

## ***Bioprospecting: Harnessing Benefits for New Zealand*** **Ministry of Economic Development, July 2007**

**Submission from Landcare Research New Zealand Limited (Landcare Research)**  
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### **1) On New Zealand's biological resources:**

- 1.1 Do you think we need to have good information about bioprospecting activities in New Zealand, including the type and nature of such activities? Please give reasons for your answer.

**Response to 1.1:** It is desirable that publicly funded/public good research results be collated into a form that is publicly accessible. A potential problem with collecting information on commercial bioprospecting is that many of these activities are governed by confidentiality obligations, so access providers and bioprospectors may be reluctant to publicise their activities.

- 1.2 As a traditional knowledge holder, bioprospector and/or access provider, what are your experiences of bioprospecting in New Zealand? Can you provide any information that would be useful to develop a bioprospecting framework in New Zealand, for example, provide information about bioprospecting costs, benefits, outcomes and current benefit sharing agreements? If so, please describe them.

**Response to 1.2:** In Landcare Research's experience, financial benefits (eg, royalty on commercial product) can be derived but may not be realised for many years, if ever. Our past projects have targeted poorly studied groups of microorganisms, and for these our guaranteed beneficial outcomes have included the funding of research that contributes to taxonomic and ecological knowledge and building capacity by providing training opportunities for access providers and post-doc researchers. Landcare Research's current agreements with access providers stipulate that any financial benefits will be shared equally and projects have been developed in association with access providers to ensure the non-financial benefits gained are potentially of use to them.

### **2) On New Zealand's current frameworks to access biological resources:**

- 2.1 Do you think the existing access frameworks would benefit from operating within a more co-ordinated and comprehensive bioprospecting framework? If so, why? If not, why not?

### **3) On a comprehensive bioprospecting framework for New Zealand:**

- 3.1 Do you think that New Zealand should have a comprehensive policy framework to manage bioprospecting activity in this country? Please give reasons for your answer.

**Response to 2.1 and 3.1:** Yes, it would be helpful to have a policy framework to ensure consistency of expectations and outcomes for all parties involved, particularly with respect to providing guidelines based on international best practice and compatible with CBD obligations.

3.2 What are your views on the proposed vision and policy principles to guide New Zealand's bioprospecting policy?

**i) Potential policy benefits and costs**

3.3 Do you see any other potential benefits or costs arising from a bioprospecting framework apart from those discussed in this document?

3.4 Which benefits do you think would be the most beneficial for New Zealand to capture?

3.5 Do you think that there are potential benefits that are not worth capturing because of the costs involved in doing so?

**ii) Policy scope**

3.6 What are your thoughts on the current definition of bioprospecting?

3.7 What are your views on how the "in scope" and "out of scope" boundaries of bioprospecting have been defined?

3.8 Do you think that non-commercial research activities should be within the scope of a bioprospecting policy? If so, why? If not, why not?

3.8.1 If yes, can you think of any specific activities that should nonetheless be excluded from the scope of a bioprospecting policy?

3.8.2 If yes, what levels of compliance should be expected from non-commercial researchers?

**Response to 3.8:** While it would be desirable to provide for fair and equitable processes for training/capacity building, access and benefit sharing arrangements in non-commercial research, we would not want to see research activities constrained by a framework aimed at controlling commercial activities.

Non-commercial taxonomic studies are based on extensive collections from nationwide locations. An overly broad regulation of collecting activities and/or slow or expensive regulatory system would do more than cause delay and raise costs, it would probably prevent most taxonomic (and many ecological) studies from occurring.

That aside, commercial bioprospecting activities do provide potential for supporting traditional taxonomic research and training/capacity building, and Landcare Research would like any policy on non-commercial research activities to encourage and contribute to the development of taxonomic knowledge and resources.

3.9 Which kinds of biological resources should be accessed for bioprospecting?

3.9.1 In your view, which of the three tiers of access (central government, local government and private) should be included in a bioprospecting framework?

3.9.2 Do you think that ex situ collections should be included in a bioprospecting policy?

**Response to 3.9.2:** Landcare Research is custodian of the following nationally significant databases and reference collections that have relevance to bioprospecting activities:

- New Zealand Arthropod Collection (NZAC)
- New Zealand Fungal Herbarium (PDD)
- International Collection of Micro-organisms from Plants (ICMP)
- Allan Herbarium for Plant Biosystematics (CHR)
- National New Zealand Flax Collection

We consider that, in order to maintain consistency of approach to biological resources within New Zealand, it would be desirable for these to be encompassed by bioprospecting policy and procedures provided they did not constrain non-commercial research and inter-institutional linkages.

