# REVIEW OF THE NEW ZEALAND BIODIVERSITY STRATEGY THEMES

**By**
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# ACRONYMS

| | |
|---|---|
| AHB | Animal Health Board |
| BioInfo | Baseline Information Programme |
| BMAC | Biosecurity Ministerial Advisory Committee |
| BNZ | Biosecurity New Zealand |
| CBD | Convention on Biological Diversity |
| CCAMLR | Convention on the Conservation of Antarctic Marine Living Resources |
| CGCG | Central Government Coordinating Group of Biodiversity Chief Executives |
| CITES | Convention on International Trade in Endangered Species of Wild Fauna and Flora |
| CMS | Convention on Migratory Species |
| CRI | Crown Research Institute |
| DOC | Department of Conservation |
| DPMC | Department of Prime Minister and Cabinet |
| EEZ | Exclusive Economic Zone |
| EPI | Environmental Performance Indicators Programme |
| ERMA | Environmental Risk Management Agency of New Zealand |
| FRST | Foundation for Research, Science and Technology |
| FTEs | Full Time Equivalents |
| FWENZ | Freshwater Environments of New Zealand |
| HSNO Act | Hazardous Substances and New Organisms Act |
| IHS | Import Health Standards |
| IUCN | World Conservation Union |
| 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 |
| MED | Ministry of Economic Development |
| MfE | Ministry for the Environment |
| MFAT | Ministry of Foreign Affairs and Trade |
| MFish | Ministry of Fisheries |
| MKT | Matauranga Kura Taiao |
| MoRST | Ministry of Research, Science and Technology |
| MSY | Maximum Sustainable Yield |
| NABIS | National Aquatic Biodiversity Information System |
| NHF | Nature Heritage Fund |
| NHMS | Natural Heritage Management System |
| NIWA | National Institute of Water & Atmospheric Research Ltd |
| NMCI | Near-Shore Marine Classification and Inventory |
| NPMS | National Pest Management Strategy |
| NPOA | National Plan of Action |
| NWCO | National Water Conservation Order |
| NWR | Nga Whenua Rahui |
| NZAEE | New Zealand Association of Environmental Education |

| | |
|---|---|
| NZERN | New Zealand Ecological Restoration Network |
| NZAID | New Zealand Agency for International Development |
| NZBS | New Zealand Biodiversity Strategy |
| NZCAS | New Zealand Carbon Accounting System |
| NZCPS | New Zealand Coastal Policy Statement |
| OBI | Outcome Based Investment |
| PCE | Parliamentary Commissioner for the Environment |
| PGSF | Public Good Science Fund |
| PNAP | Protected Natural Areas Programme |
| QEII | Queen Elizabeth II National Trust |
| QMS | Quota Management System |
| REC | River Environment Classification |
| RFP | Request for Proposals |
| RMA | Resource Management Act |
| SFF | Sustainable Farming Fund |
| SILNA | South Island Landless Natives Act |
| SMEEF | Strategy for Managing the Environmental Effects of Fishing |
| SMF | Sustainable Management Fund |
| SOI | Statement of Intent |
| SPO | Strategic Portfolio Outline |
| SPREP | Secretariat of the Pacific Regional Environmental Programme |
| SSC | State Services Commission |
| TAC | Total Allowable Catch |
| TFBIS | Terrestrial and Freshwater Biodiversity Information System |
| TPK | Te Puni Kokiri |
| UNCED | United Nations Conference on Environment and Development |
| WERI | Wetland Resource Inventory |
| WONI | Waterbodies of National Importance |

# INTRODUCTION

1. The New Zealand Biodiversity Strategy (referred to subsequently as "the Strategy") was launched on 29th March 2000. The Strategy marks an important milestone in New Zealand's collective commitment to reverse the decline in the state of New Zealand's indigenous biodiversity. It established a strategic framework for action, to conserve and, where appropriate, sustainably use and manage the biodiversity of both indigenous and valued introduced species. It also represents New Zealand's commitment under the Convention on Biological Diversity to contribute to global efforts to stem the worldwide losses of biodiversity. Government committed an additional $187M over the following 5 years to help implement the priority initiatives. This is referred to as the Biodiversity Package, or simply, "the Package" in this report.

2. The Strategy includes a vision, four overall goals and thirteen principles to guide management and implementation of the Strategy. The actual 'doing' part of the Strategy is developed under ten themes, each of which follows the same structure. Each theme starts with a 'desired outcome' statement that describes biodiversity or management outcomes to be achieved by 2020 to realize the goals. Detailed action plans, consisting of objectives and more specific actions, then provide the entry points for what needs to be done.

3. The Strategy specifies that a 'substantive review' be undertaken after 5 years to assess "goals, roles, governance arrangements, objectives and priority actions" (p 130). The authors were commissioned to undertake this independent review and this is our detailed report on what has been achieved within each of the ten themes. In this report we look at progress to date under each of the 147 actions, including the 43 actions that were identified as 'priority actions'.

**Structure of this report**

4. Each theme chapter follows the same format. The "Desired outcomes for 2020" that outline the 20-year expectations are first reproduced from the Strategy. Then a "Stocktake of progress" section summarises our review findings for the theme as a whole. A summary table in which we specify for each action whether it is identified in the Strategy as a 'priority action' and if it received funding from the Biodiversity Package follows this. We also provide our assessment of progress to date and rank the future priority for the action based on current circumstances and future importance.

5. In the summary tables '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).

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

7. The summary table is followed by an introduction to the theme and our review findings for each objective and its actions. The italicized, bolded paragraph after each action or group of actions provides the reader with a summary for that section.

8. These italicized summaries often have suggestions and recommendations that are more detailed, and more relevant to detailed future planning than the higher-level recommendations in the Synthesis Report (below).

**The Synthesis Report**

9. Our shorter companion report ("*Turning the Tide? A review of the first five years of the New Zealand Biodiversity Strategy. The Synthesis Report*") provides a summary of the review that is based on the conclusions and detail provided in this report. It includes an executive summary, high-level recommendations and a concluding chapter that reflects on achievements so far and outlines new strategic linkages that should help advance the Strategy in the next phase of implementation. We would strongly urge readers who are interested in our overall conclusions and recommendations to read the synthesis report in addition to this report on the themes. Our generic overview is only provided in the synthesis report.

**Review methodology**

10. Given the structure of the Strategy (outlined above), 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. By looking at the achievements at the level of actions we were able to identify specific outputs that we refer to as 'building blocks'. These are important developments, such as classification systems, upon which more outcome-focused activities can build during the next phase of implementation.

11. 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.

**Shortcomings**

12. Reviews of this nature are necessarily a compromise between available resources, including time, and the degree of analysis that reviewers feel is necessary to meet the

requirements for an adequate review. Given the breadth of the Strategy we must acknowledge that some aspects were not done with the thoroughness we felt was warranted. In other areas the information provided was not as relevant to the actions and objectives of the Strategy as we had expected, while for other actions the information was scanty. This particularly applies 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 were not able to make a comprehensive assessment across the full range of their work in conserving and protecting biodiversity. Their contributions to biodiversity management are therefore likely to be under-estimated in our reports. Given their responsibilities for 70% of the land areas of New Zealand, councils are major players in the future wellbeing and fate of our indigenous biodiversity. The adequacy and availability of appropriate information will need more consideration for any future review exercise.

13. 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. Again, issues of time and resource constraints limited what we were able to ascertain with respect to this theme. Finally, the review process did not allow for formal meetings with key stakeholders, sector groups, or the public. We believe this could be a useful option to pursue subsequent to consideration of our review by Government.

**Acknowledgements**

14. We would like to acknowledge the assistance we received from departmental officials in providing initial information and supplementary information as requested. Staff at the Queen Elizabeth II National Trust, Nga Whenua Rahui and Nature Heritage Fund provided us with detailed information that we appreciated. We thank the Royal Society for inviting us to a meeting to discuss biodiversity research issues with one of its committees and staff at the Ministry of Research, Science & Technology for organizing two meetings, mostly with CRI scientists, for further discussions on research needs for biodiversity. A number of people, community groups and iwi provided us with useful information and answered questions for which we thank them.

# THEME ONE: BIODIVERSITY ON LAND

Caption: A remnant of coastal forest in Westland squeezed by farmland. One of New Zealand's most threatened ecosystems, less than one percent of the pre-human, coastal forests now remain.

**Theme One: Biodiversity on Land**
**Terrestrial ecosystems, including natural and modified ecosystems and habitats, and the indigenous species that live there.**

**Desired outcome for 2020**
**A net gain has been made in the extent and condition of natural habitats and ecosystems important for indigenous biodiversity. Scarce and fragmented habitats (such as lowland forests and grasslands, wetlands and dunelands) have increased in area and are in better ecological health due to improved connections and the sustainable management of surrounding areas. Some modified habitats are restored.**
**A more representative range of natural habitats and ecosystems is secure in public ownership, complemented by an increase in privately owned and managed protected natural areas. Increased and more effective pest management, coupled with species recovery, has restored ecological processes in these areas. No new pest species have become established.**
**No further human-induced extinctions have occurred. Populations of all indigenous species and subspecies are sustained in natural or semi-natural habitats, and their genetic diversity is maintained. Fewer threatened species require active recovery programmes and ex situ management.**
**Threats to indigenous biodiversity from the activities of people are avoided or mitigated through sustainable use regimes and the sustainable management of production landscapes and urban areas.**

## Stocktake of progress on Theme One

### Expectations of the Strategy

15. The biodiversity on land theme was allocated the major share of the Biodiversity Package allocations (64%, or $118.3M up to and including the 2004/05 financial year). The allocations such as weed and pest control, threatened species work and initiatives on private land through various protection funds that were spent on Theme Two have been removed from this total. The conservation of biodiversity on land featured in two of the nine areas for implementation, namely strategic priority 5. "Sustain indigenous biodiversity in privately managed areas and in freshwater environments" and strategic priority 6. Enhance protected areas and prospects for threatened species". Of the 22 actions specified, 9 actions were considered to be priority actions. As noted in the Strategy, many of the actions are enhancements of existing programmes rather than new initiatives and so although most priority actions received some Biodiversity package money two (1.1c & 1.3a) were restricted to core funding only. Nearly all of the 13 non-priority actions were entirely reliant on core funding although one (Action1.1g) received Biodiversity package funding. Core funding for Theme One in the 2004/05 financial year is approximately $42M.

16. Expectations for strategic priority 5 highlighted by the Strategy were:
    - Protection of the full range of New Zealand's biodiversity by sustaining it on lands outside of protected areas

- Development of appropriate mechanisms (including incentives) to protect areas of high biodiversity value on private land
- Provision of clear national guidance on implementation with the RMA framework
- Improvement of co-ordination of pest management at a national and regional scale.

17. Expectations for strategic priority 6 highlighted by the Strategy were:
    - Addition to the public conservation estate where necessary of scarce or under-represented ecosystems or habitats of threatened species
    - Increased and better focused pest control and progress towards more efficient pest control and development of new technologies and tools for pest control
    - Expansion of restoration initiatives on offshore islands and at mainland islands
    - Increased recovery actions for priority threatened species

18. We discuss progress below in respect of these expectations under four main headings derived by aggregating closely related action points. Our assessment of progress and future priorities for individual action points is summarized in Table 1 below.

**Progress in protecting indigenous habitats and ecosystems**

19. This area of the Strategy had the greatest concentration of priority actions and substantial progress has been made in encouraging and supporting initiatives to protect and maintain habitats important for biodiversity on private land. All logging of indigenous forests on Crown land has effectively ceased and all logging on private land is required to be sustainable. The most obvious improvement to the network of protected lands is the increase in the area of land protected as a direct result of the three funding mechanisms (Nature Heritage Fund, Nga Whenua Rahui and Queen Elizabeth II National Trust). Also significant has been the growth of local and regional contestable funds that can also be used to support protection of indigenous ecosystems on private land. Although the South Island High Country Tenure Review has assisted in increasing the area of protected lands, improving the representativeness of the reserve network has not been as successful as it might have been. This shortcoming in the tenure review process should be rectified.

20. It is important to note that the different funds enable the targeted protection of different indigenous biodiversity resources of regional landscapes. For example, QEII Trust efforts mainly lead to the protection of small privately owned patches of formerly more widespread lowland ecosystems while NWR and NHF often lead to protection (purchase in the latter case) of larger more intact areas. Many of the areas so protected are also often unlikely to be added to "the lands administered by the Department of Conservation" (subsequently referred to as "DOC-administered lands") and there is no necessity that they should be. It is also important to recognize that only through the integrated activities of all of these funds, and by taking into account existing DOC-administered lands, is a comprehensive representative reserve network likely to be achieved. Complementarity, buffering and linkages of such places in terms of a wider regional scale network need more consideration. Greater emphasis should be placed on achieving an integrated regional scale approach than in comparing the performance of funding which supports

such widely different opportunities. This will require convergence on a common outcome rather than duplication and competition.

21. The impact of other mechanisms such as rate relief is uncertain although the methodologies are now available to quantify these and determine their relative effectiveness. However, regions with the greatest areas of unprotected indigenous ecosystems tend to be constrained in the use of economic incentives. There is a need to ensure that funding is consistently targeted to protection of the most threatened ecosystems and that areas protected are of sufficient size or in close enough proximity to buffering or connecting ecosystems to be viable in the long term. Any funding to support protection should incorporate provision for condition and trend monitoring and reporting from the outset, ensuring that the extent to which biodiversity outcomes are being achieved regionally and nationally can be regularly assessed. The ecological survey work and coordinated monitoring needed to select and prioritize sites for protection and management is still lacking in many regions of New Zealand. Although a major building block, Land Environments of New Zealand (LENZ), has been completed and disseminated, we detect some misunderstanding of what now needs to follow. LENZ will still require adequate ecological (biological) data layers to fully benefit on the ground decisions and actions and adequate condition and trend monitoring will also need to be underpinned by ecological (biological) data layers.

22. While significant progress has been made in developing methodologies to track changes in extent and representativeness, provision for the updating of information is insufficient to report adequately on achievement of biodiversity outcomes. National guidance in the form of a National Policy Statement on biodiversity is imminent but there has already been great variation in addressing key biodiversity issues at the regional and local scales. Greater leadership (at the national level), coordination and capacity building will be required to fully implement the requirements of the National Policy Statement and to operationalize coordinated monitoring of ecosystem trend and condition.

**Progress in sympathetic management**

23. This area was not a priority in the Strategy and did not receive any Biodiversity Package funding but progress has been significant and probably largely unrelated to the Strategy. The impacts of the New Zealand Landcare Trust and QEII National Trust continue to grow and aspects of biodiversity protection or enhancement are being integrated into a range of sustainable land management issues despite often being secondary to broader environmental concerns. However, we believe many opportunities to incorporate biodiversity outcomes more fully into sustainable land management activities remain to be exploited. This will require greater leadership and clearer guidance about the thresholds of sympathetic management needed to achieve particular biodiversity outcomes.

24. In urban environments the significant progress to date can mainly be traced to earlier Agenda 21 initiatives and the time now seems right to link these more closely to broader regional and national objectives. The reconnection of urban dwellers with nature will be

necessary to gain better support for reducing the wider environmental impacts of cities and gaining the resources required to restore indigenous ecosystems at regional and national scales. This area should be afforded greater priority.

**Progress in pest management**

25. This objective had the second highest number of priority actions within Theme One and received the largest share of the Biodiversity Package. Substantial progress has been made in increasing plant and animal pest control in some high value areas on DOC-administered lands. This includes complete removal of rodents from offshore islands and removing a range of animal and plant pests from expanded areas on mainland sites. Predator proof fencing has been another significant advance in terms of intensive pest management but as yet the total area protected in this way is much smaller than for intensive pest control by more conventional means. There have been significant benefits from the separately funded stoat research that has improved stoat control techniques. However, pest management remains perhaps the most intractable problem in the management of conservation lands and the Biodiversity Strategy.

26. The extent and depth of the problem demands robust frameworks for measuring biodiversity outcomes but some of the understanding required to manage the complexity, scale and range of the problems has only been developed in recent years. More leadership and much better integration of activity between central, regional and local agencies will be required to progress this area. Significant risks related to the continuing spread of plant and animal pests remain. Urbanization, population increases and a major expansion of lifestyle blocks are drivers for the continuing naturalization and penetration of weeds into the wider landscape and DOC-administered lands. The increasing area of DOC-administered lands to manage requires greater resources or efficiencies if the gains of recent years are to be maintained. And the prospect of a successful conclusion to the National Pest Management Strategy Tb control programme means that a major gap in funds to control possums adjacent to DOC-administered lands may emerge.

27. However, what is now needed, for future success in this area, is a suite of new tools and technologies that take levels of control and management of key pests to a stage beyond small incremental improvements. Contrary to the expectation of the Strategy there has been no significant or continuing increase of research to provide these solutions (see Theme Nine). This should be a major priority for the future.

**Progress in restoration of ecosystems and species**

28. In this area of the Strategy the priorities were to expand habitat and ecosystem restoration programmes and to increase recovery actions for priority threatened species. These priorities are almost inseparable and are also closely linked to progress in pest control described above. Funding from the Biodiversity Package was $26.57M. It is difficult to assess progress in this area because the overall framework within which these actions are occurring was not explicit in the information we received. There is no doubt that progress has been made in restoring a limited area of the DOC-administered lands to a

healthy functioning state and that the security of several key threatened species has been improved during the past 5 years. But it is not clear whether the proportion of DOC-administered lands receiving this level of intensive management is sufficient to assure long-term protection of an adequate sample of New Zealand's ecosystems. We are also concerned that there is a continuing trend towards major range contractions on the mainland of iconic species such as kiwi.

29. The area of land receiving this high intensity management effort is approximately 2.7% of the total DOC-administered lands. The area receiving less intensive but probably adequate management effort by DOC is a further 32%. Perhaps as much as 10% of the DOC-administered lands have little or no risks from pest invasion or ecosystem degradation (high alpine rock and snow areas) and the remaining half of the DOC-administered lands receive limited or no active management. But the Strategy is neither clear on what the actual targets are nor the biodiversity outcomes being sought other than a very general target outcome of reversing of biodiversity decline. As the available funds will never allow active management across all of the DOC-administered lands, the question becomes one of the most appropriate mix of management levels for particular species and places that maximizes restoration and protection of biodiversity values. This requires an analysis of places where high levels of valued biodiversity can be protected in the most cost-effective manner. It should include DOC-administered lands as well as private lands. This analysis should also include whether the sample of mainland islands in particular has significant gaps and/or is the best solution for the funding available. The area of mainland islands was not expanded as it was decided to direct the funding into species recovery projects and bolster existing mainland and offshore island programmes.

30. Given the lack of an explicit framework and an adequate condition and trend-monitoring network across all conservation lands, we cannot be confident that the progress to date is sufficient to reverse the overall decline in New Zealand's biodiversity. An overarching framework or model that identifies what proportion of New Zealand's biodiversity is currently secure and defines more explicit outcome targets related to sustaining representative examples of the full range of ecosystems is a high priority.

31. Similarly, a more structured approach to the reporting and management of all acutely and chronically threatened species is required; the data is not currently available to report on the whole period of 2000 - 2004 and to properly assess overall progress in achieving outcomes. The inability to deal with the decline of a large number of acutely and chronically threatened species ("priority species") appears to be due more to a lack of resources, rather than a lack of technical know how.

32. We see the emergence of integrated regional protection and restoration plans as signaling the way forward. Such an approach, set within a framework which explicitly defines biodiversity outcomes sought, reports on progress, and involves and maximizes the resources of DOC, regional and district councils and local communities, along with other relevant agencies, will greatly help to reverse the decline in biodiversity nationally.

## Table 1. Summary table of progress in Theme One

| **Summary of progress on Theme One action points (2000-2004)** | | | | |
|---|---|---|---|---|
| | **Priority Action** | **Package funding** | **Progress to date** | **Future priority?** |
| **Objective 1.1 Protecting indigenous habitats and ecosystems** | | | | |
| 1.1a Survey | No | No | Limited | Medium |
| 1.1b Add lands | Yes | Yes | Moderate | High |
| 1.1c Encourage mechanisms | Yes | No | Substantial | Low |
| 1.1d National Policy Statement | Yes | Yes | Limited | Low |
| 1.1e Expand funding | Yes | Yes | Substantial | High |
| 1.1f Remove barriers | No | No | Moderate | Low |
| 1.1g Strengthen information | No | Yes | Substantial | Medium |
| 1.1h Promote awareness | No | No | Moderate | High |
| 1.1i End unsustainable logging | No | No | Achieved | NA |
| 1.1j Phase out logging | No | No | Achieved | NA |
| **Objective 1.2 Sympathetic Management** | | | | |
| 1.2a Sustainable land | No | No | Moderate | Medium |
| 1.2b Urban environments | No | No | Substantial | High |
| **Objective 1.3 Pest management in habitats and ecosystems** | | | | |
| 1.3a Develop pest plans | Yes | No | Moderate | Medium |
| 1.3b Address barriers | No | No | Limited | Unclear |
| 1.3c Increase pest control | Yes | Yes | Substantial | High |
| 1.3d Increase pest research | Yes | Yes | Limited | High |
| **Objective 1.4 Terrestrial habitat restoration** | | | | |
| 1.4a Expand restoration | Yes | Yes | Moderate | High |
| 1.4b Regional strategies | No | No | Moderate | Medium |
| 1.4c Encourage communities | No | No | Substantial | Medium |
| 1.4d Use local species | No | No | Moderate | Medium |
| **Objective 1.5 Threatened terrestrial species management** | | | | |
| 1.5a Increase species recovery | Yes | Yes | Limited | High |
| 1.5b Review Acts | No | No | Limited | Low |

## Introduction

33. The scope of this theme is New Zealand's terrestrial ecosystems (including natural and modified habitats within and outside of protected areas, rural production landscapes and urban environments) and the indigenous species inhabiting these areas. We provide below commentary on the Theme One Actions of the Biodiversity Strategy focusing on progress in relation to key outcome areas covered in the outcome statement above. We provide general background information on the problems being addressed, the extent to which progress has been made for the period from 2000 to 2004, and extent and nature of the contribution made by funding from the Biodiversity Package. We also provide comment on future risks and changes in the wider environment that will influence future progress. The context for our comments here, as in those for other themes, is the overarching goal of New Zealand's Biodiversity Strategy, which is to halt and reverse the decline in New Zealand's indigenous biodiversity. Theme One can currently be considered the most important theme of the Biodiversity Strategy, as it will have received about $118.3M by the end of the 2004/05 financial year or 64% of the total 5-year biodiversity package.

## Analysis of objectives and actions

**Objective 1.1 Protecting indigenous habitats and ecosystems**
**a) Enhance the existing network of protected areas to secure a full range of remaining indigenous habitats and ecosystems.**
**b) Promote and encourage initiatives to protect, maintain and restore habitats and ecosystems that are important for indigenous biodiversity on land outside of protected areas.**

34. The actions identified for Objective 1.1 are intended to address the deficiencies in the current protected natural area network. These deficiencies are that the reserves network is unrepresentative of the full range of diversity of habitats and ecosystems and, that in order to achieve a more representative reserves network, land outside of the DOC-administered lands, particularly private land, will need to be protected, maintained and restored.

**Action 1.1 a**
**Complete indigenous biodiversity survey and assessment to identify habitats and ecosystems important for indigenous biodiversity.**
**Lead agency:** **DOC, LAs**
**Priority Action:** **No**
**Funding:** **Core only**

35. Until recently, the main nationally coordinated survey and assessment programme to identify habitats and ecosystems important for indigenous biodiversity protection has been the Protected Natural Areas Programme survey (PNAP). Lately, this survey has been given low priority and is under re-evaluation. No new surveys have been instigated

since 2001 and the current focus is on completing already-begun surveys and finalizing reports for publication. Of the approximately 270 ecological districts of New Zealand, 83 (31%) have been surveyed, and additionally, some 50 (19%) comprise mainly extensive protected natural areas and therefore are of low priority for survey. In 2000, an evaluation of the range of methods used in PNAP surveys (both past and current) was undertaken to assist in making choices about methods for future surveys (Bellingham 2001). The Bellingham review confirmed, subject to some revision of method and broader agency participation, the need for regional scale biodiversity surveys like PNAP to provide basic biodiversity information and identify priority sites for protection. Ad hoc surveys continue at a conservancy scale and several regional and district councils also contribute biodiversity information relevant to identifying important habitats. The current DOC focus is on providing a national overview of the level of legal protection of environments using the Land Environments of New Zealand (LENZ) classification (Leathwick et al. 2003).

36. A related framework for future DOC biodiversity monitoring activities has recently been scoped out for forests and other ecosystems (Lee et al 2004, Allen et al. 2003). But making a regional and national network operational would require a significant injection of funding and would take several years to fully develop and test. A system to monitor changes in extent and condition of terrestrial (palustrine and estuarine) wetlands (Clarkson et al 2003; Harmsworth 2002; Johnson & Gerbeaux 2004) has been trialed and is in operational use by several councils and DOC conservancies (see Theme Two).

37. ***Limited progress since 2001. Some 50% of New Zealand's ecological districts, including many that have ecosystems and habitats important for indigenous biodiversity, do not have even a reconnaissance-level biodiversity survey completed. While the statutory and planning context within which the PNAP began is now drastically altered, there is still a need for a nationally coordinated approach to identifying ecosystems important for indigenous biodiversity. The LENZ spatial framework will help to target surveys and assess significance, but LENZ will still need adequate and up-to-date ecological data layers to inform decision-making. Regional-scale ecological surveys also provide a platform for other monitoring requirements such as trend and condition assessment. A nationally coordinated (central, regional and local government) approach to the provision of relevant up-to- date biodiversity data is a much-needed priority***.

**Action 1.1b**
**Add to public conservation lands those habitats and ecosystems important for indigenous biodiversity that are not represented within the existing protected area network or that are at significant risk of irreversible loss or decline, or in situations where public ownership is needed for effective management**
**Lead agency:** **DOC**
**Priority Action:** **Yes**
**Funding:** **Core + Biodiversity Package**

**Representativeness**

38. The Biodiversity Strategy highlighted the lack of a representative network of protected natural areas, which had been known for some time. A LENZ analysis undertaken for the Department of Conservation has quantitatively demonstrated this imbalance. Land Environments (level 1) that are largely protected (see Table 1 below) are mainly located in upland and mountainous parts of the country with environments T, R, S, O and P ranging from 67-97% protection. In contrast, land environments in lowland parts of the country that coincide with important agricultural areas have low levels of legal protection with environments G, L, A, I, J, C, B, and N ranging from 0.6-7% protection.

39. **Table. Representativeness of New Zealand's protected natural area network as indicated by percentage of Level 1 Environment legally protected (data supplied to reviewers by DOC)**

| Environment Code | Environment Name | Percent of environment with legal protection |
|---|---|---|
| **R** | **Southern Alps** | **93** |
| **S** | **Ultramafic Soils** | **93** |
| **O** | **Western South Island Foothills and Stewart Island** | **82** |
| **P** | **Central mountains** | **67** |
| **M** | **Western South Island Recent Soils** | **50** |
| **G** | **Northern Recent Soils** | **7** |
| **L** | **Southern Lowlands** | **7** |
| **A** | **Northern Lowlands** | **5** |
| **I** | **Central Poorly-drained Recent Soils** | **2.7** |
| **J** | **Central Well-drained recent Soils** | **1.3** |
| **C** | **Western and Southern North Island Lowlands** | **0.9** |
| **B** | **Central Dry Lowlands** | **0.8** |
| **N** | **Eastern South island plains** | **0.6** |

40. In securing additional protected areas, Government agencies and Government administered funds e.g., Nature Heritage Fund, have increasingly been channeling efforts into improving the representativeness of the protected natural area network. Although no overall statistical summary is available, the increasing emphasis on protecting biodiversity values on private land and in using assessment criteria that explicitly include representativeness should be leading to an overall improvement. The methodology to quantitatively assess the extent to which representativeness of the protected natural area network has been achieved has been developed using the Land Environments of New Zealand spatial framework (Leathwick et al. 2003), but awaits full implementation. The three major funds, Nature Heritage Fund, Nga Whenua Rahui (NWR), and QEII Trust, supporting acquisition or protection of indigenous ecosystems on private lands have all

been successful in improving the representativeness of the protected natural area network, the former especially so as it uses selection criteria that include representativeness. In addition, QEII Trust explicitly reports on acquisitions that increase representativeness of habitats under threat and on critically scarce habitats protected (e.g., QEII Trust 2003/2004 funding report).

41. The Tenure Review of the South Island High Country pastoral leases has also provided opportunities for improving the representativeness of the DOC-administered lands. In July 2003, the Government adopted ten high country objectives, to ensure that Crown-owned land was managed in accordance with Government policy. One of those objectives (1g) requires that conservation outcomes for the high country are consistent with the New Zealand Biodiversity Strategy. There is, of course, tension between the goal of securing a more representative reserves network and of allowing continuing agricultural use on the most productive pastoral lease sites, as they strongly overlap. We are aware of several areas (e.g., Kirkliston Range) where we believe the tenure review process has not adequately addressed the issue of protecting significant indigenous vegetation and fauna habitat, and improving representativeness. Indeed, in a broad scale assessment of representativeness of protected areas in the South Island High Country, Walker et al. 2004b concluded that tenure review might be working against Government objective 1g and there has been a tendency to perpetuate the pattern of protecting less vulnerable already well-represented environments.

42. Recent analysis (Rutledge et al. 2004) of the extent of legal protection by LENZ Level II environments shows that for some level II environments (e.g. Central Dry Lowlands B5 & B6) even if all the remaining unprotected indigenous vegetation was added to the reserve network significant restoration and reconstruction would be required to achieve protection of just 1.0% of the original resource.

43. ***Moderate progress. The conservation lands in 2004 were slightly more representative of the original range of indigenous ecosystems and species than in 2000 and representativeness is more commonly being explicitly addressed in tenure reviews and reserve acquisition decision-making. The role of private landowners in correcting this imbalance will always be pivotal in the future. Important areas on private land, which could potentially improve the representativeness of the reserves network, are still being lost (see Irreversible Loss below) and opportunities to improve the representativeness through processes such as tenure review are not being fully realized. We would hope that these shortcomings in the tenure review process could be investigated and rectified. Even if all the remaining examples of poorly represented ecosystems or environments were protected, the fundamental imbalance between upland and lowland environments will remain in the network of protected lands. The only way to rectify this situation in some heavily transformed landscapes would be by restoration of highly degraded ecosystems or by reconstructing ecosystems from scratch.***

**Irreversible loss**

44. An issue closely related to improving the representativeness of the reserve network is the rate at which habitats and ecosystems important for the protection of indigenous biodiversity are being lost from the landscape. There is no information directly relevant to the period of interest (2000-2004). However, we have been able to gain a good sense of the changes in ecosystem extent just prior to this period. Walker et al. (2004a) estimate losses of indigenous ecosystem areas of 16,464 ha nationally between 1996/97 and 2001/02 based on a comparison of data from Land Cover Data Base 1 and LCDB2. This is equivalent to an annual rate of loss of 4,500 ha per annum. However, recent results using other methods, in particular, remote sensing (New Plymouth DC) and aerial photography (Waikato DC) suggest that change analysis based on LCDB may fail to detect the full extent of loss or, on the positive side, reversion of scrub to mature forest (K. Denyer pers. comm.; J. Dymond pers. comm.). However, as far as we can determine, the nationally assessed rate of loss is likely to be a reasonable estimate. Local data from Northland (Davis 2002), Rodney (Bellingham 2005), Gisborne (Chris Ward, pers. comm.), Southland (Brian Rance, pers. comm.) and Egmont Ecological District (Bruce Clarkson, pers. obs.), however, are unequivocal in showing loss of significant natural areas during the past 5 years. Economic drivers that continue to operate against retention of biodiversity resources include the high returns on a range of agricultural products and increased value of lands suitable for subdivision in and near most urban centres within the country.

45. We are therefore convinced that the extent of indigenous ecosystems has most likely continued to decline nationally and that significant natural areas, i.e., those with high biodiversity values, have been lost in many areas of the country even though accurate quantitative trends remain elusive. The LCDB change analysis also shows that greatest losses are occurring in districts or environments where more indigenous cover remains and where there is no legal protection (94.6% of loss). It is even less clear as to whether the rate of loss has declined since the instigation of the Biodiversity Strategy and whether this is attributed to the effects of the strategy. However, the DOC-administered lands have increased by 289,421 ha from 7,976,475 ha to 8,265,896 ha from 1995 to 2005. (DOC data supplied to reviewers). Data was not available to determine how this has benefited the representativeness of the DOC-administered lands. On a positive side, as lack of statutory protection is an important predictor of loss, there has been a significant reduction in the extent (almost 6 times the extent of annual loss) of indigenous ecosystems vulnerable to loss. The focus, however, needs to remain on indigenous ecosystem types most critically threatened and which may be being lost at the rate of 720 ha per year (Walker et al. 2004a)

46. Methods to analyze changes in extent of threatened ecosystems (e.g., Walker et al. 2004a) have improved significantly during the past 5 years and this has been largely driven by the need to assess progress of the Strategy. However, without a more permanent commitment to updating the LCDB or equivalent remote sensing techniques, analyzing change in the future will not be possible. Reviewing progress in this important area of

the strategy is being hindered by a lack of baseline data and a commitment to assessment of change in extent at identified milestones.

47. ***Moderate progress. There have been significant increases in the extent of indigenous ecosystems under statutory protection largely a result of the Biodiversity Package (see 1.1e). But indigenous ecosystems, some with very high biodiversity values, were being lost at a rate of approximately 4,500 ha per year up to 2001/2002 and there is no evidence that this rate of loss has declined. Without statutory protection or more effective voluntary protection mechanisms, across the majority of remaining indigenous ecosystems, this is unlikely to change in the near future. The methodology to track changes in extent of threatened ecosystems is available but financial support for regular monitoring (e.g., every five years) is uncertain. To update the Land Cover Data Base or to use other methods such as remote sensing would cost at least $500,000 every 5 years. This expenditure of approximately $100,000 per annum would provide crucial information on a range of policy and management decisions at central and regional government levels.***

**Action 1.1c**
**Encourage and support initiatives to protect and maintain habitats and ecosystems important for indigenous biodiversity on private land using a mixture of mechanisms, recognising the rights, responsibilities and interests of landowners and society, including information, education, voluntary mechanisms, economic incentives, property rights and regulation.**
**Lead agency:** **MfE**
**Priority Action:** **Yes**
**Funding:** **Core only**

48. A wide range of mechanisms to protect and maintain habitats and ecosystems important for indigenous biodiversity on private land is being utilized (MfE et al.2004; MfE 2004). Of 77 councils surveyed by MfE, 84% have rules in their plans relating to biodiversity while 16% have no rules. On the incentive side 55% of councils offer rates relief, 35% have awards and 82% provide education and advice for landowners. The MfE survey results showed that councils use a combination of policy tools and mechanisms to support biodiversity protection. A majority of councils use regulation through subdivision controls and provide support for on the ground activities such as covenanting; Landcare groups, education and landowner advice (see also Action 1.1h). There is limited information available to indicate the degree of success of this support and encouragement on achieving outcomes. Ideally, the work of Walker et al. (2004a) could be updated to cover the period of interest and in combination with the type of information collected in the MfE survey a rigorous analysis undertaken of the effectiveness of different types and mixes of incentive and regulation on the outcomes sought by the Biodiversity Strategy. A recent study (Bellingham 2005) contrasts Waitakere District Council and Rodney District Council approaches (incentives versus rules from the mid 1970s to 2000) and demonstrates that the incentive–based regime in Rodney has failed to arrest the loss of forest cover, particularly the more diverse mature forest types. Bellingham concludes

that although voluntarism and incentives may be more palatable in avoiding conflict they do not provide the long-term certainty needed for conserving nature in the landscape.

49. ***Substantial progress. There is no doubt that most councils encourage and support initiatives to protect and maintain habitats and ecosystems important for indigenous biodiversity on private land. But more relevant, in our view, is the level of effectiveness of this support and encouragement. As outlined in Action 1.1b, indigenous ecosystems with high biodiversity values continue to be lost in many areas of the country and lack of statutory protection (reserve status) is an important predictor of loss. The general trend is for regions with greater levels of biodiversity resource outside of protected areas to show higher rates of loss.***

**Action 1.1 d**
**Prepare a national policy statement and related material to provide guidance to local authorities on implementing provisions of the Resource Management Act relevant to conserving and sustainably managing indigenous biodiversity.**
**Lead agency:** **MfE, DOC**
**Priority Action:** **Yes**
**Funding:** **Core + Biodiversity Package**

50. The development of a National Policy Statement on indigenous biodiversity has been underway since 2001. The government was expected to make decisions by the end of June 2005 about its progress. Early drafts of the National Policy Statement focused on providing a comprehensive set of policies including criteria to identify significant vegetation and wildlife habitat. The development of LENZ in 2003, which maps areas according to similar environmental characteristics, has enabled quantitative delineation and identification at the national scale environments within which indigenous ecosystems have been significantly reduced from original extent. The new proposed approach to the National Policy Statement uses this spatial framework and focuses on identification and protection of ecosystems that are threatened nationally, either because they are significantly reduced from their original extent or naturally uncommon. Most councils in New Zealand have already confronted many issues contained within the draft policy statement and there is now a significant body of case law relating to issues such as significance assessment (see New Zealand Ecological Society website). Several councils have developed and operate their own guidelines to applying regional criteria and determining significance level (e.g., Environment Waikato 2002). We suspect that in recent years there has been an increased willingness to arbitrate on issues related to protection of indigenous ecosystems, although recent Environment Court cases show there is still a need for a more coordinated national approach to determining which areas are important for indigenous biodiversity protection.

51. ***Limited progress. We have been informed that the release of a draft National Policy Statement is imminent. However, many regional and district councils have already addressed the key issues relating to recognizing and providing protection of significant natural areas in their regional policy statements, district plans and management plans etc. Some opportunities for national coordination and consistency have thus been lost***

***although issues vary considerably from region to region and generic approaches likely to be advocated in a National Policy Statement may have some limitations. In some districts progress has probably already surpassed the need for national guidelines while in others capacity issues may limit progress. The development of the LENZ spatial framework, while a valuable step for focusing and prioritizing biodiversity actions, will still require adequate ecological (biological) data layers to fully benefit on-the-ground decisions and actions. This area particularly needs much stronger national leadership and integration, and collaboration of activities between central, regional and district government agencies.***

**Action 1.1 e**
**Expand and modify existing national funding mechanisms (the Nature Heritage Fund, Nga Whenua Rahui and Queen Elizabeth II National Trust) to meet current demand by landowners and communities where a priority, to protect habitats and ecosystems important for indigenous biodiversity, and to maintain the condition of protected areas through fencing and pest management.**
**Lead agency:** **DOC, MfE**
**Priority Action:** **Yes**
**Funding:** **Core + Biodiversity Package**

52. The Nature Heritage Fund (NHF), Nga Whenua Rahui (NWR) and Queen Elizabeth II National Trust (QEII) have substantially increased activity between 2000 and 2004 using the extra Biodiversity Package funds. The Nature Heritage Fund purchased some 73,358 ha and covenanted 7,383 ha of the total area protected of 147,115 ha and 10,171 ha covenanted respectively since its inception in 1995. Nga Whenua Rahui now has over 210,000 ha of Maori owned land in formal protection. QEII registered 21,968 ha of covenants between 2000 and 2004, representing 58% of the total area of registrations achieved since 1995. The individual land parcels protected by NHF and NWR tend to be much larger (covenant means 117 ha and 1195 ha respectively) than the areas covenanted by QEII that have a mean size of 34.5 ha and a median size of 6.5 ha (unpublished data supplied by QEII). We would note, however, that a number of threatened species are being protected within QE II covenants.

53. The Biodiversity Condition and Advice Funds were set up in 2002 and $5.5 million has now been allocated from the Condition Fund to almost 500 projects. Almost $3 million has been allocated from the Advice Fund so far, including $110,000 to a biodiversity advice service for rural landowners in the Waikato. Altogether, between 2000 and 2004 the Biodiversity Condition Fund has assisted private landowners to fence, control pests and undertake restoration planting to the value of $6.532M. Most of this has been in areas poorly or inadequately represented in the wider protected natural area network. The QEII annual report (2003/04) shows 75% of 853 covenants as having good canopy condition and only 2% showed a deteriorating trend. And, for ground cover condition, the equivalent figures are 56% and 7%. No equivalent data has been made available to us for the areas protected by NHF or NWR although indirect measures of funding spent on pest control in these areas also suggest an improvement in condition. For example, NWR

funded possum, goat and other pest control of more than 36,000 ha of land protected by NWR covenants up to 2002/2003.

54. ***Substantial progress. The three funds have been effective in increasing the area of indigenous ecosystem protected and the representativeness of the reserve network (see Action 1b). However, we have some small concerns regarding the extent of targeting of funding to focus on protection of the most threatened ecosystems and the generally small size of covenants protected by QEII covenant that in some cases may be difficult to sustain in the long term. The condition monitoring being undertaken by QEII is commended. We propose that a requirement of all funding to support protection of indigenous ecosystems should include an adequate proportion of the funding (c. 5%) for appropriate condition and trend monitoring. The lack of condition and trend monitoring over the majority of land protected by these funds makes it impossible to determine whether restoration outcomes are being adequately achieved***.

**Action 1.1 f**
**Identify and remove legislative and other barriers to local authorities using economic incentives (such as rate relief and financial contributions for costs), and investigate new joint national and regional/local funding mechanisms to encourage and support the protection of ecosystems and habitats important for indigenous biodiversity on private land.**

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|---|---|
| **Lead agency:** | **MfE** |
| **Priority Action:** | **No** |
| **Funding:** | **Core only** |

55. We have not been able to identify significant barriers to local authorities using economic incentives such as rates relief and financial contributions for costs to encourage and support the protection of ecosystems and habitats important for indigenous biodiversity on private land.

56. Forty-two councils (55% of those that responded to a survey by MfE in 2004) (MfE et al. 2004) offered rates relief for such activity. Twelve out of 16 regional councils and 20 out of 73 district councils operate contestable funds to help pay for the costs of protecting biodiversity on private land.

57. There are no joint funding mechanisms between local authorities and central government although this was investigated when the Biodiversity Condition and Advice Funds were set up. Instead, local authorities can co-ordinate applications from landholders and apply on their behalf for funding via the Biodiversity Condition and Advice Fund (see above). A number of councils have actively engaged in this process, particularly in Bay of Plenty, Canterbury, Wellington, Wanganui/Manawatu, Northland, Tasman and Marlborough.

58. ***Moderate progress. While no significant barriers are apparent, the extent to which local authorities use economic incentives to support the protection of indigenous ecosystems varies and is probably largely determined by the wealth and/or rating base of individual councils. Unfortunately councils with the greatest financial resources***

***also tend to be the ones where the extent of indigenous ecosystems has already been markedly reduced while those with extensive areas of unprotected indigenous ecosystems have greater economic constraints. The critical need for economic incentives to counter economic drivers leading to irreversible loss is in regions where larger amounts of high value biodiversity resource remain. There is evidence of more co-ordination developing between agencies in seeking and allocating contestable funds, but a decision was taken not to develop joint (national/regional/local) funding mechanisms to support protection of ecosystems and habitats important for protection on private land.***

**Action 1.1 g**
**Develop and strengthen information systems to increase access by local authorities, iwi and hapu, sector groups, communities and landowners to indigenous biodiversity survey and ecosystem data and information about indigenous biodiversity management priorities and protection mechanisms.**
**Lead agency:** **MfE**
**Priority Action:** **No**
**Funding:** **Core + Biodiversity Package**

59. In June 2000 the Terrestrial and Freshwater Information System (TFBIS) Programme was established using Biodiversity Package funds. This was allocated $9.6 million over five years and $2.714 million annually thereafter (see Theme Nine Action 9.5 for more detail).

60. MfE has partly funded the LENZ spatial framework and distributed this free of charge to all local authorities. This information will also be made more widely available to iwi, sector groups, communities and landowners. It is important to note however that LENZ does not contain biodiversity information per se but rather a classification (spatial framework) based on environmental variables that are predictors of biodiversity. It will enhance prioritization and selection of potential places for management attention, protection and restoration, but will need to be supplemented by biotic data.

61. The New Zealand Protected Natural Area Programme (PNAP), reports which often provide the only published regional scale inventory of indigenous ecosystems within a region, are an important source of such data. A report reviewing the use and management of PNAP survey reports (Wildland Consultants 2004) recommends they be scanned to enable image format .pdf files to be provided on request.

62. Funding from the Biodiversity Advice Fund is assisting in the provision of or facilitation of access to information relevant to the management, protection and restoration of indigenous ecosystems particularly projects such as Biodiversity Advice Waikato that focuses on helping private landowners obtain such information.

63. Also relevant to this Action point are the efforts of Crown Research Institutes (funded by the PGSF) in making their indigenous biodiversity databases more accessible. Examples include Landcare Research's National Vegetation database and New Zealand Plant

Names database. These and many others have become accessible over the web in recent years and contain information relevant to groups interested in maintaining and restoring indigenous biodiversity. We also note the large amount of information now being made available on the World Wide Web by groups such as the New Zealand Ecological Restoration Network (NZERN) on a voluntary basis.

64. ***Substantial progress. A large amount of data and information is being made accessible to parties interested in maintaining and restoring indigenous ecosystems but our impression is that the information providers are still largely driving this action. We would encourage a much greater level of involvement from potential users of the information in the decision-making regarding the nature and type of data and information being made more accessible. This would ensure greater usefulness of the information for end user biodiversity outcomes***.

**Action 1.1 h**
**Promote landowner and community awareness of opportunities to conserve and sustainably use indigenous biodiversity, and to protect and maintain habitats and ecosystems of importance to indigenous biodiversity on private land.**
**Lead agency:** **LAs, MfE, DOC**
**Priority Action:** **No**
**Funding:** **Core only**

65. As noted above (see Actions 1.1c & 1.1e), there has been a significant increase in QEII covenants over the past 5 years and this has resulted from an increasing awareness by private landowners and the community of the importance of protecting important ecosystems on private land. Of 77 councils surveyed (MfE et al. 2004), 23 (30%) stressed the importance of encouraging voluntary methods for protecting indigenous vegetation and habitats. This approach was coupled with extensive awareness raising and education programmes mentioned by 16 councils. Again, 23 councils (30%) outlined provisions to deal with the existence of biodiversity on private land including financial incentives, rates relief and promoting the use of covenants as a protection mechanism. Twelve out of 16 regional councils and unitary authorities have contestable funds available for landowners, amounting to an investment of $4.26 million per annum. This is comparable to the Government's funding for both the Biodiversity Condition Fund and the Biodiversity Advice Fund. Since the publication of the MfE report at least one regional council (Environment Waikato) has significantly increased the contestable funds available for biodiversity protection. Many community-based initiatives have benefited from allocations from these funds. For the district and city councils the information is not as complete. But of 64 district and city councils responding to the MfE survey, 20 (31%) had contestable funds totaling $447,000 in 2002/03 (MfE et al. 2004).

66. In relation to sustainable use, all harvesting of indigenous forest on private land is subject to the Forests Amendment Acts of 1993 and 2004 and requires sustainable management plans and sustainable forest management permits. The Forests Amendment Act 2004 clarified that all land needs to comply with requirements under the Resource Management Act 1991. This amendment also complements, and forms part of, a policy

package offered to South Island Landless Natives Act (SILNA) landowners. Over the period from 2002 to 2008, the policy package provides assistance for SILNA owners to pursue sustainable forest management or to enter into conservation covenants. The Government is offering a tax exemption payment for forests of high conservation value, placed under permanent reservation through conservation covenants. Under the Forests Amendment Act 2004, unsustainably harvested timber from indigenous SILNA forests may now only be sold on the domestic market. Thus, no unsustainably harvested timber from indigenous forests from any source (except planted) may be exported. SILNA forest owners who wish to harvest timber from their forests may come under the Forests Act provisions for sustainable forest management (which apply to all other private indigenous forest owners). In this case, owners can sell timber both on the domestic market and can export rimu and beech sawn timber and finished products of any species as allowed under the Act. Alternatively, they may remain outside the Forests Act requirements where they can log or clear-fell their forests (subject to district plan provisions under the Resource Management Act) and sell the resulting timber on the domestic market. However, export sale of timber from forests in this case can only be in the form of finished products.

67. ***Moderate progress. There is indirect evidence of increasing awareness and landowner involvement in the conservation of indigenous ecosystems on private land. Significant amounts of funding are now dedicated to indigenous biodiversity protection and enhancement in regions via contestable funds. However, there are still significant numbers of councils at the district scale that are not providing incentives or contestable funds to support biodiversity protection on private land. Again, we note the need to ensure the targeting of funding to the protection of the most threatened ecosystems and for building in trend and condition monitoring to ensure that restoration outcomes are being achieved.***

**Actions 1.1 i & j**
**End unsustainable logging of indigenous forest on Crown-managed land as soon as is practicable.**
**Review and phase out indigenous forest logging on Crown-managed land as soon as is practicable.**

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|---|---|
| **Lead agency:** | **Treasury** |
| **Priority Action:** | **Yes** |
| **Funding:** | **Core only** |

68. The Government decided in 2000 to ban indigenous logging on Crown-owned land. In 2001 logging was halted on Timberlands (a state owned company) West Coast estate (130,000 ha) and the land was placed under the control of DOC.

69. ***Actions achieved. However, the recent logging of approximately 100 mature rimu in Taunoka Conservation Area, Wanganui Conservancy revealed a legal loophole relating to cutting rights obtained in 1980 with the now defunct Department of Lands and Survey. An agreement in principle between the Wanganui District Council and***

***Wildlife Properties Ltd means no more logging will occur until 2008 and this delay may provide an opportunity to prevent further logging.***

**Objective 1.2 Sympathetic management**
**Integrate and use measures in the sustainable management of production lands and urban environments that are sympathetic to indigenous biodiversity.**

70. The actions identified for Objective 1.2 are intended to address the need to buffer and support biodiversity in protected areas by sympathetic management of production lands and urban environments. These areas may never support indigenous biodiversity to the extent of the core DOC-administered lands. However, sympathetic management may reduce the level of off-site impacts and extend suitable habitat for indigenous species to areas where previously landscape transformation would have removed most vestiges of indigenous biodiversity.

**Action 1.2 a**
**Incorporate indigenous biodiversity priorities into programmes for sustainable land management, including those under the Sustainable Land Management Strategy and related strategies and provide advice on giving effect to these priorities.**
**Lead agency:** **MfE**
**Priority Action:** **No**
**Funding:** **Core only**

71. The Sustainable Land Management Strategy of 1996 has since lapsed without making a significant contribution to addressing impacts of land use on terrestrial biodiversity. It was replaced by the Sustainable Farming Fund (SFF), which could contribute to incorporating indigenous biodiversity management into improved land management.

72. MfE works closely with, and provides funding to, New Zealand Landcare Trust, an organization that is committed to incorporating indigenous biodiversity priorities into sustainable land management practices. Set up in 1996 as a voluntary organization to encourage sustainable land management through community involvement, the Trust fosters an ethic of environmental stewardship. Some 187 Landcare groups are now operating nationally dealing with a wide range of issues, including sustainable farm production, protection and rehabilitation of sensitive environmental areas, pest and weed control, and native bush monitoring and biodiversity enhancement. Various programmes relating to sustainable development are underway including the Dairying and Clean Streams Accord between Fonterra, councils and central government that encourages riparian planting using indigenous species.

73. A range of Sustainable Management Fund (SMF) and Sustainable Farming Fund (SFF) projects are working on aspects of sympathetic management. The focus, however, is mainly on sustainable environmental management rather than biodiversity protection and enhancement. For the Sustainable Management Fund, one of 13 topic areas funded

(Maintaining and restoring biodiversity) is directly relevant to the Biodiversity Strategy and several others are indirectly related. In the Maintaining and restoring biodiversity topic area, projects funded have included development of a Native Forest Monitoring and Assessment Kit (FORMAK) and several Action Bio-Community projects. Of the many SFF projects funded since 2000 (324 projects) only a few have a direct connection to biodiversity issues including one on use of native trees on farms, one on integrating New Zealand flax (harakeke) into land management systems and one considering the compatibility of biodiversity conservation and economic production. The connection between both of these funds and the Biodiversity Strategy is unclear and they could be better linked. As we suggest in Theme Two (Action 2.1a), the SFF should be used more deliberately to include indigenous biodiversity in the improvement of farm management.

74. The lack of integration between the Biodiversity Strategy and wider issues surrounding ecologically sustainable uses and services of native trees and plants in the landscape and how these might contribute to biodiversity has been addressed by the Parliamentary Commissioner for the Environment's (PCE) 2002 report "Weaving resilience into our working lands: future roles for native plants on private lands". Recommendations made in this report included expanding the research funding for investigating economic uses of native plants, and providing tax deductions to landowners conserving indigenous biodiversity or establishing and maintaining nurse crops for native forestry. We believe that incentives such as these would assist in breaking down the current artificially sharp distinction in biodiversity value and management between working and conservation lands. As far as we are aware none of these PCE recommendations were actioned.

75. ***Moderate progress. We note that there are many opportunities for indigenous biodiversity protection and enhancement to occur in tandem with sustainable land management but these have not been fully exploited so far.***

**Action 1.2 b**
**Encourage and support the protection, maintenance and restoration of indigenous biodiversity in urban environments, recognising the importance of urban initiatives to enhance community awareness of, and involvement in, biodiversity conservation.**
**Lead agency:** **MfE, DOC**
**Priority Action:** **No**
**Funding:** **Core only**

76. As noted above (1.1 h), several city councils have contestable funds designed at least in part to encourage community groups to protect, maintain and restore indigenous biodiversity in urban environments. A significant number of the 3000 restoration projects registered on the NZERN database are from urban and peri-urban areas (M. Peters pers. comm., NZERN). Prior to the release of the Biodiversity Strategy seven territorial authorities (including the cities of Christchurch, Hamilton, Nelson, Waitakere and Wellington) had formally adopted Agenda 21 (Agenda 21, the Rio Declaration on Environment and Development was adopted by more than 178 Governments at the United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro, Brazil, 1992) and this has helped promote environmental sustainability including

aspects of biodiversity protection and enhancement. Waitakere City not only adopted Agenda 21 but also declared itself an "eco-city" and has been at the forefront of thinking about sustainable ways to accommodate rapid population growth (PCE 2002a). Internationally, the focus on "green cities" is still growing with the United Nations Environment programme meeting in San Francisco in 2005 and the realization that increasing urbanization can lead to a loss of connection to nature and the environment (Crane & Kinzig 2005).

77. A conference sponsored by the Royal New Zealand Institute of Horticulture held in Christchurch in October 2003 (www.rzih.org.nz/pages/conference2003.htm) and reviewed in Ecosystem Management and Restoration (Clarkson & Meurk 2004) provided a useful point at which to assess the extent to which this action point is being addressed. Many papers presented at the conference acknowledged or accepted that cities were the key to turning the threats to our natural habitats and biodiversity around. This is because cities and peri-urban areas can support a high proportion of our natural diversity, as they occur in lowland complex or transitional environments; and also because cities are the centres of culture, labour and economic resources. Green networks and corridors are now standard approaches in most urban areas although the emphasis has not been on indigenous biodiversity until recently. More recently the concept of natural heritage parks or sanctuaries has been taken up in many cities for example Wellington (Karori), Auckland (Tawharanui), Christchurch (Styx) and Hamilton (Waiwhakareke).

78. These projects and many others present significant opportunities and are leading to a convergence and stretch of skills that are taking traditional city parks, gardens and utilities management towards the realms of ecosystem management. Zoos and botanical gardens can be an integral part this process in providing the infrastructure and expertise for breeding and propagation of threatened plants and animals.

79. The New Zealand Urban Design protocol sponsored by MfE was promulgated in March 2005. One of the seven essential design qualities being promoted for New Zealand towns and cities is heritage enhancement (including biodiversity) and environmental sustainability.

80. To date the Biodiversity Advice and Condition funds have largely supported projects in rural areas of New Zealand but a particularly relevant project funded in 2004 was the Biodiversity Advice Programme for Urban Landowners (Kaipatiki Ecological Restoration Project).

81. ***Substantial progress. We note that New Zealand is essentially an urban nation as some 87% of the population is urban dwellers. The progress to date has been largely driven by other initiatives, not by the Strategy, but the opportunities presented by involving urban dwellers in indigenous biodiversity restoration are significant. The ecological footprint of urban dwellers and their preparedness to mitigate effects on indigenous ecosystems, on and off site, and integrate biodiversity protection with sustainable development will significantly determine the future of indigenous biodiversity nationally. By strengthening the connections between urban dwellers and***

***nature, support and resources for regional and national scale restoration could be greatly enhanced. Consequently, we suggest this action warrants greater priority than it has received to date.***

**Objective 1.3 Pest management in habitats and ecosystems**
**Prevent, control and manage plant and animal pests, to maintain or improve the condition and health of habitats and ecosystems important for indigenous biodiversity.**

82. The actions identified for Objective 1.3 relate to the need to control and manage plant and animal pests because of the significant levels of degradation and biodiversity loss that occur when they are unchecked. This objective was given high priority in the Biodiversity Package with $34.38M allocated to animal pests and $22.77M to weeds.

**Action 1.3 a**
**Develop and implement strategies and plans, including national and regional pest management strategies, to manage those plant and animal pests posing significant threats to indigenous biodiversity.**
**Lead agency:** **DOC, MAF, RCs**
**Priority Action:** **Yes**
**Funding:** **Core only**

83. No new national terrestrial animal pest strategies have been developed since 2000, but amendments to the National Pest Management Strategy for Bovine Tuberculosis are relevant as they strengthen efforts to control possums and ferrets as vectors of Tb.

84. Progress objectives confirmed in the 30 September 2004 amendment were:
- To prevent the establishment of vector populations (principally ferrets and possums) infected with Tb in areas that are Tb-vector free from 1 July 2004.
- To increase the area deemed to be Tb-free to at least 226,000 square kilometres by 30 June 2006. (As at 30 June 2004, the area was 201,750 square kilometres).
- To reduce the mean annual number of infected vector-related breakdowns in herds located in Tb-vector risk areas to no more than 12 breakdowns to every 1000 uninfected herds.

85. No national plant pest strategies have been developed although DOC's Strategic Plan for managing Invasive weeds (Owen 1998) is a national plan for the Department of Conservation. A national surveillance plant pest list has operated since 1996 and recently has been replaced by the National Pest Plant Accord. It identifies pest plants that are prohibited from sale and commercial propagation and distribution across the country. The Accord came into effect on 1 October 2001 and is an agreement between regional councils and government departments with biosecurity responsibilities. It provides a consistent approach to managing pest plants and ensures sound, environmental outcomes for controlling and eradicating pest plants across the country.

