

Box 2.1 Lake protection

Lake Taupo

Lake Taupo is *New Zealand's largest lake* (623 km²; 45 km wide and 190 m deep). Situated in the Waikato region, it is critical to the local economy, as it attracts many tourists and its trout fishery generates NZD 70 million per year (about 10% of the Taupo district GDP). Data point to a gradual decline in the *health of the oligotrophic lake*, with algae blooms and reduced visibility resulting from nitrogen inputs both urban and rural in origin. The decline continued during the review period: more of the particulate form of nitrogen is being found in the lake's surface waters, and potentially toxic algae blooms occurred in 2001 and 2003 (Environment Waikato, 2003). Pastoral land use contributes 37% of nitrogen input to the lake, although less than 10 km² of the catchment (which covers 2 800 km²) is used for dairy farming and about 600 km² for pasturing sheep and beef cattle. Projections suggest that if all pasture land in the catchment were converted to dairy farms, the nitrogen load to the lake would be more than 20% higher (Journeaux, 2004).

In 2003, the regional council proposed a *Strategy for Protecting Lake Taupo*. The overall target is to reduce manageable nitrogen input by 20% over 15 years (Environment Waikato, 2003), so that water quality in 2020 should be roughly the same as in 2003. Some NGOs have challenged the target as unambitious, since the lake's health was compromised by nitrogen levels in 2003 (EDS, 2004). The strategy entails changing farming practices in the catchment, upgrading sewerage systems around the lake and converting some pastoral land to low-nitrogen uses. To these ends, a *funding package* of NZD 81.5 million (45% from the central government, 33% from Environment Waikato, 22% from Taupo District Council) will be made available over the 15 years, primarily to encourage pastoral farmers to diversify to low-nitrogen land uses through a mixture of financial incentives and advisory services.

Support for action to reduce pollution of the lake is widespread, yet considerable debate remains about whether the *polluter pays principle* is being adequately applied. Effectively, there is a risk of establishing a precedent for reversal of environmental damage relying on provision of government cash to those responsible. Environment Waikato has proposed modifying its regional plan to *cap nitrogen inflow* at 2003 levels from all sources (EDS, 2004). A system of tradable nitrogen credits, evoked in the strategy, deserves further study as a potential alternative.

Lake Ellesmere

Lake Ellesmere, an *important wetland system*, is a shallow (average depth 1.4 metres), brackish lagoon in the Canterbury region, covering 265 km². In 1990, it was declared an outstanding wildlife habitat under a national conservation order (Table 2.1). It hosts up to 98 000 wetland birds at any one time, as well as commercial eel and flounder fishing. Natural events, combined with changes in land use such as conversion of surrounding flax and raupo wetlands into farms, have affected the lake ecology. Uncontrolled increases in diffuse effluents have made the lake *eutrophic*. Green algae blooms are frequent and widespread. Environment Canterbury, the regional council, faces the challenge of establishing minimum flows for the more than 40 tributaries feeding the lake so as to meet irrigation needs while protecting the lake. Consultations and studies continue, and a draft action plan has been under development since 2002.

Box 2.2 Pricing of water and waste management

Water abstraction and services

Historically, New Zealand has had plentiful water resources, and the notion that water is a public good that should be delivered at “*cost of supply*” is deeply entrenched. Abstraction of natural water from rivers, lakes and aquifers is not paid for, but administrative and compliance monitoring costs are recovered. Most *water abstraction consents* do not stipulate volumetric limits, though commercial enterprises and large domestic users (e.g. households with swimming pools) are charged on a volumetric basis. Farmers receiving water from community irrigation projects pay the full cost of supply, since such systems are privately owned by farmers’ co-operatives.

Households are rarely charged on a volumetric basis for *water supply or waste water treatment*. Instead, a flat rate is typically integrated into municipal taxes (MfE, 2004a), often calculated as a function of house or land area, capital value or both. For example, for an average New Zealand household, a variable charge for water supply amounts to about NZD 165 per year. This is paid on top of a general rate of NZD 304 per NZD 100 000 of property value. Communities with fewer than 10 000 residents are eligible for central government subsidies for water services, which may cover up to 50% of the cost.

Waste services

To finance *municipal waste services*, an increasing number of local councils are moving from tax-based funding to waste charge or “pay-as-you-throw” systems, and from zero or nominal charges to higher or full cost recovery. The shift seems to have accelerated since the New Zealand Waste Strategy (2002) established full cost recovery as a national objective. In some cases, households pay waste management charges by buying special garbage bags at NZD 1-2 per 60 litre bag. In general, however, households do not pay a separate fee for waste collection (including kerbside collection of recyclables), whose cost is incorporated into municipal taxes as a flat fee.

Landfill disposal charges are in the range of NZD 30-135 per tonne. They are generally increasing as substandard landfills are upgraded and larger landfills with modern pollution control equipment come into operation.

Box 2.4 Cost recovery in landfilling

Landfill Full Cost Accounting Guide

To help local authorities move towards *full recovery of landfilling costs* (investment and operation), the MfE published the Landfill Full Cost Accounting Guide in 1996, with updates in 2002 and 2004. Recognising that many councils take operating costs into account only when setting the landfill gate charge, the guide helps decision-makers calculate *full cost recovery charges*. The guide provides a general methodology and a *spreadsheet programme* that operators can use to estimate total cost per tonne of waste. More than 100 parameters are built into the spreadsheet, including costs for planning and design, construction of individual cells, operation, leachate and gas management systems, and closure and after-care (MfE, 2002c). The calculation result is robust, and the guide has been extensively used by local governments and private landfill operators.

Landfill waste levies

Waste levies have been used in New Zealand since 1998, when Christchurch City Council introduced one (Christchurch City Council, 2005). In 2005, three Auckland councils introduced by-laws to charge levies on all solid waste collected. Waste management companies challenged the legality of the levies before the High Court, arguing that they were invalid because local councils do not have the power to tax. The companies also expressed concern that inconsistent approaches to local waste levies would affect competition, citing the potential for “waste flight” (transport of waste to adjacent areas not subject to levies). In 2006, the High Court ruled that the councils had overstepped their powers and struck down the by-laws, leaving the councils unable to impose waste levies.

Before the court decision, consultations among the MfE, the waste industry and Auckland and Christchurch councils showed a *high degree of agreement* on the need for a waste levy to be applied nationally to avoid distorting competition among waste management operators (Ward, 2006). There was general agreement that a levy should be set at a level that would provide funding to local authorities to support long-term objectives related to minimising waste generation and diverting waste from landfill. Imposing such a levy on waste deposited at landfills was seen as the most efficient point of capture. It was generally agreed that a significant part of the revenue should be made available to local authorities to fund waste minimisation efforts, and that another part should be channeled to a central fund to support the wider objectives of the New Zealand Waste Strategy.

Deliberations and consultations continue among central and local governments and waste management industry representatives regarding the design and administration of a national waste levy. The MfE, meanwhile, is assessing possible means of administering such a levy and using it to stimulate product stewardship and waste minimisation at local level. Developing and applying such a levy, planned for 2007, will be important to support the objectives of the national Waste Strategy locally and nationally.

4. Pollution Abatement and Control Expenditure

Data on *public environmental protection expenditure* have been produced since 2001, and the latest available data are for 2003. In fiscal year 2003,¹³ public environmental expenditure for water and waste management amounted to 0.6% of

GDP (StatsNZ, 2005). The total included pollution abatement and control expenditure for waste and waste water, as well as environmental expenditure on inland water management activities aimed at sustainable use (e.g. catchment works, flood protection works, hydrological monitoring).

Local government accounted for 99% of this environmental expenditure, reflecting the importance of territorial and regional councils in environmental management in New Zealand (Table 2.6). Public expenditure on *waste water management* amounted to NZD 603 million, or 0.45% of GDP, in 2003. Of this, capital investment accounted for 54% and operation and maintenance for the remainder (StatsNZ, 2005). Public expenditure on *waste management* amounted to NZD 218 million, or about 0.16% of GDP, with current expenditure representing 89%. Since 2001, *operation and maintenance* has accounted for about 61% of total expenditure on water and waste management, with local authorities again responsible for 99% of the total.

