Biodiversity
OUR LIVING TREASURE
HE KURA TAIAO

TURNING THE TIDE?

A Review of the First Five Years of the New Zealand Biodiversity Strategy

THE SYNTHESIS REPORT

By

Wren Green and Bruce Clarkson

Note on the authors

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Turning the Tide? A Review of the First Five Years of the New Zealand Biodiversity Strategy, The Synthesis Report by Wren Green and Bruce Clarkson was submitted to the Biodiversity Chief Executives in November 2005.

EXECUTIVE SUMMARY

The launch of the New Zealand Biodiversity Strategy in 2000 marked an important milestone in the evolution of conservation management in New Zealand. It went beyond the nature conservation focus on protecting particular species and areas to embrace the totality of human impacts on our valued biological diversity, both indigenous and introduced, as a collective responsibility to protect or use sustainably.

This independent review after the first 5 years of implementing the Biodiversity Strategy examines the progress that has been made across all the themes as well as the achievements from the programmes funded by the 2000 Biodiversity Package. We have written two reports. The present synthesis report is based on our companion report that is an in-depth assessment of progress at the level of objectives and actions to which the reader is referred for more detailed comments and additional recommendations.[1] The present report summarises achievements from core funding and from the Package programmes over the period. It also makes a number of recommendations covering all ten themes that are designed to improve the delivery of the Strategy over the next 5 years.

While we commend the more high profile achievements it is important to recognise that, of necessity, the early stages of a 20-year strategy required putting in place a number of '***building blocks***' on which progress in other areas would later depend. The building blocks now in place include:
- new classification systems for marine, terrestrial and freshwater systems;
- better coordination of management for biosecurity;
- development of the Marine Protected Area policy;
- development of the Strategy for Managing the Environmental Effects of Fishing;
- creation of the contestable Advice and Condition Funds to assist private landowners efforts to protect indigenous biodiversity;
- establishment of the Matauranga Kura Taiao Fund;
- establishment of the Terrestrial and Freshwater Biodiversity Information System;
- establishment of the National Aquatic Biodiversity Information System.

Other important building blocks are still required, most notably:
- Oceans Policy to clarify, *inter alia*, governance and management responsibilities for marine biodiversity;
- National Policy Statement on biodiversity;
- indicators for biodiversity and biosecurity, linked to regional and national monitoring and reporting systems;
- comprehensive state of the environment reporting system;
- collaborative strategy to manage New Zealand's genetic resources.

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[1] "Review of the New Zealand Biodiversity Strategy Themes" W. Green and B. Clarkson, 2005.

Although we regard the Biodiversity Strategy as comprehensive in its coverage of topics we do recommend the addition of one new objective – consideration of the impacts of climate change on biodiversity and the implications for adaptation responses. Both indigenous and introduced biodiversity are highly likely to be affected by climate change with implications for biodiversity managers that are not yet widely appreciated or understood, but nevertheless need planning consideration.

The Package funds have significantly strengthened existing initiatives and thereby helped to 'turn the tide' of biodiversity losses or threats in particular contexts. Examples include:
- substantial gains on private lands through the Queen Elizabeth II National Trust, Nga Whenua Rahui and Nature Heritage Fund;
- success of "Weedbusters" strategy in significantly extending priority areas under management for weeds;
- gains for biodiversity following rodent eradication on several off-shore islands;
- intensive management in mainland islands and sanctuaries, e.g. for kiwi;
- addition of more marine reserves and significant expansion of the area protected;
- more strategies and plans for protecting threatened terrestrial and marine species;
- reduction of seabirds caught as 'bycatch' in fishing operations;
- international progress on reducing ballast water threats;
- major rise in community biodiversity projects with an increasing involvement by regional and district councils.

While these gains are commendable it is clear, despite the paucity of data to compare the situations in 2000 and 2005, that broader trends require more attention. For example:
- ongoing loss of rare and threatened biodiversity from private lands;
- dominance of economic drivers that favour the degradation of ecosystems (such as wetlands), rather than their active maintenance;
- adverse impacts of animal pests on threatened species and forest ecosystems;
- serious declines in the status of many acutely or chronically threatened species;
- continuing spread of pest fish, aquatic weeds and growing numbers of weed species;
- negative impacts of fishing on many marine habitats and ecosystem processes.

It is clear that the funds or capacity will never be available to manage indigenous biodiversity at the level of DOC's current investment in its intensively managed areas. These represent just 2-3% of the total lands administered by the department which are almost 30% of the total land area of New Zealand. Nor do we consider that such intensive management is necessary or justified for all places or species. What remains to be developed is a more explicit framework that considers the mix of biodiversity values and sets levels of management needed to achieve particular thresholds of restoration and protection. An important component of indigenous biodiversity values occur on private lands (along with valued imported biodiversity). Therefore involvement of local government agencies, communities and private interests is essential, integrated with the management expertise, capacity building and policy roles of central government agencies. The inter-dependence of the public and private sectors, central and regional, in

achieving biodiversity goals are recognised in the Strategy and now need to be embedded more firmly in the next phase of implementation.

To date, the agency focus of the Biodiversity Strategy has largely been at the level of central government, although 26% (almost $48M) of Package money was allocated for activities with a landowner and community focus. The next phase will be able to use the existing building blocks, complete the remaining building blocks and apply them to new strategic linkages that are now appropriate to achieve bigger gains for biodiversity. In Chapter 13 we outline three strategic partnership linkages that now need to be made – to local government, to communities and to sustainable development initiatives.

Building these linkages into collaborative partnerships would assist with a number of objectives. We note the new statutory requirements for environmental reporting by local authorities under the Local Government Act 2002 and the 2004 amendments to the RMA. This will provide opportunities for local and central government to agree on environmental indicators for biodiversity and biosecurity that will have regional value and relevance as well as national usefulness for assessing environmental trends that have implications for economic and social development.

Linked to the overdue need to complete and implement a comprehensive system of environmental indicators and environmental performance standards is the importance of developing monitoring and reporting systems. These are also needed by local and central government agencies for purposes such as assessing the effectiveness of management, evaluating policies and allocation of resources. This review has shown that monitoring and reporting systems are presently insufficient to meet the reporting requirements of the Biodiversity Strategy.

The importance of monitoring and reporting systems has been obscured by one important shortcoming in the Strategy – the very few time-linked and quantifiable targets that are set against which to measure progress. We recommend that, where appropriate, quantifiable targets are set to cover 5, 10 or 15 year periods. This should be part of reforms to the Strategy's governance system which would benefit from: clearer leadership, stronger accountabilities (possibly through the Statement of Intent documents), the establishment of more formal audit and review arrangements and improved reporting systems against targets.

We consider this is a good time for some course corrections that will improve the ability of central and local government agencies to play their parts, along with the wider community, in retaining and restoring what is unique and of special value to all New Zealanders about our biodiversity.

RECOMMENDATIONS

We have not made recommendations for reallocating resources within the Strategy themes and objectives. We also consider this is a task for Ministers and CEOs within a broader discussion on government priorities, based on consideration of our findings.

Theme 1: Terrestrial biodiversity (Chapter 3)
- *That references in the Strategy to 'sympathetic management' be widened to address the need for biodiversity conservation principles to be applied to all aspects of sustainable land management.*
- *That a set of key environmental indicators for terrestrial environments, appropriate for monitoring and reporting requirements at regional and national levels, be agreed to between central and local government agencies and implemented.*
- *That funding for Queen Elizabeth II National Trust and Nature Heritage Fund is continued based on an assessment of present and future needs and subject to periodic evaluations of performance.*

Theme 2: Freshwater biodiversity (Chapter 4)
- *That the protection, restoration and sustainable management of freshwater ecosystems and indigenous species be accorded higher priority in the next phase of the implementation of the Biodiversity Strategy.*
- *That a set of key environmental indicators for freshwater environments, appropriate for monitoring and reporting requirements at regional and national levels, be agreed to between central and local government agencies and implemented.*
- *That the "Water Programme of Action" incorporates more explicit initiatives to sustain and enhance indigenous biodiversity and ecosystem services.*

Theme 3: Marine biodiversity (Chapter 5)
- *That a set of key environmental indicators for the marine environment, appropriate for monitoring and reporting requirements at regional and national levels, be agreed to between central and local government agencies and implemented.*

Theme 4: Genetic resources (Chapter 6)
- *That the Ministry of Agriculture and Forestry initiate an evaluation of the need for a collaborative strategy to manage New Zealand's genetic resources, including an identification of significant areas of risk in the management of these resources and options for managing these risks.*

Theme 5: Biosecurity (Chapter 7)
- *That surveillance and the reduction of internal spread of key invasive species are given greater priority to maximize the benefits of early detection and eradication.*

- *That the biosecurity research strategy is completed as soon as possible and is linked to objectives for biodiversity and climate change research.*

Theme 6: Governance (Chapter 9)
- *That improvements to the governance systems are made to provide leadership, strengthen accountabilities, set measurable targets for objectives, develop better monitoring and reporting systems, and collaborative partnerships with local government, the private sector and non-governmental organisations.*

Theme 7: Maori and biodiversity (Chapter 10)
- *That funding for Nga Whenua Rahui and Matauranga Maori is continued based on an assessment of present and future needs and subject to periodic evaluations of performance.*

Theme 8: Community participation and awareness (Chapter 11)
- *That the Condition and Advice funds are continued, but with a particular effort to target critically threatened ecosystems and species, with monitoring as well as reporting requirements built into the funding process.*
- *That a review of institutional arrangements is undertaken to determine best practice for integrating private and public partnerships for biodiversity conservation at the regional scale.*

Theme 9: Information, knowledge and capacity (Chapter 8)
- *That Government funding for research underpinning biodiversity objectives, and related biosecurity objectives, is substantially increased.*
- *That a multi-agency working group, including local government interests, is established to identify environmental indicators for use at local, regional and national levels and to develop coordinated and integrated monitoring and reporting systems of indigenous biodiversity.*
- *That capacity building is recognised as a priority objective and a more structured, long-term approach is developed and funded across central and local government agencies.*

Theme 10: International responsibilities (Chapter 12)
- *That New Zealand's development assistance initiatives make greater use of New Zealand's technical expertise in conservation management and biosecurity.*
- *That an objective and actions relating to the impacts of climate change on biodiversity and related research questions and adaptation options be developed and added to the Biodiversity Strategy.*
- *That the potential impacts of climate change on biodiversity be accorded a higher priority in the New Zealand climate change policy, recognizing also the opportunities for whole-of-government links to investments in monitoring regimes between climate change and biodiversity objectives.*

OVERVIEW OF THE REPORT STRUCTURE

We have based the structure of this report on our interpretation of the functional relationships between the ten themes of the New Zealand Biodiversity Strategy (hereafter referred to as "the Strategy") – see Figure 1. The circular core is defined by the themes and goals that collectively focus on 'sustaining environmental systems'. Here we grouped the first four themes of the Strategy.[2] We see these as relating most directly to the achievement of Goal Three "*Halt the decline in New Zealand's indigenous biodiversity*", while Theme Four (Conservation and use of genetic diversity) which connects both indigenous and introduced biodiversity, also incorporates Goal Four "*Genetic resources of introduced species*". The three sub-circles represent the three layers of biodiversity – genetic, species and ecosystem diversity.