Please see Appendix for further comments from herbarium/systematics viewpoint.

Comment [GA1]: Comment as above

3.9.3 Do you think that non-indigenous biological material should be included in a bioprospecting policy?

### iii) Administrative frameworks

3.10 Do you think that New Zealand should have a National Focal Point? If yes, what form could it take?

3.11 Do you think that New Zealand should have a Competent National Authority? If yes, what roles and responsibilities could it have?

**Response to 3.10:**

It would be desirable to have one point of contact for all parties with an interest in bioprospecting, eg NZ access providers, NZ and international bioprospectors, and biotechnology companies for activities on Crown land. The need for this is illustrated by a recent situation in which an overseas researcher sought Landcare Research staff assistance with collecting species of stoneworts (a type of green alga) from freshwater lakes in the South Island for non-commercial research purposes – they were advised to contact the DOC offices where lakes were located, Land Information New Zealand, Ministry of Fisheries, Ngāi Tahu and Meridian for collecting permits and access permission.

The issue of activities on private land, and any decisions by private land-owners (e.g., a particular hapu or iwi) to permit bioprospecting is more complex - assurance of confidentiality would be essential if such a centralised system was invoked. The alternative would be to have clear national guidelines for best practice but without the formality and bureaucracy of a central authority.

**Response to 3.11:**

(a) It would be preferable to have one agency such as a section of MED that could manage all aspects of bioprospecting policy and procedures, and could coordinate with

existing regimes, eg DOC permit and concession process.

If permits for commercial bioprospecting activities were to be issued, a clear and simple web-based process managed by one agency would be desirable - ie, avoid ERMA/MAF confusion over who issues what, and also avoid high costs associated with these compliance regimes.

(b) The following example illustrates why it would be desirable to have a central agency and guidelines that provide more certainty on who to consult with when there is no clearly identifiable owner of indigenous flora:

Recently, Landcare Research staff were approached by an overseas nursery which is propagating by tissue culture an unusual cabbage tree cultivar called 'ti tawhiti', an old Māori cultivar once used for food. This cultivar has been sold for over 100 years under the name *Cordyline kirkii*, and was discovered by our botanists to be the same as 'ti tawhiti', which was long thought extinct. The overseas nursery wanted to use the story of its Māori origins in its sale promotion. After discussion with us on the ethics regarding use of traditional Māori knowledge, the nurseryman agreed to consider a donation on sale of the plant to an appropriate Māori organisation. This posed an immediate difficulty. Although our preliminary research has shown the plant probably originated in the central North Island, association with any particular iwi can no longer be confidently established. The absence of any established mechanism for accepting funds on trust and redistributing them appropriately meant that we were unable to follow up on this opportunity.

#### 4) On mātauranga Māori:

- 4.1 How do you think use of mātauranga Māori for bioprospecting can be most appropriately managed and protected?
- 4.2 What do you think of the suggestions made in this document as options to protect mātauranga Māori (a voluntary register, ensuring legally and fully mandated governance entities, a code of best practice for bioprospectors, or an advisory council to a Competent National Authority)?

**Response to 4.1:** Landcare Research's policy on consultation with Māori requires staff to first check that Māori concerns and interests are covered by undertaking early consultation with appropriate Māori organisations or individuals and, where appropriate, involving them in the development of the research project. Agreements recognise the importance of protecting mātauranga Māori and ensure that it is not used for any purpose without the express permission of the holder. Landcare Research acknowledges that the Māori partner may have additional obligations to whānau and hapū with respect to the use of mātauranga Māori, and that both parties want to promote its use and development without eroding the rangatiratanga of whānau and hapū over their mātauranga Māori.

**Response to 4.2:** We agree that a code of ethical conduct such as that adopted by the International Society of Ethnobiology would be desirable to safeguard Tangata Whenua rights to mātauranga Māori. We support the development of guidelines for dealing with intellectual property inherent in mātauranga Māori that could, for example, include an explicit requirement to consult and collaborate with Māori early in the planning process, especially if approval for the research to proceed rested solely with a particular iwi or hapū. The guidelines could also involve the drawing up of MOUs designed to safeguard

the interests of all involved and, among other things, provide for the training of local Māori in science methodology specific to the project. Similarly, some training in intellectual property management and negotiation of agreements could be considered as part of an overall project plan.

