CAWTHRON

The Cawthron Science Plan:

Our Direction for *Impact*

Mai i ngā maunga, ki te moana

Cawthron Institute was established in 1921 and operates as a charitable trust under the Thomas Cawthron Act 1924. Today, it is Aotearoa New Zealand's largest independent science organisation focused on aquatic environments, including rivers, lakes and the ocean.

We are based in Nelson and Auckland, and have strong partnerships with communities, iwi, government, and industry partners across the motu and internationally.

We bring together scientists, technicians, and specialists from around the world who work together to understand the environment and develop practical solutions that benefit people and nature.

Cawthron has built a strong reputation for delivering science that makes a real difference. Our expertise includes:

- **Aquaculture** (e.g. shellfish, seaweed, fish)
- **Marine and freshwater science and ecology**
- **Biosecurity** (protecting against pests and diseases)
- **Food safety, quality, and nutrition**
- **Environmental monitoring** (e.g. molecular surveillance)
- **Advanced technology and data science**

We combine scientific research with practical application – helping grow sustainable industries while protecting the environment.

A Nation Shaped by Water

Aotearoa New Zealand is a nation shaped by water, with an ocean estate fifteen times larger than our land, connected by rivers, streams and thousands of lakes. These systems are taonga, central to Māori identity, and underpin our economy, ecosystems and community wellbeing.

But these systems are under growing pressure. Freshwater health is declining, with pollution affecting many rivers and most lakes in poor condition. Impacts from land use are flowing through to estuaries and coasts, compounded by climate change, extreme weather and rising seas. Biosecurity and food safety risks are on the rise, and many unique aquatic species are under threat.

Our goal is simple: to enable development of high value resources while protecting and enhancing aquatic ecosystems to support thriving communities and economies for future generations.

Introducing Our Three *Science Missions*

Our Science Missions outline the actions that Cawthron will take to address environmental, social and economic challenges and opportunities facing Aotearoa New Zealand.

Mission 1: Supporting Thriving Ecosystems and Communities

Enhancing Marine and Freshwater Environments

After more than a century of aquatic ecosystem degradation and biodiversity loss in Aotearoa New Zealand, there is a critical need for science-based solutions that protect and enhance our river, wetland, lake, estuary, and coastal ecosystems. By actively working with communities to rejuvenate aquatic ecosystems from mountains-to-sea, we will work towards healthy aquatic environments that sustain our unique biodiversity and revitalise connections between communities and the environment. A key part of our work is to support industries to use aquatic resources more sustainably and to improve their management practices.

Mission 2: Sustainable Blue Growth

Unlocking the Potential of Ocean and Freshwater Resources

Aotearoa New Zealand's ocean and freshwater bodies present vast opportunities to supply valuable resources while staying within environmental limits. The ocean, making up 96% of our area of jurisdiction but only 3% of GDP, is our largest untapped economic asset. By managing activities within ecological limits, Cawthron aims to advance sustainable aquaculture, transition to high-value and volume aquatic products, and support innovation in marine farming to unlock greater economic and societal benefits.

Mission 3: Managing Risks

Protecting People, Aquatic Environments, and the Economy from Threats

This mission centres on identifying and mitigating biological, chemical, and ecological risks to communities, ecosystems, and industries. Key focus areas include: (a) developing systems and tools to manage and mitigate aquatic pests and pathogens, (b) ensuring food safety through hazard identification and risk management, predicting and responding to harmful algal blooms, (c) understanding climate-driven threats to aquatic systems to develop adaptive strategies for the future, and (d) identifying and reducing sociocultural, economic, and reputational risk.