86. Regional pest management strategies, however, continue to be developed by regional councils and these provide a valuable vehicle for updating and revising the animal and plant species considered as environmental pests. Valuable background research is being conducted by regional councils as part of the process of revising which plant pests are to be listed in regional pest strategies.

87. ***Moderate progress. A national strategy for prioritization and management of pest plants, similar to that already administered by DOC, should be more economical to operate and offers several advantages, including improved inter-regional consistency and co-operation, improved weed risk assessment techniques, better surveillance, and integrated research programmes. Greater coordination and cooperation between DOC and regional and district councils would further enhance progress at the regional scale.***

**Action 1.3 b**
**Review and address barriers to agencies integrating an indigenous biodiversity focus in national and regional pest management strategies under the Biosecurity Act (see Theme Five).**
**Lead agency:** **Biosecurity Council**
**Priority Action:** **No**
**Funding:** **Core only**

88. We are not aware of any specific initiative undertaken by the Biosecurity Council to consider this action before it went out of existence in 2003. While the intent of the action could be clarified, its primary focus appears to be on improving consideration of indigenous biodiversity issues in regional pest management strategies that are prepared under the Biosecurity Act. We have not been provided with information that might show how serious this issue is and therefore what future priority it warrants. The re-organisation of biosecurity management (see Theme Five) should make it easier to consider the extent to which this action is an issue and what remedial actions are needed.

**Action 1.3 c**
**Increase plant and animal pest control and management efforts to levels congruent with national biodiversity goals in areas on protected public conservation lands important for indigenous biodiversity.**
**Lead agency:** **DOC**
**Priority Action:** **Yes**
**Funding:** **Core + Biodiversity package**

**Plant pests**

89. The conservation lands, both public and private, is currently threatened by some 327 significant weed species and is subject to ongoing invasion by weeds at a rate of at least 2-3 new species per year, which naturalize from existing cultivation. These weeds are the main risk factor for at least 61 native threatened plants. They also have the potential in

many cases to completely change the nature of ecosystems and in some cases these changes may be irreversible.

90. On the DOC-administered lands a pragmatic approach has been adopted that recognizes not all weeds can be combated across the entire landscape. Thus weeds are controlled at high biodiversity sites and at sites where there is a good chance of removing weed species before they become widely established. We have been provided with good evidence of well-established prioritization methodologies and operating procedures and a robust overall strategic framework. This was under development before the advent of the Biodiversity Strategy but has strongly capitalized on the new opportunities presented by the additional funding. Currently some 777,000 ha or 10% of the DOC-administered lands is under sustained weed control and without the additional funding from the Package this area would be only 310,800ha or 4% of the DOC-administered lands. The Biodiversity Package funds have allowed DOC to not only increase the area treated but to develop other aspects such as monitoring, surveillance, database development, public weed awareness and research.

91. The new money has been largely used to prevent new weeds from establishing and preventing infestations of existing weeds on important sites from expanding. In addition, new initiatives to foster interagency co-operation and to encourage community support in controlling weeds have been undertaken, for example, the Weedbusters programme. Launched in October 2003, Weedbusters is a public awareness and education programme focusing on invasive weeds. DOC and regional councils have a lead role and along with other district and local councils and community groups have all begun to work together to reduce the threat of weeds to the natural environment. Weedbusters is now well established in all regions of New Zealand and has an active and well-attended programme of events including on the ground weed control in public and private protected areas.

92. Alignment of spending on pest control programmes between central, regional and local government agencies is a key issue for ensuring that pest control and management is cost effective and most effective on the ground. Pest managers in 14 regional councils and three unitary authorities indicated that 86% of their pest control programmes were aligned with DOC and other agencies, and community group programmes such as QEII (MfE et al. 2004). Some $11.24M was spent by councils on plant pest control in the 2003/04 financial year.

93. ***Substantial progress. It is evident that good progress on this action has been made and that this is largely a result of the additional funding. We believe the Weedbusters approach is the most important development during the past 5 years as it capitalizes on the synergies between DOC, regional and district councils and community voluntary efforts. It will, however, require a good level of ongoing support to reach its full potential and prevent burn out. However, the threats posed from weeds are continuing to expand as New Zealand's population increases with human activity the main driver behind the increasing abundance and spread of weeds. Given this scenario and the significant increase in conservation estate being achieved in the South Island High Country, maintaining the rate of gains in weed control will require additional funding***

***and resources. Continuing efforts to align pest control and management programmes among central, regional and local agencies and community groups should continue to improve outcomes***.

**Animal pests**

94. New Zealand indigenous ecosystems and their associated species are particularly vulnerable to the impacts of many introduced animals. Since there were previously no mammalian browsers the fauna is particularly vulnerable to competition and predation from introduced animals. Control operations are required for at least 46 pest animal species of which 28 are mammals. All habitat types in New Zealand are vulnerable to some loss of indigenous biodiversity from pest animals and many pest animals are widespread throughout the country.

95. More than 2.2 million ha (27.5 %) of the 8 million ha of DOC-administered lands in 2003/04 received some form of pest animal control. Pest animal control has become increasingly integrated with a greater emphasis on a site-led approach. This has arisen from recognition of both additional benefits of multiple pest removal and negative consequences of single pest species removals[1]. Much research is still required to fully understand how to successfully and efficiently conduct multiple pest control and this is the focus of a recently Public Good Science Fund (PGSF) funded Landcare Research project "Multiple pest dynamics". This project seeks to understand interactions of possums, ship rats and stoats with large-scale pest removal in both mixed forest and dryland environments. It will identify when, where, and what combination of pest species needs to be controlled for greatest conservation benefit. Also required is a much better understanding of the levels of pest control required to achieve particular species or ecosystem outcomes. For example, the relationships between levels of possum browse on native plants and possum density vary depending on the particular plant species involved[2]. These complexities mean that measuring achievement of biodiversity outcomes is difficult and time consuming.

96. The area of DOC-administered lands under sustained possum control is currently some 1.1 million ha. The Biodiversity Strategy funding has supported an increased area (287,000 ha) of sustained possum control in the last five years.

97. Progress has also been made in developing new control techniques for rodents, pest fish, ants, goats and stoats, and the scale of rat eradication on an offshore island (Campbell Island) is unparalleled elsewhere in the world. Development of pest proof fences presents new opportunities for total pest control over areas up to several hundred ha (e.g., Karori Sanctuary) but with the future prospect of areas exceeding 3,000 ha (e.g. Maungatautari Ecological Island Trust). There is currently 1,300 ha protected by high

[1] Sweetapple (2002) shows that 1080 poisoning of possums in native forest may result in long-term increases in rat numbers.

[2] Cowan & Phillips (2004) note that protecting native mistletoe requires possum numbers to be reduced and maintained at below 3% trap catch while protection of a suite of common broadleaved species may only require possums to be maintained at about 20-25% trap catch.

quality predator proof fences in New Zealand and there are projects totaling a further 10,000ha that are in advanced planning stages and have a moderately high to high likelihood of being completed within the next 3-5 years (R. McGibbon, Xcluder Fence Company, pers. comm.). These predator-proofed areas will be on lands of all tenure, from private land to land administered by territorial local authorities and the Department of Conservation. We believe that the efficiency of pest animal control has increased during the period of interest and that the development of new technologies will continue to provide improved control levels and cost effectiveness.

98. New populations of pest species have resulted from intentional human translocation movement within New Zealand (e.g., wallabies and sika deer) but no new animal pests are known to have colonized the DOC-administered lands.

99. There is currently an unprecedented expenditure on possum control in New Zealand but this is mainly under the National Pest Management Strategy for Tb (Cowan & Phillips 2004). Control expenditure under the NPMS (about $54M p.a.) is projected to decline with time as the strategy moves to a successful outcome, hopefully by 2013. As much of the possum control for Tb management occurs on private land and on farm-forest margins, there is a risk that biodiversity benefits from that control will be lost as possum control shifts or declines under the Tb NPMS. There is some urgency to this issue, as the Tb reduction strategy is running ahead of forecast and possum control is already stopping in some areas (Cowan & Phillips 2004). A review is underway of the implications for biodiversity following the winding down of Animal Health Board (AHB) possum control programmes. While there is considerable uncertainty about the benefits that have flowed from the AHB expenditures, there are a number of implications including the role of regional authorities that will need to be considered.

100. Alignment of spending on pest control programmes between central, regional and local government agencies is a key issue for ensuring that pest control and management is cost effective and provides the best outcomes. Some $17.23M was spent by councils on animal pest control in the 2003/04 financial year. Pest managers in 14 regional councils and three unitary authorities indicated that 86% of their pest control programmes were aligned with DOC and other agencies, and community group programmes such as QEII (MfE et al. 2004). Many of the larger scale pest control operations nowadays e.g., Hakarimata Scenic Reserve and Maungatautari Scenic Reserve are the result of government agency and community partnerships with multiple funding sources. Partnership models will play an increasing role for pest control on public and private land.

101. ***Substantial progress. It is evident that good progress has been made on this action but more will need to be done to further integrate pest control and to determine thresholds for pest abundance in relation to specific biodiversity gains and levels of ecosystem recovery. Furthermore, there is no sign that the need for ongoing pest animal control will abate. Additional threats are presented by the increases in deer populations on the DOC-administered lands (following the feral venison export industry downturn), the increasing community resistance to the use of toxins (such as 1080), and the strong***

***reliance on support from Tb control programmes funded by the Animal Health Board. Success can certainly be demonstrated for some high value places such as offshore and mainland island eradications. But we are also aware that extensive tracts of DOC-administered lands receive little or no pest control and that in some cases this is leading to severe degradation of indigenous ecosystems and loss of threatened species. We are not convinced that adequate ecosystem condition and trend information is available at regional and national scales to assess the extent to which current pest animal control is sufficient or to gauge overall reversal of biodiversity decline.***

**Action 1.3 d**
**Increase research into, and development of, new technologies and techniques to combat existing and emergent threats from plant and animal pests to indigenous biodiversity.**
**Lead agency:** **DOC, RCs**
**Priority Action:** **Yes**
**Funding:** **Core + Biodiversity Package**

102. In July 1999, a stoat control research programme was initiated, with funding outside of the Biodiversity Package, with $6.6 million over five years. The four key objectives of the Programme were:
    - To make stoat control more cost-effective where it is already successful,
    - To develop new techniques so that control can realistically be undertaken in more and larger areas,
    - To expand the arsenal of methods to ensure that stoat control, and the consequent benefits to biodiversity, are sustainable,
    - To seed new, longer-term projects that have the potential to dramatically increase the effectiveness of control.

103. The benefits of the research have been in increasing levels of understanding about the nature and extent of the stoat problem (worse than previously realized) and in improving the efficiency and success of existing trapping and poisoning techniques. The funding for this research has been discontinued. The Biodiversity Package funded some limited research on the most effective methods for wilding pine control. The PGSF-funded research by CRIs in this area has had no change in funding levels since 1998. Several proposals involving development of new technologies for pest control and management were submitted to the Foundation for Research Science and Technology (FRST) for the recently completed (2005) Terrestrial Natural Ecosystems bidding round but none was successful.

104. ***Limited progress. The level of research effort into the development of new technologies and techniques to manage and control weeds and animal pests to protect New Zealand's biodiversity does not match the scale and magnitude of the current problems.***

**Objective 1.4 Terrestrial habitat restoration**
**Restore areas of degraded or scarce habitats and ecological processes that are priorities for indigenous biodiversity.**

105. The actions identified for Objective 1.4 are intended to address the need to restore priority sites to a fully functioning and healthy state. This in essence is ecosystem management where an attempt is made to return the dynamics and functioning of ecosystems to a state more akin to a natural or pre-human settlement condition. Mainland islands and other species recovery work received some $16.59M of Biodiversity Package money.

**Action 1.4 a**
**Expand habitat and ecosystem restoration programmes and initiatives (including those on offshore islands, "mainland islands", kiwi sanctuary zones, and other sites within production lands and urban areas) to restore scarce or under-represented indigenous habitats and ecosystems to a healthy functioning state.**
**Lead agency:** **DOC, LAs**
**Priority Action:** **Yes**
**Funding:** **Core + Biodiversity Package**

106. Whether directly through generalized ecosystem management or indirectly through species recovery, restoration of indigenous ecosystems is largely focused on priority sites such as offshore islands (20 islands have received pest eradication programmes with a combined area of over 25,000 ha**)** and mainland islands (87,000 ha). This approach has been successful in demonstrating major improvements in ecosystem condition, in developing and honing the technologies needed to control pests such as rats and possums and in returning populations of iconic species, such as kokako, to levels where extinction is no longer likely. The total area of land intensively managed is some 213,654 ha or 2.7% of the total DOC-administered lands. The expansion of the mainland island programme to restore habitats and ecosystems has not occurred as the Biodiversity Package funding was mainly directed into species recovery projects. On offshore islands, highlights have been the successful rat eradication operations on Campbell Island, Tuhua and Raoul Island.

107. Community led or private land management of the same intensity probably covers some 20,000 ha nationally. Most of these projects have developed independently and have not received any Biodiversity Package money although more recently some have tapped into Biodiversity Advice and Condition Funds. An extremely wide range of projects is being undertaken from restoring small forest and wetland patches to very ambitious projects covering several thousand hectares. It has been estimated there are as many as 3000 community led projects and 6000 private projects (M. Peters NZERN pers. comm.).

108. ***Moderate progress. The rodent eradications from large offshore islands have been a significant technical and management achievement. There have been similar gains on small intensively managed mainland sites. However, we do not have the national trend and condition data to determine whether the proportion of DOC-administered lands restored is adequate to maintain a sufficient amount of the indigenous biodiversity resource to guard against future degradation and loss. We are convinced these efforts have made significant improvements to the condition of these high priority ecosystems***

***and in effect reversed biodiversity decline in these areas. There are also spillover benefits to surrounding, less intensively managed ecosystems adjoining these areas. But, it is equally clear that biodiversity decline continues apace in those areas not managed to this degree of effort and that the lessons learnt from these areas of intensive management could now be applied with greater efficiency and expertise to further deserving areas and species on DOC-administered lands. In this respect, the selection of priority areas (mainland islands on both DOC-administered lands and elsewhere) for this level of management attention needs to be much more explicit with the application of newly developed methods of spatial analysis (e.g., LENZ).***

**Action 1.4 b**
**Develop and implement regionally based restoration strategies identifying priority areas for restoring biodiversity and develop opportunities for collaboration both within and between regions.**
**Lead agency:** **DOC, RCs**
**Priority Action:** **No**
**Funding:** **Core only**

109. Up until recently the DOC Conservation Management Strategies and Regional Council Policy Statements and Regional and District Council Annual Plans were the main vehicle for developing and implementing regionally based restoration strategies. These have to a variable and sometimes limited extent identified priority areas, for example, schedules of significant areas or inventories of reserves of different conservation status. Recent amendments to the Local Government Act 2002 provide new opportunities through the Long Term Council Community Plan (LTTCP) process to provide for regionally based restoration plans by adopting biodiversity goals and outcomes in consultation with communities and community groups. Of 77 councils surveyed, some 71% reported having a strategy for biodiversity and 45% have a biodiversity outcome in their draft 2004 LTCCP (MfE et al 2004). Recent examples of regional scale strategies include those of Taranaki Regional Council (Taranaki Regional Council 2004) and Waikato District Council (Waikato District Council 2004). The Forest Heritage Fund has published regional protection strategies for Northland, Waikato, West Coast and Southland.

110. The advent of regional biodiversity forums e.g. Waikato and Northland Biodiversity Forums, is leading to the development of community led plans for restoration at regional scales which result from collaboration among government and non government agencies, community groups and members of the public. This is an area where much progress could be made by explicit use of a bioregional approach (Thayer 2003) to biodiversity protection, enhancement and restoration.

111. ***Moderate progress. The opportunities presented for all levels of government, as well as communities, by bioregional approaches to restoration of indigenous biodiversity are only just beginning to be harnessed. The benefits mainly revolve around better integration of government and non-government agency resources and activity and***

***empowerment of communities to take responsibility for biodiversity restoration in their region***

**Action 1.4 c**
**Encourage community understanding of, and involvement in, programmes and activities to protect, maintain and restore indigenous biodiversity through showcase projects and volunteer programmes, and improve access to information, technology, expertise and resources.**
**Lead agency:** **DOC, MfE, LAs**
**Priority Action:** **No**
**Funding:** **Core only**

112. DOC has undertaken an extensive Community Relations programme that involves volunteer programmes, partnerships, and services to build conservation skills and knowledge in the community (see Theme Eight)**.**

113. An estimated 3000 community led restorations and 6000 private restoration projects are being undertaken at present (see also Actions 1.1g & 1.2b). DOC and council staff has been providing technical support to many of the community led projects including some potentially significant show case projects such the predator proof fencing of Maungatautari being led by Maungatautari Ecological Island Trust (see Theme Eight).

114. The Biodiversity Advice and Condition Funds and regional and district council contestable funds have contributed to a growing levels of understanding and involvement by communities in the protection and restoration of indigenous ecosystems (see Action 1.1h and Theme Eight for more information on progress).

115. ***Substantial progress. The levels of involvement in volunteer programmes are probably at record levels and the challenge will be to maintain these levels of support and interest and guard against burn out.***

**Action 1.4 d**
**Promote the use of local indigenous species for restoration projects and programmes.**
**Lead agency:** **DOC**
**Priority Action:** **No**
**Funding:** **Core only**

116. The concept of ecosourcing (use of local indigenous species) has been adequately taken up in a limited number of regions in New Zealand including Waitakere, Wellington, Southland and Waikato but is by no means universally followed. Limiting factors include lack of necessary infrastructure e.g. nurseries which follow best practice and provide affordable ecosourced plants. Some questions remain as to the efficacy and desirability of ecosourcing where species populations have been drastically reduced and the data on provenance variation and in particular the genetic basis for this is very limited for most species. Recent initiatives such as Ecosourcing Waikato have been funded from

a variety of sources including council contestable funds and trust funds. The longstanding Motukarara nursery in Canterbury is funded from DOC core funding and provides ecosourced plants. Hamilton City Council nursery produces ecosourced plants that are used in city gully restorations and it will be the main supplier for the Waiwhakareke Natural Heritage Park (see Action 1.2b). Some commercial nurseries e.g., Naturally Native and Taupo Native Plant Nursery supply ecosourced plants but community groups and private restorations often have difficulty finding the funding to purchase ecosourced plants from commercial nurseries.

117. A standard operating procedure is in place within DOC for animal species translocation that takes into account which source populations are most appropriate. The SOP is a web-enabled document with hyper linking to a further range of documents. Ecological criteria are provided including questions about the source population and ecological impacts. The assessment checklist raises issues of the viability of the source population and the impact of the transferred species on the release location.

118. ***Moderate progress. The concept of ecosourcing plants has been gradually taking hold but without support for the infrastructure necessary (community nurseries or commercial wholesale or discount) or funding to purchase plants at commercial rates there is likely to be a continuing resistance to uptake. The requirements for animal translocations are fully developed and structured but there is still a need to increase community understanding of best practice.***

**Objective 1.5 Threatened terrestrial species management**
**Enhance populations and distributional ranges of indigenous species and subspecies threatened with extinction and prevent additional indigenous species and ecological communities from becoming threatened.**

119. The actions identified for Objective 1.5 are intended to focus attention on the species level of biodiversity protection and in particular on those species that are threatened or endangered with extinction. Almost $10M was specifically allocated to kiwi sanctuaries and $16.59M mainly to other species recovery. Although the emphasis in the past has been largely on birds it is now well recognised that a wide range other indigenous animals and plants require recovery planning and on the ground active management to prevent future losses.

**Action 1.5 a**
**Increase planned recovery actions to cover priority threatened indigenous species and subspecies (including kiwi sanctuary zones) so that viable representative populations are maintained in habitats and ecosystems important for indigenous biodiversity.**
**Lead agency:** **DOC**
**Priority Action:** **Yes**
**Funding:** **Core + Biodiversity Package**

120. The national threat classification system has been revised (Hitchmough 2002) and there is now much greater parity between the threat classifications of plants and animals allowing more robust assessment of management priorities. Of the approximately 2400 New Zealand indigenous species now listed as threatened:
    - Some 25% are considered "acutely threatened," facing a very high risk of extinction in the wild.
    - Some 9% are considered "chronically threatened," facing a very high risk of extinction in the wild.
    - Some 66% are considered "at risk," vulnerable to fire, loss of habitat, predation, or disease.

121. However, accurate data on the status and condition of threatened species, particularly acutely and chronically threatened species, is not available for first five years of the Strategy although there is information for the 2002/2003 year. Reporting measures are under development to provide an in depth analysis of those species covered by recovery plans. Notwithstanding the above, no species is known to have become extinct during the past 5 years and the security of several species has been significantly strengthened.

122. Based on the 2002/2003 data, of the 847 species officially listed as acutely and chronically threatened:
    - Some 77% of species had no work programmes targeted specifically at their recovery and are believed to be in decline.
    - Some 2% of species had no work programmes targeted particularly at their recovery but they are on offshore islands or similar and are stable or recovering.
    - Some 4% are species with very restricted distributions, where targeted work benefits all or most of the individuals of that species and the species is stable or recovering.
    - Some 12% of species had work carried out in 2002/2003 which improved the security of some populations, but other populations are unmanaged and in decline.
    - Some 3% of species had work planned that was intended to improve the security at the level of local populations, but the work was not carried out successfully.

123. Many new recovery programmes have been developed using Biodiversity Package funds for a range of species including Archey's frog, weka, threatened birds of the South Island beech forests and some critically threatened plant species in the Nelson/Marlborough region. The three North Island kiwi sanctuaries are progressing well, with all exceeding the required chick survival levels to provide increases in the sizes of kiwi populations. Results at the South island kiwi sanctuaries have not been adequate owing to poor laying and hatch rates at the Haast sanctuary and high stoat predation at Okarito.

124. We agree with the DOC assessment that at the current level of resourcing and knowledge it will not be possible to develop and implement recovery actions for all threatened species in all habitats and ecosystems important for indigenous biodiversity. Nor will the overall rate of decline in New Zealand's approximately 2400 species now classified as threatened be halted. The Biodiversity Package funding has targeted 77 species prioritized for action and it is anticipated that the decline of more than 70 species will be slowed or halted by this work. Arguably, the intent of the Strategy was that at least

priority species would be maintained but this still leaves the majority of acutely or chronically threatened species in decline.

125. We are not optimistic about the suggestion in the information supplied that there will be no further extinction in the next fifteen years. Our reasons for caution include the incomplete knowledge of species status and variation (especially genetic variation), recent and serious examples of disease or predation threat (frogs, kakapo, blue duck (whio) and mohua), and the continuing significant range contractions of even iconic species such as kiwi on the mainland. The lack of a monitoring programme capable of reporting on the status and condition of all threatened species at regular intervals also means that early warning of imminent loss will not necessarily occur.

126. ***Limited progress. The Strategy expectations will be difficult to meet. The challenge will be to provide more effective (on the ground) and cost effective techniques to manage a range of threats in combination, to yield maximum benefits. Some progress has been made with 113 acutely threatened species having already improved security in at least one population. However, the current extent of high intensity management will be insufficient, in our view, to prevent major range contractions and even the risk of major losses of iconic species, such as kiwi, blue duck (whio) and mohua, on mainland New Zealand within the next 20 years. Some 616 (77%) acutely or chronically threatened species remain with no targeted recovery work and are thought to be in decline.***

**Action 1.5 b**
**Review the Wildlife and Native Plant Protection Acts in terms of their effectiveness in protecting threatened indigenous species and ecosystems, taking into account mechanisms under the RMA and other relevant legislation.**
**Lead agency:** **DOC**
**Priority Action:** **No**
**Funding:** **Core only**

127. ***Limited progress. A start has been made to reviewing schedule 3 of the Wildlife Act. We believe this action has limited relevance to the Biodiversity Strategy and is a low priority in this context.***

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# THEME TWO: FRESHWATER BIODIVERSITY

Caption: Lake Papaitonga, Horowhenua. Protecting and restoring wetlands sustains their two vital roles: providing key ecosystem services and habitat for native plants and animals. Maintaining ecosystems, such as lakes and rivers, in a healthy state is far cheaper than trying to clean them up.

**Theme Two: Freshwater Biodiversity**
**Freshwater ecosystems, such as streams, lakes, wetlands, geothermal systems and underground aquifers, and the indigenous species associated with them.**

**Desired outcome for 2020**
**The extent and condition of remaining natural freshwater ecosystems and habitats are maintained. Some degraded or scarce habitats, such as lowland river systems, important wetlands and riparian areas, are restored or increased in area. Intact natural freshwater areas are protected and their natural character is maintained.**
**Human activities in catchments are managed in an integrated way, avoiding, remedying or mitigating the adverse effects of land and water use (including pollution and sedimentation) on freshwater ecosystems. All freshwater ecosystems support biological communities largely comprising indigenous species. Plant and animal pests are managed to prevent further spread, and eradicated where necessary, to protect threatened indigenous ecosystems and species. Introduced fish (including sports fish such as trout and bio-control species such as grass carp) and introduced game (such as ducks) are managed so that they do not pose threats to indigenous species of plants or animals.**
**There have been no further human-induced extinctions of indigenous freshwater species. Threatened species are on their way to recovery within their natural habitat, or in temporary ex situ facilities where necessary. The harvest of indigenous and introduced freshwater species is sustainable and does not pose a threat to freshwater biodiversity.**
**Land managers and communities continue to be actively involved in protecting and restoring freshwater bodies and habitats of special value to them.**

## Stocktake of progress on Theme Two

### Expectations of the Strategy

128. The conservation of freshwater biodiversity was one of the nine priority areas for implementation, namely, "*Sustain indigenous biodiversity in privately managed areas and in freshwater environments*". The freshwater biodiversity theme of the Biodiversity Strategy was not accorded a specific allocation from the Biodiversity Package. Rather, benefits were expected from various Theme One programmes, such as weed and pest control, and initiatives on private land through the various protection funds as well as the Biodiversity Condition and Advice Funds. It is therefore difficult to estimate how much was spent on this theme under the Package programmes, but one DOC estimate suggests it was approximately $11M over 5 years. Clear national guidance through a national policy statement on biodiversity under the RMA was also expected to assist councils to identify priorities for freshwater conservation. One matter that the Strategy alluded to was the difficulties of freshwater management caused by the complex and overlapping responsibilities of different agencies under a variety of legislation.

**Progress on protection and sustainable management**

129. The Strategy identified the development of a system to classify freshwater ecosystems as a priority action. Once this classification was developed and used to identify priority sites for protection and management a second priority action – the progressive protection of 'priority representative freshwater habitats' – was to be actioned using a suite of protective mechanisms. The only other priority action that had been identified was to provide guidance on the protection of freshwater biodiversity though a national policy statement on biodiversity under the RMA and other national-level mechanisms.

130. Of these priority actions the one that has made the most significant progress so far has been the development of freshwater classification systems. This has been a rather complicated process. The outcome is that two river classification systems have now been developed,[3] although they have different relevance to biodiversity objectives. A related classification system for lakes should be available early in 2006. A different classification system has been developed for wetlands, but there is no one system that has been adopted and is in use at a national level. We conclude, therefore, that this priority action is well advanced, but not yet completed. Classification systems are still needed for estuaries and underground water systems.

131. The next important step, in the absence of guidance from a national policy statement on biodiversity or other similar mechanisms, is for the development of a consensus around preferred classification systems for freshwater ecosystems and their application. (This is particularly urgent for wetlands.) This consensus will need to be developed with regional councils and should provide a national consistency that meets the management and reporting needs of regional councils and central government agencies. The needs of policy and decision-makers, managers and reporting requirements (regional, national and international) should drive the consensus. Such systems need to be based on good science, but not driven by research perspectives.

132. Progress on protecting 'priority *representative* freshwater habitats' has, in comparison, been more limited so far, given the relatively recent development of the classification systems. A draft list of nationally important rivers was proposed in December 2004 as a project within the 'Water Programme of Action' to identify Waterbodies of National Importance (WONI). This is a good step forward. Currently, eleven rivers and two lakes have the limited protection afforded to their biodiversity by being classified as nationally important water bodies through National Water Conservation Orders (NWCOs). This protection mechanism substantially pre-dates the Biodiversity Strategy and has a different focus than the criteria used to identify the candidate list of important rivers under the WONI project.

133. Regional councils have, to varying degrees, identified important wetlands and other freshwater habitats that are priorities for protection and have applied different mechanisms for their conservation. Riparian management projects and other council

[3] The first is the River Environment Classification (REC). The second system, Freshwater Environments of New Zealand (FWENZ), was due for completion in July 2005.

initiatives are usefully contributing to the conservation of freshwater biodiversity, but there is no national overview or information available on the effectiveness of these actions in the wider context of gains and losses during the past five years.

134. A number of actions in the Strategy called for more development of incentive mechanisms for protection focused on private landowners and the provision of advice and support to land managers and communities wanting to protect freshwater ecosystems. There are a variety of incentive and regulatory mechanisms now in place and used by regional councils. These have most likely been developed independently of the Strategy. We did not have information on how these are applied throughout the country or whether there has been any evaluation of their effectiveness. A wider sharing of this information and a review of the relative merits of existing mechanisms could be a cost-effective and useful way of advancing these actions.

135. We note that wetlands on private land are increasingly being protected and managed through Queen Elizabeth II Trust covenants and through purchases via the Nature Heritage Fund. While the total areas involved may not be large at present, relative to the areas at risk, this is one important mechanism that took advantage of the additional Biodiversity Package allocations. The Biodiversity Condition and Advice funds have also provided useful assistance and information related to management and protection of freshwater habitats for many community and river care groups.

136. We are concerned by the slow progress so far in updating the policies on wetlands and geothermal systems and by the absence of clear national criteria for protecting and managing wetlands (Action 2.1g). This needs to be a priority for the next phase of the Strategy, given evidence that New Zealand's remaining wetlands, especially those on private land, continue to be destroyed or degraded despite providing significant economic and biodiversity 'goods and services' to landowners and other sectors. In 2001, the Auditor-General had already identified the shortcomings with respect to policy and guidance that was contributing to wetland degradation.

137. There has also been limited progress during the first years of the Strategy in the development of monitoring procedures for freshwater bodies (Action 2.1h) although individual councils may have developed their own.[4] In the absence of statutory reporting functions under the RMA to the Minister for the Environment, there may have been a lack of incentive for such procedures, despite the earlier work done in MfE under the Environmental Performance Indicators Programme (1996-2001). The absence of biodiversity indicators for monitoring purposes makes it difficult to measure performance and assess the effectiveness of accountabilities. It also means there is an absence of data to identify trends in condition. Without trend data, it is more difficult to identify what remedial action is needed and when it should be taken. The new environmental reporting requirements under the RMA 2004 amendments and the Local Government Act 2002 provide additional impetus to complete indicators and monitoring systems for terrestrial and freshwater biodiversity.

[4] Regional councils and territorial authorities already have extensive systems in place for monitoring water quality and water flows.

**Progress on freshwater habitat restoration**

138. This is a key objective in the Strategy that has seen only patchy progress so far. It could be argued that until priority areas for indigenous biodiversity protection have been identified (Objective 2.1) specific restoration initiatives would need to remain lower order priorities. We appreciate that several regional councils have already taken effective initiatives to protect important freshwater systems, while in other regions freshwater ecosystems and habitats have deteriorated in quality or been lost completely. This patchy response by councils underscores the importance of national leadership and guidance on classification systems, identification of representative candidate areas for protection, completion of freshwater indicators and standards, and the resolution of related policy and management ambiguities.

139. Unfortunately, as is the case for other major themes of the Strategy, there does not appear to be much baseline data from 2000 to compare with 2004 conditions. What is known is that agricultural intensification, as measured between 1998 and 2002, included increased use of fertilisers and other agricultural chemicals and changed land uses to an extent that has led to loss and degradation of freshwater habitats, especially on lowland, private lands. The New Zealand public now rank water issues ahead of air pollution as their top environmental concern. Efforts to address this problem include the Dairying and Clean Streams Accord along with many council and community initiatives that are focused on riparian protection and catchment management. We suggest that the Sustainable Farming Fund (SFF) could play a more useful role than it does at present in helping key stakeholders investigate better management practices that would sustain freshwater habitats and ecosystem services, thereby benefiting biodiversity as well as farm management.

140. The inter-connectedness of many water systems means that priority areas for biodiversity protection can be adversely affected by the mismanagement of connected, but distant water bodies. Local changes can have consequences in distant places. Polluted streams, for example, can damage wetland habitats, or loss of riparian vegetation may affect fish populations in downstream rivers. We suggest therefore, that the Strategy needs to address the more generic need to maintain or restore freshwater habitats and ecosystems, in general, for both biodiversity and economic reasons.

**Progress on pest and threatened species objectives**

141. There have been useful specific gains under the Strategy objectives relating to freshwater pest fish. The first national survey of pest fish distribution has been completed. Since the approval was granted by ERMANZ to use the fish toxin, rotenone, on pest fish populations (in April 2003), DOC has successfully eradicated mosquito fish (*Gambusia*) and koi carp in the Nelson and Northland regions. The Nelson eradications were of the only known populations of these two species in the South Island and are therefore particularly important. DOC is rightly targeting the eradication of pest populations that threaten larger pest-free areas before they spread further, especially in the Nelson/Marlborough region. While there are now tools available for controlling or

eradicating pest fish the national survey suggests that most pest fish are now more widely distributed than they were five years ago. Some pest populations might have already been present, however, but undetected prior to the national survey. Research of the impacts of pest fish on native species has shown they can have serious effects on indigenous biodiversity, both plants and animals, and additional control techniques are needed.

142. There is evidence that freshwater weeds have spread in several regions, particularly into lakes, in the past five years, despite recent efforts under the Weedbusters programme (see Theme One). Preventing the spread of freshwater weeds and pest fish has received some funding for public awareness and educational campaigns, although expenditure has been modest compared to the potential costs of controlling future outbreaks. Deterioration in water quality, which has been noted for various lakes and rivers, favours the establishment and spread of weed species over native plants.

143. The extension of the threatened species priority-setting systems to freshwater species have now been completed (Action 2.4a). The threatened freshwater fish species now have recovery plans in place, but we do not know how many of these plans have the necessary funding to make them operative. About 40% of indigenous fish species are listed as 'threatened'. Two high-profile threatened bird species that are reliant on rivers or wetlands, blue duck and brown teal, are being actively managed, but predators and loss of wetland habitat are putting their long-term survival at serious risk.

144. Current DOC engagement with private landowners and councils with respect to pest as well as threatened species management is likely to expand in the future. We support such a move. Both pest and threatened freshwater species often occur on private land where councils and agencies have particular roles to play, including as information providers and facilitators contributing to local initiatives.

**Status of harvested freshwater species**

145. The final action under the freshwater theme (Action 2.5) addresses the management of species, indigenous and introduced, that are commercially harvested. The species that have been clearly identified as most at risk are the native eels, especially the long-finned eel, which is a taonga species for Maori. Other indigenous fish species are also threatened. During the past five years the pressures on the long-finned eel have increased. Some harvest-oriented research has been conducted by the Ministry of Fisheries although the ecological roles of eels also need further study. It is likely that stronger conservation measures will be needed to sustain viable eel populations in the next phase of the Strategy.

**Drivers and risks**

146. Our review of progress on Theme One (Biodiversity on land) identified drivers behind the loss of threatened vegetation and habitats on land. Similar drivers, especially agricultural intensification in recent years, are responsible for the loss or degradation of

freshwater habitats, especially on private land. The effectiveness of existing mechanisms to address these in the context of the RMA and other relevant legislation needs to be reviewed and their adequacy assessed. These economic drivers can have a level of impact that, in sum, exceeds local initiatives to protect and restore freshwater habitats and ecosystems.

**Leadership and collaboration**

147. One theme that emerges from our analysis of Theme Two is the need for clearer leadership in what continues to remain an area with complex and overlapping responsibilities, and hence diminished accountabilities. Leadership is required if there are to be significant advances in the next 5-10 years of the Strategy with respect to conserving freshwater biodiversity. An important aspect of central leadership will be how greater collaboration is developed with local authorities who have major management responsibilities for freshwater ecosystems and for balancing development against conservation goals. Local authorities or regional councils are listed as key players for nearly all of the Theme Two actions, but our perceptions are that there has not been the degree of engagement and collaboration so far that would help to progress several of the actions.

**Capacities**

148. The resolution of agency accountabilities and leadership roles for meeting freshwater objectives overall will need to be linked to a consideration of capacities. The central government agencies most responsible for Theme Two appear, overall, to have less capacity and resources directed at freshwater policy, guidance and management issues than they did five years ago.

149. The following Table 2 summarises our assessment of progress against each of the actions over the 2000 – 2004 period and our recommendations for how these actions should be ranked as priorities in the next phase of the Strategy.

## Table 2. Summary table of progress in Theme Two

| **Summary of progress on Theme Two action points (2000-2004)** | | | | |
|---|---|---|---|---|
| | **Priority action** | **Package funding** | **Progress to date** | **Future priority?** |
| **Objective 2.1 Protect & sustainably manage freshwater ecosystems** | | | | |
| 2.1a National policy statement | Yes | Yes | Limited | Medium |
| 2.1b Classification systems | Yes | No | Substantial | Medium |
| 2.1c Protect priority habitats | Yes | Yes | Limited | High |
| 2.1d Review protective mechanisms | No | Yes | Moderate | Medium |
| 2.1e Develop incentive mechanisms | No | No | Moderate | Medium |
| 2.1f Provide advice | No | Yes | Moderate | Medium |
| 2.1g Review wetlands policy | No | No | Limited | High |
| 2.1h Expand monitoring procedures | No | No | Limited | High |
| **Objective 2.2 Managing pests in freshwater habitats** | | | | |
| 2.2a Manage pest and weeds | No | Yes | Limited | High |
| **Objective 2.3 Freshwater habitat restoration** | | | | |
| 2.3a Restoration priorities | No | No | Limited | High |
| 2.3b Inventory migration barriers | No | No | Limited | Low |
| **Objective 2.4 Threatened freshwater species management** | | | | |
| 2.4a Priority-setting systems | No | No | Substantial | Low |
| 2.4b Implement recovery actions | No | No | Limited | High |
| **Objective 2.5 Managing freshwater species for harvest** | | | | |
| 2.5a Manage risks re harvesting | No | No | Limited | High |

## Introduction

150. Theme Two covers all freshwater ecosystems (streams, lakes, wetlands, geothermal systems and underground aquifers) as well as the freshwater species living in them. We also include bird species that are heavily dependent on freshwater habitats. As many water systems may be alternatively part of protected areas as well as unprotected lands (e.g. rivers and streams) their condition is particularly dependent on effective management regimes and clear accountabilities across the public/private sector divide. Theme Two allocations from the Biodiversity Package were not clearly demarcated as for other themes and we have had to rely on a number of assumptions (provided by DOC) to estimate that about $11M was spent on freshwater components of Theme One programmes. This money was primarily spent on pest and weed control, protection of wetlands on private land and assistance to community groups. We provide the following comments on progress during the last 5 years in meeting the objectives for Theme Two and identify a number of areas that will require an increased effort in the next period of implementing the Strategy.

## Analysis of objectives and actions

**Objective 2.1 Protection and sustainable management of freshwater ecosystems**
**a) Ensure that management mechanisms, including mechanisms under the Resource Management Act and protected areas statutes, adequately provide for the protection of freshwater biodiversity from adverse effects of activities on land and in water.**
**b) Protect a full range of remaining natural freshwater ecosystems and habitats to conserve indigenous freshwater biodiversity, using a range of appropriate mechanisms.**

151. The actions identified for Objective 2.1 address freshwater management issues that are characterised in the Strategy as *"...relatively complex [with] sometimes overlapping responsibilities for freshwater environments and species, under a large number of laws."* Many streams and rivers originate in high-altitude, protected conservation lands (Conservation Act) before flowing into the jurisdictions of regional councils (managed largely under the RMA), but affected by land uses controlled by district councils, before ending in estuaries administered under Regional Coastal Plans.

**Action 2.1 a**
**Provide appropriate national guidance and assistance to decision makers and management agencies on the protection of freshwater biodiversity through a national policy statement on biodiversity, the National Agenda for Sustainable Water Management (NASWM) and the Sustainable Land Management Strategy.**
**Lead agency:** **MfE**
**Priority Action:** **Yes**
**Funding:** **Core + Biodiversity Package**

152. A national policy statement on biodiversity has been under development for a number of years and is reported on in more detail under Theme One (Action 1.1d). The extent to

which it will address management mechanisms for freshwater areas appears to be very limited. Meanwhile, the MfE/MAF 'Water Programme of Action' public discussion paper of December 2004 suggested central government "*could develop national policy statements*" concerning freshwater priorities and requirements for regional councils on water quality and water allocation, rather than protection.

153. A draft National Agenda for Sustainable Water Management (NASWM) was developed under the Environment 2010 programme, but was not adopted by Government. Subsequently, the Government's 'Water Programme of Action', established in 2003 as part of the Sustainable Development Programme of Action, could help to protect the most important freshwater ecosystems and biodiversity values. In the January 2003 Programme of Action one of the three desired outcomes for freshwater was: "*Waterbodies with nationally significant natural, social or cultural values are protected*."

154. The MfE/MAF 2004 public discussion document makes no reference, however, to the Biodiversity Strategy, nor is safeguarding biodiversity values a central theme in any of the proposed actions. This omission has been criticised, as biodiversity and ecosystem aspects of freshwater should be central elements in any consideration of the sustainable use of water resources. Protecting biodiversity values could be advanced as an important outcome of the action to "Address nationally important values" by identifying water bodies with nationally important biodiversity values for protection. Achieving this task will be linked to progress made on implementing freshwater classification systems, which we cover under Action 2.1 b.

155. The Sustainable Land Management Strategy of 1996 has since lapsed and was replaced by the Sustainable Farming Fund (SFF), which could make a useful contribution to remedying the impacts of land-use on freshwater biodiversity. Only a few of the completed SFF projects have looked at water issues and primarily on issues of water supply or efficient use of water. Two of 23 integrated catchment management projects funded by SFF have examined dairy farm impacts on lakes (Lake Taupo and Lake Rerewhakaaitu). Given the significant adverse impacts that agricultural intensification is having on freshwater systems (see Action 2.3), we would encourage the SFF to be used more directly to improve farm management practices with respect to sustaining and restoring freshwater ecosystems and habitats. As we comment later, there are sound economic reasons for improving the quality of freshwater systems that flow through private land, including farmland.

156. ***Limited progress. There has not been sufficient progress to date within this priority action to identify national leadership, guidance or assistance to management agencies on the protection of freshwater biodiversity. The current "Water Programme of Action" should be reassessed to incorporate biodiversity enhancement as a central theme, given the economic, environmental and cultural benefits that result from maintaining healthy freshwater ecosystems. The Sustainable Farming Fund could be a useful mechanism for exploring better management practices in the agricultural sector that would sustain freshwater habitats and ecosystems, with subsequent on-farm benefits as well.***

**Action 2.1b**
**Develop and apply a comprehensive classification system for freshwater ecosystems, in line with the framework and criteria developed under the Environmental Performance Indicators Programme, to help identify protection priorities.**
**Lead Agency:** **MfE**
**Priority Action:** **Yes**
**Funding:** **Core only**

157. The development of accepted national classification systems for all freshwater ecosystems has yet to be achieved. During the past 4 years there have been significant achievements with respect to developing classification systems, but important work remains to be done. We would note the confusion that could arise within this action as the current wording explicitly links the development of a classification system to outcomes of the Environmental Performance Indicators Programme. This linkage is not necessary. Classifications are based on physical attributes of the system in question. Performance indicators are based on quite separate considerations of what happens to those systems, regardless of their classification or ranking of value.

158. A framework and criteria for classifying wetlands was developed under the Environmental Performance Indicators Programme which included a draft hierarchical classification for all freshwater ecosystem types (Ward and Lambie 1999). This was further refined to produce a classification of wetland types in New Zealand (Johnson and Gerbeaux 2004). Several councils have conducted inventories using this classification.

159. With respect to rivers, there have been two main strands of work which should come together during 2006. The first strand was the development of the River Environment Classification (REC) system by NIWA with support from MfE as part of its indicators programme.[5] The REC has been used successfully by several regional councils for their management and reporting functions, although it operates at a fairly coarse scale. The REC is a hierarchical rule-based system for classifying river segments using natural and human induced characteristics of catchments that strongly affect physical and biological conditions in rivers. While the REC is a substantial step forward, it is less focused on classifying the drivers of biodiversity values in rivers or defining the priority rivers for protection for their ecosystem and species values. In 2004, the River Environment Classification was used by NIWA and MfE, with assistance from the regional councils, to determine the current water quality at regional and national levels. Current trends in water quality are reported under Objective 2.3 below.

160. The task of developing spatial classification systems with a stronger connection to biodiversity features has been the focus of the second strand of development work by NIWA with DOC funding.[6] The objective of this work is to provide surrogate measures of freshwater biodiversity potential to enable sites to be prioritised for management input.

[5] The River Environment Classification was first released in 1999 and published in 2002.
[6] Funding started in 2003, by DOC, as part of the development of its Natural Heritage Management System (NHMS).

It is a freshwater equivalent of the Land Environments of New Zealand (LENZ) and is currently called FWENZ – Freshwater Environments of New Zealand. Like LENZ, it will use the underlying physical and natural drivers of biological patterns (e.g. geology and climate) that divide freshwater environments in a manner that is equivalent to the patterns shown by New Zealand's freshwater biodiversity.[7]

161. A FWENZ classification system for rivers was due to be completed by July 2005 and for lakes within a further 6 months. DOC plans to eventually develop similar GIS-based spatial classifications to cover palustrine wetlands[8] and estuaries – two types of waterbodies that are under threat in many regions. Johnson and Gerbeaux (2004) developed a wetland type classification system that can be used for international reporting and state of the environment reporting under the RMA.[9] This classification system is not spatially enabled, however, and requires manual assessment of sites to classify wetland types, i.e. it is more labour intensive.

162. The purpose of developing FWENZ is to have classification systems for freshwater water bodies that are meaningful at ground level, accepted, and applied by decision makers and managers in central government and regional councils. For the first time there will be a national approach to waterbody classification that focuses on biodiversity. These classification tools are a critical component of systems being developed to identify priority sites for protection. There is, however, a substantial risk attached to this goal. In our view it was unfortunate that divergent science advice and limited funding effectively precluded much regional council involvement in the development phase undertaken by NIWA. Without the involvement of the major players in water management the classification system might suffer from inadequate 'buy-in' and result in its limited use by councils, especially those that are already using the REC. The lack of engagement with councils when developing FWENZ has been identified as a risk by DOC which held a workshop with some councils and MfE in December 2004 and has updated councils on progress at various technical workshops over the past two years. MfE and DOC agree that further initiatives are needed. DOC's intentions of testing FWENZ before its release offer further opportunities to involve councils.

163. DOC and MfE are presently jointly funding NIWA to test the relative strengths of FWENZ and REC with regards to their ability to classify physical properties of river systems (e.g. water quality and quantity) that are relevant to resource managers. They plan to reach agreement and provide national guidance on the relative strengths and uses of each classification system. The developmental stages of FWENZ have shown that it is better than REC in differentiating distinct sites on the basis of aquatic biodiversity values, as well as at a variety of scales that are relevant to managers of biodiversity.

[7] A separate exercise in bringing freshwater information together for freshwater systems (Freshwater Information New Zealand – FINZ – is reported on under Theme 9.
[8] Palustrine wetlands are those with fixed water plants, i.e. swamp, marsh, bog, fen
[9] Their classification project was funded by the Sustainable Management Fund. The 2004 publication was funded from the Terrestrial and Freshwater Biodiversity Information System (TFBIS) Programme of the Biodiversity Strategy Package.

164. Related to, but separate from the work on the Freshwater Environments of New Zealand, has been a project as part of the 'Water Programme of Action' to identify Waterbodies of National Importance (WONI). A DOC discussion document (Chadderton et al 2004) proposed a method and criteria for identifying freshwater ecosystems of national importance for biodiversity. It provides a candidate list for nationally important rivers only and it relies on the river catchment units and river classes of the REC. The intention is to further develop and refine this work using the tools developed by FEWNZ.

165. Since these classification systems and the draft list of biologically important rivers are relatively recent proposals, they have yet to be used to help identify priorities for protecting representative examples of a full range of freshwater ecosystems – an important goal of this freshwater objective.

166. ***Substantial progress. There have been substantial advances in the classification of river systems and wetlands, particularly for management objectives that focus on regional council interests. Classification systems that give priority to biodiversity values of rivers and are the equivalent of the LENZ approach are due to be completed shortly. Work is still needed to get agreement between agencies concerning the use of classification systems for wetlands (a priority), and to develop classifications for underground systems and estuaries. To some extent, there now exists sufficient classification systems for some freshwater systems, but there is a lack of agreement between agencies as to which ones to use. A task for the lead agency is to facilitate discussion and agreements about rationalising which systems to use in particular circumstances. There is a clear need to apply classifications in a nationally consistent way, across all landscapes and management agencies for protection and management purposes for freshwater habitats.***

**Action 2.1 c**
**Progressively protect priority representative freshwater habitats, using a suite of protective mechanisms.**
**Lead agency:** **DOC**
**Priority Action:** **Yes**
**Funding:** **Core + Biodiversity Package**

167. As we reported with respect to Action 2.1 b, classification systems for all freshwater ecosystems have yet to be completed. Until then it is extremely difficult to identify priority representative habitats, let alone move towards their protection on a systematic basis.

168. There is another action that should be identified as crucial in the sequence between having a classification system and protection. Specifically, *criteria* are needed for decisions on what constitutes 'representative' habitats for protection. This has yet to be done. Meanwhile, pressures have been building on these habitats, especially those on private lands. For example, half of the remaining palustrine wetlands are in protected areas while the rest are on private land, often in lowland places and particularly vulnerable to degradation and loss. (See the discussion under Objective 2.3)

169. The Water Programme of Action project to identify Waterbodies of National Importance (WONI) (see Action 2.1 b) should provide important information needed to progress this Action. The question of criteria for determining 'representativeness' will be addressed within this project.

170. In the absence of a national approach to protecting freshwater habitats, various local authorities have already initiated protection of freshwater habitats. For example, Environment Canterbury developed an integrated catchment plan for the Waimakariri catchment that considers biota as well as matters of water quality and quantity. The Taranaki Regional Council have in place a riparian management project that involves farmers in protecting and enhancing riparian boundaries with fencing and replanting. A number of regional councils have agreed Regional Action Plans with Fonterra in terms of implementation of the Clean Streams Accord. These plans address issues of riparian management. Initiatives range from planting and protection programmes to demonstration zones. Furthermore, the Clean Streams Accord requires that existing regionally significant or important wetlands (as defined by the regional councils) are fenced and their natural water regimes are protected (50% to be fenced by 2005, 90% by 2007). A difficulty associated with implementation is the fact that a number of regional councils have yet to identify regionally significant wetlands. Unfortunately, we do not have sufficient information to comment on the country-wide contribution of council initiatives to this objective.

171. Thirteen nationally important water bodies are protected using a mechanism that came into effect in 1981, via the Water and Soil Conservation Act, namely National Water Conservation Orders (NWCO). Protection currently applies to 11 rivers and two lakes (Lake Wairarapa and Lake Ellesmere). Three of the rivers received protection after the Biodiversity Strategy came into effect, but had been 'in the process' for some time prior.[10] The application to protect the Rangitata River still awaits a decision. No new applications are in the pipeline.

172. The NWCO mechanism has worked well to protect a suite of values (including biodiversity, social and recreational) when rivers were under specific threats, such as from hydro development. As such, it has been an ad hoc process and is rather expensive. Also, a NWCO does not protect water *per se*, riparian vegetation, freshwater biota or river beds. It would be timely to see if the process could be made more cost-effective. It would also be appropriate to review the responsibilities of both the applicants for a NWCO and the resulting management agencies to improve accountabilities.

173. ***Limited progress. Advancing this priority action is dependent to a considerable degree on the completion of classification systems for freshwater ecosystems that assist the identification of priority sites. To date, useful initiatives have been taken at local or regional scales, although important habitats are still vulnerable to loss or ongoing degradation. Instituting protection for a national network of priority representative***

[10] The rivers were the Buller (2001), Mohaka (2004) and Motueka/ Riwaka (2004). Other rivers under a NWCO are: Motu, Rakaia, Manganui-a-teo, Ahuriri, Grey, Rangitikei, Kawarau and Mataura.

***sites will require national leadership, collaboration with regions, and the innovative use of a range of mechanisms. Specific initiatives partnered by central and local government could play an important role in achieving this priority action. Given the complexity of ownership, a combination of funding for protection on private and public land will most likely be required to achieve this objective.***

| |
|---|
| **Action 2.1**<br>**d) Review the range of available protective mechanisms for freshwater biodiversity and determine any required changes to improve their efficiency and effectiveness, including the removal of disincentives to protection.**<br>**e) Support, and where necessary develop, joint national and regional/local incentive mechanisms for protecting scarce and under-represented freshwater bodies and their surrounding areas on private land, and provide support to landowners to maintain the biodiversity values of these areas (see Action 1.1f)**<br>**f) Provide advice and support to land managers and communities (both rural and urban) who wish to protect freshwater waterways, wetlands and habitats in their area to encourage the protection of areas that are a priority for indigenous freshwater biodiversity.**<br>**Lead agency:** **DOC**<br>**Priority action:** **Yes**<br>**Funding:** **Core + Biodiversity Package.** |

174. These actions are linked, insofar as progressing Action 2.1d will help significantly with 2.1e, 2.1f and 2.1g. A stocktake project is proposed by DOC to describe the extent and effectiveness of existing protective mechanisms. As part of the Water Programme of Action a technical paper on the issue of water allocation and use was made available on the MfE website in December 2004 to assist public consultation. We understand further work might be extended through the Water Programme of Action to cover the scope of this Action.

175. Wetlands on private land are being protected through Queen Elizabeth II Trust (QEII) covenants and also through the Nature Heritage Fund. For example, in 2003/04, 43 of the 194 QEII covenants (22%) protected wetlands. Some 300 of the current total number of covenants (about 15% of the 2000 registered covenants) have a wetland component under protection (Margaret McKee, pers. com.) The Nature Heritage Fund, under its expanded criteria, has protected important wetlands in the past five years including, for example, the Ahuriri wetlands. Wetland restoration work is undertaken by some private organisations such as the Waiau River Wildlife Enhancement Trust in Southland, funded by ECNZ/Meridian Energy. The Biodiversity Condition and Advice Funds include criteria for protection of freshwater habitats and the two funds have allocated about $2M on freshwater biodiversity-type projects. The Condition Fund projects have primarily been for fencing of wetlands and riparian margins, removal of willows and restoration plantings. Advice Fund projects were mostly for management plans, strategies to guide wetland management and production of guides.[11]

176. Fish and Game New Zealand spent $1.32M during 2003/2004 for habitat protection through direct development work on the ground. It also spent $160,000 on wetland

[11] For example, "Understanding the wet in wetlands" by Greater Wellington Council.

management. Fish and Game probably spent over a million dollars in the 5-year period in its resource management advocacy for natural water systems, including Water Conservation Orders.

177. While there has been progress under a number of voluntary schemes, e.g. the Dairying and Clean Streams Accord, the development and dissemination of incentive mechanisms with wider application for private landowners to maintain freshwater habitats could well lead to more significant gains overall. In the face of the economic drivers currently affecting freshwater habitats (see our discussion under Objective 2.3) there are benefits in more widely applying existing incentive mechanisms as well as developing and trialling new ones.

178. A number of regional councils have made grants through their environmental grants schemes to local community groups for wetland enhancement and protection initiatives. Other council initiatives include: establishing schedules of significant wetlands, which are then protected through rules controlling drainage and reclamation; providing advice and information to landowners on wetland management and rehabilitation; work with stream care groups; providing financial assistance for fencing, planting and pest control around freshwater habitats. Over the past 5 years there has been a significant increase in the number of community groups that are involved in protecting and restoring streams and wetlands. The information to quantify this growth is not available.

179. We lack the information to report nationally, however, on the cumulative outcomes of these actions or the overall contributions they are making to maintaining or improving the condition of freshwater habitats.

180. ***Moderate progress. Completing these actions will support the implementation of Action 2.1c as well as other freshwater management objectives. At present, there are economic incentives, particularly under agricultural intensification, for many landowners to degrade or destroy, rather than protect, freshwater ecosystems and habitats. While there are counteracting positive incentives to improve farming practices (e.g. the Dairying and Clean Streams Accord, riparian retirement projects), the broader evidence is that these incentives are currently not sufficient in the overall picture of degrading freshwater ecosystems and habitats. While these actions were not priority actions, they could provide useful mechanisms for increased protection, especially for local authorities in regions where freshwater habitats are presently under threat. We suggest there is merit in close cooperation between lead agencies and local authorities in the next phase of this work and that higher priority is given for advancing these actions.***

| **Action 2.1 g** | |
|---|---|
| **Develop clear national criteria for protecting and managing biodiversity in wetlands and geothermal systems through a review of the 1986 Wetlands Policy and 1986 Geothermal Policy, and incorporate in a national policy statement on biodiversity (see Action 1.1 d).** | |
| **Lead agency:** | **DOC** |
| **Priority action:** | **No** |
| **Funding:** | **Core only** |

181. Formal reviews of the dated Wetlands Policy and Geothermal Policy have yet to be started and are therefore not likely to inform a national policy statement on biodiversity in the near future. These reviews are an urgent priority in the context of improving wetlands' protection and management. The 2001 conclusion that New Zealand "*has no single, coherent national policy statement covering all wetlands*" (Controller and Auditor-General 2001) is still valid today.[12] We understand that the draft National Policy Statement on biodiversity does address issues of protection of significant wetlands and geothermal systems, but this is unlikely to address the broader issues that would be covered in a review of the 1986 Wetlands Policy.

182. The state of wetlands exemplifies the urgency of these tasks. Our remaining lowland wetlands[13], in particular, are continuing to be degraded or lost entirely although, quite aside from biodiversity considerations, they provide valuable ecosystem services. These services include water storage and flood control, erosion control, water purification, waste disposal, maintaining the water table, removal and transformation of nutrients (PCE 2002). The indirect economic value of these services from wetlands to New Zealand has been estimated to be worth about $35,000 per hectare (Patterson and Cole 1999). While this figure can be challenged, the central point is that providing similar services from engineering works would be considerably more than is realised by most landowners. The lack of market signals about the value of keeping these natural assets in good condition means that short-term economic decisions often prevail over more cost-effective actions. The costs of restoration or replacing these 'free services' with flood control systems, waste treatment, preventing erosion and improving water quality are significantly greater than those of maintaining wetlands in good condition.