**5) On international bioprospecting frameworks:**

5.1 What aspects of the Bonn Guidelines of the Convention on Biological Diversity (CBD) do you believe should be considered in developing a domestic bioprospecting framework?

5.2 Are there aspects of international bioprospecting frameworks as outlined in section 5 (or any others you know about) that could be useful to consider during the development of a bioprospecting framework in New Zealand?

**6) On any other issues:**

6.1 Do you have any further suggestions or comments on the issues raised in this document?

**Response:**

The following extracts from the summary to Landcare Research's brief of evidence to the Waitangi Tribunal hearing on the Wai 262 claim are also of relevance to the development of bioprospecting policy:

(a) Any policy outcomes should be mindful of potential impacts on the research and development environment, and ensure that it provides sufficient certainty so that parties are not discouraged from undertaking research in New Zealand. Furthermore, we would not want to have opportunities for international collaboration diminished.

(b) We acknowledge the need for Māori to be fully involved in any national and international dialogue or negotiations that have the potential to impact upon their rights as guaranteed under the Treaty of Waitangi.

(c) It is our view that the current regime, whereby relationships between CRIs and Māori entities are developed over time in response to needs identified by Māori themselves, is preferable to a formal legislative process for consultation. Guidelines to assist both CRIs and Māori, particularly in negotiating intellectual property sharing arrangements, would however be welcomed.

## APPENDIX

### **Comments from a herbarium/systematics viewpoint on the MED *Bioprospecting: Harnessing Benefits for New Zealand* discussion paper**

Ilse Breitwieser plant systematist, Director, Allan Herbarium; OBI Leader, Defining New Zealand's Land Biota

Rob Smissen, plant systematist, Allan Herbarium

12 October 2007

### **Managing bioprospecting activity and capturing benefits of bioprospecting activity for biodiversity knowledge**

From page 12 of the discussion document:

“... enable the systematic gathering and storing of information about what bioprospecting activities are occurring in New Zealand, as well as the associated costs and benefits of these pursuits. This information could be valuable for a number of reasons, including maintaining an overview of the scope and nature of bioprospecting activities in New Zealand, monitoring the general success of bioprospecting policy, and improving the alignment of the bioprospecting framework to policy objectives.”

The involvement of taxonomic expertise in this could be crucial, at least in validating specimen identifications. This requires deposition of voucher specimens with New Zealand Herbaria, such as the Allan Herbarium; but costs should be met by the Bioprospectors. Nomenclatural issues are likely to arise over the time frame of commercial bioprospecting, and stored information may need to be annotated in the light of taxonomic changes and synonymies to remain accurate and interpretable.

This is particularly the case if the statement on page 19: “increased scientific and public knowledge of the natural environment, for example, taxonomic information.” is to be realised. Such knowledge needs to be built on properly vouchered, curated, named and data-based specimens and will require these costs to be built in through the framework.

This functionality is more boldly stated on page 38:

“gather and store information about all bioprospecting activities in New Zealand – establish a database and facilitate the formation of linkages between bioprospectors, research facilities and access providers; ...”

Vouchering of material will be critical to such a database, particularly given the long time lag to commercialisation based on bioprospecting. Taxonomic expertise must be involved in the design and implementation of databases. This is particularly the case if the biodiversity knowledge benefits raised elsewhere in the discussion document are to be realised.

Page 35 of the report notes:

“Collections of material held for research purposes generally have a database to support them.”

Funding to support databasing of existing and new specimens in New Zealand's Nationally Significant Collections and Databases is needed to provide the backbone knowledge to facilitate ethical bioprospecting and for control of bioprospecting. Database coverage of the Allan Herbarium, for example, is c. 20%, inadequate to fulfill the expectations of the discussion document.

### **Facilitating non-commercial (biosystematic) research within or in parallel to the framework**

Page 20 notes:

“...promoting the exchange of information between New Zealand and international research institutions, thereby creating valuable networks. ...Bioprospecting activities can also provide valuable information that assists with conservation and environmental management. Bioprospectors often need to record information on taxonomy, species distribution and the variation of species' density over time.”

For benefits of this sort to be captured, specimens will need to be deposited with appropriate institutions, such as the Allan Herbarium, along with formally recorded data. Since this will also be important in the role of “... gathering and storing information about what bioprospecting activities are occurring in New Zealand” (page 12) such an arrangement would be doubly advantageous.

