ASIA-PACIFIC FOREST INVASIVE SPECIES NETWORK (APFISN)

NEWZEALAND REPORT

1. About New Zealand

New Zealand is approximately 1,600 kilometers south-east of Australia. It is comprised of two main islands (the North and South Islands) and several smaller islands. The combined land area is 270,534 sq kilometers.

Its geography includes extensive grassy plains, the large mountain chain of the Southern Alps, the volcano region of the North Island, fiords, glaciers, lakes and rainforests. Its summer covers the December to February period, and its winter June to August. The climate is relatively mild in most parts.

New Zealand is an independent state of the Commonwealth. The Queen is represented in New Zealand by the Governor General.

The Country's population is 4.0 million. Its economy is heavily dependent on overseas trade. Dairy and meat exports make a large contribution to the economy. However industries such as forestry, horticulture, fishing, manufacturing and tourism are becoming more significant.

The term "biodiversity" is used to refer to the protection of the economy, environment and public health from "pests" (which includes diseases such as SARS). It includes activities to prevent new pests arriving, and the eradication or control of those already present. As an isolated island nation, biosecurity is especially important to New Zealand.

More information about New Zealand can be found on: www.govt.nz/aboutnz

2. ***Basic information on forestry situation***

New Zealand's a forest resource, which covers 29 percent of the total land area, comprises two distinct types:

1. natural forest made up indigenous trees; and
2. planted forest, made up of introduced tree species that have been established for their commercial value.

In addition, there are many amenity trees in urban and parks. These include many different introduced species.

Natural forests

New Zealand 6.4 million hectares of natural (indigenous) forest, much of which is located mainly in or near mountainous areas. These forests contain unique wildlife, including some endangered or threatened species. The forests are important both ecologically and for recreation.

The government is the major owner of natural forest. The Department of Conservation manages about 77 percent of the total area for conservation and recreational values. Privately owned indigenous forests are required by law to be managed in a way that maintains their productivity and amenities in perpetuity. The Forest Act 1949 does this by:

- requiring private owners to manage their natural forests through sustainable management plans and permits;
- controlling input of indigenous timber species to sawmills; and
- prohibiting the export of woodchips or logs of indigenous tree species.

Planted forests
New Zealand has had planted forests since the 20th century. Over 1.7 million hectares have now been established. About 90 percent comprise radiata pine, a conifer from California. Over half of the radiate pine forest stands have been pruned to enhance their wood quality. The planted forests estate is relatively young, with 61 percent less than 16 years old. The average time between planting and harvesting is 28 years.

Detailed statistics on New Zealand's planted forests can be found on www.maf.govt.nz/statistics/primaryindustries/forestry/forest-resources/national-exotic-forest-2001/index.htm

3. *General overview of the Forest Invasive Species (FIS)*

Newly introduced pests
There are many "pests" (including fungal diseases) that would seriously affect the country's forests if they became established. For example gall rust fungus (*Endocronartium harknessii*) could seriously impact on the country's radiate pine forests.

In recent years some newly introduced pests, such as Asian gypsy moth and white spotted tussock moth, have been successfully eradicated. Other introduced pests such as painted apple moth and fall webworm appear to have been eradicated, although monitoring is still being undertaken as a precautionary measure. A programme to eradicate Dutch elm disease has been underway since 1989. Although this disease has been successfully eradicated from Napier, there

is still a persistent infestation in Auckland. Recently the Government has declined to increases funding for the response programme and discussions are now occurring with local Government about the transfer of lead responsibility of this programme to the local level.

Established pests and diseases
Many new species of plants and animals were deliberately introduced during the early period of European settlement. Some of these rapidly became forestry pests due to favorable conditions. For example possums, deer and goats are widespread and cause significant damage to trees and other plants. Various weed species are also a problem. Rats, stoats and ferrets are a serious threat to indigenous birds within forests.

The pine needle blight *Dothistroma pini* is common in young radiate pine forests, especially in damper parts of the country. It is controlled by the aerial application of copper sprays.

