

Submission by



to

TE PAPA ATAWHAI
DEPARTMENT OF CONSERVATION
and
TOITŪ TE WHENUA
LAND INFORMATION NEW ZEALAND

on the

LONG-TERM INSIGHTS BRIEFING
CONSULTATION DOCUMENT

12 November 2021

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BIOTECH NZ SUBMISSION ON THE LONG-TERM INSIGHTS BRIEFING CONSULTATION DOCUMENT

12 NOVEMBER 2021

SUMMARY

1. BioTechNZ wishes to thank Te Papa Atawhai Department of Conservation (DOC) and Toitū Te Whenua Land Information New Zealand (LINZ) for the opportunity to submit on the Long-Term Insights Briefing Consultation Document. We welcome the invitation to provide feedback on our submission.

BACKGROUND

2. BioTechNZ is a purpose driven, membership-funded organisation. Our vision is to maximise New Zealand's bioscience and technology capability to create a strong New Zealand bioeconomy. Our diverse range of members all share a desire to maximise the ways biotech can help address the world's agricultural, environmental, and health problems.
3. We raise awareness and increase understanding of biotechnology to enable our nation to embrace the best opportunities biotech offers to us, helping us to live better, healthier and more productive lives.
4. BioTechNZ connect innovators, investors, regulators, researchers, social entrepreneurs and the public, and acts as a neutral centre of gravity for discussion, debate, policy development and collaboration around biotechnology in New Zealand.
5. BioTech New Zealand (BioTechNZ) is an association of the New Zealand Tech Alliance (NZTech). NZTech is a member funded, not-for-profit, non-governmental organisation that represents twenty tech associations, with over 1600 members who collectively employ more than 100,000 New Zealanders: over 10 percent of the New Zealand workforce.

COMMENT

6. **Do you agree that the Long-term Insights Briefing should focus on new and improved information and biotechnology to find ways to care for Aotearoa New Zealand's biodiversity in the future?**
 - 6.1. Yes. BioTechNZ agrees that there should be a focus on *both* new and improved information and biotechnology to find ways to care for Aotearoa New Zealand's biodiversity in the future.
 - 6.2. **Why or why not?**
 - 6.3. Biodiversity is the variety of life at the genetic, species and ecosystem levels. Our biodiversity is precious, and when we look at safeguards we need to think of biodiversity not just as it is today, but also how it will look in the future.
 - 6.4. Collection of good data will be crucial to our efforts to protect biodiversity. This data includes:
 - Tracking individual animals and their movements

- Measuring species occurrence and locations
- Remote sensing of environmental drivers of biodiversity loss

6.4.1. This data can then be used to:

- Create inventories
- Support and strengthen monitoring
- Develop live databases that are continuously updated

6.4.2. This will provide accurate information for decision-making, and also enable open exchange and sharing of data regionally, nationally, and globally.

6.5. New Zealand has an opportunity to broaden the discussion to encompass rapidly evolving modern genomic technologies that appear likely to play important roles in addressing conservation challenges. Biotechnology has come a long way, but due to the New Zealand Hazardous Substances and New Organisms Act 1996, modified organisms, which includes gene editing, are unable to be used in the field.

7. BioTechNZ notes that many New Zealand species are not found anywhere else in the world, so it is therefore key that we innovate for ourselves to ensure that we can fix our own problems.

8. Are there any parts of information or biotechnology that you think need to be covered in the Long-term Insights Briefing? This can include applications in other sectors and disciplines, international approaches, social innovation, and any unintended consequences.

8.1. New and improved information/data could help us to:

- Improve monitoring of biodiversity across landscapes through satellite and aerial imaging, including on-ground systems, such as robotics
- Add local climate data and measure water, wind, and UV levels, which may be altered by climate change and impact biodiversity
- Distribute multiple sensing systems
- Enable human physical monitoring by volunteers for comparative analyses
- Identify changes in the presence and prevalence of species through satellite/aerial imaging

9. Biotechnology can be used in a number of ways:

9.1. Traditional Biotechnology

- Environmental DNA sampling and metabarcoding approaches can provide holistic data on species composition, diversity, connectivity, nutrient cycling, and ecosystem health
- Non-invasive DNA sampling for identification and tracking individuals within species
- Use of existing genomic sequences of threatened species may help identify specific mutations linked to species endangerment, including those associated with susceptibility to disease and infertility, potentially facilitating the prediction of species' responses to environmental change

9.2 Modern Biotechnology

- Where the genetics are well understood, new approaches may extend to the direct genetic manipulation of species using gene editing techniques to rapidly mitigate against direct population challenges like disease

- Edit genes in pest species to inhibit reproduction
- Edit genes to ensure specific characteristics are passed on to offspring that improve the resilience of our taonga, or weaken pest species through “gene-drives”
- Develop vaccines against pathogens that attack our vulnerable indigenous species, with potential in both plants and animals

10. How can we make sure we include other forms of expertise when making decisions about the use of information and biotechnology? Examples include mātauranga Māori social science and citizen science.

10.1 BioTechNZ recommends:

- Engaging with New Zealand research institutes
- Engaging with global experts
- Engaging with biotechnology industry and tech associations, including BioTechNZ and the international [Biotechnology Innovation Organization \(BIO\)](#).

11. What else should DOC and Toitū Te Whenua consider?

11.1. Alongside the rapid development of biotechnology and information technology, the space-air-ground integrated monitoring of changes and development trends of biodiversity has become possible. Such a monitoring network will provide timely, highly accurate data and assist with decision-making through geographical information system and intelligent analysis.

12. CONCLUSION

12.1 Thank you for the opportunity to provide feedback. We are happy to engage further to discuss our submission and provide any further assistance.

12.2 If you have any queries do not hesitate to contact me.

Yours sincerely,

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