Table 2.6 **Annual government expenditure for water and waste management, 2001-03**
(NZD 000, 2001 prices)

	2001	2002	2003
Central government			
Waste ^a	7 526	8 593	8 404
Waste water ^b	—	—	—
Inland water management ^c	1 231	1 276	1 363
Subtotal	8 757	9 869	9 767
Local government			
Waste ^a	214 024	204 555	198 770
Waste water ^b	588 321	621 317	572 113
Inland water management ^c	76 723	67 350	64 483
Subtotal	879 068	893 223	835 367
Total	887 825	903 091	845 134
% by local government	99.0	98.9	98.8

a) Includes expenditure for waste collection, transport, treatment and disposal.

b) Includes expenditure on sewerage networks and storm water management.

c) Includes inland water management activities aimed at sustainable use (catchment works, flood protection works and hydrological monitoring).

Source: StatsNZ, 2005.

To achieve its objectives, New Zealand will need to increase investment in environmental infrastructure projects such as sewerage reticulation in rural areas, waste water treatment plants and landfills with pollution controls. In sparsely populated rural regions, establishing and operating waste management infrastructure at local level can lead to *diseconomies of scale*. In many cases, inter-council co-operation to build larger, more modern landfills (with leachate collection and landfill gas management, for example) could reduce costs and improve environmental performance of waste management facilities. Recognising this opportunity, some regions (e.g. West Coast, Waikato, Taranaki) have developed regional waste plans to help co-ordinate territorial authorities' infrastructure investment needs.

2. Economic Importance of Ecological Assets

New Zealand's ecological assets represent significant economic value. *Natural ecosystem processes* are the foundation of the country's land-based primary production (e.g. farming, forestry, horticulture). They provide essential inputs and "ecosystem services", including raw material production, water purification, waste decomposition, crop pollination, pest control and climate regulation. In 2003, the Biosecurity Council estimated that *60% of national exports and 20% of GDP* depended on primary production (Biosecurity Council, 2003). A "clean and green" environment is also an asset sustaining New Zealand's growing tourism sector and its exports of agriculture products (Chapters 4 and 5).

As in other OECD countries, the *annual value of the ecosystem services* provided by nature in New Zealand may exceed GDP. A 1999 economic study estimated that the country's natural systems, including introduced and indigenous species, generate annual value nearly three times greater than GDP (Patterson and Cole, 1999). *Terrestrial ecosystems* were valued at NZD 46 billion per year, including NZD 9 billion from direct outputs (e.g. food, fibre), NZD 30 billion from ecosystem services (e.g. erosion control, soil formation, pollination, pest control) and NZD 7 billion from passive values (e.g. option, existence and bequest values). *Marine ecosystem services* were valued at NZD 184 billion per year (four times higher than terrestrial inputs), reflecting the fact that the country's exclusive economic zone (EEZ) is 14 times greater than its land area.

Thus, the *value of biodiversity at the margin* is considerable in New Zealand. For example, in the year of the analysis, a 5-10% loss of annual direct benefits from indigenous biodiversity would have been worth NZD 500-1 000 million (i.e. up to 1% of GDP). By comparison, in the same year, the government spent less than NZD 200 million on biodiversity management. Since the adoption of the Biodiversity Strategy in 2000, New Zealand has put more priority on nature conservation through *expanded funding and policy measures*. For example, DOC budget allocation for nature conservation increased by 75% between 1995 and 2004, to over NZD 126 million. The risk of biodiversity loss increased during the review period and will likely continue to do so, due to growing international trade and travel and to climate change, all of which increase the likelihood of introduction of pests and diseases (OECD, 2003).

3.2 *Invasive species*

Invasive pests and weeds pose *serious threats to indigenous species* in New Zealand, as they compete with them for habitat and food, degrade or alter their habitats and sometimes prey on them. The most damaging animal pests include possums, rats, rabbits, goats, deer, stoats and feral cats. Naturalised plant species (2 400 species) outnumber native plants (2 350 species) and compete with them for habitat (Beston, 2005). New Zealand has traditionally prioritised control of pests posing risks to primary production and trade (e.g. possum, white spotted tussock moth), and has implemented a variety of effective management measures (Chapter 7). Bio-security risks to indigenous flora and fauna have received less attention. The annual damage caused by pests, weeds and pathogens reportedly topped *1% of GDP* in 1999, and has likely not decreased since (NZCA, 1999). The 2003 Biosecurity Strategy put continued emphasis on protecting against invasive species. In addition to taking measures aimed at blocking the entry of new pest species, New Zealand operates extensive programmes to eradicate or contain established pests and to control their impact on protected natural areas. The annual costs of damage by pests and weeds, and the expenditure by the central government, regional councils and the private sector to combat them, are high and increasing (Box 3.1).

Box 3.1 Expenditure on bio-security

In 2003, New Zealand's *expenditure on bio-security* totalled NZD 500 million (0.37% of GDP), including activities undertaken by the central government, regional councils, industry and private landowners. Government funds accounted for about 60% of this total.

Central government funding for preventive bio-security measures increased from NZD 83 million in 1998 to NZD 141 million in 2003 (PCE, 2000; Biosecurity Council, 2003). About 87% of this funding goes to MAF, while DOC receives about 2%, MFish 2% and the Ministry of Health 9%. MAF's Biosecurity New Zealand unit co-ordinates most central government expenditure for *preventive bio-security measures*, which include extensive and routine inspections of passengers, baggage, imported goods and mail at airports, seaports and postal sorting centres. Seizures of suspect material from arriving aircraft and passengers more than doubled during the review period, reflecting growth in bio-security risks associated with increased international travel and shipping, as well as increased inspection capacity (e.g. more X-ray machines). Even so, the burgeoning of new invasive species – such as didymo, a freshwater algae – has resulted in new threats to native ecosystems, with high costs to the economy (NZIER, 2006). In 2004, DOC spent more than NZD 45 million on the *control of established animal pests and invasive weeds* in protected areas.

Regional councils spend at total of about NZD 40 million per year on pest management, half of it funded through the Animal Health Board for tuberculosis control (PCE, 2000). Reported spending by *regional and district councils* for biodiversity protection is dominated by expenditure for control of invasive species (Table 3.2).

Table 3.2 Local government spending for indigenous biodiversity protection, selected councils, 2003/04

	Marlborough District Council (NZD 000)	Northland Regional Council (NZD 000)	Environment Waikato (NZD 000)
Control of animal pests	83	812	860
Control of plant pests	476	185	793
Protection of habitats ^a	140	114	1 314
Restoration of riparian margins ^b	110	27	696
Other services ^c	100	5	48
Total	909	1 143	3 711

a) Includes protection of land areas of significant ecological value and land care arrangements.

b) Includes soil erosion control and integrated river bank management.

c) Includes provision of public information and policy development.

Source: MfE, 2005.

Box 3.3 High-country land tenure review, 1998-2005

The *Crown Pastoral Land Act* (1998) authorised the review of tenure of 304 state-owned properties leased to farmers for livestock grazing since the 1940s. Together, the properties cover about 23 700 km² (9% of the national land area) in the high country of the South Island. Since the mid-1980s, the *removal of agricultural subsidies* and changes in the international wool market have reduced the profitability of the leases, which limit farmers to making pastoral use of the land. By 2005, the tenure review of 66 pastoral leases (covering about 330 km²) had been completed, with leaseholders being granted freehold title to 55% of the land, 44% being transferred to full government ownership and the rest remaining under lease.

The *objectives of the land tenure review* are to promote ecologically sustainable land management, to protect significant inherent values while facilitating the highest economic use of the land, and to secure public access and enjoyment of high-country land. Tenure review is highly controversial; farmers seek to maintain rights to use the land for various purposes, while other stakeholders seek to maximise landscape, biodiversity and recreation values.

The newly recuperated high-country land is being used to create a *network of high-country parks*. The parcels are especially valued for their tussock grasslands, hitherto under-represented in conservation areas. In 2004, the central government authorised a NZD 79 million package to fund the establishment of the new South Island parks and reserves. For 2004-08, the package allocates NZD 61 million to Land Information New Zealand to fund the tenure review process and to pay settlements negotiated with farmers. The package allocates an additional NZD 18 million to DOC to fund its participation in the review process, including creation of the new nature parks as well as *weed and pest control* within them.

The *New Zealand Landcare Trust*, an NGO established in 1996 with funding from the MfE and corporate sponsorship by Transpower New Zealand, promotes sustainable land management and biodiversity initiatives in *rural communities*. It works with 187 grassroots land care groups on local land management issues, particularly control of plant and animal pests, restoration or conservation of threatened terrestrial ecosystems, and recovery of threatened animal or plant species (Nimmo, 2004).

