

NEW ZEALAND

CONSERVATION AUTHORITY

TE POU ATAWHAI TAIAO O AOTEAROA

Te Ara Paerangi: Future Pathways MBIE Green Paper

SUBMISSION FROM THE NEW ZEALAND CONSERVATION AUTHORITY

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The Legislative Basis for the New Zealand Conservation Authority's submission

1. The New Zealand Conservation Authority (the Authority) was established under the Conservation Act 1987 (the Act), with members appointed by the Minister of Conservation (the Minister). It is an independent statutory body with a range of functions, but primarily acts as an independent conservation advisor to the Minister and the Director-General of Conservation.
2. The Authority has a role as an objective advocate on matters of national significance and interest in the conservation arena and to provide high quality independent advice to the Department of Conservation (DOC) on its strategic direction and performance.
3. The Authority has a range of powers and functions, under the Act, as well as under other conservation related legislation. Under the Act (section 6C(2)(c) refers) the Authority has the power to "advocate the interests of the Authority at any public forum or in any statutory planning process." It also has the functions to "investigate any nature conservation or other conservation matters the Authority considers are of national importance, and to advise the Minister or the Director-General, as appropriate, on such matters" and to "advise the Minister and the Director-General annually on priorities for the expenditure of money" (s 6B(1)(d) and (h) respectively).
4. Following the logic of the above powers and functions, the Authority takes a strong interest in the resourcing needs of the New Zealand science system and has previously advised both the Minister of Conservation and the Minister of research, Science and Innovation of their concerns. It follows, therefore, that they have taken a close interest in the MBIE Green Paper and make this submission accordingly.

NZCA Submission

5. The Authority's submission is based on its analysis of a range of reports including those listed in the Reference section at the end of this submission, the Ministry of Business,

Innovation and Employment. (2021) paper *Te Ara Paerangi Future Pathways*, and the professional experience of its members working within the science sector.

Background and Context

6. The New Zealand Conservation Authority (**NZCA**) has a strong interest in the effectiveness of the NZ science system. Robust science is critical for planning and decision-making for the care of our natural environments and the protection and conservation of biodiversity, habitats and ecosystems across all domains (marine, freshwater and terrestrial), as well as the interconnected importance and diversity of ecosystem services (provisioning, regulating, cultural services and supporting services) upon which we all depend on.
7. NZCA considers that a ‘connected, resilient and adaptable modern system’ for NZ science is essential and we need a system that important to have a system that encourages, not stifles, innovation
8. We **disagree** with the statement in the Green Paper that “*Our research, science and innovation sector has served Aotearoa NZ exceptionally well.*” In our view the experimentation with the NZ science system over the past 30 years has **not** served the nation well and has led to many significant and potentially enduring issues that need to be addressed. These include: the science conducted and lack of focus on the strategic needs of NZ Inc; under-funding/lack of recognition of key infrastructure, and science capability and inequalities associated with honouring the Treaty in a meaningful way; the lack of career structure at all stages of the science career pathway; the excessively high transaction costs associated with bidding for research funding; the institutional structures that include result in excessively high overheads being charged to clients (public and private); to name a few of the major issues. We are also concerned that the science funding mechanisms that predominate at present do not give priority to areas where research is required for robust policy development and implementation by government departments/agencies (central and local) and mana whenua. In addition, the translation of research results and implementation pathways are not facilitated by the current structures or funding systems.
9. We also **agree** with the comments by Gluckman (2013) “*Given that many of the most important decisions that must be taken by any government will relate to matters of resource allocation and risk assessment, the current lack of protocols for commissioning or generating evidence -informed advice across government is of concern and runs contrary to best practices internationally.*”¹ We consider the inability of the priorities of departments and agencies to meaningfully influence the allocation of research funding through mechanisms such as the Endeavour and Smart Ideas tools to be a significant problem.
10. We **agree** with the statement “*the current system incentivises fragmentation and unproductive competition while struggling to adapt to changing national needs*”.
11. NZCA is mindful that there have been a number of initiatives over the past 30 years to prioritise science needs and develop strategies that have not been successful for various reasons, one of which has been the absence of cross-party agreement on support for science and how the sector should be structured and funded. A number of strategies have been developed for specific science sectors which have also not been actioned/realised because they have not been accompanied by the funding, or the

¹ Gluckman, P. (2013). Interpreting science – implications for public understanding, advocacy and policy formation. A discussion paper. Office of the Prime Minister’s Science Advisory Committee. 12 pp.

political leadership or will to realign organisations, structure the science system, and /or develop appropriate funding tools/mechanisms to enable the strategies to be effective.

