demonstrate a plan for evaluation.
- Organisations seeking funding for biodiversity projects should be focused on ecosystems in threatened environments, or that are severely depleted or under-protected, or key habitats for threatened or regionally endemic species, or areas of high ecological value that are subject to significant threats.
- In line with biodiversity best practice, projects will be reviewed for priority actions (in this order: legal protection e.g. through covenant; physical protection e.g. pest/livestock control; habitat restoration or enhancement; habitat re-creation/reconstruction).
- Where planting is a component of the project, the organisation needs to demonstrate they will use locally eco-sourced indigenous plants (if applicable).

Additional documents required

- A management plan that has been endorsed by a relevant technical expert/s including details of landownership, any consents, permits or licences granted/needed for the project, and how you will monitor and evaluate the project.
- For all the projects that involve action on the ground, you must provide a letter of support/approval from the landowner for the specific activity you are seeking funding for. This counts as one of the two letters of support you need to provide.
- It is important to inform mana whenua about your project. Please inform the current Chair of the relevant iwi/hapū by letter. We require a copy of this letter. Note, we do not require a letter of support from the iwi/hapū.
- For projects on habitat protection/restoration on private land, if covenant is not possible, we may ask you to obtain a letter from the landowner which states their commitment to maintain and keep the project in place for the duration of their ownership of the property and on sale of the property to talk to the new owner about the importance of the project.

[95] https://ratafoundation.org.nz/en/funding/what-we-fund/sustain

What we don't fund

- Projects that are, or are likely to be highly socially divisive, lacking social license, for example organisations applying to fund projects, which are political in nature.
- Research except where the cost may legitimately be part of a project or programme evaluation.
- Projects that have no community involvement and support.
- Funding for land purchase.

Rātā Foundation

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