Conservation on private lands is important to protecting indigenous biodiversity, as the majority of remaining under-represented ecosystems (e.g. lowland forests, dune systems, freshwater wetlands, riparian habitats) occur as remnants on private land (Davis and Cocklin, 2001). *Covenants* or conservation easements for at least part of the property are usually passed on in perpetuity on the property's title. *Funds and trusts* encourage farmers and other landowners to enter into such agreements (Box 3.4). In 2004, regional councils offered some NZD 4.3 million in "contestable funds" (competitive grants) to support nature conservation activities on private land (Lauder and Wilson, 2004). The area of private land under covenant agreements increased by 81% between 1995 and 2005, to 1 118 km² (Table 3.3).

Box 3.4 The use of grant funds to encourage biodiversity protection on private land

New Zealand real estate markets have been adapted to "unbundle" certain ecosystem services from other property uses through *perpetual conservation easements* called covenants. Such an easement represents a privately negotiated encumbrance on a designated property, which is passed on in perpetuity with the title to the property (OECD, 2004). Private landowners' participation in such agreements is encouraged by competitive grants known as contestable funds. Such approaches have been expanded since the launch in 2000 of the Biodiversity on Private Lands package, which created the Biodiversity Advice Fund and the Biodiversity Condition Fund and increased funding for several existing funds and trusts encouraging conservation on private land (e.g. Nature Heritage Fund, Nga Whenua Rahui, Queen Elizabeth II Trust).

The *Biodiversity Condition and Advice Funds* allocate money to promote pest control measures on privately held lands. The Advice Fund sponsors workshops, field days and publications to inspire landholders to protect indigenous biodiversity and facilitate best-practice sharing. The Condition Fund supports projects to improve the condition of indigenous habitats and communities on private land, notably through pest control. Since the funds' inception in 2002, about NZD 8.5 million has been allocated to some 500 projects. Nearly three-quarters of the funding has gone to small projects (i.e. less than NZD 15 000 each), many involving fencing off parts of a farm to control pests that threaten native biodiversity. Larger projects funded include establishment of a help line for rural landowners in Waikato (NZD 110 000) and measures to control kiwi predators in the far north (NZD 135 000) and invasive species on Great Barrier Island (NZD 80 000).

The *Nature Heritage Fund*, established in 1990 by the central government, provides contestable funds for the legal protection of biodiversity values on private land. Individual landowners, NGOs, local authorities and government departments submit applications for the purchasing or covenanting of land. Much of the land purchased through the fund is protected under the Reserves Act (1977) and subsequently managed by DOC or vested in councils. Landowners wishing to protect natural areas while retaining title to the land may register a Nature Heritage Fund covenant on the title. The fund then provides *assistance* with the costs of fencing, surveying and registration. Administered by an independent committee, the fund is serviced by DOC and receives annual state funding of about NZD 11 million. Priority is on proposals that meet criteria of representativeness, sustainability, landscape integrity and amenity values.

The *Nga Whenua Rahui*, a fund established in 1991 by DOC, supports the protection of native flora and fauna on Maori-owned land. It is geared to dealing with large numbers of dispersed owners, and offers the possibility to retain rights to traditional harvesting and access. Some covenants (kawenata) incorporate review options rather than being perpetual, so future generations can make their own decisions regarding the resource. In some cases, the Nga Whenua Rahui provides funding over and above the costs of protection, in consideration of forgone income opportunities. By 2005, the fund had helped protect over 1 900 km² of Maori-owned land at a total cost of about NZD 32 million. The bulk of the grants support the fencing off of indigenous areas from farmed land, with registration and legal costs making up the remainder.

The *Matauranga Kura Taiao Fund*, a contestable fund established in 2000 and administered by the Nga Whenua Rahui committees, supports initiatives to preserve traditional Maori knowledge about biodiversity and to promote its application for sustainable management of natural resources. From 2001 to 2004, the fund disbursed NZD 2.3 million and supported 61 projects, ranging from workshops on traditional knowledge to the establishment of endemic plant reserves.

The *Queen Elizabeth II Trust*, established in 1977, is an independent organisation that promotes the protection and enhancement of natural areas on privately owned land. By forming an Open Space Covenant under the trust, private landowners may stipulate particular management practices that are registered on the title in perpetuity. The covenants are defined so that they disallow certain specified uses of the property (e.g. further building or development) or to provide only for certain specified uses (e.g. agricultural or touristic). The easement is then conveyed to the trust. In February 2005, 2 029 registered covenants were in place, covering 701 km². An additional 539 approved covenants were awaiting registration, for a total of 2 568 covenants covering 857 km² (Bayfield, 2004). This represents an increase in area covered under the trust of about 80% since 1996.

The *Landcare Trust grant programme*, established in 1996 by the MfE and Transpower, awards grants to non-profit community groups undertaking projects that enhance sustainable land management or biodiversity on private rural land. Projects have ranged from pest management to tree planting and establishment of nurseries.

The *Significant Community Based Projects Fund*, launched by the Prime Minister in 2005 with a four-year budget of NZD 32 million, supports community-based projects that contribute significantly to regional or national environmental conservation objectives. In the first round of projects, the Maungatautari Ecological Trust received NZD 5.5 million towards establishing an ecological island reserve.

5. Sectoral Integration of Nature Conservation and Biodiversity Concerns

5.1 Tourism

The *tourism industry* is one of New Zealand's largest foreign exchange earners, an important source of employment and a major contributor to GDP (9.4%) (TRCNZ, 2005). International visitor arrivals increased by 67% between 1995 and 2004, to reach 2.25 million (TNZ, 2005). About two-thirds of visitors report that nature-based activities are a primary factor in their choice of New Zealand as a destination. In 2004, 33 million visits were made to conservation areas, with about 90% of visitors coming for day walks or short camping trips (DOC, 2004). As numbers of visitors to national parks and other conservation areas have increased, so have related *pressures on nature*. Upgraded walking trails, bigger huts and improved facilities have been opened in many parks in an attempt to reduce congestion. Since 2001, DOC has invested nearly NZD 10 million (including, for instance, NZD 1 million at Abel Tasman National Park) to upgrade toilet facilities from latrines to pump-and-treat systems in some parks.

Visitors are asked to respect the New Zealand Environmental Care Code when in conservation areas. The code features a ten-point checklist on waste management, surface water use and respect for fragile ecosystems and cultural heritage (DOC, 2005c).

Although the *2005 General Policy for National Parks* and the 2005 Conservation General Policy recognise the need to moderate the environmental impacts of visitors and tourism concessions, they also stipulate that public access to public conservation lands and waters must remain free of charge. *Charges* for the use of accommodation, facilities and services can be levied, however, and have served as an important means of demand management since 1989. Use of such charges should be expanded, in application of the user pays principle and as a way to continue managing demand. Also, as the *New Zealand Tourism Strategy 2010* points out, there is a need to monitor and assess visitor impacts on the protected environment and to design mechanisms for reducing them, such as booking systems and one-way routes (TSG, 2001). The strategy also calls on tourism operators to make greater use of pricing strategies, especially during peak demand periods.

5.2 Fisheries

Despite an EEZ spanning 30 degrees of latitude, the world's sixth largest, New Zealand contributes only 1% of the total global fish catch. Two-thirds of its EEZ is commercially barren, due to extreme depths and lack of nutrient-rich currents (MfE, 1997). Nonetheless, in 2004, fish products were the sixth largest export earner, contributing NZD 1.1 billion in 2005. Together, hoki, snapper, ling and orange roughly account for about 50% of the total annual commercial catch, while aquaculture is mostly based on the green-shell mussel, Pacific oyster, king salmon and abalone (StatsNZ, 2002).

Capture fisheries are managed under a *quota management system* (Chapter 4). For each target species, a total allowable catch (TAC) is established. TACs are set at levels designed to allow for sustainable harvest, and thus take into account recreational, customary and commercial fishing. The total commercial catch is allocated as individually transferable catch limits. Other measures, such as gear restrictions, are in place to mitigate potential adverse effects on non-target species. The system has successfully avoided the stock collapses that have occurred in some other OECD countries. Implementation of the 1996 Fisheries Act added an additional 50 species to the system during the review period. *Aquaculture* became the fastest growing sector of the New Zealand seafood industry during the review period (Chapter 5).