Most of the remaining themes fall into two major groups that we have classified as "enabling" and "engaging" themes, both of which play critical roles in helping to achieve the central Goal 3. There are three "enabling" themes, two of which – biosecurity (Theme Five) and information and knowledge (Theme Nine) – contribute directly to the core themes by reducing the threats and impacts of invasive species and by providing, via research, new knowledge and techniques to better manage biodiversity in all the major environments. The third "enabling" theme is governance (Theme Six). We have represented governance as having a role with respect to all the other themes, providing the direction, coordination, resources and motivation to enable the other themes to achieve successful outcomes.
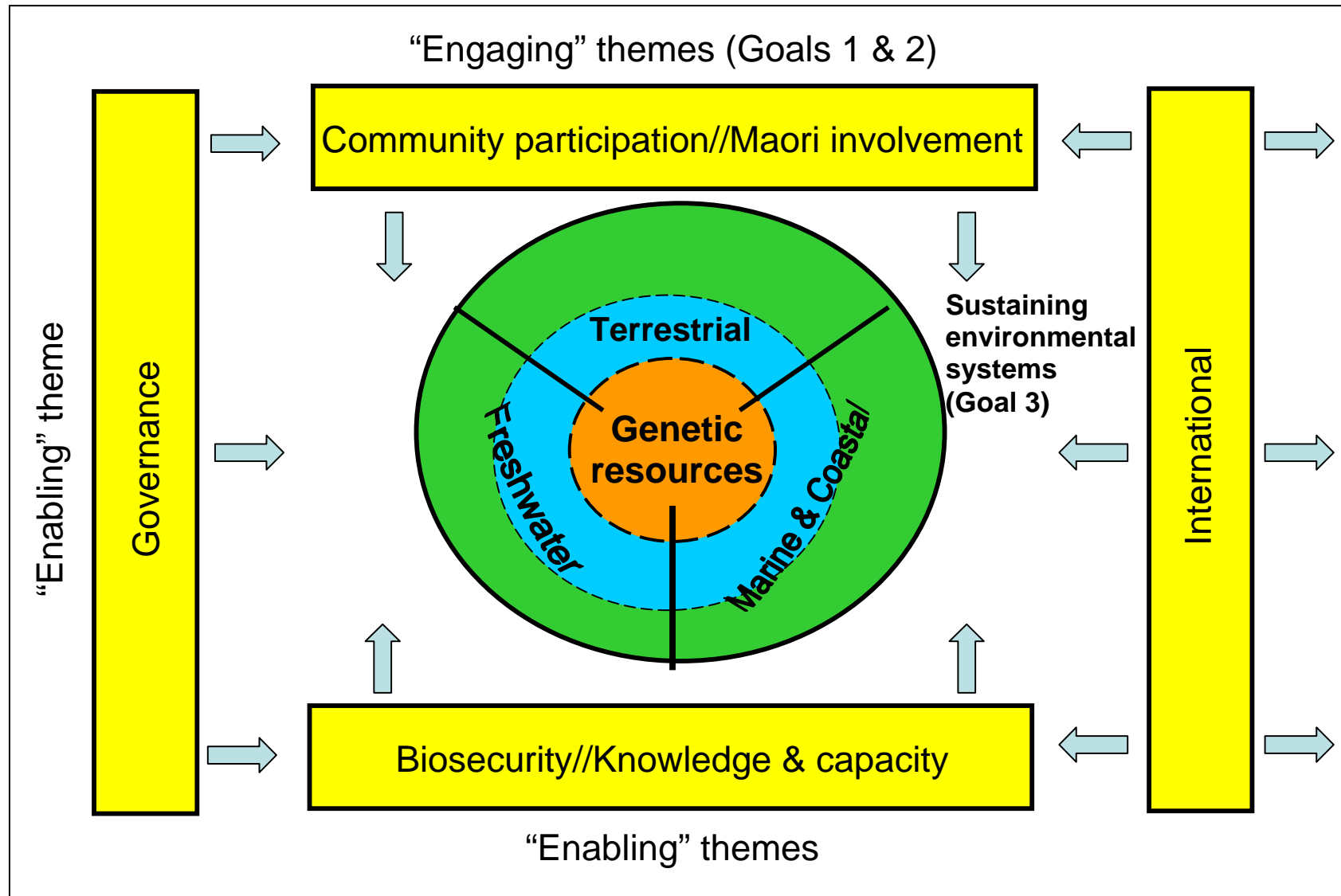
This structural arrangement somewhat simplifies the actual positioning of biosecurity within the Strategy. Theme Five is largely focused on overall biosecurity management and border control. In addition, the first three themes all have their own biosecurity components with respect to the management of animal pests and weeds. Schematically, these pest management elements are subsumed within the 'biosecurity' box, which serves to reinforce the point that biosecurity is a means to an end, not an end in itself.

There are two "engaging" themes – community participation and awareness (Theme Eight), linked to Goal One "*Community and individual action, responsibility and benefits*" and Maori and biodiversity (Theme Seven), which is linked to Goal Two "*Treaty of Waitangi*".

We use the term "engaging" to signify the essential role that Maori and communities have to play in implementing the Strategy at a variety of different levels. Their focus is also on achieving Goal 3, with access to the systems, information and knowledge that are made available through the two enabling themes, 5 and 9. Again, their input should be facilitated, supported and encouraged by an effective governance system.

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[2] Theme 1 – biodiversity on land; 2 – freshwater biodiversity; 3 – coastal and marine biodiversity; 4 – conservation and use of genetic resources.

Figure 1. Framework for action – linking the themes

"Engaging" themes (Goals 1 & 2)

Community participation//Maori involvement

"Enabling" theme

Governance

International

Terrestrial

Freshwater

Genetic resources

Marine & Coastal

Sustaining environmental systems (Goal 3)

Biosecurity//Knowledge & capacity

"Enabling" themes

The remaining Theme Ten – international responsibilities – is positioned off to one end and operates as a two-way bridge, contributing New Zealand expertise and assistance to international initiatives, while also feeding back new knowledge of benefit to New Zealand as well as international obligations that need to be met.

Following an introductory chapter the report is divided into four parts that cover our review of the themes, based on the functional relationships described above. In the concluding chapter we summarize our findings on the level of progress after 5 years and make some suggestions for strengthening and re-positioning the Biodiversity Strategy into the future.

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PART A. REVIEW CONTEXT

1. INTRODUCTION

1.1 Background to the review

When the New Zealand Biodiversity Strategy was launched on 29th March, 2000, the coordinating government agencies were charged with:

- "*Undertaking a substantive review of the Strategy after five years, assessing goals, roles, governance arrangements, objectives and priority actions.*" (p.130)

An independent review after 5 years allows for a timely assessment of progress across the objectives with a particular focus on the 43 actions (out of a total of 147) that were designated as 'priority actions'. Actions identified as priorities were considered as contributing most in the first five years to achieving the goals, or needing to occur first, before other actions could be implemented.

Government's approval of the Strategy was accompanied by a $184M package (the "Biodiversity Package") over 5 years to implement key actions.[3] This Package allocated additional funding to some, but not all, of the priority actions. The review therefore examines the outputs and outcomes from the Biodiversity Package programmes (described in detail in the earlier annual reports to Biodiversity Ministers), as well as reviewing the overall progress that has been made towards achieving the 20-year "desired outcomes" of the Strategy.

1.2 Purpose of this report

This synthesis report builds upon our review of the ten themes of the Strategy (see next section). It provides the reader with a summary of our key findings and the cross-cutting issues as well as new issues that have arisen since the Strategy was developed. It also includes a number of forward-focused recommendations that we believe will help improve the delivery and effectiveness of the Strategy. We see these as 'course corrections', not as fundamental realignments. There are numerous recommendations in our related report ("Review of the New Zealand Biodiversity Strategy Themes") that are intended to assist the more detailed planning processes, such as the development of annual budgets and work plans.

As the Strategy is only 5 years old it was not considered appropriate for the reviewers to specifically comment on the four goals that provide the high-level outcomes for biodiversity in New Zealand.

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[3] The original allocation was $187 million, but the allocation to the Oceans Policy programme was subsequently reported on separately to Biodiversity Package programmes.

1.3 Methodology

The Strategy is an extensive and comprehensive document that addresses a range of biodiversity management issues. Delivery is through a hierarchy of ten themes that break down into 45 objectives, supported by 147 actions. Each theme has a "Desired outcome for 2020" section which is written in visionary terms, rather than specifying targets to be achieved. The identification of priority actions in the Strategy was useful – both to address urgent needs and to concentrate on achieving the "first things first" that are needed to support subsequent initiatives.

Given this structure, and recognizing that the Strategy still has 15 years to run, our decision was to build up a picture of what had been achieved at the level of objectives by reviewing progress against each of the underlying and supportive actions. To review only at the level of the visionary 'desired outcomes' would have run the risk of overlooking the progress made with the 'building blocks' on which the next phase of implementing the Strategy depends. Our more detailed review of all the objectives and actions are contained in our "*Review of the New Zealand Biodiversity Strategy Themes*" report. This lengthier report on the ten themes provides a detailed account of outputs and outcomes to date against the objectives and activities. It also includes a summary 'stocktake of progress' for each theme as well as a summary table with our ranking of progress to date and a future priority ranking for each action. The reader is referred to "*Review of the New Zealand Biodiversity Strategy Themes*" report for the supporting material that underpins the following comments and recommendations.

To assist our analysis we were provided with information from the four main coordinating agencies (DOC, MfE, MFish, MAF) and with additional material that we requested. We were also assisted by feedback from three meetings of research scientists, mostly from Landcare Research and NIWA, which were organized by Ministry of Research, Science and Technology staff and the Royal Society. No constraints were put on additional contacts we wished to make to gather further information and perspectives.

1.4 Shortcomings

Reviews of this nature are necessarily a compromise between available resources, including time, and the degree of analysis that reviewers feel is required. Given the breadth of the Strategy we must acknowledge that some aspects were not done with the thoroughness we felt was warranted. In some areas the information provided was not as relevant to the actions and objectives of the Strategy as we had hoped and for other actions the information was scanty. This applies, in particular, to our analysis of the contributions that local authorities are making to biodiversity management, both individually and with local communities. Information on these outputs and outcomes are not collated nationally, nor are they easy to obtain from councils. While we spoke to a number of councils, we did not make a comprehensive assessment. Their contributions to biodiversity management are therefore likely to be under-estimated in our reports. The adequacy and flow of information will require consideration for any future review.

In retrospect, we would have felt more comfortable if the theme relating to 'Maori and biodiversity' had been reviewed by someone more directly involved with those activities. Ensuring the breadth of understanding of such a diverse range of topics is another consideration for any future review. Finally, the review process did not allow for meetings with key stakeholders, sector groups, or the public although that may be an option to consider subsequent to consideration of our review by Government.

1.5 Acknowledgements

We would like to acknowledge the assistance we received from departmental officials in obtaining supplementary information when requested. We appreciated the contributions made by scientists at the three meetings that were held to discuss the future research needs for biodiversity. We also thank the numerous individuals who answered our questions and provided us with helpful information.

2. "BIODIVERSITY IS EVERYONE'S BUSINESS"

This quote is from the Rt Hon Helen Clark, Prime Minister, in the Foreword to the Strategy. The central message in the Foreword is that the NZ Biodiversity Strategy is for the nation, not just for the managers of protected areas. For example: *"We need to manage our working landscapes well and look after the scarce ecosystems in those areas*."

That New Zealand has a strategy to address the management of its indigenous and introduced biodiversity is an important achievement. Four years in preparation, with extensive consultation and release of a draft strategy, the result was a strategy that articulated a coherent vision for our unique biodiversity that had widespread support. It sought to be inclusive of both central and local government in delivering results by working in partnerships between management agencies, businesses, community groups and landowners. The Strategy was comprehensive, set priorities, identified key players (mostly central or local government) and assigned lead responsibilities for each action. In brief, the Strategy provided an adequate platform for tackling the decline of our indigenous biodiversity – as had been identified in the 1997 State of the Environment report.[4] The vision and desired outcomes were lofty in their reach, but they did arise from a strong identification by many New Zealanders of what is unique and important to protect in our varied environments.

In our view the Strategy correctly identified the need for the integrated response that would be needed for success including: better knowledge to underpin smarter management; more coordination between agencies; widespread and informed community action; and market-driven rewards and sanctions.

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[4] Ministry for the Environment 1997. *The State of New Zealand's Environment, 1997*. Ministry for the Environment, Wellington.

What the Strategy did not do was set specific, time-linked targets against which progress and accountabilities could be measured. We comment on the consequence of this in Chapters 9 and 13 and make suggestions for the future.

The extra $184M from Government to assist with implementing the Strategy was an acknowledgement that the challenge of 'turning the tide' could not be achieved within existing resources. Figure 2 shows the allocation of the Biodiversity Package by (A) theme and by (B) agency and fund. The bulk of the 'theme' focus was on terrestrial issues which includes a large sum allocated to funds for species and protection initiatives on both public and private lands. The amount spent on Theme Two (freshwater biodiversity) was estimated from various programmes as there was not a specific allocation for Theme Two programmes.

A significant amount was allocated to DOC to strengthen existing programmes, particularly for threatened species, weed and animal pest work. One consequence of these allocations was a perception, probably more noticeable at local government levels, that this was more of a "DOC's strategy" and less a strategy for the whole country. Given that 26%, or almost $48M, was allocated for activities outside central government departments (mostly for protection of biodiversity on private lands), this perception may be based as much on a lack of engagement between levels of government as on the actual allocation of Biodiversity Package funds.