12. In 1992 the government released its first statement of national priorities for the PGSF – Public Good Science Fund. Through the 1990s this was further developed. The concept implemented in 1992 called for the production of a 5-year priority statement, that was to be reviewed every 3 years, with the idea that if priorities needed to be shifted there would be time for this to be signalled to the science community, enabling some research programmes to be completed and new areas to be initiated, with opportunities for staff training and redirection. The first broad strategic statement was released in 1994, and in 1995 a report outlined *Priorities for 2001: Public Good Science Investment*. This approach did not survive. The shift to the Outcome Based Investment (**OBIs**) approach in the mid-2000s and was intended to enable longer term planning and support both underpinning as well as shorter term higher risk science. OBIs lasted barely 8 years.
13. Over the past 5-6 years there have been reviews and strategies published that have included important references to science, or been focused on science explicitly, such as the Royal Society Te Apārangi report on Taxonomic Collections and Databases (2015), Biosecurity 2025 (2016), Conservation and Environment Science Roadmap (2017), Te Mana o Te Taiao /Aotearoa New Zealand Biodiversity Strategy (2020) – but the translation from strategy statements to implementation has not been seen.
14. There has also been the publication of the National Statement of Science Investment 2015-2025 (2015) which appears to have had little influence on outcomes for science practitioners or agencies/organisations reliant on scientific data, analyses, evidence-based advice.
15. Over the past decade, in particular, the situation for early career scientists has become even more parlous than previously, particularly the lack of support for post-graduate fellows, and the very marginal (well below living wage) stipends for post-graduate students.

Te Hōkaitanga/Scope

16. The focus of the Green Paper on the ‘public’ research system is understandable, but in order to arrive at the “*connected, resilient and adaptable modern system*” that is being sought, it will probably require that the scope of the Pathways work has to be broadened. We consider competition that now exists between universities and Crown Research Institutes (**CRIs**)/other research institutes (such as Cawthron, Callaghan) in many cases is not helpful for wider science outcomes for NZ, and leads to unnecessary additional costs, processes and inefficiencies.
17. We agree that there needs to be much better connection between the public research institutions and wider community – whether local and central government, iwi, or community.
18. We note that the Green Paper refers to public research institutions. The concept and definition of public institution may need to be examined and clarified in future stages of the Pathways work. From the NZCA’s perspective, CRIs often appear to be function primarily as profit driven consultancies rather than in the interests of the wider NZ public. The major NZ museums - Te Papa (funded by MCH) and metropolitan museums (funded largely by rate payers) - do meet our understanding of public research institutions.

Ngā Whakaarotau Rangahau/Research Priorities

1. *What principles could be used to determine the scope and focus of research priorities*

19. We would hope that the Ministry for Business, Innovation and Employment (**MBIE**) is building on the experience and analyses of effective science models: a great deal of work has been carried out on this topic both in NZ and internationally. While the ‘case

for change' section of the Green Paper cites a selection of recent publications, there are many more examples that could be drawn on, e.g. Royal Society Te Apārangi report on Taxonomic Collections and Databases (2015), Biosecurity 2025 (2016), Conservation and Environment Science Roadmap (2017), Te Mana o Te Taiao /Aotearoa New Zealand Biodiversity Strategy (2020)

20. The granularity of setting national priorities has been identified and discussed by Gluckman (2012) - *"to what extent should priority settings occur at a national level with the goal of meeting national priorities, at a sector level to meet the needs of industry, at a research organisation level with the goal of meeting the strategic plans of those organisations, or at a team level with the aim of building specific research capabilities?"*²

2. What principles should guide a national research priority setting process – and how can this process best give effect to Te Tiriti?

21. We consider the recommendations of 'Te Pūhahitanga: a Tiriti-led Science-Policy Approach for Aotearoa New Zealand' address key areas to support the operationalisation of Te Tiriti.

Te Tiriti, Mātauranga Māori me Ngā Wawata o te Māori /Te Tiriti, Mātauranga Māori and supporting Māori aspirations

We consider that section is best responded to by the Tiriti partner. The Authority acknowledges the current science system is 30 years old and does not overtly advance Tiriti partnerships in science, grow Maori researchers, address knowledge gaps or Maori capability across the science system. The current science structure and funding lacks coherency and the fragmented militates against effective Maori engagement and influence at a governance / meso scale design into which programmes of work are built.