In 2005, MFish published a *Strategy for Managing the Environmental Effects of Fishing*, laying out plans for standards to regulate the environmental effects of fisheries so as to help meet the obligation under the Fisheries Act to assure sustainable use of fish stocks as well as ecological sustainability (MFish, 2005). Measures to mitigate adverse effects of fishing on non-target populations include fishing method restrictions, observer programmes, imposition of marine mammal by-catch limits and requirements that fishing boats be equipped with by-catch mitigation devices. In 2005, MFish published two marine invertebrate guides to strengthen monitoring of the by-catch of benthic invertebrates.

Under a national plan to reduce seabird deaths related to fishing, *voluntary codes of conduct* have been introduced in key fisheries to lower seabird by-catch (MFish, 2003). In 2005, in response to reports that some squid trawlers were not complying with the code for the squid fishery, MFish directed certain vessels to return to port and pick up on-board observers. *Bird-scaring devices* were later required for all trawlers 28 metres or over, fishing in New Zealand waters.

5.3 Forestry

Since human settlement, the *indigenous forests* that covered 85% of the land area around 1 000 years ago have been reduced to 23% (about 62 000 km²), mostly confined to mountainous areas and some low-lying remnants of the West Coast, Southland and Northland (MfE, 1997). The bulk of surviving indigenous forests (49 000 km²) are government owned, and managed as part of conservation lands. Some 80% of indigenous forests on private land are Maori owned. In 2001, 1 300 km² of state-owned indigenous podocarp forests, originally earmarked for logging, were transferred to DOC for conservation.

New Zealand strove to promote *sustainable forestry practices*, particularly of remaining indigenous forest, during the review period. The amended Forests Act stipulates that indigenous timber can be produced only from forests managed so as to be maintained in perpetuity as functioning ecosystems and as economic resources for the owners (Chapter 5). *Forest certification* through the Forest Stewardship Council is widespread. In addition, by 2005, nearly 2 500 km² of privately owned native forests had been protected through acquisition and covenants (Box 3.4).

5.4 Agriculture

The agriculture sector is *New Zealand's largest export earner*, contributing nearly 53% of the country's total merchandise export value in 2004. Since removal of agricultural *production subsidies* in the late 1980s, *land use has undergone a*

transformation, with many marginal grazing lands taken out of production and either converted to plantation forestry or left to revert to indigenous vegetation. As running sheep on marginal pastureland was no longer profitable, sheep numbers have fallen sharply (Chapter 5). Driven by high world prices for milk solids, dairy farming boomed, and there was a 50% increase in the number of cows (Davies-Colley *et al.*, 2003). Marginal pasture that had been pulled out of production was often converted to plantation forest, which was encouraged by fiscal instruments. While these shifts have had positive implications (e.g. protection of indigenous forests), the wholesale shift to dairy farming has strongly altered nutrient balances in lowland ecosystems (Chapters 2 and 5), with negative *consequences for aquatic ecosystems* in particular (Box 3.2).

Fisheries

New Zealand has the world's *sixth largest EEZ* but produces less than 1% of global fisheries output, as much of the EEZ is commercially barren. Fisheries and aquaculture are New Zealand's sixth largest export sector (NZD 1.1 billion in exports in 2005) and employ over 26 000 people, directly and indirectly. Capture fisheries contribute about 80% of the sector's total production value and aquaculture the rest. New Zealand kept major exploited stocks stable during the review period through input controls (e.g. restrictions on fishing area, method or time, and minimum legal sizes) and output controls (e.g. species catch limits) (Box 4.3).

As the 2005 *Strategy for Managing the Environmental Effects of Fishing* recognises, awareness is mounting of the need to take ecosystem considerations more comprehensively into account in fishery management as fishing intensity and pressure increase (MFish, 2003 and 2005). Initiatives in recent years include research on the environmental effects of fishing, a national plan of action to reduce seabird mortality, regulatory measures to address dolphin mortality, *closure of 19 seamounts to trawling* and expansion of marine reserves and protected areas. During the review period, more than 100 seamounts were trawled each year, and many suffered significant damage (Clark and O'Driscoll, 2003).

The *aquaculture sector*, mainly based on green-shell mussel, Pacific oyster, king salmon and abalone, expanded rapidly during the review period. Regional councils have the authority to grant or refuse resource consents for aquaculture. A moratorium on new consents, imposed nationwide from 2002 to 2004, allowed the development of legislation aimed at rationalising allocation of aquaculture permits. Some regional councils are working together to develop a regime of *user charges* that would complement tendering of aquaculture sites. Further work is needed to better understand the impact of aquaculture on marine ecosystems and fisheries (Cole, 2002), and to

define measures to address them. In 2006, the central government identified aquaculture as a priority growth industry and announced plans to strengthen policy guidance to regional authorities concerning development of the littoral zone for aquaculture.

Seafood industry operators adopted various *codes of practice* during the review period with the aim of minimising the effects of fishing on *protected species* (MFish, 2003). In particular, tuna charter vessels generally adhere to a code of conduct for avoiding seabird mortality. In the capture fishery sector, fishers follow codes of practice for mitigating seal, sea lion and seabird by-catch. The fishing industry helps finance information collection and research programmes (e.g. by-catch reporting systems, observer programmes), carried out by regulators in relation to protected marine species, through Fisheries Service Levies and Conservation Service Levies.

Box 4.3 The fishery quota management system

New Zealand's fishery *quota management system* is an output control management system for commercial capture fishing. It sets an overall commercial catch limit in conjunction with individual tradable limits.^a Allocating individual catch limits largely eliminates the race to maximise catch at the opening of the season. The resulting increased certainty gives fishers more incentive to match their investment in fishing capacity to their individual catch limits (OECD, 2005c).

New Zealand manages *more marine species* through tradable quotas than any other country: 92 species and 592 individual fish stocks. It does not exclude lower-value species but has sought to bring all commercially exploited fish into the system. Thus, catch limits for lower-value species in some cases become binding on higher-value target fisheries (Newell, 2004).

The Ministry of Fisheries estimates that 82% of commercially *exploited stocks are maintained at or near target levels* (MFish, 2006). New Zealand has largely avoided the significant stock collapses that have occurred in many fisheries. As the country does not subsidise the fishery sector, it recovers the administrative costs of the system from the commercial fishing industry.

Maori tribes assumed a much greater role in fishery management during the review period, as their share of the commercial fishing quota has grown to about 40%. In 1992, Maori negotiated with the government for "full and final settlement" of their claims to commercial fisheries. The final agreement gave Maori: i) 10% of existing individual transferable quotas; ii) 20% of the total allowable commercial catch for any additional species introduced into the system; iii) funding to purchase a 50% share of Sealord Products Ltd.,^b roughly valued at NZD 350 million at the time; and iv) a procedure for management of traditional or customary fishing areas.

- a) Commercial fishing quotas are generally tradable within the same fish stock, but not across regions, species or years. There are limits on the total quota an individual party can hold.
- b) At the time of the agreement, Sealord Products held 27% by volume of the New Zealand fish quota.

Tourism

Tourism has been growing rapidly (by about 8% per year between 1999 and 2004) and is the largest single source of foreign exchange revenue in New Zealand, accounting for NZD 6.41 billion per year (TIA, 2006). The sector employs the full-time equivalent of over 90 000 persons directly and 69 000 indirectly, contributing over NZD 15 billion per year to GDP (about 9.4%). In 2005, international visitor numbers reached 2.25 million (TRCNZ, 2006). About two-thirds of all international visitors reportedly engage in nature-based activities (Chapter 3).

The *New Zealand Tourism Strategy 2010* aims to achieve sustainable growth and establishes environmental protection as a goal (TSG, 2001). It calls for more co-operation between the Ministry for Tourism and the MfE to develop and promote initiatives encouraging resource use efficiency and adoption of environmental management systems. It also sets as a goal “to recognise the value of the natural environment and actively protect, support and promote its sustainability”. In 2004, the Department of Conservation managed about 4 600 concessions for activities, including tourism, grazing and telecommunications, on public conservation lands. Before authorising concessions, the department evaluates the likely environmental effects of the proposed activity. Continuing efforts will be needed to mitigate the environmental impacts of tourism, particularly in popular national parks (Chapter 3).

The *Tourism Industry Association of New Zealand* has strongly promoted Green Globe 21 sustainable tourism certification to the industry. The number of Green Globe 21 certified operators grew from 4 in 2001 to 72 in 2003. During the review period, the central government provided funding to upgrade and expand *water supply and waste water treatment infrastructure* in communities with small populations and high tourism demand (Chapter 2). The MfE and the Ministry of Tourism promote the greening of tourism through the Environmentally Sustainable Tourism project.