A number of other fungi cause damage to trees and /or wood: for example cyclaneusma needle-cast, diplodea dieback and whorl canker (both caused by *Sphaeropsis sapinea*) and armillaria root disease.

A significant number of pests of eucalypt trees have become established, largely because of the proximity of Australia and the amount of trade and travel between Australia and New Zealand. Some of these pests of eucalypt trees have deliberately or accidentally introduced biological controls.

Cypress canker disease, caused by *Seiridium* spp, continues to affect many cypress plantations and woodlots, particularly macrocarpa (*Cupressus macrocarpa*).

The wood wasp Sirex attacks the trunks of pine trees, especially stressed trees. However the activity of this wasp has been reduced by the introduction of a biological control.

Information on some high profile forest pests can be found at:
www.maf.govt.nz/biosecurity/pests-diseases/forest/index

Scion (former Forest Research), a government owned research organization, maintains a database of the pests present in New Zealand that affect trees through trees its subsidiary organization, Ensis.

Appendix 1 provides New Zealand annual pest and disease status report for 2004/2005.

4. ***Strategies adopted/measures taken to control***

Introduction

A "Biosecurity Strategy" (www.maf.govt.nz/biosecurity/bio-strategy/biostrategy) was published in August 2003 and has been fully endorsed by the Government. It sets an overall direction for biosecurity and identifies priority areas. The Strategy applies to land, freshwater and marine environments.

The strategy includes 57 expectations for the future of the biosecurity system. It recognises the breadth and complexity of the biosecurity system and the contribution it makes to protecting New Zealand's economic base, environment and human health. The Strategy noted the considerable challenges in managing the system due to the widening of the scope of biosecurity and the increasing flow of goods and services across the borders. It identified that the biosecurity system and particularly the identification and management of risks had become increasingly reactive.

The biosecurity system involves a number of players-central government, regional government, industry groups and community groups-as well as the general public. The Biosecurity Strategy advocates more effective coordination among agencies at a national and regional level, and greater engagement with communities. MAF needs to clarify roles and responsibilities, and increase coordination among these groups. MAF also needs to work hard to earn the confidence and trust of its various stakeholders, particularly when making difficult decisions that balance different values.

The Biosecurity Strategy did not suggest any specific changes to legislations; however, it indicated that the Biosecurity Act and several other pieces of legislation should be reviewed at some time.

The Biosecurity Strategy recommended ten steps to be implemented immediately:

Step	Action	Current Status
1	Make MAF clearly accountable for overall management of the whole biosecurity systems, on behalf of all New Zealanders	Complete
2	Put in place the necessary systems, structures and capabilities within MAF to support its role- starting with strong strategic capability	Underway
3	Establish governance mechanisms (including a reconstituted Biosecurity Council and chief executives' forum) to support this strategy's implementation and monitor performance	Complete
4	Encourage all New Zealanders to support and participate in biosecurity through a social marketing programme	Initial steps
5	Identify, ways to involve Maori in biosecurity issues and decisions, nationally and locally	Initial steps
6	Identify, priorities and review current and emerging risks- from pre-border to pest management and across aquatic and terrestrial environments	Initial steps
7	Establish national leadership and co-ordination of pest management	Underway
8	Recognise the contribution of science to biosecurity (strategically and operationally) and fund it properly	Initial steps
9	Ensure decision-making processes take account of risks to the economy, biodiversity, taonga, human health and lifestyle in setting priorities	Underway
10	Increase funding over the next five years for priority areas and build organizational capability across the system	Underway

New pests can enter New Zealand through many different "pathways" For example they can enter as "hitchhikers" on or within a sea container. Some pathways are strongly targeted; others less so. Although much is known about the pathways through which pests enter and move about, more scientific research is needed on ways of detecting pests and blocking pathways. The risk posed by new pests is mitigated at different points: pre-border, at the border and post-border.