Figure 2. Allocation of Biodiversity Package Funds

A. By theme
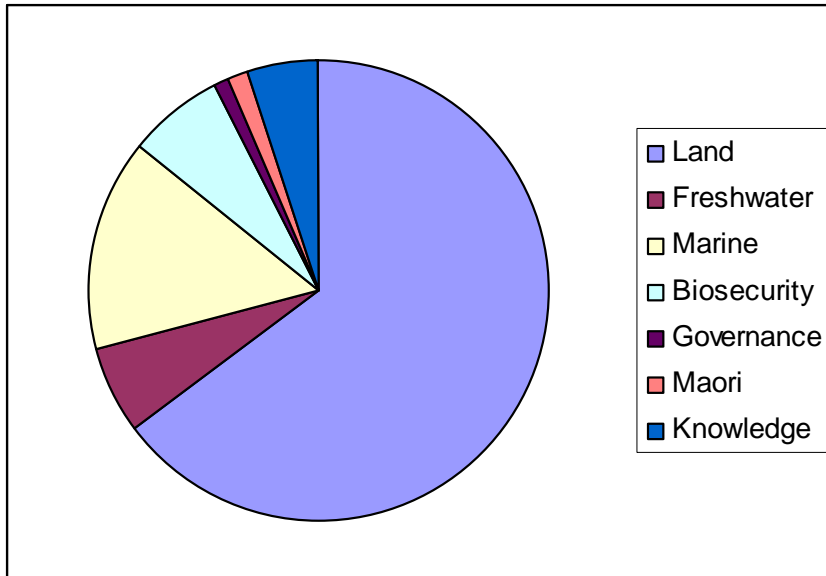
B. By agency and fund
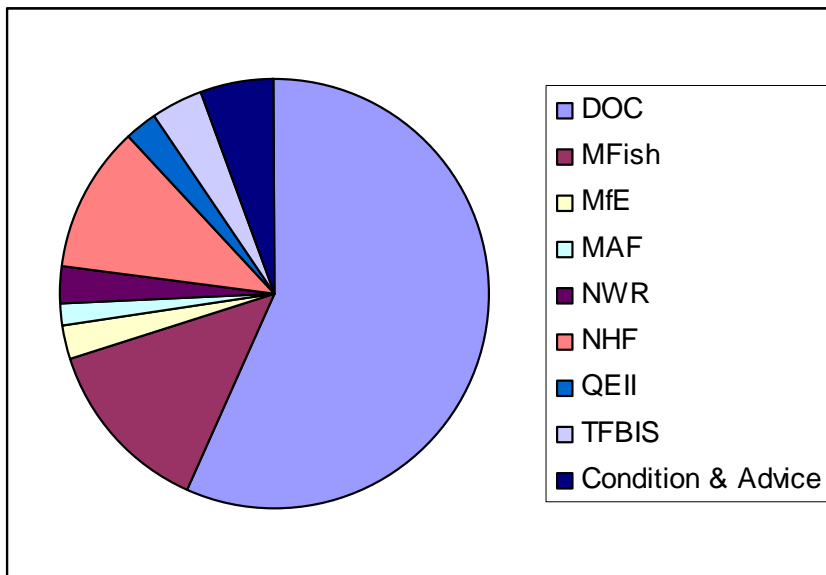
PART B. PROGRESS IN SUSTAINING ENVIRONMENTAL SYSTEMS

3. OUTCOMES FOR TERRESTRIAL BIODIVERSITY

Theme One received a majority of the Biodiversity Package allocations (67%), primarily to enhance existing programmes such as species recovery, weed and animal pest control, and protection of biodiversity on private land. This reflected the view that these core initiatives required to 'turn the tide' needed additional funding if greater progress was to be made.

3.1 Protecting indigenous habitats and ecosystems

We consider there has been a good match between priority actions, funding allocations and substantial progress in key areas. All logging of indigenous forests on Crown land has effectively ceased and logging on private land is required to be sustainable. There has been a significant increase to the network of protected lands as a direct result of the extra funding to the three major funds (Nature Heritage Fund, Nga Whenua Rahui and Queen Elizabeth II National Trust). These funds, which collectively received 16.3% of the total Package allocation play complementary roles and meet different objectives. The Nature Heritage Fund sets priorities to protect, by purchase or covenant, key threatened habitats based on regional protection strategies which, in turn, rely heavily on Protected Natural Area Programme surveys.[5] We would like to stress that all three funds have the added spin-off of raising individual, iwi and community support for wider conservation initiatives (see also Chapters 10 and 11). Considerable encouragement and resources to private landowners to protect biodiversity has also come from some councils, TFBIS information (see Chapter 8) and the Condition and Advice Funds (see Chapter 11). But what is the overall picture with respect to habitat and ecosystem protection?

The successes of these voluntary and financial incentive mechanisms have been off-set by losses of indigenous ecosystems, some with very high biodiversity values. Most of our threatened biodiversity is now in the most modified and least protected environments. These are the lowland and coastal areas. The overall rate of loss was about 4,500 ha per year between 1998 and 2002; there is no baseline data for comparing country-wide gains and losses over the 5 years of the Strategy. There is good circumstantial evidence that this rate of loss has continued since 2002, due in large part to economic drivers for agricultural intensification and the high rate of conversion of agricultural land to lifestyle blocks. The most loss of habitat has occurred in regions where biodiversity has the least protection.

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[5] Further PNAP surveys are considered a priority for about one-third of New Zealand's ecological districts.

One objective of the Strategy was to increase the representativeness of protected natural areas. This has been achieved to some extent in the past 5 years, but important areas on private land have been lost. Opportunities to improve representativeness through the tenure review process are not being fully realized. In the South Island high country a greater range of environments has been protected, but the most vulnerable environments in the lower altitude ecosystems have not been protected. The net outcome has been the loss of important biodiversity resources.

In short, voluntary mechanisms alone are not enough. There is also a place for prescriptive rules along with a mix of economic incentives and purchase. Funding for purchase or other forms of protection should, as a priority, target the protection of the most threatened ecosystems and of areas that are large enough to be viable in the long term. One complication is that regions with the largest areas of unprotected indigenous ecosystems, where the rates of loss are highest, tend to be most constrained in their ability to use economic incentives.

Councils have lacked the guidance that was expected to come from a National Policy Statement on biodiversity to meet their RMA responsibilities, which was one of the Strategies priority actions. Without a Policy Statement many regional councils have subsequently developed their own biodiversity-related policies, although with highly variable results. When the National Policy Statement on biodiversity is operational national leadership will be particularly important to assist with capacity building and monitoring of key ecosystem indicators (see also Chapter 8).

3.2 Sympathetic management

'Sympathetic management' is the biodiversity component of sustainable land management, i.e. managing productive lands in a way that recognises or supports the needs of indigenous biodiversity. This was not a priority objective, but there has been substantial progress based on funding support from sources such as the Sustainable Management Fund (SMF) and the Sustainable Farming Fund (SFF). The NZ Landcare Trust, for example, with MfE funding has 187 Landcare groups encouraging sustainable land management that often include initiatives that assist indigenous biodiversity.

This part of the Strategy argues for land management practices that are sympathetic to indigenous biodiversity. We suggest that this part of the Strategy should have wider relevance by addressing land management practices that are sympathetic to *all* valued as well as indigenous species. The challenge for farming systems is to recognise their role in providing for and sustaining their portion of the ecosystem services that they receive from public lands. Cheap farm goods that are ultimately paid for by depleted soil biodiversity, degraded wetlands and polluted waterways are damaging their own long-term sustainability as well as indigenous biodiversity. This is a global problem facing highly intensive agricultural systems. Consequently we believe there are significant benefits from developing greater linkages between biodiversity concepts and objectives and sustainable land management activities. Both the SFF and SMF could play much greater roles in this regard than they do at present.

The other aspect of this objective was to encourage urban initiatives concerning indigenous biodiversity. There has been substantial progress, probably independent of the Strategy, which was largely driven by initiatives from city councils and communities. The MfE-sponsored New Zealand Urban Design protocol includes biodiversity and environmental elements. Strengthening the connections between urban dwellers (87% of our population) and nature could greatly increase support for regional and national restoration initiatives and strengthen sustainable city initiatives. Urban biodiversity sanctuaries (such as the Wellington Karori Sanctuary) assist directly with species protection and serve as major educational assets.

3.3 Managing animal pests and weeds

There has been substantial progress in controlling terrestrial weeds that we attribute to several factors, starting with the development by DOC of their strategic approach to managing weeds. This has clearly benefited from the Package funds which now support 60% of the weed control on 770,000 ha (10%) of the lands administered by the Department. Two years ago the "Weedbusters" programme was launched. We believe this is one of the most important developments in the past 5 years as it capitalizes on the synergies between DOC, regional and district councils and community voluntary efforts. It is well established throughout New Zealand and has contributed to a close alignment of weed control programmes between DOC, regional councils, the unitary authorities and other organisations. It will need ongoing support to reach its full potential, however, recognizing that new weeds are emerging at the rate of 2-3 per year from the pool of over 24,000 introduced species of higher plants already in New Zealand. Many of the Biodiversity Condition Fund projects were for weed control on private land where weeds spread with urbanization and peri-urban development.

Improved control techniques and Package funding made possible the impressive successes in eradicating rodents from priority islands including Campbell Island (11,000 ha). Ten other priority islands have remained rodent free. The result has been significant gains for indigenous species and ecosystems, including many threatened species. Improved operational efficiencies have held control costs for aerial poisoning operations, despite general inflationary pressures. Predator-proof fencing has been another significant advance for intensive pest management, but requires very high initial investments that make it more suited to public and private sector initiatives. Regional councils spent about $28M on weed and animal pest control in 2003/04, which are well aligned with DOC priorities. What has been difficult to assess is the *overall outcome* for indigenous biodiversity, given the patchy nature of monitoring programmes across agencies. There is also little data that specifically relates to the period covered by the first 5 years of the Strategy.

We need to comment on the gains in the context of the overall size of the task. There has been success in pest control and eradication for high value areas such as offshore islands, sanctuaries and mainland islands, but these represent about 2.7% (213,600 ha) of the lands administered by DOC. A further 32% of these lands received less intensive

management and about 55% of the lands administered by DOC where management would also be beneficial received only limited or no management.[6] We are not in a position to judge if the current efforts in pest and weed management will be sufficient to assure long-term protection of indigenous species and to minimise the risks of extinction of threatened species. Existing control techniques could be effectively applied over a larger proportion of conservation lands if funding permitted.

Significant gains in the future will require a suite of new tools and technologies that can take the ability to control pests to levels well above small incremental improvements. Contrary to the expectation of the Strategy there has been no significant or continuing increase of research effort to provide these tools (see Chapter 8).

3.4 Restoring species and habitats

The Strategy priorities of expanding habitat and ecosystem restoration and assisting priority threatened species are closely linked and also to pest control. Package funding has supported the development of many new recovery plans for threatened species which is the first stage in assessing management priorities and work plans. It has also led to gains, through intensive management, for the kiwi populations in the three North Island kiwi sanctuaries, although kiwi ranges are showing disturbing contractions overall. Improved security of at least one population for 113 acutely threatened species is one outcome of Package programmes. However, 77% of the acutely or chronically threatened species still lack targeted recovery work and are most likely in decline. The inability to deal with these 'priority' species appears to be due to a lack of resources.

In the absence of explicit targets that identify what proportion of New Zealand's habitats and ecosystems need to be protected to sustain representative examples of the full range of ecosystems, and without an adequate condition and trend-monitoring network in place, it is difficult to evaluate overall achievements across public and private lands. Without an explicit framework and monitoring information we cannot be confident that the efforts to date are on target to reverse the overall decline in New Zealand's terrestrial biodiversity or to meet more specific targets, if they were defined, within the overall vision of the Strategy.

3.5 Gains, future priorities and linkages

The gains from Biodiversity Package funding have been in: significantly extending the areas of indigenous biodiversity under various forms of protection; major gains for predator-free islands and for some populations of iconic bird species (but at considerable cost); improved control techniques; and major extensions of weed control programmes. Despite the gains, there have also been significant losses. It is difficult to 'score progress' towards achieving the desired outcomes without quantifiable targets and given the patchy monitoring and reporting systems. What information we do have indicates that

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[6] The remaining 10% of land administered by the Department is not at risk from pests (e.g. high alpine rock and snow areas).

controlling animal pests to achieve specific outcomes for threatened species and habitats remains perhaps the most difficult problem facing the management of conservation and private lands.