2.3 *Economic instruments*

Water management

In general, there is *no charge for water abstraction* from natural surface or groundwater sources. Under the RMA, regional councils issue resource consents for water abstraction to users on a first-come, first-served basis. Most councils charge applicants a fee for processing water abstraction consents, and for monitoring compliance with them. Although the RMA allows for the transfer of water permits, such transfers have remained very rare. One exception is in the Waikato region, where a transferable permit programme is being introduced for the management of nitrogen run-off from land in the Lake Taupo catchment (Chapter 2).

Municipal and industrial water services (e.g. supply, sewerage reticulation and waste water treatment) are generally financed through a uniform annual charge or one based on house or land area and/or capital value. Concerning *water supply*, authorities often charge industrial users a volumetric charge for reticulated water supply, while households pay a flat annual charge. A few councils have attempted to charge individual users on a volumetric basis via metering, but such attempts have invariably led to resistance. However, some local authorities are applying volumetric charges, notably Auckland, with 1.5 million inhabitants. Waste water collection and treatment services are seldom charged based on flows or nutrient loading.

Waste management

The provision of *waste services to households* is funded in a variety of ways, including full community-good funding (through property tax), full “pay-as-you-

throw” systems for residual waste and a combination of approaches. *Waste services to business or industry* are generally provided on a commercial basis. Local authorities operating landfills are now supposed to recover the full costs of the landfill operation and investment costs by introducing *user charges* (Chapter 2). The New Zealand Waste Strategy set a December 2005 target for operators of all landfills and waste water treatment plants to be administering user charges calculated to enable full cost recovery. Although the target was missed, *considerable progress* has been made.

Other economic instruments

Local authorities collect *administrative charges* for receiving, processing and granting resource consents. In practice, the degree to which the user pays varies from authority to authority, but applicants must generally cover costs of environmental impact assessments, and charges can also be imposed on applicants requesting changes to plans. The RMA also provides for tendering of the right to occupy coastal space, and for the introduction of *royalty regimes* for the extraction of natural resources (e.g. sand). The Hazardous Substances and New Organisms (HSNO) Act has provisions allowing local authorities to set charges for performing regulatory functions.

Perspectives

The 1996 OECD review recommended fuller implementation of the *polluter pays*⁹ and *user pays*¹⁰ principles as basic principles of domestic environmental law. The polluter pays principle aims at internalising externalities so as to correct market failures relating to pollution and to avoid distortions in international trade. While New Zealand applies the user pays principle in a few environmental management areas, little progress has been made in applying the polluter pays principle, for instance in the form of charges or regulations for diffuse pollution.

Greening of government procurement

Greening of government procurement is still in its *early stages* in New Zealand. No specific policy or government target has been formulated regarding greening of purchasing policies, nor are sustainability criteria part of government procurement policy, a responsibility of the Ministry of Economic Development. Government agencies are expected to ensure, however, that their procurement is consistent with national environmental policies. In 2003, the MfE launched the *Govt 3 programme*, aimed in part at motivating central government agencies to improve the sustainability of their purchasing. By 2006, all core government departments were participating in the programme, and incorporating sustainability criteria into procurement policies, particularly regarding cleaning services, office supplies and laptop computers (MfE, 2004). The Govt 3 programme promotes the purchase of eco-labelled products, such as office furniture using wood that has been legally logged from sustainably managed forests.

2.5 Environmental expenditure

Public environmental expenditure

Public environmental protection expenditure, monitored since 2001 through national accounts, totalled NZD 1.27 billion in 2003, or roughly 0.9% of GDP (Table 4.6). The total covers: i) pollution abatement and control expenditure for water, waste, soil and air management; and ii) environmental expenditure on inland water management activities aimed at sustainable use (e.g. water supply, protection of biodiversity). Operating costs represent 71.5% of the total and capital expenditure makes up the rest.

Local authorities accounts for 75% of environmental protection expenditure and 99% of pollution abatement and control expenditure (Chapter 2). The major items of local authority expenditure are waste water management (64%) and waste management (22%), while the bulk of central government expenditure is for biodiversity and landscape (66%) and research and development (23%).

Private environmental expenditure

Although not yet systematically surveyed, *private environmental expenditure* is estimated at NZD 200-300 million per year, equivalent to 16-24% of public environmental protection expenditure (StatsNZ, 2005). The *business sector* claims

that RMA compliance costs, as well as costs and delays associated with getting resource consents, frustrate infrastructure investment (MfE and LGNZ, 2002). Although comparative studies on costs and delays have been carried out, they have been based on small-scale case studies that do not allow general conclusions to be drawn. Some examples show, however, that *costs and uncertainties associated with getting or renewing a resource consent for a project*, coupled with inconsistency in regions' environmental standards, lead to high costs and long delays (NZBCSD, 2004). In 2005, amendments to the RMA introduced changes designed to *reduce costs and delays*, through improved mediation, while reinforcing and strengthening the role of national policy statements and environmental standards in the making of local policies and plans (Benson-Pope, 2005).

Table 4.6 **Public environmental expenditure**, ^{a, b} 2001-03
(NZD 000)

	2001	2002	2003
Total current expenditure by:	852 170	859 322	906 116
Local authorities	566 400	547 125	585 965
Central government	285 770	312 197	320 151
Total capital expenditure by:	313 115	390 304	361 397
Local authorities	307 164	386 555	354 862
Central government	5 951	3 749	6 535
Total expenditure	1 165 285	1 249 626	1 267 513
% of GDP	1.0	1.0	0.9

a) Pollution abatement and control expenditure as well as expenditure on protection of biodiversity and landscape.

b) At current prices.

Source: StatsNZ, 2005; OECD, 2006.

Box 5.1 Structural changes in the agriculture sector

A sweeping reform of the agriculture sector in the mid-1980s removed all producer subsidies. The reform was born out of concern over an economic situation characterised most notably by high unemployment, rising inflation, stagnant per capita GDP, a growing fiscal deficit and a chronic current account deficit. New Zealand's agricultural producer subsidy equivalent peaked at 34% of production value in 1983, when support equalled roughly 4% of GDP (Vangelis, 2006). The sector showed signs of the distortionary effects of subsidisation, including a disconnect between supply and demand, inflated product prices and overuse of inputs, including land and agrochemicals. Although transitional assistance to groups affected by sectoral reform is increasingly seen as a standard economic tool to ease reform, New Zealand used such measures sparingly (i.e. farmers were offered debt rescheduling and restructuring). *Ex ante analysis* of likely environmental impacts was not carried out, and flanking measures were not developed, largely because the reforms were carried out so rapidly, reflecting the severity of the economic situation.

The *phase-out of agricultural support* catalysed the conversion of pastoral land to plantation forest, as market conditions increased the relative returns from forestry compared to pastoral agriculture. Between 1997 and 2001, about 595 km² of forest was planted per year, mostly on former agricultural land (MAF, 2003a). Remaining agricultural land is increasingly used for intensive dairy farming or high-value horticulture. Overall, as the extent of agricultural land has shrunk, its productivity has grown, with farmers increasingly taking advantage of economies of scale (average farm size has grown by 19% since 1997) and using off-farm inputs such as irrigation water and fertiliser. This intensification of agricultural operations was associated with a shift from *sheep to dairy farming* (Figure 5.1). From a peak of 70 million in 1983, the sheep population has dropped to 39 million; since 1996, sheep numbers have declined by about 19% (StatsNZ, 2002a). Dairy cow numbers have risen from 3.1 million in 1983 to 4.2 million in 1996, and 5.4 million in 2005.

New Zealand's agriculture sector is highly reactive to changes in *international commodity prices, exchange rates and market conditions*, because it is fundamentally oriented towards export and its level of subsidisation is very low (Chapter 5). It is estimated that the Uruguay round of multilateral trade negotiations created market conditions (e.g. greater access, lower tariffs) that increased New Zealand's agricultural exports by NZD 6.13 billion over 1995-2004 (MAF and MFAT, 2006). Sensitivity to international market forces increased, following the *dramatic decline in agricultural producer support* from a peak of over 30% of farm receipts in the mid-1980s to a low of 2% in 2005^a (OECD, 2005). By comparison, the OECD average was 31% in 2005.