183. The 2001 report by the Auditor-General concluded that there was inadequate policy direction on freshwater wetlands, divided agency responsibility, limited progress in implementing existing actions, inadequate monitoring and a decline in advocacy by DOC for wetlands conservation. One consequential concern was that regional councils will rule on resource consent hearings mainly on the basis of the arguments favouring wetland modification.[14] The Auditor-General also noted that: "*The Ministry for the Environment potentially has a stronger role than the Department of Conservation in influencing freshwater wetlands conservation on private land.*" Regrettably, these policy confusions, accountability shortcomings and the recommendation of the Auditor-General to establish a national framework for planning and monitoring for wetland conservation and protection has not been addressed in the past four years.

184. ***Limited progress. We believe the low level of progress on this action, coupled with the ongoing losses and degradation of unprotected wetlands, now make this action more***

[12] Local authorities have national level direction for saltwater wetlands in the National Coastal Policy Statement. Some Conservation Management Strategies (covering all DOC conservancies) address wetland issues and regional and local authorities must take account of these documents.
[13] Wetland losses have been estimated at over 90% of those that existed prior to European settlement although there is no national overview of the current status of wetlands.
[14] An example of this happening is described in the 2001 report by the Parliamentary Commissioner for the Environment concerning the Tasman District Council's approach to wetlands.

***urgent within the Biodiversity Strategy. The same drivers that are reducing rare vegetation habitats on private land are also having negative impacts on remaining wetlands. Protection and management of wetlands needs to have a stronger focus under regional council plans. This is more likely if policy responsibilities for wetlands are clarified and stronger guidance is provided via a national framework for planning and monitoring of wetland conservation. The economic benefits to landowners of maintaining healthy wetlands, compared to the costs of restoration or providing other solutions, needs to be highlighted and promoted***.

| | |
|---|---|
| **Action 2.1 h** | |
| **Expand monitoring procedures (and establish new ones) for freshwater bodies (including lakes, rivers, underground systems, wetlands and geothermal systems) important for indigenous biodiversity to enable early action to maintain these ecosystems.** | |
| **Lead agency:** | **DOC** |
| **Priority Action:** | **No** |
| **Funding:** | **Core only** |

185. Reporting national trends on the condition of wetlands is not possible at present, despite their ecological and economic importance to the country. A national Wetland Resource Inventory (WERI), administered by DOC, was focused only on ecologically and regionally significant wetlands and has not been systematically updated. The extensive amount of freshwater monitoring that is undertaken by local government is largely focused on water quality and water volumes, although regional councils undertake state of the environment monitoring programmes that include biological assessments. This monitoring information has not been aggregated to provide a national overview, assuming that the diverse monitoring approaches made this a possibility. More detail on monitoring issues is covered in Theme Nine under objective 9.4.

186. Work was done on potential indicators for freshwater biodiversity as part of the initial efforts to develop a national set of environmental indicators (MfE 1998), but this work was brought to a close in 2002. Subsequent work by MfE has focused on developing and implementing air and water quality standards.

187. ***Limited progress. Monitoring systems for freshwater ecosystems are not in place throughout New Zealand. There would be significant benefits if these were designed to contribute to the assessment of management objectives and accountabilities at both regional and central government levels. Some of the present shortcomings in the management of freshwater biodiversity can be attributable to shortcomings in monitoring systems and reporting that obscures performance and accountabilities. The development of monitoring systems that will benefit regional objectives and can also be aggregated to provide national-level statistics will benefit central agency planning and policy objectives as well as meet international reporting requirements. These will provide benefits not only for biodiversity reporting, but also for export markets that increasingly require evidence of environmental standards for farms providing agricultural products***.

**Objective 2.2 Managing pests in natural freshwater habitats and ecosystems**
**Prevent, control and manage plant and animal pests that pose a threat to indigenous freshwater biodiversity.**

188. Less visible, and without the public recognition that applies to terrestrial pest species, New Zealand presently has 24 water weeds, 13 amphibian and three freshwater fish species declared to be "unwanted organisms" under the Biosecurity Act 1993. Their management and preventing their spread within the country is a task for central and regional government agencies. New Zealand has about 35 freshwater fish species (nearly 90% are endemic) and their status is made worse by the presence of pest fish and water weeds. The Freshwater Fish Regulations 1983 are also relevant to this objective as they define freshwater species that will be considered pests in New Zealand.

**Action 2.2 a**
**Develop and implement strategies and plans, including national and regional pest management strategies, to manage those plants and animals posing a threat to indigenous freshwater biodiversity and those potential pest species already present in New Zealand but not yet widespread.**

| | |
|---|---|
| **Lead agency:** | **DOC, regional councils** |
| **Priority action:** | **No** |
| **Funding:** | **Core + Biodiversity Package** |

189. No national pest management strategies focusing on freshwater pests have been developed in the past 5 years and there is probably no obvious candidate species that would warrant the considerable effort that is involved. Regional councils identify freshwater plant and animal pests in their regional pest management strategies and the DOC Conservation Management Strategies (covering all regions) also include reference to freshwater pest problems where appropriate. Section 26ZM of the Conservation Act makes it illegal to move freshwater organisms.

190. An initial national survey of the distribution of freshwater pest fish was completed in 2002, using Biodiversity Package funds. It provided, for the first time, a national overview that can guide future decisions on priority work for eradication, control and future survey projects. During the last 5 years most pest fish species have spread to occupy larger areas in both islands than they did in 2000.[15] Current survey results suggest no new pest fish species have established in New Zealand in the past four years, but one species, the European gudgeon (*Gobio gobio*) was only recently added to the list of unwanted organisms. The priority during the period was to educate the public, as well as contain and where possible, eradicate populations of pest fish and weeds. Progress in pest fish and weed control has been modest, but with useful gains in a few specific places.

[15] The concentration of the main pest fish species (catfish, *Gambusia*, koi carp, perch, rudd and tench) has largely been from the centre of the North Island, through the Waikato, Auckland and North Auckland regions. Perch, rudd and tench are also scattered down the eastern South Island.

191. The control of pest freshwater fish was hampered by a lack of tools, particularly the unavailability of rotenone (a fish toxin) for use in New Zealand. Rotenone was finally registered for use by DOC in April 2003 and was subsequently used successfully on fish populations of koi carp and *Gambusia* in the Nelson and Northland conservancies. The presence of pest fish species in Nelson region is a concern, given the proximity to the high-value Nelson lakes and headwaters of the Buller River. This makes the eradication of koi carp and *Gambusia* more significant, given that these were the first populations of both species known to be in the South Island. A crustacean, marron (*Cherax tenuimanus*), has appeared in the wild in the last 12 months. Fine-mesh monofilament gill nets may be a potentially viable and cost-effective option for control of pest fish and were successfully used for control of rudd in shallow Waikato lakes. More research on control techniques is underway by NIWA.

192. Pest fish threaten native species in a variety of ways. *Gambusia* attacks native fish, especially whitebait species, and are a serious threat.[16] Within Lake Taupo, adult catfish are known to feed on freshwater crayfish (koura), which are an important food for large eels elsewhere.[17] Other pest fish (rudd) are important browsers of new plant growth and new seedlings and have been likened to 'underwater possums'.

193. Freshwater weeds are difficult to control and are easily spread (if unintentionally) by boat owners to uninfected rivers and lakes, via trailers and boats. This makes information and public awareness campaigns, targeted at key areas, of particular importance. Such campaigns have received limited funding so far, but they are likely to be the most cost-effective approach to containing the problem of freshwater weeds as well as reducing the ongoing and illegal spread of pest fish.

194. A driver for potential new threats from aquatic weeds is the aquarium trade. A recent NIWA survey of the aquarium and nursery trades found over 180 aquatic plants that have not yet naturalised in New Zealand. The majority are tropical plants and of low risk, but 73 of these species are considered to be weeds elsewhere. The warmer waters of Northland are vulnerable to the release and spread of fish and plants that would not survive in our colder climates. Regions currently with the most pest fish species are Auckland and Waikato.

195. The change in the extent and impact of freshwater problem plants since 2000 is not known for New Zealand as a whole, nor is the overall effort that regional councils put into surveying and managing the problem. But there are indications that the situation is deteriorating in a number of regions. A recent re-assessment of lakes in Northland indicates that invasive weed species have spread rapidly into previously uninfected lakes. Freshwater weeds are spreading in Lake Waikaremoana although the incursions of *Lagarosiphon* in Lake Waikaremoana and the South Island have been successfully contained and probably eradicated – monitoring continues. The weed hornwort has

[16] In Northland, a few *Gambusia* spread from a cattle trough to a nearby stream, colonised the water course downstream to the harbour, adapted to sea-water and colonised the mangrove swamps. They can then spread within harbours and infect other rivers.
[17] Eels do not occur in Lake Taupo.

spread rapidly in Lake Taupo in the last 3-4 years. Biodiversity Package funds were used in 14 weed-led and 16 site-led weed projects in freshwater systems during the last 5 years. These projects all met their objectives. The sudden appearance of the diatom (*Didymosphenia geminate*) in the Waiau and Mararoa river in Southland in October 2004 and its discovery a year later in Otago, Tasman District and other Southland rivers highlighted the rapidity with which new pest species can spread in freshwater environments. It also underscored the need for control agencies to move decisively with delimiting surveys, informing the public and the justification of a conservative approach to risk assessment and subsequent management.

196. ***Limited progress. The positive achievements in the past 5 years have been the completion of the first national survey of pest fish, licensing of rotenone for use as a fish toxin and local and regional successes at eradicating particular pest fish and weed populations. At a national level, there are signs that control programmes have not been sufficient to slow or halt the spread of freshwater weeds into previously uninfected lakes and the further spread of pest fish species. Some weed species have probably benefited from deteriorating water quality in lakes, rivers and streams. Pest fish have most likely benefited from the drivers behind reductions in water quality that we discuss under Objective 2.3 (below) and can themselves reduce water clarity (through bio-turbation – stirring up bottom sediments).***

**Objective 2.3 Freshwater habitat restoration**
**Restore areas of degraded or scarce natural freshwater habitat and ecosystems that are priorities for indigenous biodiversity.**

197. This is a key objective within this theme to help 'turn the tide' for freshwater biodiversity throughout the country. The objective presumes that priority areas for restoration are known, or will be identified before the more detailed restoration actions are undertaken. This has yet to be done. However, meeting this objective may, we suggest, also require a broader approach to include other, non-priority water ecosystems as well. This is due to the particularly inter-linked nature of water flows between different places and systems, in contrast to protecting priority terrestrial areas.

**Actions 2.3**
**a) Develop and implement regionally based strategies and action plans to prioritise, restore and maintain priority freshwater and riparian ecosystems and to provide opportunities for collaboration between regions and between land and water managers.**
**b) Compile regional inventories of significant artificial barriers to the migration to and from the ocean of indigenous freshwater species and progress priority actions to restore fish passage.**
**Lead agencies:** **DOC, MfE**
**Priority actions:** **No**
**Funding:** **Core only**

**Trends**

198. Progress under this objective has been poor at a time when freshwater issues have emerged as matters of high public and policy concern. For example, a major report by the Parliamentary Commissioner for the Environment (PCE 2004) examined the impact of intensive farming on the 'natural capital' of the New Zealand environment. With respect to fresh water, it concluded that intensive farming, with substantial rises in the application of urea and phosphorous and increasing demands for irrigation, is decreasing water quality and reducing water supplies for surface and groundwater ecosystems in many regions. This has led to significant rises in the amount of faecal matter, eroded sediments, chemical and nutrient runoff from pastures and crops ending up in water bodies. The outcomes include: waterways and lakes that are nutrient enriched and increasingly degraded; sediments smothering in-stream animals, plants and streambeds; irrigation that both removes water from freshwater ecosystems and transfers contaminants from the land to surface water and groundwater.

199. This PCE report was preceded by the May 2003 launch of the Dairying and Clean Streams Accord agreed between Fonterra Co-operative Group, the Minister for the Environment, the Minister of Agriculture and regional councils to work together "*to achieve clean, healthy water, including streams, rivers, groundwater, and wetlands in dairying areas.*" The Accord was developed after strong public pressure from various interest groups, including Fish & Game New Zealand, who were concerned by the deterioration in water quality and environmental impacts. The Accord sets a number of performance targets that are currently being met, according to self-reporting by dairy farmers. Conservation groups have called for independent audits of the Accord's implementation.

200. In April 2005, a new study by Lincoln University showed that water quality has overtaken air pollution as New Zealander's leading environmental concern since a similar 2003 study. Management of farm effluent and runoff was seen as the least well managed of the environmental problems investigated while increases in rates to fund enhancement of lowland streams was supported. Farming (43%) was identified as the main cause of damage to water in rivers and lakes, confirming the PCE's conclusion (2004, page 128) that "*The farming sector is likely to face rising public pressure to adequately address the trends*."

**Drivers**

201. Agricultural intensification therefore emerges as the major driver affecting freshwater habitats, water quality, water abstractions rates and development pressures on freshwater ecosystems. Other drivers include urban and peri-urban developments, stormwater runoff and sewage discharges which also lower water quality and reduce freshwater habitats, especially in lowland regions and coastal cities. These impacts are felt not only within freshwater habitats, but also in estuaries which are key environments, for economic and biological reasons, with respect to inshore fisheries and marine ecosystems.

**Public engagement**

202. On a positive note, there has been a significant increase in community involvement in riparian restoration and clean-up activities in the past few years. Many of these initiatives are actively supported by councils and quality information is available on 'best practice' methods. (Refer to Theme Eight chapter). What has yet to be assessed is the overall benefits from these initiatives and how to sustain them over time to provide lasting benefits for biodiversity. There are examples of several agencies aligning resources and activities to assist with specific restoration initiatives, which can be complex and long-term. One such example is the Waipa Peat Lakes and Wetlands Accord, between Waipa District Council, NZ Fish and Game, DOC and Environment Waikato to collectively work with landowners, tangata whenua and interested parties towards the restoration and enhancement of lakes and wetlands in the Waipa District. The Hamilton City Council has set aside 55ha, including a peat lake and surrounding catchments, to restore indigenous ecosystems typical of Hamilton District.

**Agency responses**

203. The Strategy refers to the legal and jurisdictional complexities that hinder freshwater management. In earlier sections under this theme we have referred to the slow progress in providing agency leadership as an important element in reducing these complexities. The effective restoration of freshwater habitats and ecosystems will depend on addressing these issues as well as providing the expertise and guidance for managers and landowners that is needed.

204. One such need is a better understanding by management agencies of 'environmental bottom lines' or condition, below which degradation of freshwater systems is not acceptable from environmental or economic perspectives. These include the risks to tourism, to New Zealand's 'clean and green' reputation, and the loss of essential ecosystem services that freshwater systems (streams, rivers, wetlands, etc) provide to our primary production sectors. Establishing these 'bottom lines' will make it easier to determine appropriate interventions for restoration by management agencies.

205. Given this wider context it is not surprising that the performance by regional councils to maintain and enhance freshwater systems has been patchy. As with many other activities we do not have data covering the activities of all councils, nor any indication of the overall national situation.[18] At one extreme there are still no approved water plans in place for Canterbury (the largest regional user of freshwater in the country) under the RMA. In contrast, Taranaki has increased the area of protected wetlands from 1660 hectares in 1994 to 2890 hectares in 2004. This has been achieved through the 2001 "Regional Water Plan for Taranaki" (which identified 76 regionally significant or important wetlands) by affording protection through rules controlling drainage and reclamation activities. This increased to 60% (from 38%) the proportion of protected

[18] In the absence of a system to collect information from regional councils and central government agencies and aggregate it to provide a national overview, the unsatisfactory fall-back position is to rely on a number of local accounts.

significant wetlands in Taranaki. The Taranaki Regional Council provides financial assistance to landowners for fencing, planting and legal protection. This is a good example of effective collaboration between a regional council and landowners with a mix of 'carrot and stick' tools. Several other councils are using their environmental funds to protect and restore wetlands, often in conjunction with other agencies and community groups.

206. The identification of Waterbodies of National Importance (WONI) (refer to Action 2.1b) will need to be completed before the priority freshwater ecosystems that require restoration can be identified. Given the role of regional councils with respect to managing freshwater systems, it would be appropriate to add regional councils as a key 'lead agency' in Objective 2.3 to advance this work.

207. There has been some work done by several councils on identifying and removing barriers that prevent migration of indigenous freshwater fish species, such as dams and weirs, but ambiguous accountabilities between agencies have hindered wider progress. A review of the regulations regarding fish passages and the overlaps with RMA responsibilities is planned as part of a review of freshwater jurisdictions. Clearer directions and clarification of which agency has leadership responsibilities would bring clarity and better accountabilities for this action and a clearer focus on the restoration of freshwater habitats.

208. ***Limited progress. This is a key objective under the freshwater theme and could usefully be extended beyond its current focus on <u>priority</u> areas for indigenous biodiversity. Given both the inter-connectedness of water systems ( groundwater aquifers feed springs, that feed streams and wetlands; river quality affects estuaries) and the economic, social and cultural importance of these systems, the Strategy has a wider role to play in supporting restoration of freshwater habitats beyond priority sites.***

209. ***While there have been positive initiatives by a number of regional councils, the overall impression is that wider economic drivers, primarily in the agricultural sector, have had significantly negative impacts on many freshwater habitats, particularly lowland lakes, rivers and wetlands. As a consequence, a much higher priority will need to be accorded to this objective in the next five years of the Strategy if it is to be achieved.***

**Objective 2.4 Threatened freshwater species management**
**Enhance population numbers and ranges of indigenous freshwater species threatened with extinction and prevent additional species and ecological communities from becoming threatened.**

210. The protection of native fish species does not have the same level of public support or awareness as does threats to native birds. No native fish have the level of legal protection afforded to birds under the Wildlife Act. Native fish only have legal protection when they occur in an area where taking is prevented or restricted. However, 40% of New Zealand's freshwater fish species are classified as 'threatened' and are under increasing pressure from loss of habitat, degradation of riparian vegetation and reduced water quality. As

well as fish, this objective includes threatened birds that depend on freshwater habitats. The status and needs of freshwater eels are discussed under Objective 2.5.

**Actions 2.4**
**a) Extend threatened species priority-setting systems to cover indigenous freshwater species.**
**b) Increase and implement planned recovery actions to cover priority threatened freshwater species so that viable representative populations are maintained (or restored and maintained) across their natural range.**
**Lead agency:** **DOC**
**Priority actions:** **No**
**Funding:** **Core only**

211. With respect to the first action, DOC has completed the revision of the national species Threat Classification criteria and has now listed all relevant freshwater species.[19] Recovery plans now exist for all threatened freshwater fish species, but the extent to which they are funded for implementation is not known to the reviewers. DOC has worked with landowners to protect populations of the newly-discovered Northland mudfish species, mostly by fencing small wetlands. A major effort went into surveying the acutely threatened non-migratory Otago galaxiids. This information was needed in relation to determining aspects of the Otago Regional Council's water plan that could otherwise have adversely affected these threatened populations. We do not know if there is sufficient information on the other threatened fish species to provide similar advocacy advice to appropriate councils.

212. Some threatened bird species depend entirely on freshwater ecosystems. Current efforts by DOC to protect endangered blue duck and brown teal populations in rivers and wetlands exemplify the extent of the predation threat to many indigenous species and the impacts of habitat loss. Blue duck populations have been declining steadily nationwide due to stoat and possum predation. A 2005 technical review proposes that future management efforts be concentrated at five sites where, providing funding is sufficient, it might be possible to protect the long river and stream margins of blue duck habitat from predators. Using island refuges that are effective for other threatened species is not an option. Decline to extinction is likely for unprotected blue duck populations given the pervasive pressure from predators and the difficulty of controlling predators along extensive stretches of streams and rivers.[20]

213. Brown teal, by contrast, live in lowland wetlands, but are equally vulnerable to predators, including feral cats. Loss of wetlands, usually to agricultural intensification, has been another significant factor in decline of brown teal populations.[21] Future survival of the

[19] The sizable gaps in knowledge of many freshwater species, especially the invertebrates, should be noted in this regard.
[20] Stoats can travel long distances which, given the sparse distribution of blue duck along rivers or streams, makes it particularly difficult to protect a big enough area to sustain viable populations.
[21] Northland is an important region for brown teal, but the ongoing loss of wetlands in recent years has eliminated many brown teal populations.

species in the wild currently depends on DOC's ability to control predators at three specific wetland sites in northern New Zealand.

214. ***Substantial progress for 2.4a; limited for 2.4b. The first part of this action has been completed and recovery plans are also now in place for all threatened freshwater fish species. The next stage will be to implement them. This will often require DOC to work with regional councils and landowners, as information providers and facilitators, since many threatened populations occur in freshwater habitats on private land where their protection, restoration and maintenance will require a variety of approaches and landowner-agency partnerships.***

**Objective 2.5 Management of freshwater species for harvest**
**Ensure that harvest of indigenous and introduced freshwater species and associated activities do not adversely affect indigenous freshwater biodiversity**.

215. This objective focuses on the management of whitebait and the three freshwater eel species, of which the long-finned eel is a taonga species for Maori with a long history of customary use as a very important food source. The objective also includes consideration of the impact of the introduced salmonid species on indigenous biodiversity.

**Action 2.5**
**a) Ensure fisheries management planning to assesses risks to threatened indigenous species from their harvest and from introduced species, and take appropriate action to manage these risks, and, where necessary, clarify fisheries management responsibilities.**
**Lead agency:** **DOC**
**Priority actions:** **No**
**Funding:** **Core only**

216. DOC has the legislative responsibility for whitebait, but has limited powers with respect to influencing the harvesting impacts. The limited information on catch trends, in South Westland, shows a decline. However, natural factors have a significant influence on harvest levels and this makes it difficult to distinguish natural variation from the impacts of catch volumes. Consequently, the overall conservation status of the harvested species is not clear.

217. Although there has been commercial harvest of eel for many decades they were only brought into the Quota Management System (QMS) in the past few years.[22] Although quota levels have been set for both species it is not known if the current catch levels and Total Allowable Catch (TAC) are sustainable, nor what impacts their exploitation is likely to have on freshwater ecosystems. Eels are the top predator in many water systems and their decline is having unknown impacts on predator-prey systems. In addition to fishing pressures, eels are severely affected by destruction of natural habitat, blockage of upstream fish passages and by direct mortality through the effects of hydro-electric

[22] The South Island fishery for eels was introduced into the QMS in October 2000, the Chatham Island fishery in October 2003 and the North Island fishery from October 2004.

turbines and drainage clearance. Eels can adapt to pasture habitats where they can show better growth rates, possibly due to higher levels of insect food supplies from pastures. Research suggests large, long-finned females, with an average lifespan of 27-61 years (and a maximum of about 100 years), cannot survive passing through turbines in their efforts to migrate to the sea for spawning. Consequently eel transfer programmes have been undertaken by commercial fishers to move large females from above hydro dams to the coast to assist breeding. We do not know how extensive these transfer programmes are, or their overall contribution to eel populations. The longevity of long-finned eels makes them more susceptible to over-exploitation than short-finned eels. This longevity could also mask over-fishing which may only become apparent immediately prior to the fishery's collapse.

218. Knowledge on which to base estimates of sustainable fishing levels for eels is poor and difficult to obtain. The complex life cycles and ecology of eels means it is inappropriate to apply standard population models that are applied to other fish species and no formal stock assessment exists. Long-finned eels are now absent from many rivers and are most likely to be in gradual decline. Research, funded by the Ministry of Fisheries will start later in 2005 to monitor commercial and customary eel fisheries. The paucity of knowledge and the ongoing declines in eel populations justified the 2004 closures on all commercial eeling in several catchments[23] and underscores the urgency for effective protective action, especially for long-finned eel.

219. The Taupo trout fishery is subject to the Sportsfishery Management Plan and we understand that this plan adequately addresses risks to threatened indigenous species. In other places the management of freshwater fisheries is less clear, given that trout and salmon are top predators in streams and rivers and have significant adverse impacts on native fish and crustacean populations.

220. ***Limited progress. The New Zealand eel species have shown recent declines and the taonga species, the long-finned eel, is now the rarest and classified as being in 'gradual decline'. During the first 5 years of the Strategy the status of the long-finned eel has deteriorated and warrants a conservative approach to its management. Overfishing has been a significant contributing factor in these declines – as it is for freshwater eels worldwide. As an issue of greater concern to Maori than to non-Maori, priorities include clarifying the roles of key agency players, and acting with precaution to curtail exploitation, safeguard migration routes and improve eel habitats, including wetlands.***

221. ***Adequate information on harvest rates for various whitebait species is not collected and what constitutes sustainable harvest levels for whitebait species remains unclear. What is clear is that a number of whitebait species are under stress, such as the giant kokopu. Trout and salmon are top predators in freshwater systems and are one of the factors reducing populations of indigenous fish and crustacean species.***

[23] In 2004, the Minister of Fisheries closed all types of commercial fishing from the Motu, Mohaka and most of the Wanganui River catchments. Lakes Poukawa and Tahora are also closed to all commercial fishing for eels.

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# THEME THREE: COASTAL AND MARINE BIODIVERSITY

Caption: Scaly-headed triplefin. New Zealand's marine environment is much larger than its land area and is home to significantly more species. But our knowledge of marine biodiversity and marine processes is relatively poor.

**Theme Three: Coastal and Marine Biodiversity**
**Coastal and marine ecosystems including estuaries, inshore coastal areas, and offshore areas within New Zealand's jurisdiction, and the resident and migratory species within them.**

**Desired outcome for 2020**
**New Zealand's natural marine habitats and ecosystems are maintained in a healthy functioning state. Degraded marine habitats are recovering. A full range of marine habitats and ecosystems representative of New Zealand's indigenous marine biodiversity is protected.**
**No human-induced extinctions of marine species within New Zealand's marine environment have occurred. Rare or threatened marine species are adequately protected from harvesting and other human threats, enabling them to recover.**
**Marine biodiversity is appreciated, and any harvesting or marine development is done in an informed, controlled and ecologically sustainable manner.**
**No new undesirable introduced species are established, and threats to indigenous biodiversity from established exotic organisms are being reduced and controlled.**

## Stocktake of progress on Theme Three

### Expectations of the Strategy

222. Theme Three received 20% of the Biodiversity Package allocations, some $37 million for 12 programmes, making it second in funding to the Theme One allocation. This was a major theme in the Strategy which recognised our status as an island nation with a huge marine area to manage, about which we know very little, and which supports a $2 billion a year fishing industry. “Manage the marine environment to sustain biodiversity” was Strategic Priority 7 for implementation. Of the 28 actions specified, 10 actions were ranked as priority actions – those likely to best position New Zealand in the first 5 years to achieve longer-term goals. There were high expectations for marine biosecurity initiatives, with almost $10M allocated to six programmes and a similar amount to establish marine reserves.

223. Based on the designation of priority actions and funding allocations, the expectations for significant biodiversity gains were in three main areas – knowledge acquisition, improving marine biosecurity systems and progressing efforts to establish marine protected areas.

224. We summarise progress made with respect to these priorities and other objectives under the following five headings and summarise our assessment of progress with respect to the individual theme actions in Table 3.

**Progress in understanding coastal and marine ecosystems**

225. An important priority for the theme has been largely met – the development of marine classification systems suitable for use at different scales in the marine environment. A suite of complementary systems are close to completion, led by the July 2005 launch of the Marine Environment Classification (MEC). The MEC uses a similar approach to that applied to the development of Land Environments of New Zealand (LENZ). It is complemented by other classification systems, based on biological information, that are close to completion. Collectively, these classifications are important 'building blocks' that will facilitate progress on other marine initiatives: identification of priority areas for survey, mapping and research; identification of candidate areas for what could constitute a representative network of marine protected areas; areas where other initiatives may be needed to protect and conserve species and ecosystems.

226. The caveat must be added that these classification systems need further testing, validation and piloting against management objectives. They are not yet sufficiently robust to be applied in an uncritical manner. We would suggest that this next phase provides a great opportunity for central and regional government co-operation, especially with respect to testing the in-shore classification systems where councils have major management responsibilities under the RMA.

227. Progress on improving the knowledge base and availability of information on coastal and marine ecosystems has been mixed. The Package funded several projects under the Baseline Information Programme (BioInfo) several of which are still running. The National Aquatic Biodiversity Information System (NABIS) went public in August 2004 and, with further development, may become an important information tool that is used more widely. While there have been other useful initiatives that have added valuable knowledge of the marine environment there has also been a serious decline in real terms in the funding available from FRST for marine research since 1998.[24] This has led to the termination of valuable long-term research projects (see also Objective 3.7) and a significant loss of capacity for marine research.

228. This mismatch between research needs, funding decisions and proposals by Government to significantly expand the research effort (via the Ocean Survey 20/20 project) suggests the need for higher level co-ordination and priority setting. We recommend that the Oceans Policy process addresses this issue as well as the issue of 'knowledge barriers'. A recent paper (MfE 2005) identifies the problem – not only do important gaps remain in our marine knowledge, but there are also several barriers preventing the more effective analysis, use of, and access to, existing information of the marine environment. Developing and implementing a research strategy for understanding the implications of climate change on coastal and marine environments should be a new priority for this research theme. Evidence is increasing that there could be climate change effects ranging from increased coastal erosion to changes in ocean current patterns affecting nutrient flows and recruitment of key fish stocks.

[24] FRST is identified as the 'Government lead' with respect to advancing Action 3.1a – improve knowledge.

229. A renewed effort is warranted with respect to re-invigorating the development of an environmental monitoring system for marine ecosystems. Further work on marine indicators has only progressed through work by the Ministry of Fisheries (MFish) in the last few years – on fish stocks and fishing impacts. This work is ongoing. We make this point on the need for indicators and monitoring in other themes as well. In the context of coastal and marine issues it could provide another useful area of co-operation between central and regional government.

**Progress on better governance of coastal and marine management**

230. This combines our assessment of objective 3.2 (co-ordinated marine management) and 3.3 (sustainable coastal management) given the overlap between them. One programme received significant funding from the Biodiversity Package (Programme 14 - $2.3M), but the full range of benefits that flowed with respect to improving better co-ordination across agencies are not clear from the information provided to the reviewers. However, we have been advised that there has been a strengthening of marine expertise within DOC and a greater alignment of work programmes between DOC and MFish, for example, on the delivery of the Conservation Services Programme.

231. Developing better governance of marine management, including in the coastal environment, has been the task of the Oceans Policy process since July 2000. The need for substantial improvements in our systems of marine management has been well established and we make reference at several points in this theme to matters that need to taken up by the Oceans Policy process. We understand it was reactivated in late-2005 after a formal delay while Government considered foreshore and seabed issues during 2004. We welcome that resumption. It has been clear during this review that in the absence of higher level clarification of policy and responsibilities it can be exceedingly difficult and contentious to balance arguments for exploitation against conservation, especially when knowledge is inadequate and jurisdictions are blurred.

232. Regional councils now have added legal responsibilities with respect to coastal management and marine biosecurity (Objective 3.5) but often lack the funding and expertise to meet their obligations. Responsibilities for important issues such as who should monitor coastal plans and the coastal environment remain blurred. As a consequence there has been very little monitoring of environmental outcomes by councils. The effectiveness of the New Zealand Coastal Policy Statement (NZCPS) as a policy instrument therefore remains uncertain.

233. In summary, it remains a high priority to improve the management responsibilities and accountabilities associated with coastal and marine environments. We also found the coastal elements in the Strategy were scattered through the theme to the extent that their collective impact tends to be downplayed and their importance can be easily overlooked. Whether for this reason or as a consequence of other factors (e.g. little engagement by regional councils with the Strategy), it has been hard to asses how much has been achieved for conservation of biodiversity in the coastal environment.

**Progress in sustainable use of marine resources**

234. There are indications of recent moves towards more a more ecosystem-based approach to management of fisheries. The damaging impacts of bottom trawling were recognised and Government closed 19 seamounts to all trawling and part of Spirits Bay in 2001 as a consequence. Additional similar closures of seamounts may well be warranted for the same reason. Other steps to protect threatened marine species have been taken and are discussed below. A 'Strategy for Managing the Environmental Effects of Fishing' (SMEEF) was released by Government in August 2005. Once implemented it could go a long way towards reducing previous damaging impacts associated with 'by-catch', destructive fishing methods and with over-fishing. Much will depend, however, on the quality and effectiveness of the 'environmental standards' that have yet to be set as part of the SMEEF and the extent to which it is able to consider ecosystem condition as a whole.

235. The Ministry of Fisheries also intends to replace the present approach of developing stock strategies with 'fisheries plans'. Preliminary work is intended to be done in 2005-06. MFish regards fisheries plans as representing an integrated approach to fisheries management, presumably with close links to the SMEEF. The effectiveness of both the SMEEF and the new fisheries plan approach in protecting marine biodiversity while providing for fishing will need to be assessed at a later date. We would expect to see a move away from the limited measures of 'sustainability' that are currently attached to total allowable catch and maximum sustainable yield figures.

236. More environmental research needs to be contracted by MFish, given the low proportion of its annual research budget that is allocated for environmental research ((less than 10%) and the recent tendencies to significantly under-spend these proposed allocations.

**Progress in managing marine biosecurity risks**

237. Almost $10M was allocated to six programmes to improve New Zealand's marine biosecurity, making it the best funded of the objectives (3.5) within this theme after marine reserves. There were good outcomes with respect to the completion of surveys of 16 harbours and the establishment of follow-up surveillance surveys in eight of our busiest ports. Over 170 species 'new' to New Zealand waters were identified, but how many of these may become economic or environmental pests remains to be seen. The outputs of the other programmes were less notable. For example, much still remains to be done to reduce the risks from hull fouling, given that half the hull cleaning facilities around the country would need major upgrades to meet the guidelines that have been developed. Work on monitoring ballast water exchange has made more progress, but this pathway, as well as hull fouling, remains a substantial biosecurity risk.

238. There are management issues around marine biosecurity that also need to be addressed, probably under the more generic Theme Five – Biosecurity and Biodiversity. Major responsibilities for coastal and marine biosecurity fall to regional councils under the Biosecurity Act, but their low funding base for this work, as well as having little expertise

and even less related political support has had predictably poor outcomes. Clarifying these roles, responsibilities and funding issues is a task for Biosecurity New Zealand to lead. For the marine environment the key elements to better biosecurity are prediction (knowing the vectors and pathways) and pre-emption (reducing the risks of arrival by cost-effective means).

239. Despite the expenditure, much remains to be done at several levels – research, policy development, clarifying responsibilities, funding – before there is a substantial reduction in the marine biosecurity risks faced by New Zealand. These tasks converge around the emerging issue of reducing risks caused by internal movements of vessels around New Zealand. We identify this under Theme Five, but it is attracting stronger concerns for the marine environment too. A clear example that warrants a system of targeted inspection and cleaning for vessels travelling around New Zealand waters is the ongoing threat that the seaweed *Undaria* poses to pristine, high quality locations now that the control campaign against *Undaria* has been abandoned.

**Progress in protecting species, habitats and species**

240. This summary section covers Objectives 3.6 (Protecting marine habitats and ecosystems) and 3.7 (Threatened marine and coastal species management). About $11.5M was allocated to advancing the marine reserves programme and three of the four actions under this objective were accorded 'priority' status. Although the area under marine reserves has increased substantially in the last 5 years, most of this increase is due to the creation of the Auckland Islands marine reserve that was previously a marine mammal sanctuary. Only three reserves were added around the North and South Islands in that time through the usual process under the Marine Reserves Act which is still often protracted and contentious, as well as expensive. Four more applications await the concurrence of the Minister of Fisheries, including the proposal for a large (50,000 ha) marine reserve for Aotea/Great Barrier Island.

241. A quite different process led, via special legislation in 2005, to the creation of eight marine reserves in Fiordland after a 10-year initiative by local interests and user groups. While some conservation organisations have concerns about the outcomes it does represent a significant addition to the marine reserves system inside a larger management and use regime. We understand that there are other regional initiatives now underway that have similarities to the process followed for the Fiordland initiative. Some communities and iwi would prefer to discuss protection proposals within a broader framework of considering protection issues alongside use and development options.

242. Slow progress marked efforts to review the Marine Reserves Act 1971. The Marine Reserves Bill (which will streamline the process) has now been with the Select Committee for about 3 years. We hope the new Parliament will be able advance the Bill which provides for a less costly process for advancing marine reserve proposals along with other proposed improvements.

243. The priority action which has absorbed much official effort in the past few years has been the development of a new approach to marine protection - the creation of a *marine protected areas* network using the full range of protection tools under a range of Acts, while retaining marine reserves as the main mechanism. There has been considerable work done on the policy for marine protected areas (yet to be approved by Government) which would be able to use the new classification systems, summarised above, to propose representative areas for protection. But while it broadens the number of protection tools available for use, the marine protected areas approach still restrains the public dialogue if communities want to discuss development issues alongside protection options. We see the public focus moving towards expecting a more integrated approach to planning for use, as well as for protection in the coastal/marine environment.

244. There has been moderate progress on threatened species issues, primarily the development of a national plan to reduce seabird by-catch and DOC's comprehensive marine mammal action plan for 2005-2010. However, several seabird taxa are now in worse condition than 5 years ago, although others are recovering thanks to changes in fishing practices and the use of innovative fishing gear. Many seabird losses are caused by foreign fishing vessels in international waters. Relevant seabird research funded by FRST has been cut, and there is little money for developing and implementing recovery plans and population management plans for the high priority, critically threatened seabird and marine mammal species. Work on key threatened marine species should be a high priority for the next phase of the Strategy.

245. New Zealand has now ratified the Convention on Migratory Species and two related agreements which has increased its ability to influence international efforts to conserve several threatened species, especially seabirds.

**Councils and communities**

246. Unfortunately we have not been able, within this review, to systematically survey council activities with respect to coastal and marine management for biodiversity. The detailed review of the NZCPS (Rosier 2004) concentrates on the planning aspects of the NZCPS and the RMA, although she does comment on the lack of environmental monitoring by councils. We have referenced above to some of the practical and financial constraints that affect the ability of local government to meet its responsibilities in addition to the overlapping jurisdictions and issues over management accountabilities. The dynamics of the land-sea interface in terms of biological and physical processes, as well as human activities, place particular demands on the development of management regimes that are relevant, holistic and administratively effective.

247. Communities are increasingly initiating their own responses to local concerns over coastal and marine issues both with and without the support of councils and central government agencies. There are examples where this has led to positive outcomes, as can also be shown for terrestrial-based, local initiatives. This raises important questions about how best to engage with communities (Theme Eight) and the changing expectations that

communities have of government agencies. We make some related observations concerning governance of the Strategy that are also relevant to this point.

## Table 3. Summary table of progress in Theme Three

| **Summary of progress on Theme Three action points (2000-2004)** | | | | |
|---|---|---|---|---|
| | **Priority action** | **Package funding** | **Progress to date** | **Future priority?** |
| **Objective 3.1 Improving coastal and marine knowledge** | | | | |
| 3.1a Improve knowledge | No | Yes | Moderate | High |
| 3.1b Survey & classification | Yes | No | Substantial | High |
| 3.1c Identify importance | No | No | Limited | High |
| 3.1d Identify & assess threats | Yes | Yes | Limited | High |
| 3.1e Develop monitoring system | No | No | Limited | High |
| 3.1f Promote awareness | No | No | Moderate | Medium |
| **Objective 3.2 Coordinated marine management** | | | | |
| 3.2a Management policy | Yes | Yes | Limited | High |
| 3.2b Advocacy roles | No | No | Significant | Medium |
| **Objective 3.3 Sustainable coastal management** | | | | |
| 3.3a Effectiveness of NZCPA | No | No | Limited | Medium |
| 3.3b Coastal initiatives | Yes | No | Limited | Low |
| 3.3c Priority site restoration | No | No | Limited | Medium |
| **Objective 3.4 Sustainable marine resource use practices** | | | | |
| 3.4a Implement Fisheries Act 1996 | Yes | No | Moderate | High |
| 3.4b Protect sensitive species | Yes | No | Moderate | High |
| 3.4c Application of precaution | No | No | Moderate | Medium |
| 3.4d EIA integration into fisheries | No | No | Moderate | Medium |
| 3.4e Managing adverse impacts | No | No | Limited | Medium |
| **Objective 3.5 Managing marine biosecurity risks** | | | | |
| 3.5a Enhance border control | Yes | Yes | Substantial | High |
| 3.5b Marine pest responsibilities | No | No | Limited | High |
| 3.5c Exotic species distribution | No | Yes | Substantial | High |
| 3.5d Pest control measures | No | Yes | Moderate | High |

| | | | | |
|---|---|---|---|---|
| **Objective 3.6 Protecting marine habitats and ecosystems** | | | | |
| 3.6a Strategy for protection | Yes | No | Substantial | High |
| 3.6b Marine protected areas | Yes | Yes | Moderate | High |
| 3.6c Review Marine Reserves Act | Yes | No | Substantial | High |
| 3.6d Promote community initiatives | No | No | Substantial | Medium |
| **Objective 3.7 Threatened marine & coastal species management** | | | | |
| 3.7a Threatened species system | No | No | Completed | Low |
| 3.7b Protect threatened species | No | No | Moderate | High |
| 3.7c Implement recovery plans | No | No | Limited | High |
| 3.7d Accede to Bonn Convention | No | No | Completed | N/A |

## Introduction

248. Theme Three is concerned with conservation within New Zealand's coastal and marine environments, including the Exclusive Economic Zone. In total, this covers an area that is not only fifteen times larger than our land area but also more diverse, both with respect to the marine physical environment and the richness of its biological diversity. As much as 80% of New Zealand's indigenous biodiversity is marine and fewer than half of the estimated 23,000 species have been identified. Our current knowledge of how marine ecosystems function, the Strategy states, is inadequate to show whether we are sustainably managing marine resources or not. Addressing the challenges of improving knowledge, protecting marine habitats, improving marine biosecurity and ensuring that the use of marine resources is sustainable were identified as important priorities.

249. The following commentary looks at progress over the last 5 years against the seven objectives and their associated actions. After Theme One, this theme received the largest allocation from the Package, a total of $36.8M for 12 programmes, or 20% of the total 5-year Biodiversity Package. Six of these programmes ($9.5M) were targeted for marine biosecurity initiatives and will be reported on here, rather than under Theme Five (Biosecurity).

## Analysis of objectives and actions

**Objective 3.1 Improving our knowledge of coastal and marine ecosystems**
**Substantially increase our knowledge of coastal and marine ecosystems and the effects of human activities on them.**

250. This objective recognises that knowledge of marine species and their ecosystems lags far behind our comparable knowledge of terrestrial environments. Obtaining this knowledge is significantly more expensive than for land-based studies and is also needed over a much larger area. Increasing this knowledge base is a fundamental requirement, however, that underpins the sustainable management of fisheries resources as well as understanding the broad dynamics of marine ecosystems and how these are being affected by human activities and natural changes. Although it has not been a feature of the Strategy efforts so far, understanding the impacts of various land uses, such as urban and agricultural systems, on marine biodiversity also needs to be included under this objective. Two actions had priority status and one-third of the marine Biodiversity Package money (about $13M over 5 years) went into three information-centred marine programmes.

**Actions 3.1**
**a) Improve our knowledge of marine species, including taxonomy, distribution, habitat requirements, and the threats to species.**
**b) Survey, assess, and map habitats and ecosystems important for indigenous biodiversity and develop an agreed bioregional classification system[25].**

[25] Bioregional classification is based on a combination of biological, geographical and social or management criteria.

**c) Identify the uniqueness, representativeness, and importance of the biodiversity of New Zealand's coastal and marine ecosystems.**
**d) Identify, assess, map, and rank the threats to New Zealand's coastal and marine biodiversity.**
**e) Develop an environmental monitoring system to provide information and a spatial understanding of: the status of marine species; fish stocks; habitats important for indigenous biodiversity; marine environmental health; threats to biodiversity; and the effectiveness of measures to avoid, remedy or mitigate the adverse effects of activities on marine biodiversity. Ensure that this information is readily accessible to all interest groups.**
**f) Promote individual and community awareness of the effects of activities on marine biodiversity, and the opportunities and responsibilities to protect and maintain habitats and ecosystems of importance to biodiversity.**
**Lead agencies:** **MFish, MfE, DOC, FRST**
**Priority actions:** **Actions b) and d)**
**Funding:** **Core + Biodiversity Package**

### Marine classification systems

251. Action 3.1b – the development of marine classification systems – was rightly identified as a priority action for the first 5 years. It underpins other actions in this objective and is also the key to progressing marine protected areas (Objective 3.6) in a more systematic manner. In July 2005, Government launched the New Zealand Marine Environment Classification (MEC) system. The Marine Environment Classification has been in development over the past 4 years[26], but has been funded independently of the Biodiversity Package. The MEC establishes a hierarchical classification using several data layers of physical data to describe the marine environment. It assumes that the link between physical and oceanographic factors and associated biodiversity is sufficiently strong that a classification based on the physical environment can serve as an adequate proxy for underlying biodiversity patterns.

252. The MEC operates at two scales – one for the whole EEZ, the other at a regional level which is intended to make it useful to regional councils who are important potential users of the MEC. The MEC classifications are intended to provide useful spatial frameworks of marine environments to guide environmental and conservation management. It is important to note that the MEC would be improved with additional information and now needs to be tested by validation surveys and against management requirements. This will require further resourcing.

253. Other classification systems are needed to complement the MEC by using biological, rather than physical information. One such DOC-led system that is near completion is the Near-Shore Marine Classification and Inventory (NMCI). The NMCI is based on inventories of biological information and focuses on relatively shallow water (approx. 50-100m depth) out to the limits of the territorial sea. The information is at two scales: a mesoscale (100-1000km) describing eight biogeographic regions and a micro-scale (10-100km) describing coastal, shelf and off-shore island units. DOC also commissioned the

[26] Development was led by MfE with the commissioned work done by NIWA.

development of a classification for shallow subtidal reef communities which has been completed (Shears and Babcock 2004). Early indications are that this system may have real value in assisting with broader classification requirements.

254. Work has begun on the Estuary Environment Classification (EEC) (Hume et al 2003) since the MEC does not cover estuarine ecosystems. The Maritime New Zealand is developing a Coastal Resources Atlas to support planning and management of oil spills.

255. In combination, these various classification systems are probably sufficient to significantly advance other marine objectives, although we would caution that there may be issues to resolve over the different scales at which they have been designed to operate. They should help guide priority-setting for future biodiversity surveys (Actions 3.1a, b,c,d) and assist in identifying representative marine ecosystems that could constitute a network of representative protected marine areas (Objective 3.6).

**Improving the knowledge base**

256. The acquisition of new knowledge of marine biodiversity and the development of mechanisms to ensure it is widely available and used need to be addressed as separate questions. The Baseline Information Programme (BioInfo) was established to "…develop a more complete understanding of the biodiversity and function of New Zealand marine ecosystems, with a special emphasis on functionally important marine communities and communities that are under pressure from human impacts." (Action 3.1a). The intention is to "…ultimately inform the development of an ecosystem-based approach to the management of fisheries." A number of research projects were commissioned and have been completed or are still ongoing. The various projects included: a focus on 'at risk' habitats, such as seamounts and soft-sediment communities; trophic structure of fish assemblages on the Chatham Rise; survey of the Norfolk Ridge/Lord Howe Rise; taxonomy of New Zealand's crustose coralline algae.

257. A separate Package-funded initiative was research directed at increasing the understanding of selected marine communities in the Ross Sea. While the Ross Sea is an area of interest and baseline information from relatively undisturbed ecosystems will certainly be useful, we question whether it was a high priority, given the low level of information for other areas closer to New Zealand that are under greater pressure from fishing and bottom-trawling. Intended benefits from the Ross Sea research include, amongst others, better understanding of polar ecosystem functions and of the marine biodiversity of the Balleny Islands to support New Zealand's efforts for protection of the area. The website established to distribute information from Ross Sea research (www.rosssea.govt.nz ) does not appear to be operational.

258. Although there is widespread recognition of the importance of substantially increasing our knowledge of marine environments there has been no funding increases for marine research by FRST since 1998. Given the increased costs of running research vessels and general inflation, there has been a serious decline in real terms in this research sector. NIWA advised a decline of 30-40% of full-time equivalent staffing positions in

freshwater and marine disciplines since 1998. This is part of the wider decline in environmental RS&T which has declined in real value by 11% since 1998 based on the Consumer Price Index (MoRST 2004). The MoRST report also identified "…a lack of clarity about the roles and responsibilities in the New Zealand environmental science system." (page 47) The FRST allocations for marine research in July 2005 have funded three new areas of research[27], but have not increased the overall level of expenditure for marine research. Research into seamounts, their biodiversity and effects of fishing will continue. However, important long-term research into seabirds has been terminated (see Objective 3.7).

259. It is most unlikely that a continuation of these funding levels for marine RS&T will provide the knowledge needed to underpin the marine and coastal aspects of the Strategy, even on a priority issues basis. This has serious implications for the conservation objectives of the Strategy (Objective 3.6, 3.7), coordination of marine management (Objective 3.2), the sustainable use of marine resources (Objective 3.4) and biosecurity issues (Objective 3.5)

260. We are encouraged, however, by the March 2005 announcement by Government of the launch of the Ocean Survey 20/20 initiative. This ambitious undertaking includes in its vision providing New Zealand with the knowledge of its ocean territory to, *inter alia*, "conserve, protect, manage and sustainably utilise our ocean resources." Funding permitting, Ocean Survey 20/20 could provide valuable new resources for the validation work that is now needed with respect to the new marine classification system (see below), as well as conservation and protection goals.[28] We assume that the competing mix of survey priorities, between obtaining data on extractive resources and understanding biodiversity, will be informed by the Oceans Policy outcomes and the priorities for knowledge of marine biodiversity that have already been identified.

261. The second aspect of this theme objective, improving the availability and usefulness of marine information, has been a major focus of the National Aquatic Biodiversity Information System (NABIS) programme. NABIS displays summarised information in map format as a Geographical Information System (GIS). Most potential users identified that NABIS should function as a decision-support tool, using summary information from a number of key databases (Second Annual report of Programme Performance 2001-2002, NZBS). Following development over the past 4 years Version 1 was available on the internet from August 2004. MFish intends to improve both the information content and functionality of the system in subsequent years. Making the necessary improvements to NABIS will be important if the level of buy-in by stakeholders beyond MFish (one of the original intentions of NABIS) is to be achieved. This may well depend on future budget input and the availability of new information. We have not obtained user feedback on the present usefulness of NABIS.

[27] Details of the new FRST marine projects are: estuarine eco-diagnostics (determining the capacity to absorb pollution impacts); Ross Sea sustainability (with an emphasis on the fishing impacts on toothfish); marine recreation (effects of rising visitor use on prime recreational areas and species).

[28] Of the proposed six key goals, three have biodiversity components: stewardship and management; conservation and protection; sustainability of resource utilisation.

262. A WWF-New Zealand workshop in May 2003 brought together marine scientists and valuable information (including an inventory of data sets) about marine biodiversity (Arnold 2004). The publication was funded by MFish with further support for the development by WWF of a literature review of New Zealand's marine biodiversity information. The report identifies important knowledge gaps; 'vast regions are unexplored' and ecosystem processes that are poorly understood. The workshop also concluded that the declining number of marine taxonomists makes it harder to address some of the important information gaps. This could become a serious capacity issue when the Ocean Survey 20/20 project gets underway.

263. Overall, various initiatives during the past 5 years have clearly improved our collective understanding of New Zealand's marine environments. As a result, the area of New Zealand's oceans that have been surveyed has roughly doubled in the past 5 years. However, this still represents only about 2% of New Zealand's EEZ;

**Using knowledge more effectively**

264. Despite the advances in understanding in recent years we are starting from a relatively poor knowledge base of our marine environments. The importance of information for setting priorities for ocean management and some of the significant gaps that remain were summarised in a June 2005 report by MfE (MfE 2005). This report is a contribution to the Ocean Survey 20/20 project and should help future work on priority setting under an Oceans Policy (see Objective 3.2).

265. Three important summary points from the MfE report are:
- Significant and important gaps remain to be filled through further research and survey (e.g. on the types and distribution of introduced marine species);
- Barriers are preventing access to and effective use of, existing information;
- Analysis of information requires improved tools for accessing, sourcing and interpreting marine information.

266. Barriers include: intellectual property issues (e.g. bathymetric data, Crown-funded for its collection, must be bought from CRIs, often at prohibitive cost); lack of data in spatial format, lack of consistent definitions; wide distribution of data among diverse agencies; unclear responsibility for data collection; lack of protocols for use of information; lack of resourcing to collate and manage data. The report notes that there are at least 15 different data sets showing the New Zealand coastline, based on different definitions of its boundary. There is no nationally complete and authoritative data set depicting mean high-water springs despite this being a key administrative boundary for management under the Resource Management Act.[29] There is still, the report argues, a need for "a comprehensive national meta-database of marine information sources".

[29] In addition, there is the problem caused by the dynamic nature of coastal processes. The Mean High Water Spring boundary not fixed in time or space as sediments build or sea levels rise. This underscores the importance of an administrative system that integrates management responsibilities across the land-sea boundaries.

267. Finding solutions to these 'knowledge barriers' that are compounding the shortcomings of our existing marine knowledge will require leadership from central government and the identification of a co-ordinating agency. Leadership and a whole-of-government response will also be crucial if there is to be an effective integration of the knowledge needs and conservation objectives of the Biodiversity Strategy with the activities of the Ocean Survey 20/20 initiative and the Oceans Policy project. We understand that Government is developing a work programme and budget for Ocean Survey 20/20 for decisions later in 2005.

268. Further work is needed to complete the development of an environmental performance indicators and monitoring system for the marine ecosystems (Action 3.1e) Some work was completed on monitoring coastal and marine areas prior to the Strategy (e.g. Froude 1998), but the only marine indicators that have been agreed to by Ministers and implemented are those relating to fish stocks and fishing impacts. MFish is currently reviewing the fish stock indicators and will be further developing the 'fishing impacts' set. The Ministry intends to have these on the Internet later this year and to further expand and develop its marine indicators. Other indicators were originally developed for marine ecosystems and human use and values, but have not progressed past the stage of being agreed to by those experts involved in their development.

**What are the 'threats'?**

269. The second priority action (3.1d) that also received Package funding was a programme to identify, assess, map and rank the threats to coastal and marine biodiversity. After 2 years of planning it was decided that the original programme was "overly ambitious and was unachievable in its original form" (NZBS – Fourth annual report) Most funds were re-directed to MFish work on marine reserves and marine protected areas.

270. Particular threats to a range of species (Objective 3.7) and from some activities (e.g. bottom trawling (Objective 3.4) have already been identified. Coastal developments and land-based pollution are other threats, as climate change may become in the future. What this suggests is that the potentially useful aspect of this action is the reference to '*rank the threats'*, which requires an assessment of the *cumulative* and relative impacts of a wide range of diverse threats, ranging from over-fishing to coastal sedimentation. This may raise awkward questions about the point at which legitimate use activities (e.g. recreational and commercial fishing) might also be considered a threat, and the criteria for arriving at that decision, given the uncertainty that is attached to our knowledge of marine systems.

271. While this may have been considered as an "overly ambitious" project we suggest it remains a highly relevant priority, particularly the need to assess and rank the known threats to coastal and marine biodiversity. The reference to 'mapping threats' probably applies more to coastal threats in specific places (e.g. from pollution sources, sedimentation risks) than it does to the marine environment, although specific marine

habitats with high biodiversity values (e.g. specific seamounts) would be relevant for inclusion.

**Community awareness**

272. There have been a wide number of efforts by agencies to promote awareness of marine biodiversity, some of which have been covered above (Action 3.1f). These include new websites, reports and brochures. There have been a large number of community initiatives ranging from successful cleanups of estuaries to programmes supported by several regional councils that are successfully restoring dune systems at minimal costs. The successes of the Dune Care initiatives by Environment Bay of Plenty are described in Theme Eight. In Wellington, the city council has put significant funding support behind an ambitious private-sector proposal for a marine education centre. Given the importance of the marine environment to New Zealanders the benefits of such educational facilities is clear.

273. ***Moderate progress overall. Major achievements of the first 5 years have been the development of key building blocks – several marine classification systems and the National Aquatic Biodiversity Information System (NABIS). Although here is a considerable amount of information already on NABIS, we suggest it needs to be more user-friendly, especially for novice users, and is likely to require ongoing financial support to achieve its full value.***

274. ***We are pleased to note the complementarity of the classification systems that are now emerging for marine environments. They should prove valuable for meeting fisheries as well as conservation objectives. There is a need now to validate the classification systems by applying them directly to specific management tasks. This would be more cost-effective than tackling the various initiatives in an uncoordinated manner, but may well require extra resourcing. There are opportunities here for regional and central government agencies to work together on this and on other actions such as identifying important areas for protection and management.***

275. ***The classification systems and new techniques for mapping ocean floors will help prioritise areas within the large EEZ for further survey and study. Knowledge of the marine environment is improving, but will take a major effort if many uncertainties about system functions and basic species information are to be rectified. There have been a number of gains in understanding of marine ecosystems through various research projects funded through the BioInfo programme. However, the decline in FRST funding for marine research is a major impediment to sustaining this work at the necessary level of investment that is required. Better resourcing will be required to further advance important actions related to knowledge acquisition (3.1 a, b, c).***

276. ***Work on completing the environmental monitoring system made little progress during this period with the exception of work by MFish on fish stocks and fishing impacts indicators. There is a good opportunity now to engage regional and central government agencies in agreeing on a set of indicators and monitoring systems as part of an***

***integrated national monitoring and reporting system. This will require leadership and would logically be a matter for inclusion in the Oceans Policy process. Work on identifying, assessing and ranking threats should be advanced.***

277. ***One area of knowledge that will need to be substantially advanced in the next period of the Strategy is understanding the potential impacts of climate change on coastal and marine environments and options for adaptation. The independent review of the New Zealand Coastal Policy Statement noted that "More clarity is needed at national planning levels, especially in regard to the influence of climate change data on the location and design of public infrastructure in the coastal marine area."(Rosier 2004). Jacobsen (2004) noted that climate change could see many coastlines switch to a trend of long-term erosion with unpredictable effects on coastal ecosystems. Potential impacts on coastal and marine biodiversity need to be better understood alongside possible infrastructural and coastline implications.***

**Objective 3.2 Coordinated marine management**
**Develop processes for a marine management that enable decision makers to consider whole marine ecosystems.**

278. Prior to the development of the Strategy the need for substantial improvements in marine management were identified during a wide-ranging 1998 marine conference (Wallace et al 1998) and by a broad investigation by the Parliamentary Commissioner for the Environment into marine management (PCE 1999). Some of the terms used to describe our marine management in the PCE report were – "arbitrary", "incomplete", "complicated, with overlapping and fragmented management responsibilities", "hampered by lack of an overarching strategy and goals." The Biodiversity Strategy also referred to unclear responsibilities, lack of accountability for actions and outcomes, lack of coordination and management agencies that often had "…competing economic, social and environmental purposes" (p.58). This objective is directed towards addressing these issues and $2.3M was allocated to looking at managing information at different scales and also to encouraging better co-ordination at a regional level to promote marine biodiversity.[30]

[30] An additional allocation for the Oceans Policy project was subsequently removed from the Biodiversity Package and reported on separately.