Priorities for future protection should continue to be to identify and protect representative habitats and ecosystems that are poorly represented in the present network of protected areas. This approach will require a focus on coastal, lowland and montane habitats. Most of the threatened plant species are also at lower elevations and will therefore benefit from this approach to habitat protection. An adequate range of incentive and protection mechanisms already exist and are being widely used by councils. The challenge is to strengthen the focus on protecting the most threatened habitat types and provide for statutory protection when other mechanisms are ineffective. We understand the draft National Policy Statement on biodiversity focuses on this problem of protecting scarce and threatened habitats.

The ability to monitor vegetation at a number of scales has increased considerably in recent years and now provides new monitoring tools that were unavailable just a few years ago. Financial support for regular monitoring, such as through the Land Cover Data Base (LCDB) is presently uncertain, but in our view continuation of this specific tool would provide crucial information for managers at central and local government levels.

An important linkage for future work is to consider the impacts of climate change on terrestrial biodiversity. We discuss this more fully in Chapter 12. There are likely to be implications for the protected areas system, the increasing value of 'corridors' for plants and animals, and for changes in the impacts of pests and weeds.

3.6 Recommendations

- *That references in the Strategy to 'sympathetic management' be widened to address the need for biodiversity conservation principles to be applied to all aspects of sustainable land management.*

- *That a set of key environmental indicators for terrestrial environments, appropriate for monitoring and reporting requirements at regional and national levels, be agreed to between central and local government agencies and implemented.*

- *That funding for Queen Elizabeth II National Trust and Nature Heritage Fund is continued based on an assessment of present and future needs and subject to periodic evaluations of performance.*

4. OUTCOMES FOR FRESHWATER BIODIVERSITY

Specific allocations to this theme were not easily identified within the Biodiversity Package programmes. Money from the Package was primarily for work on wetlands protection and management of pest species. The overall allocation appears to have been in the order of $11M. Priority actions focused on developing classification systems and protection priorities.

4.1 Protection and sustainable management

Significant progress has been made on the priority action of developing classification systems for freshwater ecosystems. Collectively, these provide the important building blocks from which priority representative freshwater habitats can be identified as the first step towards protecting 'a full range of remaining natural freshwater ecosystems and habitats'. A wide range of protection mechanisms already exist to advance protection outcomes and have led to some notable gains, such as riparian management. There is, however, no national overview on their application and effectiveness.

Overall, there has been a serious decline in the quality of many freshwater systems which is having negative impacts on biodiversity values and ecosystem services. Establishment of environmental indicators and monitoring regimes for freshwater systems are needed to measure performance of management agencies and improve accountabilities. The long-finned eel, a taonga for Maori, is now classified as threatened and warrants a more conservative approach to its management. Other acutely and chronically threatened freshwater species show a continuing decline in their status.

4.2 Managing pests and weeds

There have been gains with the eradication of pest fish in some regions, particularly in the Nelson/Marlborough regions which may stop their spread into the South Island. The first national survey of pest fish distribution has been completed which suggests that most pest fish are probably distributed more widely than they were 5 years ago. New control techniques are needed. Despite control initiatives, freshwater weeds have spread in several regions, often linked with declines in water quality and exacerbated by poor public understanding of the importance of preventative action.

4.3 Restoring freshwater habitats and species

This is an important Strategy objective, given the benefits that flow to species, water quality and ecosystem services from normally functioning freshwater systems. Some regional councils have good initiatives in place while elsewhere economic drivers, especially agricultural intensification, have resulted in significant deterioration to freshwater systems. Current initiatives to rehabilitate Lake Taupo and the Rotorua lakes underscore the point that maintaining ecosystems is far less expensive than costs of

repair. There are now recovery plans for the most threatened freshwater fish species. Blue duck and brown teal are actively managed, but are very threatened by predators.

4.4 Gains, future priorities and linkages

There has been significant progress with developing classification systems for most freshwater ecosystem types. The next step is to develop a national consensus on specific classification systems which can be used for management and to identify representative sites for protection. The formal review of the wetlands policy is now an urgent priority given the ongoing deterioration and loss of wetlands on private land, although there have been gains for some important wetlands through protection mechanisms. An updated wetlands policy would provide a framework and guidance for the increasing opportunities to protect wetlands through the various protection, advice and condition funds. A number of these shortcomings reflect unclear agency accountabilities.

Important gains were made in eradicating some pest fish populations, although the overall problem is growing. The management of freshwater pests and weeds will require greater resourcing, clearer accountabilities and more public engagement than it has received so far. At the same time there are indigenous freshwater species, including eels, that are threatened and will need active management. There are other agency accountabilities regarding freshwater, including leadership responsibilities, which need to be clarified.

Surveys have shown that the public now rate freshwater issues as the most important environmental problems facing New Zealand. There is a strong biodiversity component to these concerns that can be incorporated into other government initiatives that are presently considering questions of water quality and allocation, such as the 'Water Programme of Action'. Linkages should also be made from this theme to any future work on the impacts of climate change on indigenous biodiversity. As with other themes there is a need to finalise sets of environmental indicators that are useful for monitoring and regional management requirements and can also be aggregated for national reporting and state of environment monitoring.

4.5 Recommendations

- *That the protection, restoration and sustainable management of freshwater ecosystems and indigenous species be accorded higher priority in the next phase of the implementation of the Biodiversity Strategy.*

- *That a set of key environmental indicators for freshwater environments, appropriate for monitoring and reporting requirements at regional and national levels, be agreed to between central and local government agencies and implemented.*

- *That the "Water Programme of Action" incorporates more explicit initiatives to sustain and enhance indigenous biodiversity and ecosystem services.*

5. OUTCOMES FOR MARINE BIODIVERSITY

The third of the core 'sustaining environmental systems' themes (Theme Three) had a particular focus on extra funding to address knowledge gaps and marine biosecurity initiatives. It also had a strong focus on advancing marine reserve initiatives. These projects received almost $28M, or 15% of the Package allocation.

5.1 Improving governance and management

The Strategy clearly articulates as a priority action the improvements that are needed for more effective and accountable management of marine biodiversity. The Oceans Policy initiative was established in July 2000 to address a wide range of marine management issues but this work slowed and then was formally delayed while Government considered foreshore and seabed issues during 2004. We welcome the recent resumption of work on the Oceans Policy to address *inter alia:* clarification of management roles and accountabilities of each agency; requirements for cooperation and coordination between agencies; the management of land use activities that can adversely affect marine habitats; identifying the importance of information and research in setting priorities for ocean management; and consideration of the cumulative adverse effects on the coastal and marine environments.

While these substantive issues still require resolution we note the strengthening of marine expertise within DOC and greater alignment of work programmes between DOC and MFish, such as on the Conservation Services Programme.

5.2 Understanding and monitoring coastal and marine ecosystems

An important achievement was the development of various marine classification systems for use at different scales. The MEC (Marine Environment Classification) (launched in July 2005) will shortly be followed by a complementary near-shore classification and inventory system. These building blocks[7] provide a platform for identifying priority areas for future marine surveys and a scientific basis for identifying representative marine ecosystems for possible protection.

Our knowledge of New Zealand's complex and extensive marine systems lags well behind that of terrestrial systems which led to the targeting of the knowledge and information programmes within the marine theme. However, the magnitude of the task of acquiring sufficient fundamental ecological knowledge to sustainably utilize the ocean's resources will require funding well in excess of that currently available from the Biodiversity Package funding.[8] The current knowledge gaps concerning marine processes are an impediment to developing sustainable resource management.

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[7] These classification systems still require further testing and piloting against management objectives.
[8] Marine research funding averaged $63M/year between 2001/02-02/03. "Marine research in New Zealand: a survey and analysis" 2003. R. Chapman & C. Lough. Project for MoRST, Wellington.

Although regional councils now have additional responsibilities for coastal management and marine biosecurity, they often lack the funding and expertise to fulfill these obligations. With blurred responsibilities for monitoring coastal plans and the coastal environment, as well as funding difficulties, there has been very little monitoring of environmental outcomes in the coastal environment. Whether the New Zealand Coastal Policy Statement (NZCPS) is an effective policy instrument in this regard therefore remains unclear.

The coastal elements of the Strategy need more coherence within Theme Three and would benefit by specifying more specific and measurable objectives for the coastal environment. The paucity of information has not allowed us to assess trends in the state of biodiversity in New Zealand's coastal environments. Several councils have taken useful initiatives, but these have not, to our knowledge, been necessarily targeting priority sites. Anecdotal evidence on the drivers for coastal development suggests that pressures on fragile and rare coastal habitats have increased in the past 5 years.

5.3 Sustainable use of marine resources

One of the ongoing challenges for managing fisheries is to balance the pressures for exploitation against conservation interests and the need for precaution, when knowledge is poor, to ensure long-term sustainability of stocks and the resilience of ecosystem functions. During the past 5 years, there have been improvements in the implementation of the Fisheries Act and quota reductions in response to evidence that a number of quotas were unsustainable.

A potentially important step towards meeting the relevant Strategy objective has been the development and recent release (in August 2005) of the "Strategy for Managing the Environmental Effects of Fishing" (SMEEF). This represents a clear move towards the elucidation of a more ecosystem-based approach to fisheries management. Much of its future value for biodiversity conservation will depend on the quality and effectiveness of the 'environmental standards' that are required as part of the SMEEF and the monitoring regime that is implemented. There will need to be an increase in the expenditure on environmental research that is targeted at specific questions relating to the effects of fishing on the environment. A watching brief would be appropriate to see how the SMEEF is implemented and its impact on fishing practices.

5.4 Marine biosecurity

Package funding helped substantially to redress our poor knowledge of what introduced and potentially invasive marine species are already present in New Zealand's ports and harbours. Over 170 'new' species were identified; an unknown number may become invasive. A shortage of marine taxonomists is delaying completion of this work. Ongoing surveys of priority ports will be essential, and is already underway, as will a stronger emphasis on prevention if biosecurity risks in the marine environment are to be reduced.

Other work supported by the Package on ballast water initiatives and hull fouling should continue to be priorities since these are the major pathways for marine invasive species. A number of activities relating to hull cleaning were completed, but we consider that progress remains limited until further initiatives ranging from clarifying statutory responsibilities to providing adequate facilities for cleaning vessels are addressed. We have commented under section 5.2 on the difficulties that regional councils currently face in meeting their statutory obligations for marine biosecurity.

5.5 Protecting species habitats and species

Overall, there have been significant additions to the marine protected areas system, via new marine reserves, which was a funded priority within the Strategy.[9] Several other proposals for marine reserves are currently awaiting final Ministerial decisions. The eight new marine reserves in Fiordland were the culmination of a quite different process of dialogue and may well represent a more preferred approach by communities seeking to reconcile competing demands between protection and recreational or commercial use.

Considerable effort has gone into developing a new approach to marine protection via "Marine Protected Areas", using a wider range of protection tools. Together with the new marine classification systems this will allow for a more defensible basis for identifying and proposing representative areas for protection. In 2001, Government took the important step of closing 19 seamounts and part of Spirits Bay to trawling in recognition of the damaging impacts of bottom trawling. These represent less than 4% of the seamounts in New Zealand's EEZ and more may well qualify for similar protection given the higher levels of endemism that typically occur on seamounts.

A number of Strategy building blocks for protecting threatened species are now in place, but will require additional funding to progress to implementation. These include revision of the threatened species priority system, ratification of the Convention on Migratory Species and related agreements, a national plan to reduce seabird bycatch and DOC's marine mammal action plans (2005-2010). There have been gains and losses for various species of seabirds and marine mammals and a sustained effort will be needed to further reduce bird and marine mammal losses resulting from poor fishing practices and pollution. New Zealand's "Southern Seabirds Solutions" has been successful in reducing bird bycatch in some fisheries. Cuts in FRST funding for research into seabirds and marine mammals will undermine conservation and management initiatives.

5.6 Gains, future priorities and linkages

Several important building blocks for the next stage of implementing the Strategy are now well advanced: marine classification systems, new marine reserves and the Marine Protected Area policy, first surveys of harbours and ports for introduced species, development of SMEEF and strategies for protecting key threatened marine species.

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[9] This was one of the few objectives with a specific, time-related target: protect 10% of New Zealand's marine environment by 2010.

Government has recently resumed work on the major objective of resolving a number of marine governance and management issues via the Oceans Policy. We have noted the delays that marked efforts to review the Marine Reserves Act 1971 and would hope that the Marine Reserves Bill (which will streamline the process) will become a higher priority for the new Parliament.