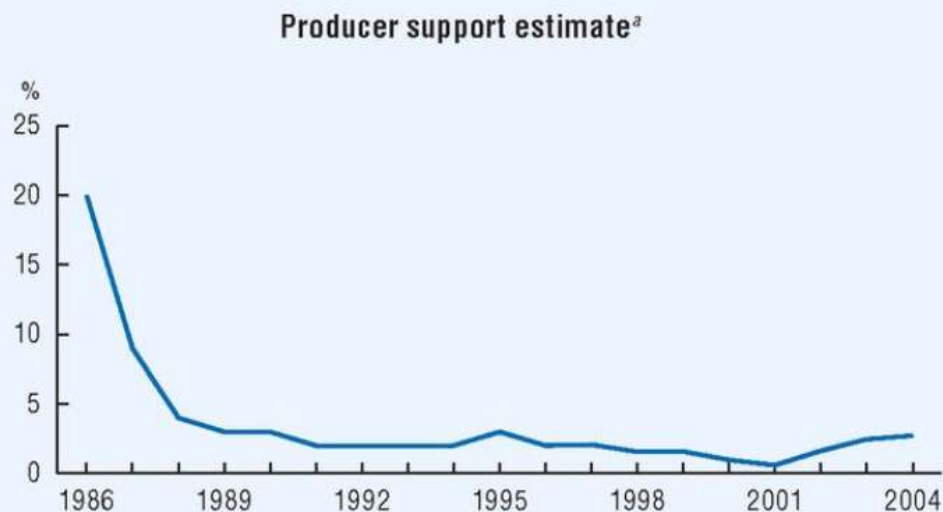
Sectoral reforms have been associated with *large shifts in land use and stock intensity*, with implications for soil and water quality (PCE, 2004). Thousands of hectares of marginal pasture previously used for subsidised sheep grazing are now in forest production or have been left to regenerate as native bush (Figure 5.1). The sharp increase in dairy farm productivity during the 1990s was very similar to what occurred in the highly supported European Union (3.3% and 3% per year, respectively, measured as milk solids produced per hectare). In Europe, productivity gains stemmed almost entirely from increased milk production per cow. While this was also the main driver in New Zealand, an increase in *stock intensity (cows per hectare)* contributed one-third of the increase (OECD, 2004).

As the area farmed has fallen, *agricultural productivity has increased*. Between 1990 and 2003, the area of farmland fell by 15% while production increased by 38%.^b Factors contributing to the increase in production include improved animal husbandry and breeding, technological change and scale economies through expansion of average farm and orchard size. From 1994 to 2004, the number of cows per hectare increased by 19% and milk solids per hectare by 34%. Even in the sheep industry, where numbers have fallen, significant productivity improvements have resulted in higher lambing percentages and higher carcass weights, both up by 25% since 1980.

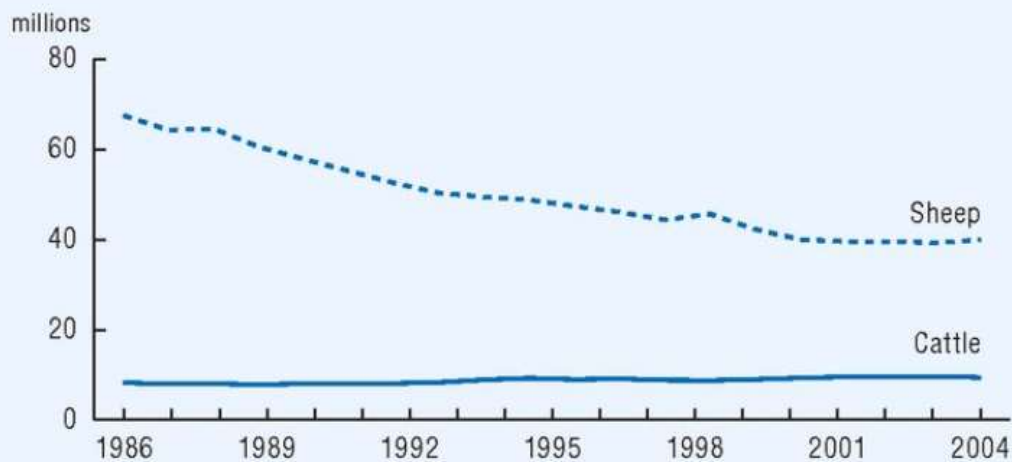
Arable crop farming has become increasingly focused on producing maize silage for dairy production; it is now the biggest single arable crop. The area of land in horticulture has increased, with about 40% of it used for fruit production and 60% for vegetables. The number of vineyards rose from 190 in 1994 to 421 in 2003, and the area planted in grapes grew by 142%.

-
- a) Remaining budgetary support for agriculture is for research, pest and disease control and climatic disaster relief, with small but increasing payments made to farmers undertaking agri-environmental measures to protect indigenous biodiversity.
- b) Production as measured by the FAO agricultural production index.

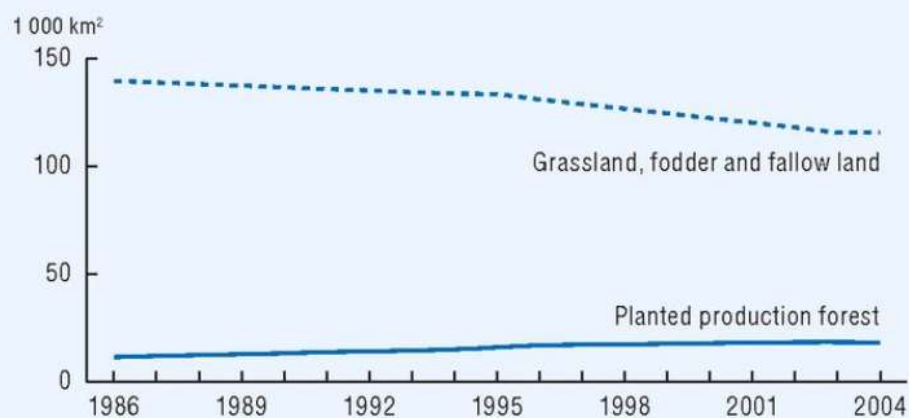
Figure 5.1 **Agricultural subsidies and land use trends**



Livestock numbers



Agricultural and forestry land use



a) PSE (Total producer support estimate), as calculated by OECD: transfers to farmers as a percentage of their gross receipts.

Source: OECD PSE/CSE database, 2006; MAF 2005; FAO 2006; SNZ 2005.

Box 5.3 Sustainable Farming Fund

The Sustainable Farming Fund (SFF), established by MAF in 2000, supports projects that help agricultural producers *reconcile economic, social and environmental objectives*. Funds are allocated through annual contestable funding (competitive grants) to projects lasting from one to three years. Projects must be producer-led, representative of a community of interest and provide partnership funding. Funds cannot be used for capital expenditure, to support commercial entities or to benefit a single organisation or company. Project teams have to report progress on agreed work programmes.

By 2006, the SFF had funded over 400 projects in several allocation rounds (Steel, 2005). Funding ranged from NZD 1 300 to NZD 600 000 per project, with an average grant size of NZD 130 000. The SFF received NZD 24 million for its first three years of operation (2000/01 to 2002/03), to cover both administrative costs and grant payments. Following a successful review, the budget allocation for the second three years (2003/04 to 2005/06) was increased to NZD 28.5 million, and it is NZD 29.6 million for the three years beginning in 2006/07.

An *initial evaluation* of the SFF in 2002 was based on questionnaire-driven interviews with managers and sponsors of 33 projects, as well as interviews with key industry and sector organisation personnel and local government managers. Because the projects were very recent or still going on, the resulting assessment was preliminary. Nevertheless, it elicited useful feedback from project managers that provided input for subsequent improvements to the fund's financial, management and reporting systems.

A *more comprehensive evaluation* in 2004, led by an independent consultancy, categorised the 257 projects sponsored according to: i) major stakeholder (primary sector, processing, communities); ii) predominant outcome (knowledge, application, transfer); and iii) range and type of benefits (economic, environmental, social). It revealed that the SFF project portfolio was fairly balanced and diverse. More detailed analysis of specific groups of projects was carried out to quantify benefits. Analysis of seven groups comprising 106 projects indicated potential economic return to GDP (or farm-gate production) in the range of NZD 330-530 million per year. Realising these benefits will require further investment and other resources to enable or facilitate adoption. Potential environmental benefits were noted but not quantified.