**Actions 3.2**
**a) Clarify and agree on comprehensive government policy objectives for marine biodiversity management, considering all stakeholder, and public interests. Define agency responsibilities, especially for areas outside of the 12 nautical mile limit, and revise these if necessary[31].**
**b) Advocate for the conservation and sustainable use of marine biodiversity in areas subject to international jurisdiction, including the Ross Dependency and other Antarctic areas.**

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| **Lead agencies:** | **Department of Prime Minister and Cabinet, MfE** |
| **Priority actions:** | **Action a) only** |
| **Funding:** | **Core + Biodiversity package** |

279. The primary mechanism for considering these management issues now lies outside the Strategy framework. In July 2000, Cabinet agreed to the development of an Oceans Policy for New Zealand designed to ensure integrated and consistent management of the oceans within New Zealand's jurisdiction (Action 3.2a). A Ministerial Advisory Committee on Oceans Policy was established. Subsequently, a vision, goals, values and principles were developed to guide the second stage of Oceans Policy[32] which is focused on designing policies to achieve the vision. A considerable amount of work was done on this second stage during 2003, including an identification of the issues that need to be addressed and a stocktake of current management approaches, policies, legislation and institutions. We have not analysed this material with respect to how it is aligned with the objectives of the Biodiversity Strategy since it may be subject to further change.

280. The completion of the proposed Oceans Policy package was then delayed so that it could take account of government decisions on public access and customary rights to the foreshore and seabed during 2004. With the subsequent passage of legislation on foreshore and seabed issues the way was clear to return to the Oceans Policy initiative and work re-commenced by officials in late-2005.

281. We view clarification of marine management responsibilities within a clear strategic framework as central to resolving major issues that have confused and handicapped marine management for decades. Current statutory responsibilities are often at odds with marine ecosystem processes and therefore undermine the conservation of biodiversity. For example, the whole near-shore marine ecosystem lies within the control of the RMA which can also regulate fishing provide the controls are for RMA reasons rather than the management of the fishery (s30(2)). Fisheries and the environmental effects of fishing are excluded from the RMA, despite the effects of fishing on in-shore ecosystems. What is needed is a policy framework that supports integrated decision-making across the coastal-marine boundaries and beyond.

282. The Biodiversity Package supported one programme that straddled work under this objective and the previous one. A number of small projects were set up as case studies to

[31] This action addresses a range of marine environment management issues of which biodiversity is only one component.
[32] The Oceans Policy project does not cover the Ross Sea or the Antarctica.

encourage better co-ordination across agencies, iwi, and the community to promote marine biodiversity at a regional level. Completed projects were largely focused on contributing to information management and the Fiordland work contributed to the recent establishment there of several marine reserves (see Objective 3.6). One proposed customary management study was not pursued and an alternative option is being considered.

283. While the higher level policy issues of ocean management remain to be resolved there has been progress at the inter-agency level to improve co-ordination between agencies. This has been one of the functions of the Marine Conservation Unit in DOC. Related initiatives have included: an interagency protocol on marine reserve process; and improved alignment of the work of the Conservation Services Programme between DOC and MFish.

284. There has been a significant amount of activity and conservation benefits from New Zealand initiatives relating to Activity 3.2b. These include: New Zealand's vigorous efforts to retain the moratorium on whaling thorough the International Whaling Commission; initiatives under the Convention on Migratory Species; the Southern Seabirds Solution Trust which is aimed at voluntary reductions of seabird by-catch in Southern Hemisphere fisheries; and initiatives relating to the Ross Sea and Antarctica. Despite the gains, major concerns remain over fishing practices (both legal and illegal) in the high seas, including the level of exploitation of toothfish in the Ross Sea. Other international initiatives in marine conservation are discussed under Objective 3.7 and in Theme Ten.

285. ***Limited progress. Work has recently resumed on the Oceans Policy. Clarification of roles, responsibilities and accountabilities for marine management are urgently needed to resolve the numerous problems that were identified prior to the Strategy. In the absence of a higher level, strategic policy framework that supports integrated decision-making, the setting of national priorities and the balancing of tensions between marine exploitation and conservation objectives will continue to be difficult. There has been progress on inter-agency coordination on matters such as processing marine reserve applications and better aligning the work of the Conservation Services Programme between DOC and MFish. There has been considerable activity at the international level by New Zealand advocating for protection of marine species such as cetaceans and seabirds.***

**Objective 3.3 Sustainable coastal management**
**Protect biodiversity in coastal waters from the adverse effects of human activities on land and in the coastal zone.**

286. The New Zealand Coastal Policy Statement (NZCPS) was developed, as required by the Resource Management Act 1991 (RMA), to guide regional councils in fulfilling their responsibilities for management of the coastal environment. The NZCPS does not guide marine policy beyond the limits of the territorial sea. It is, however, the statutory RMA national policy statement that applies to the zone (from the coastal environment out to 12

nautical miles) within which most of the conflicts between people's activities occur. This is also the area with a complex of overlapping legislative jurisdictions concerning biodiversity protection and use.[33] Responsibilities for protecting biodiversity within the zone fall, therefore, to several agencies of central and local government.

**Actions 3.3**
**a) As part of the review of the New Zealand Coastal Policy Statement (NZCPS), assess its effectiveness, and that of regional coastal plans, in protecting marine biodiversity, and recommend changes accordingly[34].**
**b) Expand programmes to mitigate the adverse effects of land use on coastal biodiversity, and incorporate marine biodiversity priorities into programmes for sustainable land use, including the Sustainable Land Management Strategy, National Agenda for Sustainable Water Management (NASWM), and related strategies.**
**c) Maintain or restore the biodiversity of priority sites in the coastal environment.**
**Lead agencies:** **DOC, MfE**
**Priority actions:** **Action a) only**
**Funding:** **Core only**

287. The NZ Coastal Policy Statement was independently reviewed in 2004 (Rosier 2004). That review concluded that the NZCPS policies had been effective at influencing regional policy statements and regional coastal plans, but only partially effective in influencing district plans. Some district councils lack specific coastal rules and use their rules for subdivisions in rural areas to assess applications for coastal activities, despite the very different characteristics and vulnerabilities of coastal environments.

288. The most negative finding of Rosier's report is that: "*The poorest area of implementation has been in monitoring environmental outcomes and assessing the degree to which plans and policy statements have influenced environmental results.*" (Rosier, page 66). Monitoring requires performance measures, or indicators against which to evaluate effectiveness. As we have commented earlier (Objective 3.1e), there is currently no agreed and implemented national environmental monitoring system to assess the effectiveness of measures to avoid, remedy or mitigate the adverse effects of activities on coastal and marine biodiversity. A draft set of coastal indicators was developed in 1999, but has not been progressed since. Only the Taranaki Regional Council has assessed the efficiency and effectiveness of its regional coastal plan, but not against any national guidelines (Rosier 2004).

289. Funding implications are often behind a reluctance to implement national requirements, such as monitoring, even assuming the existence of a good set of indicators. We agree with Rosier: "*That this is one area where responsibilities are blurred at all levels.*" We recommend that the Oceans Policy review address and clarify responsibilities for monitoring both coastal plans and the coastal environment. Under Objective 3.5 we refer

[33] See the report by the Parliamentary Commissioner for the Environment (1999) for a summary of jurisdictions, agencies and operations in the New Zealand marine environment.
[34] There is a need for the New Zealand Coastal Policy Statement to be consistent with a national policy statement on biodiversity (see Actions 1.1d and 2.1g).

to the various difficulties faced by regional councils with respect to managing their biosecurity responsibilities in the coastal environment.

290. Although we lack a national overview of whether the NZCPS and regional coastal plans have been effective in protecting coastal and marine environments there is anecdotal evidence of negative impacts on coastal environments. Increased numbers of coastal sub-divisions and development, plus the high demand for coastal beach properties in the past few years are likely to continue to increase pressure on coastal environments and biodiversity values.

291. In June 2005, Government proposed a timetable and process for formally reviewing the NZCPS, via a Board of Inquiry, during 2006/07. This review will also need to consider the implications of climate change for the coastal environment, given the improved understanding that now exists concerning likely coastal impacts of rising sea levels, increases in the number of storm events, and changes in rainfall patterns. These factors all have implications for coastal environments and the in-shore marine area, such as increases in coastal erosion (Jacobsen 2004), cyclonic events causing large sediment runoffs, changes to the freshwater flows into estuaries.

292. While the pressures to use coastal areas for development have increased, and are subject to the NZCPS, we are not aware of any programme initiatives from central government agencies that have been focused on mitigating the effects of adverse land use on coastal biodiversity (Action 3.3b). There is a related research initiative under the MFish BioInfo programme. Regional initiatives are covered in the next paragraph.

293. Action 3.3c, the maintenance or restoration of biodiversity on priority sites in the 'coastal environment', first requires the identification of priority sites. This is, in turn, dependent on a surveying and ranking exercise which has not been undertaken, to our knowledge, at a national level. The completion of classification systems may now lead to the identification of priority sites, but this would require central leadership, coordination and support if it is to be done for the country as a whole. The extent of regional initiatives to protect priority sites has not been brought to our attention. This action may be interpreted as applying to coastal terrestrial zone, or in-shore marine areas, or both. The wording of the objective refers to 'protecting biodiversity in coastal waters…' which implies an overall marine focus. A similar confusion applies to other references to 'coastal' scattered through this theme, which has the effect of leaving coastal actions somewhat in limbo.

There has been considerable regional activity over the last decade focused on coastal care *per se* by regional and district councils involving local communities. The focus of these actions has primarily been on initiatives such as reducing erosion, cleaning up estuaries and dune restoration, rather than focusing on priority sites. This is not to diminish the positive value of these coastal care programmes in remedying the adverse effects of human activities which have also benefited local plant and animal species. (See Theme Eight for further information on coast care initiatives.)

294. Local initiatives can be ambitious and comprehensive, involving various agencies. For example, in 1997, farmers, fishers, iwi and recreational users, concerned by erosion and loss of environmental quality, established Whaingaroa Environment, a management group wanting a healthy and sustainable environment for the Whaingaroa (Raglan) Harbour. With backing from the regional and district councils and information from DOC, the group has developed a comprehensive catchment management plan. Community initiatives can stimulate better integration and cooperation between regional and district councils (van Roon 1999).

295. ***Limited progress. The formal review of the New Zealand Coastal Policy Statement will not start until 2006. (The review was delayed by the foreshore and seabed issue.) The 2003 amendments to the RMA require councils to give effect to the NZCPS which increases the significance of the review's outcomes. The review faces two major challenges when it tries to assess the effectiveness of the NZCPS in protecting coastal and marine biodiversity. First, the lack of progress over the past five years in establishing agreed sets of coastal and marine indicators means there are no national standards against which to monitor impacts. Second, there has been very little monitoring of environmental outcomes by councils (Rosier 2004). In the absence of indicators or standards, coupled with inadequate monitoring, the effectiveness of the NZCPS as a policy instrument remains to be tested against environmental outcomes.***

296. ***Useful and effective initiatives on coastal protection are underway by several councils, but these have not, to our knowledge, been targeting priority coastal sites (Action 3.3c). There have not been specific programmes from central government agencies focused on mitigating the effects of adverse land use on coastal biodiversity. Given the small amount of monitoring that has been done we lack the information to provide an overall assessment on progress against this objective. With increased coastal development and the decreases in the water quality of lowland rivers, adverse effects on coastal waters from land-based activities are likely to be increasing.***

**Objective 3.4 Sustainable marine resource use practices**
**Protect biodiversity in coastal and marine waters from the adverse effects of fishing and other coastal and marine resource uses.**

297. Despite the major improvements that the Quota management System (QMS) represented over the pre-1986 fisheries management systems, both for the economics of the fishing industry and environmental considerations, significant problems remained at the time of the Strategy launch. The Strategy refers to the need to better address the research and management actions that affect the inter-relationships between fishing activities and other components of marine biodiversity.

298. In 1999, the Auditor-General reported negatively on how the Ministry of Fisheries (MFish) was gathering the information needed to meet its responsibilities under the Fisheries Act 1996. The audit concluded that for 31 of 44 fish stocks (representing 60% by value of all fish caught within the EEZ) there were "significant gaps" in the information required for their sustainable utilization and these uncertainties were not

being explicitly stated. It also concluded the Ministry needed to: give greater priority to fulfilling the environmental requirements of the 1996 Act; fund more research on the effects of fishing on the aquatic environment; and continue work with MfE on the Environmental Performance Indicators Programme (Auditor-General 1999). These recommendations are connected with most of the following actions and therefore provide a useful benchmark from which to assess some aspects of progress over the following 5 years.

299. Two actions were given priority status, but no additional Biodiversity package funds were allocated to supplement core expenditure.

**Actions 3.4**
**a) Ensure implementation of the purpose and principles of the Fisheries Act 1996, including programmes to sustain or restore harvested species and associated and dependent species to ecologically sustainable levels, and integrate marine biodiversity protection priorities into programmes for sustainable fisheries use, such as fisheries plans, using an ecosystem approach.**
**b) Identify the coastal and marine species and habitats most sensitive to harvesting and other disturbances and put in place measures to avoid, remedy, or mitigate adverse effects from commercial, recreational and Maori customary fishing activities.**
**c) In the absence of, or uncertainty about, information required for the sustainable use of marine resources, apply the precautionary principle when setting sustainability measures for fishing or setting controls for other coastal and marine uses[35].**
**d) Improve the environmental impact assessment (EIA) of fishing and other marine and coastal resource use, and integrate these assessments EIA into fisheries decision-making processes (including sustainability measures and fisheries plans) and other marine management processes.**
**e) Avoid, remedy or mitigate the adverse impacts of human activities (such as marine transport and mining) on marine biodiversity and develop habitat restoration programmes where appropriate.**
**Lead agencies:** **MFish, DOC, Maritime Safety Authority**
**Priority actions:** **Actions a) and b)**
**Funding:** **Core only**

### Implementing the Fisheries Act 1996

300. In June 2005, the Auditor-General released a follow-up report on how well the Ministry of Fisheries had implemented the recommendations from the 1999 report. Since these two reports are well aligned with the first 5 years of the Strategy, the second report provides a useful independent assessment of progress in those specific areas.

301. The 2005 report was more favourable, commenting that a number of the deficiencies identified in 1999 were being addressed. For most, but not all stocks, clear assessments of the limitations of the information are now given. MFish proposes a series of 3 to 5-year research plans for the major fish species to address the gaps in research to determine

[35] This requirement is included in section 10 of the Fisheries Act 1996.

if fisheries are being managed in a sustainable way (Action 3.4a). Related research is planned or underway under the MFish Aquatic Environment research programme.

302. Future research findings will be an important input to the current proposal to develop fisheries plans for fisheries management. Fisheries plans will replace the present stock strategies. MFish plans to develop 2-3 Fisheries Plans in 2005-06 as a 'proof of concept' and to seek approval for them as fisheries plans under s11A of the Fisheries Act 1996. MFish advised us that these plans will primarily be based on a stock or a number of stocks coincidentally taken in fisheries. The effectiveness of this approach will need to be assessed in a subsequent review.

303. MFish intends this approach to represent an integrated approach to fisheries management. We presume 'integration' to include, as stated explicitly in Action 3.4a, the use of an ecosystem approach to integrate "…marine biodiversity protection priorities into programmes for sustainable fisheries." One measure of how effective integration is in practice will be the importance attached to the environmental effects of fishing and efforts that are made to reduce them (see section below). Past practice has not paid sufficient attention to the environmental factors beyond stock assessment in the determination of the total allowable catch (TAC) for quota species. The significant harm done through 'by-catch' had been treated as an externality. Quite apart from the 'side-effects' of fishing are problems with the setting of the TAC. Although fisheries scientists may recommend reduced TAC levels, the fishing industry can create pressures to push up the TAC (Meister 1999).

304. The bigger question facing commercial fisheries is how the multiple aspects of sustaining both fisheries and the marine environment can be argued and defended through a primary reliance on estimates of maximum sustainable yield (MSY). As more species are added to the quota management system, for which information is most likely sparse, the reliance on a single parameter to determine sustainability of ecosystem functions and fish stocks becomes increasingly tenuous. Hence the importance of the move by MFish to determine sustainable levels of catch by including other factors

305. If integration is to be effective beyond stock management it will require MFish to also address two of the related criticisms by the Auditor General in 1999 – give greater priority to fulfilling the environmental requirements of the Fisheries Act and fund more research on the effects of fishing on the aquatic environment. We discuss the MFish initiatives and needs of each of these in turn.

**Environmental impacts of fishing**

306. Partly as a response to the earlier criticisms in the report by the Parliamentary Commissioner for the Environment (PCE 1999) and in recognition that initiatives to reduce adverse fishing impacts "…have been largely reactive and lack overall coordination" (MFish 2005), the Ministry of Fisheries has developed a draft "Strategy for managing the environmental effects of fishing" (SMEEF). The draft Strategy was

released by Government in August 2005 and is a recognition that fisheries management needs to improve the environmental performance of fishing (Action 3.4b).

307. The central element of the SMEEF is to develop environmental standards as the key mechanism for defining acceptable limits of the effects of fishing on the aquatic environment. These environmental standards will then feed into the fisheries plans and other management processes, thereby providing a desired fisheries outcome that meets 'whole of government goals and strategies' (MFish 2005, page 2). The SMEEF will also need to take account of other initiatives, including the Oceans Policy and the New Zealand Biodiversity Strategy.

308. The extent to which the SMEEF will be effective in delivering better environmental outcomes for the marine environment can only be assessed at a later date. Much will depend on the environmental standards that are developed and set and on the monitoring that is subsequently carried out. It is encouraging to note that the SMEEF places greater emphasis on obtaining information about marine ecosystems on which to base environmental standards and that those managing the fishery have the obligation to demonstrate that the effects of fishing are within environmental standards. An important 'test' of the SMEEF as to its wider benefits will be the extent to which it considers ecosystem condition as a whole.

309. This broader integrative approach signalled by the development of the SMEEF will, we presume, pick up the intentions of Action 3.4d through the proposed relationship between the SMEEF and fisheries plans. This action calls for an improvement of the environmental impact assessment of fishing and other related resource use, but there has been no environmental assessment process established so far under the Fisheries Act. This is despite the inclusion in the Act of the definition of sustainability as needing to avoid, remedy or mitigate any adverse effects of fishing on the aquatic environment (s.8). We understand that as part of the development of Fisheries Plans, Environmental Impact Assessments will be developed.

**Correction measures and research**

310. The 2005 follow-up report by the Auditor-General concluded that MFish is now giving more attention to fulfilling the environmental requirements of the Act. It cites the closure of part of Spirits Bay in Northland and 19 seamounts to scallop dredging and all trawling.[36] The closure of the seamounts by Government in 2001 was an acknowledgement that bottom trawling was causing significant damage to benthic communities and species and that efforts to implement a voluntary closure of seamounts had been unsuccessful. It was an important and significant move to provide protection for some representative areas of significant biological diversity without having a significant impact on commercial fishing opportunities.

[36] Research by NIWA on seamounts was an important contributor in identifying both the destructive impacts of deep sea trawling and potential seamounts for protection.

311. We question, however, if closing 19 seamounts (less than 4% of the 514 seamounts that occur in the New Zealand EEZ), will be sufficient to protect a representative range of the species and communities that have evolved on these marine features.[37] Most seamount species are unknown to science, endemism is likely to be significant, yet bottom dredging and trawling are known to cause significant, sometimes irreversible damage to these seafloor communities and ecosystems. A recent scientific review noted that many bottom-dwelling species are sensitive to habitat disturbance and can become so rare that their roles are "functionally extinct" (Thrush and Dayton 2002). In many cases this has virtually eliminated natural systems that might serve as baselines to evaluate these impacts.

312. NIWA have FRST funding for further research on the impact of fishing on seamounts, but the current level of trawling activity may well justify earlier intervention and further seamount closures before proposed research programmes are completed. The rich New Zealand fisheries on seamounts have been targeted for the last 20 years although considerable damage is done in the first few trawls. MFish is currently developing a larger strategy under the SMEEF to address the effects of fishing on the benthic environment.

313. We note that there were a number of research projects proposed between 2001 and 2003/4 for investigating the effects of fishing on the environment that were withdrawn (MFish 2004). Several of these projects were, for example, to examine the impacts of bottom trawling on benthic communities, a particularly important research question, as shown by the FRST funding that is now allocated for this purpose (above). The reasons for the withdrawal of these projects are unclear to us, although we note that they were project proposals that were to be funded by industry and are discussed with stakeholders before being approved, or rejected.

314. MFish allocations in the 'environmental research' category were significantly underspent during these years. Although the appropriation for MFish environmental research ranged from 4% to 9% over 3 years (2001/02 – 2003/04), the actual expenditure on environmental research ranged between 1.5% and 5% of the overall money spent in those years (which was also underspent overall).[38] The major emphasis on fish stock over environmental research has further implications for the application of the precautionary approach (see below). However, useful research on the impacts of seabird by-catch was funded and actioned during this period.

315. The 2005 Auditor-General's report also notes that action has been taken to limit the by-catch of New Zealand sea-lions, dolphins and seabirds. We will cover this under Objective 3.7.

[37] In 1999, the species on 70 seamounts (20% of Tasmanian seamounts, covering 370 square kilometers) were protected as marine reserves by the Australian Government. The majority of the 19 New Zealand seamounts that were closed had been unfished or only lightly fished and therefore were unlikely to have a significant effect on existing fishing operations.

[38] Data from the reply to a 2005 Parliamentary question.

**Precautionary approach**

316. Action 3.4c, urging application of the precautionary principle when setting quotas or other controls over uses, is more of a process question that could be applied to a range of marine management practices. The core concept of the precautionary principle, or precautionary approach, is "…a mechanism to counter a widespread regulatory presumption in favour of allowing development/economic activity to proceed when there is a lack of clear evidence about its impacts." (Cooney 2004). It is a response to uncertainty that has been incorporated into many fisheries management agreements and remains contentious. In the Fisheries Act it is stated as part of a section on 'information principles' where the wording allows for considerable latitude in interpretation.

317. We do not have the information to assess how precaution has been applied with respect to fisheries management, but it lies behind some the 1999 criticisms by the Auditor-General that uncertainties in information used to set quota were not being explicitly stated. The major reductions in annual quota set for orange roughy and hoki suggests that the earlier application of precaution in the face of uncertainty about maximum sustainable yield (MSY) would have been appropriate. New Zealand should be seeking to avoid the fate of overseas fisheries that have collapsed when a precautionary approach in setting fishing levels was overruled by commercial and political pressures to retain higher catch levels.

318. The commercial imperatives behind the Fisheries Act ensure that the primary focus of the considerable research effort funded by MFish is directed at the various fisheries. Less effort is expended at understanding the interactions between fisheries and other components of marine ecosystems. Uncertainty therefore tends to be greater with respect to the non-stock aspects of fishing activities, e.g. consequences of bottom trawling. With relatively less uncertainty regarding the utilisation of the resource (fish stocks) and the pressures in favour of utilisation, it is difficult for decision-makers to favour precaution on the grounds of possible, but unproven adverse impacts. MFish has developed guidelines for how to interpret the information principles set out in s10 of the Act.

319. ***Moderate progress. There has been a move within the Ministry of Fisheries towards taking more account of the environmental impacts of fishing and to reduce the quota on some important fish stocks that were showing obvious signs of unsustainable fishing levels. This policy move towards adopting a more ecosystem approach to fisheries management should be encouraged and strengthened. We acknowledge, however, the difficulties associated with obtaining the necessary information to make this approach effective. There are links to Objective 3.1 and the need for a more co-ordinated approach to identifying priority areas for marine research. The rationale for MFish significantly under-spending on environmental research during this period is unclear when many important questions had been identified for investigation. The draft 'Strategy for Managing the Environmental Effects of Fishing' (SMEEF) from MFish could be a significant step towards achieving this objective. Much will depend on the quality and effectiveness of the 'environmental standards' that have to be developed and the monitoring regime that is subsequently implemented.***

320. ***The closure by government of 19 seamounts and part of Spirits Bay to bottom trawling and scallop dredging in 2001 was a positive move in recognition of the significant damage being done to benthic communities. It was an important step following the unsuccessful efforts to implement a voluntary closure by the industry. This closure protects less than 4% of the seamounts within New Zealand's EEZ and therefore is unlikely to be adequate to protect a representative range of seamount species and communities. Other initiatives with respect to threatened species are covered in Objective 3.7.***

**Objective 3.5 Managing marine biosecurity risks**
**Develop an integrated system to identify biosecurity risks to marine biodiversity from exotic organisms and establish appropriate management responses to prevent and reduce these risks and to minimise their impacts.**

321. Objective 3.5 and related actions address the threats that indigenous marine biodiversity face from alien species, particularly those already known to be invasive elsewhere. The economically important aquaculture industries, especially mussel farming, are also susceptible to imported invasive species. The one priority action (Action 3.5a) and other actions were backed by funding from the Biodiversity package. In total, $9.85M was allocated over 5 years to six programmes focused on improving border control against marine invasive species.[39] The work programme was for harbour surveys, developing risk profiles, ballast water, management tools, surveillance and incursion response options. The allocation to marine biosecurity programmes was an explicit acknowledgement that New Zealand was lagging well behind in identifying potential threats from marine invasive species and in having effective management tools to deal with them.

322. The objective, as currently written, implies biosecurity risks can be 'prevented'. Reduction of risks is possible; prevention of risks is not. The key aspects of the objective are the need for 'an integrated system' for risk identification and 'appropriate management responses'.

**Actions 3.5**
**a) Enhance border control to prevent harmful species and diseases establishing and being spread within New Zealand's marine environment (by practices such as discharge of ballast water and the de-fouling of ship hulls).**
**b) Determine responsibilities for the management of established marine pests so that appropriate measures (including preparing and implementing pest management strategies under the Biosecurity Act 1996) can be undertaken promptly and efficiently.**
**c) Identify the distribution of exotic species and assess the actual and potential impacts of these on marine ecosystems and biodiversity.**
**d) Increase pest control and management efforts to levels congruent with national biodiversity goals and develop new technologies and techniques to combat existing and emergent threats to marine biodiversity from marine pests.**

[39] Government recognized the gap in marine biosecurity with the provision of an additional $19.5M over 4 years in the 2004 Budget.

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| **Lead agencies:** | **MFish,[40] DOC, Maritime Safety Authority** |
| **Priority actions:** | **Action a) only** |
| **Funding:** | **Core + Biosecurity Package** |

323. It probably took about 150 years (1800-1950) for the first 60 new (post-Polynesian settlement) marine species to arrive and establish in New Zealand waters. It took only 50 years for the next 60 new marine species to arrive (Hewitt et al 2004), although that number is highly likely to be an under-estimate. Growth in volumes of sea trade, especially with countries with similar water temperatures (e.g. Australia, Japan) mean that risks of further incursions will inevitably rise.[41] The survey of 13 ports and three marinas, funded through Programme 16 (part of Action 3.5c), usefully identified many new species, a number of which have yet to be described. A shortage of research taxonomists has delayed this work and, without significant recruitment of more marine taxonomists, is likely to delay other important aspects of better understanding marine biodiversity (see Theme Nine also). We suggest there is merit in doing similar surveys in the key anchorage places at sub-Antarctic islands and other important islands, such as the Kermadec Islands, two key marine reserves. A modest baseline survey of the main anchorage at the Auckland Islands has been finished and will be reported on shortly.

324. Although referred to as "baseline surveys" these surveys only establish baselines with respect to the current species assemblages, not past patterns. Given our poor knowledge of the marine environment we are unclear about the status of many species referred to as "cryptogenic" - are they naturally occurring or did they arrive with human assistance? The primary value of the recent port surveys will come with the ongoing surveillance activities in harbours and major ports.[42] How many of the 170+ 'new species' are likely to be economic or environmental marine pests is not known. What is clear is that there are many *known* marine pests that are increasingly likely to arrive and establish in New Zealand unless stringent measures are taken to exclude them.

325. The Strategy correctly focuses on hull fouling and ballast waters as the two major pathways through which to reduce the likelihood of successful marine invasions. Of these, hull fouling is the major pathway, accounting for about 70% of new marine species. Preventing invasive species from arriving is certainly the cheapest option and often the only way to ensure new species do not establish here. In part, this is because invasive marine species are generally not noticed as quickly as are terrestrial pests and they are usually harder to eradicate once discovered. Surveillance initiatives, and that should include an enhancement of the role of community surveillance, therefore needs to be a more important initiative within this objective than it is at present.

326. We note the progress that has been made through the programme of compliance monitoring of ballast water exchange (Programme 18). It needs further investment,

[40] With the transfer of responsibilities and staff to MAF from MFish for marine biosecurity the lead agency for Actions 3.5 should be MAF.

[41] Tasmanian harbours have some of the major marine invasives that threaten New Zealand, hence the extra precautions that are taken with ballast water on ships originating from there.

[42] These ports and marinas are being re-surveyed 3-5 after the initial surveys.

including the development of new technologies, before it could be regarded as adequate. New Zealand has advocated internationally for a legally binding regime for ballast water control and management. The Ballast Water Management Convention was finally adopted by the International maritime Organisation in February 2004, but has not yet entered into force. Package funding has supported work with other countries to develop tools to verify that mid-ocean exchange has occurred. Compliance monitoring assumes, however, that the process of exchanging ballast water effectively eliminates the risks. Unfortunately this is not the case, hence the need for research into more efficient and effective techniques for ballast water exchange or for killing any hitchhiker organisms *in situ*. New Zealand was cooperating with Australia on ballast water research but funding was discontinued some years ago. That research would have supported Action 3.5d.

**Hull fouling issues**

327. The successful eradication of *Undaria* from a fishing vessel that sank just off the Chatham Islands in 2000 was an important achievement. It was offset by the failure to eradicate *Undaria* from Stewart Island and the likelihood that, with the ending of the control programme, the ongoing spread of *Undaria* around New Zealand coasts is highly likely. Concerns have been expressed about *Undaria* establishing in Fiordland unless stringent efforts are made to keep it out (see the discussion on 'Internal borders' below). The Government intends to develop programmes to provide biosecurity protection for the Fiordland Marine Area.

328. More generic work on reducing risks from hull fouling was focused on guidelines for hull cleaning facilities. Guidelines were developed by the Auckland Regional Council in 2001/02, with input from MFish, but a survey of facilities around the country found that 51% would need major upgrades to meet the proposed minimum containment standards. A public consultation paper to adopt Biosecurity (Hull Cleaning) Regulations under the Biosecurity Act was proposed in 2001/02, but remains as a draft. Objections by yachting interests to the consultation paper included the costs of upgrading marina facilities and whether the benefits would justify the costs. The Auckland Regional Council provided funding for the construction of demonstration facilities, built in accordance with the draft guidelines (4th Annual Report on the NZBS). "Good practice" public awareness material for yacht and boat owners has been distributed hull cleaning, but without upgrades to many facilities the long-term effectiveness of such efforts is questionable.

**Sorting management responsibilities**

329. The difficulties of effectively managing hull fouling, the major vector for new marine organisms, are symptomatic of several management issues that have yet to be resolved with respect to marine biosecurity in general (Action 3.5b & d). Under the Biosecurity Act managing pests in the coastal-marine area falls to regional councils. Few regional councils, however, have any expertise in marine biosecurity, nor the funding base through the user-pays approach of the Biosecurity Act to support marine biosecurity initiatives. Regional council politicians currently lack a mandate to support marine biosecurity from their ratepayers and also require clarification of their legal responsibilities – assuming

they have the finances to meet their obligations (Vaughan 2004). The pathways around New Zealand for coastal traders rarely reflect regional council jurisdictions. Therefore, unless all councils with major ports around New Zealand have the same standards and facilities to deal with hull fouling, efforts by individual councils are likely to be ineffective. Councils are further hampered by a much lower level of public awareness of marine biosecurity issues compared with public support for management of terrestrial pests.

330. Clarifying roles and responsibilities of central government and local authorities with respect to marine biosecurity will be a one of the roles of Biosecurity New Zealand, partly through its Central and Regional Government forum (see Theme Five). One current initiative of the Biosecurity Strategic Unit within MAF is to understand and describe the 'legislative landscape' as an initial step in clarifying these roles and responsibilities. The problems of clarifying roles and resourcing councils to effectively take on coastal and marine biosecurity responsibilities will, however, require more effort than these initial steps, useful as they are. Both the Oceans Policy Initiative and the forthcoming review of the NZCPS will provide opportunities to determine the appropriate roles and mandates for councils with respect to marine biosecurity responsibilities.

331. Part of the assessment of the costs and benefits of increasing the effort to manage marine invasives needs to consider industry interests as well as biodiversity values. For example, the New Zealand mussel industry recognises its vulnerability to invasive species and the need to participate in a 'robust biosecurity framework' [43] Such a framework was lacking when the sea squirt, *Didemnum vexillum*, first discovered in a Waikato harbour in October 2001, was transferred to the Queen Charlotte Sound shortly afterwards on a barge. Disagreements over mandates and responsibilities led to a 2-year delay before an unsuccessful eradication was attempted in September 2003. The later identification of *D.vexillum* as an indigenous species put the response beyond the mandate of MFish, but without removing the threat to the mussel industry.[44]

**New technologies**

332. A greater effort in developing and using new technologies is also required (Action 3.5d). The earlier work on research on ballast water management under other funding arrangements was valuable, but significant research questions remain. We have noted above the research that is underway to provide more reliable verification that ballast water exchange has actually taken place in mid-ocean. Techniques for hull cleaning could probably be significantly improved and be cheaper as well as more effective than current methods. At a practical level, visual inspection of fishing tackle is ineffective and inefficient compared, say, with a chemical treatment (e.g. chlorine-based bleach). This could be done off-shore with certification, or at the point-of-entry.

[43] "Threats and opportunities in the Greenshell™ mussel industry". Paper presented at the Second Biosecurity Summit, November, 2004.

[44] While from a legal perspective indigenous species are not subject to the same controls as exotic species, they can be regarded as 'invasive' if their movement to new places has been via human, not natural, means and they then have adverse impacts in the new location.

**Managing 'internal borders'**

333. One management approach that we believe needs greater policy and management effort than is presently given in the Strategy (or in the Biosecurity Strategy) is to develop more effective controls at key *internal* borders. This applies not only for marine, but for terrestrial biosecurity issues as well. At present it is being applied to shipping as a 'vector management programme' for a few specific places, such as keeping *Undaria* out of the Chatham Islands and the sub-Antarctic islands. Many other areas are at risk from *Undaria* including the waters of Fiordland with its significant World Heritage and marine protected areas values. The lack of a national approach to internal movements of vessels also has implications for marine-based enterprises, such as mussel farming.

334. Australia is currently developing a range of guidelines for all vessels moving *within* Australia. These will address both ballast water and hull fouling issues. Their initial voluntary approach might be 'ramped up' to more mandatory measures if necessary (Parker 2004). The rationale for biosecurity initiatives for Australia's internal borders includes: protection of iconic regions such as marine protected areas, World Heritage areas, Ramsar sites; reduce the rate of spread of invasives; buying time to develop more effective control or eradication measures. A similar rationale could apply in New Zealand. The most obvious point is that Cook Strait is a natural barrier for limiting internal movements of invasive species that has been significantly under-utilised so far. Very few nations have the advantage of a natural barrier that effectively divides the country in half. We are pleased to have been advised by Biosecurity New Zealand that it regards the investigation and implementation of internal border management as a strategic priority.

335. ***Moderate to substantial progress. Of the six funded programmes the two associated with initial surveys of harbours and ports and their ongoing surveillance have made the most progress (Actions 3.5 a, c). They have clearly shown that there are more new marine species in these key entry points than were previously known and underscore the need to sustain regular surveillance programmes and develop better management tools for reducing risks in the two key pathways – hull fouling and ballast water.***

336. ***There has been more progress on monitoring compliance of ballast water exchange than on the more difficult and probably more important challenge of managing hull fouling which involves central government and regional council responsibilities. Implementing border controls for hull fouling is a critical need. More effective management of hull fouling will require the resolution of several issues – better techniques, clarification of legislative responsibilities between central and local government, limited capacity and funding within councils, low public awareness of the issues and threats. Biosecurity New Zealand will have important roles to play in addressing these challenges, while guidance should emerge from the Oceans Policy Initiative as well as from the formal review of the New Zealand Coastal Policy Statement.***

***Meeting the objective of managing marine biosecurity risks will also require more effort to develop cost-effective and efficient technologies and the development of policies and practices on internal border control. The value and cost-effectiveness of internal border management needs more serious consideration than it has received so far, both for marine and terrestrial biosecurity. The role of public and community surveillance in marine biosecurity is critical and needs greater recognition and support in the Strategy.***

**Objective 3.6 Protecting marine habitats and ecosystems**
**Protect a full range of natural marine habitats and ecosystems to effectively conserve marine biodiversity, using a range of appropriate mechanisms, including legal protection.**

337. The need to set aside valued natural places from exploitation has long been an accepted social undertaking for terrestrial ecosystems, but has a much shorter history for marine environments. This objective seeks to address that imbalance and sets one of the few quantitative targets in the Strategy – the protection of 10% of New Zealand's marine environment by 2010 in a network of representative marine protected areas. The Strategy gave this objective a high degree of priority by ranking three of the four actions as 'priority' and through the allocation of $11.5M over 5 years to progress marine reserve initiatives.

**Actions 3.6**
**a) Develop and implement a strategy for establishing a network of areas that protect marine biodiversity, including marine reserves and other coastal and marine management tools such as mataitai and taiapure areas, marine area closures and seasonal closures, area closures to certain fishing methods and world heritage sites.**
**b) Achieve a target of protecting 10% of New Zealand's marine environment by 2010 with a view to establishing a network of representative protected marine areas.**
**c) Review the Marine Reserves Act 1971 to better provide for the protection of marine biodiversity, including extending its jurisdiction to protect marine biodiversity within and beyond the 12 mile limit.**
**d) Promote and encourage individual and community initiatives to protect, maintain and restore habitats and ecosystems that are important for marine biodiversity.**
**Lead agencies:** **DOC, MFish**
**Priority actions:** **Actions a), b) and c)**
**Funding:** **Core + Biodiversity Package**

338. Action 3.6a proposed a new philosophical and management approach to achieving marine protection for New Zealand that impacts on the objective as a whole. By including management tools that are primarily within the Fisheries Act and the RMA it is assuming that extractive use can be compatible with maintaining healthy marine ecosystems. This new approach therefore requires a strategy that retains the marine reserves option, presumably as the key legal mechanism, and adds to it all the other existing biodiversity protection tools[45] to establish a network of marine protected areas.

[45] As currently exist under the RMA and Fisheries Act 1996.

It was not until November 2004, that a draft policy paper was released for public comment (MFish & DOC 2004) defining 'marine protected area' and outlining sets of principles (generic, implementing, network, site and tool selection).[46] The paper also discussed how the various protection tools would be integrated. Clearly, an assessment of the effectiveness of this new approach will be for a future review to determine.

339. The proposed policy should be more inclusive of other interests in developing an overall protection regime for the marine environment. For example, by including the RMA provisions it could also provide a more effective bridge between coastal/ estuarine/in-shore processes that collectively affect many significant areas of marine biodiversity. However, we attach an essential caveat to these comments. The caveat is that the success of the new policy approach will critically depend on how the 'protection standard' is defined and applied to potential sites. We presume the standard will provide for a level of ecological integrity consistent with maintaining marine ecosystems in a healthy functioning state. We would be concerned if it downgraded the status and efforts to more effectively use the marine reserve option via the current Marine Reserves Bill. We note that the Marine Reserves Bill provides that representative examples of the full range of marine communities and ecosystems that are common or widespread will be protected as close as possible in a natural state within marine reserves. This is an important provision. Marine reserves are the tool that provides sites with the greatest protection possible from human activities (mining, fishing, structures, etc), although other disturbances (e.g. land-based pollution) are still possible.

340. Although Action 3.6a currently includes reference to mataitai and taiapure as potential marine protected areas they would still need to meet the necessary protection standard. Whether iwi or hapu would be willing, for example, to close off a large part of a mataitai on a long term basis to all or most fishing remains to be seen. It is also unclear whether they would be allowed to do so under the Fisheries Act unless the closures could be justified in terms of the purpose of the Fisheries Act which is focused on sustainable utilisation rather than biodiversity protection *per se*.

**Achieving 10% marine protection**

341. The major focus of the past 5 years has been on establishing more marine reserves and $11.5M was allocated to this purpose. Given the amount of money allocated to this programme the results have not matched the efforts expended. Our conclusion needs to be explained in the broader context of what could also be considered as being considerable progress.

342. In January 2003, the Marine Mammal Sanctuary around the Auckland Islands was changed to marine reserve status. This added an impressive 484,000 ha to the other major marine reserve around the Kermadec Islands (748,000 ha, established in 1990) With a total of 1,232,000 ha, these two reserves represent 97.9% of the total area now under marine reserve protection and represent diverse and important areas of marine

[46] Government has yet to release its final decision on the draft policy paper.

biodiversity now under full protection. The total area of the territorial seas that is now in marine reserves is 7.4%, leaving aside the question of how representative these reserves are of our marine habitats.

343. However, to the 15 marine reserves that existed around the North and South Islands when the Strategy was launched, only three more, totalling just 2,720 ha, had been added in the 5 years up to March 2005. [47] This total of 18 was then significantly boosted by eight Fiordland reserves (9,430 ha) added via special legislation in mid-2005 after a 10-year initiative by local interest and user groups (supported, in part, by grants from MfE). Several other applications are either waiting for concurrence from the Ministers of Fisheries and Transport or are still working through discussions with stakeholders and communities. The Aotea/Great Barrier Island application that is awaiting the concurrence of the Minister of Fisheries will add almost 50,000 ha for near-shore marine protection. The 26 marine reserves around the North and South Islands now total about 27,000 ha, or 0.16% of New Zealand's territorial seas.

344. Although the biodiversity benefits of marine reserves have been demonstrated in the scientific literature, new proposals continue to generate a considerable amount of opposition and protracted consultations. This has not been helped by the concurrence powers of different agencies under the Marine Reserves Act which has led to an inefficient duplication of consultation processes and other delays.

345. Marine reserves are now more widely distributed around New Zealand (DOC 2005), but it is recognised that the process to date has essentially been one of ad hoc additions rather than on the basis of identifying representative areas of all the marine habitats. It is only with the very recent development of marine classification systems (see Objective 3.1) that it is now possible to take a more systematic and strategic approach to defining what would constitute a representative network of marine protected areas and reserves. This shortcoming is recognised in the marine protected areas policy paper and by DOC in how it intends to proceed in the future. The suite of new classification tools will be used to assist with inshore and offshore selection of marine protected area sites. DOC will be developing a national framework and a regional approach to identifying gaps in the representative network so that these can be the subject of applications. . This will allow for multi-site applications and a more cost-effective process to be followed.

346. When North Island and South Island reserves are added to the more distant reserves (Auckland and Kermadec Islands), the total area under marine reserve status is 7.4% of the area of the territorial seas. As a percentage of New Zealand's EEZ this figure drops substantially, but the present Marine Reserves Act limits reserves to areas inside the territorial sea boundary.

**Marine Reserve Act review**

347. The proposed review of the Marine Reserves Act 1971 was a priority action (Action 3.6c), but has progressed more slowly than might have been expected. A Bill has been

[47] In comparison, 10 marine reserves were created in the 4-year period of 1992-995.

under consideration by the Local Government and Environment Select Committee for over 3 years. The review should remain a priority action, given four important elements of the Bill: extension of its jurisdiction from the 12 nautical mile limit to the 200 nautical mile EEZ[48]; streamlining the approvals process which is currently often protracted and expensive; time limits on phases of the application process; provision for greater community involvement in the management of marine reserves, including in the development of management plans and the potential for community groups or iwi to undertake day-to-day management instead of DOC.

**Community initiatives**

348. There has been an encouraging increase in the amount of community involvement focused on the conservation of coastal, estuarine and marine areas (Action 3.6d). This includes the growth of 'coast care' organizations in many regions, usually with backing by regional or district councils, and estuary clean up initiatives (see Theme Eight for details). Some of these groups are achieving positive, cost-effective results. A 10-year initiative by local interests in Fiordland led, in April 2005, to the creation of the Fiordland Marine Area and eight new marine reserves (see above). An ambitious initiative to establish a multi-million dollar, marine education centre on the Wellington south coast has financial support from the Wellington City Council. Assuming passage of the Marine Reserves Bill and with the adoption of a strategy for establishing a network of protected areas, there will be increased opportunities for community and stakeholder involvement with marine conservation initiatives and management.

349. In June 2002, DOC released a strategy aimed at building community support for marine protection (DOC 2002). It is directly linked to the Department's role with respect to this objective and sets out 14 priority actions in support of three key result areas. The Department strengthened its capacity for marine work with the creation of its Marine Conservation Unit in 2003/04. Some of the priority actions are dependent on the passage of the Marine Reserves Bill.

350. ***Moderate to substantial progress. There was initial progress with the review of the Marine Reserves Act 1971 (Action 3.6c), but the Marine Reserves Bill has now been with the Select Committee for over 3 years. Earlier passage of this Bill would have helped progress the first two priority actions and established a less costly process for advancing marine reserve applications.***

351. ***A draft policy for establishing marine protected areas (MPA) is now with Government for approval (Action 3.6a). This policy takes a new philosophical approach to what tools could be used for marine protection purposes by assuming that some extractive use may be possible – as long as it does not compromise the healthy functioning state of the marine ecosystem. The critical test of this approach will depend on the definition and application of the 'protection standard' that has yet to be completed.***

[48] This would allow for a higher level of protection of areas within the EEZ than is currently possible under the Fisheries Act.

352. ***If that can be done in a way that protects the full range of biodiversity values in question we see potential advantages in widening the range of management tools in support of a network of marine protected areas. It may lead to a more constructive dialogue to emerge between communities, tangata whenua and government agencies over resolving conflicting views not only over protection, but also the need to sort out recreational and commercial fishing issues at the same time. This whole debate is now greater than the sum of its parts. It also has implications for the future of the MPA approach and whether it is likely to be successful if it is artificially separated from the realities of other competing demands for resource use or protection.***

353. ***The allocation of Biodiversity Package money to the development of marine reserves does not appear to have made a significant contribution to the increased number of approved marine reserves around the North and South Islands where the major conflicts lie. Why? As we discuss above, the current approach prevents communities from discussing a range of both development and protection tools at the same time. Separate jurisdictions make it difficult to take an integrated approach to spatial planning for coastal and inshore marine environments. This should be a task for the Oceans Policy Initiative to resolve. If the efforts to establish eight marine reserves in Fiordland (driven by the local community since 1995) had not come to fruition in mid-2005, the gains in the past 5 years would have been modest. We appreciate, however, that there are four applications awaiting the concurrence of the Minister of Fisheries that will add a further 53,670 ha to the marine reserves system.***

354. ***The change of status of the marine mammal sanctuary around the Auckland Islands to marine reserve (in 2003) added 484,000 ha to the system. The distant marine reserve areas (Kermadec and Auckland Islands ) represent 97.9% of the total area in marine reserves and, with the in-shore reserves, total 7.4% of the territorial seas area. The present marine reserves around the North and South islands, where commercial and recreational fishing pressure is greatest, make up only 0.16% of our territorial seas.***

**Objective 3.7 Threatened marine and coastal species management**
**Protect and enhance populations of marine and coastal species threatened with extinction, and prevent additional species and ecological communities from becoming threatened.**

355. The focus of activity to date has been largely on particular groups of marine species – primarily sea birds and marine mammals. A number of threatened species issues are also covered and reported on under Objective 3.4. For other groups, such as marine invertebrates and fish, much less is known about population dynamics and whether they are at risk of extinction. Consequently, it is difficult at present to address their specific management needs, other than those undertaken as part of generic initiatives in fisheries activities (Objective 3.4).

356. The Strategy is not clear with respect to the reference to "coastal species" – is the focus meant to be on 'terrestrial coastal' or 'marine coastal', or both? As we have discussed earlier, responsibilities for coastal management lie primarily with regional councils rather than with central government agencies. Since we have little evidence of engagement by

councils with the Strategy and have received none with respect to this theme, our evaluation will exclude consideration of the management of coastal species.

**Actions 3.7**

**a) Review the threatened species priority setting systems and extend them to assess coastal and marine species**

**b) Identify and protect threatened species and their key habitats**

**c) Implement recovery plans and population management plans for those threatened marine species ranked as high priority**

**d) Accede to the Convention on Migatory Species (the Bonn Convetion) to provide an international framework for new Zealand's participation in protecting migratory and widely ranging species such as albatross.**

**Lead agencies:** **DOC**
**Priority actions** **None**
**Funding:** **Core only**

357. The priority setting system for threatened marine species has been reviewed and the re-listing of relevant taxa is currently being undertaken (Action 3.7a). The lack of general information for many marine species means this exercise is difficult to complete. At this stage DOC expects the marine mammal listings to largely stay the same. The draft re-classification indicates that thirteen endemic seabird species have become more threatened in the past 5 years[49] while just four taxa have shown increases and are less threatened. The majority of the endemic albatross species are rated from 'vulnerable' through to 'critically endangered'. With the most diverse and abundant seabird assemblage on Earth, New Zealand has obligations that are regional and global, as well as national.[50]

358. In April 2004, MFish and DOC released a national plan of action (NPOA) to reduce by-catch of seabirds (MFish & DOC 2004). It identified a wide range of management measures that would help reduce seabird by-catch and the research needed to support the plan. In May 2005, the Minister of Fisheries reported that two-thirds of the squid fishing fleet had failed to comply with the voluntary code under the NPOA. As a consequence, Government introduced regulations for this squid fishery. Mitigation measures can effectively reduce the thousands of seabird deaths, primarily albatross and petrels, caused annually by commercial fishers in southern waters. Other fisheries may well be doing a better job at following voluntary codes, but the results have yet to be assessed.

359. In December 2004, DOC released a comprehensive 5-year "Action Plan" for marine mammals (Suistead & Neale 2004). It has sections covering: planning & strategy; management; science; relationships and community. These two action plans – outlining

[49] Two of these are as a consequence of errors in the taxa's 2001 listing. Five are listed as more threatened due to a change in the definition of "range restricted".

[50] Of a world total of 349 seabird species, 84 species breed in New Zealand and 25 of these are endemic to New Zealand. Some 140 seabird species feed in New Zealand waters and are therefore affected to varying degrees by human threats to their feeding and reproductive needs.

management needs for seabird and marine mammal protection – are two significant initiatives. If given appropriate levels of support, they provide an important platform for protecting New Zealand's priority threatened marine species (Actions 3.7 b & c).

360. The next phase for marine mammal protection calls for the development of recovery plans and population management plans for the priority marine species under threat (Action 3.7c). Further, we are concerned that there is inadequate research capacity or funding to provide the necessary knowledge required to develop, implement and monitor effective management plans for many key marine species.

361. The FRST Ecosystem funding starting on 1 July 2005 cut all seabird research.[51] New Zealand is now the only country with sub-Antarctic territory responsibilities that does not have an active seabird programme. The FRST funding cut has also terminated a 10-year dataset and data gathering programme on Buller's albatross. Such datasets are providing unique insights for other countries into long-term changes that improve our understanding of climate change, fishing impacts and changes to marine ecosystems. DOC has allocated low levels of funding for seabird and marine mammal research during the past 5 years. Many seabird populations are now benefiting from rodent eradication (e.g. on Little Barrier Island, Campbell Island), but without research and monitoring it is difficult to determine how much other factors (such as fishing practices, climate change) are influencing population responses.

362. There are other long-term consequences of low and declining seabird numbers that may be having subtle, yet significant impacts on island ecosystems. There is evidence from the paleo-ecological record that the high, pre-settlement densities of seabirds in and around New Zealand were major sources of nutrients, via their guano, especially for islands with large seabird colonies (Richard Holdaway, pers. com.). Ecosystems of small islands appear to be very dependent on bird excreta as a primary source of nutrients for terrestrial plants, which in turn support the terrestrial ecosystems (Markwell 1997).

363. The 5-year Action Plan for marine mammals identifies the species-led, top priorities for conservation as the threatened Hector's and Maui's dolphins, Southern right whale (especially mainland populations) and the NZ sea lion.[52] Area closures and restrictions on set-netting are in place to reduce the deaths of both Hector's and Maui's dolphins. Numbers of Maui's dolphins remain critically low. The issue-led actions with the highest priority are: recreational and commercial fishing, RMA coastal development (esp. marine farming), strandings and sightings. A DOC discussion paper (Lloyd 2003) describes a number of potentially negative impacts of mussel farming on marine mammals and seabirds. These are not a significant concern at present, but could become an issue given the major expansion plans of mussel farming in the future, especially into offshore farms. A particular issue could be offshore farms located across the seasonal migration routes of large whales.

[51] This was being done by NIWA and Te Papa scientists.

[52] Over 100 New Zealand sea lions are killed annually by the squid fishery. The Auckland Island marine reserve protects a primary habitat for the New Zealand sea lion both for feeding and breeding.

364. At the global level some shark species are increasingly seen as under major threat from direct and indirect fishing activities. In New Zealand, the development of a National Plan of Action for the Conservation and Management of Sharks (NPOA – Sharks) is underway.

365. New Zealand acceded to the Convention on Migratory Species (the CMS, or Bonn Convention) in 2000 (Action 3.7d). Following accession, New Zealand has since signed and ratified (both in 2001) the Agreement on the Conservation of Albatrosses and Petrels which is a multilateral agreement developed under the auspices of the CMS. This Agreement only entered into force on 1 February 2004 and implementation is still in its infancy. It seeks to coordinate international efforts to mitigate known threats to albatross and petrels, both at sea and on land. Two important 'range states' (states through whose territories these birds 'range') have yet to ratify the Agreement – Chile and Argentina. In addition, New Zealand is a signatory to the United Nations Food and Agriculture Organisation's International Plan of Action for Reducing the Incidental Catch of Seabirds in Longline Fisheries (IPOA). Involvement in these agreements gives New Zealand more leverage to protect wide-ranging species, such as albatross, that are threatened by commercial fishing operations in international as well as national waters.

366. The proposition for a South Pacific Whale Sanctuary was first put forward by New Zealand and Australia to the International Whaling Commission in 2001 and has been promoted, without success, at subsequent annual meetings of the Commission. New Zealand has also been working with Australia to develop a regional agreement for the protection of marine mammals in the South Pacific since 2003. This agreement would be under the aegis of the CMS should it proceed. New Zealand has also been promoting the financial benefits that flow from whale watching (includes other cetaceans as well) as a commercial endeavour. This sector of world tourism grew substantially through the 1990s and by 1998 was estimated to be worth US$1 billion globally (Hoyt 2000).

367. ***Moderate progress. Important building blocks are now in place, but these are largely 'scene setting' for important management initiatives that now need to be actioned. The building blocks include: revision of the threatened species priority- setting system; accession to the Convention on Migratory Species (CMS) and two related agreements concerning threats to seabirds; the production in 2004 of a national plan to reduce seabird by-catch; and DOC's marine mammal action plan for 2005 -2010. During this period the status of several seabird taxa has deteriorated, despite initiatives such as Southern Seabird Solutions, the development of techniques to reduce seabird mortality from fishing operations and the implementation of voluntary codes by the fishing industry.***

368. ***Paradoxically, while New Zealand has become more active internationally with respect to seabird and marine mammal protection, there has been a significant reduction in the national research effort into seabird species and marine mammals. While this research can be relatively expensive, it underpins the efforts to better understand not only how***

***management affects seabird and cetaceans, but also wider processes that are having long-term impacts on marine and small island ecosystems.***

369. ***The priority will now be to develop and implement recovery plans and population management plans for a number of marine species that are critically threatened and have been ranked as high priority. These management initiatives will be more effective if they are supported by an expanded research effort.***

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# THEME FOUR: CONSERVATION AND USE OF GENETIC RESOURCES

Caption: Genetic diversity is one of the three layers of biodiversity – along with the diversity of species and ecosystems. The loss of exotic and native genetic diversity can affect productive farmlands and the survival of threatened species.

**Theme Four: Conservation and Use of Genetic Resources**
**The conservation and use of genetic resources of indigenous and important introduced species in New Zealand, and the sharing of benefits from their use.**

**Desired outcome for 2020**
**The diversity of genetic resources of important introduced species within New Zealand is maintained, effectively supporting our primary production and biotechnology industries. This is achieved in ways that do not prevent the conservation of indigenous biodiversity.**
**In situ conservation of indigenous genetic resources is complemented by ex situ means, where necessary.**
**There is an integrated policy for the management of all genetic material in New Zealand and for bioprospecting activities, in accord with agreed international commitments. There is appropriate domestic and international access to indigenous genetic material, taking into account New Zealand's sovereignty and rights to the benefits from its genetic material, as well as rights and obligations under the Treaty of Waitangi.**
**Populations of introduced species that are threatened or extinct in their original habitats are maintained in New Zealand where return to their country of origin is not feasible or desirable, using methods that do not pose a threat to indigenous biodiversity.**

## Stocktake of progress on Theme Four

### Expectations of the Strategy

370. The Conservation and Use of Genetic Resources theme was not allocated any Biodiversity Package money and only one objective had priority actions. However, this theme was the fourth goal of the Strategy: "*Maintain the genetic resources of introduced species that are important for economic, biological and cultural reasons by conserving their genetic diversity*." as well as providing the ninth priority action. The Strategy presumes that the maintenance of genetic diversity of economically important species will be 'left to the market and producers' leaving Government to focus on its broader strategic interests.

371. We agree with this broad approach, with some caveats, and discuss below the progress made in defining those strategic interests. Our assessment of progress against individual action points is summarised in Table 4 following this stocktake.

### Progress in policy development concerning genetic resources

372. All three actions in the first objective were ranked as priority. The main focus was to develop a collaborative strategy to manage New Zealand's genetic resources for both indigenous and introduced species (Objective 4.1). The purpose was to assign management responsibilities for maintaining genetic resources between Government, industry, research institutions and managers of collections of genetic resources. However, a lead agency has yet to be identified for this initiative and there has been little progress, exacerbated by a lack of funding.

373. One of the obstacles to progress has most likely been the perception of insufficient commonality of interests, which may actually be diverging with the increasing commercial development of biotechnology interests. It should, in our view, remain a high priority action as in the absence of an overarching strategy important aspects of indigenous and introduced genetic diversity may be compromised by sectoral interests. We suggest MAF would be an appropriate lead agency for this initiative, given its productive sector linkages and overall biosecurity responsibilities. DOC and MoRST would have specific expertise as contributing agencies with indigenous species and science responsibilities.

