



## Submission to Emissions Reduction Plan 23 November 2021

### 1. Most important things to be considered:

#### Currently proposed emissions reductions plans

It is the mandated responsibility of this Government and the Treaty of Waitangi to protect its citizens. Significant emissions reductions must begin by protecting critical natural infrastructure, that is, services essential for not only the functioning of our society and economy but to mitigate the existential threat of climate change.

The term 'critical infrastructure' is most often used to describe built structures: utilities (3-waters and power), transport enabling systems (roads, bridges, railways, airports etc.), and communications. The term is mechanistic insofar as all parts are interlocking, interdependent, and can be rationally explained.

Ecosystem services are also mechanistic, providing **natural critical infrastructure**: clean water, nutrient recycling, oxygen production, carbon sequestration, and naturally regenerative kai, etc. In short, the entire toolkit of essential infrastructure services without which humans cannot exist.

When natural critical infrastructure is damaged or destroyed, it disables or removes the capability of built infrastructure. Hence, natural critical infrastructure is a first order essential that supersedes and underpins built critical infrastructure.

#### Protecting all existing natural infrastructure and restoring what has been degraded and lost will:

- Reduce emissions
- Increase carbon drawdown and provide permanent sequestration
- Mitigate the impacts of unavoidable climate change, and
- Assist with adapting to these impacts

## Emissions from badly damaged critical natural infrastructure

**For this submission, we focus on one example: braided river ecosystems**

Destroying the large braidplains and associated wetlands of braided river ecosystems through *ongoing* agricultural expansion<sup>1</sup> has:

- Increased their potential flood damage risk to critical built infrastructure: In 2019 the Canterbury Region alone had a \$40 billion risk exposure to floods (based on 2016 replacement costs).<sup>2</sup>
- Turned carbon sinks into carbon and methane sources (created emissions), particularly where wetlands support large peaty soils such as the Kopuatai bog, Waikato. This one wetland alone stores 24 million tonnes of carbon—the rough emissions equivalent of New Zealand’s entire fleet of five million driving vehicles for a year. Of the almost 67,000 hectares of drained peatlands in the Waikato, most are used for dairying. The Climate Change Commission’s draft advice notes that emissions from organic soils are among the most significant land discharges not yet included in the accounting towards New Zealand’s targets under the Paris Agreement.
- Reducing the natural flow regime of braided rivers has prevented sediment being delivered to the coast to enable beach-building processes as sea levels rise. (The entire Canterbury Plains were built by this process). This threatens critical built infrastructure along coasts. Combined with coastal squeeze preventing what would otherwise be a natural migration inland of coastal systems, this threatens to increase emissions from coastal wetlands and their enormous carbon-sponges: saltwater marshes and mangroves.
- Excessive agricultural nutrient runoff into braided river ecosystems has threatened clean water.
- The combination of low river flows + intensive irrigation + agricultural runoff has exacerbated algae blooms, resulting in methane emissions.
- To compound emissions from the Kopuatai bog and other wetlands, and from dying rivers, as an industry, dairy farming and processing together are the largest greenhouse gas emitters in New Zealand<sup>3</sup> yet the agricultural sector is not required to address emissions until 2025, and then at a 95% discount.

## 2 Recommendations to reduce emissions

1. Include all human-caused emissions in reporting. We must know the sources in order to reduce emissions. This is common sense.
2. Natural ecosystems including oceanic ecosystems must be regarded as critical natural infrastructure. This will enable their protection to prevent further emissions. This is consistent with the Treaty of Waitangi and mātauranga Māori.
3. Restore damaged critical natural infrastructure so that they can become carbon sinks once more. This includes removing pest ungulates<sup>4</sup> and weed species<sup>5</sup>, and immediately ceasing bottom trawling for seafood<sup>6</sup>. This will also ensure ongoing life-supporting ecosystem services

and help mitigate the impacts of climate change and bolster adaptation. This is consistent with the Treaty of Waitangi and mātauranga Māori.

4. Invest in re-tooling the entire current agricultural system. Not just restorative or regenerative agriculture, but cellular agriculture<sup>7</sup>. This will:
  - a. Significantly reduce current agricultural emissions
  - b. Help restore critical natural infrastructure by providing significantly more space for critical natural terrestrial infrastructure, which in turn will;
  - c. Enable greater capacity to drawdown and permanently sequester carbon dioxide, and;
  - d. Reduce the multiple compounding risks to critical built infrastructure as well as society as a whole.
  - e. Becoming a global leader in agriculture re-tooling, creating economic and social prosperity particularly in light of COP26 emphasis on rapid reduction of methane emissions

### 3. New initiatives

Even with the above recommendations, there is insufficient land to enable a sufficiently rapid emissions reduction plan. However, Aotearoa does have sufficient ocean area to vastly and quickly enable blue carbon sequestration. Kelp absorbs CO<sub>2</sub> at a staggering rate and may offer the most lucrative carbon farming as well as food farming possibilities through multi-trophic farming systems.