Box 5.4 Environmental management systems in the agriculture sector

Sustainable Winegrowing New Zealand, established by five vineyards in August 1995 as an industry initiative directed through New Zealand Winegrowers, has been adopted by growers from all of the country's grape growing regions. It addresses agrochemical use, soil health, water availability and quality, and biodiversity. Growers conduct a self-audit each year, and an independent auditor conducts random controls every three years on average. In June 2006, SWNZ had 490 members representing 130 km² out of a total wine production area of 200 km². Although growers do not receive a price premium, cost savings have resulted through more efficient spraying. During the review period, the use of broad-spectrum organophosphate pesticides has steadily decreased, while the use of more targeted insect growth regulators has risen.

The *KiwiGreen* programme began in 1992 and was made a condition of kiwifruit supply in 1997. While it began as a quality assurance programme relating to food safety and quality, it provided environmental benefits by shifting growers to less toxic chemical use. The area covered by KiwiGreen increased from about 60 km² in 1994 to 115 km² in 2003; of this, around 5 km² is in organic production (MAF, 2001).

The area covered by integrated pest management in *apple production* rose from 70 km² in the late 1990s to 120 km² in the early 2000s. It involves monitoring for pests and diseases, responding only where thresholds are exceeded, using non-chemical control such as canopies, sticky bands, biological control and pheromones, and using "soft" chemicals.

Livestock farmers are involved in several environmental management system initiatives. *Market Focused* was introduced in 2001 to help dairy farmers address environmental management issues (Dexcel Partners, 2005). Project Green was initiated in 2001 to develop a minimum voluntary standard for sustainable production of sheep, beef cattle, deer and goats. Through a series of farm trials, plans covering animal management, land and environment, and social responsibility, along with associated software, have been developed. The *New Zealand Deer Farmer's Landcare Manual* was launched in June 2004, gathering and documenting knowledge from deer farmers on the effects of deer on the farm environment and successful ways to deal with these effects.

The government has facilitated efforts to certify organic agriculture, primarily to assure market access for producers. At the request of organic exporters, the New Zealand Food Safety Authority established the *Official Organic Assurance Programme*. The initial objective was to provide assurance that organic product exports met EU requirements. The programme was recently extended to cover access to the United States and Japan. As of 2003, around 800 farms were either certified as or converting to organic. The area concerned totals 460 km², nearly quadruple the area in 1994. While the vast majority of farms concerned are horticultural operations, almost half the area (over 210 km²) is in sheep and/or beef production.

Table 5.2 Public expenditure addressing environmental effects of agriculture and forestry, 1997-2004^{a, b}

(million NZD)

	1997	1998	1999	2000	2001	2002	2003	2004
East Coast Forestry Project	2.64	3.50	3.91	3.35	2.14	2.39	3.96	4.07
Organics Initiative	...	...	...	...	0.33	0.25	0	0
Soil conservation	10.66	10.29	9.38	12.67	11.99	15.44	12.79	12.12
Sustainable forestry management	1.27	0.39	1.04	1.49	1.42	1.38	1.48	2.01
Contestable Water Fund	0	0	0	2.25	1.35	0	0	0
Disaster relief	0.43	0.49	0.09	5.02	0.19	0	0.01	5.65
Flood control and land drainage programmes	5.99	7.04	7.18	6.91	13.74	12.72	13.17	14.60
Land-care groups	0.25	0.37	0.40	0.40	0.40	0.40	0.40	0.40
Agri-environmental research ^c	79.48	79.11	79.11	90.70	89.58	96.48	90.03	88.98
Sustainable Farming Fund ^d	...	...	...	...	0.51	2.95	3.97	3.53
Sustainable Management Fund	1.10	1.10	0.94	0.94	1.19	0.30	0.10	1.30
Pest management	34.45	39.44	38.79	37.84	44.89	50.74	52.77	60.30
Total	136.30	141.75	140.87	161.61	167.79	183.07	178.71	193.00

a) Including goods and services tax of 12.5%.

b) Financial years ending 30 June.

c) Includes funding from the Foundation for Research, Science and Technology (Public Good Science and Technology Fund) and Royal Society (Marsden Fund).

d) Established in September 2000.

Private sector

Environmental reporting by industry is at an early stage. The Business Council for Sustainable Development promotes triple bottom line (TBL) reporting by industry, and about 30 companies periodically release TBL reports, with summary information about their social and environmental performance (Chapman and Milne, 2003). The MfE estimates that 50 enterprises regularly issue environment reports. Several recent studies have suggested that, while the number of New Zealand companies undertaking TBL or environmental reporting is rising slightly, the standard of reporting trails best practices in other OECD countries (Milne *et al.*, 2000). In particular, the level of detail and completeness of information regarding environmental performance, targets and achievements was found to be generally deficient, and very few companies engage independent auditors to verify their reports.

New Zealand has no *Pollutant Release and Transfer Register* (PRTR), despite the 1996 OECD Council Recommendation on PRTRs, which calls for member countries to establish such registers and make them publicly available. The government considered developing a PRTR but decided not to because pollutants are legislatively controlled. Experiences of other OECD countries suggest that such a register would, at a minimum, provide a useful database of industrial releases to air, water and soil, and of waste transported to treatment and disposal sites.

6.2 *Benefits of access to nature, recreational areas and other environmental amenities*

Under national legislation on nature conservation, *public access to nature conservation areas* must be free of charge (Chapter 3). Parks and conservation areas cover some 32% of the national territory, and are primary tourist attractions. A 2002 DOC study of the *benefits of conservation and recreation management* identified positive social outcomes ranging from improved physical and mental health (leading to reduced health care costs) to heightened appreciation of special places, increased perceived quality of life, strengthened environmental ethics and more environmentally sound behaviour (Booth *et al.*, 2002). In recent years, nature tourism has grown quickly and some popular places in parks have suffered environmental damage from tourism activities (Chapter 3).

Access to private land for recreation is an important part of New Zealand's lifestyle and culture. Public access has traditionally been assured to the "Queen's Chain" of water margin land along rivers, streams, lakes and seas. Historically, the land forming the Queen's Chain has been linked by walkways, some officially declared and others simply grandfathered. Under the 1975 and 1990 Walkways Acts, over 150 such paths are in use, many not yet formally surveyed or declared in the government gazette ("gazetted"). Most official walkways cross public land, which entails fewer legal hurdles and management issues, and lower costs (establishing walkways on private land requires costly surveying). For walkways crossing *private land*, gazetting provides landowners with legally enforceable rights and enables compensation to be paid if losses occur due to use of the walkway. Without gazetting, no such rights are conferred, and user access depends on landowners' goodwill.

During the review period, much public debate took place about how to guarantee *access to water margins* when this entails crossing private land. In 2003, a ministerial reference group was appointed to evaluate whether the arrangements for walkers' access to water margins, public land and private rural land were sufficient. Its report (Acland *et al.*, 2003) proposed a *New Zealand Land Access Strategy* to provide clarity and enduring access. It would have aimed to assure access to a five metre walking strip along parts of the *coast, rivers, lakes and other water bodies* that have been identified as having significant "access value". In 2005, plans to initiate mapping to establish the location of the walking strip were abandoned, and a new panel was appointed to review access to and along water margins. Although there is general support for assuring access, how to do this remains the subject of heated debate, with farmers in particular raising concerns over bio-security and legal liability for any damage done by walkers.

3. International Trade and the Environment

3.1 Context

New Zealand's economy is *dependent on overseas trade* (Chapter 4). In the past, a large proportion of its exports (mainly agricultural products) went to the UK, but its trading partners have become more diverse. Australia is New Zealand's most important export market, accounting for nearly 20% of the value of total exports in 2004. It is followed by the US (14.3%), Japan (11.4%), China (6.3%) and the UK (5.1%). On international markets, New Zealand's "*clean and green*" image brings a premium price for goods deemed safe or environmentally sensitive, such as dairy and meat products from animals that graze year-round on open pastures.

Dairy and meat products are the top two merchandise export categories (worth NZD 6 billion and NZD 4.5 billion, respectively, in 2004), followed by wood and wood products, fish and machinery. More than 90% of New Zealand's dairy production is exported. Meat exports, which made up almost 30% of national exports in the mid-1960s, had dropped to 10% by the early 2000s but have since begun rising again. Organic food exports are relatively minor but growing. New Zealand's extensive plantation forests are for the most part certified as sustainably managed under an internationally recognised eco-label (Chapter 5). Tourism is the biggest source of export dollars, and nature-based activities are cited as main attractions by two-thirds of international visitors (Chapter 3).