Pre-border activities

Requirements that must be met before specific types of goods can enter the country are set out in import health standards (IHSs). The development of IHSs

involves extensive consultation to ensure all risks are identified and covered by pre-entry measures such as testing, pre-shipment inspection, treatment or quarantine. Sometimes post-border conditions are also imposed as a further safeguard. Care is taken to ensure that all the compliance requirements of IHSs are technically justified, and therefore do not contravene World Trade Organization (WTO) free trade agreements.

New Zealand takes a leading role in international organizations that reduce the risk of importing – or exporting – pests. Although there are few international agreements to notify trading partners about environmental pests, a number of informal networks are emerging through organizations such as the International Union for the Conservation of Nature (IUCN). New Zealand has been successful in getting the International Plant Protection Convention to start addressing highly invasive weeds.

Strict controls apply to the deliberate introduction of new organisms that may be brought into the country for commercial or other purposes. These controls ensure that any deliberately introduced new organism is unlikely to become a pest.

Border activities

A quarantine service based around the major entry points for cargo, passengers and international mail undertakes a range of activities. The main activities are:

- the use of x-ray machines and detector dogs at international airports (for passengers, baggage and mail);
- baggage searches at airports (This is done periodically, after baggage has passed an x-ray machine, in order to validate inspection systems and measure their sensitivity);
- instant fining of passengers who fail to declare risk goods;
- increasing public awareness of biosecurity risks through a programme known as " Protect New Zealand",
- assessing cargo at sea and air ports to ensure all risk goods conform to import requirements;
- screening manifests of a sea containers and risk cargo, and follow up actions where appropriate;
- sample inspections of containers (This is to ensure the validity of cleaning certificates and the absence of pests); and
- inspecting imported machinery and used cars.

Smuggling of risky foods, plants, wooden items and animals is a serious biosecurity problem. Interceptions are frequently made of items that people are trying to bring in illegally.

Post- border activities

Incursion response

Once an organism has been detected in New Zealand, an "incursion response" is initiated to stop or restrict its spread, identify it, and define its distribution ('delimitation'). This is followed by an assessment of whether to attempt eradication, controlling its spread, or doing nothing.

Response plans have been prepared for major pest thrests such as gypsy moth. Although the number of threats is too numerous to be covered by specific response plans, generic plans cover most of them. The Government bears the ultimate responsibility for responding to new incursions, and carefully considers any responses that require unbudgeted expenditure

Controlling established pests

Over half New Zealand's biosecurity's expenditure is used to control established pests. Control measures may contain pests in defined areas, reduce the rate of spread to new areas, or reduce population levels. The Department of Conservation (DoC) annually spends over$50 million on managing pests (including weeds), and regional councils over $25 million on this. DoC is developing decision tools and supporting databases for pest management. There is substantial other expenditure by the Ministry of Agriculture and Forestry, and industry and communities on pest management.

5. ***National pest reporting and recording***

Programmes are in place to enable early detection and reporting of newly introduced forestry "pests" (including diseases). These programmes cover:

- surveys of trees near all major airports and sea-ports, plus high risk natural forest sites (government funded);and

- surveys of planted forest (forest owner funded). The planted forest surveys involve aerial surveys of all significant sized forests and follow-up ground surveys.

In addition, the public is encouraged to report suspected new pests. By law, New Zealanders are required to report any organisms that they consider are not normally seen in New Zealand. Legislation ensures that compensation is available to those directly affected by government eradication programmes. One of the purposes of having these compensation provisions is to remove commercial disincentives to reporting suspected new pests.

A free identification service is available to members of the public, importers, growers and forest owners with concerns about pests affecting trees. This is run by the government owned research organization, Scion. There is a small charge for routine identifications not covered under the "possible incursion" banner.

6. ***Legal framework***

The Biosecurity Act 1993 is the main legislation that empowers and informs the country's biosecurity activities. The Act provides for the exclusion, eradication and management of unwanted harmful organisms. The Act is administered by MAF and, while it does not compel action, it provides mechanisms enabling agencies within and outside of government to access wide-ranging regulatory powers.