### 4. Main opportunities and impacts of reduction policies

- Upholding the Treaty of Waitangi and utilising mātauranga Māori
- Become a global leader in agriculture re-tooling, creating economic and social prosperity particularly in light of COP26 emphasis on rapid reduction of methane emissions
- Catch up with many other countries already expanding kelp farming as part of a multitrophic ocean farming approach. The advantages vs land-based crops:
  - Doesn't need fresh water
  - Doesn't need agrichemicals to grow
  - Doesn't need pesticides
  - Doesn't burn down
  - Doesn't use land
  - Has more iron than meat
  - Has more calcium than milk
  - Reduces the acidification of waters in its immediate surroundings
  - [Serves as a protective nursery](#) for organisms particularly vulnerable to [acidification](#), such as oysters and mussels.

---

## Footnotes/references

1. Grove et al (2021): *Agricultural land use change in mid-Canterbury hill and high country, 1990- 2019: implications for indigenous biodiversity and ecosystem health*, Environment Canterbury <http://braidedrivers.org/wp-content/uploads/AgriculturallandusechangeinmidCanterburyhillandhighcountry19902019implicationsforindigenousbiodiversityandecosystemhealth.pdf>

And

Greenep and Parker (2021) *Land use change on the margins of lowland Canterbury braided rivers, 2012-2019*, Environment Canterbury: <http://braidedrivers.org/wp-content/uploads/LandusechangeonthemarginsoflowlandCanterburybraidedrivers20122019-1.pdf>

2. Paulik et al, (2019): *New Zealand Fluvial and Pluvial Flood Exposure* NIWA/National Science Challenges: <https://deepsouthchallenge.co.nz/wp-content/uploads/2021/01/Exposure-to-River-Flooding-Final-Report.pdf>

3. Ministry for the Environment (2021) *New Zealand's Greenhouse Gas Inventory*, <https://environment.govt.nz/assets/Publications/New-Zealands-Greenhouse-Gas-Inventory-1990-2019-Volume-1-Chapters-1-15.pdf>

and

Environmental Protection Authority (2021) *ETS Participant Submission* <https://www.epa.govt.nz/assets/Uploads/Documents/Emissions-Trading-Scheme/Reports/Emissions-returns/Participant-Emissions-Report.pdf>

4. Hacknell & Robson (2021) *Protecting our Natural Ecosystems' Carbon Sinks*, Forest & Bird. <https://www.forestandbird.org.nz/sites/default/files/2021-06/Protecting%20our%20natural%20ecosystems%27%20carbon%20sinks%20-%20Forest%20%26%20Bird%20report.pdf>

5. Parliamentary Commissioner for the Environment (2021) Report – *Space invaders: A review of how New Zealand manages weeds that threaten native ecosystems* <https://www.pce.parliament.nz/our-work/news-insights/media-release-turning-back-a-silent-invasion>

6. Sala et al (2021) Protecting the global ocean for biodiversity, food and climate, *Nature* 592, pp 397-402: <https://www.nature.com/articles/s41586-021-03371-z>  
“Marine sediments are the largest pool of organic carbon on the planet and a crucial reservoir for long-term storage. If left undisturbed, organic carbon stored in marine sediments can remain there for millennia. However, disturbance of these carbon stores can re-mineralize sedimentary carbon to CO<sub>2</sub>, which is likely to increase ocean acidification, reduce the buffering capacity of the

*ocean and potentially add to the build-up of atmospheric CO<sub>2</sub>. Thus, protecting the carbon-rich seabed is a potentially important nature-based solution to climate change... Eliminating 90% of the present risk of carbon disturbance due to bottom trawling would require protecting 3.6% of the ocean."*

7. Tubb and Seba (2019) *Rethinking Food and Agriculture 2020-2030*, RethinkX:  
<https://www.rethinkx.com/food-and-agriculture>

And

Prime Minister's Chief Science Advisor: Cellular Agriculture <https://www.pmcsa.ac.nz/topics/cellular-agriculture/>