374. For similar reasons it should also be a high priority to advance work on the development of an integrated policy and legislative framework for managing bioprospecting in New Zealand (Objective 4.3). Many countries have already responded to bioprospecting issues through a variety of mechanisms and the long delays could give the appearance of 'shutting the stable door after the horse has bolted'. This action is currently led by the Ministry of Economic Development (MED). Now that the MED has resumed work on domestic bioprospecting policy (in 2005), following up on its earlier work done in 2002/03, we recommend it is advanced in close collaboration with other relevant agencies and in the context of the broader strategic approach to managing all genetic resources (Objective 4.1). However, a significant barrier to advancing bioprospecting policies has been the issues surrounding the unresolved Treaty claim – Wai 262 (see below).

**Progress in managing genetic collections and genetic diversity**

375. The current default option is that commercially important gene stocks of introduced species are presumed to be adequately cared for by private and commercial interests, or by research organisations, while DOC manages risks to the genetic diversity of threatened indigenous species through the implementation of its species recovery plans (Actions 4.1). While many such recovery plans have been written, funding constraints have significantly limited their implementation (see Theme One for details). Assessing the importance of maintaining genetic diversity within fish stocks and other marine species are difficult topics to research and have yet to be undertaken in New Zealand.

376. A recent review (Brockerhoff et al 2004) discovered a surprisingly large number of substantial collections of genetic material (at least 3,000 to 4,000) in private hands throughout New Zealand. These collections (mostly plants) represent a mix of economic, cultural and biodiversity values and interests. The Brockerhoff review raised a number of policy issues about the respective roles of commercial and government agencies concerning the management of collections that should be evaluated, but as part of the development of a collaborative strategy to manage our genetic resources.

**Progress in addressing Maori issues over use of genetic resources**

377. There has been little progress in the past 5 years with respect to addressing Maori concerns over the use of matauranga Maori in the exploitation of indigenous genetic resources. While these concerns have been expressed, a significant barrier to making progress has been unresolved Treaty of Waitangi claims, especially Wai 262. A related action was providing for Maori interests in the review of the Patents Act. This review of the Patents Act is proceeding and a draft bill does have various provisions in relation to Maori.

**Progress in access issues to genetic material**

378. While a minority of the thousands of species introduced to New Zealand over the centuries have done huge damage to indigenous species, other plant and animal introductions have been essential to developing and sustaining our current economic prosperity. Enjoying continued access to overseas genetic resources therefore requires high biosecurity standards as well as establishing fair and equitable processes for importers. There have been a number of concerns raised around the ERMA processes and MAF regulations that are now in place. (Refer also to Theme Five.) We welcome the current MoRST/MAF/ERMA initiative to explore these issues and to look at possible new measures. At the same time it will be important not to let trade agreements compromise biosecurity risks or potentially increase risks to indigenous genetic resources. That will mean specific recognition of agencies with biosecurity and biodiversity responsibilities having standing alongside trade negotiators when trade agreements are under discussion – whether it is the World Trade Organisation or free trade agreements. Other actions under Objective 4.2 are continuing along timetables that are largely set by other mechanisms, such as international negotiations and meetings of parties to conventions and treaties.

**Progress in conserving threatened introduced species**

379. This objective (4.5) could appropriately remain a low priority within the Strategy. There are international arrangements in place for zoos to cooperate on programmes to breed threatened species. New Zealand currently holds over 260 globally threatened tree species, scattered among many private collections, but there does not seem to be any current demand to repatriate any of these to their native ranges. On the other hand, a number of threatened introduced species could have the potential to enhance the genetic diversity of New Zealand's economic species. We have not been made aware of problems at the moment over holding threatened introduced species in secure facilities to prevent damage to indigenous New Zealand species.

380. On the reverse side, there should be an onus on New Zealand to control the export of known pests to countries that are unaware of the potential problems they are importing. At present, New Zealand has no legal mechanism to prevent such exports and hence, for example, exporters continue to sell mustelids and possums to Japan as pets. We should be setting a better example of international best practice in this regard.

## Table 4. Summary table of progress in Theme Four

| **Summary of progress on Theme Four action points (2000-2004)** | | | | |
|---|---|---|---|---|
| | **Priority action** | **Package funding** | **Progress to date** | **Future priority?** |
| **Objective 4.1 Conservation of N.Z.'s genetic resources** | | | | |
| 4.1a Develop collaborative strategy | Yes | No | Limited | High |
| 4.1b Risks to introduced species | Yes | No | Limited | Medium |
| 4.1c Risks to indigenous species | Yes | No | Moderate | Medium |
| **Objective 4.2 Access to genetic material from other countries** | | | | |
| 4.2a Ensure access to N.Z. | No | No | Moderate | High |
| 4.2b Overseas collecting | No | No | Limited | Medium |
| 4.2c International negotiations | No | No | Limited | Medium |
| 4.2d Participation in CBD | No | No | Moderate | Medium |
| 4.2e Co-op. research initiatives | No | No | Moderate | Low |
| **Objective 4.3 Bioprospecting in New Zealand** | | | | |
| 4.3a Develop bioprospecting policy | No | No | Limited | High |
| 4.3b Integrated framework | No | No | Limited | Medium |
| **Objective 4.4 Matauranga Maori and use of genetic resources** | | | | |
| 4.4a Resolution of claims | No | No | Limited | High |
| 4.4b Develop agreements | No | No | Limited | Medium |
| 4.4c Patents Act review | No | No | Moderate | Medium |
| **Objective 4.5 Conservation of threatened introduced species** | | | | |
| 4.5a *In situ* conservation | No | No | Limited | Low |
| 4.5b Protected populations | No | No | Limited | Low |

## Introduction

381. This theme includes a mix of conservation and sustainable use actions and extends consideration of the Strategy to agencies with a development focus.[53] The genetic level of biodiversity generally has the lowest public profile of the three components of biodiversity (genetic, species and ecological (or ecosystem) diversity). It also had a low priority in the Strategy with three priority actions identified out of 15 actions in total. This theme received no allocation of additional funds via the Biodiversity Package. However, it is of fundamental importance when considering the overall wellbeing of biological diversity. Loss of genetic diversity within a species, which is often an outcome of reduction to a small numbers of individuals, can seriously reduce the ability of a species to recover from stresses and cope with environmental change. In addition to its importance for the survival of indigenous species, genetic resources also underpin the economic prosperity of our primary production sectors.

382. Although this theme was low priority it is the one, along with Theme Three (Marine), that most directly raises questions about the relationship between protection and sustainable use of indigenous species, as well as addressing these questions at the genetic level. We provide a summary on the initiatives that we are aware of and conclude with a comment on the future priorities within this theme.

## Analysis of objectives and actions

**Objective 4.1 Conservation of New Zealand's genetic resources**
**Conserve the diversity of New Zealand's genetic resources so as to maintain their current and potential benefits to New Zealanders.**

383. This objective recognises the policy work that needs to be done to bridge both the use and conservation aspects of genetic resources whether for indigenous or introduced species. There are some related practical issues that concern the management of collections. Identification of the risks associated with managing introduced and indigenous species were a priority. Although a large number of 'key players' are listed for the first two actions in the Strategy, no lead agency of government had been assigned when the Strategy was released. To our knowledge this situation has not changed. All three actions were ranked as priority actions, but no Package money was allocated for their implementation.

[53] The main additional agency involved through this theme is the Ministry of Economic Development, referred to in the Strategy under its previous name – Ministry of Commerce (MoC).

**Actions 4.1**
**a) Develop a collaborative strategy to manage New Zealand's genetic resources (from both introduced and indigenous species), focusing on:**
**i) effective cooperation between government, industry, research institutions and managers of collections of genetic resources;**
**ii) clearly assigning responsibilities for maintaining New Zealand's genetic resources; and**
**iii) managing information about collections of genetic resources.**
**b) Identify significant areas of risk in the management of the genetic resources of New Zealand's introduced species, including information gaps, and recommend how these risks can be effectively managed.**
**c) Identify significant areas of risk in managing genetic resources of New Zealand's indigenous species that are threatened or in decline (with reference to threatened species recovery programmes), and recommend how these risks can be reduced, for example, through germplasm banks.**
**Lead agencies:** **Not yet assigned, DOC**
**Priority actions:** **Action a) only**
**Funding:** **Core only**

384. From the wide range of key players that were identified in the Strategy – including MoRST, FRST, primary production industry associations, NZ Biotechnology Assn, zoos – it is clear that the proposed collaborative strategy to manage New Zealand's genetic resources was intended to be a broad consideration of all relevant issues and possible commercial applications, including biotechnology considerations. In May 2003, Government released the New Zealand Biotechnology Strategy and has also established the Bioethics Council. One section of the Biotechnology Strategy discusses research to "…address sustainability and biosecurity, and protect biosecurity" (page 25). One key action reads:
"*FRST, in conjunction with the Ministry for the Environment (MfE) and the Department of Conservation (DoC), and MAF is to develop a research strategy for environmental biotechnology*."

385. Such a research strategy could be part of a broader collaborative strategy, but there has been no start made so far on either the proposed collaborative strategy (Action 4.1a) or the research strategy for environmental biotechnology.

386. At present, we sense there are insufficient incentives within government and other players, especially the primary production sectors, to embark on what could be a significant exercise. We have been informed that resource constraints have also been an issue delaying work on this action. The Strategy assumes there are sufficient common interests to bring these diverse organisations together to develop a genetic resources strategy applicable to both introduced and indigenous species. We suggest that presumption should first be investigated and tested as a first step, particularly in the context of the diverse (and possibly diverging) range of CRI research activities, commercial developments, biotechnology initiatives and Maori interests that have evolved since the Strategy was developed.

387. In 2001, MAF received a comprehensive report which it had commissioned that is relevant to this theme as well as to aspects of Themes One and Two (Perley et al 2001). The Perley report was focused on safeguarding New Zealand's agricultural biodiversity and was motivated by MAF's wish to "…better meet New Zealand's commitments to the Convention on Biological Diversity (CBD)." Protection of genetic diversity was a sub-theme of the broader objectives[54] and could have featured in the four focal areas identified by the Conference of the Parties to the CBD for case studies: pollinators, soil biota, sustainable forestry management and integrated landscape and farming systems. All four focal areas are relevant to New Zealand's interests from the perspectives of indigenous biodiversity as well as agricultural biodiversity. The agreed approach of the CBD to the overall project had already been identified as 'ecosystem management'. This approach favours a multi-species approach to safeguard ecosystem processes, a multi-disciplinary approach to finding lasting solutions and emphasizes local participation methods.

388. The review concluded that: "*New Zealand has largely failed in applying the Ecosystem Management framework and that its CBD commitments could act as a spur to finally get it underway. MAF therefore have a much bigger opportunity and challenge than simply safeguarding agricultural biodiversity – the Ministry can also facilitate a broadening and maturation of New Zealand's conservation philosophy in a way that will connect its people to the land and a responsible land ethic*." To our knowledge, MAF did not use this report as the basis for subsequent policy-related initiatives. There are aspects of the environmental objective of the Sustainable Farming Fund that contribute to these issues although we have not looked at the extent to which Fund projects assist with safeguarding agricultural biodiversity. In our discussions of Theme Two (freshwater biodiversity) we suggest the Sustainable Farming Fund could make a greater contribution to connecting ways of sustaining biodiversity in agricultural systems.

389. One area where the benefits of greater cooperation are easier to identify is in the development of a more coherent response to the management of collections of genetic resources. This is relevant to Actions 4.1a and 4.1b, especially to the problems associated with maintaining genetic resources. The review by Brockerhoff et al (2004) conservatively estimated "…at least 3-4,000 significant holdings of exotic species in New Zealand, mostly in the hands of informed and 'expert' amateurs."[55] Over 90% of these are plant collections, about 2% are animal collections and most are privately funded. A substantial number (44%) had over 1000 types of organisms. While few probably contain unique material with demonstrated economic value these collections include at least 267 globally threatened exotic tree species, subspecies and varieties.

[54] In summary, the objectives were:
1. Review literature and existing research underway relevant to MAF's CBD commitments;
2. Identify gaps in knowledge and a prioritized research agenda to meet New Zealand's CBD commitments; and
3. Identify elements for good case studies and suggest potential case studies for New Zealand.

[55] Brockerhoff et al, page 16.

390. In August-October 2003, a Seed Carriers Hikoi was held because of concerns that government agencies were not responding to requests concerning heritage exotic genetic collections, especially in terms of Objective 4.1 of the Strategy. The Hikoi wanted to find a way to protect seeds that "represent the cumulative experience and wisdom of our ancestors, and are our gift for future generations". [56]

391. We have reported elsewhere (Theme Nine) on the difficulties in adequately funding nationally important collections held by different organisations. The FRST-funded nationally significant collections are predominantly of indigenous (dead) biota, which is appropriate given the focus is on collections that support the maintenance of healthy resilient ecosystems. Very few of the exotic species collections are recognised as significant by regional and national agencies and even fewer receive funding. Brockerhoff et al (2004) argue that exotic species collections do not receive the recognition accorded to indigenous collections. With significant constraints on public funds for maintaining even the priority collections this is not likely to change.

392. The Brockerhoff report includes 17 recommendations that address many of these issues and identifies a number of the risks facing the management of genetic resources of introduced species. These will be useful for policy initiatives, a more detailed risk analysis and for dialogue between the key players that have a collective interest in the fate of a wide assortment of exotic species collections. However, the Brockerhoff report recommendations make a number of presumptions about the place and importance of collections that first need to be tested through the development of the proposed 'collaborative strategy' (Action 4.1a).

393. Identifying risks associated with the genetic resources of indigenous species that are threatened or declining is an integral part of the development of recovery plans for these species by DOC (Action 4.1c). While some threatened species may not yet have these risks identified, it is an established part of the process. The larger challenge lies in implementing these recovery plans, which are restrained by available resources (see Theme One). DOC also considers genetic aspects in its re-introductions programmes, which emphasise the importance of local 'sourcing' for plants and animals, when possible. Some of the risks to threatened plant species are being managed in novel ways. For example, some threatened species are now successfully used as fill-in plantings in traffic islands while others are widely sold for garden plantings.

394. While the Strategy is clearly focused on the genetic resources of terrestrial species similar questions can also be directed to marine species that are subjected to direct exploitation or are indirectly affected by fishing activities. This applies to threatened cetacean species and rare seabirds and could potentially apply to fish stocks. Maintaining genetic diversity is a difficult problem for commercial fishing to address in an explicit manner and raises quite different issues for wide-ranging well-mixed stocks compared with sessile or poorly mixed stocks. There is no research currently underway by MFish on this topic.

[56] Ibid, page 12.

395. ***Limited progress. There has been no progress so far on the main priority action – the development of a collaborative strategy to manage New Zealand's genetic resources, including both introduced and indigenous species. We suspect that there has been insufficient commonality of interest amongst the key players to advance this initiative, possibly exacerbated by a lack of resources. Whether our perception is justified or not is best tested by exploring the issues and overlaps in a systematic way. A 2001 report to MAF (Perley at al 2001) concludes, and we agree, that the linkages between agricultural biodiversity and indigenous biodiversity should be stronger. This would have benefits for Themes One and Two as well. We recommend therefore, that as a first step a more critical evaluation should be undertaken of the present merits of such a genetic resources strategy and its relationship to related activities including bioprospecting policies and biotechnology developments. There are probably linkages to other objectives relating to Maori interests in managing genetic resources that will need to be considered as part of this evaluation.***

396. ***There are a number of issues around the many collections of exotic (mostly plant) species, recently estimated at 3000- 4000, that are now established around New Zealand. Many of these collections are substantial and have been maintained for many decades with private funds. These issues also need to be approached in a strategic manner as the costs and benefits of greater governmental and commercial involvement need to be carefully assessed. The questions around collections should be considered in the wider context of the proposed collaborative strategy, not in isolation.***

**Objective 4.2 Access to genetic material from other countries**
**Maintain access by New Zealanders to genetic material from overseas and participate in international frameworks relating to access to genetic resources and related knowledge and technology.**

397. This objective addresses the importance of having access to the genetic resources of other countries, especially for improving the genetic stock of commercially important species, and for making reciprocal access available to other countries. It is also important to have opportunities to import species from overseas as biological control agents. Some of the actions under this objective also need to be considered in relation to Theme Five (Biosecurity). No actions were ranked as priority and no Package money was allocated.

**Actions 4.2**

a) **Implement the Hazardous Substances and New Organisms Act to ensure ongoing access by New Zealand to genetic material from overseas, while safeguarding indigenous biodiversity and human health.**
b) **Review arrangements for collecting genetic resources overseas, by New Zealand individuals, companies and research institutions, and conclude agreements as appropriate**
c) **Continue to participate in renegotiating the International Undertaking on Plant Genetic Resources, and participate in relevant future multilateral or bilateral agreements for access to genetic resources for food and agriculture.**
d) **Participate in multilateral and bilateral processes relating to access to genetic resources (not limited to genetic resources for food or agriculture) within the Convention on Biological Diversity framework.**
e) **Continue to develop cooperative research programmes and share information about genetic resources between New Zealand institutions, institutions in other countries, and international bodies.**

| | |
|---|---|
| **Lead agencies:** | **To be assigned, ERMANZ, MAF, Ministry of Economic Development (MED)(previously MoC)** |
| **Priority actions:** | **None** |
| **Funding** | **Core only** |

398. We have commented in Theme Five about some difficulties relating to the HSNO Act and applications to import new species (Action 4.2a). While the over-riding need not to compromise biosecurity objectives is paramount, there have been widespread criticisms of the compliance costs and complexities of the HSNO Act process for the approval to introduce new plant material and also with MAF regulations. These are further documented in the report by Brockerhoff et al (2004) in the responses to a survey and from interviews. Over 80% of respondents, which included major commercial research and public institutions as well as collection holders, made negative comments about ERMA processes and MAF regulations. Notwithstanding the obvious need for a rigorous importation process, the concerns related to procedural shortcomings that are documented by Brockerhoff's report.

399. In response to these criticisms a workshop was held in August 2005, initiated by MoRST, MAF and ERMA, about access to plant resources that covers Actions 4.2a. Issues were identified around the import processes of the HSNO Act and the Biosecurity Act. As an outcome, an inter-departmental group and an industry group were proposed as a way to further explore the issues and recommend new measures. Details of an inter-departmental project to identify barriers to plant importations and possible remedies are being finalized in late-2005. These groups will not be looking at the wider matters covered in Action 4.2b.

400. The International Undertaking on Plant Genetic Resources (Action 4.2c) developed into the International Treaty on Plant Genetic Resources for Food and Agriculture which came into force in 2004. The Treaty aims to enable the conservation and sustainable use of plant genetic resources for food and agriculture and the fair and equitable sharing of the benefits arising out of their use. A critical barrier to its full implementation concerns

the terms governing the transfer of particular resources from gene banks to plant breeders. New Zealand has not yet signed the Treaty. MAF is looking at the benefits and risks to New Zealand agriculture of doing so. This will also influence New Zealand's response to arrangements for overseas collecting of genetic resources (Action 4.2b).

401. A fuller account of New Zealand's involvement with the Convention of Biological Diversity (Action 4.2d) is covered under Theme Ten. MAF takes a particular interest in aspects that concern introduced species and access to genetic resources. At present, the Strategy identifies the Ministry of Economic Development as lead agency for Action 4.2d. This should be reassessed as the relevant expertise lies within DOC and MAF, while MFAT acts as the coordinating agency.

402. The CRIs and other research interests have ongoing relationships with overseas counterparts about which we have obtained no specific information (Action 4.2e). We doubt if the Biodiversity Strategy has had much influence on these arrangements, particularly in the absence of any strategic oversight that might otherwise influence research programmes and information exchange.

403. ***Limited progress. There have been various difficulties faced by importers of genetic material from ERMA process requirements and in relation to the Biosecurity Act. As we have discussed under Theme Five, these issues may inadvertently be compromising biosecurity standards, while also frustrating efforts to legally obtain genetic material of economic importance. There is a MoRST/ MAF/ERMA initiative underway to consider and resolve these issues. Other aspects of this objective seem to be advancing according to their own timetables. A new lead agency should be identified to lead and coordinate Action 4.2d.***

**Objective 4.3 Bioprospecting in New Zealand**
**Develop an integrated policy and legislative framework for managing bioprospecting in New Zealand, including arrangements for sharing benefits from the use of genetic resources, which are consistent with international commitments.**

404. This objective addresses the need for a comprehensive policy framework and a legislative response to the complex of issues around bioprospecting, benefit sharing and meeting various international commitments. The additional aspects that need to be considered in the New Zealand context relate to claims under the Treaty of Waitangi as well as the New Zealand Biotechnology Strategy (2003). No actions were ranked as priority and no Package money was allocated.

**Actions 4.3**
**a) Develop policy on access to, and the use of, New Zealand's indigenous genetic resources and the sharing of benefits from their use, taking into account Maori interest in these resources (see Theme Seven) and providing as much certainty as possible for all parties.**
**b) Review existing controls and legislation regulating the bioprospecting of indigenous genetic resources, with a view to developing a more integrated framework for managing bioprospecting and distributing its benefits[57].**
**Lead agency:** **DOC**
**Priority actions:** **None**
**Funding:** **Core only**

405. Bioprospecting has been going on in New Zealand by both New Zealand and overseas companies for many years. The agency leading the development of bioprospecting policy framework for regulating bioprospecting activities is the Ministry of Economic Development (MED), although the Strategy has DOC in this role. MED released a discussion paper on bioprospecting in November 2002 (MED 2002) and released a summary of the submissions it received in early 2003. Since 2003, MED have been working on the policy issues internally in consultation with other departments. Policy recommendations have not advanced far enough to go to Cabinet. While work is going on behind the scenes, current management would seem to be in line with the statement in the Strategy: "*Although there are some controls under the Wildlife Act 1953, the approach to managing bioprospecting in New Zealand is currently ad hoc."* We understand that MED resumed more active work in 2005 on bioprospecting policy and is discussing with other departments the scope and nature of a domestic bioprospecting policy.

406. The Conservation General Policy (DOC 2005) provides criteria governing the collection of material from public conservation lands and waters, whether for commercial or non-commercial use, including indigenous species (section 12 – Research and information needs).

407. One of the major policy issues to be resolved is how to respond to the related issues under Treaty of Waitangi claims. The most pertinent of these is the unresolved 'Wai 262' claim concerning the ownership of biological resources (see also Theme Seven for further details). Questions over ownership of natural resources and this unresolved Treaty claim raise procedural questions as to whether a bioprospecting framework can be developed alongside consideration of the claim or whether the claim needs to be settled first. We do not know if Government has a preferred approach on this point.

408. While progress in New Zealand has been slow, other countries have developed legislation (such as Australia). These various overseas initiatives could usefully inform the development of New Zealand's policy options on bioprospecting. For example, guidelines have been issued under the Convention on Biological Diversity on how to approach issues of access and benefit sharing of genetic resources (Secretariat of the

[57] This action will need to be aligned with the International Undertaking on Plant Genetic Resources for Food and Agriculture (IUPGRFA).

CBD 2002). A number of countries have established regimes that govern bioprospecting by foreign interests.

409. There are also linkages between bioprospecting (the identification of potentially valuable natural products for commercial development), biotechnology and genetic engineering (which provide one mechanism for commercial development via biotechnology). Some responses to the MED discussion paper (above) linked bioprospecting to concerns about genetic engineering as well as to questions of how benefit sharing would be managed.

410. ***Limited progress. Lead agency responsibilities reside with MED to develop the policy and legislative framework for managing bioprospecting. There was initial work done during 2001-2002, but considerable policy development is still required, including basic questions as to what process to follow. The work is significantly complicated by the relationship between advancing bioprospecting policy and the unresolved 'Wai 262' claim under the Treaty of Waitangi.***

**Objective 4.4 Matauranga Maori and use of genetic resources**
**Ensure that the use of matauranga Maori (traditional knowledge) in the identification and commercial use and development of intellectual rights to indigenous genetic resources occurs only with the consent of the holders of that knowledge, and that they share in any subsequent benefits (see Theme Seven).**

411. This objective is closely linked to Objective 4.3 with the additional consideration of intellectual property rights for indigenous people. There has been international concern expressed by indigenous peoples that knowledge gathered over centuries has been exploited commercially without their agreement. No actions were ranked as priority and no Package money was allocated.

**Actions 4.4**
**a) Address, and seek to resolve, Treaty of Waitangi claims to ownership of biological resources, including indigenous genetic resources.**
**b) Develop agreements that safeguard the use of matauranga Maori in the identification, use and development of intellectual rights to indigenous genetic resources, and ensure appropriate sharing of resultant benefits.**
**c) Provide for Maori interests in indigenous genetic resources, and concerns relating to the patenting of lifeforms, to be taken into account during the review of the Patents Act.**
**Lead Agencies:** **TPK, Ministry of Economic Development**
**Priority actions:** **None**
**Funding:** **Core only**

412. The slow progress with resolution of the 'Wai 262' claim is covered in Theme 7.3 and referred to above (Action 4.4a). Maori concerns over intellectual property have been expressed at various times. Those concerns are summarised, for example, in the Mataatua Declaration which covers control over customary knowledge, intellectual property rights, benefit sharing, and bioprospecting. This declaration was an outcome of the First International Conference on the Cultural and Intellectual Property Rights of Indigenous

Peoples, convened by the nine tribes of Mataatua, Bay of Plenty, in June 1993. The Mataatua Declaration has not been formally considered by the Government.

413. As with the bioprospecting policy framework, there would appear to be limited progress on Actions 4.4a & b, given the linkages to unresolved Treaty claims and the need to find ways to acknowledge traditional Maori knowledge. There are also a number of separate international conventions relating to intellectual property that need to be considered in this context.

414. The review of the Patents Act 1953 has been underway for several years (Action 4.4c) and a draft Bill was posted on the MED website at the end of 2004. The intention was to introduce the Bill to Parliament later in 2005 for consideration by Select Committee in 2006. There is provision in the draft for the establishment of a Maori Consultative Committee that would advise the Commissioner of Patents on matters of interest to Maori. Other aspects of the Bill will also be relevant to Maori concerns.

415. The property rights matter is addressed as follows in the general case in DOC's Conservation General Policy in section 12(e): "Any property rights, including intellectual property rights, should be safeguarded for the benefit of the Crown, on behalf of the people of New Zealand." (DOC 2005).

416. ***Limited progress. With major unresolved Treaty claims, notably Wai 262, there seems to be little likelihood of progress on the substantive actions until the issues covered under Objective 4.3 have been addressed. A Patents Bill may be introduced to Parliament in late 2005, thereby giving opportunity for Maori interests to be raised in Select Committee stages.***

**Objective 4.5 Conservation of threatened introduced species**
**Assist with international efforts to conserve threatened introduced plants and animals in New Zealand, provided that this does not conflict with conserving indigenous biodiversity.**

417. There are a remarkably high number of exotic species in New Zealand, mostly plants, some of which are threatened in their native ranges. This objective considers New Zealand's international obligations and opportunities to provide assistance as long as indigenous species are not negatively affected. No actions were ranked as priority and no Package money was allocated.

**Actions 4.5**
**a) Support the *in situ* conservation of threatened introduced species by returning them, where possible and environmentally desirable, to their place of origin.**
**b) Maintain small populations of threatened introduced species in facilities or clearly defined areas where their presence will not pose a threat to indigenous species, where reintroduction to their country of origin is not feasible or is undesirable because of the risk of introducing pests or diseases.**
**Lead agencies:** **Not yet assigned**
**Priority actions:** **None**
**Funding:** **Core only**

418. A useful stocktake of the New Zealand situation regarding threatened introduced species was provided in a 2004 report for MAF (Brockerhoff et al 2004). It identified at least 267 globally threatened tree species in New Zealand collections including some that are critically endangered. The authors conclude, however, that probably few of the naturalised introduced plants are of 'extreme conservation interest'. We are not aware of efforts that have been made in recent years to return any of these plants to their native range or whether there have been any requests to do so. It is also not clear if any efforts have been, or should be made, to inform other countries that New Zealand has naturalised plant species which are endangered in their native range. The New Zealand species threat classification system is linked into foreign species threat classifications and it is intended to list species that have some sort of threat status outside New Zealand.

419. Far fewer of the introduced animal species in New Zealand are threatened in their native ranges compared with introduced plants. However, there are some, and in 2003 20 tammar wallabies were sent to Victoria, Australia where they were considered extinct in their natural habitat. No returns of rare mammal breeds have been activated in recent years (Brockerhoff et al 2004). There has been interest expressed in 'returning' the shorthaired bumble bee from New Zealand to the UK where it is apparently extinct. We are not aware of initiatives that are specifically addressing Action 4.5b, which seems focused on animal species, rather than on the larger number of threatened introduced plants that are growing here.

420. A number of threatened introduced species are of public interest and may have a role in enhancing the genetic diversity of New Zealand's economic species. This applies particularly to plant species and is reflected in the large number of private plant collections held by private individuals.

421. Most zoos are linked into international agreements and protocols on breeding and exchanging threatened species. While these actions are supportive of the intent of this objective New Zealand zoos have encountered difficulties with the import and export of exotic animals of high global conservation value (Brockerhoff 2004). This includes problems with importation protocols for new species and ERMA requirements.

422. On the reverse side of considering the export of threatened introduced species is what New Zealand should not be doing by exporting introduced *pests*. At present, we lack a

legal mechanism to control the export of known pest species. Countries that do not appreciate the potential consequences of such introductions are unwittingly importing potential problems (Warren 2004). One example is the export market of possums and mustelids to Japan as pets. As Warren points out, this could be considered in contravention of the alien species principles agreed to by Parties under the Convention on Biological Diversity.

423. The low level of activity and the ongoing absence of an assigned lead agency all indicate that these actions have been of low priority. They are probably not seen as contributing to the main task of the Strategy – turning the tide on New Zealand's biodiversity loss.

424. ***Limited progress. We consider this to be correctly viewed as a low priority objective, given the main goals of the Strategy. There is a potential for threatened introduced species to enhance the genetic diversity of New Zealand's economic species. New Zealand has the potential to assist other countries by sending plants or animals that are threatened in their native range, but there does not appear to have been any concerted effort to do so. We are also uncertain about how many requests there have been from other countries to assist or whether they are aware of the threatened species that are held in New Zealand. At the same time, New Zealand should not be adding to the potential pest problems of other countries by exporting known pest species – such as possums and mustelids.***

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# THEME FIVE: BIOSECURITY AND BIODIVERSITY

Caption: Pests come in all shapes and sizes. ‘Didymo’ (*Didymosphenia geminata*) was discovered in Southland rivers in October 2004 and within a year had been accidentally spread as far as the Buller River in Nelson. Great vigilance and public involvement will be needed to keep it out of the North Island.

**Theme Five: Biosecurity and Biodiversity**
**The management of risks to indigenous biodiversity and important introduced species from the introduction and spread of harmful organisms, including animal pests, weeds and diseases.**

**Desired outcome for 2020**
**The risks to New Zealand from pests and unwanted organisms (including genetically modified organisms) are managed to protect our indigenous biodiversity and important introduced species. A precautionary approach is taken with respect to new organisms, including genetically modified organisms.**
**Biosecurity management is effectively coordinated between central and local government, private agencies and interested groups. Systems for managing pests affecting primary production and indigenous biodiversity are coordinated. New Zealand's biosecurity system complements international arrangements to minimise the risks of entry of unwanted organisms to New Zealand.**
**Management and surveillance systems are backed by effective research and the assessment of biosecurity risks. Ecologically and socially acceptable mechanisms are in place to balance the benefits of new introduced species against potential risks to indigenous species and ecosystems and other valued introduced species.**

## Stocktake of progress on Theme Five

### Expectations of the Strategy

425. Issues concernin***g*** biodiversity and biosecurity were identified as a priority area for implementation in the Biodiversity Strategy, namely, "*Identify and manage biosecurity risks to indigenous biodiversity*". Biodiversity package funding for the theme was a modest $2.7 million although a larger amount was allocated for marine biosecurity programmes ($9.5 million) (see Theme Three for review of progress on marine biosecurity). The relative size of these allocations reflected concerns that marine biosecurity was lagging well behind terrestrial systems. The Strategy noted that the increased volume of trade from a wider number of countries was increasing risks to indigenous biodiversity as well as to economically important species. A major theme in the Strategy was the need to clarify roles and responsibilities for pest management and to improve coordination across the whole of the biosecurity system.

### Progress in co-ordinating biosecurity management

426. Co-ordinating biosecurity management and clarifying responsibilities was the first objective in the Strategy and included the first of only three priority actions. Improving co-ordination was also relevant to other objectives, such as managing biosecurity risks and improving the border control system. We conclude that major progress has been made through the work of the Biosecurity Council that completed the Biosecurity Strategy (**"**Tiakina Aotearoa Protect New Zealand") in 2003[58] and Government's

[58] The Biodiversity Package provided $1.1 million towards the completion of the Biosecurity Strategy.

subsequent commitment to its implementation. During 2004, there was a re-organisation of biosecurity agencies culminating in the creation of 'Biosecurity New Zealand' and the Biosecurity Strategic Unit within MAF in November 2004. The new structure provides the platform for more co-ordinated development of policy, clearer accountabilities, better integration of central and regional government roles and further work on efforts to standardize risk assessment.

427. Although we regard the progress towards meeting objective 5.1 as substantial, we still rank the future priority as 'high' given the importance of further improvements in the coordination of biosecurity management. A number of reviews since 2000 have highlighted areas for improvement, including a need to review the effectiveness of current legislation relevant to biosecurity and pest management.

428. A specific test for the new structures will be how they respond to the increasing risks to indigenous biodiversity, both marine and terrestrial, from potential pests. The historical strengths of MAF in the biosecurity area were in the primary production sectors and on the border points of entry. It is too early to assess how effectively the broader mandates for marine and terrestrial biodiversity will be actioned by the new Biosecurity New Zealand (BNZ) agency within MAF. The newly created Biosecurity Ministerial Advisory Committee (BMAC) has an important role to play in advising the Minister on how effectively biosecurity management is being co-ordinated with respect to indigenous biodiversity (refer Objective 5.1d).

**Progress in improving risk assessment and risk management**

429. In this section we summarise progress with respect to assessing and managing biosecurity risks, border control and managing risks to biodiversity from new organisms. Overall, we consider progress has been moderate and many of the actions should still be regarded as having a high priority into the future.

430. A small amount of Biodiversity Package funding ($1.6M) was spent on extra work in relation to risk assessments, import health standards and incursion responses. An integrated risk management framework for biosecurity now exists. It will be used to guide decision making for activities where MAF is accountable for service delivery. It is also available as an input into other agencies' decision-making if they wish. The earlier absence of a framework for prioritizing resource allocation across the biosecurity system was an issue that clearly needed addressing.

431. A research strategy for biosecurity is still to be completed. The delay provides a valuable opportunity to take into consideration overlapping research needs to meet biodiversity objectives and also consider how climate change impacts may influence biosecurity management and the need for related research, particularly with respect to adaptation responses (see Theme Ten for further discussion).

432. More work is also needed to finalise a nationally-agreed set of pest indicators for assessing the effectiveness of biosecurity management in protecting indigenous

biodiversity and valued introduced species. This also requires further work on monitoring techniques, information management and reporting systems, particularly with the overall objective of establishing systems that can be used at a range of scales (local, regional and national) and will be able to satisfy different reporting obligations. Until these are in place, it will be difficult to assess the performance and accountabilities of the various biosecurity agencies. We would urge a collaborative approach to address these tasks, between central and local government agencies. Recent work by DOC on its inventory and monitoring strategy, as well as its Natural Heritage Management System could usefully contribute to this exercise. There should be cost-savings in adopting a more integrated approach to monitoring and reporting between agencies.

433. Border control has improved in a number of ways. There are, for example, much higher rates of inspection for sea containers, mail and passenger baggage. There is a better understanding of pathways and guarding against exotic species that pose particular risks to indigenous species. A good example of the latter is the development and implementation of the National Invasive Ant Surveillance programme that started in 2001 in response to the fortuitous discovery of the red imported fire ant (*Solenopsis invicta*) at Auckland Airport earlier that year. The same fire ant was subsequently found at the port of Napier in 2004, thanks to new surveillance systems. But the continual rise in trade volumes, visitor numbers and new trading partners all serve to increase the risks.

434. The new Pre-Clearance Directorate within Biosecurity New Zealand, MAF, should be better placed to reduce the problems that have existed around the development of import health standards. There has been a significant backlog of applications for several years and a concern that earlier import health standards did not incorporate an adequate risk analysis of threats to indigenous biodiversity. It is too soon to assess the effectiveness of the new structures in addressing the actions in the Strategy.

435. The Environment Risk Management Authority New Zealand (ERMA) has major responsibilities for assessing the risks posed by new organisms, including genetically modified organisms (GMs). Much of the assessment is part of the process applicants go through when applying to import a new organism. We are concerned that the high costs of this process have undermined a major part of ERMA's role. For example, the cost of obtaining permission to import new plant species is seen as excessively high and has probably led to more illegal importations (including known risk plants) than legal importations in the past 5 years. These problems and those raised by importers relating to MAF regulations are currently being considered (see Theme Four for details).

**Progress in managing potential pest species**

436. There has been substantial progress in implementing the two actions listed under Objective 5.5 in the past 5 years although they still retain a 'high' priority ranking for the future. The development of procedures to prevent escape from captivity of potential pest species has been achieved though the development of a number of voluntary codes of compliance with industry associations. These have included codes with the aquarium, nursery and pet shop trades, for example. Their effectiveness remains to be seen.

437. What the Strategy fails to consider in this theme, however, is the need for better surveillance systems that address not only potential pests, but also the spread of existing pests within New Zealand. This particularly includes the emergence of new weed species from the large pool of naturalised plants, a few of which switch their status from “benign’ to ‘pest’ every year. In Theme One we discuss the progress that has been made with respect to strategies for weed control and the importance of early identification and eradication of new weed pests. Delays can increase costs substantially, or make eradication impossible. While surveillance is a more prominent element in the Biosecurity Strategy, it would be appropriate to give it a higher profile in the Biodiversity Strategy as well, given its importance in efforts to eradicate pests before they become too well established.

438. We believe there is probably better public awareness about introduced species and the risks they pose to native species than there was 5 years ago. Some of this has come from well-planned initiatives, such as the TV “Border Patrol” series, while spray programmes to control moth incursions have generated both positive and negative reactions and sensitized urban populations to the risks of new invasives.

439. The following Table 5 summarises our assessment of progress against each of the actions over the 2000 – 2004 period and our recommendations as to how these actions should re ranked as priorities in the next phase of implementing the Strategy.

## Table 5. Summary table of progress in Theme Five

| **Summary of progress on Theme Five action points (2000-2004)** | | | | |
|---|---|---|---|---|
| | **Priority action** | **Package funding** | **Progress to date** | **Future priority?** |
| **Objective 5.1 Coordinating biosecurity management** | | | | |
| 5.1a Assign roles | Yes | Yes | Substantial | High |
| 5.1b Procedures for cooperation | No | No | Substantial | High |
| 5.1c Emergency response strategy | No | No | Substantial | High |
| 5.1d Periodically review mgmt. | No | No | Limited | Medium |
| **Objective 5.2 Assessing and managing biosecurity risks** | | | | |
| 5.2a Potential pest species effects | Yes | Yes | Moderate | High |
| 5.2b Develop risk analysis | No | Yes | Moderate | High |
| 5.2c Develop indicators | No | No | Limited | High |
| 5..2d Finalise Research Strategy | No | No | Moderate | High |
| **Objective 5.3 Border Control** | | | | |
| 5.3a Educate travellers | No | No | Moderate | High |
| 5.3b Import health standards | No | No | Limited | High |
| 5.3c Improve border control | Yes | No | Substantial | High |
| 5.3d Minimise illegal trade | No | No | Unknown | Low |
| 5.3e Info. for importing countries | No | No | Unknown | Low |
| **Objective 5.4 Managing risks to biodiversity from new organisms** | | | | |
| 5.4a Risk assessment framework | No | No | Substantial | High |
| 5.4b Clarify responsibilities | No | No | Achieved | Low |
| 5.4c Establish Royal Commission | No | No | Achieved | N.A. |
| **Objective 5.5 Managing potential pest species** | | | | |
| 5.5a Prevent escape from captivity | No | No | Moderate | High |
| 5.5b Raise public awareness | No | No | Substantial | High |

## Introduction

440. The scope of this theme is managing the risks to both indigenous biodiversity and important introduced species from intentional and unintentional introductions of pests and diseases and their spread within New Zealand. The concept of biosecurity management includes a decision-making and risk analysis framework, biosafety measures, border control, surveillance and emergency response systems to exclude and eradicate unwanted organisms and pests.[59] Management of already established animal and plant pests is covered under Themes One, Two and Three, not within this theme.

441. We review here the Theme Five actions within the five overarching objectives. We provide general contextual information and comment on progress made between 2000 and 2004, and on the extent and nature of the contribution made by the funding from the Biodiversity Package. Theme Five was allocated $2.70M, or 1.5% of the Biodiversity Package, in two programmes, by the end of the 2004/05 financial year. A related allocation of $9.53M funded six programmes specifically for marine biosecurity and these are reported on under Theme Three.

### Completion of "Tiakina Aotearoa Protect New Zealand"

442. Although it is not listed under any of the objectives or actions, the completion of the Biosecurity Strategy was the major priority during this period and the overarching initiative within this theme. With the assistance of $1.13 million from the Biodiversity Package, the Biosecurity Strategy for New Zealand was completed[60] and released in August 2003 by the Biosecurity Council. Government subsequently committed to implementing the Strategy as the basis for improving the biosecurity system. The Biosecurity Strategy identifies the need to advance Action 5.2d) from the Biodiversity Strategy – the finalisation and implementation of a biosecurity research strategy.

443. The Biosecurity Strategy focuses on pre-border, border and post-border activities designed to keep out new pests while recognising that biosecurity also covers the management of established pest species. In line with Objective 5.1 (below) the Biosecurity Strategy addressed the central issue of improving co-ordination across the biosecurity agencies through its key recommendation for single agency responsibility and accountability for the biosecurity system. Government accepted the recommendation that MAF assume this role and provide the overarching leadership required to develop a more strategic 'whole-of-system' focus to biosecurity. A period of substantial re-organisation within parts of MAF followed, leading to the creation, in November 2004, of Biosecurity New Zealand. The new agency's leadership role encompasses economic, environmental, social, human health and cultural outcomes. It also has international trade and animal welfare responsibilities. A Biosecurity Strategic Unit was also established within MAF to

[59] "Pest" is used here to mean any organism that is harmful, or potentially so, to economic, biodiversity, health or cultural objectives. The term has a more specific definition in the Biosecurity Act 1993.
[60] Development of the Biosecurity Strategy took three years and involved an extensive process of public submissions and public meetings, as well as the involvement of many management agencies, sector groups and research organisations.

deal with cross-cutting issues and champion the Biosecurity Strategy. It reports directly and independently to the Director-General of MAF.

444. With the creation of the new agencies within MAF there is a need to reassess the 'lead government agency' currently assigned to a number of actions in this theme. For example, the actions assigned to the Biosecurity Council, now dis-established, should mostly pass to MAF. MAF is tasked with balancing its obligations to the Biosecurity Strategy (compared with the historical MAF focus on the biosecurity of agriculture and forestry sectors), with the biosecurity requirements of the Biodiversity Strategy and its primary focus on indigenous species.

## Analysis of objectives and actions

**Objective 5.1 coordinating biosecurity management**
**Effectively coordinate biosecurity management within and across central and local government and non-governmental agencies, and clarify responsibilities for managing risks from unwanted organisms to indigenous biodiversity and valued introduced species.**

445. This objective addresses the governance requirement that numerous reviews of biosecurity have highlighted – that the fragmentation of responsibilities and funding between multiple agencies was hindering governance, blurring accountabilities and affecting policy and response capabilities. The co-ordination between regional councils and central government agencies needed clarifying and improving. The recognition that risks to New Zealand's biosecurity are increasing – from global health scares, to the major growth in trade and tourism and new risks from climate change – puts particular pressure on improving coordination of, and delivery by, the biosecurity management agencies.

**Actions 5.1**
**a) Clarify and assign roles and responsibilities for biosecurity management, for both publicly and privately owned areas, for managing potential pest species already present in New Zealand but not yet widespread.**
**b) Develop procedures to enhance cooperation between agencies and encourage information sharing on biosecurity issues.**
**c) Develop and implement a strategy to maintain and develop coordinated expertise and technical capacity within relevant agencies to enable efficient and effective emergency response actions to unwanted organisms.**
**d) Periodically review whether biosecurity management is being effectively coordinated with respect to indigenous biodiversity.**
**Lead agency:** **Biosecurity Council**[61]
**Priority actions:** **Action a) only**
**Funding:** **Core only**

[61] As noted in earlier comments, government lead agency for this and other actions that refer to the Biosecurity Council now mostly pass to Biosecurity New Zealand.

446. Only Action 5.1a) was highlighted as a priority action. One of the responsibilities of MAF will be to lead the implementation of these four actions. Given that the new agencies within MAF were only created in late 2004, it is too soon to assess their performance with respect to these actions. The Biosecurity Strategic Unit has already acted to set up mechanisms to improve coordination and cooperation. A new Chief Executive's Forum has been established, as well as the Central and Regional Government Forum and a central/regional government coordinating group. These forums should contribute to the implementation of Actions 5.1a), b) and c). Several joint MAF/regional council projects are already addressing a number of key issues that relate to these actions. These include a project by the Biosecurity Strategic Unit to clarify and improve co-ordination between regional councils and central government (Action 5.1b). 'Biosecurity Summits' have been held annually since 2003 and provide useful opportunities for the new structures to be discussed with stakeholders.

447. In January 2005, the Biosecurity Ministerial Advisory Committee (BMAC) was established and will assume the advisory functions of the previous Biosecurity Council. The BMAC is a stakeholder advisory committee to provide independent advice to the Minister of Biosecurity on the performance of the overall biosecurity system and to monitor the implementation of the Biosecurity Strategy. The BMAC should have a role in providing input on Action 5.1d), namely, commenting on the effective coordination of biosecurity management with respect to indigenous biodiversity.

A relevant example relating to Action 5.1a) was the development and release in August 2001 of the National Pest Plant Accord. This is a voluntary agreement between (most) regional councils and biosecurity departments to prevent the sale, distribution, or propagation of specified pest plants. The accord list specifies plants that have been identified as 'unwanted organisms' under the Biosecurity Act 1993 and clarifies the roles and obligations agreed to by the parties.

448. ***Substantial progress. The overall objective – coordinating biosecurity management – has been actioned, first with the completion of the Biosecurity Strategy (August 2003) and secondly, with the subsequent re-organisations that created Biosecurity New Zealand and the Biosecurity Strategic Unit within MAF. Although the new structures are still in a "shakedown" phase, four forums (for CEs, two for regional councils/central government, and a Ministerial advisory committee) have already been established and a number of related projects are underway. It is too early to comment on the effectiveness of these arrangements, but we are confident that the next five years should see major gains from the new structures and clearer accountabilities. Improving biosecurity for freshwater and marine systems should be a priority objective, given the current lack of clarity with respect to responsibilities, the substantial risks from new plant pests and marine organisms, as well as the ongoing spread of pest fish and freshwater weeds (see Themes Two and Three).***

**Objective 5.2 Methods of assessing and managing biosecurity risk**
**Establish effective methods of assessing and managing risks from unwanted organisms to indigenous biodiversity in conjunction with those methods for introduced species.**

449. This objective recognizes that the assessment of risks to our primary production sectors, mostly agricultural and forestry, from 'risk' goods entering New Zealand is much better developed than the assessment of biosecurity risks to indigenous flora and fauna. There are two reasons for this. First, far more resources have been applied to identifying the economic and biosecurity risks to productive sectors. Secondly, it is much more difficult to assess risks to indigenous species with respect to potential environmental and economic consequences.[62] These actions seek to narrow that gap and feed the results back into more effective risk management and decision making.

**Actions 5.2**
**a) Assess the probability and likely scale of adverse effects on indigenous biodiversity from potential pest species, including species that are:**
**i) not in New Zealand, but may be accidentally introduced through international trade and travel; and**
**ii) already in New Zealand, but which have not become widespread .**
**b) Develop appropriate risk analysis and management procedures between government agencies to ensure consistent approaches to assessing the ecological, social and economic risks posed by pests, weeds and diseases, including the definition of agreed levels of biosecurity risk.**
**c) Develop and implement indicators under the Environmental Performance Indicators Programme and strategies for assessing the effectiveness of biosecurity management in protecting indigenous biodiversity and valued introduced species.**
**d) Finalise and implement the Biosecurity Research Strategy.**
**Lead agencies:** **Biosecurity Council, MAF, MfE, regional councils**
**Priority actions:** **Action a) only**
**Funding:** **Core + Biodiversity Package**

450. Much of the work under these actions was DOC contributions to ongoing work programmes within MAF, such as to developing risk assessments, import health standards and incursion responses. The risk assessment and management of potentially damaging species is a priority strategic issue and requires a better set of risk assessment tools. One important initiative within this Programme was the development of an ant prevention plan for the Pacific, given the rising threats and impacts that a range of ant species pose not just to the Pacific island countries, but to New Zealand as well. Greater awareness of the risks from ants, especially to biodiversity, followed the fortuitous discovery (and subsequent destruction) of a nest of the red imported fire ant (RIFA, or *Solenopsis invicta*) at Auckland Airport in March 2001. It transpired that the ants had

[62] In many cases it is not possible to predict whether exotic species will become pests in New Zealand and their likely level of impact on indigenous species. A prior history as a pest species is the best predictor of likely risk, but species that are not pests elsewhere, may, and have, become pests in the New Zealand environment.

been present for many months and that none of New Zealand's international airports and ports were subjected to regular surveillance for ant incursions. As the red imported fire ant spreads to new countries (substantial infestations were discovered in Hong Kong and Taiwan late in 2004) and up the western coast of North America the risk of more ant incursions in New Zealand increases.

451. MAF released a guide titled "Biosecurity integrated risk management framework" in June 2004 (Action 5.2b). It acknowledged the particular difficulties associated with risk assessment for environmental and cultural effects and conceded the relatively poor information base that exists for assessing risks to indigenous flora and fauna. It has been trialed, implemented and further refined. This framework is used by BNZ to assist with delivery/decision making, but is not used by other agencies when carrying out their activities.

452. The cessation of the Environmental Performance Indicators Programme has meant that there are no nationally agreed indicators yet in place for assessing the effectiveness of biosecurity management in protecting indigenous biodiversity and valued introduced species (Action 5.2c). In June 2003, MfE released a proposed set of pest indicators near the end of the EPI Programme that have been available as an aide to biosecurity agencies. Since they were not progressed to the next stages of review, confirmation, refining sampling methods and clarification of roles and responsibilities for monitoring and reporting, there is a good opportunity now to reconsider these proposed indicators in the light of subsequent work done by other agencies, particularly DOC.

453. Until appropriate monitoring techniques have been agreed to for establishing performance measures and measuring the effectiveness of pest management programmes it will be difficult to assess overall performance and measure accountabilities across regional councils and other government agencies. DOC has methods for monitoring weed and animal pest control at sites, but the aggregation of measures into a national picture has still to be achieved. DOC is also working on the development of its Natural Heritage and Monitoring System (NHMS) which has areas of overlap with this work. We would urge greater collaboration between DOC, MfE, MAF and regional councils in progressing work on pest indicators, monitoring techniques and reporting systems. It would be timely to do so and could well result in cost savings.

454. The importance of science and research to biosecurity was also highlighted by the Biosecurity Strategy (Action 5.2d). The development of a Biosecurity Research Strategy has been underway for some time within MAF and its development now has the benefit of a MoRST investigation in 2004 that identified research priorities for biosecurity.[63] It would also be appropriate to include considerations of the potential impacts of climate change on biosecurity and what research might be needed to assist management and adaptation responses.

[63] Research themes identified were: knowledge gaps (taxonomy/diagnostics/forensics, detection and surveillance, integrated information system, micro-organisms); critically important tools (for stoats, mounting successful eradications); global partnerships; capability gaps (freshwater environments, marine capacity, animal health diseases).

455. ***Moderate progress. The groundwork for an integrated risk management framework has been completed and is now being implemented within Biosecurity New Zealand. This framework is an important element in the effort to better assess and manage biosecurity risks, especially for indigenous species and ecosystems. However, the recognition of inherent uncertainty about the invasive potential of many exotic species will need to be made explicit in future risk assessments. This will apply to a greater extent to potential impacts on indigenous species and ecosystems than to potential pests of economically important species.***

456. ***The selection and validation of indicators and better monitoring techniques are needed to assess performance and improve accountabilities of biosecurity agencies. It would be timely for central government agencies and regional councils to set up a collaborative arrangement to further advance the earlier work on indicators, monitoring and reporting systems with a view to providing relevant information for regional, national and international reporting requirements. The research strategy for biosecurity is still to be completed and should help set the direction for priority research that is needed to underpin the various components of biosecurity, including new management tools. We suggest it would be useful to consider the implications of potential climate change impacts in the research strategy. This is also discussed in Theme Ten.***

**Objective 5.3 Border control**
**Maintain and enhance integrated border control measures as the first and most important line of defence for minimising biosecurity risks to New Zealand's indigenous biodiversity and valued introduced species.**

457. While border control is crucial in defending New Zealand against new pests, it is now widely acknowledged that there are many actions and initiatives that need to take place off-shore, or pre-border, before risk products or travellers arrive here. These pre-border actions need to be made more explicit here and given greater prominence in Theme Ten – New Zealand's International Responsibilities. The present actions listed under this objective provide for a continuation of actions that were already part of border control responsibilities. There is, however, an extra emphasis on ensuring that threats to indigenous biodiversity are part of import health standards.

458. We also discuss another topic that is not explicitly covered in the Strategy, but is receiving increasing attention. This is the issue of reducing the rate of spread of pest species within New Zealand by focusing on key pathways and maximizing the use of natural barriers to movement, particularly Cook Strait. We refer to this as better control of 'internal borders'.

**Actions 5.3**
**a) Educate travellers and importers about the risks posed to indigenous biodiversity by the illegal and accidental importation of unwanted organisms.**
**b) Ensure that the development of import health standards incorporates a risk analysis of threats to indigenous biodiversity.**
**c) Continue to improve an integrated border control system to minimise the risks to biosecurity from the accidental or illegal importation of unwanted introduced species.**
**d) Minimise the loss of indigenous biodiversity through illegal trade.**
**e) Develop mechanisms to make available to the importing countries any relevant information New Zealand has on the potential invasiveness of species being exported.**
**Lead agencies:** **MAF, DOC**
**Priority actions:** **Action c) only**
**Funding:** **Core only**

459. There have been a variety of government campaigns to educate travellers and importers about biosecurity risks, but these have not been funded in a consistent manner in the past. The "Protect New Zealand" campaign has been phased out by Biosecurity New Zealand and replaced by two campaign concepts – "Keep Watch" (which focuses on the border and surveillance and general awareness) and "Outbreak Control" (for incursion response communications). We do not have any information on the effectiveness of previous campaigns, but would urge that resources need to provide for a higher level of engagement and support for achieving biosecurity goals that goes beyond a 'public awareness' focus. The 'human dimension' of biosecurity systems is crucial to overall success, yet it is often overlooked in research, policy and management considerations. All incoming airline flights to New Zealand, for example, provide an ideal, but underutilized, opportunity to inform and educate visitors, not only about quarantine requirements and clearance checks but the *reasons behind* New Zealand's strict border control system.

460. The Pre-Clearance Directorate within Biosecurity New Zealand includes a team that will develop Import Health Standards (IHS), an area of MAF work that was reviewed in 2003 in recognition of the growing backlog of applications for import health standards and frustration with the process by importers. Details of a proposed streamlined system for developing IHS were released for consultation in April 2005. Action 5.3b specifically identifies the need for import health standards to consider the risks to indigenous biodiversity and the extent to which this is achieved in the new system should be externally monitored in the future. This has been an area of concern as IHSs that were drafted before the HSNO Act allowed for species to be imported with little regard to potential risks to indigenous biodiversity. For example, the Import Health Standard for aquarium species approves for import more than 117 marine fish species and 69 invertebrate species, yet the pest potential for many of these species is unknown should they escape.[64] The various problems associated with pre-HSNO Act approvals to import species that pose risks to indigenous biodiversity are well recognised. MAF and ERMA, for example, are working with stakeholders on the related issues associated with freshwater species.

[64] Editorial in 'Water & Atmosphere' 12(3) 2004. NIWA, Hamilton.

461. The MAF Pre-Clearance Directorate that will manage biosecurity risks up to the point imports enter New Zealand. This Directorate will be responsible for risk analysis, biosecurity standards, monitoring (of border activities and pathways) and exports. The integration of these key pre-entry aspects of biosecurity should contribute substantially to implementing Action 5.3c). There have been a number of important improvements in border control such as 100% screening of passenger baggage and X-ray examination of mail as well as inspections of all sea containers. Other improvements in border control relate to initiatives on marine biosecurity that we report on under Theme Three.

**Internal Borders**

462. In Theme Three we refer to the risks posed to many pristine waters from the accidental spread of marine pests via hull fouling or ballast water. In Theme Two we discuss the appearance and rapid spread of new pests, such as *Didymo* in South Island rivers, and the successful initiatives by DOC to eliminate populations of two pest fish species from the South Island through operations in Nelson/Marlborough. Under the heading of 'internal borders' we believe there are cost-effective opportunities to limit the (mostly) accidental spread of pest species within New Zealand. This applies to terrestrial, freshwater and marine species and includes risks to economically important species as well as to indigenous species. A major opportunity exists to make more use of the unique circumstance that New Zealand is divided into two roughly equal main islands, that Cook Strait provides a significant barrier to the natural spread of many pests and therefore provides a real opportunity to reduce human transfer of key pests between the North and South Islands.

463. Threats to indigenous biodiversity from illegal trade (Action 5.3d) are greater in other countries, but do occur in New Zealand from time to time as evidenced by smuggling attempts that are intercepted at the border. New Zealand has obligations in relation to the trade in endangered species that it meets with respect to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (see Theme Ten). The wording of this action could also be aimed at travellers trying to bring species banned from trade into New Zealand. Leaflets and posters have been produced that convey these messages to travellers, but could be more widely distributed by the travel industry.

464. Under international agreements for the import and export of risk goods New Zealand has obligations that cover Action 5.3 e) to make relevant information available to importing countries on the potential invasiveness of species that are being exported. Based on information we received these obligations are being met, although we were not able to explore the relevant activities in detail.