The Biosecurity Act specifically covers:

- Management of risks associated with the importation of risk goods (Part 3);
- Monitoring of New Zealand's pest and disease status (Part 4);
- Management or eradication of pests through national and regional pest management strategies (Part 5);
- Direct exercise of powers by a Government agency outside of formal pest management strategies (Part 6); and
- Exigency (emergency) action to prevent, manage or eradicate unwanted organisms (Part 7).

WTO standards relating to sanitary and phytosanitary requirements are important in determining border controls. MAF's commitment to the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement) and the standard setting bodies recognized in that Agreement reflects New Zealand's commitment to the World Trade Organization and the establishment of fair and consistent rules for international trade.

The SPS agreement allows member countries to determine their own of protection of human, animal or plant life or health, and requires that any restrictions on trade deemed necessary to achieve that protection be non-discriminatory (including between their own territory and that of other members, i.e. import and export regimes), transparent and scientifically justified.

As multilateral trade liberalization proceeds, SPS measures increasingly become the critical determinants to market access for agriculture, horticulture, forestry and fish products. Thus the pressure to develop robust international standards enabling trade in these products is increasing rapidly across the three standards setting bodies recognised in the SPS agreement: World Organisation for Animal Health (OIE), International Plant Protection Convention (IPPC), and Codex Alimentarius Commission (Codex).

The Hazardous Substances and New Organisms Act 1996 provides powers to control the deliberate introduction of new organisms for beneficial purposes. It is administered by the Environmental Risk Management Authority New Zealand and requires risk assessment and public consultation as part of the decision process for introducing new organisms.

7. *Key institutions involved in FIS strategies*

Many organisations are involved in biosecurity- central government, regional authorities, industry and community groups.

Central government roles

MAF

MAF is the lead biosecurity agency. MAF administers the Biosecurity Act, creates most biosecurity regulations and import standards, provides assurances for exported primary products, manages biosecurity risks at the border, provides diagnostics for suspect pests and diseases, and carries out responses to nationally siginificant pests and diseases (e.g. moth eradication programmes in Auckland). It also has a new leadership role in relation to national –scale pest management. (www.maf.govt.nz)

Within MAF, there are two major groups involved in biosecurity being:

- Biosecurity New Zealand (www.maf.govt.nz/biosecurity); and
- MAF Quarantine Service (www.maf.govt.nz/quarantine).
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Biosecurity New Zealand

Biosecurity New Zealand was established in November 2004 within MAF, drawing staff from the previous Biosecurity Authority, MAF Policy and the Ministry of Fisheries. Biosecurity New Zealand has approximately 280 full-time equivalent staff.

The new structure represents a move away from a previous "sector-focus" (i.e. animals, plants, and forestry) to one based on a "points of intervention" model. The six structural units reporting to the Assistant Director-General are:

Pre-clearance:- managing biosecurity risks up to the point where they receive biosecurity clearance to enter New Zealand. This includes risk analysis, import health and other operating standards (e.g. for managing airports and ports), monitoring and export assurances;

Post clearance:- providing effective management of biosecurity risks in New Zealand- surveillance, incursion response and pest management;

Investigation and Diagnostic Centres:- investigating reports of suspected exotic pest and diseases to the point of definitive diagnosis. The centres operate from Tamaki (Auckland), Wallaceville (Upper Hutt) and Lincoln (Canterbury);

Compliance and Enforcement;- auditing, investigating and responding to serious breaches of legislation administered by MAF- primarily the Animal Welfare and Biosecurity Acts;

Policy and Business:- providing policy, strategic science, international coordination and management processes to underpin and support the rest of the structure. It supports the governance of the biosecurity system by co-ordinating the key organisations and providing an overview of key policy issues. Its key focus for 2005/06 is on implementing a performance measurement for the whole system, clarifying roles and responsibilities, and reviewing the Biosecurity Act, including the compensation provisions. It also provides the secretariat for the three main governance and advisory forums; and

Animals Welfare: - promoting policies and developing standards appropriate to society's expectations for the humane treatment of animals and close liaison with agencies involved in animal welfare, such as the Royal New Zealand SPCA. It also provides support and the secretariat for two

Ministerial advisory committees. Animal welfare currently falls within the Agriculture Ministerial portfolio and animal welfare issues are discussed in the briefing to the incoming Minister of Agriculture.