In other areas we suggest that future priorities are primarily a continuation of initiatives that are already underway. These include: funding increases for marine research, which will require better alignment of strategic research between funding agencies, including FRST (see also Chapter 8); initiatives for marine biosecurity, including ongoing support for international efforts to improve ballast water management and compliance; hull cleaning initiatives; additional funding for implementing action plans for key threatened species; and a strong focus on continuing efforts to reduce the adverse environmental effects of fishing.

The coastal objectives in the Strategy would benefit from a reassessment, including a clarification of actions that connect coastal and inshore marine processes. One example is the impact that pollutants and run-off from freshwater systems can have on estuaries, inshore habitats and species. Marine research would form a component of the work we recommend should be done on climate change impacts on biodiversity (see Chapter 12).
As we have already commented in the two preceding chapters, measuring accountability, performance, and biodiversity outcomes has been exceedingly difficult in the absence of key environmental indicators and monitoring regimes.

5.7 Recommendation

- *That a set of key environmental indicators for the marine environment, appropriate for monitoring and reporting requirements at regional and national levels, be agreed to between central and local government agencies and implemented.*

6. OUTCOMES FOR GENETIC RESOURCES

We positioned this theme at the centre of the circle (Figure 1) as it relates to elements in all three natural systems (land, freshwater, marine) while having a particular focus on introduced species. This goal provides one useful opportunity to make more explicit the relevance of an 'ecosystem management' approach to managing both agricultural and indigenous biodiversity. The genetic wellbeing of biodiversity is a basic requirement for the survival of species and the proper functioning of ecosystems.

6.1 Conserving genetic resources

While this was the fourth goal of the Strategy it was a low priority with no extra allocation of resources. This apparent mismatch may reflect a reasonable presumption at

the time that markets and producers will look after the genetic diversity needs of our economically important introduced species. The particular role for government lies in the policy arena. The identified priorities were to develop a collaborative strategy to manage New Zealand's genetic resources (both indigenous and introduced) and identify significant areas of risk relating to their management. We propose that a lead agency now needs to be identified to advance both priorities, firstly by undertaking a critical evaluation of the current merits and contents of such a strategy and its relationship to bioprospecting policies and biotechnology developments. We suggest MAF is the appropriate lead agency, given its links to primary production sectors and biosecurity responsibilities, with support from DOC and MoRST. One task that should be part of the strategy is to identify a coherent management regime for New Zealand's collections of genetic resources, both exotic and indigenous material, that now number in the thousands.

A related priority is the completion of an integrated policy and legislative framework for managing bioprospecting in New Zealand. This has made slow progress in recent years and has been affected by complex issues surrounding unresolved Treaty claims. The current approach to bioprospecting is essentially ad hoc.

Identifying risks to the genetic resources of threatened indigenous species is part of DOC's process of producing species recovery plans. The larger challenge lies in having the resources to implement these plans.

6.2 Accessing genetic resources

This relates both to importing new genetic material and related international agreements for accessing genetic resources, including for food and agriculture. There have been widespread criticisms of the ERMA processes and MAF regulations which are now being explored as part of a MAF initiative. We discuss related issues in Chapter 7 on biosecurity. Access to overseas genetic resources, while maintaining high biosecurity standards, remains a critical issue for introduced genetic diversity in particular.

6.3 Maori interests

Maori have concerns including: the implications of bioprospecting policies; intellectual property rights; the protection of collections; and the retention of matauranga Maori. These are related to, and complicated by, progress of Treaty claims, especially Wai 262, the claim regarding indigenous flora and fauna. Progress in Treaty areas is most likely to determine how rapidly Maori interests in their use of genetic resources are able to be addressed in these aspects of the Strategy.

6.4 Future priorities and linkages

We have ranked as high priority a critical evaluation of the need for a collaborative strategy to manage New Zealand's genetic resources. This would include a more coherent response to the management of New Zealand's many collections of genetic resources, given the difference between private and Crown interests. Our rationale is that, in the

absence of an overarching strategy, important aspects of indigenous and introduced genetic diversity may be compromised by competing sectoral interests, including primary production and biotechnology sectors. Issues surrounding unresolved Treaty claims are likely to delay the completion of an integrated policy and legislative framework for managing bioprospecting in New Zealand, although this should remain an important priority to progress as circumstances permit.

There are potential linkages between this theme and future impacts of, and adaptation to, climate change. For example, overseas strains of pasture grasses better adapted to drought conditions may be one of the adaptation responses for eastern regions that are likely to experience more frequent and severe droughts. We have also commented on the potential to make more explicit an ecosystem management framework that links agricultural biodiversity with indigenous biodiversity. This could help reduce the somewhat artificial divide between our relationships to conservation philosophy and a responsible land ethic.

6.5 Recommendation

- *That the Ministry of Agriculture and Forestry initiate an evaluation of the need for a collaborative strategy to manage New Zealand's genetic resources, including an identification of significant areas of risk in the management of these resources and options for managing these risks.*

PART C. PROGRESS IN 'ENABLING' THEMES

7. OUTCOMES FOR BIOSECURITY MANAGEMENT

Managing biosecurity risks and coordinating biosecurity management are the particular focus of Theme Five, while specific aspects of biosecurity, namely managing established animal and plant pests, are covered in our review comments under Themes One, Two and Three (Chapters 3-5). We will comment here on some overarching aspects of biosecurity and future priorities.

7.1 Coordinating biosecurity management

There has been substantial progress in the last 5 years towards the objective of improving the coordination of biosecurity management. The Biosecurity Strategy for New Zealand was completed in 2003, followed in 2004 by a re-organisation of the biosecurity agencies. This led to the creation of 'Biosecurity New Zealand' (BNZ) within MAF in November 2004. MAF is now responsible for delivering more coordinated development of biosecurity policy, clearer accountabilities, better integration of central and regional government roles and a more standardized approach to risk assessment. There is stakeholder support for the initiatives that have already been taken by BNZ, including a greater emphasis on developing more effective partnerships.

7.2 Risk assessment and risk management

An integrated risk management framework for the importation of new organisms has been developed. There is a better awareness within MAF of risks to indigenous biodiversity. Border control work has been strengthened and has improved accordingly. Some important new surveillance programmes are now in place, such as the National Invasive Ant Surveillance programme. Surveillance initiatives need to continue to respond to increasing risks to indigenous biodiversity.

The Package allocation in this area was very modest, relative to annual MAF expenditure for pre-border and border activities. More input is needed to review old Import Health Standards, including the additional consideration of risks to indigenous biosecurity, and to continue the risk assessment work on priority exotic species. The biosecurity research strategy is overdue for completion. Another action in the Biodiversity Strategy awaiting completion is the finalization and implementation of a set of pest indicators and monitoring techniques that will be useful in assessing the performance and accountabilities of biosecurity agencies.

7.3 Managing risks from new organisms and potential pest species

In retrospect, the fortuitous discovery and subsequent eradication of a nest of the Red Imported Fire Ant (*Solenopsis invicta*) from Auckland Airport in 2001 was potentially

the 'lucky break' of the century for biosecurity agencies (and for biodiversity). At the time, it highlighted the need to for more research into pathways and wider border surveillance systems to address risks to indigenous biodiversity, a requirement that has been recognised by Biosecurity New Zealand.

Responsibilities for managing and monitoring new organisms, including genetically modified organisms, are now clear. We are concerned, however, that the rigorous and costly systems set in place by ERMA for the importation of new organisms may be acting as a perverse incentive that has encouraged people to bring in new species, particularly plants, by illegal means. We welcome the current efforts to address these concerns.

Useful initiatives with respect to developing voluntary codes of compliance with industry associations should help to reduce escapes from captivity of potential pest species and reduce the inadvertent spread of pest species. Public awareness of biosecurity risks has risen, although aerial spray operations require more effective relationships to be built with communities or adverse reactions may undermine future political support.

7.4 Gains, future priorities and linkages

Although there have been considerable achievements in several aspects of the biosecurity system over the past 5 years we have ranked particular initiatives within all of the objectives as 'high priority' for the future. In some cases this reflects the need to complete earlier initiatives that are now a higher priority (e.g. complete the biosecurity research strategy). It also reflects the importance to our primary industries and biodiversity of continuing to improve biosecurity systems. We note the links to Theme Four with respect to the importance of continual access by primary producers to overseas genetic resources and the aspects of ERMA and MAF requirements that are critical to this objective.

Future needs for the biosecurity system relate to response capacity to potential new problems and dealing with existing pests and weeds. While a greater effort on improving pre-border systems is likely to reduce some risks, the reality is that incursions will probably become more frequent, given the drivers of growing volumes of trade, more trading partners and increasing tourist numbers. New detection technologies and ongoing improvements in surveillance coordination will become increasingly important. Improved surveillance is particularly relevant and cost-effective for responding to the appearance and spread of weeds that will establish from the *existing* pool of introduced plants. Hence the relevance of the 'Weedbusters' approach we discussed in Chapter 3.

We also note the linkages to climate change impacts. Scientific reviews suggest that rising temperatures will improve conditions for some existing pests by, for example, increasing the likelihood that some exotic plants will escape the current climatic constraints that limit their spread and impact. Improved surveillance technologies, assessing climate change impacts and improved understandings of potential pest impacts will all require additional research expenditure (see Chapter 8).

One future priority of growing importance is what is currently referred to as 'internal border issues'. This refers to the cost-effective opportunities to limit the deliberate and accidental spread of pest species within New Zealand and is relevant to terrestrial, freshwater and marine risks. For example, little advantage is currently taken of the unique opportunities to prevent or limit the spread of pest animals and plants across Cook Strait. This could be highly cost-effective by slowing or eliminating the spread of pests such as varroa bee mite, clover weevil, freshwater weeds and pest fish between the North and South Islands.

7.5 Recommendations

- *That surveillance and the reduction of internal spread of key invasive species are given greater priority to maximize the benefits of early detection and eradication.*

- *That the biosecurity research strategy is completed as soon as possible and is linked to objectives for biodiversity and climate change research.*

8. OUTCOMES FOR INFORMATION, KNOWLEDGE AND CAPACITY

Much is expected from the second 'enabling' theme judging by the Strategy's desired outcomes in Theme Nine for 2020. There were five priority actions and the only Package funding ($9.8M) related to information sharing (TFBIS). Other themes are also expected to contribute to the desired outcomes, while funding research was seen as a responsibility primarily for the Foundation for Research, Science and Technology (FRST).

8.1 Research on biodiversity

The first priority action in this objective, developing and implementing a coordinated research strategy, has made good progress both within FRST and DOC. But this building block now requires a much greater investment in research funding if the knowledge that is critical to the success of the Strategy is to be obtained. Although DOC and MFish fund environmental research the largest allocations come from FRST and these amounts have been declining in real terms since 1998. Addressing knowledge gaps in basic and strategic sciences, especially in marine and freshwater areas, is insufficiently funded, while solution-oriented, applied research remains seriously under-funded.

The current FRST funding system, aside from the limited funding stream, has three negative outcomes. First, the transaction and reporting costs are high and secondly, it has generated a level of competition between major providers that is counter-productive for a relatively small research community trying to understand complex, multi-disciplinary, multi-scale, environmental problems. Thirdly, there is a lack of coordination between research funders which has led to a mismatch between priorities and allocations.

Many basic and applied research topics were suggested to us, but getting results will probably require additional government funding outside Biodiversity Package sources. Since major research programmes have a long lag time useful outcomes for biodiversity managers are not likely until the second decade of the Strategy.

8.2 Classifying and mapping biodiversity

As we reported in Chapters 3, 4 and 5 there has been substantial progress in developing broad classification and mapping tools using the significant increases in computing power combined with satellite imagery. The next stage of obtaining agreement, adoption and application of the best mix of methodologies throughout the country should now become a management-led, not science-driven, priority. A greater commitment of time and resources to building buy-in at local government levels will pay dividends for the other related objectives of monitoring, reporting and the development of adaptive management responses. This will need to be accompanied by greater support for councils and management agencies, many of which have limited capacity for using sophisticated information technology systems.

We would also stress the importance of following the current classification phase with initiatives to continue working at smaller scales, such as the Protected Natural Areas Programme (PNAP), and add the information on species and other features that are required for adequately evaluating protection options and management decisions.

8.3 Information sharing and capacity building

Substantial progress was made through the allocation of Package money to the Terrestrial and Freshwater Biodiversity Information System (TFBIS) programme. As a result a significant amount of existing data and information has been made available to agencies, groups and individuals with roles or interests in maintaining and restoring indigenous ecosystems. It can be difficult to measure the contribution such information systems make to biodiversity outcomes. We suggest that the programme would benefit from including more of the end-user groups in the consultation stages.