465. ***Moderate to substantial progress. The actions generally call for improved performance in existing practices rather than identifying new initiatives. There is an extra emphasis on the need for import health standards to now include a risk analysis of the threats to indigenous biodiversity. It is too early for us to comment on how well more recent import health standards reflect this requirement of taking a wider perspective. The***

***border control system has been substantially improved with respect to passenger and mail screenings, as well as sea container clearance.***

466. ***We suggest that the Strategy should also address what is currently referred to as 'internal border' issues. This refers to cost-effective opportunities to limit the deliberate and accidental spread of pest species within New Zealand. Taking more advantage of the natural barrier of Cook Strait is one example of where this could be actioned***

**Objective 5.4 Managing risks to biodiversity from new organisms**
**Manage the introduction of new organisms (including genetically modified organisms) in a way that avoids adverse effects on New Zealand's indigenous biodiversity and valued introduced species.**

467. The functions of the Environment Risk Management Authority New Zealand (ERMA) with respect to new organisms were being developed in 1997/98, not long before the development of the draft Biodiversity Strategy. The following actions, none of which were ranked as priority, mostly identify the need for procedures and responsibilities that fell within ERMA's perceived role.

**Actions 5.4**
**a) Develop and apply an integrated risk assessment framework that can be consistently applied for assessing the risks posed to biodiversity by the importation of new organisms (including genetically modified organisms).**
**b) Clarify responsibilities of different parties involved in biosafety management, in particular responsibilities for:**
**i) post-release monitoring; and**
**ii) management responses where unintended adverse effects from new organisms occur.**
**c) Establish a Royal Commission to review key issues surrounding the import, development and release of genetically modified organisms in New Zealand.**
**Lead agencies:** **ERMA New Zealand, MfE**
**Priority actions:** **None**
**Funding:** **Core only**

468. An integrated risk assessment methodology was developed by ERMA that is derived from the requirements of the Hazardous Substances and New Organisms Act 1996. The methodology, in line with the principles of the HSNO Act, provides for a qualitative assessment of risks to biodiversity from new organisms. The methodology is refined from time to time in the light of experience. It must be noted, however, that the costs to applicants wishing to import new organisms can be high (both procedural and financial).

469. As a consequence, for example, ERMA has received less than five applications to import new plant species in the past seven years. Much larger numbers of applications to import plants used to be approved annually prior to ERMA's establishment under previous legislation that gave little consideration to potential environmental impacts. This is not to condone past practice, but to note the public's enthusiasm for bringing in new species,

particularly plants. Rather than losing interest in importing new plants there is anecdotal evidence that individuals have resorted to more expedient and illegal means of obtaining new species, including smuggling and direct mail order. A survey in 2004 found that over 80% of respondents, which included major commercial research and public institutions, made negative comments about ERMA processes and MAF regulations (Brockerhoff et al 2004) concerning the importation of new plant species. We report on this in more detail under Theme Four and on current initiatives by MoRST, MAF and ERMA to address these issues.

470. The consequences of these illegal introductions can be serious for indigenous species and ecosystems. For example, there is recent evidence from a NIWA survey that many of the 65 aquatic plants previously unknown in New Zealand before 1980 arrived illegally for use by hobby aquarium and pond keepers.[65] These 65 species constitute at least 27% of the species used in the aquatic plant trade. Some of these may have arrived prior to the requirements of the HSNO Act. Consequently, while there are methodologies now in place to assess new organisms, the high transaction costs of obtaining an ERMA approval may well have led to illegal activity that undermine the purpose and intent of the legislation. ERMA is investigating ways of reducing the costs of applications for approvals of low risk plant species.

471. In 2003, responsibilities concerning the monitoring of new organisms (Action 5.4b), including genetically modified (GM) organisms, were clarified through amendments to the HSNO Act. MAF is the formal enforcement agency in relation to new organisms under the HSNO Act, which includes monitoring compliance of any controls imposed by ERMA. An improvement in the 2003 amendment to the HSNO Act was the addition of a new Conditional Release category, which allowed for controls to be placed on new organisms that are released into the environment. Conditional release allows for more flexibility in decision making on a case-by-case basis. MAF's responsibilities for monitoring and enforcement of containment and conditional release apply equally to GM and non-GM organisms. MAF's enforcement powers also derive from the Biosecurity Act provisions. We consider that Action 5.4b has now been achieved.

472. Government established the Royal Commission on Genetic Modification on 8 May 2000 and the Commission reported on 27 July 2001 (Action 5.4c). The Commission recommended a 'proceed with caution' approach on genetic modification, stressing the need to minimise and manage the risks. 'Proceeding with caution' assumes that New Zealand has the necessary pool of expertise within its ecologists, agricultural scientists, molecular biologists and other relevant disciplines to evaluate and predict the ecological effects of field-released transgenic organisms. Possible ecological effects were summarized in a recent position paper by the Ecological Society of America (Snow et al, 2005). They include:

1. Creating new or more vigorous pests and pathogens;
2. Exacerbating the effects of existing pests through hybridization with related transgenic organisms;

[65] See article "Managing tomorrow's weeds today – a risk assessment approach to aquatic weed management" by Paul Champion in 'Water & Atmosphere' 12(3) 2004, pp 14-15. NIWA, Hamilton.

3. Harm to non-target species, such as soil organisms, non-pest insects, birds and other animals;
4. Disruption of biotic communities, including agro-ecosystems; and
5. Irreparable loss or changes in species diversity or genetic diversity within species.

473. Research into the impacts of biotechnology since the Royal Commission is now largely funded by FRST[66] and examines both environmental and social impacts. A related MoRST report (MoRST 2003) notes that the FRST research package was not intended to, and will not answer all the questions about the potential impacts of GM organisms in New Zealand, but rather addresses generic social and environmental issues about GM and biotechnology impacts in New Zealand. It remains to be seen how many of the possible ecological effects are researched within the FRST package or by other research programmes.

474. ***Substantial progress. The procedural aspects of the first two actions have been met. Potential imports of new organisms are assessed against an integrated risk assessment framework. Responsibilities for managing and monitoring new organisms, including GM organisms, are clear. These have been improved through the 2003 amendments to the HSNO Act which created a new Conditional Release category.***

475. ***We note, however, that ERMA processes may, paradoxically, be undermining the protection of New Zealand's borders. For example, importers of aquatic plants (and some other importers) feel the costs of making legal importation of new species are too expensive when compared with the value of imported stock (Champion and Clayton 2001). Over a quarter of plants sold in the aquatic plants trade are highly likely to have arrived without screening by border control, although some of these may have arrived before the HSNO Act was in place.***

476. ***Responsibilities for monitoring and enforcement relating to new organisms, including GM organisms, have been clarified – these responsibilities reside with MAF. The 2003 HSNO Act amendments provide more flexibility with the addition of the Conditional Release category. We regard Action 5.4b has having been achieved and it now remains to be seen how these responsibilities work out in practice.***

**Objective 5.5 Managing potential pest species**
**Eradicate or contain introduced species that have the potential to become serious threats to New Zealand's indigenous biodiversity and valued introduced species.**

477. A large majority of the exotic species (plants and animals) already in New Zealand are not pests, i.e., do not currently pose a risk to indigenous or valued biodiversity. Over time, however, some will become pests and their early detection, eradication or containment is the most cost-effective management option. This Objective has been subsequently addressed, and in greater detail, in the Biosecurity Strategy.

[66] The FRST package totals approximately $7.7M per year for 3 years.

478. One shortcoming in this objective, and indeed in the whole theme, is the absence of actions relating to the need to establish effective surveillance systems, both for species that get through the border system and for species already here that *only later* become pests – as do many introduced plants. This generic issue has already been discussed under Themes One, Two and Three.

**Actions 5.5**
**a) Develop and implement procedures to prevent the escape from captivity of imported species with the potential to become pest species.**
**b) Raise public awareness about introduced species that pose a potential threat to indigenous biodiversity.**

| | |
|---|---|
| **Lead agencies:** | **Biosecurity Council, ERMA New Zealand** |
| **Priority actions:** | **No** |
| **Funding:** | **Core only** |

479. We will address the issues of potential animal and plant pests separately. The current focus of Action 5.5a is on containing animals held in places such as zoos, safari parks and farmed species, such as deer, that could pose a risk should they escape. It has also considered aquarium plants – held by private and commercial interests. In the past few years a number of voluntary compliance codes have been developed with industry associations (e.g. aquarium, nursery and pet shop trades) to improve compliance and reduce risks. We have do not have information on how widely used and effective these codes are in practice. There has also been a large number of species declared "unwanted organisms" under the Biosecurity Act which prevents the breeding sale, trade or giving away of the listed species.

480. But Action 5.5a does not adequately address the other major issue – 'containing' the terrestrial plant species that have already been introduced into New Zealand. Of the nearly 25,000 plant species that have been introduced into New Zealand so far, 2,220 or almost 10% have naturalised, that is, survive and reproduce in the wild without human assistance. This number is about the same as the number of indigenous vascular plant species that occur naturally in New Zealand. This is one of the highest percentages recorded for introduced flora in the world (Williamson 1996). Of the naturalised plants, 325 (15%) are currently classified as DOC weeds (S. Timmins, pers. com.). About ten exotic plant species now reliant on cultivation will naturalise each year and a further 1-2 of the 2,220 naturalised species will become weeds every year. *Therefore, tomorrow's weeds are already growing in New Zealand since the large pool of naturalised species is likely to provide new weeds indefinitely.* Preventing their 'escape from captivity' is effectively impossible.

481. When considering the extent and nature of the 'future weed' problem a specific action is needed to address the need for early identification and effective surveillance of new pest species with the aim of prompt eradication. This approach is part of DOC's weed strategy and is being increasingly adopted by regional councils. The latter are, however, sometimes constrained by the process of developing regional pest management strategies, which is too cumbersome given the frequency with which new weeds appear.

482. Although the importance of surveillance is not clearly identified in the Biodiversity Strategy, biosecurity surveillance systems were the subject of a major review during 2001/02[67] and are discussed in the Biosecurity Strategy. That review proposed better co-ordination for marine, freshwater flora and fauna, terrestrial flora and forestry as priorities that have since helped shape the roles and structures of Biosecurity New Zealand. A November 2002 report by the Controller and Auditor-General (2002) found that surveillance was seen as the weakest component of biosecurity and needed clearer goals and outcomes for biosecurity surveillance measures. The Auditor-General also noted the important role played by the public in alerting agencies to the presence of exotic pests. The Biosecurity Strategy made six recommendations with respect to providing effective surveillance programmes.

483. There has been significant progress with respect to Action 5.5b during the past five years. Planned initiatives (e.g. the TV 'Border Patrol' series) and unanticipated events (aerial spraying campaigns in Auckland and Hamilton, foot and mouth scare) have raised public awareness of the importance of border security and early detection of incursions by potential pests. Again, the Biosecurity Strategy gives more prominence to the importance of changing the behaviour of New Zealanders and visitors than does this strategy with respect to biosecurity issues. Given both the positive (identifying new arrivals of pest species) and negative behaviours (illegal importations, internal liberations of pest species, dumping weeds) that people display and the major consequences that follow, this will continue to be an important element in the biosecurity system. Both central and local government agencies are moving beyond earlier 'public relations' approaches to more substantive and effective co-operative engagements with communities and groups.

484. ***Substantial progress. Voluntary codes of compliance have been developed to reduce the risk of escape and spread of potential pest species from captivity, for example, with the aquarium and nursery trades. There is a shortcoming in the action, however, as it does not identify the importance of developing more effective and targeted surveillance systems. This applies in particular to the major problem of the extremely large pool of naturalised introduced plants which add a further 1-2 new weed species to the environment every year. The issue most likely requires the development of a new action of objective within the Strategy. Surveillance is an important element in the Biosecurity Strategy which had the benefit of two reviews of surveillance systems in 2002. The early identification of potential pests is often essential if eradication is to succeed and is therefore an important aspect of the protection of indigenous biodiversity.***

485. ***Both planned and unplanned events (e.g. TV programmes and aerial spraying) have raised public awareness of the threat that introduced species can pose to indigenous species. Ongoing efforts will be required to improve public understanding of biosecurity issues and these will need consistent funding support.***

[67] See 'Biosecurity Surveillance Review' by Prime Consulting International, August 2002. The Review made 98 recommendations, both strategic and operational.

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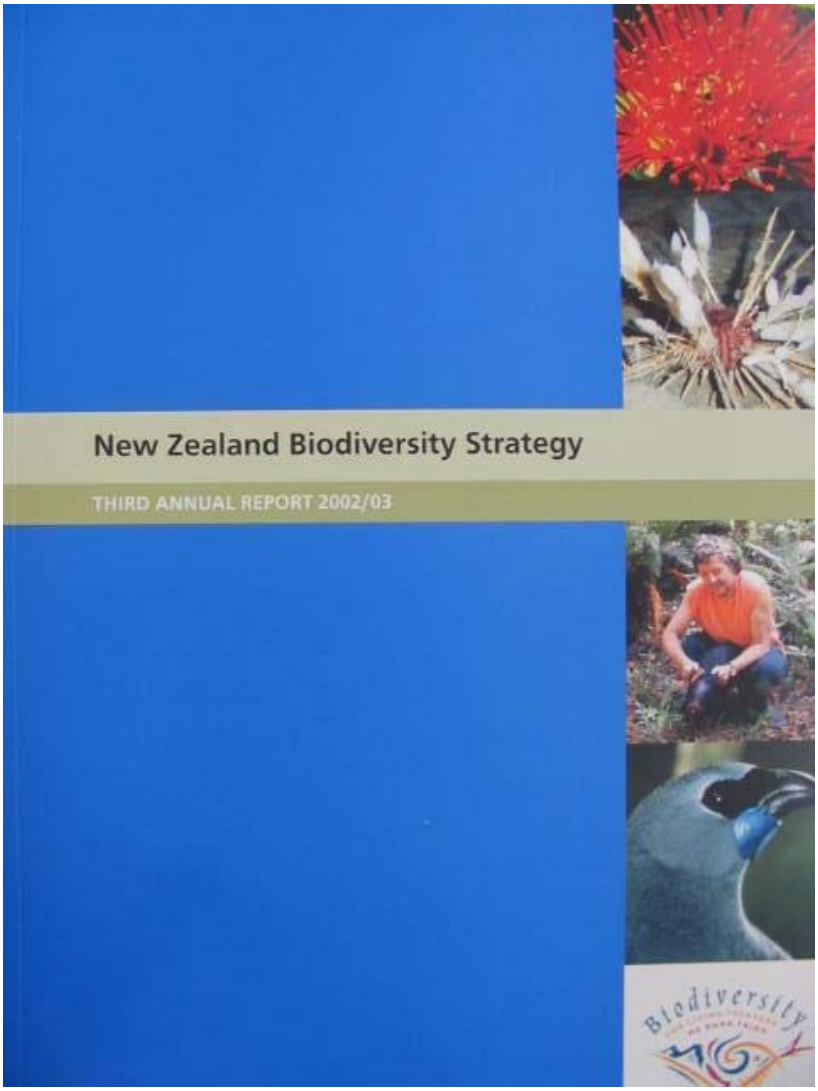
# THEME SIX: GOVERNANCE




Caption: A number of things make for good governance – establishing clear roles, responsibilities and accountabilities, as well as having good monitoring systems and effective leadership.

**Theme Six: Governance**
**The role of Government in setting national biodiversity goals and coordinating their achievement.**

**Desired outcome for 2020**
**New Zealand has clearly identified national priorities for conserving and sustainably using indigenous biodiversity and important introduced species. There is strategic alignment with New Zealand's biodiversity goals across government agencies and between central and local government and the private sector.**
**Central government is playing a key role in leading, funding, coordinating, and monitoring biodiversity policy and management initiatives, while enabling and encouraging local government, the private sector and communities to participate in biodiversity management, at a regional and local level, and to undertake locally appropriate actions. Roles, responsibilities and lead agencies are clearly defined.**
**The Government is taking a lead in fulfilling obligations under the Treaty of Waitangi and in playing an effective international role in contributing to global solutions to biodiversity issues.**

## Stocktake of progress on Theme Six

### Expectations of the Strategy

486. This theme outlined key responsibilities for central government agencies charged with leading and coordinating the implementation of the Biodiversity Strategy. The first of the overall priority areas for the Strategy was “Better governance”. This included setting the national priorities, providing national guidance, maximizing engagements across all levels of government and with the public as well as reporting on progress towards the objectives and goals. A modest allocation of $1.94M over 5 years covered the coordination, annual monitoring and reporting requirements**.**

487. We assessed progress with respect to the action points and make a number of recommendations to improve the future governance arrangements.

### Implementing the Strategy

488. The Central Government Coordinating Group of Biodiversity Chief Executives (CGCG) was established shortly after the launch of the Strategy to monitor and evaluate the overall implementation of the Strategy. The CGCG has functioned well with respect to the production of annual reports to Ministers and Cabinet and taking decisions on the reallocation of Package resources between programmes. Other tasks that the CGCG was responsible for, such as developing key milestones, performance measures, coordinating and linking central government and community initiatives, have not been well developed. This group of CEs has functioned without an oversight role from the Department of Prime Minister & Cabinet (DPMC) and State Services Commission (SSC) that had been foreshadowed in the Strategy.

489. There is little evidence that the Strategy has yet become widely embedded across central government departments and ministries that have a role, or potential role to play in implementing the Strategy. The Strategy is referenced in few Statement of Intent (SOI) documents, with the exception of DOC where it is also reflected now in the structure of DOC's output classes. The Strategy may well have had more influence on business planning and purchase agreements if there had been a stronger indication of leadership through governance mechanisms and clearer indications on how a whole-of-government approach was to be developed and implemented.

490. We hope there will be stronger leadership during the next phase of the Strategy, particularly to engage more government agencies in its delivery and build collaborative partnerships with local government, the private sector and non-governmental organisations. This will be important for cross-cutting issues such as agreeing on indicator, monitoring and reporting programmes. (Theme Nine) More effective whole-of-government responses could be developed if central government agencies used their SOIs to specify their roles in implementing the Strategy.

**Reporting on outcomes**

491. There have been annual reports from the CGCG on the Biodiversity Package programmes and the Third Annual Report provided a useful, wider report on biodiversity issues beyond the Package programmes. But there are particular difficulties in attempting to provide an overview report on progress towards achieving the objectives of the Strategy. The first reason is that very few actions currently have quantifiable targets against specific timelines. While setting targets can be a difficult process we would urge that this be attempted for relevant actions. If it is done in a transparent manner it can improve the 'buy-in' by other agencies, including local government, and act as a reality check for high expectations of what can realistically be achieved.

492. As reviewers we became aware that there was limited generic baseline information for 2000 against which future changes and trends could be assessed for a number of important initiatives. This reflects the wider problem that monitoring and reporting systems have been patchy and uncoordinated between agencies for a number of themes. Information that is presently gathered by regional councils and central government agencies is collected for different statutory purposes and is correspondingly difficult to aggregate. But until that issue is addressed a collective overview of the state of the New Zealand environment will remain elusive.

493. The question of what to monitor is linked to the need to develop and implement cost-effective and useful indicators for monitoring biodiversity. Developing monitoring methods is a focus of Theme Nine. A considerable effort went into the MfE-led Environmental Performance Indicators (EPI) Programme to develop indicators for terrestrial, freshwater and marine environments. This work was stopped at the point that sets of draft indicators were made available as 'guidelines'. This work and other subsequent initiatives (such as DOC's work on inventory and monitoring and its Natural Heritage Monitoring System (NHMS)) should be advanced to the stage that there is an

agreed approach to using specific indicators, monitoring and reporting systems by central and local government agencies.

494. Reporting on aspects of New Zealand's biodiversity is now a larger responsibility for regional councils under the 2004 amendments to the RMA and under the Local Government Act 2003. It would be opportune to see if the different monitoring and reporting requirements of various levels of government could be better aligned. Until they are it will be difficult to develop nationally useful descriptions of conditions and trends of indigenous biodiversity.

**Improving accountabilities and review functions**

495. Measuring accountabilities has been difficult without more quantifiable targets and better monitoring systems in place. If these changes are made then any subsequent review exercises will be easier to undertake. We support external reviews of the implementation of the Strategy and suggest that future overall reviews might be an appropriate task for the Parliamentary Commissioner for the Environment or for the Office of the Controller and Auditor-General.

496. We also suggest investigating the merits of assigning an 'overall lead agency' responsibility to improve coordination across agencies and particularly with local government agencies. Our summary of progress on governance arrangements is provided in the following Table 6.

## Table 6. Summary table of progress in Theme Six

| **Summary of progress on Theme Six action points (2000-2004)** | | | | |
|---|---|---|---|---|
| | **Priority action** | **Package funding** | **Progress to date** | **Future priority?** |
| **Objective 6.1 Governance and biodiversity** | | | | |
| 6.1a Add to government planning | Yes | No | Limited | High |
| 6.1b Establish implementation structure | Yes | Yes | Limited | High |
| 6.1c Monitor and report on NZBS | No | Yes | Moderate | High |
| 6.1d Biodiversity within SOE reports | No | No | Limited | High |
| 6.1e Develop NPS on biodiversity | No | No | Limited | Low |

## Introduction

497. The governance theme concerns the role of Government in leading and coordinating the implementation of the Strategy. Within this broad role the Strategy identifies a number of specific requirements – establishing national biodiversity goals and priorities, identifying roles and responsibilities in biodiversity management, providing national guidance, and coordinating policies and programmes for the conservation and sustainable use of biodiversity. Although it is a small theme in terms of the number of actions and the modest levels of additional funding allocated, effective governance is a crucial element in harnessing the resources, responding to 'gaps', maximising the engagement and coordinating the diverse elements that ultimately determine the success of the Strategy. Effective governance also includes transparency in assessing performance and accountability for achieving outcomes.

498. The overall importance of governance is recognised in the Strategy which defines the first of the nine priority areas for the Strategy as "Better governance" and gives 'priority' status to two of the five actions. To assist with the additional workload required to meet annual monitoring and reporting requirements three government agencies (DOC, MFish, MfE) were collectively allocated $1.94M over 5 years from the Biosecurity Package. We provide comment below on the governance arrangements and recommend various improvements for the future.

## Analysis of objectives and actions

**Objective 6.1 Governance and biodiversity**
**Government provides strategic direction, funding, national guidance, coordination and monitoring, and encourages private sector, community, and individual participation to ensure the conservation and sustainable use of New Zealand's biodiversity.**

499. The single objective and the following five actions should encompass all the elements necessary to achieve effective governance of the Strategy. There are two aspects of governance that need to be reviewed. The first is the overall progress that has been made towards establishing and implementing national priorities for biodiversity conservation and the performance of the governance roles of the key players. We look at these broad aspects of governance in the following sections.

500. The second aspect, which we will not be examining, is more narrowly focused on how well central government agencies have managed the administrative mechanisms of coordinating implementation of the Strategy. These include administration of the Biodiversity Package programmes and annual reporting functions. Officials will be reporting separately on how effectively those arrangements have been managed so far.

**Actions 6.1**

**a) Incorporate the commitments in New Zealand's Biodiversity Strategy into government and departmental planning, including Strategic Result Areas (SRAs), Key Result Areas (KRAs), strategic business plans, and departmental performance and purchase agreements.**

**b) Establish an effective structure (with lead agencies identified) and mechanisms to implement and monitor the implementation of New Zealand's Biodiversity Strategy and to facilitate the resolution of issues and conflicts that may arise during implementation.**

**c) Monitor and report on the implementation of actions and achievement of goals and objectives in New Zealand's Biodiversity Strategy on an annual basis, and review action priorities within the strategy, including a comprehensive review of the strategy five years after its adoption.**

**d) Monitor and report on the state of New Zealand's biodiversity as part of the national state of the environment monitoring programme.**

**e) Develop a national policy statement to provide guidance to decision makers on implementing the biodiversity protection provisions of the Resource Management Act (see actions 1.4a and 2.1a).**

| | |
|---|---|
| **Lead agencies:** | **DOC, MfE, Department of Prime Minister & Cabinet, State Services Commission.** |
| **Priority actions:** | **Actions 6.1a and b.** |
| **Funding:** | **Core + Biodiversity Package** |

### Integration into departmental planning systems

501. Action 6.1a) sets out an expectation that several government departments[68], with oversight from the Department of Prime Minister & Cabinet and State Services Commission, would identify their specific commitments to the Strategy through their various planning systems. While the terminology has now changed from that used in the Strategy, we expected to find appropriate references to the Strategy in the strategic business plans and Statements of Intent (SOIs) produced by government agencies. We only examined documentation from the four main agencies involved in the governance of the Strategy – DOC, MFish, MfE, and MAF as well as speaking to officials in DPMC and SSC for implementing the Strategy.

502. From those discussions we concluded that there was no specific oversight role established within DPMC or SSC.

503. Specific references to the Strategy were sparse in the planning documents and purchase agreements of most agencies, including in the current Statements of Intent, and absent from MAF documents. The exception was DOC, which had a number of references to the Strategy in different documents over the past few years, as one might expect given the major allocation of Package money it received. We suspect it is unlikely that other departments outside the core group have referred to the Biodiversity Strategy in their planning documents, given their non-involvement in its governance structure or as recipients of Package funding.

[68] The action item lists 13 departments and ministries in total as needing to meet this requirement.

504. We conclude, therefore, that there was no overarching commitment across central government agencies to build the implementation of the Strategy into their respective business planning and purchase agreements. Hence the Strategy was not built into a whole-of-Government approach in line with the intentions of Action 6.1a. To some extent this reflects the fact that the Strategy did not identify different reporting requirements for departments nor make a strong distinction in how 'core business' needed to change to meet the delivery requirements of the Strategy.

505. ***There was not a clearly articulated requirement to change the business planning approach that agencies were already following within their separately legislated mandates.***

506. The implementation of the Strategy did result, however, in DOC redefining its output classes to better align with the Strategy. These changes were reflected in DOC's 2002-2005 SOI and in subsequent annual reports. The department's business planning has been increasingly organised along the lines of the goals and outcomes of the Strategy.

**Structure to monitor implementation of the Strategy**

507. Within a few months of the Strategy's launch the relevant chief executives established a governance model for a system that would monitor and evaluate implementation of the Strategy (Action 6.1b). This CEs group, the Central Government Coordinating Group of Biodiversity Chief Executives (CGCG), was to be responsible for monitoring and evaluating the overall strategy implementation and reporting annually to a Biodiversity Ministers' Group and Cabinet.[69] Responsibility for providing adequate monitoring and evaluation within individual programmes was to rest with the lead agency for that programme. Performance measures, key milestones, and review points for programme work plans were to be developed subsequently. CEs were also to consider on-going roles for the biodiversity officials group and how quality-assurance issues were to be addressed and by whom (e.g. internally by agencies or externally). The CGCG also provided a mechanism for chief executives to decide on reallocation decisions between Package programmes. Another task for the CGCG detailed in the Strategy was to identify ways to provide for involvement of the wider community and to make sure that central government and community initiatives were appropriately linked and coordinated.

508. We conclude that a structure was promptly established between the lead agencies to implement the Strategy and to monitor its implementation. It has functioned as a useful and effective mechanism for chief executives to sort out reallocations of Package funds and to provide the mechanism to produce annual reports on Package programmes for Ministers. The original composition of the CGCG is still appropriate, given the future priorities we have identified in theme chapters. The significant shortcoming was its limited delivery with respect to the other functions expected of the governance structure. This might be attributed, in part, to a reduced capacity in DOC to service the CGCG not long after it was established. A larger part of this shortcoming is probably due to the

[69] Membership of the CGCG is: DOC, MfE, MFish, MAF, The Treasury and MoRST.

limited obligations on lead agencies to incorporate more specific delivery commitments into their planning processes and Statement of Intent documents.

509. No specific oversight roles were developed by the DPMC and SSC as proposed in the Strategy. In the absence of clear guidelines or leadership on how agencies were expected to adjust their 'core business' activities (see previous section) the default response was for the specific Package Programmes to become the primary focus for delivering the Strategy.

510. ***The larger vision of all levels of government and communities contributing to a Strategy of national relevance has yet to be fully realised.***

**Reporting on achievements of the Strategy**

511. Action 6.1c refers to monitoring and reporting against goals and objectives of the Strategy as well as reviewing 'action priorities'. The unstated implication is that this refers to the Strategy as a whole. It also identifies the need for a "comprehensive review of the strategy five years after its adoption". This latter action is being addressed through the current exercise of an independent review.

512. During the first 4 years of annual reporting the CGCG did not provide a comprehensive monitoring and reporting of the progress of the whole Strategy, but focused on reporting progress against the twenty Package programmes. A deliberate effort was made in the Third Annual Report (DOC 2003) to provide an expanded and more critical report of biodiversity work and issues outside the Biodiversity Package programmes. This broader report was positively received by outside commentators. The other cross-departmental initiatives that had been identified for the CGCG to develop and implement – performance measures, key milestones, quality-assurance issues, coordination with community initiatives – appear not have progressed past the initial proposal stage.[70]

513. The approach taken by the CGCG member agencies in confining their reporting efforts to the Package Programmes can be seen as a pragmatic response. It reflected the primary focus that developed around the Package programmes as well as unresolved and linked issues around monitoring and reporting. Monitoring actions feature prominently in the Strategy in Theme Six (Governance) and in Theme Nine (Information, Knowledge and Capacity). In Theme Six the focus is on overall reporting on achievements, while in Theme Nine the emphasis is on developing cost-effective methods for monitoring. Theme Nine highlights the Environmental Performance Indicators (EPI) Programme (NZBS, page 110) and elucidates the importance of consistent methods to monitor biodiversity to overcome the problems of non-comparable information across different issues and administrative boundaries. The importance of monitoring is summarised in third strategic priority action (NZBS, page 125) on "Becoming smarter biodiversity managers"),

[70] There was a considerable amount of biodiversity work done with communities, including the Action BioCommunity initiative, along with the various interactions with respect to the Biodiversity Condition and Advice Funds. The question is whether these were add-ons or were appropriately linked and coordinated with central government.

namely: "*Improved systems to promote information sharing, a consistent approach to monitoring and user-friendly reporting at national, regional and local levels are keys to enabling people to adapt their actions to contribute towards achieving New Zealand's biodiversity goals*."

514. MfE, given its earlier responsibilities to develop the EPI Programme, had been assigned as lead agency in the Strategy for the five Theme Nine actions relating to monitoring. Despite the extensive work and consultations that led to the release of draft indicators covering all biodiversity themes they were then not advanced past the stage of being made available as 'guidelines'. Consequently, central and local government agencies still lack a nationally consistent, agreed approach to monitoring and reporting that had been identified as a strategic priority in the Strategy. We consider this is now an even higher priority as over the last 5 years there has been evidence of further pressure on threatened indigenous species, as well as loss and degradation of indigenous habitats. Without adequate and comparable data on trends at regional and national levels the management and policy responses are more likely to be compromised and of limited effectiveness. The lack of reliable, comparable trend data also reduces accountabilities as measuring performance against outcomes is difficult or patchy.

515. As well as this ongoing shortcoming in monitoring systems, when the Strategy was launched in 2000 the baseline data for many of the biodiversity issues that the Strategy specifically sought to remedy was patchy, poor or largely anecdotal. We are referring to information held across the country and agencies (central and local government) as a whole. This has added to the difficulties of assessing specific progress that has been made over the past 5 years, a point we have made repeatedly in earlier theme chapters.

**Quantifiable targets**

516. As well as the patchy baseline of information in 2000 and the lack of completion in the EPI Programme that was to provide biodiversity indicators for monitoring purposes, there was a third significant issue that affected reporting against outcomes. The Strategy provides essentially visionary statements for the themes in the 'Desired outcomes for 2020' but very little by way of quantifiable, intermediate targets, with timelines, against which to measure progress. We acknowledge that setting targets is not an easy task, especially if it is to be a collaborative exercise involving regional as well as central government agencies. However, if it is done in a transparent manner, with input from key stakeholders, it can provide realistic targets against which progress can be measured. Targets can be adjusted as circumstances require and can add the necessary realism to some public expectations that 'everything can be fixed'.

517. ***Without quantifiable targets and a monitoring and reporting framework beyond the Package Programmes, there has been a limited basis for measuring accountabilities against overall outputs and outcomes.***

**A need for pragmatic monitoring**

518. We also acknowledge that monitoring can be expensive. It is necessary to assess the costs and benefits of various monitoring options, to be pragmatic and management-led, not science-driven, in the choice of indicators and monitoring regimes. In this context a monitoring regime of the Strategy's objectives and actions would need to take account of the following. The Strategy contains a mix of actions; some are one-off (e.g. stop logging of Crown Forests, review specific Acts), some require longer time frames to implement (e.g. establish protective networks), while other will require ongoing effort (e.g. pest control, species recovery). Effective monitoring and reporting systems need to reflect the different timescales inherent in both the mix of actions and the time it is likely to take to pick up noticeable changes in the particular system being monitored. For example, changes to the land area under protection could be easily monitored on an annual basis whereas monitoring the recovery of some species or forests after pest control might be most sensible at 3-yearly intervals.

**Reporting on the state of New Zealand's biodiversity**

519. The lengthy 1997 report on the New Zealand environment (MfE 1997) provided the first comprehensive stocktake of the state of the environment (Action 6.1d). It noted that the 1996 performance review by the OECD had concluded that New Zealand's information base was very limited and better environmental information was needed for environmental management (OECD 1996). The first and 'strongest conclusion' in the 1997 report was: "*New Zealand's environmental information needs considerable upgrading if the state of the nation's environment is to be accurately described and trends detected*." It noted that the RMA required better environmental information and identified the need for improvement in three areas: national indicators, basic research and applied research. We comment on the needs for basic and applied research in the Theme Nine chapter and on the current significant shortfalls in research funding for biodiversity.

520. State of environment reporting is a growing responsibility for local government agencies that now have additional environmental reporting functions under the 2004 amendments to the RMA (section 35) and under the Local Government Act 2002 in relation to delivering on the Long Term Council Community Plan (LTCCP) function. These require reporting at 5- and 3-yearly intervals respectively. MfE currently has a focus on reporting on specific issues[71], rather than reporting more generally on biodiversity and environmental trends. It is not clear to us where the leadership and responsibility now resides with respect to developing monitoring and reporting systems that meet the following three objectives. The first objective is to meet the needs of local government agencies for their management and reporting purposes on the state of the environment, including biodiversity. The second is to be able to aggregate regional data to deliver a nation-wide picture of trends, most likely based on key indicators. The third objective is

[71] In recent years MfE have advanced work on air and water quality and six national environmental standards for air quality came into effect in September 2005. Proposed national standards for human drinking water sources are currently under consultation.

to be collecting appropriate information at regional and national levels that will enable New Zealand to meet international reporting requirements.

521. If state of environment reporting is to provide useful trend data on key variables it will not require a repeat of the effort and investment that went into producing the 1997 report. It will require a more flexible approach to establishing monitoring and reporting systems that can satisfy regional requirements of local government agencies and be flexible enough to be useful for wider reporting on environmental trends that provide nationally-relevant information. Given the limited progress in the last 5 years we consider the task is now more urgent. Many natural systems are under increasing stress as extractive pressures increase.

522. ***The state and trends of our 'natural capital' require monitoring no less than do economic and social indicators and for the same reasons – to improve management, evaluate and adjust policies, assess performance and accountabilities, and to contribute to national development.***

523. Meeting these objectives will also meet the requirements of reporting against the outcomes of the Strategy.

**National policy statement on biodiversity**

524. Actions regarding the development of a national policy statement on biodiversity also occur in Theme One (Action 1.1d) and Theme Two (Action 2.1), as well as in Action 6.1e. The reader is referred to the chapter on Theme One for more detailed assessment of progress. We have recommended a downgrading of the priority of this action on the basis that the value of the policy as providing guidance to regional councils is now much diminished, given that many councils have developed their own approaches to biodiversity obligations over the past 5 years.

**Improving governance**

525. To improve governance arrangements for the next phase of the implementation of the Strategy we propose that serious consideration be given to the following proposals.

526. **1.** ***Set targets within themes.*** For many of the actions within themes quantifiable targets could be set. This should be done through a consultative and transparent process, with the related objective of increasing 'buy-in' and wider ownership of the Strategy across central and local government, the private sector and communities. Setting targets could also help reduce unrealistic expectations of what can be achieved in 5-, 10- or 15-year timeframes. The targets should also be time-linked. As we have noted above, different objectives and actions may well need different timeframes to achieve useful outcomes. Targets may have to be adjusted in the future as circumstances and funding determine. With more measurable targets than there are at present, subsequent reviews of the Strategy will be easier to undertake and accountabilities will be easier to assess.

527. **2. *Improve accountabilities.*** The most obvious accountabilities, so far, have been with respect to the delivery of the Biodiversity Package Programmes. To meet the broader objectives of a comprehensive governance system we believe that whole-of-government expectations will require additional changes. In particular, we propose that the Statement of Intent (SOI) documents should be used across the central government agencies that have a role in contributing to the Strategy. This may well extend to agencies beyond those represented in the CGCG. In this way agencies would identify the outputs and outcomes that each would be responsible for delivering. The SOIs would also help clarify how the different legislative mandates of each agency would be aligned with respect to its obligations for specific performance in relation to the Strategy.

528. **3. *Strengthen audit and review functions.*** As part of considerations to changes in governance arrangements we suggest it is timely to also examine future review and audit functions. This current review is mandated in the Strategy, but no subsequent comprehensive reviews against outcomes of the Strategy are formally identified. We believe this review process has provided a valuable opportunity to independently assess progress so far and reassess priorities. Reviews can also re-invigorate the process of implementing the Strategy and provide an impetus for re-commitment to the goals. They also play an important role in raising matters relating to coordination and governance.

529. We would strongly support a commitment by Government to future comprehensive reviews of the Strategy. We would also support external, as opposed to internal reviews, while acknowledging the importance of agency cooperation in providing relevant and comprehensive information to a review process. Consideration should also be given to assigning review roles to the Parliamentary Commissioner for the Environment or to the Office of the Controller and Auditor-General. The Local Government Act 2002 created a new audit reporting responsibility for the Auditor-General. That requirement is to audit the Long Term Council Community Plans (LTCCP) developed by communities and which councils are required to report on every 3 years. Each LTCCP includes an environmental wellbeing component. Although the Auditor-General may choose to audit only specific elements in the LTCCPs, we believe that any periodic reviews of the Strategy should be comprehensive across the themes.

530. **4. *Assign a lead agency responsibility.*** While the Central Government Coordinating Group (CGCG) has been responsible for monitoring and implementation of the Strategy we think there is merit in assigning an 'overall lead agency' responsibility for coordinating the implementation of the Strategy. This would be additional to the use of SOIs and other ways of improving accountabilities and detailing agency responsibilities. A lead agency could have responsibilities for improving coordination for delivery between agencies, with local government, the private sector and communities. A particular priority would be improving the engagement of local government in delivery of the Strategy. There would be resource implications to provide the required level of support, but this could well be offset by the extra gains in terms of outputs provided by involving a wider range of organisations.

531. **5.** ***Improve monitoring and reporting.*** While monitoring and reporting across all objectives and activities on an annual basis is neither necessary nor cost-effective, there needs to be a significant improvement in the ability of central and local government agencies to provide timely and sufficient reporting information. As a first step we would encourage a collaborative exercise between central and local government agencies on indicator and monitoring systems. It is an opportune time to link local government requirements for environmental monitoring and reporting (under the RMA and Local Government Act 2002) with national and international requirements to monitor and report on the state of biodiversity. Collaboration could build on the earlier work of the EPI Programme and, hopefully, also benefit from the work done within DOC on the current development of its inventory and monitoring system as well as the DOC Natural Heritage Management System (NHMS). *There would be substantial benefits if this collaboration resulted in a national system of agreed indicators and monitoring regimes.*

532. For the first time New Zealand would have an integrated environmental monitoring and reporting system that met different local, regional and national requirements for management purposes and assessing the state of the environment. The information would make an important contribution to policy reviews and adaptive management projects. There would also need to be a linked investment in information systems and information management. All too often a significant investment in monitoring management practices, such as possum control operations, has not been adequately supported by appropriate systems for managing and storing the information. Establishing a nationally linked system for environmental monitoring and reporting would be a significant achievement. It would require a commitment of additional resources over time from the various players if it was to work. Other countries are grappling with the same complex issues, but recognise the importance of persisting with the effort.

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# THEME SEVEN: MAORI AND BIODIVERSITY


Caption: Ngati Kuia taking delivery of three female kakapo transferred from Little Barrier Island, to Maud Island, 15 May 1998. Many iwi have protected large areas of Maori-owned forests and are increasingly involved in pest management and recovery projects for taonga species.

**Theme Seven: Maori and Biodiversity**
**The interests and role of Maori in biodiversity management.**

**Desired outcome for 2020**
**The relationship Maori have with New Zealand's indigenous biodiversity, as tangata whenua, is recognised and valued in the process of conserving and sustainably using biodiversity. Traditional Maori knowledge, or matauranga Maori, about biodiversity is respected and preserved and informs biodiversity management.**
**Effective working relationships, founded on the Treaty of Waitangi, are continuing to be built between government agencies and iwi and hapu, enabling their involvement at all levels of biodiversity management. The resolution of Treaty claims has expanded the roles Maori play in biodiversity management, enhanced the integration of cultural values, and informed how benefits from the use of indigenous biodiversity can be shared by New Zealanders. There is greater community understanding of Maori customary use of native species and this continues to be ecologically sustainable.**
**Maori are managing their interests in biodiversity reflecting different iwi and hapu priorities, and sharing in the benefits of its use, to support their economic and social aspirations and fulfil their responsibilities as kaitiaki.**

## Stocktake of progress on Theme Seven

### Expectations of the Strategy

533. The Maori and biodiversity theme was allocated a minor share of the Biodiversity Package with total expected spending after 5 years of $2.41M. However, aspects of the desired outcomes were expected to be addressed in several other themes most notably in Themes 1, 2 and 3. Maori and biodiversity featured in one of the nine areas for implementation, namely strategic priority 4. “Strengthen partnerships with Maori”. Of the 13 actions specified, three actions were considered to be priority actions and only two areas received Biodiversity Package funding, the Nga Whenua Rahui programme and the Matauranga Kura Taiao programme.

534. Expectations for strategic priority four highlighted in the Strategy were:
- Enhanced and more consistent partnerships with Maori throughout the country;
- Recognition, use and protection of matauranga as part of a move towards shared management;
- Retention, promotion and safeguarding of matauranga Maori;
- Development of agreements enabling sustainable customary use.

535. We discuss below progress in respect of these expectations under each objective heading. Our assessment of individual action points is summarised in Table 7 below.

**Progress in partnership development**

536. This objective has made moderate progress overall, although the statistics relating to engagement and participation by Maori with government agencies and resource management processes have shown little change in the past 5 years. However, the quality of the partnerships and influence on the desired biodiversity outcomes remains unclear. The highlight of this objective has been the success of Nga Whenua Rahui in covenanting significant Maori-owned lands and forests and protecting some of these areas from pest impacts. This has been a direct result of the Biodiversity Package funding. There is more that could be done but rates of uptake are limited by the requirements for appropriate dialogue and consultation and the capacity of Nga Whenua Rahui to manage increasing numbers of relationships. Interest in protecting further areas remains high as iwi adjacent to covenant lands make enquiries about the Fund. The emphasis on cultural and spiritual significance in selecting Nga Whenua Rahui sites is important to ensure success but the correlation between cultural and spiritual significance and ecological significance should be assessed to ensure that critically important sites for threatened species and improving representativeness are not overlooked. As with other protection programmes, there is a need to build in condition and trend monitoring as well as reporting from the outset of funding allocation.

**Progress in matauranga Maori**

537. This objective has made moderate progress overall. A good start has been made on establishing and operating a contestable Matauranga Kura Taiao fund. But there is a long way to go before matauranga is afforded the recognition and respect foreshadowed in the Strategy. This is not just about successfully completing a series of funded small projects but requires a significant shift in understanding for many New Zealanders if matauranga is to be mainstreamed into biodiversity management. Capacity in this area is stretched, and much knowledge has been lost and will need to be resurrected. There is real urgency needed in progressing this outcome. Much of the existing expertise and knowledge is held by elderly Maori, by kaumatua and kuia, who have less and less time left to pass on their knowledge to the next generation.

**Progress in Treaty of Waitangi claims settlement processes**

538. This objective was not a priority in the Strategy and we have not been provided with enough information to make an adequate assessment of progress.

**Progress in science and research**

539. This objective was not a priority in the Strategy but has made good progress in developing the frameworks and processes required to ensure that Maori interests in government funded science programmes are recognised and provided for. The amount of science categorised as relevant to Maori has increased significantly in the latest FRST funding round, but we are unsure whether Maori have been closely involved in designating the research as meeting this requirement. The amount of funding allocated

for Maori-centred or Kaupapa Maori research is still very limited. Capacity issues remain and relate to fundamental educational constraints. These will require stronger measures and leadership from other sectors and agencies to overcome. The funding for science in Natural Ecosystems (the topic area most relevant to the Biodiversity Strategy) has been static and some of the resistance to incorporation of a Maori dimension may simply result from the potential dilution of existing research approaches caused by this additional requirement.

**Progress in customary use**

540. This objective has made limited progress overall. DOC has made a start with the completion of a draft policy on customary use and a number of examples of successful customary use management initiatives are underway. This objective is closely linked to the partnerships objective (7.1) and matauranga objective (7.2) and is probably best achieved as part of a broader approach. Progress in all of these areas will require much greater dialogue between Maori and non-Maori groups working on biodiversity protection and enhancement projects. Currently different, but we believe complementary, approaches and value systems are kept somewhat separate by funding mechanisms. Some additional funding should go to projects that build connections and encourage dialogue.

## Table 7. Summary table of progress in Theme Seven

| **Summary of progress on Theme Seven**<br>**Action points (2000-2004)** | | | | |
|---|---|---|---|---|
| | **Priority action** | **Package funding** | **Progress to date** | **Future priority?** |
| **Objective 7.1 Partnerships in biodiversity management** | | | | |
| 7.1a Participation | Yes | Yes | Moderate | High |
| 7.1b Protocols | No | No | ??data | Medium |
| 7.1c Support | No | Yes | Substantial | Medium |
| **Objective 7.2 Matauranga Maori** | | | | |
| 7.2a Work with Maori | Yes | Yes | Substantial | High |
| 7.2b Recognise Maori role | No | No | Limited?? | Medium |
| 7.2c Enable incorporation | No | Yes | Limited?? | Medium |
| 7.2d Educate New Zealanders | No | No | Limited | Medium |
| **Objective 7.3 Treaty of Waitangi claims settlement processes** | | | | |
| 7.3a Monitor settlements | No | No | Moderate | Medium |
| 7.3b Advise on biodiversity | No | No | ??data | Low |
| **Objective 7.4 Science and research** | | | | |
| 7.4a Incorporate Maori needs | No | No | Substantial | High |
| 7.4b Encourage partnerships | No | No | Moderate | Medium |
| **Objective 7.5 Customary use of biodiversity** | | | | |
| 7.5a Develop and implement policy | Yes | No | Limited | Medium |
| 7.5b Facilitate access | No | No | Limited | Medium |

## Introduction

541. The scope of this theme is the development and enhancement of the interests and role of Maori in biodiversity management. Over centuries of close interaction and interdependence with the environment Maori have developed a strong relationship with indigenous biodiversity. Understanding and acceptance by non-Maori New Zealanders of a Maori worldview, and the development of effective working relationships founded on the Treaty of Waitangi, will enable an expanded role for Maori in biodiversity management and fulfillment of kaitiaki responsibilities (Roberts et al. 1995, Harmsworth 2004). Only one programme was directly funded within this theme (Programme 25 Maori knowledge and participation) although many actions within Themes 1, 2, 3, 5, 8 and 9 are expected to also benefit Maori by incorporating a Maori dimension within the actions being undertaken. The total funding allocated over 5 years was $2.405M and this was expected to contribute to objectives 7.1 and 7.2 and actions 7.2a and 7.2c of the Strategy. A significant amount of additional funding was provided for Nga Whenua Rahui from elsewhere in the Package.

## Analysis of objectives and actions

**Objective 7.1 Partnerships in biodiversity management**
**Develop partnerships between Maori and Crown agencies in the conservation and sustainable management of biodiversity, consistent with the principles of the Treaty of Waitangi.**

542. This objective addresses the need to further improve working relationships and partnerships between Maori (iwi and hapu) and biodiversity management agencies. The Strategy identified a number of factors constraining the development of effective arrangements including the reluctance of some management agencies to consider partnerships and the variability in experiences in building and maintaining working relationships. The only priority action was Action 7.1a, designed to encourage iwi and hapu participation in processes for managing biodiversity within their rohe. Biodiversity Package funding supported this objective while a separate line of funding supported 7.1c (Nga Whenua Rahui).

**Actions 7.1**
**a) Improve current management to encourage iwi and hapu participation in processes for managing biodiversity within their rohe, including management of conservation areas, and resource management processes applying outside of these areas, and recognise iwi and hapu resource management plans that address biodiversity issues within their rohe.**
**b) Negotiate and establish protocols and arrangements with iwi and hapu at regional and local levels with respect to the management of specific habitats or particular species within their rohe, as a basis for building and maintaining effective working relationships and partnerships.**
**c) Increase measures to support the conservation and sustainable use of biodiversity on Maori owned land in ways that enable the retention of tino rangatiratanga (ownership and control) through such mechanisms as Nga Whenua Rahui.**
**Lead agencies:** **DoC, MfE**
**Priority Actions:** **Action a) only**
**Funding:** **Core + Biodiversity Package for a) only**

543. Under the Conservation Act, the New Zealand Conservation Authority gives advice to the Minister of Conservation on departmental policy development, Maori customary use, Treaty issues and conservation matters of importance. The New Zealand Conservation Authority and 14 regional conservation boards have provision for Maori representation. The proportion of Maori members has equaled or exceeded 30% since 1999 with the highest proportions (38-40%) recorded from 2001 to 2003.

544. A 2004 survey of local authority engagement with Maori updated an earlier survey (1997) and enabled general progress to be assessed (Local Government New Zealand 2004). Formal consultation processes increased from 25% (n=64) in 1997 to 80% (n=86) in 2004. Informal consultation and information sharing increased from 17% (n=64) in 1997 to 92% (n=86) in 2004.

545. Maori participation in Resource Management Act (1991) processes can be gauged in the two-yearly survey of local authorities but note these statistics relate only to the resource consent process. The results from the last four surveys are given in the following table.

| Survey period | Authorities with budgets for Maori/iwi participation in RMA | Staff guidance re need to notify Maori of RMA proposals |
|---|---|---|
| **1997/98** | **58%** | **No data** |
| **1999/00** | **65%** | **61%** |
| **2001/02** | **49%** | **59%** |
| **2003/04** | **56%** | **65%** |

546. The first column shows how many authorities made a budgetary commitment to Maori/iwi participation in RMA processes during each 2-year period. The table shows a fluctuation between years, but a decline during the period of the Strategy compared with the previous 4 years. Another measure is the proportion of local authorities that have criteria, or who provide guidance for staff to determine when iwi or hapu are likely to be

affected parties in a resource consent application and should be notified about the proposal. Again, there does not appear to be a significant upwards trend during the past 5 years.

547. Iwi management plans can be used for input into consents and plans. The Resource Management Amendment Act 2003 altered the status of these documents. When preparing plans or policy statements, local authorities are now required to take into account iwi management plans. Guidance on iwi management plans is provided in the Ministry for the Environment publication "Whakamaui ki Nga Kaupapa: Making the best of Iwi Management Plans under the Resource Management Act 1991", published in 2001 and updated in 2003. Of those councils that have criteria or provide guidance for their staff to determine when iwi or hapu are likely to be affected parties in a resource consent application 42% (23) made written criteria/set policy available to the public for consent applications. In 2003/2004 formal consultations with iwi were undertaken for 10,709 (20%) of all resource consents.

548. Aside from involving iwi and hapu in RMA-specific proposals, an important aspect of this objective is the development of partnerships with Crown agencies for managing local biodiversity, such as through co-management agreements. Motatau Forest restoration, begun prior to, and showcased in the Strategy, has provided a successful model for iwi-led management of a crown reserve. An intensive pest control undertaken from 1997 has led to a spectacular recovery of native forest and populations of kukupa (native pigeon). Another long-standing example has been the co-management of Whenua Hou and the Titi Islands (Sanson et al. 2000). Similar examples of iwi led or iwi co-management have increased gradually throughout the country. At least 17 co-management arrangements have been successfully negotiated since 2000 although these have not directly resulted from the Biodiversity Strategy and in many cases have a broader ambit than biodiversity (Information supplied to reviewers by DOC). There has also been a significant increase in the area of Maori land protected (see below).

549. Nga Whenua Rahui (NWR) is an independent Ministerial Fund established to help Maori landowners formally protect indigenous areas. Maori landowners have the choice of two main legal mechanisms: a kawenata (s77A Reserves Act) or the creation of a Maori reservation under section 338 Te Ture Whenua Act. Voluntary protection is negotiated with landowners on the understanding that ownership and control of the protected areas remain with tangata whenua. Applications are received from Maori landowners and the independent Advisory Committee takes into consideration the cultural and spiritual significance[72] as well as the ecological importance of the areas, when making recommendations to the Minister of Conservation. More than 210,000 ha of Maori owned land is now in formal protection registered by NWR. In addition, NWR has been able to fund, through extra Biodiversity Package money, possum, goat and other pest control over more than 36,000 ha of land protected by NWR covenants up to 2002/2003 (see Theme One, Action 1.1e). The Fund is actively encouraging the owners, usually through their iwi trust board, to assume a greater ongoing role for managing and

[72] The Nga Whenua Rahui application form gives priority to cultural and spiritual significance over ecological significance

enhancing the biodiversity values of their forests. Protection by NWR covenants has also led to a greater willingness by regional councils (e.g., Environment Bay of Plenty and Hawkes Bay Regional Council) to contribute matching funding e.g., for fencing and pest control to further assist with biodiversity protection and enhancement (M. Mohi pers. comm.) It is the protected status that NWR provides over Maori land that has been instrumental in obtaining regional council (as well as Animal Health Board) support and funds. This should enable the Fund to withdraw from funding future pest control as other agencies assume these responsibilities.

550. The Sustainable Management Fund through the topic area "Maintaining and enhancing the exercise of kaitiakitanga" has recognised the role of tangata whenua as kaitiaki. The objectives are to encourage Maori to develop ways of incorporating matauranga Maori into environmental planning, develop working models for resource management training for Maori, and develop innovative models for iwi management planning and monitoring. Some 15 projects totaling $1.35M have been funded to date. These include a regional state of the environment report (Maniapoto), a lake management plan (Lake Omapere) and an Iwi Management Plan Toolkit. This topic area was discontinued from 2003/04 but tangata whenua can, however, still apply for funding under the other categories.

551. It is important to note the progress in protecting and restoring indigenous biodiversity on Maori land that has occurred independently of Biodiversity Package support. A notable example is the management of the upper slopes and summits of Mount Tarawera near Rotorua by Ngati Rangitihi. Here an ecotourism business is resulting in effective protection and restoration of the mountain in conjunction with provision of jobs and income for the iwi concerned. The noticeable improvement of vegetation condition in the last 5 years has resulted from control of vehicular traffic and pest control programmes associated with the tourist operation (B. D. Clarkson pers.observation). Although we do not have quantitative data, we have the impression that there has been an increase in iwi asserting kaitiakitanga over their lands and undertaking management to enhance indigenous biodiversity values.

552. ***Moderate progress overall. There has been considerable success in some areas of this objective especially in the progress of Nga Whenua Rahui in protecting and managing biodiversity on Maori-owned land. Availability of Biodiversity Package support for pest control on NWR areas has led to additional, possibly longer-term support by regional councils. There appear to be the structural elements in place for wider progress towards this objective, but it was difficult to get a sense of what difference the Strategy has made in one of the key areas of increasing the number of protocols and arrangements with iwi and hapu for managing specific habitats or particular species. We received a wide range of opinion from the extremely limited number of iwi and hapu we were able to discuss this objective with. Some groups felt there had been significant progress while others were extremely critical of government agencies in paying lip service to the development of quality partnerships consistent with the principles of the Treaty of Waitangi. One group commented that the process tends to be captured by "corporate Maori approaches".***

**Objective 7.2 Matauranga Maori**
**Recognise and respect the role of matauranga Maori in biodiversity management and provide for its retention and protection.**

553. This objective addresses the need to foster traditional Maori knowledge that is under-used and vulnerable to on going erosion and loss. Traditionally, the transfer of knowledge among Maori has involved expert individuals (tohunga) and wananga. Wananga here are not restricted to large formally constituted education institutions but include local iwi and hapu gatherings. Modern influences, however, have seen this system undermined and the recording, collection and dissemination of matauranga Maori has increasingly taken other forms. Nevertheless, many kaumatua have traditional knowledge related to cultural activities and experiences associated with New Zealand's native biodiversity. A pre-eminent requirement is that matauranga Maori is controlled and disseminated on terms acceptable to iwi and hapu. The Strategy identified several issues constraining recognition, use and protection of matauranga Maori including lack of formal mechanisms to sustain matauranga Maori and the potential conflict between promoting public understanding of matauranga Maori and the desire of Maori to protect this information from improper use. Action 7.2a, designed to include Maori knowledge specialists in developing a framework for the retention and promotion of matauranga Maori and its use in biodiversity management, was the only priority action. Actions 7.2a and 7.2c received Biodiversity Package support.

**Actions 7.2**
**a) Work with Maori knowledge specialists to develop a framework for the retention and promotion of matauranga Maori and its use in biodiversity management.**
**b) Recognise the knowledge and role of Maori as kaitiaki in the conservation and sustainable use of biodiversity, including the cooperative management of public conservation areas and local authority resource management processes.**
**c) Enable Maori to incorporate traditional values and practices within tikanga-based biodiversity projects (such as the DoC Tikanga Atawhai projects) as part of their role as kaitiaki, and as a means of promoting and reviving matauranga Maori.**
**d) Educate New Zealanders about the role of matauranga Maori in biodiversity conservation and management.**

| | |
|---|---|
| **Lead agencies:** | **TPK, DOC, MfE** |
| **Priority Actions:** | **Action a) only** |
| **Funding:** | **Core + Biodiversity Package for a) and c)** |

554. The Matauranga Maori programme, established in 2000, is a $2.4 million 'contestable' fund designed to increase iwi and hapu participation in managing biodiversity in ways consistent with customary knowledge. Maori organizations, iwi and hapu can apply for funding from the Matauranga Kura Taiao (MKT) contestable fund established in 2000 to support initiatives that retain and promote traditional Maori knowledge and its use in biodiversity management. The MKT fund also provides an opportunity for tangata whenua to participate in biodiversity management in their rohe.

555. The fund is administered by the Nga Whenua Rahui committee, which reports directly to the Minister of Conservation. The first applications to the fund were sought in late 2001. Twenty-five applications were received, 14 of which were approved, totaling $172,000. Eight of these projects targeted the use of traditional knowledge and its use in ecological management, four involved wananga as a means of transferring traditional knowledge concerning biodiversity, and two projects involved the development of tikanga-based environmental plans.