MAF Quarantine Service

The MAF Quarantine Service is the arm of MAF that manages biosecurity risks at New Zealand's ports, airports and related facilities, both here in New Zealand and offshore. Staff identify and manage potential biosecurity risks at the border and provide domestic and offshore inspection and clearance services. The Quarantine Service staff remain the primary public face of MAF e.g. by appearing on the TVNZ programme 'Border Control'.

The Quarantine Service is a large shift-based operation. It has recently been restructured to clarify roles, provide clear lines of accountability, ensure the structure supports MAF strategy, and improve management support. The Quarantine Service has just over 600 full-time equivalent staff.

The Quarantine Service structure includes five main business units.

Auckland Cargo Manager – Responsibility for all cargo operations in Auckland – AKL Wharf, Air Cargo, Zones & Inspections, International Mail Centre:

Auckland Airport Manager – Responsibility for all operations at AKL Airport;

Regional Operations Manager – Responsibility for all operations excluding AKL – Tauranga, Wellington, Christchurh, Offshore Programme, Regional Ports;

Service Manager – Responsible for national service provision to MAFQS – Sea Containers, Transitional Facilities, Post Border, Dog Programme, Training, Enforcement, Audit, OSH;

Strategic Development Manager – Responsible for prioritization of project activity and strategic planning, including – Information management, X-ray Programme, Project Office, Process Improvement, Technical Functions, Project Managers;

Department of Conservation

The Department of Conservation carries out a large amount of pest management activity, both on the Crown estate and on private land. (www.doc.govt.nz)

Environmental Risk Management Authority

The Environmental Risk Management Agency decides on applications to import, release or develop new organisms. (www.ermanz.govt.nz)

Several other agencies also carry out pest management on land that they administer on behalf of the Crown, e,g. Land Information New Zealand, and the New Zealand Defence Forces.

Regional councils

There are 14 regional councils in New Zealand. Among other things, regional councils manage biosecurity issues in their respective areas. Regional councils can develop 5-year regional pest management strategies under the Biosecurity Act to protect values important to their communities. All 14 regional councils now regional pest management strategies in place. (www.localgovt.co.nz)

Research Organisations

Section (formerly Forest Research)
This government owned research organization provides diagnostic service and scientific advice, and maintains a database of forestry "pests "(including fungal diseases).

Landcare Research
Landcare Research is also a government owned research organisation. It undertakes environmental research including research on managing pests already present in New Zealand. They have a research programme to develop a biological control for possums. (www.landcaresearch.co.nz)

Industry and other organizations

The majority of pest management is carried out voluntarily by landowners on their own property, but community and industry groups also organise and coordinate various pest management activities. Other organisations (including Crown agencies) can develop national pest management strategies under the Biodisecurity Act enabling them to access regulatory powers Currently there are only three national pest management strategies for: American foulbrood (a disease of bees), varroa (a mite that attacks bees), and bovine tuberculosis (a disease of cattle and deer). The National Beekeepers' Association, Varroa Agency Incorporated, and the Animal Health Board administer these respectively.

Governance and advisory forums

Following recommendations in the Biosecurity Strategy, the government rearranged the governance and advisory bodies for biosecurity and created three main forums:

Biosecurity Ministerial Advisory Committee

The Biosecurity Ministerial Advisory Committee is a fully representative stakeholder advisory body. Its role is to provide the Minister for Biosecurity with independent advice on the overall biosecurity system, including strategies, policies, efficiency, effectiveness and capability. The advice is intended to address the full range of environmental, economic, human health and social/cultural outcomes south by the government.

The thirteen members of the committee are appointed for a three-year term, and may be reappointed for up to two additional consecutive terms. Membership may be terminated at the discretion of the Minister for Biosecurity.