Recent Highlights

11+
Partnered with over 11 Pacific Nations to enhance regional capability in Aquaculture, Biosecurity and Food Safety

36 million
Oyster spat produced over the past two years to support sustainable food and thriving ecosystems

25+
Adaptation Plans to support community and industry response to climate threats across the Pacific and New Zealand

5,120
Seagrass seeds planted over the past two years to support estuarine biodiversity and water quality

70 tonnes
Mussels deployed for restoration, restorative aquaculture and living-filter initiatives across Te Tauihu over the past two years

Introducing Our Four *Transformational Science Platforms*

Cawthon's four Transformational Science Platforms are long-term science programmes designed to create lasting impact across our Missions. They focus our expertise and partnerships on areas where we can help restore aquatic ecosystems, support resilient communities, and grow a sustainable blue economy. We invite partners, funders, iwi, industry, government, and communities to join us on this journey. Please reach out if you'd like to contribute knowledge, practical support, or sustainable resource, so we can deliver enduring impact for Aotearoa New Zealand and beyond.

Mountains-to-Sea: Te Tauihu

Restoring Thriving Aquatic Systems

We aim to protect and enhance aquatic ecosystems from mountains-to-sea in Te Tauihu, through developing and implementing effective, innovative community-led restoration solutions. In doing this we aspire to create a scalable model that restores thriving habitats, boosts biodiversity, and supports productive fisheries and mahinga kai. Our vision is for abundance, and we believe that the ecological productivity of Te Tauihu can be restored to provide for our community values. We will achieve this through piloting and implementing new aquatic restoration solutions, from mountains-to-sea, in partnership with iwi, the Department of Conservation, councils and community groups.

Advancing Ecological Aquaculture

Food within Planetary Limits

Cawthron's Advancing Ecological Aquaculture Programme seeks to develop aquaculture systems that work within ecosystem limits while delivering resilient food production, environmental regeneration, and enduring social and cultural value. The programme applies ecological principles to design and manage aquaculture systems that go beyond food provision to enhance ecosystem function, climate resilience, and economic performance. Cawthron will achieve this through integrated land based, coastal and open ocean pilots, co-designed Living Labs with iwi, industry, and communities, and robust monitoring and accreditation frameworks that translate trusted ecological benefits into scalable practical tools and commercial success across Aotearoa New Zealand.

Navigating Blue Climate Solutions

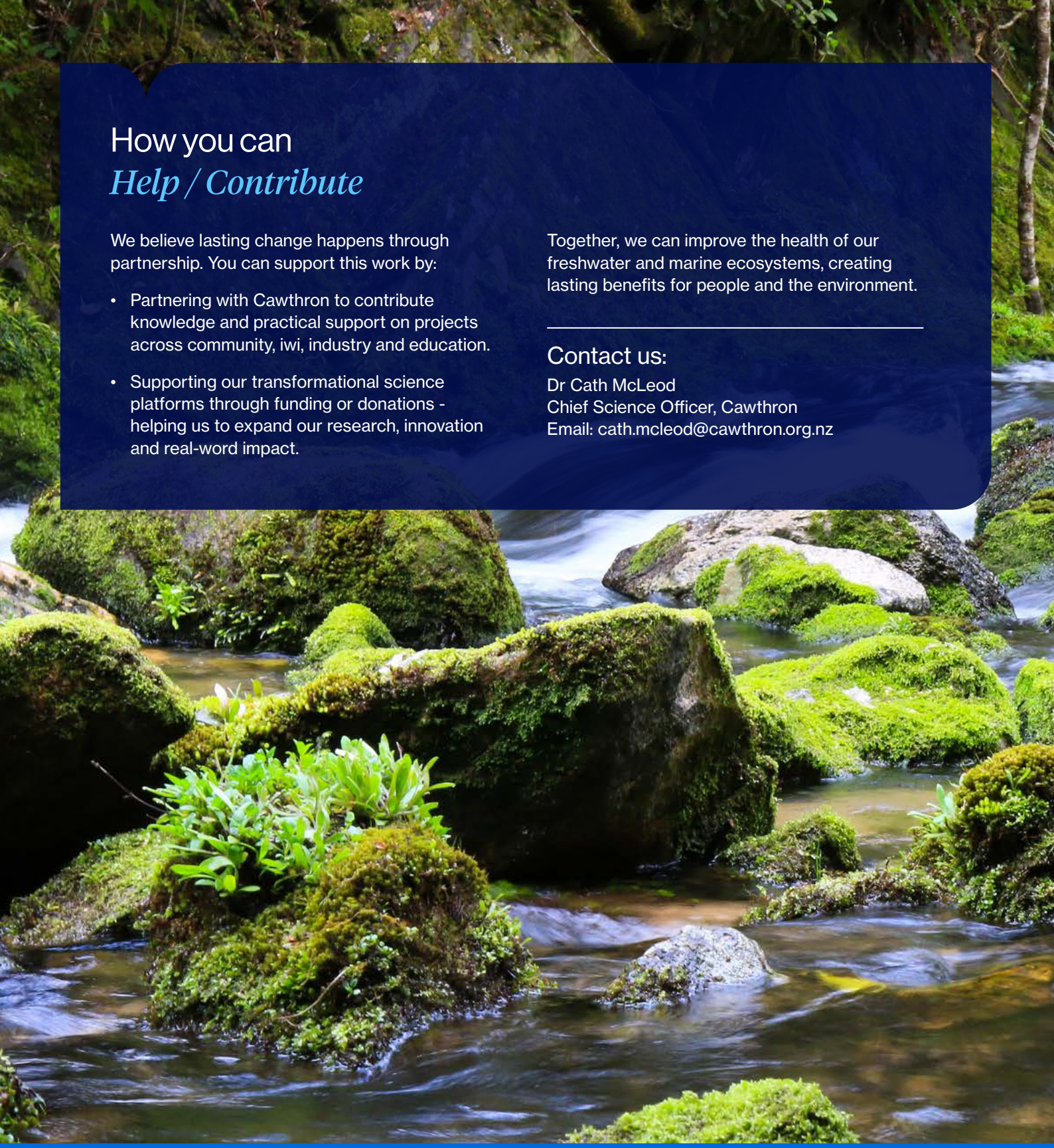
Enabling safe, scalable, and nature-positive solutions for climate stability