556. The types of projects to receive funding include:
- The restoration of tuna (eel) habitat using customary knowledge.
- The development of a native nursery for cultural purposes.
- The establishment of a framework for the revival of traditional knowledge in the management of biodiversity on ancestral lands.
- The programme has been promoted with local and central government agencies. In particular, one restoration project involves a 'whole of government' approach including Te Puni Kokiri, Community Employment Group and Environment Bay of Plenty.

557. By the end of the 2005 it is expected that some $857,313 will have been expended on 62 projects spread widely throughout New Zealand. The average funding level per project is $13,827.

558. The Tikanga Atawhai fund of $75,000 per annum is available to fund conservation projects of high significance to iwi and hapu. The fund is not tagged to biodiversity outcomes but in some cases has assisted biodiversity protection e.g., the joint Ngai Tahu/DOC Buff Weka translocation program has been allocated the Southern Regional Office share of the fund ($25,000) for the last 5 years.

559. As noted in 7.1, formal consultations are often undertaken with iwi or hapu in relation to resource consents. We have not been provided with any information on the impact or uptake of matauranga in these consultations. Media coverage tends to highlight examples where misunderstanding or differences between parties are significant, rather than the positive outcomes.

560. There have been some early steps in the education of New Zealanders about the role of matauranga Maori in biodiversity conservation and management. For example, there are new university papers at some universities (e.g., SCIM 101 Science, Maori and Indigenous Knowledge at Canterbury University) and the Matariki celebrations around the country were given higher prominence this year.

561. ***Moderate progress overall. There has been considerable achievement in some areas of this objective in particular the establishment of the Matauranga Kura Taiao and its funding of a large number of projects that promote Maori traditional knowledge and its use in biodiversity management. The projects, however, are small and we are unsure on the longer-term capacity benefits which result from this approach. We have the impression that there has been some improvement in the recognition of the role of***

***matauranga in biodiversity management. But adequate assessment of progress in this area would require much fuller consultation with Maori. We suspect there are more opportunities for the outputs from some of these projects to provide feedback to relevant agencies, such as DOC, in ways that could assist with related objectives, like 7.1. This will depend largely on the amount of trust that exists between the respective parties.***

562. ***One of a very limited number of iwi/hapu groups consulted suggested that Matauranga is well respected, not only by Maori groups, but also by non-Maori groups, as evidenced by practice in local and regional biodiversity forums. But other groups felt there was continuing resistance by government agencies, including the New Zealand Conservation Authority and conservation NGOs, on input from Maori on such matters.***

563. ***A priority issue is the rapid loss of matauranga knowledge as kaumatua and kuia pass away; knowledge needs to be passed on to the new generation of Maori before it is irretrievably lost.***

**Objective 7.3 Treaty of Waitangi claims settlement processes**
**Ensure policy development in relation to the conservation and sustainable use of biodiversity is responsive to the outcomes of Crown Treaty settlements and that Treaty settlement proposals are advanced in ways that enable the conservation and sustainable use of biodiversity.**

564. This objective addresses the need to link beneficial biodiversity outcomes to opportunities provided by the Treaty of Waitangi claims settlement process. No priority actions were specified for this objective.

**Actions 7.3**
**a) Monitor Treaty settlements and ensure Treaty settlement provisions and biodiversity management policies are compatible and complementary.**
**b) Advise parties negotiating Treaty settlements on the biodiversity implications of settlement options.**
**Lead agency:** **DoC**
**Priority Actions:** **No**
**Funding:** **Core only**

565. Since 1992, thirteen Deeds of Settlement have been signed that provide redress to iwi and hapu for historical claims arising from breaches of the Treaty of Waitangi and its principles by the Crown. In addition, the pan-Maori fisheries settlement, a final settlement of all Maori commercial fisheries claims, has been concluded with the Crown. The financial redress provided in these settlements totals more than $637M (www.decisionmaker.co.nz). Between 2000 and 2004, four Treaty of Waitangi claims (Te Uri O Hau, Ngati Ruanui, Ngati Tama and Ngati Awa) have been settled and another 22 are currently in negotiation.

566. A range of legal instruments is available to give redress including:
- Statutory vesting of fee simple estate (title to land) for small discrete sites of high significance;
- Statutory vesting and gifting back of sites of great significance;
- Statutory vesting of riverbeds or lakebeds of great significance;
- Overlay classifications (Topuni, Taki Poipoia or Kirihipi);
- Statutory acknowledgements (acknowledgements by the Crown in statute of an iwi's particular association to certain special areas which will facilitate their input into Resource management Act processes);
- Deeds of recognition (a specific obligation to consult iwi and have regard to its views in relation to the management or administration of areas managed by the Crown);
- Protocols; and
- Temporary camping entitlements for food gathering purposes.

567. Where sites of high conservation value have been included in settlements provision has been made to ensure management consistent with these values. For example, section 325 of the Ngai Tahu Settlement Act requires all the ex Crown Titi Islands have management plans in place. DoC is working with Ngai Tahu as technical advisors (Sanson et al. 2000). This however may be the exception as management plans are rare in relation to other settlements.

568. The Ministry of Fisheries has developed a "strategy to implement the Fisheries Deed of Settlement" that sets out how MFish will deliver on its obligations arising from the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 and how it will comply with the principles of the Treaty. The Strategy focuses on establishing strong working relationships at a regional level between MFish and iwi/hapu fisheries representatives, including undertaking training and capacity building on both sides of the partnership relationship. MFish was successful in a new initiative bid to fund the implementation of the Treaty Strategy which includes employing relationship managers (Pou Hononga), establishing regional fisheries fora where iwi and hapu representatives can provide input into fisheries management processes, and employing extension officers to support tangata whenua.

569. The Settlement Act requires the Minister to recommend the making of regulations recognizing and providing for customary food gathering and the special relationship between tangata whenua and those places that are of customary food gathering importance. A range of customary fishing tools has been employed including the establishment of Mataitai Reserves, Taiapure and Rahui. These customary tools have the potential to support Biodiversity Strategy goals but how this might be affected is still unclear (see Theme Three).

570. Limited progress has been made on consideration of WAI 262, the indigenous flora and fauna claim. A review was undertaken of Crown policies and practices that relate to flora and fauna between 1983 and 1998 (McClean & Smith 2001). This review outlined the complexity of the issues of the WAI 262 claim, for example, the extent to which Maori

can manage and control flora and fauna that is regulated by land ownership, land status and legislation. A Waitangi Tribunal draft 'statement of issues' document that will outline the proposed pathway for the inquiry into the claim has been prepared. A considerable amount of claimant evidence has already been heard. The next step, once the statement of issues is completed, is to release it to the parties for comment. Once the statement of issues is finalised and the approach to be taken during the enquiry is clear, evidence regarding the claim will be heard from the Crown and third parties, which could be in 2006 (C. Dawson pers.comm.).

571. The revised General Policy for National Parks (New Zealand Conservation Authority 2005) and revised Conservation General Policy (DOC 2005) provide guidance on Treaty of Waitangi responsibilities. As part of settlement negotiations, claimants are advised of the biodiversity values of the sites under consideration.

572. ***Moderate progress. While we can determine in a general sense that there has been some progress on the issues relating to this objective, we have not been provided with enough information to enable a definitive assessment. We note that in the very limited discussions we have undertaken with iwi and hapu that opinion about progress in this objective varies considerably. Two groups noted that Treaty settlements had provided a platform for development of Maori capacity for biodiversity research and management. Another group suggested that Treaty settlements are fiscal and not about eco-capital and that the settlement process has only expanded involvement at the Iwi Authority and Trust Board level. The 2004 Foreshore and Seabed Act was referred to by several groups as setting back earlier progress in this area.***

**Objective 7.4 Science and research**
**Recognise and provide for Maori interests and involvement in government-funded scientific research about biodiversity.**

573. This objective addresses the need to recognize Maori biodiversity science and research needs within government science funding processes. No priority actions were specified within this objective.

**Actions 7.4**
**a) Develop a process for incorporating Maori biodiversity research needs into priority setting for research at national, regional and local levels.**
**b) Encourage partnerships between science providers and Maori in undertaking appropriate government-funded research.**

| | |
|---|---|
| **Lead agencies:** | **MoRST, FRST** |
| **Priority Actions:** | **No** |
| **Funding:** | **Core only** |

574. The Foundation for Research, Science and Technology's (FRST) Strategic Portfolios Outlines (SPOs) produced in 1999, in particular the Land, Freshwater and Estuarine Ecosystems and Environments SPO and Marine Ecosystems and Environments SPO

(FRST 1999) signaled the need to consider inclusion of species and ecosystems of interest to Maori and emphasized the need to increase research on the Maori dimension of these topic areas. At this time the amount of Maori-led or Maori- relevant research was extremely limited. A longstanding example of bicultural research funded by FRST is the research on sustainability of traditional harvest of titi (*Puffinus griseus*) (Moller 2000).

575. In 2002/2003, the contestable funding investment round in the Sustainability portfolio led to a slight increase in the amount of Maori-led or Maori-relevant research funded.

576. FRST convened a Maori Ecosystem Advisory Group in 2004 to advise on Maori specific target outcomes in the Natural Ecosystems portfolio. The advisory group included Dr Charlotte Severne (NIWA), Julie Black (Department of Conservation), Rauru Kirikiri (Landcare Research) and Kirsty Woods (Treaty of Waitangi Fisheries Commission).

577. The advice of the group was that FRST should invest in RS&T that enables hapu and iwi to be more actively engaged in the management of indigenous marine, terrestrial and freshwater species and ecosystems of importance to Maori with an approximate 2/3 marine/freshwater 1/3 terrestrial split.

578. It also advised that the following characteristics should be required behaviours in research addressing this outcome:
- Hapu and iwi set the priorities and drive the direction of the research; these groups are part of the research with the programme clearly embedded in the relevant communities and clearly developed process to integrate research into the ecosystems planning and management activities of hapu and iwi;
- It makes a significant contribution to developing the ecosystems management capability of these groups; and affirms the culture and essential Maori approaches of these groups to managing the species and ecosystems of importance to Maori, including recognising, protecting and evolving customary Maori ecological knowledge and achieving the groups' distinct ecosystem management aspirations.

579. The advice of this group, as well as submissions received, was considered by FRST in developing the 2004/05 Natural Ecosystems request for proposals (RFP). The target outcome and required characteristics identified above have been embedded in FRST's Natural Ecosystems 2004/05 RFP.

580. The group also endorsed FRST's Maori-specific assessment criteria i.e., Outcomes for Maori, connections and partnerships with Maori end user groups and Maori Human capital development. These criteria have been tailored in the RFP to align with the outcomes and key behaviours sought.

581. The group also emphasised:
- That there is a mix of potential research approaches either that focused on improved hapu/iwi management and/or improved Maori management with partner resource management authorities. The point here is that research should make a particular effort to work with Government policy agencies e.g. MFish, MfE, DOC,

territorial local authorities, where appropriate, to engage and provide information that will inform Government policy development to protect species and ecosystem values of importance to Maori.

- Encouraging the involvement of other key and potential co-funding partners such as Te Ohu Kai Moana, MFish and DOC, including Nga Whenua Rahui.

582. The investment results of the recent (2004/2005) FRST Natural Ecosystems portfolio contestable funding round have provided a significant boost to funds for Maori-directed research. Research specifically relevant to Maori has increased from $4.427M to $12.7M and research involving Maori has increased from $748k to $1.241M. Maori-centred research has increased from $63k to $939k and Kaupapa Maori research has increased from $0 to $407k. FRST commented at the 4 July 2005 investment workshop that a range of proposals scored highly in both mainstream science and in addressing Maori issues.

583. Research funding through the Sustainable Management Fund has contributed to the development of partnerships between Maori and science providers across a number of programmes.

584. All Crown Research Institutes and universities have some partnerships or agreements with iwi and hapu in relation to areas of mutual interest, according to their respective websites. Our impression is that the number of partnerships and agreements has increased significantly, but we have no comprehensive data to assess the rates of change from 2000 to 2004, or to assess the quality or influence of these partnerships and agreements on outcomes.

585. ***Moderate progress overall. Significant efforts have been made in the latest FRST funding round to recognize and provide for Maori interests and involvement in the major government funded scientific research about biodiversity but the amount of Maori-centred or Kaupapa Maori research is still limited. The major issue here is one of research capacity since the numbers of Maori researchers available to provide relevant expertise is limited. There are also problems in recruiting and retaining Maori in science careers and research. The Tuapapa Putaiao Maori Fellowships scheme offered by FRST is supporting Maori to gain scientific qualifications in science, engineering or technology, where the numbers of Maori graduates are particularly low. There is also continuing resistance in some areas of the science community to incorporating Maori approaches to understanding and managing biodiversity.***

**Objective 7.5 – Customary use of biodiversity**
**Recognise and provide for the customary use of indigenous species by Maori, consistent with the conservation and sustainable management of biodiversity.**

586. This objective addresses the need to recognize that customary use is a vital part of sustaining relationships with traditional areas and maintaining cultural integrity, knowledge and values. The term “customary use” embraces traditional Maori use,

practices and knowledge and refers to contemporary uses of biological resources by Maori founded on this body of lore. The Strategy identified constraints to progress in this area including poor public understanding of customary use issues as well as conflicts and trade offs between user groups e.g., commercial and recreational. Action 7.5a designed to develop and implement policy on sustainable customary use was specified as a priority action.

**Action 7.5**
**a) Develop and implement policy to address outstanding issues relating to the sustainable Maori customary use of native species based on the New Zealand Conservation Authority's work in this area, including policy that encourages iwi to provide sufficient habitat for native species to establish conditions that allow customary use of those species.**
**b) Work with Maori to facilitate access to traditional materials, developing sources and harvesting techniques which minimise the potential adverse effects on indigenous biodiversity, and, where necessary, developing alternative materials.**

| | |
|---|---|
| **Lead agency:** | **DOC** |
| **Priority Actions:** | **Action a) only** |
| **Funding:** | **Core only** |

587. A draft DOC policy on customary use of natural resources consistent with kaitiakitanga, wise conservation and conservation legislation has been developed (2005) based on the NZ Conservation Authority's earlier work in this area (New Zealand Conservation Authority 1997).

588. As outlined in the draft:

> "It is the policy of the Department of Conservation to recognise and provide for the customary use of natural resources by tangata whenua, consistent with kaitiakitanga, wise conservation, and conservation legislation. This recognises government policy as articulated in the New Zealand Biodiversity Strategy, the conservation aspirations of New Zealanders which are reflected in conservation legislation, the department's responsibilities to Maori under Section 4 of the Conservation Act, and the kaitiaki responsibilities of tangata whenua.

589. In providing for customary use, the Department of Conservation will:

- Make decisions on customary use applications on a case-by-case basis, taking into account ecological considerations, the relevant legislation, and the department's customary use policy.
- Work together with tangata whenua, recognising practical considerations and legal constraints, to establish and operate administrative systems relating to customary use consistent with the department's section 4 responsibilities."

590. Although we have been provided with general information on customary use, we have not seen quantitative data on the extent or type of customary use or the number of iwi or hapu able to exercise such rights.

591. Current use of natural resources by Maori encompasses a wide spectrum, including:
- use of large trees for whare and waka
- use of plants as tohu for fishing and planting times
- harvesting of plants for rongoa and kai
- use of feathers, flaxes, ti, pingao, kiekie, and feathers for weaving
- use of dyes from muds and soils, tree bark and berries
- use of oils from shark liver and plant seeds
- making of taonga from bones, shells, mako teeth and wood

592. A number of effective customary use management initiatives including traditional mechanisms such as rahui are already occurring:
- Ngati Hine at Motatau has placed a rahui on kukupa.
- Ngati Whare has placed a rahui on totara in Whirinaki.
- The Department of Conservation and Ngati Wai have agreed on a protocol for the management of stranded whales in Ngati Wai rohe.
- Some conservancies refer applications for materials for cultural uses directly to tangata whenua for their recommendation and advice, or to cultural use committees.

593. Several councils have addressed aspects of this objective, for example, Christchurch City Council has a cultural materials policy that defines protocols for access to cultural material on council owned and administered land.

594. ***Limited progress overall. A draft policy on customary use of natural resources has just been completed. However, we have not been provided with sufficient information that would enable us to fully judge progress. Besides, greater discussion with Maori would be required to obtain their views on progress in this area. One commentator suggested there is still a lot of confusion in this area and that media, politicians and some NGO groups have played a major role in dividing communities around indigenous rights, kaitiakitanga and customary use. One of a very limited number of iwi/hapu groups consulted suggested that there has been a backlash against indigenous management and its values base. Another group suggested there is greater understanding of Maori customary use of native species. Progress in the past on customary use has been hindered by suspicion and lack of trust by non-Maori groups and poorly-informed public attitudes.***

595. ***Until there is a meaningful national dialogue around what are perceived as conflicting value systems further progress is likely to be slow. These confusions over values lie at the heart of making progress towards the 2020 Strategy outcomes for this theme, not***

***only with respect to customary use[73], but also the theme's other actions, objectives and 2020 outcomes. Demonstrating achievements through partnerships, such as the restoration of Motatau Forest, has a major part to play in this wider context.***

[73] The Strategy outcome for customary use is: ***"There is greater community understanding of Maori customary use of native species and this continues to be ecologically sustainable."*** (Presumably the 'sustainability' applies to the use, rather than the community understanding.)

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# THEME EIGHT. COMMUNITY PARTICIPATION AND AWARENESS

Caption: Children planting pingao as part of a community dune restoration project in Otago. Community initiatives to conserve biodiversity have blossomed in recent years, helped by central and local government funds.

**Theme Eight: Community Participation and Awareness**
**The role of New Zealand communities in biodiversity management**

**Desired outcome for 2020**
**New Zealanders have embraced a vision for conserving and sustainably using biodiversity. They have an enhanced and broader appreciation of New Zealand's biodiversity and better understand the indigenous species, habitats and ecosystems associated with the places where they live - on farms, in and around towns and cities, and in the surrounding natural areas.**
**Children and adults are learning about biodiversity through schools, polytechnics and universities and community programmes, and are actively involved in its care. People value biodiversity, know how they can contribute to its conservation and sustainable use, and are taking responsibility for action within their businesses, communities and lifestyles.**
**Individuals within management agencies, researchers and professionals, private resource managers (and users), iwi and hapu and the wider community know and respect each other's roles in biodiversity management and are sharing their knowledge. Each group has sufficient information and capability and is actively incorporating biodiversity priorities in its management programmes, businesses and day-to-day activities. All are involved in, and contributing in some way, towards the achievement of New Zealand's biodiversity goals.**

## Stocktake of progress on Theme Eight

### Expectations of the Strategy

596. The Community Participation and Awareness theme was directly allocated a very small share of the Biodiversity Package with total expected spending after 5 years of $0.38M all of which will go to Programme 26 Marine biodiversity education and awareness programme. However, many aspects of the desired outcomes were expected to be addressed in several other themes most notably in Themes One, Three, Seven and Nine. When the funding in these areas is taken into account, Theme Eight could be considered to be receiving more than $10M after 5 years. Community participation and awareness featured in one of the nine areas for implementation, namely strategic priority 2. "Enhance community participation and learning". Of the 11 actions specified, three actions were considered to be priority actions with one action (8.1 a) specifically received Biodiversity Package funding, Programme 26. Marine biodiversity education and awareness, as noted above.

597. Expectations for strategic priority 2 highlighted in the Strategy were:
- Improvement of information systems to make best use of existing and new information and making this accessible to people and communities;
- The private sector incorporating biodiversity considerations into their business operations- agriculture, forestry, horticulture, fisheries, aquaculture and tourism;

- Biodiversity becoming part of educational curricula guidelines and the development of suitable resource material to support this and creating a growing understanding of biodiversity and a culture of care within New Zealand.

598. We discuss progress in respect of these expectations under each objective heading. Our assessment of individual action points is summarised in Table 8 below.

**Progress in community involvement and awareness**

599. This objective has made moderate to substantial progress with community involvement in conservation and sustainable use of biodiversity probably at an all time high in New Zealand. It is uncertain how much of this growth can be ascribed to Biodiversity Strategy actions; indeed much of this seems, in our opinion, to be parallel development. It is important, however, that these opportunities are fully capitalised on and that a real improvement in the levels of protection and restoration of New Zealand ecosystems results from all of this effort. At present, because of lack of adequate monitoring and reporting systems, it is unclear what is actually being achieved. All incentives and mechanisms for involvement that require funding and professional staff time need to be explicitly linked to such monitoring and reporting systems and to adaptive management processes if real progress is to be made. There is also a need for better evaluation and prioritisation processes. This will ensure that the projects being worked on are the best selections in terms of the potential for turning the tide of biodiversity loss and that activities on private and public land are as well integrated as possible to maximise benefits. It is essential that community involvement contributes more than just feeling good about having participated.

**Progress in resource managers' support for conservation and sustainable use of biodiversity**

600. This objective has made moderate to significant progress with a significant increase in the amount of private land being protected and managed as a result of funding support from the Biodiversity Package. There has also been a significant increase in the numbers of community groups and partnerships. Again, the impact of this on turning the tide on biodiversity decline is hard to assess and no quantitative data on resulting trend and condition is available in most instances. As noted above, there is a need for better evaluation and prioritisation processes, especially as the expanding requirements on resource managers to service and support projects is occurring against a background of declining core funding. Sector-based initiatives, especially in agriculture, have made some progress, but still more can be done to integrate biodiversity conservation and protection into sustainable production landscapes.

**Progress in environmental education**

601. This objective has made significant progress with a wide range of high quality resources available for teachers interested in teaching environmental education. While there

appears to be a good variety of opportunities to learn about biodiversity in schools and so better understand the local environment, the impression is that these opportunities may still depend largely on the interest, knowledge and skills of individual teachers, as environmental education is not mandatory. It also appears that in some schools and tertiary providers field based activities are now less often used due to funding and/or safety constraints. Research suggests that environmental education does enhance student understanding but it is too soon to assess its effectiveness in terms of achieving Strategy outcomes. It does seem that the general levels of understanding of aspects of biodiversity are not high, based on some limited polling, but that the majority of year 12 students had adequate understanding of various aspects of New Zealand's biodiversity.

602. We propose that the current outcomes within this theme need to be widened to explore the linkages between environmental and biodiversity problems and unsustainable practices. This extends consideration of conservation and sustainable use of biodiversity *per se*, to place it in the larger context of education for sustainability. This would allow for more holistic treatment of cause and effect issues within the whole theme, and especially within Objectives 8.1 and 8.3.

## Table 8. Summary table of progress in Theme Eight

| **Summary of progress on Theme Eight action points (2000-2004)** | | | | |
|---|---|---|---|---|
| | **Priority action** | **Extra funding** | **Progress to date** | **Future priority?** |
| **Objective 8.1 Community awareness and involvement** | | | | |
| 8.1a Making information available | Yes | Yes | Substantial | High |
| 8.1b Public awareness programme | No | Yes | Moderate | High |
| 8.1c Better community involvement | No | No | Substantial | High |
| **Objective 8.2 Role of resource managers** | | | | |
| 8.2a Develop incentive mechanisms | No | No | Moderate | Medium |
| 8.2b Support community groups | No | No | Moderate | High |
| 8.2c Support practical initiatives | No | No | Substantial | High |
| 8.2d Encourage sector initiatives | Yes | No | Moderate | High |
| 8.2e Develop ‘awards’ systems | No | No | Substantial | Low |
| **Objective 8.3 Environmental education** | | | | |
| 8.3a Biodiversity into curriculums | Yes | No | Substantial | Medium |
| 8.3b Maori educational needs | No | No | Moderate | Medium |
| 8.3c Groups & enviro. education | No | No | Substantial | Medium |

## Introduction

603. The scope of this theme covers the role of New Zealand communities in biodiversity management and the need to involve people individually and collectively in conserving and sustainably managing New Zealand's biodiversity. Only one programme under this theme is funded by the biodiversity package namely Programme 26 – the Marine biodiversity and awareness programme. However, elements of this theme are widely supported in other Biodiversity Package funding streams most notably in Themes One, Three, Seven and Nine. The objectives covered elsewhere in the review are indicated in the text below. In some cases the "allocation" of funding to a particular theme (as in the Biodiversity Strategy Third Annual Report) is rather artificial and in fact the present theme receives significant support from Theme One in form of the Biodiversity Advice and Biodiversity Condition Funds (see Theme One chapter).

## Analysis of objectives and actions

**Objective 8.1 Community awareness and involvement**
**Enhance and broaden individual and community understanding about biodiversity (in particular, New Zealand's indigenous biodiversity) and increase community involvement in the conservation and sustainable use of New Zealand's biodiversity.**

604. This objective addresses the need to enhance understanding of New Zealand's biodiversity and to encourage greater community involvement in its conservation and sustainable use. The Strategy noted the general lack of understanding of the importance of biodiversity and the lack of awareness of existing information. It also recognised that accessibility of biodiversity information was not as good as it might be especially for communities involved in conservation management. Three actions were identified under this objective but only one (8a relating to developing and supporting incentive mechanisms) was considered a priority. The Biodiversity Package funding allocated was expected to contribute to actions 8.1a, 8.1b, 8.3a and 8.3c. We comment on progress so far, and new opportunities to extend this objective as an important component of learning about sustainability in its wider context.

**Actions 8.1**
**a. Make information about biodiversity available to people and communities, relevant to their local environments (that is, on the extent and management needs of ecosystems, habitats and native species), to enable them to make decisions and take action to support the conservation and sustainable use of biodiversity.**
**b. Develop a public awareness programme about New Zealand's lesser known or appreciated indigenous ecosystems, habitats and species important for biodiversity conservation.**
**c. Encourage greater community involvement and partnerships in management programmes and participatory projects to conserve and sustainably use biodiversity.**
**Lead agencies:** **DOC**
**Priority actions:** **Action a) only**
**Funding:** **Core + Biodiversity Package**

605. The only Biodiversity Package funded programme within Theme Eight (as per the Third Annual Report) contributes mostly to this objective. The Marine biodiversity education and awareness programme led by MFish has produced a range of outputs including STARfish (www.starfish.govt.nz) which comprises student activities, fact sheets, resources and teachers notes on marine biodiversity and biosecurity topics aims at secondary school students. Other outputs were:

- Poster competitions for year 9 and 10 students;
- Support for the Ross Sea website and Ross Sea poster and essay competition;
- A paua gauge and paua biodiversity brochure;
- The NABIS promotional brochure;
- Support for the publication of three reports that document and promote the biodiversity of New Zealand's marine environment (part of the World Wildlife Fund Eco-regions Initiative).

606. DOC, MfE and MAF all contributed to the development of the New Zealand Biodiversitywebsite (www.biodiversity.govt.nz) launched in December 2002 which is a major source of information for people and communities working on biodiversity projects around New Zealand. General levels of knowledge about biodiversity may be improving, as shown by 2003, 2004 and 2005 UMR surveys (Information supplied to reviewers by DOC). In the 2005 survey 65% of the public had heard of "biodiversity" whilst 91% were familiar with "ecosystems". There was moderate awareness but little concrete knowledge about "biodiversity" whereas people were able to give a more accurate definition of biodiversity by their usage of "ecosystems".

607. The Terrestrial and Freshwater Biodiversity Information System (TFBIS) also contributes to making information available to people and communities and is reported on in detail under Theme Nine.

608. The Action Bio-community programme sponsored by Local Government New Zealand and funded through the Sustainable Management Fund made considerable progress atencouraging collaboration at a regional level. This is reported on in Theme One and Theme Nine. Initiatives like the Northland, Southland and Waikato Biodiversity Forums are helping to integrate and coordinate protection and restoration activities at regional scales.

609. The Biodiversity Advice Fund is making an important contribution to this objective and is reported on in the review of Theme One.

610. There are now many examples of community involvement and partnerships in management programmes throughout New Zealand. These include a range of large and small projects. A notable large project is Maungatautari Ecological Island. Here the community, in collaboration with DOC and the regional (Environment Waikato) and district council (Waipa District Council), have embarked on an ambitious plan to protect and restore some 3000 ha with a predator proof fence and active management to restore the indigenous ecosystems. This project demonstrates the enormous benefits of

collaborative approaches to indigenous ecosystem restoration. Private financial resources and volunteer labour on a scale not often available to government agencies are being marshalled along with traditional funding and technical support to provide a local solution to the active management required to restore the reserve. We have no quantitative data on the change in numbers of partnerships and levels of community involvement in such projects but anecdotal evidence suggests there has been a significant increase.

611. As we discuss under Objective 8.3, there are opportunities to recognise the relevance of this theme to wider learning and education about sustainability. Within this objective information about biodiversity and nature's limits can be used to broaden understanding of environmental sustainability and the connections between environmental issues and social, cultural and economic concerns (PCE 2004). The underlying causes and unsustainable practices behind many of today's environmental problems need to be linked to people's daily experiences in their communities and local environments. Making these connections will help to strengthen efforts to change not only individual behaviours, but also to redesign those systems that perpetuate unsustainable environmental practices.

612. ***Moderate to substantial progress. For the amount of funding received, there has been good progress on the marine biodiversity and awareness programme. Overall, however, levels of knowledge amongst the general public remains low, as evidenced by UMR polls and more needs to be done to raise awareness of lesser known or appreciated ecosystems and species other than native birds. More information on indigenous biodiversity is being made available on the World Wide Web by government and non-governmental agencies and by specific programmes such as TFBIS.***

613. ***Accessibility and relevance of information remain key issues, however, for people and communities wishing to be more involved in conservation management. Much of the information currently available needs to be translated into popular and non-technical forms. The upsurge in levels of community involvement places strains on the agencies trying to service these requirements and there is also a need for more strategic and integrated approaches to deciding which projects should be priorities for support. The new fund announced recently to support community-led projects of regional and national importance should further enhance progress in this area.***

614. ***There are opportunities to link this objective (along with Objective 8.3) to current initiatives to promote learning and education about sustainability issues. Many of today's unsustainable practices have negative impacts on biodiversity at local community levels.***

**Objective 8.2 Role of resource managers**
**Encourage natural resource managers and users, and landowners to adopt realistic and pragmatic steps to conserve and sustainably use biodiversity.**

615. This objective addresses the need for resource managers to support community activities through the provision of information and technical capacity and to encourage community participation with incentives, facilitation of collaborative approaches to conservation and sustainable use and by developing partnerships between community groups and government agencies where relevant. Five action points were specified but only one (8.2d relating to encouraging and supporting sector-led initiatives) was considered a priority. No Biodiversity Package funding was allocated.

**Actions 8.2**
**a) Support, and where necessary develop, joint national and regional/local incentive mechanisms to encourage land, freshwater and marine management practices that lead to the conservation and sustainable management of biodiversity (see also actions 1.1f and 2.1e).**
**b) Promote and support, in partnership with the Landcare Trust, landcare groups and other community-based groups, the integration of biodiversity considerations into sustainable land and water management initiatives.**
**c) Support activities through the Sustainable Management Fund that enhance landowner and community understanding of ways to avoid or minimise the effects of human activities on biodiversity, and encourage community involvement in practical initiatives that help achieve the sustainable management of biodiversity.**
**d) Encourage and support sector-led initiatives to effectively incorporate biodiversity considerations in their strategic planning and operational practices, with a focus on the agriculture, forestry, horticulture, fisheries, aquaculture and tourism sectors.**
**e) Develop and use national and regional "biodiversity awards" to reward notable efforts or achievements by landowners, businesses and community groups to conserve and sustainably use indigenous biodiversity.**

| | |
|---|---|
| **Lead agencies:** | **MfE, DOC, local authorities** |
| **Priority actions:** | **Action d) only** |
| **Funding;** | **Core only** |

616. Anecdotal evidence from the New Zealand Ecological Restoration Network (NZERN) suggests there are approximately 3000 community conservation groups in New Zealand. Similarly the evidence is that resource managers and their agencies have played an increasing role servicing and supporting such groups around the country. The Department of Conservation's Awareness Fund ($2M) was set up in 2000 out of the "green initiatives" package and has enabled the development and implementation of 60 community projects annually nationwide. Most regional and district councils now have environmental initiative funds to support local conservation projects and the Biodiversity Advice and Condition Funds have made a significant contribution to protecting indigenous biodiversity on private lands (see Theme One chapter for a full discussion of these initiatives).

617. The New Zealand Landcare Trust is a non-governmental organisation facilitating sustainable land management and biodiversity initiatives with rural communities. The Trust, funded by the Ministry for the Environment and a corporate sponsor, Transpower New Zealand, consists of a team of co-ordinators and support staff. Regional co-ordinators work with groups around the country, providing support and information to

assist them manage their land more sustainably. Some 504 groups are currently listed on the Trust's website (compared with 250 groups in 2000) with the majority being focussed on aspects of stream and river care. But a diverse range of issues including sustainable farm production, protection and rehabilitation of sensitive environmental areas, pest and weed control, native bush monitoring, river monitoring and rehabilitation, as well as biodiversity enhancement (protection of native flora and fauna) are being worked on.

618. Activities under the Sustainable Management Fund and Sustainable Farming Fund have already been discussed under Theme One and Theme Two as have sector-led initiatives to incorporate improved biodiversity outcomes into strategic planning and operational practice (see Theme One).

619. A wide range of biodiversity awards is promoted by Government and non-governmental organisations including Green Ribbon Awards (MfE), Conservancy Conservation Awards (DOC) and Old Blue Awards (Royal Forest and Bird Protection Society). Many of the awards promoted predate the Biodiversity Strategy. Apart from recognising the outstanding contributions of individuals and groups these serve to highlight desirable approaches to conservation and sustainable use of biodiversity and provide valuable publicity for the Biodiversity Strategy goals and objectives.

620. ***Moderate to substantial progress. Although this objective has not been directly supported by Biodiversity Package funding, there has been good progress in many areas, as evidenced by the continuing growth in numbers of community groups involved in aspects of conservation and sustainable use of biodiversity. New Zealand Landcare Trust registered groups, in particular, have doubled in number in the past 5 years. As noted in the Theme One and Three commentaries, some opportunities to incorporate biodiversity outcomes in sector-based activities have not been fully exploited. National and regional award systems to encourage conservation and sustainable use of indigenous biodiversity are now well established. The Biodiversity Advice and Condition funds have made significant advances in the protection and restoration of indigenous ecosystems and species on private land.***

**Objective 8.3 Environmental education**
**Expand and enhance education about biodiversity as a key element in developing environmental education programmes and activities.**

621. This objective addresses the need for better-integrated educational initiatives, the mainstreaming of biodiversity concepts into broader environmental educationprogrammes and the incorporation of matauranga Maori concepts where relevant. The Strategy recognised that environmental education activity was not as coordinated as it could be, that biodiversity concepts were poorly recognised in education programmes and that matauranga Maori concepts and values associated with environmental education needed to be recognised in such programmes. Three action points were specified in this objective but only one (8.3a relating to integrating biodiversity considerations into the National Strategy for Environmental Education) was considered a priority. No Biodiversity Package funding was allocated to this objective.

**Actions 8.3**
**a) Integrate biodiversity considerations into the implementation of New Zealand's environmental education strategy, including the development of environmental education curriculum guidelines for schools, the establishment of an in-service training programme for teachers and guidance for local authorities.**
**b) Assist Maori in identifying their education needs in relation to the maintenance and promotion of matauranga Maori (traditional knowledge and practices) in biodiversity management, as part of the proposed broader environmental education needs assessment.**
**c) Promote and coordinate the role of environmental education in the conservation and sustainable use of biodiversity (as part of the implementation of the New Zealand Environmental Education Strategy) and encourage the active participation of local authorities, iwi and hapu, businesses, and environmental and community groups in developing and implementing environmental education activities.**
**Lead agencies:** **MfE, TPK, Ministry of Education**
**Priority actions:** **Action a) only**
**Funding:** **Core only**

622. Many of the ideas outlined in the Strategy were first promoted in the *Environment 2010 Strategy*, where the goal of environmental education was seen to be:

> "To encourage environmentally responsible behaviour and informed participation in decision-making by promoting environmental education throughout the community".
>
> *Environment 2010 Strategy*, page 57

623. This goal was further elaborated in *Learning to Care for Our Environment: Me Ako ki te Tiaki Taiao: A National Strategy for Environmental Education* (Ministry for the Environment, 1998).

624. The Government's educational goals require programmes that enable students to realise their full potential as individuals and to develop a sense of the shared values that are integral to New Zealand society. An essential component of these shared values is respect for the diverse ethnic and cultural heritage of New Zealand people, with acknowledgement of the special place of Maori and of New Zealand's role in the Pacific and as a member of the international community of nations.

625. Studies of the environment are an important part of this area of learning. Students aresupposed to be given the opportunity to explore environmental issues, which are important to their community, to New Zealand, to the Pacific, to the wider world, and to future generations. They have opportunities to learn how and why people conserve and modify their environment. They are expected to develop the knowledge, skills, and attitudes needed to make responsible decisions about the protection and wise use of local, national, and global resources and environments. Students examine decisions about the

use of resources, considering their effects on different groups, and the ethical questions and values underlying these decisions.

626. A diverse range of on-line resources has been made available for teachers under Environmental Education - Links' (under the website at the end of the paragraph). This page has a collection of recommended links that are relevant to environmental education. It includes links to organisations that are active in environmental work and may provide either advice or resources to support environmental education programmes. Some 55 listings are revealed with a key word search using "biodiversity". (See http://www.tki.org.nz/r/environ_ed/links_e.php). This website also has material on "Education for a sustainable future", thereby providing broader opportunities to show the connections between biodiversity goals and sustainable development objectives.

627. The directory 'Environmental Education Directory of New Zealand'(see www.eednz.org.nz) lists resources relating to the New Zealand environment and covers New Zealand produced material and places to visit. All materials have been designed to meet at least one of the objectives of the 1998 National Strategy for Environmental Education - awareness, participation, attitudes and values, knowledge and understanding, and skills. There is a facility for adding new resources to the directory, or making corrections to existing entries.

628. "Enviroschools" is a particularly successful environmental education programme. It is a holistic programme in which students develop skills, understanding, knowledge and confidence through planning, designing and creating a sustainable school. Action projects undertaken by Enviroschools have both environmental and educational outcomes that benefit the school and the wider community. The Enviroschools Foundation was formed in 2003, however its history goes back some ten years to an initiative by the Hamilton City Council. Valuable initiatives such as this need ongoing support, backed by adequate professional development for teachers who are implementing education for sustainability.

629. DOC and many councils (see for example Environment Waikato's website www.ew.govt.nz/forschools/) have made important contributions to environmental education through the provision of staff, teaching resources and encouragement to schools and teachers wishing to introduce environmental education projects into the classroom. Biodiversity is a major focus of DOC's education work. This includes initiatives such as teaching resources focused on indigenous species, habitats and ecosystems, workshops, fieldtrips, conservation events and national programmes such as Weedbusters, LEARNZ, and outdoor education programmes funded through the Ministry of education's LEOTC fund.

630. Vote Education initiatives (2002 Budget) set in place a continuing development of the Environmental Education area. Funding was allocated for 2002/03 of $0.25M to provide teacher professional training to implement the *Guidelines for Environmental Education in New Zealand Schools.* These provisions involve the continuation of a national professional programme for environmental education and on-line material and research to

support this programme. The Guidelines support the implementation of the Government strategy *Learning to Care for Our Environment: Me Ako ki te Iiaki Taiao: A National Strategy for Environmental Education*. In a wider context, the teaching of Environmental Education addresses the requirements of the Government's Environment 2010 Strategy.

631. The expected benefits of the initiative were:
    - Enabling teachers to become familiar with the Guidelines for Environmental Education in New Zealand Schools
    - Demonstrating the Ministry of Education's commitment as one of the lead agencies in the Government's national strategy for environmental education outlined in Learning to Care for Our Environment: Me ako ki te Tiaki Taiao, 1998, Ministry for the Environment
    - Providing a mechanism for increasing teacher and student awareness of New Zealand's climate change programme as part of the consultation process involving the reduction of greenhouse gas emissions in line with the ratification of the Kyoto protocol.

632. Funding was also allocated for Environmental Education Co-ordination: 2002/03 ($1.5M), 2003/04 ($1.3M), 2004/05 ($1.3M), 2005/06 ($1.3M) giving a four year total (02/03-05/06) of $5.4M. This appropriation was to extend the quality, extent and sustainability of environmental education in schools and Kura Kaupapa Mäori through a programme of co-ordination and development. The programme was expected to facilitate environmental education co-ordination by:
    - Developing professional capability and enhancing the delivery of environmental education in schools and classrooms
    - Establishing clearer priorities in environmental education
    - Using shared experiences by practitioners; furthering and using informal and formal research
    - Identification and remediation of gaps in current activities
    - Recognition of needs for particular sectors, particularly kura
    - Pooling resource material and professional development opportunities
    - Improving effectiveness of learning activities.

633. Research on current practice in environmental education in New Zealand schools(Bolstad et al. 2004) found that environmental education enhances student knowledge and understanding of the environment and environmental issues and develops student values and attitudes towards the environment. Future limiting factors identified were:
    - the non-mandatory status of environmental education,
    - the need for resourcing in the form of environmental education units and the equipment needed to take action for the environment,
    - the need for funding for teacher release time to plan, prepare and share ideas, to make contact with support people, and be involved with action for the environment.

634. The extent of inclusion of biodiversity concepts into the school curriculum is indicated by the content of recently published textbooks and manuals. For example, Year 12 and Year

13 Biology Student resource and activity manuals (published by Biozone International Limited) have up-to-date examples featuring New Zealand flora, fauna and ecosystems.

635. The 2004 Level 2 (Year 12) NCEA Science examination contained a question on New Zealand's "endemic life" (aspects of adaptation and evolution of endemic flora and fauna). Some 60.2% (n = 1478) of students answering this question reached the "achieved" standard or better.

636. At the tertiary level, the recent publication of "Biology Aotearoa", as a supplement to the widely-used first year textbook "Biology" by Campbell & Reece, is also evidence of progress. We have no quantitative data on the development and growth of environmental education in the tertiary sector but it is our impression that this has grown during the period of interest. A wide range of university papers is available including papers on New Zealand flora and fauna, ecology, conservation biology and more recently restoration ecology. Apart from increasing the knowledge on issues relating to New Zealand biodiversity of the general undergraduate science student, a significant proportion of students taking them take on or already involved in teaching at primary and secondary levels. At least one university is known to teach the principles and practice of environmental education to Masters degree level.

637. In addition to contributions by education providers, many community groups and non-governmental organisations now sponsor or coordinate workshops and seminars on aspects of New Zealand's biodiversity. There is a role here for local government but those with a small rating base often lack the capacity to provide environmental education programmes.

638. The New Zealand Association of Environmental Education (NZAEE) promotes environmental education initiatives at both a national and regional level. They have eight regional branches; Northland, Auckland, Manawatu, Bay of Plenty, Waikato, Wellington, Christchurch and Southern. NZAEE offers a national environmental education conference very two years, coordinates Seaweek at the national level, frequently hosts workshops and forums, and is an active participant in a number of initiatives including the UN Decade of Education for Sustainable Development (2005-2015). The association also serve in an advisory capacity on an array of environmental education issues.

639. In light of the growing recognition of the importance of education for sustainability (for example, the UN Decade of Education for Sustainable Development referred to above) we propose that this Strategy objective is widened. Without detracting from the achievements we have reviewed above, environmental education needs to make clearer the underlying causes of environmental problems, their links to impacts on biodiversity and the need for more sustainable ways of promoting quality of life. A report by the Parliamentary Commissioner for the Environment (PCE 2004) summarises the "slow and rocky start in New Zealand" of environmental education. It also highlights the need for environmental education to make the connections between environmental issues and social, cultural and economic concerns. Both developed and developing countries are experimenting with a number of ways of doing this (Tilbury et al 2002) in response to the Rio Declaration of 1992 following the UN Conference on Environment and Development

(UNCED). New Zealand, as a signatory to the Declaration undertook to integrate sustainable development into all levels of our education systems.

640. The Biodiversity Strategy has a role to play in this wider endeavour. The desired outcomes for this theme should, we suggest, be broadened to include these wider and linked dimensions of environmental education.

641. ***Substantial progress. Although no Biodiversity package funding was specifically allocated to this objective significant progress has been achieved with support of Vote Education and other core funding. Environmental education has a strong following from professionals at all levels of the education system but as it is not mandatory there is significant variation in the coverage and quality in different schools. Whereas previously it was unusual to see local examples of flora, fauna, and ecosystems routinely used in class work or included in resource material this is now becoming more widespread. Education providers offer a wide range of conservation, restoration and environmental education training. However, environmental education needs to be seen as a major component of the larger subject of education for sustainability. Theme Eight should also address underlying causes of environmental and biodiversity problems and what broader changes are needed to reduce the negative impacts.***

## References cited – Theme Eight


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# THEME NINE. INFORMATION, KNOWLEDGE AND CAPACITY

Caption: A plant ecologist surveying coastal communities. Biodiversity research is essential – not only for understanding how our natural systems work, but also for developing better ways to help endangered species and for controlling pests and weeds

**Theme Nine: Information, Knowledge and CapacityRequirements for information, knowledge and capacity to effectively manage biodiversity.**

**Desired outcome for 2020**
**We have become more effective as a country at learning about biodiversity and our management of it. Decisions that affect New Zealand's biodiversity are based on sufficient and timely information and effective management approaches, underpinned by a growing knowledge base which draws on local and traditional knowledge (matauranga Maori). When information is inadequate, a precautionary approach to decision making is taken.Significant progress has been made in identifying and describing indigenous species, their distribution, and their genetic properties. Critical shortfalls in information have been addressed in key taxonomic groups and environments, including marine environments. New Zealand has made significant progress towards mapping our ecosystems and understanding how ecosystems function and the human-induced impacts on them. Investment in applied research has enabled technical breakthroughs, especially in relation to pest and weed control technologies that are ecologically appropriate, socially acceptable and of practical use to resource managers. Economic and social applied research guides the development of increasingly effective management methods.**
**We have become more systematic in our management of biodiversity. A bioregional approach to the assessment of biodiversity and coordination of its management draws effectively on the knowledge, skills and experience of national, regional and local organisations, communities, iwi and hapu, and individuals. Information about biodiversity at all levels is widely accessible, and resource managers are able to select the best mix of management tools from a range of mechanisms to suit local conditions. Those responsible for managing activities that affect biodiversity have sufficient capacity to do so, and share their skills and experience with others.**
**Monitoring and state of the environment reporting provide relevant and widely available feedback on the status of, and trends in, indigenous biodiversity. An adaptive management approach has been developed and widely adopted that enables ecological and other relevant information to be incorporated in decision making.**

## Stocktake of progress on Theme Nine

642. The Information, Knowledge and Capacity theme was allocated a minor share of the Biodiversity Package with total expected spending after 5 years of $9.88M all of which will go to Programme 27 – Terrestrial and Freshwater Biodiversity Information System (TFBIS). However, aspects of the desired outcomes were expected to be addressed in several other themes most notably in Themes One, Two and Three. Information, Knowledge and Capacity featured in one of the nine areas for implementation, namely strategic priority 3. “Becoming smarter biodiversity managers”. Of the 14 actions specified, five actions were considered to be priority actions and only one action (9.5a) received Biodiversity Package funding, TFBIS, as noted above. However, the Natural Heritage Management System (NHMS), also a part of Action 9.5a, was funded from the Biodiversity Package but from other Themes. In addition, Marine Information was funded in Theme Three ($14.1M).

643. Expectations for strategic priority 3 highlighted in the Strategy were:

- Improved systems to promote information sharing, a consistent approach to monitoring and user friendly reporting at national regional and local levels;
- Information systems which share information not just about progress on actions and results but on best practice hands-on techniques;
- Identification of gaps in knowledge relating to key threats;
- Acceleration and completion of baseline biodiversity surveys and assessment of threats;
- Investment of research in pest control techniques and management approaches that best support indigenous biodiversity on private lands.

644. We discuss below progress in respect of these expectations under each objective heading. Our assessment of individual action points is summarised in Table 9 below.

**Progress in expanding the research frontier**

645. This objective has made limited progress overall due mainly to the static research funding environment (declining in real terms since 1998). Although a good start has been made on coordinating and aligning research strategies, critical research relevant to the success of the Strategy (and identified in the Strategy) has not been expanded. The problem is further exacerbated by the knowledge gaps in basic and strategic science especially in the marine and freshwater areas that underpin the applied or solution driven science needed by ecosystem managers to adequately address the key threats to indigenous ecosystems. It would be valuable to allocate some Biodiversity Package funding to critical pest management issues. But, in the absence of additional support (outside of the Biodiversity Package) for basic and strategic research in a range of areas, this would be unlikely to provide a significant breakthrough, as opposed to incremental improvements. Progress will therefore remain strongly dependent on research funding outside of the Biodiversity Package, but this is declining in real terms. Achieving many of the outcomes of the Strategy will not be possible without an expansion of research in gaps identified at the outset of the Strategy.

**Progress in taking stock of ecosystems**

646. This objective has made substantial progress in the development of classification and mapping systems to cover land, freshwater and marine ecosystems but the survey, identification and assessment of threats to key ecosystems has stalled. The time is right to now move beyond the classification phase to the application of these techniques to prioritisation and decision-making (i.e., systematic conservation planning). This next phase will require significant attention to building capacity and expertise within the relevant management agencies. A much greater level of buy-in will need to be achieved before these methods are thoroughly embedded and routinely used by management agencies rather than by research providers. The free of charge distribution of these classification systems and provision of workshops are vital steps in this process but we are concerned that the uptake has been very uneven across the country. Much greater support will need to be supplied to councils and management agencies (including

community-led projects) with limited information technology capability to improve this situation. Failure to adopt these methodologies more widely within the country will lead to difficulties in regional and national scale achievement and measurement of outcomes.

647. It is important to recognise also that the classification building phase is only the beginning and needs to be followed closely by enhancement of other data layers especially those relating to species and the biotic attributes of ecosystems for the adaptive management required in other objectives. This objective and objectives 9.3 and 9.4 are interdependent. Progress in each is required to achieve the complete framework of monitoring, reporting and adaptive management necessary to effectively manage indigenous ecosystems and measure achievement of biodiversity outcomes.

**Progress in monitoring changes in our biodiversity**

648. Objective 9.3 (Action 9.3b only) and 9.4 were a priority in the Strategy but no Biodiversity Package funding was allocated. At the individual project level in other themes, however, some Biodiversity Package money will have contributed to measuring and monitoring achievements. Initial impetus in this area from the Environmental Indicators Programme prior to and early in the period of interest (2000-2004) has not been capitalised on to the extent we expected. Moderate progress has been made in some elements of these objectives but we are not convinced, on the basis of the information supplied, that the leadership required to achieve the coordinated, integrated condition and trend monitoring of indigenous biodiversity regionally and nationally will make adequate progress by 2020. We believe the Strategy objectives and actions are crucial components of a systematic approach to conservation planning. We would urge that leadership responsibilities in monitoring is clarified as soon as possible and that a multi-agency working group is established to get this objective back on track.

**Progress in sharing and reporting information and best practice**

649. Substantial progress has been made with this objective through the Biodiversity Package funding of the TFBIS programme. This has resulted in a significant amount of data and information being made available to parties interested in maintaining and restoring indigenous ecosystems. The impacts of this action on biodiversity outcomes are however difficult to determine on the basis of the information we have been provided with. The nature of several of the projects funded and the apparent dominance of research providers in determining the type and nature of data and information being made available suggests to us the need for greater involvement of end users in deciding which projects will give greatest on-the-ground benefits. Aspects of accessibility, data querying and manipulation also need to be considered in close dialogue with potential end users.

**Progress in building capacity**

650. This objective was not a priority and received no Biodiversity Package funding. Progress is limited to moderate as although a wide range of informal and formal activity is reported it is not evident from the information supplied that there is clear leadership in

this area or that a strategic plan to address the actions specifically outlined in the Strategy has been produced. Rather we have been informed of a series of uncoordinated individual projects that contribute to varying degrees, but do not suggest that best practice is routinely disseminated or embedded into relevant organisations. We believe the Strategy objective and actions identified are still relevant and important to success in achieving a reversal of biodiversity decline and urge a more structured approach starting with a strategic plan across agencies for capacity building. Again, we would like to see leadership in this area clarified urgently. The Action Bio-community approach to inter-agency and community group capacity building should be reinstated.

**Progress in valuing biodiversity**

651. This objective has made moderate progress overall but is an area where international experience is growing and which can be readily drawn on for future application. Progress will be dependent on significant changes in the incorporation of ecological accounting in economic models and practice nationally and internationally. A wide range of incentives and voluntary mechanisms is already being used to encourage private landowners to protect indigenous biodiversity, but economic drivers are still leading to irreversible loss of high value indigenous ecosystems in many parts of the country.

## Table 9. Summary table of progress in Theme Nine

| **Summary of progress on Theme Nine Action points (2000-2004)** | | | | |
|---|---|---|---|---|
| | **Priority action** | **Package funding** | **Progress to date** | **Future priority?** |
| **Objective 9.1 Partnerships in biodiversity management** | | | | |
| 9.1a Expand research | Yes | No | Limited | High |
| 9.1b Invest in research | Yes | No | Limited | High |
| **Objective 9.2 Ecosystem methods for mapping biodiversity** | | | | |
| 9.2a Classify & map | No | No | Substantial | Medium |
| 9.2b Accelerate survey | Yes | No | Limited | Medium |
| **Objective9.3 Keep track of change** | | | | |
| 9.3a Clarify accountabilities | No | No | Limited | High |
| 9.3b Develop monitoring methods | Yes | No | Limited | Medium |
| **Objective 9.4 Reporting and adaptive management** | | | | |
| 9.4a Use monitoring results | Yes | No | Limited | High |
| **Objective 9.5 Share information & best practice** | | | | |
| 9.5a Develop and promote systems | Yes | Yes | Substantial | Medium |
| **Objective 9.6 Build capacity** | | | | |
| 9.6a Document codes of practice | No | No | Moderate | Low |
| 9.6b Incorporate biodiversity values | No | No | Limited | Medium |
| 9.6c Review and monitor capacity | No | No | Limited | High |
| 9.6d Skills training and education | No | No | Moderate | High |
| **Objective 9.7 Valuing biodiversity** | | | | |
| 9.7a Review mechanisms | No | No | Limited | Medium |
| 9.7b Investigate incentives | No | No | Moderate | Medium |

## Introduction

652. The scope of this theme is the need for adequate information, knowledge and capacity to underpin the effective implementation of all biodiversity management actions proposed in the Strategy. This Theme focuses on needs, at a national, regional and local level, to improve and share knowledge, information and experience, build capacity to more effectively manage biodiversity and learn lessons by monitoring and reporting progress. Only one programme funded by the Biodiversity Package is entirely confined to funding within this Theme: Programme 27, Terrestrial and Freshwater Biodiversity Information System (TFBIS). The majority of action points within this theme were not funded by the Biodiversity Package.

## Analysis of objectives and actions

**Objective 9.1 Expand the research frontier**
**Identify and fill critical gaps in scientific knowledge, including applied research, and prioritise and coordinate future research to address key issues and threats to biodiversity.**

653. This objective addresses gaps in scientific knowledge of New Zealand's biodiversity that constrain its effective management. The Strategy identified a number of perceived gaps including: knowledge of the taxonomy, distribution and population viability of indigenous species, classifying and understanding the extent, condition and functioning of ecosystems, and knowledge about the interaction between indigenous and introduced species, including introduced pests. It was suggested that processes were needed to identify critical knowledge gaps and to target Crown and private research (providers) to fill them.

654. Some eight key research areas were identified:
- Diversity and ecological roles of microorganisms,
- Land based invertebrates and plants,
- Coastal and marine species and ecosystems,
- Impacts of exotic species on indigenous biodiversity,
- Genetic diversity of indigenous species,
- Ecological and evolutionary processes and their links with ecosystem stability and function,
- Interactions between the physical and environmental characteristics of a habitat and its biodiversity,
- Effects of climate variability and change on biodiversity, including their effects on biosecurity risks to indigenous and important introduced biodiversity.

655. It was also suggested that techniques to control the adverse effects of introduced pest species needed to be enhanced by investment in applied research. Several areas of focus were recommended:
- Enhancing methods to control possums and weeds, especially biocontrol,

- Developing effective techniques for the control of predators such as stoats, and newly introduced pest species in marine environments,
- Developing methods to effectively control the impact of vertebrate pests and diseases on both indigenous biodiversity and our important introduced species.

656. Both actions specified under this objective were considered priority actions but no Biodiversity Package funding was allocated to either action point.

**Actions 9.1**
**a) Develop and implement a coordinated research strategy to identify and fill gaps in our knowledge and understanding of biodiversity relevant to key threats.**
**b) Invest in relevant research that contributes to better management of introduced pests and enhanced management of indigenous biodiversity.**

| | |
|---|---|
| **Lead agencies:** | **DoC, MfE, MoRST, FRST** |
| **Priority actions** | **Yes** |
| **Funding:** | **Core only** |

657. The Foundation for Research Science and Technology (FRST) produced Strategic Portfolio Outlines (SPOs) for the main areas relevant to the Biodiversity Strategy just prior to its release in 2000. These were:
- "Protection and restoration of land, freshwater and estuarine ecosystems and environments";
- "Protection and restoration of marine ecosystems and environments".

658. Although predating the Strategy these SPOs were influenced by the discussion and submission processes that were already underway for the Biodiversity Strategy. The FRST 2002/03 Sustainable Development Portfolio Request for Proposals required that proposals should align with relevant external strategies and the existing SPO document(s), unless deviations from the SPO were indicated. External strategies included the New Zealand Biodiversity Strategy.

659. The Department of Conservation developed a research framework in 2003 (DOC 2004) to better align the Department's research programmes with those funded by the Public Good Science Fund. Research portfolios defined within this framework were:
1. Terrestrial restoration and pests
2. Species and ecosystems under threat
3. Conservation assessment
4. Aquatic protection and restoration
5. People, history and conservation

660. The FRST 2003/2004 Natural Ecosystems Requests for Proposals piloted a new approach to the investment of the Public Good Science Fund namely outcome based investment. This style of investment aims to focus on outcomes rather than outputs and requires significant interaction with, and support from, end users to achieve intermediate outcomes specified for the research proposed. The six Target Outcomes defined for the

Request for Proposals were developed largely in response to the requirements of the New Zealand Biodiversity Strategy:

1. Define New Zealand's biota
2. Reverse the decline in New Zealand's biodiversity
3. Biosecurity – incursion management
4. Biosecurity – management of existing pests
5. Protect the unique ecosystems of the Southern oceans and Antarctica
6. Adopt an ecosystem-basis for sustainable use of aquatic and terrestrial biota and other resources

661. Although the target outcomes identified link to the Strategy in a general sense they provide only a general context and particular actions or priorities within the Strategy have not been strongly developed.