Biosecurity Chief Executives Forum

The Biosecurity Chief Executives Forum comprises chief executives of MAF, the Department of Conservation, the Ministry of Health, the Ministry of Fisheries, and Te Puni Kokiri. It provides advice to the Director- General of MAF. The forum is to monitor the performance of the biosecurity system; ensure clarity of roles, accountabilities and responsibilities; and improve the performance of the overall biosecurity system.

Biosecurity Central/Regional Government Forum

The purpose of the Biosecurity Centeral/Regional Government Forum is to improve coordination across centeral and regional government biosecurity agencies. The Director-General of MAF chairs the forum, which includes the

chief executives from all regional authorities, the Department of Conservation, the Ministry of Health, the Ministry of Fisheries, and Land Information New Zealand.

8. ***Facilities which can be made available for regional cooperation***

New Zealand also hosts many international delegations that come to gain an appreciation of how New Zealand undertakes its biosecurity functions. It also provides training support and consultancy services to some of its neighboring countries.

New Zealand has a good infrastructure for hosting international conferences, a number of which are held in each year.

Appendix 1 –NEW ZEALAND ANNUAL PEST AND DISEASE STATUS REPORT – 2004/2005

Collated and summarised by J. Bain, L. Bulman, M. Dick and D. Jones (Ensis) from data and information from the Forest Health Database, *Forest Health News* (Ensis), the Forest Health Reference Laboratory Diagnostic Service, and other Forest Biosecurity and Protection staff (P. Crane, K. Dobbie, J. Gardner, I. Hood, D. Kriticos, S. Mansfield, M. Watson and T. Withers).

1. Plantations:

PINUS RADIATA:
Pests:
No insect problems of any note were recorded in *P. radiata* plantations. The status of *Essigella californica* (Aphididae) in NZ is equivocal. We are establishing a study to gauge the coincident effects of *E. californica* and *Cyclaneusma minus* on growth rates of *P. radiata* at two sites with contrasting climates.

Diseases:

Dothistroma needle blight

Records of Dothistroma needle blight confirmed a slight increase in disease severity in 2004, compared with the level reported for 2003. Disease was severe in 2002, as a result of high rainfall in the 2001/02 summer. The total number of records, and those where severity was greater than 25%, increased in 2004 (figure 1).

Figure 1 – Forest Health Database records of *Dothistroma pini* during the period 2000-2004

This aerial spray programme in the North Island for 2004 -2005 at 72,688 ha was marginally greater than the previous season when an area of 69,724 ha was sprayed, (figures provided by the Dothistroma Control Committee). The 2002 – 2003 spray programme was the largest ever undertaken at 182,290 (figure 2). The area sprayed is a separate, but less refined indicator of the annual impact and extent of Dothistroma needle blight throughout the whole country, since it may be influenced by other forces driving company activities (for example: budget constraints, changes in silvicultural practices, increasing area of at-risk age classes due to greater planting in the 1990s).

Figure 2 – Area sprayed annually for Dothistroma control in the North Island

Cyclaneusma needle cast

Based on Forest Health database records, the severity of Cyclaneusma needle-cast was again low, as it was in previous seasons (figure3). Disease severity was less than 15% for almost 70% of the Cyclaneusma needle-cast records for the last four years, compared with almost 50% of the records for the one year before that. These lower disease levels are attributed to the dry conditions experienced over much of the country during the four autumn periods. These data must be viewed with caution, because only 17% of records in the database were collected during the peak Cyclaneusma needle-cast expression period of September/October/November. The main infection period is summer for *Dothistroma* and autumn for *Cyclaneusma*.

Figure 3 – Forest Health Database records of Cyclaneusma minus during 2000/01-2004/05

Physiological needle blight

Very few reports of the physiological needle blight (in the past often referred to as 'Strasseria-associated needle cast') were made in 2004. Isolated events were recorded in localised areas of individual stands in the occasional forest in Auckland, Bay of Plenty, Taupo, and Wellington.