There were a number of initiatives undertaken in capacity building for the many local government and community organisations with responsibilities and interests in biodiversity management. Some of these were positive initiatives, for example, via TFBIS and the Sustainable Management Fund,[10] but the overall impression was of unintegrated, one-off projects. The longer-term objective of embedding best practice, cost-effective techniques and other capacity building objectives will require more sustained, coordinated initiatives that are based on a strategic plan that should be developed across agencies. There is a need to clarify leadership and responsibilities to implement what remain as highly relevant objectives and actions. Achieving biodiversity

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[10] Positive examples from the Sustainable Management Fund were the Action Biocommunity Programme and the Forest Monitoring and Assessment Kit.

goals will require a broader capacity to act effectively across the country than is the case at present.

8.4 Tracking and reporting change

Despite the clear messages in "The State of New Zealand's Environment" (1997) and the accurate situation analysis of the Strategy, progress has been slower than we expected in meeting two key and related objectives. First, the need to develop and apply consistent measures and methods to monitor key changes in indigenous biodiversity throughout the country. Secondly, to feed the monitoring results on conditions and trends into reports that are useful and relevant at local, regional and national scales for a variety of purposes. These include meeting statutory obligations (under the RMA and Local Government Act 2002), improving management practices, assessing performance outcomes and accountabilities, testing and modifying policies.

We accept that there are real difficulties in meeting these objectives, that embedding useful sets of environmental indicators and monitoring systems is more difficult than measuring economic performance and social wellbeing. Nonetheless, they should be pursued and used for similar purposes, given the fundamental importance of the state of our biodiversity in supporting primary production sectors and sustaining the 'clean green' attractions of New Zealand's environment for tourism.

The earlier MfE work on the Environmental Performance Indicators programme led to sets of proposed indicators that have provided useful guidance for regional councils for their own monitoring programmes, where these exist. However, despite the additional statutory reporting obligations now facing local authorities there remains wide variation in approaches to monitoring biodiversity and little sign of the leadership that is required to improve the situation. What is needed is a national focus that integrates and aggregates monitoring and reporting obligations to meet agreed sets of objectives, at local, regional and national scales.

DOC is continuing the development of a comprehensive and management-focused national inventory and monitoring framework for assessing biodiversity as well as development of its Natural Heritage Management System (NHMS). The latter will provide an integrated set of classification, decision support and inventory and monitoring tools that collectively move DOC to an outcome-based management approach. When it is operational NHMS should meet the reporting requirements of the Strategy and is also consistent with the mapping and tracking objectives of the Strategy. We mention these two specific and ambitious initiatives since if it was possible to engage regional and district councils in their development there could be significant cost-effective gains well beyond any benefits that might accrue to DOC alone.

8.5 Valuing biodiversity

There has been limited progress in valuing biodiversity, including attaching an economic value of ecosystems services, although there is a growing amount of international

literature on the subject that could be drawn on. The use of financial incentives and voluntary mechanisms has increased, assisted significantly through Package funding, but economic drivers are still leading to irreversible losses of high-value indigenous ecosystems in many parts of the country.

8.6 Gains, future priorities and linkages

The Package funding has provided many useful information outputs via TFBIS while new mapping and ecosystem classification tools provide significant building blocks for the next implementation stages of the Strategy for this enabling theme.

The earlier suspension of work on finalizing a set of biodiversity indicators could now be seen as an advantage. A resumption of that work could be linked to progressing monitoring and reporting standards and requirements, related to new statutory reporting requirements of local authorities, as well as to initiatives to embed in related capacity building programmes. These initiatives could draw on the considerable amount of conceptual thinking that has been done in the past 5 years by different agencies. They would also be consistent with Government's encouragement for partnership collaborations between central and local government. Any progress will require leadership and considerable inter-agency cooperation starting with the development of a broad agenda and workplan.

A caveat. While we see these as important future priorities we recognise the cost implications, not only of development, but also the ongoing costs of implementing and sustaining effective monitoring and reporting systems. One reason managers often resist monitoring programmes is the argument that they reduce funds needed for operations. If monitoring requirements are to be increased, and we argue there are valid reasons for doing so, then the additional costs incurred will result in reduced services, unless core funding for the agencies concerned is increased.

The most important priority is to rectify the inadequate and uncoordinated funding for biodiversity research, including research related to biosecurity and climate change topics (see Chapter 12). We have concluded that achieving many of the outcomes of the Strategy will not be possible without a significant expansion of research on topics that are already signaled in the Strategy. Significant breakthroughs in new techniques for pest management, for example, are most unlikely under current funding allocations.

8.7 Recommendations

- *That Government funding for research underpinning biodiversity objectives, and related biosecurity objectives, is substantially increased.*

- *That a multi-agency working group, including local government interests, is established to identify environmental indicators for use at local, regional and national levels and to develop coordinated and integrated monitoring and reporting systems of indigenous biodiversity.*

- *That capacity building is recognised as a priority objective and a more structured, long-term approach is developed and funded across central and local government agencies.*

9. GOVERNANCE OF THE STRATEGY

An effective governance structure has a number of overarching functions including to: oversee and assist with the implementation of the Strategy; monitor progress; define the roles, responsibilities and accountabilities of the relevant agencies. Given the spread of biodiversity functions between key players at central and local government levels, another key function of governance is leadership that facilitates effective coordination and collaboration.

9.1 Implementation arrangements

The Central Government Coordinating Group of Biodiversity Chief Executives (CGCG) has functioned effectively with respect to producing the annual reports that account for activities against expenditure for the Biodiversity Package programmes. The CGCG forum has also been useful for chief executives to liaise over changes to programmes and reallocations of Package resources. However, the expectation that the commitments in the Strategy would be incorporated into government and departmental planning has yet to be realized. Very few references to the Strategy have appeared in departmental business plans and Statements of Intent even of the agencies in the CGCG, with the exception of DOC. The related oversight role that was signaled in the Strategy for the DPMC and SSC was not implemented. Guidance for regional councils through a National Policy Statement on biodiversity has not yet been provided and the value of providing early guidance to councils has now diminished. There has been increased central/local government engagement on matters such as biosecurity and positive local government involvement in relation to the Condition and Advice Funds.

We would have expected more evidence of leadership through the governance mechanisms with a stronger emphasis on whole-of-government coordination on the cross-cutting issues such as indicator and monitoring programmes. We hope that the next phase of the Strategy will address these issues as better leadership will be needed to deliver the partnerships with local government, the private sector and non-governmental organisations. Their full engagement is required if the Strategy is to achieve its intended objectives by 2020.

9.2 Reporting on outcomes

Specific reporting against the Strategy has been largely confined to the annual reports on the Package programmes, although DOC's annual departmental reporting has been increasingly aligned with the Strategy outcomes. While those reports have been comprehensive, particularly the Third Annual Report, there are two reasons why we have found it difficult to provide an 'overview' report. First, very few actions had quantifiable targets against timelines. We accept that setting targets can be a difficult and somewhat

arbitrary exercise. Nonetheless, targets can be adjusted later and setting realistic targets, through a transparent process, can be a reality check and help temper high expectations that society may have.

The second difficulty is that monitoring and reporting systems have been patchy and uncoordinated within a number of themes. There does not appear to have been an effort to compile baseline information, even at a coarse scale, at the beginning of the Strategy against which to assess later changes and trends. The monitoring information that is gathered by regional councils and central government agencies is generally collected for different statutory purposes and is difficult to aggregate to get a collective sense of the state of the New Zealand environment. The Strategy presumed that cost-effective methods, including indicators, would be used for monitoring and reporting purposes.

We also accept that developing and implementing cost-effective and useful indicators for monitoring biodiversity is proving to be a difficult task in other countries as well. We would respond that the task is now urgent as the growing rates of resource use are putting natural systems under increasing stress. Monitoring the state and trends of this 'natural capital' is as important as monitoring economic and social wellbeing. Fortunately, a great deal has already been accomplished through the Environmental Performance Indicators Programme. This could provide a useful platform for moving forward as a collaborative exercise between central and local government.

9.3 Future priorities

We propose that the following changes to the governance arrangements would improve delivery of the Strategy and increase the chances of achieving its goals.

1. Set targets. Where appropriate, quantifiable targets should be set within each theme through a transparent and consultative process. This should be built into a wider process aimed at increasing the sense of 'buy-in' and wider ownership of the Strategy across the different sectors of society and government. Targets need to be time-linked, for example 10-, 15- and 20-year targets, although the setting of timeframes will need to be considered in the context of reviews and that different objectives may require different timeframes to achieve useful outcomes. Assessing progress against targets will also require work on reporting systems (see item 3 below).

2. Improve accountabilities. These need to be extended beyond the current focus which has been largely on Biodiversity Package programmes. Improved accountabilities would need to address the whole-of-government expectations of the Strategy, coordination issues and performance against targets. We propose that the Statement of Intent (SOI) documents would be the most appropriate vehicle for identifying the outputs and outcomes that individual agencies would contribute to the Strategy. This would also help clarify management priorities in a whole-of-government context and the alignment with different legislative mandates.

There are also review and audit functions relating to accountability to consider. Apart from this current, mandated review there is no provision for additional comprehensive

reviews against the Strategy's outcomes. We believe reviews provide opportune times to re-invigorate the process and reassess priorities. If a process of external review is chosen, which we would strongly support, then we suggest consideration is given to assigning this role to either the Office of the Controller and Auditor-General, or the Parliamentary Commissioner for the Environment. We noted that the Local Government Act 2002 created a new audit reporting responsibility for the Auditor-General in relation to the Long Term Council Community Plans (LTCCP) which are reported on every 3 years and have an environmental wellbeing component.

We also think the merits of assigning an 'overall lead agency' responsibility for coordinating the implementation of the Strategy should be seriously considered. While the use of SOIs would improve accountabilities and could detail cooperative arrangements between agencies, improving coordination between agencies and levels of government would be an ongoing task that may benefit from designating a lead agency. It could operate in a similar fashion to the current biosecurity system – over-all accountability is held by MAF, while other agencies have responsibility for specific outputs and outcomes.

3. Improve reporting systems. These are an important part of improving accountabilities and assessing progress towards goals. They require monitoring systems which must be pragmatic and focused on outcomes. Effective monitoring and reporting systems also contribute to adaptive management responses and policy reviews. While councils now have new reporting requirements under the Local Government Act 2002 (see above) local authorities are also required to monitor and report on the state of the environment of their regions (under 2004 amendments to the RMA, section 35) at least every 5 years.

This would seem an opportune time therefore, to consider how the local government requirements for environmental monitoring and reporting could be linked to monitoring of biodiversity for nation-wide priorities and international reporting obligations. We still regard as an important action the requirement to "Monitor and report on the state of New Zealand's biodiversity as part of the national state of the environment monitoring programme." (NZBS, page 91) A collaborative exercise on indicator and monitoring reciprocities and capacity building requirements would be a useful avenue for increasing collaboration between central and local government to meet the Strategy's objectives.

9.4 Recommendation

- *That improvements to the governance systems are made to provide leadership, strengthen accountabilities, set measurable targets for objectives, develop better monitoring and reporting systems, and collaborative partnerships with local government, the private sector and non-governmental organisations.*

PART D.   PROGRESS IN 'ENGAGEMENT' THEMES

10. OUTCOMES FOR MAORI AND BIODIVERSITY

This theme addresses Goal Two of the Strategy ("Treaty of Waitangi"), through an emphasis on protecting Maori interests in biodiversity as well as building and strengthening partnerships with iwi and hapu to conserve and sustainably use indigenous biodiversity. A Maori dimension was also built into several other themes. About $2.4M of Package money went to this theme and a further $5.5M to Nga Whenua Rahui (NWR).

10.1 Developing management partnerships

The highlight has been the ongoing success of Nga Whenua Rahui in covenanting Maori-owned lands with over 210,000 ha of Maori-owned land now under formal protection. The Package allocation has also funded pest control for 36,000 ha of NWR-covenanted forests. There have been two promising aspects of these gains. First, a significant rise in interest amongst iwi to covenant their forested lands and their subsequent interest in progressing to pest control and even reintroductions of threatened species. Secondly, the protected land status has led some regional councils to contribute matching funding to further assist with biodiversity protection and enhancement programmes. This trend may well enable NWR to reduce its support for repeat pest control operations.