5. What are your thoughts on how to enable and protect mātauranga Māori in the research system?

The decoupling of Māori from their natural environments, culturally significant keystone (taonga) species and traditional territories through colonisation, biodiversity and environmental degradation, rural to urban migration, governmental laws and policies, the loss of knowledge holders, to name a few, continue to erode the quality of mātauranga. Mātauranga Māori is dependent upon the quality of the human to nature relationship. Adequate investment needs to be placed upon mechanisms that reconnect this relationship for knowledge protection, continuation and regeneration. The potential use and mining of mātauranga by non-Māori have real issues around representation, adequate and culturally appropriate IP protections and data sovereignty (including how it is collated, used and stored). A systems approach that embeds mātauranga within the science system is required. Enabling mātauranga a iwi (local place base knowledge) is essential for mātauranga has context. Therefore, co-development led by Māori should be a pre-requisite.

6. What are your thoughts on regionally based Māori knowledge hubs?

Regional hubs have the potential to be more targeted and effective, but they need to be well thought through and strategically planned and placed. The hubs could work to fast track the inequalities within the system, including the procurement and refreshing of new knowledges and capability. We consider that the hubs may offer useful opportunities, we also consider that this concept is best left for tangata whenua to respond to.

Te Tuku Pūtea/Funding

22. While it is noted that there has been an increase in science funding since 2010, there have also been significant increases in transaction costs for organisations bidding for

² Gluckman, P. (2012). Which science to fund: time to review peer review? Office of the Prime Minister's Science Advisory Committee. 11 pp.

money, disproportionate resources spent on governance and administration, and increased competition between CRIs and between CRIs and universities. The increased funding is not seen by practitioners in the science workforce but is evidenced in increased administrative layers, governance, and oversight bodies.

23. Rather than seeing increased funding, the underpinning research supported by SSIF funds in CRIs has been eroded very significantly, with major negative impacts on staff, and underpinning science programmes.

7. How should we determine what constitutes a core function and how do we fund them?

24. We think that the three categories of activity identified in the paper meet the test of “core function”, namely
- a) Critical research capability that is essential to New Zealand’s functioning as a country. For example, ongoing research into infectious diseases and cybersecurity threats, as well as research on our unique flora and fauna, geology, and cultural context.
 - b) High-priority services: e.g. seismic monitoring, forensic laboratories
 - c) Databases, collections and monitoring: environmental databases, collections, particularly taxonomic collections, and databases with their associated taxonomic/systematic expertise, environmental monitoring (of state and condition) including weather and climate services, and geophysical monitoring

8. Do you think a base grant funding model will improve stability and resilience for organisations? How should we go about designing and implementing such a funding model?

25. Base funding would help to alleviate some of the current precarious funding arrangements where nationally significant and scarce science skills are being lost because of breaks in funding or through short term resourcing, rather than recognising the long-term nature of a number of areas of science endeavour which are not suited to 2-4 year funding terms.
26. The money directed to the Science Challenges has involved an inordinate expenditure on governance, and a reduction in funding for long term underpinning science programmes – and has resulted in further insecurity for scientists working in associated areas.
27. We are also concerned by the competition for funding between CRIs and universities and the consequences /costs for the science system.

Ngā Hinonga/Institutions

28. We agree with the statement about the lack of clarity of CRIs objectives and the tension between commercial performance and operations in the interest of NZ Inc. 9. How do we design collaborative, adaptive and agile research institutions that will serve current and future needs?
28. The mixed public/private model operating in the CRIs is not producing the best outcomes for NZ – with many examples of patch protection and competition. Although the CRIs state in their 2021 report “Value of Crown Research Institutes in Aotearoa New Zealand’s science system today - A Report for Science New Zealand (September 2021)”, *‘Each CRI has a Statement of Core Purpose set by Government in 2010. The Statements of Core Purpose set out the unique purpose of each CRI and the areas in which a CRI leads and those in which it contributes....’*, in fact, the boundaries between a number of the CRIs has become blurred as competition for scarce funding drives over-bidding and competition for scarce resources.

29. Interdisciplinary collaboration happens effectively within CRIs where there is a wide skill mix – and this points to the need to consider the size and remit of institutions to enable more stability and potentially more capacity to adapt to changing circumstances.

10. How can institutions be designed to better support capability, skills and workforce development?

30. In recent years one of the mantras of science policy staff at MBIE has been that capability development and retention is the responsibility of individual firms (in this case meaning CRIs and other science organisations). This approach has not served NZ well. There is a clear need for better integration of training and skills/capability development, as well as a national overview of NZ-wide capacity to meet future science and policy needs.