On page 30 it is proposed that:

“Non-commercial activities should have a more straightforward process as compared with commercial ventures, in order to avoid discouraging valuable research activities such as studies into biodiversity conservation”

If this is not achieved than massive damage would be done to the underpinning study of taxonomy, but probably also to ecological science in New Zealand.

This risk as captured on page 34 as:

“to non-commercial biological researchers. This could occur as a result of introducing aspects, such as additional procedures and processes, before and during a research project. This could be perceived as delaying project progress and raising compliance costs.”

We feel this probably understates the extent of the risk. It needs to be borne in mind that meaningful taxonomic studies usually need to be based on extensive collections from nationwide locations. Rather than causing delay and raising of costs, an overly broad capture of activities and/or slow or expensive regulatory system would probably prevent most taxonomic studies from occurring.

If it didn't, then the risk

“... to the government. This could occur through, for example, raised running and monitoring costs caused by a larger number of applications ...”

would be considerable and the system may wind up being slowed down by large numbers of applications for non-commercial studies. MED should not underestimate the number of collections and localities involved in maintaining and extending taxonomic knowledge of New Zealand's biota. How the use of existing ex-situ collections in this work is integrated into the framework will also be critical.

It is not clear that the example on page 51 has much relevance to taxonomic work, because our research is seldom structured around collecting from limited geographic areas in this way. For example, a taxonomic study in New Zealand may already obligate researchers to consult with dozens of iwi and each of DOCs regional conservancies, as well as private land owners. If this could be simplified, then inclusion in the framework would be beneficial. However, based on the minutes of the various hui posted on the MED website, it is unlikely that relations between the Crown and iwi will allow such a smooth process.

### **Managing collections to minimise the risks of unethical bioprospecting and failure to capture benefits for New Zealand stakeholders in biodiversity**

Page 38 states

“For example, the issuing of permits could be conditional on the negotiated use of mātauranga Māori being suitable and conducted with the appropriate holders of that knowledge and/or the general adequacy and legitimacy of benefit sharing between bioprospectors and the respective resource providers ...”

As a potential source of knowledge and/or specimens for bioprospecting Landcare Research is unlikely to be equipped to deal formally with this, so a central agency that could act as a permit issuing authority would be a necessary gatekeeper and people wanting access to information or specimens should approach collection managers based on that authority. However it is vital herbaria and other collections continue to be able to loan material to bonafide non-commercial researchers overseas. Limitations and controls may be appropriate, particularly to accommodate iwi views and interests and the crowns obligations under the Treaty of Waitangi.

On page 22 the report acknowledges that

“it may be difficult to determine whether samples collected or purporting to be collected for non-commercial research are subsequently used for commercial purposes, especially overseas.”

Here, collection managers may need help to develop policies preventing the use of specimens for bioprospecting activities that still allow the exchange of specimens vital to the role of taxonomists in determining what organisms are present in New Zealand, or at least agreement that our procedures are adequate. Precisely what activities are included in the framework therefore becomes critical.

Particularly given the timeframes often involved in going from biodiscovery to commercialisation the proposition on page 34 that

“if a biological sample collected for non-commercial activities is then used for commercial activities, documentation would be available to confirm this chain of events ...”

again requires that vouchered specimens, curated, named and databased be deposited in appropriate collections to underpin the paper chain.

### **Aspects of the nature and composition of the New Zealand Flora relevant to the discussion**

Perhaps not critical to the policy framework but nonetheless noteworthy is the remark on page 8 that

“New Zealand has unique and diverse flora and fauna that have evolved as the result of a long period of geographical isolation”

This is a widespread but potentially misleading view, at least in relations to plants. Contemporary scientific views largely emphasise the floristic links between New Zealand and the rest of the world. A potential implication of this is the need to understand and classify the New Zealand flora in a global context (eg, return of *Koromiko* et al. from *Hebe* to *Veronica*)

Along similar lines the remark on page 35 that there is, in relation to the native biota, a

“relatively narrow genetic base of introduced biological material.”

may require some qualification since the species level diversity of the introduced vascular plant flora exceeds that of the native flora by approximately two fold, and the number of cultivated non-indigenous species exceeds that of the native flora by at least 10-fold. In addition, some taonga species such as *Kūmara*, that are not native to New Zealand, may need to be explicitly included in the framework to protect Mātauranga Māori.