It was less clear, partly because of deficiencies in the information, what advances there have been in the number and effectiveness of arrangements for iwi and hapu to mange specific habitats or particular species. The statistics relating to engagement and participation by Maori with government agencies and local authorities have shown little change in the past 5 years. The quality of those partnerships and their influence on biodiversity outcomes was unclear.

10.2 Matauranga Maori and customary use

A good start has been made with the establishment of the Matauranga Kura Taiao fund using the Package allocation. A number of projects have been funded to assist with retaining traditional knowledge and applying it to biodiversity management. There are probably a growing number of opportunities for the outputs of some of these projects to provide more feedback to management agencies and to assist with the development of management partnerships. A real concern is the rate at which matauranga knowledge is being lost as elderly kaumatua and kuia pass away. This places a time-linked priority on any consideration of further funding for this programme. There will need to be a significant shift in understanding by many New Zealanders if matauranga is to play a more important role in managing biodiversity in relevant contexts.

A 2005 draft policy on customary use has been completed by DOC, but there would appear to have been limited progress overall. Divergent viewpoints held by Maori and non-Maori groups, compounded by poorly informed public attitudes, will slow further

progress until there is a meaningful national dialogue over what are perceived to be conflicting value systems.

10.3 Science and research links

The 2004/2005 FRST-funding allocations provided a significant boost to funds for Maori-directed research, albeit from a very small base. There is the significant issue of a limited number of Maori researchers with the relevant expertise which will require leadership from other sectors to overcome. All Crown Research Institutes and universities have partnerships or agreements with iwi, but we lack comprehensive data to assess the influence of these partnerships on outcomes.

10.4 Gains, future priorities and linkages

The funding from the Package has provided the most identifiable gains so far for Maori in relation to the Strategy. Increased funding to Nga Whenua Rahui has benefited biodiversity values by moving iwi interests beyond protection to more extensive programmes of pest control and management of taonga species. Gains are starting to show from the projects in the Matauranga Maori programme and these have the potential to link more strongly with other initiatives in customary use and from the growing interest by iwi and hapu in protecting forests and managing pests. A longer-term challenge will be to reconcile the different perspectives held by Maori and non-Maori over customary use and management approaches within an agreed understanding of biodiversity objectives.

10.5 Recommendation

- *That funding for Nga Whenua Rahui and Matauranga Maori be continued based on an assessment of present and future needs, subject to periodic evaluations of performance.*

11. OUTCOMES FOR PARTICIPATION AND AWARENESS

Although Theme Eight is positioned near the end of the Strategy it supports Goal One – community and individual action, responsibility and benefits. There are increasing opportunities to link gains from this goal with other theme objectives, especially with respect to initiatives to conserve and restore biodiversity on private land. This would be consistent with our view that governance arrangements for the Strategy need to be more proactive at building collaborative partnerships that will help to deliver the desired outcomes over the next 15 years.

11.1 Increasing community awareness and involvement

Community involvement in conservation and sustainable use of biodiversity is probably at an all-time high in New Zealand. Estimates range between 3,000 and 5,000 for the number of community-led or private projects involving protection, management or restoration of indigenous biodiversity. The funding from the Biodiversity Package has

contributed to the growth of community awareness and involvement, most notably through the Biodiversity Advice and Condition Funds. A significant amount of parallel growth has also occurred independently of the Strategy as the so-called "Green Renaissance" has gathered pace. Linking private and public programmes to maximize benefits at regional scales remains, however, as a significant challenge. There are also efficiency and effectiveness gains to be made through a better sharing of 'lessons learned' between communities engaged in similar activities. One example is the benefits of sharing lessons learned between regions on the best approaches to care and restore coastal dune habitats. Central government could help facilitate such benefit sharing, which can be a cost-effective way of achieving good outcomes for biodiversity.

11.2 Developing partnerships

The number of partnerships for conservation and sustainable use has also grown rapidly and they vary considerably in scale and complexity. Balancing core activity on conservation lands with increasing demands for supporting partnerships on private land can be difficult. Again, integrating private and public approaches is needed. Good priority setting should ensure that the most important places and critically endangered ecosystems are protected and restored. More effort is still needed to integrate biodiversity conservation and protection into sustainable production landscapes and reduce negative impacts on indigenous biodiversity. (See also Section 3.4.) A range of voluntary and financial mechanisms exist and are in use by councils, but capacity is a problem for some rurally-oriented councils with at-risk habitats.

11.3 Environmental education

There is a good range of high quality resources and programmes now available for teachers and schools to undertake environmental education relevant to the Strategy. But uptake and effectiveness remain key issues. Opportunities for students in many schools appear to be strongly dependent on the interests and passions of individual teachers and biodiversity remains but a small part of a much wider topic – the environment. With a population increasingly divorced from direct contact with nature and given New Zealand's unique natural heritage, the challenge of raising levels of knowledge about the importance of biodiversity is significant, especially since environmental education is not a mandatory part of the curriculum.

11.4 Gains, future priorities and linkages

The key issue is ensuring that the opportunities and resources available for community-led conservation management and restoration are fully capitalized on. If this support can be focused on the high priority areas or issues, then the gains for biodiversity could be even greater. At present, individual success stories are easy to point to, but patchy monitoring and reporting systems make it difficult to assess what overall difference is being made. More use of prior evaluation and prioritization should help to focus on the projects that are the best in terms of reversing biodiversity loss. We recognize, however, that many projects have other important benefits such as raising awareness and these include the beneficial outcomes from the funds focused on private lands. Improved integration of private and public efforts, coupled with monitoring and reporting systems

will assist adaptive management and reduce the risks of burn-out or failure to make a real difference.

Environmental education would benefit considerably from professional development tools which more directly assist teachers in developing teaching units from the wide array of material available and linked to the existing resource website (http://www.tki.org.nz/r/environ_ed/links_e.php). There are also links to be made between environmental education opportunities and the development of biodiversity sanctuaries in urban areas (see Section 3.2).

11.5 Recommendations

- *That the Condition and Advice funds are continued, but with a particular effort to target critically threatened ecosystems and species, with monitoring as well as reporting requirements built into the funding process.*

- *That a review of institutional arrangements is undertaken to determine best practice for integrating private and public partnerships for biodiversity conservation at the regional scale.*

PART E. PROGRESS IN INTERNATIONAL ENGAGEMENT

12. OUTCOMES FOR INTERNATIONAL RESPONSIBILITIES

'International responsibilities' (Theme Ten) was a low priority within the Strategy and received no Biodiversity Package support. Although the Ministry of Foreign Affairs and Trade (MFAT) was the lead Government agency for most of the actions it was unclear how this responsibility is taken into consideration by MFAT when it is tasked with coordinating and responding to international biodiversity requirements and initiatives.

12.1 International engagement opportunities

There has been an increasing amount of engagement by New Zealand on global biodiversity issues over the past 5 years, ranging from the Convention on Biological Diversity (CBD) to a range of initiatives concerning the Antarctic region. New Zealand has now ratified the Convention on Migratory Species (CMS – the Bonn Convention) and has been actively involved in a wide range of meetings and forums relating to relevant biodiversity conventions, treaties and agreements. In some areas this involvement has contributed to positive outcomes, such as reducing seabird bycatch in the Southern Ocean. New Zealand has maintained its engagement on biodiversity issues with other countries, but still with its primary focus on the Pacific island countries, often through the Secretariat of the Pacific Regional Environmental Programme (SPREP). One area that needs more attention is New Zealand's implementation of the Ramsar Convention (concerning wetlands protection), which has not made the gains that were expected.

At a global level, habitat loss, invasive alien species and over-exploitation are recognized as the major drivers behind the alarming rise in the number of threatened species and the decline in the capacity of ecosystems to deliver goods and services. We believe New Zealand could make a more wide-ranging contribution than it does through its present assistance programmes by a wider application of its world-leading expertise in biosecurity systems, threatened species management and techniques for eradicating and managing invasive species. This would require additional resourcing or greater collaboration with NZAID (New Zealand Agency for International Development).

12.2 Climate change and biodiversity

National and international discussions and actions on climate change issues have grown considerably since the Strategy was being developed. Consideration of climate change impacts on biodiversity, both indigenous and introduced, is absent from the Strategy and has received little consideration in the development of New Zealand's climate change policy and adaptation responses. The possible consequences of climate change for indigenous and valued introduced biodiversity are profound. This applies to all levels of biodiversity – genes, species and ecosystems – and to productive landscapes as well as indigenous ecosystems. The implications of climate change for biodiversity justify much

greater consideration of the policy implications, research needs and operational management responses than they have received so far.

There is another point of connection between climate change initiatives and biodiversity that is worth considering. The development of the New Zealand Carbon Accounting System (NZCAS) provides a significant opportunity to deliver whole-of-government benefits linking climate change objectives and biodiversity monitoring requirements. We have commented at various points in this report about the need for improved environmental monitoring systems for a variety of purposes. In this particular case, the requirements for information on land cover needed for the NZCAS should be developed in conjunction with the land cover data needed for biodiversity management.

12.3 Gains, future priorities and linkages

The 2005 UN Millennium Ecosystem Assessment showed that unprecedented human demands on ecosystems have led to a widespread loss of ecosystem services. These losses have been recognised as a significant barrier to achieving the Millennium Development Goals to reduce poverty, hunger and disease. They also underline the essential linkages between maintaining environmental systems and human wellbeing. Therefore we suggest New Zealand's international expertise in conservation management and biosecurity systems are increasingly relevant to the international agendas that link development, livelihoods and the environment. These linkages are also consistent with the 2005 draft "NZAID Policy for Environment in International Development".

Accordingly, we suggest this theme is given a higher priority within the Strategy and that a stronger connection is made between the two Theme Ten objectives. This connection could be strengthened by more extensive use, across a wider range of countries, of New Zealand's expertise in conservation management (especially species management, pest eradication and control) and in biosecurity systems. We believe there are opportunities for operational agencies including, but not limited to DOC, to work more closely with NZAID and overseas donor agencies. Developing these synergies could enhance New Zealand's international reputation and standing and provide tangible biodiversity benefits for a large number of countries.

12.4 Recommendations

- *That New Zealand's development assistance initiatives make greater use of New Zealand's technical expertise in conservation management and biosecurity.*

- *That an objective and actions relating to the impacts of climate change on biodiversity and related research questions and adaptation options be developed and added to the Biodiversity Strategy.*

- *That the potential impacts of climate change on biodiversity be accorded a higher priority in the New Zealand climate change policy, recognizing also the opportunities for whole-of-government links to investments in monitoring regimes between climate change and biodiversity objectives.*

PART F. ADVANCING THE STRATEGY – WHERE TO FROM HERE?

13. TURNING THE TIDE: 5 YEARS ON

13.1 Overview of achievements so far

The New Zealand Biodiversity Strategy has provided an important focus and vehicle for addressing what is needed to sustain our indigenous biodiversity. It also provides for a more integrated approach to the management of our productive landscapes. In 2000, Government recognized that 'to turn the tide' on biodiversity losses would take more resources and initiatives on a wider number of fronts to achieve. Our review has shown that the extra $184M provided through the Biodiversity Package has made important contributions in a number of areas during the first 5 years. Highly threatened taonga species have benefited through intensive management in particular areas. Technical advances have led to major successes in rodent eradication, especially on of-shore island, and helped the control of pest fish, while pest and weed control programmes cover greater areas with much better coordination between agencies than previously.

The Package has funded the development of important 'building blocks', such as marine and freshwater classification systems, which will help in setting targets for completing representative networks of protected areas in marine, freshwater and terrestrial environments. Increased allocations to the acquisition and protection funds, along with establishment of the Biodiversity Condition and Advice funds, have added significantly to the areas of private land under protection and assisted many iwi, landowners and community groups to reduce weeds and pests. Biosecurity management is now much better coordinated and marine biosecurity initiatives have provided the first results of port and harbour surveys.

But along with these gains significant management and conservation challenges remain. About 55% of the lands administered by DOC would benefit from some management but receive little or none at all. Regional councils implement major weed and pest control programmes and while their expenditure levels are known the gains for biodiversity are not. A much higher proportion of our threatened species now have recovery plans, but the resources to implement them are insufficient. Consequently, the status of the majority of our acutely or chronically threatened species continues to decline. The status of freshwater systems and their indigenous species has also declined in many regions and is now a national economic as well as environmental concern to the public. There are government initiatives examining a number of issues concerning water, but biodiversity aspects are not high within the list. The number and extent of marine reserves has increased substantially in 5 years and an 'ecosystem approach' to fishing is gaining ground, although overfishing, destructive fishing techniques and by-catch impacts are still significant threats to marine ecosystems and numerous species.