662. However, the Outcome Based Investment (OBI) process required high levels of engagement and interaction between science providers and end users. The Department of Conservation, for example, invested a significant amount of time in the process to ensure that the research being proposed by research providers was relevant to their needs and aligned to the New Zealand Biodiversity Strategy. Other end users did not engage as fully in this process as was hoped (Webber 2005) and some stakeholders have recommended that the OBI model not be applied in the future (Royal Society of New Zealand Biodiversity Committee 2005).

663. A significant proportion of the Natural Ecosystems funding allocated in 2005 will contribute to better management of introduced pests (Target Outcome 4) and enhanced management of indigenous biodiversity (Target Outcome 2) but there has not been an expansion of the research frontier due to funding constraints. In particular, several proposals involving development of new technologies for pest control and management were submitted to FRST but none could be funded. There appears to be some research provider versus end user disagreement on the funding balance that should occur between the four major Target outcomes (TO 1-4) and the nature of the research currently funded. We note that all target outcomes form part of a value chain beginning with underpinning elements such as identification and description of species (TO1) and understanding the autecology's of species or dynamics and functioning of ecosystems (parts of TO2, TO3 and TO4) through to strongly applied or solutions oriented research (parts of TO2, TO3 and TO4).

664. This value chain is not as well connected as it might be and international research at least suggests research findings are often not utilized to the extent they should be by ecosystem managers (see for example Pullin et al. 2004 and Sutherland et al. 2004). But all ecosystem management should be linked in some way to the platform provided by the Natural Ecosystems and other relevant research portfolios. Many end users consulted (and some researchers), suggest there should be a much greater funding proportion of applied research which will provide solutions to the critical problems facing New Zealand's indigenous biodiversity while others (mainly research providers) emphasize the current lack of data and basic knowledge about species and ecosystems. The tension is

promoted by the static funding levels (see below) and the depth and breadth of problems faced.

665. The Ministry of Research, Science and Technology (MoRST) reviewed the Environmental Research Output Class (OC14) up to June 2003 and reported that the funding for many areas of environmental research had remained static since 1998 (i.e., declined in real terms) and in some areas since 1993. Capability in many environmental research areas was shown to be declining with the number of FRST-funded scientists in NIWA and Landcare Research having declined by 20% since 1998. In the area most relevant to the Strategy the Natural Ecosystems portfolio ($32M) funding for most areas has been static since 1998, although $5.925M was added in September 2004 for upgrading and maintaining nationally significant databases and collections and supporting air quality and marine biosecurity research.

666. The Ministry of Fisheries has significantly increased its spending on non-stock assessment research and staff capacity in the last five years with staff Full Time Equivalents (FTEs) in marine environment research increasing from 0.5 FTE in 1998/99 to 8.5 FTE in 2003/03 and environmental research funding from $356k in 2000/01 to $4.3M in 2003/04 (see also Theme Three Objective 3.4).

667. Two MoRST sponsored workshop/meetings held as part of the present Biodiversity Strategy review considered research gaps relevant to this objective as well as areas of future research importance. In brief, the workshops reiterated the relevance of most of the priorities already mentioned in the Strategy (see introduction to this Theme) but identified some additional research areas where it was thought future effort would be particularly useful in enhancing the reversal of biodiversity decline. These included remote surveillance technology, multiple pest species control and use of new information technologies and integrated databases to develop predictive models to support all stages of biodiversity management. Research providers also noted that much of the innovative research was lost (not funded) in the recent FRST Natural Ecosystems bidding round.

668. ***Limited progress. Although a good start has been made on coordinating and aligning research strategies with the Biodiversity Strategy the investment in relevant research has declined in real terms. The Outcome Based Investment process shows potential to better align research with ecosystem management end user needs and thus the requirements of the Strategy. But we detected high levels of dissatisfaction with the process in terms of transaction costs and on-going administrative and reporting costs that are diluting the already limited amount of funding going to actual research output. Major research gaps in understanding outlined in the introduction to this section remain and the profile of research funded in the recent FRST Natural Ecosystems round remains heavily weighted towards basic and strategic underpinning research with solution-oriented, applied research e.g. new technology development to control weeds and pests, seriously under-funded.***

669. ***Further, the overall funding profile has 50% of the fund allocated to terrestrial research and 25% each to freshwater and marine ecosystems. Freshwater and marine***

***research arguably require at least as much funding as is currently allocated to terrestrial ecosystems if significant progress is to be made in the research gaps already noted in the Biodiversity Strategy. The increase in Ministry of Fisheries activity on non-stock assessment research is noted but we do consider it is concordant with the size and importance of New Zealand's EEZ in relation to biodiversity resources. A MoRST sponsored workshop on research gaps as part of the current review reiterated many of the gaps already identified in the Strategy but also identified some new opportunities for research contributing to the Strategy outcomes. Extra Biodiversity Package funding should go to research that directly addresses Biodiversity Strategy outcomes but this will need to be supported by additional funding (from other sources) of priority basic and strategic research if longer term biodiversity outcomes gains are to be achieved. Given the lead-in time to establish research teams and to deliver solutions to significant conservation problems, it is unlikely that an expansion of the research frontier now would be able to deliver significant benefits until the second decade of the Strategy.***

**Objective 9.2 Use ecosystem-based methods to map out indigenous biodiversity.**
**Develop and implement effective approaches to map indigenous biodiversity at ecosystem scales and inform management actions and research.**

670. This objective addresses the need to take stock of ecosystems using classifying and mapping tools that enable informed decision-making by managers. Two actions were specified neither of which was considered a priority action and no Biodiversity Package funding was allocated.

**Actions 9.2:**
**a) Develop effective methods of ecosystem classification and mapping biodiversity and for identifying and monitoring key biodiversity issues and threats.**
**b) Accelerate biodiversity survey, identification and assessment of threats to key ecosystems. (See also Actions 1.1a, 2.1b and 3.1b).**

| | |
|---|---|
| **Lead agency:** | **MfE** |
| **Priority actions:** | **Action b) only** |
| **Funding:** | **Core only** |

671. As discussed in Themes One, Two, and Three, a range of classification systems to cover land, freshwater and marine ecosystems has been developed (LENZ, REC, FWENZ, MEC). These classifications are contributing or will contribute to conservation and resource management work undertaken by central and local government. They provide spatial frameworks for prioritization, risk and threat assessment and organizing inventory and data bases in ways that promote true ecosystem management (see Maltby et al 1999) and systematic conservation planning (see Stephens et al. 2002).

672. MfE has made available free of charge to each local authority the LENZ database but we have only anecdotal evidence of their actual in-house use by ecosystem management

agencies. As noted below in Objective 9.5, our impression is that usage is more often than not still dependent on access to expertise outside the management agencies.

673. As discussed in Theme 1, biodiversity survey work has not accelerated. Indeed the major biodiversity survey initiative, the New Zealand Protected Natural Area Programme (PNAP) has stalled with no new surveys instigated since 2001. PNAP reports often provide the only published regional scale inventory of ecosystems within a region. In most cases the emphasis is on vegetation, plants and birds with other biota, e.g. invertebrate biota, rarely included. Nevertheless such systematic surveys of biodiversity resources are essential for prioritizing which places should be protected and understanding the risks and threats to maintaining biodiversity resources. A report has been produced reviewing the use and management of PNAP survey reports (Wildland Consultants 2004). This recommends a web-based approach to provide image format .pdf files on request. All PNAP reports would need to be scanned to achieve this; they could then be supplied either via CD Rom or via the web. The current DoC focus has been on providing a national overview of the level of legal protection using the LENZ classification but (as noted in Theme One) this data will still need to be supplemented with up-to-date ecological data layers to inform decision making. In addition, regional scale surveys also provide a platform for other monitoring requirements such as trend and condition assessment.

674. In 2004, the Ministry of Fisheries launched the National Aquatic Biodiversity Information System (NABIS). This is a GIS-based data management tool that at May 2004 had:

- 209 layers depicting biological distributions for 99 species of finfish and 21 species of invertebrate
- Two layers depicting distributions of marine mammal breeding colonies for 2 species
- 126 layers depicting fishery related boundaries (QMAs, FMAs, statistical areas, recreational fishing survey zones, compliance regions, CCAMLR boundaries)
- 20 layers depicting geographic reference information (land, roads, towns, rivers etc.)
- Commercial catch data for 94 species of commercially caught finfish and invertebrate

675. NABIS is designed to be a tool to make information about the spatial distribution of living organisms in the New Zealand marine environment more accessible to decision makers and the general public. It attempts to achieve accessibility by:

- Making this information freely available on the Internet, with no logons or passwords required,
- Presenting information in a manner which does not require any degree of "scientific expertise" to interpret,
- Supplying a substantial source of supporting context information (metadata), so that users can determine whether the data on NABIS is appropriate for their purpose.

676. However, when we accessed the NABIS web site and tried to manipulate the data layers we had some reservations about the user friendliness of the system. We have been informed that work is underway to rectify this situation.

677. ***Substantial progress has been made on developing classification and mapping tools for identifying and monitoring key biodiversity issues and threats (see Themes One, Two and Three) but there is a danger that too much effort and emphasis is going into the classification phase of this work without sufficient effort on the application and uses of the classifications developed. Unless there is agreement among providers and users on the best available classifications (classifications are artificial conceptual frameworks) and unless classifications and mapping tools are widely taken up by biodiversity managers prepared to apply them in prioritization and decision making, progress will continue to be impeded by continuing debate in search of the perfect method. In the case of many of the classifications already available, we believe the emphasis should now be on application to systematic conservation planning. With respect to National Aquatic Biodiversity Information System, some of the information seems unrelated to the Strategy goals and more relevant to in-house management requirements. But it can be used as a consultation tool to encourage constructive dialogue between communities, tangata whenua and the Government by allowing discussion from a shared information base. Work is ongoing to improve its user friendliness.***

**Objective 9.3 Keep track of change**
**Use consistent measures and methods to monitor and provide information on key changes in the extent and condition of indigenous biodiversity.**

678. This objective addresses the need to understand the changes in extent and condition of New Zealand's biodiversity. One of the two actions specified (9.3b) was considered a priority action but no Biodiversity Package funding was allocated.

**Actions 9.3:**
**a) Clarify agency accountabilities for monitoring and reporting on indigenous biodiversity.**
**b) Develop, select and use cost-effective methods (including indicators) for monitoring indigenous biodiversity and threats to indigenous biodiversity.**

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|---|---|
| **Lead agencies:** | **MfE** |
| **Priority actions:** | **Action b) only** |
| **Funding:** | **Core only** |

679. As discussed in Theme One, methods for monitoring the extent and representativeness of indigenous ecosystems have been developed but without a permanent commitment to updating the Land Cover Data Base, or equivalent remote sensing techniques, analyzing change in the future will not be possible. Condition and trend monitoring at all scales is lacking. Work is underway to implement an inventory and monitoring programme with a consistent set of standards for the design, collection and analysis of biodiversity data. The first stage of the programme has been the production of a report (Lee et al. 2004) that

outlines an ambitious national inventory and monitory framework for the assessment of ecological integrity. This work to date has been focused within DOC and it would have been valuable to engage councils and other indigenous ecosystem managers to a greater extent early in this project as the problems to be addressed and benefits of such a proposal are much wider than on land managed by DOC.

680. The MfE Environmental Performance Indicators programme undertook an extensive consultation process to develop a range of environmental indicators for air, freshwater, marine and land to form the basis for nationally coordinated environmental monitoring of the state of the environment. Proposed indicators for the marine environment, terrestrial and freshwater biodiversity were included in a set of some 160 environmental indicators identified by the programme. (MfE 1998a &1998b) In 2002, however, the Environmental Indicators programme was reassessed. It was felt that it was not possible to progress all the 160 indicators to a stage where MfE could work with partners in local and central government to report nationally on all these indicators so a decision was made to focus on New Zealand's priority environmental issues (MfE 2004). In terms of developing biodiversity indicators progress was greater for extent type measures than for condition and trend measures. For example, the one council effort to address indigenous biodiversity on private land (MfE, DOC & LGNZ 2004) utilised the proposed extent indicator and a LENZ spatial framework to quantify the representativeness of New Zealand Protected Natural Areas.

681. After 2002, the focus for the following two years was on:

- Air quality and what changes are needed to existing air quality monitoring to assess the effectiveness of the national environmental standards for air quality
- Water quality and quantity indicators that link to the Water Programme of Action, enabling monitoring of New Zealand's key water issues.

682. Biodiversity, waste, urban areas and sustainable development were noted as issues MfE had an interest in, but to achieve the desired outcomes (in relation to the EPI programme) it was decided, “to keep it simple” and concentrate efforts in air quality and water quality (MfE 2004).

683. The Department of Conservation monitors vegetation condition as part of outcome monitoring with respect to vegetation response to reduction of possum numbers after 1080 operations. This mainly involves measurement of Foliar Browse Index (FBI) of selected plant indicator species and Residual Trap Catch Index (RTC) of possums. Green (2003) reviewed some 70 departmental reports of vegetation monitoring surveys covering 1080 operations at 40 locations and made recommendations on improvements in methodology. These included the needs for:

- broader suites of indicator species to be monitored,
- better understanding of the relationship between Residual Trap Catch and the response of vegetation,
- selection of time scales relevant to the species being measured,
- non-treatment sites as control samples against which to measure the significance of changes,

- measurement non-palatable species as controls if non-treatment sites were not used,
- better understanding of "natural" versus pest induced changes,
- consideration of understorey monitoring to achieve a whole system understanding.

684. With appropriate staff capacity and quality control, it is apparent that much of the methodology to undertake sound vegetation condition monitoring is available. Such monitoring has however generally been undertaken and approached on a project by project basis and an obvious need is for regional and national scale integrated monitoring to determine the achievement of biodiversity outcomes. In compiling and reviewing the 70 DOC reports Green (2003) has provided one such meta analysis but this approach needs to be extended and expanded to a structured meta analysis which is repeated at 5 to 10 year intervals if a true picture of the state of at least some components of indigenous biodiversity is to emerge. This would then be able to be linked back to inform ongoing priority setting and adaptive management called for by objective 9.4 of the Strategy. Data like this will be a key component of the development of a Natural Heritage Management System (NHMS) by DOC (see Objective 9.4 below).

685. ***Limited progress. Despite a significant amount of previous effort in this area, this has not been capitalized on because of various changes in priorities. We are not convinced that there has been any significant clarification of agency accountabilities for monitoring and reporting on indigenous biodiversity at any scale. There is wide variation in approach between agencies and little sign of the leadership that is required in this area. The comments reported in the 2004 MfE Indicator newsletter suggest to us that MfE does not consider the biodiversity indicator and monitoring area a priority (despite being named as lead agency for this objective). While this situation prevails limited progress at regional and national scales can be expected in this area. The draft indicator sets have provided guidance to regional councils for their own monitoring programmes (where these exist), but without a national focus and guidance that integrates and aggregates reporting obligations their significance and usefulness has been curtailed.***

**Objective 9.4 Reporting and adaptive management**
**Ensure that local, regional and national reporting on the state of indigenous biodiversity informs ongoing priority setting for biodiversity management and research as a key part of an adaptive management approach.**

686. This objective addresses the need for ongoing condition and trend monitoring of indigenous biodiversity and reporting, and the feedback of monitoring results to ensure appropriate changes are made to management and prioritization to ensure outcomes are achieved. Only one action was specified and this was considered to be a priority action although no Biodiversity Package funding was allocated.

**Action 9.4:**
**a) Use monitoring results to provide local, regional and national views on the state of New Zealand's indigenous biodiversity, to report on progress towards achieving biodiversity goals, review and re-focus management action, and inform research to fill critical information gaps.**

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|---|---|
| **Lead agencies:** | **MfE** |
| **Priority actions:** | **Yes** |
| **Funding:** | **Core only** |

687. New Zealand's first State of the Environment report was produced in 1997 and provides a baseline for some aspects of reporting on progress towards achieving biodiversity goals. However, the 1997 report is mainly narrative in approach and opportunities for quantitative repeatable measurement and reporting are limited in many areas. No territorial local authority or Department of Conservation conservancy has a purpose driven, systematic monitoring network that would enable changes in indigenous ecosystem extent and condition over the past 5 years to be reported on at the regional scale. Although there is no information directly relevant to the past 5 years, changes in the extent of indigenous ecosystems are discussed fully in Theme One. Many regional and district councils have produced State of the Environment reports (e.g., Rotorua District Council 2002) based on regionally-relevant environmental performance indicators.

688. The level of biodiversity monitoring, however, is extremely uneven across New Zealand. At least one regional council openly states they conduct no monitoring of terrestrial biodiversity (Hawkes Bay Regional Council 2004) and most others conduct minimal biodiversity monitoring or reporting for their district or region, as evidenced by their annual plans and reports. Several councils are beginning to grapple with issues of biodiversity monitoring and reporting. For example, Environment Southland monitors trend and condition of selected wetlands using the methodology developed by Sustainable Management Fund project 5105 'Coordinated monitoring of New Zealand wetlands' (Clarkson et al. 2003) and reports on this annually in their Annual Environmental Monitoring Report (Environment Southland 2004).

689. DOC is developing the Natural Heritage Management System (NHMS) – an integrated set of classification, decision support and inventory and monitoring tools that will support the conservation of natural heritage. The major achievements of NHMS to date are the completion of two pilot Measuring Conservation Achievement (MCA) projects. The first project piloted a wide range of tools and methodologies in the Twizel district and the second expanded on and developed further concepts and methods in the Maniopoto District. The reasons for the development of NHMS are given (in DOC 2005) as:
    - By 2010 DoC works more consistently, systematically and efficiently to sustain and restore New Zealand's indigenous Natural Heritage.
    - The Department is confident that the right work is being undertaken at the best places and real progress to highly valued outcomes is being made.
    - Staff know that they are doing the most important work and record the results of their work in an organisation designed to learn and improve.

- Accessible reports based on an understanding of environments and quality inventory and monitoring show:
  - The state of natural heritage can be quantified.
  - Where improvements have been made, recovery is underway or where research is being undertaken to answer critical questions about the state of natural heritage.
- The difference made by the Department and its systematic approach to conservation is identifiable

690. Thus, making NHMS fully operational would largely satisfy the requirements for objective 9.4 of the Strategy as it applies to DOC-administered lands and would result in a fundamental shift to an outcome based management approach. NHMS has the potential to be applied more widely, which requires buy-in at the development stage by collaborating with regional and district councils. Many of the components of monitoring and reporting required for NHMS to be successful are those described in other objectives (9.2 and 9.3) of the present Theme.

691. ***Limited progress. The level of biodiversity monitoring is extremely uneven across New Zealand and the systems or frameworks are not in place for adequately reporting on changes in biodiversity condition and trend at any broad regional or national scale within New Zealand. Methodologies to allow this are reasonably well developed (see Theme One) but key data requirements e.g., Land Cover Data Base are not provided for with any certainty. Without significant leadership and financial support from the Biodiversity Package or similar, it is likely that progress will continue to be limited over the full period of the Strategy.***

692. ***We see the overarching development of DOC's Natural Heritage Management System (NHMS) as critical to being able to measure progress in achievement of the outcomes specified by the Strategy and providing the adaptive management feedback loop necessary to adjust and refine management procedures. However, many of the building blocks required to operationalise this management system remain incomplete and the information technology software, hardware and capability required is currently inadequate. If it remains limited to the DOC-administered lands, the system will fail to provide a more useful measurement of regional and national progress towards achieving biodiversity outcomes. We would recommend including other government agencies in the development of NHMS as an integrated system for measuring conservation achievement on lands of all tenure.***

**Objective 9.5 Share Information and best practice**
**Consolidate and share existing and new information, methods, technologies and management experiences so that others can benefit from relevant knowledge about indigenous biodiversity.**

693. This objective addresses the need to breakdown barriers and impediments to effective sharing of biodiversity information, including newly developed information. This will

ensure that all agencies and groups have access to the best information and management techniques. Only one action was specified; this was considered to be a priority action and Biodiversity Package funding was allocated to set up the Terrestrial and Freshwater Information System (TFBIS).

**Action 9.5:**
**a) Develop resources and systems that promote the consolidation and sharing of information about indigenous biodiversity and hands-on biodiversity management.**

| | |
|---|---|
| **Lead agency:** | **MfE** |
| **Priority action:** | **Yes** |
| **Funding:** | **Core + Biodiversity Package** |

694. In June 2000 the Terrestrial and Freshwater Information System (TFBIS) Programme was established using Biodiversity Package funds. The purpose of the programme is to support biodiversity conservation by improving awareness of and access to fundamental data and information about terrestrial and freshwater biota and biodiversity held by government agencies and other organizations. The programme was allocated $9.6 million over the first five years and $2.71 million annually thereafter. A wide range of projects (at least 47 individual projects) has been funded by TFBIS to date. These can be grouped into six broad information categories. The associated number of projects funded in each is shown in brackets:
    - Digitise publications/species lists (5)
    - Digitise backlog/databases (17)
    - Miscellaneous digitized information (7)
    - Reports/Plans (9)
    - Hardware/software (3)
    - Restoration guides (6)

695. In reviewing the brief descriptions of the 47 individual projects funded by TFBIS, we felt that a minority were somewhat removed from achieving the outcomes desired by the Strategy and seemed more like core Public Good Science Fund (PGSF) activity. We believe some refinement in the extent and nature of end user involvement in the review and allocation process is required, in particular from the community group and hands-on user perspectives. The value of some products e.g., restoration guidebooks is immediately obvious but some of the products seem to be most valuable to researchers rather than to those actively involved in protection and restoration.

696. MfE has partly funded the Land Environments of New Zealand (LENZ) spatial framework and, as noted earlier, distributed this product free of charge to all local authorities. This information will also be made more widely available to iwi, sector groups, communities and landowners. We have no data on the extent to which the LENZ spatial framework has been taken up and used by local authorities. Several contract reports commissioned by regional or district councils and by the Department of Conservation (e.g., Walker et al. 2004; Clarkson & Downs 2002) have utilized LENZ as

a spatial framework for considering significance of indigenous vegetation for planning or resource consent purposes under the Resource Management Act 1991.

697. Beginning in 2000, the Department of Conservation has been developing a biodiversity platform to hold biodiversity inventory data for access by Department staff and with the ability to transfer data sets to local authorities and others with Geographic Information System (GIS) capability. The system is now widely used within and outside the Department with external use reaching a monthly average of 1850 discrete hits with each visit averaging 180 hits indicating a considerable number of queries are occurring at each visit.

698. The development of NABIS (see Action 9.2 above) is relevant to this action point.

699. Also relevant to this action point are the efforts of Crown Research Institutes (funded by the PGSF) in making their indigenous biodiversity databases more accessible. Examples include Landcare Research's National Vegetation database and New Zealand Plant Names database. These and many others have become accessible over the web in recent years and contain information relevant to groups interested in maintaining and restoring indigenous biodiversity. We also note the large amount of information now being made available on the World Wide Web by groups such as the New Zealand Ecological Restoration Network (NZERN) on a voluntary basis.

700. ***Substantial progress. A large amount of data and information is being made accessible to parties interested in maintaining and restoring indigenous ecosystems. Our impression is, however, that the information providers may have too much influence on this action point and we are not convinced that some of this work which seems to be core Public Good Science Fund activity should be funded from this source. We would encourage a greater level of involvement from potential users of the information in the decision-making on the nature and type of data and information that should be made more accessible. This would ensure greater usefulness of the information for end user (including community group) biodiversity outcomes.***

**Objective 9.6 Build capacity**
**Enhance the capacity of people and organisations to fulfil their responsibilities to conserve and sustainably manage New Zealand's indigenous biodiversity.**

701. This objective addresses the issue that many organizations lack the capacity to address biodiversity issues in their work programmes and communities, iwi, hapu and businesses also encounter difficulties in getting access to the skills, people, resources, tools and methods to manage indigenous biodiversity or their effects on it. Four action points were specified, but none was considered a priority and none was allocated Biodiversity Package funding.

**Actions 9.6:**
**a) Document codes of practice and expected performance standards for use of the most cost effective techniques for managing biodiversity and provide for the evaluation and continuous improvement of these techniques and the sharing of information on best practice.**
**b) Incorporate biodiversity values into sector- and industry-based environmental management systems, performance standards, guidelines, environmental policies and codes of practice, with the help of advice and information from government agencies.**
**c) Ensure that biodiversity management agencies review and monitor their capacity to implement best practice management techniques, enhance their competencies and share these experiences with others.**
**d) Ensure appropriate skills training and education to enhance the capacity of people and relevant management agencies to manage indigenous biodiversity.**

| | |
|---|---|
| **Lead agency:** | **MfE** |
| **Priority action:** | **No** |
| **Funding:** | **Core only** |

702. While no Biodiversity Package funding was committed to this objective, a wide range of formal and informal activities have occurred across the country. However, the data we have been provided with gives only individual or local "success stories" making it very difficult to adequately gauge regional or national progress. In particular it is difficult to determine the degree to which best practice is disseminated and embedded into relevant agencies or organizations.

703. After the launch of the Biodiversity Strategy in 2000, the Ministerial Advisory Committee on Biodiversity on Private Land (MAC 2000) recommended specific measures be taken to build the capacity of local government to deliver biodiversity outcomes. The resultant Action Bio-community Programme was sponsored by Local Government New Zealand and funded through the Sustainable Management Fund (SMF 9042, SMF 9054) between 2001 and 2004. One focus of the programme was enhancing capacity on the ground which was intended to strengthen opportunities for exchange and learning between projects, partnering with other funders and support the development of networks and communities of practice. A biodiversity management toolbox was also created (www.biocommunity.org.nz) and is a valuable resource kit for local government staff and their associates (Action Bio-community 2004). The programme is no longer funded.

704. Several universities and polytechnics offer courses and workshops designed to assist agencies and community groups to gain training and skills relevant to ecosystem management; for example, flora and fauna identification, ecology including restoration ecology.

705. Several councils have education centres and/or programmes that contribute to capacity building for biodiversity outcomes. A wide range of funding sources including the Biodiversity Advice Fund, council funding and Charitable Trust grants supports environment centres in several parts of the country. These provide networks which

provide access to information and expertise and enhance capability by sponsoring training and workshops that can be directly relevant to biodiversity issues.

706. As noted in Theme One, the MfE-administered Sustainable Management Fund has supported many projects especially in the funds maintaining and restoring biodiversity topic area which assist in knowledge dissemination and capacity building. A specific example of relevant capacity building is the development of the Forest Monitoring and Assessment Kit (supported by SMF funding) and its subsequent dissemination and training workshops. Similarly, the 16 LENZ workshops sponsored by TFBIS attracted 345 attendees and the majority feedback from attendees was very positive. The attendance at those was predominantly central, regional and local government but all sectors were represented. Areas of interest were predominantly resource management and conservation, with science policy, restoration and biosecurity also mentioned.

707. DOC began work on a workforce capability strategy in 2003/04 to ensure that in the future appropriately trained staff are available to deliver conservation outcomes including those relevant to the Biodiversity Strategy. The draft strategy indicates changing priorities for DOC's future work and these are largely aligned to aspects of the Strategy, in particular, the need balance the demands of conserving while fostering access for the public and allowing for business interests to develop, working more closely with tangata whenua, and engaging communities and other stakeholders as DOC recognises it cannot meet desired outcomes on its own.

708. ***Moderate progress. The early signs of development of capacity and sharing of best practice were evident especially in the Action Biocommunity programme but these are still not adequately embedded into the activities of all the agencies which have responsibilities and interests in achieving the biodiversity outcomes identified in the Strategy. We lack evidence of significant leadership in this area, with most advances coming from un-integrated, one-off projects. These are seemingly unrelated to the development of the Strategy and without direct Biodiversity Package support.***

**Objective 9.7 Valuing biodiversity**
**Improve the knowledge of market and non-market values of indigenous biodiversity and develop methodologies to evaluate the full cost of activities in terms of their impacts on these biodiversity values.**

709. This objective addresses the problem that in many cases the true value of biodiversity is not accounted for in the market because most of the benefits of biodiversity are considered externalities with low or zero market value. Two action points were specified but neither was considered a priority action and no Biodiversity Package funding was allocated.

**Actions 9.7:**
**a) Review mechanisms that have been used in other countries to value biodiversity, and where practicable, develop ways to apply these techniques in New Zealand.**
**b) Investigate and raise awareness of the range of incentives (including financial, information and property-based mechanisms) which resource managers can use to encourage and reward sympathetic management of indigenous biodiversity (see also Actions 1.1e, 1.1f and 2.1e).**

| | |
|---|---|
| **Leady agency:** | **DoC, MfE** |
| **Priority action:** | **No** |
| **Funding:** | **Core only** |

710. The recently completed 2003/04 FRST Natural Ecosystems funding round saw one relevant research project Eco-Services for Iwi supported ($399,274 per year for 4 years). A compilation of existing research on the ecosystems services concept, the theoretical basis for ecosystems services, the state of global ecosystem services, ecosystem services valuation methodologies and data, and markets for ecosystem services, are the intended early products of this research. As the research is at a very early stage no applications relevant to biodiversity outcomes can be expected at this time.

711. A 2000 New Zealand Treasury Working Paper (Clough 2000) reviewed the experience with incentive measures from around the world. Criteria for analyzing the success of incentive measures were identified but no detailed examination of mechanisms or application was undertaken. A wide range of incentives could be grouped into the following five categories:
    - Conservation management agreements and fixed period contracts between conservation agencies and individual landholders over defined areas of land.
    - Purchase of partial interests in land, such as easements or covenants, either directly from landowners, or by conservation agency purchase and resale with a covenant attached.
    - Purchase of freehold interest in land and subsequent management by a conservation agency or voluntary body.
    - Restricting landholder development rights and allowing them to trade residual entitlements.
    - Establishing proprietary rights in wildlife products.

712. The review by Clough indicated that many of these categories were already in use in New Zealand although concern was expressed that some incentive instruments in use can be poorly targeted for conservation purposes. As outlined by Clough (2000), the voluntary nature of many incentive schemes entails a degree of self-selection, depending on helping those who are predisposed towards conservation to achieve more. However, this alone will not ensure the most important sites are brought under suitable management, and in order to protect more critical sites some more costly measures may be required.

713. A positive attitude towards habitat conservation cannot be relied upon as substitute for offering landholders economic incentives adequate to recompense both the market and non-market costs they incur for conservation (van Kooten & Schmitz 1992). The current

situation is discussed in Theme One under Action 1.1 e and Theme Two.1 e. In brief, the Biodiversity Package has expanded national funding mechanisms thereby increasing the area of indigenous ecosystem protected and the representativeness of the reserve network. But rare ecosystems and important sites are still being destroyed and appropriate selection criteria, although being increasingly used to guide selection, are not always predominant (see Theme One).

714. ***Limited progress. This field of inquiry (valuing ecosystem services) is clearly well developed elsewhere in the world but New Zealand appears to be lagging behind. For this approach to be successful, however, a significant shift in methodologies for valuing and managing biodiversity and ecosystem resources compared to the current economic (market-driven) models would be required. The use of financial incentives and voluntary protection mechanisms is increasing the extent and representativeness of the reserve network, but economic drivers are still leading to the irreversible loss of high value indigenous ecosystems in many parts of the country (see Theme One)***

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# THEME TEN. INTERNATIONAL RESPONSIBILITIES

Caption: Young Emperor penguins on Dumont d'Urville, Antarctica. New Zealand's direct involvement with international responsibilities for biodiversity extends from the cold of Antarctica to the tropical islands of the Pacific – and beyond.

**Theme Ten: New Zealand's International Responsibilities**
**New Zealand's international role and responsibilities in terms of the conservation and sustainable use of global biodiversity.**

**Desired outcome for 2020**
**New Zealand has a visible and effective international role in seeking to ensure improved biodiversity management globally by participating in international forums, sharing information and expertise, and fostering bilateral and multilateral cooperation in biodiversity conservation efforts.**
**New Zealand has an active role in biodiversity conservation in surrounding marine areas, the Southern Ocean, and Antarctica.**

## Stocktake of progress on Theme Ten

715. The International Forums and Treaties theme was not allocated any Biodiversity Package money and only one of the seven actions was considered a priority. The priority action relates to continuing support, through the New Zealand Agency for International Development (NZAID), for the Secretariat for the Pacific Regional Environmental Programme (SPREP). This particular action also provides the only reference to Theme Ten in the 'strategic priorities' section of the Strategy where it features in the context of managing our biosecurity risks offshore by assisting small island countries 'to increase their capacity for biosecurity management' (page 128). One question for the reviewers was whether this low level of priority for international engagement on global conservation and sustainable use of biodiversity remains an appropriate ranking.

### Progress on international participation

716. Over the past 5 years there has been increasing participation by government agencies in international forums and involvement with international conventions as per the first objective. Some of this involvement is discussed in the following sections and has been referred to under other themes (see 3.7 and 5.2). Through this involvement New Zealand has helped achieve valuable gains on issues such as the reduction of seabird bycatch in the Southern Ocean. The Convention on Biological Diversity (CBD) remains the leading biodiversity convention requiring New Zealand engagement. We are of the view, however, that the level of resourcing put into the Clearing House Mechanism of the CBD falls short of what New Zealand could effectively contribute, given its expertise and the CBD emphasis on technology transfer, exchange of information, and technical and scientific cooperation.

717. An international issue that is clearly requiring greater consideration is assessing the impacts of climate change on biodiversity and the development of adaptation responses for biodiversity. There has only been preliminary work done on this topic in New Zealand and it has yet to feature as an integral part within the New Zealand climate change policy package.

718. ***We recommend therefore, that a new objective and actions are added to the Strategy to consider climate change impacts on biodiversity – both indigenous and valued introduced biodiversity. We have made the point in earlier theme chapters that climate change will have diverse impacts, especially when planning for adaptation responses. These considerations need to be added to appropriate themes in the Strategy as it moves into the next phase of implementation.***

719. As an international issue climate change would benefit from greater cooperation across the relevant expertise within the CBD and the UN Framework Convention on Climate Change (UNFCCC). Other conventions also have roles to play in contributing to a better understanding of policy and adaptation implications of climate change impacts on biodiversity. Achieving these synergies is proving difficult and expensive, partly because of duplication of efforts.

720. We also suggest that more is required to advance Action 10.1d) – the development of mutually supportive trade and environmental policies.

721. A recent international scientific assessment (MEA 2005) showed declines in the condition of most global ecosystems on which human wellbeing ultimately depends. Through the UN, the international community has committed to a set of Millennium Development Goals (MDG) that includes environmental targets. The message is that international development agendas and environmental agendas are increasingly linked although they have historically been treated separately.

722. From this perspective we propose that it is timely to undertake a strategic review of New Zealand's approach to its international engagement on biodiversity issues in a wider international development context. While international participation in relevant forums and treaty systems will obviously continue to be of primary importance, there are new opportunities emerging to promote inter-country cooperation (Objective 10.2). For example, the recent advances in rodent control techniques and species recovery have global relevance, as do New Zealand's approaches to biosecurity systems. These could be 'sold' more widely and enhance New Zealand's international reputation as well provide real benefits for the biodiversity of other countries.

723. ***In summary, given the continued deterioration of global natural systems, with the increasing risks to political, economic and social security, we suggest that the priority ranking for international engagement on global conservation and sustainable use of biodiversity within the Strategy should be reviewed and raised to a higher level.***

## Table 10. Summary table of progress in Theme Ten

| **Summary of progress on Theme Ten action points (2000-2004)** | | | | |
|---|---|---|---|---|
| | **Priority action** | **Extra funding** | **Progress to date** | **Future priority?** |
| **Objective 10.1 International forums and treaties** | | | | |
| 10.1a Input to CBD and other treaties | No | No | Moderate | High |
| 10.1b Review treaty implementation | No | No | Limited | Medium |
| 10.1c International negotiations | No | No | Moderate | Medium |
| 10.1d Trade & environment links | No | No | Limited | High |
| **Objective 10.2 Inter-country cooperation** | | | | |
| 10.2a International collaboration | No | No | Limited | Medium |
| 10.2b NZAID and SPREP links | Yes | No | Substantial | High |
| 10.2c Between country cooperation | No | No | Limited | High |

## Introduction

724. The tenth and final theme in the Strategy addresses New Zealand's international role and responsibilities, focusing both on the contribution New Zealand can make to global conservation and the sustainable use of biodiversity as well as using international opportunities to further national goals for biodiversity conservation. Other actions on international initiatives are covered in Theme Three (Objective 3.7) and Theme Four (Objective 4.2). Some aspects of biosecurity actions also have an international component. This theme was a relatively low priority with only one priority action out of seven actions in total with no extra money from the Biodiversity Package.

## Analysis of objectives and actions

**Objective 10.1 International forums and treaties**
**Contribute towards the international effort to conserve and sustainably use global biological diversity through participation in relevant international forums and treaty systems.**

725. Over the last 20 years there has been a proliferation of conventions, treaties and agreements (international and regional) addressing environmental issues. These initiatives have become increasingly linked to sustainable development initiatives, including poverty eradication programmes and targets. For example, the outcomes of the 2002 United Nations Conference on Sustainable Development and the UN Millennium Development Goals (also 2002) have specific targets relating to environmental sustainability. At the same time, there is recognition that the high aspirations of the 1992 Earth Summit have not led to the concerted global action that is required to halt environmental degradation and over-exploitation of natural resources. In 2005, the serious global deterioration of ecosystems and the linkages to human well-being were comprehensively reported on by the Millennium Ecosystem Assessment (MEA 2005). This major international scientific undertaking to assess the global 'state of the environment' has underscored the urgency of significant changes in policies, institutions and practices that are needed to reverse the degradation of ecosystems that contribute to net gains in human wellbeing and economic development.

**Actions 10.1**
**a) Promote and coordinate credible, constructive and sustained government agency involvement in international organisations, programmes and activities to fulfil New Zealand's obligations and responsibilities under the Convention on Biological Diversity and related treaties.**
**b) Review implementation of those international treaties relevant to the conservation and sustainable use of biodiversity to which New Zealand is a party.**
**c) Participate in international negotiations, in priority areas for New Zealand as appropriate, on the development of new international environmental instruments relevant to the conservation and sustainable use of biodiversity, such as the negotiation of a Biosafety Protocol to the Convention on Biological Diversity.**
**d) Promote the development and use of mutually supportive trade and environmental policies for the conservation and sustainable use of biodiversity in international trade and other forums.**

| | |
|---|---|
| **Lead agencies:** | **Ministry of Foreign Affairs and Trade** |
| **Priority actions:** | **None** |
| **Funding:** | **Core only** |

It is not within the capacity of this review to evaluate the effectiveness of New Zealand's engagement with the various treaties, conventions and other international initiatives. We will briefly comment on New Zealand's involvement with the major conservation agreements before suggesting new areas that deserve consideration and proposing a re-evaluation of international priorities in a wider contemporary context. None of the actions within 10.1 were given priority ranking and no additional funding was provided.

### Major biodiversity agreements and involvement

726. The most comprehensive convention under which New Zealand has biodiversity obligations is the Convention on Biological Diversity (CBD) as noted in Action 10.1a. New Zealand has ratified the Convention and has been actively involved in most of the core meetings of the Convention: the Conference of the Parties; the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA); working groups; and inter-sessional meetings. New Zealand has hosted ad hoc technical expert group meetings on marine and coastal protected areas, and on international law aspects of invasive alien species. The CBD also includes articles relating to transfer of technology, exchange of information, and technical and scientific cooperation that we cover in our discussion of Objective 10.2.

727. As a Party to the CBD, New Zealand has also agreed (in 2002) to the first global plant conservation strategy. It includes 16 time-related targets to be reached globally by 2010. These include recovery plans, training and awareness programmes, and for 30% of agricultural practice to recognize nature conservation principles. We are not aware of what specific initiatives have been taken by government agencies to advance these targets. We do note under Theme One, work on recovery plans for threatened species.

728. New Zealand participates in meetings of the Biosafety Protocol to the Convention on Biological Diversity (the Cartagena Protocol on Biosafety), to which it became a party in

2005. This protocol addresses the safe transfer, handling and use of living modified organisms (LMOs) that may have an adverse effect on biodiversity, taking into account human health, with a specific focus on transboundary movements. The Protocol entered into force in September 2003.

729. Obligations regarding the trade of threatened species flow from the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) that New Zealand ratified in 1989. New Zealand is a Party to CITES with DOC having lead responsibility for meeting the obligations. A report by the Auditor-General (2001) concluded that New Zealand's international obligations under CITES were being successfully fulfilled. We consider this is still the case and note that New Zealand has been assisting Pacific island countries with training of border staff in CITES procedures. Pacific island countries have limited capacity to meet CITES requirements and New Zealand assistance can be a significant benefit to them. Some risks were identified by the Auditor-General concerning New Zealand being used as a laundering point for the legal export of illegally obtained non-native, CITES-listed birds.

730. Other threatened species issues, such as seabird by-catch, are also being addressed via the Convention on Migratory Species (CMS) that New Zealand ratified in 2000. In recent years New Zealand has become more active under the CMS and related agreements as we reported under Theme Three, Objective 3.7. The major focus has been on seeking international support to reduce the destructive impacts of fishing methods on seabird populations, many of which are now seriously threatened.

731. The Convention on Wetlands of International Importance (the Ramsar Convention) covers all aspects of wetland conservation and wise use and was ratified by New Zealand in 1976, but without the formal designation of a lead agency. A report by the Auditor-General (2001) concluded that while New Zealand was generally meeting the specific obligations of the Convention, the measures that had been taken had "…*failed to arrest the continuing degradation of wetlands*" and that this was "…*especially true in respect of privately owned land*." (Auditor-General 2001, page 15). We elaborate on problems regarding the implementation of the Ramsar Convention for wetland protection under Theme Two, Action 2.1g.

732. International marine conservation issues are covered by a number of agreements. The United Nations Convention on Law of the Sea includes an obligation on each nation state "to preserve and protect the marine environment" (Article 192). New Zealand has been actively involved in a related process, the United Nations Informal Consultative Process on the Law of the Sea (UNICPOLIS). In 2004, this led to Cabinet approval of a strategy aimed at securing improved international protection of biodiversity on the high seas, particularly seamount protection from the impacts of bottom trawling and the creation of high seas marine protected areas. New Zealand and Australia intend to start formal discussions on a new Regional Fisheries Management Organisation (RFMO) to address a significant gap in international fisheries management in the South Pacific Ocean and Tasman Sea. A key objective for such an agreement will be to address the adverse impacts of fishing on marine biodiversity.

733. The main biodiversity agreement that is focused on the Southern Ocean and Antarctica is the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR). Whales and seals are not covered by CCAMLR. New Zealand is active within CCAMLR, has implemented its conservation measures, is promoting the marine protected area concept and is working on a revised marine protected area proposal for the Balleny Islands. New Zealand has also been leading the efforts to mitigate seabird by-catch from long-line fishing in the Southern Ocean (see also Theme Three, Objective 3.7). Much of this serious and on-going loss of seabirds is associated with long-lining for toothfish (*Dissostichus* spp.), the extent of which is also putting the sustainability of toothfish populations at risk. Much of the damage to fish stocks and seabirds comes from illegal, unregulated and unreported (IUU) fishing. New Zealand led conservation initiatives within CCAMLR that now include a prohibition on the dumping of offal, a requirement to use tori lines while fishing, a prohibition on fishing within 10 nautical miles of 22 identified seabird breeding sites and a prohibition on fishing within 50 nautical miles of the Balleny Islands. New Zealand's international efforts to conserve whales and other cetaceans have been covered under Theme Three, Objective 3.7.

734. New Zealand has significantly increased its activities with the World Heritage Convention in the past few years. Since 2004, New Zealand has been a member of the World Heritage Committee and a member of the 7-country Bureau of the Committee. New Zealand is in the process of preparing its 'tentative list' of potential World Heritage sites. In 2004, New Zealand hosted a successful Pacific World Heritage workshop to establish a programme of work for natural areas in the Pacific. World Heritage listings carry international prestige and can provide benefits leading to the protection of biodiversity.

**Other international forums**

735. In addition to the schedule of meetings associated with conventions, treaties and regional agreements, there are other growing opportunities to engage with countries and organisations on global biodiversity initiatives. These are not signaled very well in the actions under Objective 10.1. They include, for example, the 10-yearly 'Parks Congress' gatherings and the 4-yearly World Conservation Congress events, both under the aegis of the World Conservation Union (IUCN). There is considerable potential for New Zealand to contribute to, and benefit from, these major international gatherings.[74] New Zealand did participate in these specific meetings with representation from government and NGOs. An increasing number of partnerships are being formed between donor agencies, large international NGOs and countries to address specific conservation and development issues that increasingly link the two objectives within this theme, but in more complex ways than was the case some years ago.

[74] The Third World Conservation Congress, held in Bangkok in November 2004, was attended by about 5,000 delegates from over 100 countries. The Parks Congress meetings have similar numbers of participants and help to guide the international agenda for advances in protected areas management.

736. As we note at the end of this section, there are new strategic opportunities for making better use of New Zealand's particular expertise in biodiversity management and it is important to consider these new options for international engagement in partnership with other organisations. For example, IUCN is expanding its offices and programmes in Asia (from where 500 regional Secretariat staff are managed) and opened a Pacific office in Fiji in October 2005. These are regions that are also the focus of the environmental component of the NZAID initiatives (see discussion under Objective 10.2), along with Latin America.

**Climate change and trade links to biodiversity**

737. Despite New Zealand's engagement with various international initiatives there are two areas where the conservation of biodiversity requires greater promotion than it receives at present.

738. The first of these relates to regional and international discussions on climate change issues as they relate to biodiversity. Discussions within the UN Framework Convention on Climate Change (UNFCCC) initially paid little attention to the potential impacts of climate change on biodiversity. The primary focus was on identifying ways to reduce the human contributions to rising global temperatures (mitigation) and 'adaptation' (actions to primarily assist vulnerable developing countries to cope with and adapt to the inevitable effects of climate change).

739. What is also needed, however, along with the mitigation and adaptation options being developed for different countries (e.g. Orlando et al 2002) is a better national and international understanding of climate change impacts on marine, terrestrial and freshwater ecosystems and species. Preliminary research indicates that these changes can be profound, with far-reaching consequences for management agencies as well as for communities that are dependant on local resources for their livelihoods. For example, many protected areas are managed on the assumption that the distribution and composition of species will not substantially change while, in practice, many may be ill-equipped to adapt to rapid climatic changes (Dudley 2003).

740. A technical paper from the Inter-governmental Panel on Climate Change (IPCC) concluded climate change is already affecting biodiversity and is likely to exacerbate existing pressures, such as habitat loss, over-harvesting and invasive species (Gitay et al 2002). An Australian workshop on climate change impacts on biodiversity reported effects ranging from coral bleaching to anecdotal evidence that rats on sub-Antarctic Macquarie Island now have two litters per years instead of one (Howden et al 2003). Existing data showing that climate change is already affecting species has come almost exclusively from the Northern Hemisphere, via traditions of long-term monitoring of the distribution, abundance and life-cycles of several groups of organisms. We are not aware of any similar data sets existing for New Zealand

741. Parties to the CBD have called for strengthened collaboration between the two conventions on the impact of climate change on biodiversity and for the integration of

biodiversity considerations into the implementation of the UNFCCC and its Kyoto Protocol. A working party representing the two conventions is now examining these issues.

742. New Zealand could contribute to regional and international fora to improve the understanding of climate change impacts on biodiversity and adaptation responses. However, New Zealand has yet to explicitly consider the potential impacts of climate change on biodiversity within its own climate change strategy. Cabinet has agreed that adaptation is a necessary part of the climate change policy package (CAB (02) 13/12), but it does not specifically spell out biodiversity issues. In 2001, a generic report was commissioned by MfE to look at the links between climate change and biodiversity (McGlone 2001). This report concluded there would be 'inevitable impacts' on indigenous biodiversity and ecosystem functioning with existing stresses being further strengthened by ongoing climate change. A number of policy implications and research initiatives were identified, but have not been subsequently advanced. Other work within DOC has also identified the need to consider climate change impacts, at least with respect to how DOC might better prepare for extreme climatic events in the future (McFadgen 1999)

743. Given the increasing evidence for global warming and climate change impacts since the Strategy was developed, it would be highly appropriate to bring consideration of the potential impacts of climate change on biodiversity into the Strategy. We recommend this be done through the addition of a new objective and related actions. There may be useful linkages to be made between this proposal and advancing work on the New Zealand climate change strategy, especially with respect to adaptation implications.

744. The second area where greater promotion of biodiversity is needed is in Action 10.1d – the development of "mutually supportive trade and environmental policies for the conservation and sustainable use of biodiversity". While the Ministry of Foreign Affairs and Trade (MFAT) is designated as lead Government agency for all actions under Objective 10.1, technical expertise in biodiversity resides with other ministries and departments. For example, MfE now has four FTEs working in the area of trade agreements and ensuring environmental aspects are covered. Good cooperation between agencies is therefore required in developing policy as well as delegation briefs to international meetings. We have received little information to indicate that conservation and biodiversity considerations are an integral part of appropriate trade discussions and trade agreements. We have been told that recent trade agreements have provision for explicit biosecurity controls, which is one relevant consideration.

**A more strategic approach**

745. Despite the increase in the amount and range of activities that have taken place in the past 5 years, it is timely to ask whether the past focus and low level of priority for this theme

746. International developments in the past 5 years include:

- a greater linkage between biodiversity issues and poverty alleviation/development objectives;
- increasing recognition that environmental sustainability underpins poverty elimination as well as development in general;
- a scientifically documented worsening in the condition of global ecosystems and of threatened species;
- growing expertise within New Zealand in conservation/species management, ecological restoration techniques and pest management;
- increasing damage to indigenous biodiversity from invasive species and climate change effects;
- a rise in the number and complexity of partnerships between countries, donors, communities and large NGOs to tackle biodiversity challenges, often in a development context,
- stronger voices by countries with common interests, such as the SIDS (Small Island Developing States), on development and environmental issues,
- growing pressures on biodiversity and biosecurity from the globalization and growth of trade and various trade agreements;

within the Strategy is still appropriate for the next period of implementation.

747. These developments point to a worsening state of the biosphere and a corresponding need for greater action and commitment to address the problems by the world community. Ongoing environmental degradation is already having political, economic and social consequences. New Zealand's growing expertise in a number of critical areas of biodiversity conservation means it has skills that are valuable in a wider global 'market' than they are being applied to at present.

748. Since we have not been informed if any initiatives have been taken under Action 10.1b (Review implementation of international treaties….) we suggest it would be timely to undertake a broader reassessment of New Zealand's international engagement with biodiversity forums and treaties linked to a consideration of inter-country initiatives (Objective 10.2). This could make more explicit the linkages between New Zealand expertise in biodiversity conservation and how it could contribute to meeting the government's sustainable development and poverty elimination goals (NZAID 2005).

749. For example, DOC's operational and technical expertise in rodent eradication from islands, in threatened species recovery, and integrating conservation with protected areas management is recognised and respected internationally. While this expertise has been applied to Pacific island countries linked to SPREP, DOC is not funded to do the same for the Galapagos Islands that is home to globally significant, highly threatened biodiversity and is also in the Pacific. There are many biologically diverse islands in other regions that could also benefit from New Zealand expertise, either through direct applications, secondment options or the establishment of training courses.[75] Our

[75] DOC has not established any regular training courses catering for overseas participants, although previous departments, such as Lands and Survey did so. Development agencies often fund training programmes for developing country personnel.

'biodiversity aid opportunities' could be tied more strongly to activities that would make more effective use of New Zealand skills and knowledge than is being achieved at present.

750. We appreciate that DOC is not currently funded to provide these 'international services', nor has it been in the past. Nor are we suggesting that it would be appropriate to divert current departmental resources to provide for an expanded international role. A more strategic approach, coupling both biodiversity priorities and development assistance considerations, may well reveal cost-effective benefits and opportunities beyond New Zealand's current international involvement.

751. ***Moderate progress. New Zealand has been actively involved with a growing number of international treaties and meetings relating to biodiversity in the past 5 years. Foremost is activities concerning the Convention on Biological Diversity, but other involvements cover trade in endangered species, wetlands protection (but with some shortcomings – see Theme Two), marine and Antarctic conservation. In April 2002, Parties to the CBD agreed on the first global plant conservation strategy. It includes targets to be reached by 2010, including by New Zealand although we are not aware of specific initiatives that have been taken in this context.***

752. ***Issues that require more consideration are extending climate change policy to consider the impacts of climate change on biodiversity and the development of 'mutually supportive trade and environmental policies'. In particular, we recommend that a new objective and actions be added to the Strategy to consider the impacts of climate change on both indigenous and valued introduced biodiversity. This additional objective should also make a contribution to the New Zealand climate change strategy. There are linkages between this recommendation and future actions needed in other themes as well.***

753. ***We believe it is timely to review New Zealand's approach to its international engagement on biodiversity issues. While there are emerging priorities within the existing biodiversity treaties, including the CBD, there are also new opportunities for partnerships with international organisations, such as IUCN, given the growing recognition that environmental well-being underpins human health and development potential. The linkages between the two objectives within this theme could be strengthened.***

**Objective 10.2 Inter-country cooperation**
**Seek continued and effective cooperation and support for the conservation and sustainable use of biological diversity, directly between governments and through people-to-people cooperation.**

754. The 'on-the-ground' aspects of international efforts for conservation and sustainable use of biodiversity ultimately succeed or fail at the level of governments and with communities and individuals. Objective 10.2 is the vital 'implementation' follow-up phase of objectives and goals that are set via international forums and agreements. As

such this objective links to implementation elements of the CBD (Action 10.2a). It also links to development initiatives of the New Zealand Agency for International Development (NZAID) as well as the regional environmental organisation for the South Pacific – the Secretariat of the Pacific Regional Environmental Programme (SPREP).[76] Continuing to work with SPREP (Action 10.2b) was the only priority action within this objective and theme.

**Actions 10.2**

**a) Enhance New Zealand's information exchange and collaboration internationally in biodiversity science, research and technology through the use of the Internet Clearing House Mechanism (CHM), travel grants, and involvement in relevant international and regional organisations.**

**b) Continue to promote policies and programmes for New Zealand's Overseas Development Assistance and the South Pacific Regional Environmental Programme (SPREP) for environmentally sustainable development in partner countries, with priority given to assisting developing and small island countries in the Asia-Pacific region to identify environmental priorities and increase their capacity to conserve and sustainably use biological diversity.**

**c) Cooperate and work with other countries on biodiversity issues of mutual concern and in areas in which New Zealand has particular expertise or needs, such as research on shared taxa, threatened species management and recovery, prevention and elimination of invasive species, biological restoration techniques, and biodiversity assessment.**

**Lead agency:** **Ministry of Foreign Affairs and Trade, DOC**
**Priority actions:** **Action b) only**
**Funding:** **Core only**

### International co-operation and collaboration

755. A central component of the work that Parties agree to undertake within the Convention on Biological Diversity is to assist other countries, especially developing countries, by assisting with technology transfer (CBD, Article 16), exchanging information (Article 17), and promoting international technical and scientific cooperation (Article 18). The Clearing House Mechanism (CHM) is the CBD structure that promotes and facilitates technical and scientific cooperation and requires each Party to establish a national focal point.

756. The New Zealand Focal Point is provided by DOC through, we understand, the 5% time allocation of a policy position. Much has been done in answering enquiries, producing material for other countries, engaging in various taxonomy initiatives etc. However, our overall impression is that this work is not receiving the resources and support that are required. In the context of the threats to biodiversity, for example on islands throughout the world (where many species are endemic), and the match to the technical skills to those in DOC and other agencies, New Zealand is in a unique position to make a more significant and valuable contribution than it does at present.

[76] NZAID replaces "New Zealand Overseas Development Assistance" (Strategy Action 10.2b), while SPREP used to stand for "South Pacific Regional Environmental Programme".

757. The global threats to biodiversity, matched against our comparative expertise, indicate that the priority international initiatives for assisting other countries with biodiversity conservation are well captured by the list at the end of Action 10.2c.[77] To that list we would only add 'management of visitor services' which is usually an integral part of funding the management of protected areas and is often poorly managed in developing countries.

758. If the actions under Objective 10.2 were treated more as an integrated package then more could be achieved than is presently the case under different lead agencies. DOC, in conjunction with NZAID, is well positioned to assist with delivering such a package, subject to additional resources. It has key technical skills to support some of the 'Areas of Focus' within the draft 'NZAID Policy for Environment in International Development' (NZAID 2005).[78] These include expanding access to environmentally sound and locally appropriate technologies that conserve biodiversity and provide tools and technologies for managing invasive alien species. NZAID is already providing important assistance to the Cooperative Islands Initiative to tackle invasive species issues in the Pacific and has maintained this focus for a number of years through its support for core staff positions in SPREP. This targeted support to SPREP is paying dividends and is helping to build capacity within countries to better manage their biodiversity.

759. Action 10.2c has generic relevance and logically feeds into other actions within Objective 10.2 as well as Action 10.1a. We have covered these considerations in our discussion under Objective 10.1 – "A more strategic approach". Initiatives taken within Action 10.2c should be within a framework of assisting with capacity building for developing countries. New Zealand has already developed a number of relevant initiatives within this context. These include, for example, Southern Oceans Solutions to address seabird by-catch (Theme 3.7), the development of an ant prevention plan for the Pacific, which will help New Zealand's biosecurity as well (Theme 5.2), and the Cooperative Islands Initiative (Theme 10.2). These have been cost-effective actions to address major priority issues with economic as well as biodiversity benefits. We would repeat our earlier comment that one area where New Zealand could make a significant contribution to international efforts in capacity building for biodiversity management is in providing training opportunities and courses. These could be in New Zealand or in-country in response to country or donor requests.

760. ***Moderate progress. New Zealand's main effort within this objective has been the continuation of its engagement and support of the Secretariat of the Pacific Regional Environmental Programme (SPREP). This level of support is appropriate, given New Zealand's area of focus in the Asia/Pacific region. Use of the Clearing House Mechanism of the CBD offers greater opportunities for international involvement than***

[77] These are: "research on shared taxa, threatened species management and recovery, prevention and elimination of invasive species, biological restoration techniques, and biodiversity assessment". (NZ Biodiversity Strategy, page 119).

[78] Although this is a draft policy document (as of October 2005) we believe it outlines an accurate and timely approach to embedding environmental considerations in international development assistance.

***it has been used for so far. Opportunities for cooperation with other countries and international organisations have increased considerably and provide valuable opportunities to contribute New Zealand's considerable skills in biodiversity management on a wider global scale than is done at present with limited resources. The draft 'NZAID Policy for Environment in International Development' provides a useful mechanism as a basis for building stronger linkages between NZAID and departments with technical skills in biodiversity management. Our proposal (above) for a review of New Zealand's approach to international biodiversity issues would include the actions within Objective 10.2.***

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