12. How do we design Tiriti-enabled institutions?

31. There are both structural issues to address as well as issues associated with funding models.
32. Tiriti-enabled institutions will be engaged in co-development of research, training of all staff in an understanding of Te Ao Māori, values and aspirations, and how this intersects with the areas of research being undertaken.
33. Research funding that is on 2-5 year time frames does not enable longer term relationships to be developed and maintained. When the funding runs out, effectively the relationships have to be terminated – there are no codes to charge to, and scientists are unable to continue exchanging knowledge with iwi/communities.
34. As stated earlier, we endorse the recommendations of *Te Pūhahitanga: a Tiriti-led Science-Policy Approach for Aotearoa New Zealand* to address key areas to support the operationalisation of Te Tiriti.

13. How do we better support knowledge exchange and impact generation? What should be the role of research institutions in transferring knowledge to operational environments and technologies?

35. Achieving better knowledge exchange and impact generation needs to start at the inception of the research – in the development stages through to the transfer to operational environments. Funding models at present do not enable longer term relationships to be developed and maintained – when the funding runs out, there are no resources to continue maintaining and developing relationships.
36. Base grant funding could be a key to enabling better knowledge exchange and improved processes for understanding the needs of government agencies, iwi, community, business.

Te Hunga Mahi Tangahou/Research Workforce

15. What impact would a base grant have on the research workforce?

37. Increased stability for the work force, with the capacity for individuals to plan and prepare for a career in science, as well as enabling teams to plan and develop/invest in staff.

Te Hanganga Rangahau/Research Infrastructure

17: How do we support sustainable, efficient, and enabling investment in research infrastructure?

38. A case study of issues that need to be addressed in NZ infrastructure can be seen in the analysis of Taxonomic Collections and Databases, in a review conducted by the Royal Society Te Apārangi in 2015. This critically important research infrastructure has been identified over the past 3 decades as being critically underfunded and in need of significant reorganisation.

39. The natural environment collections sector has identified the need for a coordinated and distributed network of collections to enable best outcomes for NZ- providing fundamental and authoritative baselines for biodiversity inventory, ecological research and natural resource management. However, the fact that these collections are held across multiple types of research institutes under different funding models, has apparently placed this critical infrastructure in the “too hard” basket. At present the collections, databases and associated research are reliant on individual organisations’ prioritisation processes – a situation that poses a risk of unintentional consequences if not addressed.
40. The fragmentation of investment in collections and taxonomic research in New Zealand is a major issue. The key sources of investment currently are MBIE (for CRIs and Cawthron Institute); the Ministry for Culture and Heritage (Museum of New Zealand Te Papa Tongarewa); City Councils (metropolitan and regional museums); Tertiary Education Commission (Performance Based Research Fund), and Universities (assorted research funds).
41. Another issue is the disconnect between funding and the delivery of services – biological collections’ infrastructure and associated research is largely invisible to the many beneficiaries, as numerous services that rely on and access such infrastructure are delivered through government agencies or other intermediaries. Even where services are provided directly, these are often provided through tools and information systems alongside the advice of taxonomy experts, with the physical collections and their curation and management needs largely unseen.
42. As noted in the Royal Society report:

Erosion of investment, particularly evident in the CRI sector, has seen loss of national capability in specialised expertise in taxonomy and curation through redundancies, reduced hours, and non-replacement of retiring staff. In addition, it has led to collections being closed or having limits put on access, and reduced ability to protect specimens and deliver services.

Continued decline in support for the collections is a real risk for New Zealand, especially if it continues to occur largely out of sight and incrementally until a major event in the future highlights deficiencies. It also means that New Zealand is limiting its opportunities to adopt new technologies and provide best-practice interoperability of data and information systems, both domestically and internationally.

The Royal Society panel concluded “a whole-of-systems approach must be taken to interconnect providers, custodians, practitioners, stakeholders, and end-users.” They identified that changes needed to be implemented as “an integrated package to ensure the most effective and efficient use of existing and future resources, addressing coordination, investment, stewardship, protection, and training”. As a consequence of the review, the Chief Executives and Leaders representing the 13 institutes that hold the majority of NZ’s natural history collections agreed on the need for formation of a group to increase collaboration among the national taxonomic collections. Species Aotearoa was established to represent the national biosystematics research and taxonomic collections communities and has engaged in a number of strategic actions including participating in the joint Australian New Zealand initiative “Discovering Biodiversity – a decadal plan for taxonomy and biosystematics in Australia and New Zealand 2018-2027”.

43. The current situation of environmental databases (refer PCE reports) , and the situation of taxonomic collections, databases and associated taxonomic research, are of specific concern for the NZCA given the role of biodiversity and biosecurity in the continued health and well-being of NZ, and the priority we place on the evidence-based decision-making.

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