Increased research across marine, freshwater and terrestrial systems is urgently needed to improve our understanding of ecosystem processes that underpin management interventions and to develop new technologies for pest control. Yet funding levels have increased slowly, or declined in real terms. The extra gains from the acquisition and protection funds have certainly protected important areas of biodiversity, but across the country we continue to lose rare and threatened habitats and ecosystems on private land. Short-term economic drivers favor, for example, the draining of wetlands rather than their retention for the value of their ecosystem services.

Yet there are grounds for cautious optimism. Of the 43 priority actions in the Strategy, we have scored 35% as having achieved 'significant' progress after the first 5 years and another 23% were scored as 'moderate' progress. (See following Table 1 for details.) We also ranked 67% of these priority actions as 'high' priority for further attention, which indicates that many of them continue to be relevant for the immediate future. The gains that are made in the next 5 years will depend on sustained resourcing levels, improved governance arrangements and strategic linkages that are needed to widen the 'buy-in' to the Strategy by local government, non-government and private sector interests.

13.2 Improving governance

In Chapter 9 we summarized our views on changes that are needed to the governance arrangements that would help the 'course corrections' that are needed if the Strategy is to fulfill its original objective of making biodiversity 'everyone's business'. In brief, we recommend that governance would be improved by:
- setting quantifiable targets against timelines for all appropriate actions;
- improving accountabilities for central government agencies;
- greater leadership focused on developing collaborative partnerships with local government, the private sector and non-governmental organisations;
- establishing stronger review or audit functions via the Auditor-General or the Parliamentary Commissioner for the Environment;
- designating an 'overall lead agency' responsibility for implementing the Strategy;
- improving reporting systems, based on agreed indicator and monitoring systems.

13.3 New strategic linkages

In Chapter 2 we referred to the expectation that the Strategy would require an integrated response for success. It identified four elements to provide the integration: better knowledge for smarter management; more coordination between agencies; widespread and informed community action; market driven rewards and sanctions. These elements are inter-related and will not succeed in isolation from each other. The Strategy also correctly recognised the importance of partnerships in delivering results, a point that was well made in the report "Biodiversity and Private Land".[11]

In looking forward 5 years we see the next phase of implementing the Strategy as having to sustain and increase efforts by key central government departments, plus a much

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[11] "Final report of the Ministerial Advisory Committee on biodiversity and private land". 2000. Ministry for the Environment, Wellington.

greater effort on conserving biodiversity on private lands. This would recognise the urgent need to address the ongoing loss of valued habitats and biodiversity on private lands, the importance of a wider awareness of the relevance of biodiversity concepts to managing production lands, such as recognizing the economic value of ecosystem services, and the role of private landowners in assisting threatened species by controlling weeds and animal pests.

As Chapter 3 makes clear this will involve more than simply increasing the allocations to funds such as QEII National Trust , Nga Whenua Rahui and the Nature Heritage Fund, although those initiatives are important parts of the mix. It will involve forming more complex partnership arrangements and putting more emphasis on the economic and social aspects of biodiversity issues to 'win hearts and minds'. It will mean clarifying and integrating important matters of 'scale': *national scale* objectives for resource management, economic and social development; *regional scale* planning and management requirements; *local scale* community concerns over particular places; and *property scale* imperatives to earn a living. A related issue is the need to address different capacities for biodiversity management at different scales and the variable capacity within scales as between regional councils. Addressing capacity issues also requires addressing implementation and funding questions – this messy aspect of helping people needs to be faced.

If there has been a generic problem with the delivery of the Strategy so far it has been the insufficient involvement of other key players, particularly the regional, unitary and district councils. The focus has been too much on central government delivery of the objectives and actions and not enough on facilitating the involvement of other key players. While the Strategy is comprehensive in its coverage through the ten themes we suggest it omits one important issue – climate change impacts. We also feel that it could make a more direct contribution to sustainable development initiatives as a component of the 'environmental pillar' which would link it more clearly to productive landscapes. We outline these proposed new linkages under the following four headings.

Linkage #1. To climate change policy.   Add to the Strategy an objective and actions to consider the impacts of climate change on biodiversity, both indigenous biodiversity and valued biodiversity (Chapter 12). It would link New Zealand to growing international and regional efforts to understand climate change impacts on biodiversity and their implications for adaptation responses. This new objective should also be linked to the ongoing development of the New Zealand climate change strategy. We also identify opportunities for cost-savings by combining the land cover monitoring required for the New Zealand Carbon Accounting System with land cover data needed for biodiversity management and research into ecosystem processes.

Linkage #2. To local government. There are a number of opportunities here. For example, local authorities have new environmental reporting obligations under the Local Government Act 2002 and the 2004 amendments to the RMA (Chapter 9). These provide an opportunity to build collaborative partnerships around the needs to establish environmental indicators, performance measures, monitoring regimes and reporting

requirements. We have stressed throughout this report the need to progress these objectives for a number of reasons and see this as an opportunity to meet regional and national needs by working on solutions together. Collaboration would also reduce the risk of councils generating data at a regional level that could not be easily and usefully aggregated to provide national information on the state of key trends in the environment.

Linkage #3. To communities. To build on the growing community interest and involvement in tackling a wide range of biodiversity initiatives, ranging from pest control and estuary clean-ups to improving catchment management. There are increasing opportunities for central and local government agencies to assist as information providers, facilitators and partners in cost-effective ways to meet local objectives. This does not require changes in the structures of agencies, but a different focus in how and why they do business. Some have already started. For example, in 2004, all the key stakeholders in Northland[12] produced a regional biodiversity restoration strategy called "Whole of Northland Approach". Their listed outcomes,[13] which are consistent with the Strategy, reflect the collective interests of local government, communities and agencies such as DOC.

Linkage #4. To sustainable development initiatives. The Government has developed a Programme of Action relating to sustainable development initiatives. The Biodiversity Strategy provides an opportunity to widen the discussion about the contribution of the 'third pillar' to sustainable development and the role of biodiversity. There are opportunities to bring more biodiversity considerations into future initiatives, particularly in the agricultural sectors. An important part of these discussions will be to underline the principle that it is much cheaper to *maintain* natural systems than it is to pay the *repair* bill, or to suffer the resulting loss of production. In Australia, the Prime Minister's Science, Engineering and Innovation Council made this point in a 2002 report[14] and stressed that programmes seem to be directed too frequently towards repair rather than to maintenance of natural assets. The current estimated costs of improving water quality in Lake Taupo is a case in point.

Achieving the desired outcomes of the New Zealand Biodiversity Strategy for 2020 may or may not happen. They remain as visionary goals for the whole country and will require the involvement of the whole country to be realised. The challenge for the next 5 years will therefore be to bring a wider and more inclusive approach to the tasks. Only in that way are targets that are set for the next 5, 10 and 15 years going to be realistic and within reach of success.

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[12] Northland Regional Council, district councils, DOC, landowners, iwi, communities.

[13] Outcomes include: Make PNA-type information available and fill gaps; increase biodiversity restoration capacity ; parties collectively identify priorities; develop a collective monitoring programme.

[14] "Sustaining our natural systems and biodiversity". Report of the Prime Minister's Science, Engineering and Innovation Council, May 2002.

Table 1. Summary table of assessed progress against priority actions.

Explanatory notes

1. 'Priority actions' were identified in the Strategy on the basis that they:
- "will contribute most in the first five years to achieving the goals; or
- need to occur first, before other actions can be implemented." (NZBS, page 30).

2. 'Assessed progress' is based on our analysis of outcomes or outputs that have been achieved so far relative to the size of the task.

3. 'Future priority score' is our assessment of the importance of the action in the next phase of implementation of the Strategy, based on current threats and its relevance to other actions.

Action #	Brief description of the action	Assessed progress	Future priority score
1.1b	Add impt. habitats to public conservation lands	Moderate	High
1.1c	Encourage initiatives for private land protection	Substantial	Low
1.1d	National policy statement on biodiversity	Limited	Low
1.1e	Expand funding for: NHF, NWR, QEII Trust	Substantial	High
1.3a	Plans & strategies for weed & pest mgmt.	Moderate	Medium
1.3c	Increased weed & pest control efforts	Substantial	High
1.3d	Increased research for weed & pest control	Limited	High
1.4a	Expand restoration programmes	Moderate	High
1.5a	Increase actions for key threatened species	Limited	High
2.1a	National policy statement & other assistance	Limited	Medium
2.1b	Classification system for freshwater ecosystems.	Substantial	Medium
2.1c	Protect priority representative f.w. habitats	Limited	High
3.1b	Bioregional marine classification system	Substantial	High
3.1d	Assess, rank threats to coastal & marine biodiv.	Limited	Medium
3.2a	Clarify marine biodiversity management	Limited	High
3.3b	Expand mitigation of adverse land use on coasts	Limited	Low
3.4a	Ecosystem approach for sustaining fisheries	Moderate	High
3.4b	Reduction of neg. effects of fishing activities	Moderate	High
3.5a	Better border control for NZ's marine environ.	Substantial	High
3.6a	Strategy for protecting marine biodiversity	Substantial	High
3.6b	Protect 10% of NZ marine environment by 2010	Moderate	High
3.6c	Review the Marine Reserves Act 1971	Substantial	High
4.1a	Collaborative strategy for NZ genetic resources	Limited	High
4.1b	Risks for genetic resources of introduced spp.	Limited	Medium
4.1c	Risks for genetic resources of native species	Moderate	Medium
5.1a	Clarify roles for biosecurity management	Substantial	High
5.2a	Assess risks for native spp from potential pests	Moderate	High
5.3c	Improve integrated border control system	Substantial	High

6.1a	Incorporate NZBS into departmental planning	Limited	High
6.1b	Implement NZBS and monitor implementation	Limited	High
7.1a	Iwi & hapu participation in biodiv. management	Moderate	High
7.2a	Framework for retaining matauranga Maori	Substantial	High
7.5a	Address customary use issues	Limited	Medium
8.1a	Biodiversity information to assist communities	Substantial	High
8.2d	Biodiversity issues into sectoral planning	Moderate	High
8.3a	Biodiversity into environmental education	Substantial	Medium
9.1a	Develop research strategy for biodiv re threats	Limited	High
9.1b	Research for better mgmt of pests & native spp	Limited	High
9.2b	Accelerate surveys & identification of threats	Limited	Medium
9.3b	Develop & use monitoring methods for biodiv.	Limited	Medium
9.4a	Report on state of environ. & Strategy progress	Limited	High
9.5a	Systems for sharing info. & best practice	Substantial	Medium
10.2b	Promote inter-country coop. esp in Asia-Pacifc	Substantial	High

In summary, we have ranked one third (35%) as having made "substantial" progress in the first 5 years of the Strategy, while we scored two-thirds (67%) as "high priority" for contributing to the future outcome of the Strategy. This indicates their ongoing relevance as priority actions that warrant further attention.

ACRONYMS

BNZ	Biosecurity New Zealand
CBD	Convention on Biological Diversity
CGCG	Central Government Coordinating Group of Biodiversity Chief Executives
CMS	Convention on Migratory Species
DOC	Department of Conservation
DPMC	Department of Prime Minister and Cabinet
ERMA	Environmental Risk Management Agency of New Zealand
FRST	Foundation for Research, Science and Technology
LCDB	Land Cover Data Base
LENZ	Land Environments of New Zealand
LTCCP	Long Term Council Community Plan
MAF	Ministry of Agriculture and Forestry
MEC	Marine Environment Classification
MfE	Ministry for the Environment
MFAT	Ministry of Foreign Affairs and Trade
MFish	Ministry of Fisheries
MoRST	Ministry of Research, Science and Technology
NHF	Nature Heritage Fund
NHMS	Natural Heritage Management System
NWR	Nga Whenua Rahui
NZAID	New Zealand Agency for International Development
NZCAS	New Zealand Carbon Accounting System
PNAP	Protected Natural Areas Programme
QEII	Queen Elizabeth II National Trust
RMA	Resource Management Act
SFF	Sustainable Farming Fund
SMEEF	Strategy for Managing the Environmental Effects of Fishing
SMF	Sustainable Management Fund
SOI	Statement of Intent
SPREP	Secretariat of the Pacific Regional Environmental Programme
SSC	State Services Commission
TFBIS	Terrestrial and Freshwater Biodiversity Information System