We aim to develop grounded and scientifically robust frameworks, tools and technologies for Aotearoa New Zealand and the Pacific to face climate change. This will support private and public stakeholders to identify coastal to inland water-related climate risks and to implement the most promising solutions to mitigate climate change and adapt to its consequences. We will use innovative approaches to develop and assess the effectiveness and limits of a wide range of options ranging from marine ecosystem restoration and CO_2 removal to coastal adaptations along the protect-to-retreat continuum. We will build on our deep scientific understanding of natural and societal processes as well as on our international networks to help stakeholders differentiate between robust, long-term solution pathways and short-sighted fixes. We will also use our position as a trusted, independent institution to inform approaches proposed by external agencies.

Oceans to Tables: Pacific Blue Foods

Building Pacific-led, climate-resilient aquatic food systems

Our aspiration is a long-term, Pacific-led, transdisciplinary partnership to transform aquatic food systems, building climate-resilient, nutritious and sustainable blue foods that restore coastal ecosystems while strengthening livelihoods, cultural wellbeing and economic resilience. The initiative brings together Aotearoa New Zealand's leading scientific expertise with Pacific communities and Pacific governments to co-design and implement integrated, place-based programmes. We aim to deliver safe and nutritious aquatic foods, support high-value product development, expand market access, restore aquatic ecosystems, enhance community-based capabilities, and enable locally-led prosperity and resilience.



How you can
Help / Contribute

We believe lasting change happens through partnership. You can support this work by:

- Partnering with Cawthron to contribute knowledge and practical support on projects across community, iwi, industry and education.
- Supporting our transformational science platforms through funding or donations - helping us to expand our research, innovation and real-word impact.

Together, we can improve the health of our freshwater and marine ecosystems, creating lasting benefits for people and the environment.

Contact us:

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Mau tonu te au kakara i te moana | *So that the sweet scent of the ocean remains*

Bold Science.
Deep Care.
Thriving Oceans.

Mai i ngā maunga, ki te moana

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cawthron.org.nz