New Zealand has increasingly sought to facilitate trade, both multilaterally (through the World Trade Organization) and through *free trade agreements*, particularly with partners in the Asia-Pacific region. It has had a trade agreement with Australia since 1983. New Zealand recently concluded or is pursuing bilateral or regional trade agreements with Thailand, Chile, Singapore and Brunei. Trade agreement negotiations

are under way with China, Malaysia and ASEAN countries. In 2001, the government adopted a framework for systematically including environmental standards in trade agreements. As a consequence, a mutual commitment to meet *environmental standards* is included in the recent agreement with Thailand and in the Trans-Pacific Strategic Economic Partnership (New Zealand, Brunei, Chile and Singapore).

3.2 *Endangered species*

New Zealand implements its *commitments under CITES* (the Convention on International Trade in Endangered Species of Wild Flora and Fauna) through the 1989 Trade in Endangered Species Act. Schedules to the Act, periodically updated to reflect changes in the CITES appendices, specify the CITES-protected flora and fauna which are barred from trade. The Department of Conservation issues import and export permits and captive breeding permits. MAF is responsible for quarantine, and the Customs Service for border control. Representatives of these three agencies make up the Wildlife Enforcement Group, set up in 1993 to co-ordinate information and counter illegal trade.

New Zealand's location and wealth of unique species makes it a *staging area for the world wildlife trade*. In 1997, the Royal Forest and Bird Protection Society reported that illegal export of indigenous plants and animals from New Zealand, as well as smuggling of CITES-listed species from other countries through New Zealand, had reached worrying levels (Williams, 1997). Also in 1997, TRAFFIC, an international non-government network monitoring global trade in endangered species, reported that bird smuggling in New Zealand was being carried out by organised crime syndicates. The accidental death in 2003 of the principal wildlife smuggler in New Zealand and the bird flu epidemic in 2005 have led to a sharp decrease in the smuggling of listed bird species in recent years. In 2003, a New Zealand customs official observed that endemic beetles were being openly traded via the Internet around the world.⁴ Concern about the increasing illegal trade in and declining wild populations of geckos (Watson and Steere, 2006) led to their classification under CITES Appendix 3 in 2003.

The number of *seizures of CITES-protected species or materials* at the border ranged between 4 000 and 5 000 per year in the early 2000s. Of these, 90% occurred at Auckland International Airport. Since the late 1990s, the main items seized have been coral and traditional Chinese medicines, though wildlife smuggling remains a concern. In its *action against illegal trade*, New Zealand has in recent years successfully prosecuted a number of CITES violators, including members of a bird smuggling syndicate⁵ and two persons posing as botanists, who were transporting 300 specimens of native orchids and other rare plants taken from conservation areas

(Interpol, 2006). Concerns about possible involvement by Asian triad gangs, an upsurge in smuggling of native orchids and insects, and emerging bio-security risks have been growing. Given these trends, an assessment of enforcement issues would be timely, in particular whether fines and jail sentences serve as real disincentives for wildlife smuggling at their present levels, in light of the potential gains, and whether consideration should be given to reinforcing controls at points of retail sale of wildlife products and traditional Asian medicines, in addition to border controls.

New Zealand has actively supported *CITES education, training and awareness raising* nationally and throughout the region. At Auckland International Airport, a series of CITES fact sheets, describing species of particular interest to travellers, have been distributed since 2003. Border control officers undergo periodic training courses to sharpen their recognition of CITES-protected species and derived products. Special information campaigns have been elaborated to raise awareness of CITES issues among Chinese and Pacific Islander communities in New Zealand; although quantitative indicators of the *impact of these native-language programmes* are not available, they are believed to have helped reduce imports of CITES-protected goods by individuals (CITES Secretariat, 2001; Delahunt, 2003). Part of the programmes' success stemmed from the involvement of community leaders. Thus, consideration should be given to building CITES education partnerships with other community-based groups, such as bird protection societies and environmental groups.

3.3 Timber

Tropical timber

Between 2000 and 2005, New Zealand's *imports of tropical timber* rose slightly, reaching 12 000 m³ according to data from the International Tropical Timber Organization (ITTO, 2006) (Figure 7.3). New Zealand is a consumer member of the ITTO, and like most countries has struggled to meet the ITTO's Objective 2000 (ensuring that all traded timber is from forests certified as sustainably managed). To move towards Objective 2000, New Zealand has encouraged the use of certification regimes and eco-labels. Through its Interim Timber Procurement Policy it has also worked to ensure that government-purchased wood and wood products come from sustainably managed forests.

Members of New Zealand's *Imported Tropical Timber Group (ITTG)*, which includes major importers and retailers as well as environmental NGOs (with MAF as an observer), have pledged not to import tropical timber from certain countries that are known for unsustainable forest practices, and not to advertise or otherwise promote tropical timber decking that comes from unsustainably managed forests.

Figure 7.3 Imports of tropical wood,^a selected countries, 2005



a) Logs, sawn wood, veneer and plywood.

Source: ITTO 2006.

In 2004, the New Zealand Timber Importers Association, a member of the ITTG, for the first time expelled one of its members (a foreign-owned timber importing company) for violating this code of conduct.

Illegal logging

New Zealand has participated in a range of *international efforts against illegal timber trade*, such as the Forest Law Enforcement and Governance initiative, the Asia-Pacific Forestry Commission of the Food and Agriculture Organization (FAO) and the United Nations Forum on Forests. The country is also developing a national policy to guide its efforts against illegal logging and related trade.

5.1 *Official development assistance*

The *New Zealand Agency for International Development* (NZAID) was established as a semi-autonomous body within the Ministry of Foreign Affairs and Trade in 2002. It was charged with managing the government's allocation of official development assistance (ODA), with a central focus on eliminating poverty and a core (but not exclusive) focus on the Pacific. Environmental concerns are mainstreamed into ODA with two particular objectives: promoting environmentally sustainable resource use and development that is consistent with the receiving country's priorities, and enhancing assets of the poor through conservation of natural resources.

In 2005, New Zealand's *ODA expenditure as a percentage of GNI* was 0.27%⁹ (Figure 7.4). In 2007, the share of ODA in GNI is projected to rise to 0.28%, compared with the OECD-DAC average of 0.33% and the UN target of 0.7%, which the New Zealand Government endorsed in Rio. Total ODA amounted to NZD 389 million in 2005. In May 2006, the government announced that ODA would be increased by NZD 138 million over the next four years, with priority on bilateral aid to Vanuatu, Papua New Guinea, the Solomon Islands, Fiji and Vietnam. ODA directed at *environmental activities in the Pacific* rose from NZD 1 million in 1997 to about NZD 4 million in 2005.

5.2 *Environmental co-operation for regional development*

Strong bilateral ties with Australia have been maintained through New Zealand's regular representation on Australia's Environment Protection and Heritage Council¹⁰ and Natural Resource Management Ministerial Council. Among other efforts, such co-operation has led to the recent harmonisation of the two countries' environmental standards for a range of consumer products (e.g. appliances).

New Zealand strives to integrate environmental concerns into its assistance and regional co-operation with *South Pacific island countries*. In 2005, 4.5% of its ODA in the Pacific region was specifically oriented towards strengthening environmental management (Cornforth, 2005). New Zealand has offered technical assistance and training to South Pacific countries to enhance their CITES enforcement capacity.¹¹ It also hosted the 2003 Interpol meeting on *wildlife crime*, which allowed Pacific island countries to attend for the first time, and inspired a subsequent Pacific Islands Forum resolution to take measures to better incorporate biodiversity protection concerns into trade. In addition, New Zealand provides bilateral assistance for sustainable forestry and management of ODS to Pacific island countries.

New Zealand remains active in the *Pacific Regional Environment Programme*,¹² providing technical expertise and programme support, particularly for training in environmental management and protection. It has ratified the programme's protocols on the prevention of pollution by dumping and co-operation in combating pollution emergencies (Noumea Convention), and helped make the amendments consistent with the London Convention and its protocols. New Zealand chaired the Pacific Island Roundtable for Nature Conservation, which recently created the first inventory of conservation activities in the Pacific region. As chair of the *Pacific Islands Forum* in 2004, New Zealand focused on development of a *Pacific Plan* to strengthen regional co-operation and integrate environmental concerns into economic policies. A first draft was endorsed at the forum meeting in October 2005.