Nectria fuckeliana

A nationwide survey to look for stem fluting and other signs of Nectria disease outside the known infected area was carried out this year. A total of 202 stands were inspected and fluting was seen in 13%. Samples were taken from fluted trees and *Nectria fuckeliana* was not isolated. The incidence of fluting recorded during the national survey was markedly lower than that found in the known infected area. There was almost no expansion of the range of *Nectria fuckeliana*, the most recent record was made at Te Moana, about 7 km WNW of the previous northernmost find. The fungus is still confined to the lower half of the South Island. A profile of the basic biology of *Nectria fuckeliana* is emerging as a result of field and laboratory observations and experiments. Fruiting bodies, which appear on infected branch stubs and stem cankers, contain viable spores in all seasons of the year. Ascospores can germinate at a broad range of temperatures, from 5 to 28% ^{0}C, although at either end of the scale germination is very slow or abnormal. Spore dispersal appears to be primarily through water-splash. Studies on the effect of silviculture, stub treatment, and environment on disease development are continuing. Disease susceptibility of other conifers and of *Pinus radiata* nursery plants is also being examined.

Armillaria root disease

Armillaria root disease, caused primarily by *A. novae-zelandiae*, remains widespread in many pine plantations through much of the country. *Armillaria limonea* also contributes to losses in first rotation stands planted on sites cleared of native forest. In second or third rotation stands mortality of young trees is less common. However, chronic, non-lethal infection of older trees can still lead to significant increment loss.

NURSERIES

Root rot caused by *Phytophthora cinnamomi* was the most common serious nursery disease. Outbreaks were recorded in nurseries in warmer regions in both the North and South Islands.

DOUGLAS FIR (PSEUDOTSUGA MENZIESII):

Diseases:

Phaeocryptopus gaeumannii (Swiss needle disease)

Swiss needle cast disease (*Phaeocryptopus gaeumannii*) was again recorded throughout New Zealand and remains the most significant disease of Douglas fir.

EUCALYPTUS SPP:

Pests:

Creiis lituratus (Psyllidae) was first found in New Zealand in June 2002 and is still confined to urban Auckland. In August 2004 *C. lituratus* was recorded for the first time from *Eucalyptus major* in New Zealand. Other known hosts in New Zealand are *Eucalyptus botryoides, E. grandis* and *E. saligna*.

Acrocercops lacinella (Gracillariidae) was first recorded in New Zealand in January 1999. It is a significant pest in coastal New South Wales, where it causes outbreaks of damage from time to time on *Eucalyptus pilularis*. *A. laciniella* has a wide host range, which also extends to species within the eucalypt sub-genus *Symphyomyrtus*. It has spread quite rapidly throughout the North Island and in June 2004 was found in the South Island (Nelson) for the first time. It has since spread and in June 2005 was found in Marlborough (South Island).

Enoggera nassaui (Pteromalidae) is an egg parasitoid introduced into New Zealand in the late 1980s and again in 2000 for the biological control of the eucalyptus tortoise beetle *Paropsis charybdis* (Chrysomelidae). In 2001 an obligate hyperparasitoid of *E. nassaui, Baeoanusia albifunicle* (Encyrtidae), was detected in New Zealand. That same year, another egg parasitoid of *P. charybdis* was recorded in New Zealand, the wasp *Neopolycystus insectifurax* (Pteromalidae). Attack rates of the two egg parasitoids and the hyparasitoid have been monitored since the summer of 2001-02. Each summer *P. charybdis* egg batches were collected from several *Eucalyptus nitens* plantations in the Bay of Plenty/Taupo region. For the 2004-05 summer, three plantations were monitored. Parasitism by *E. nassaui* increased from November to January then declined in February at all three sites. At two sites the hyperparasitoid followed a similar trend in abundance to *E. nassaui* while *N. insectifurax* was not collected until January, when they too began to increase in abundance. Neither *B.albifunicle* nor *N. insectifurax* have been recorded from the third site. These trends are generally similar to those observed in previous summers, although *B. albifunicle* was recorded earlier in the summer at one of the sites than previously.

It appears *E. nassaui* will be effective in reducing *P. charybdis* populations in early summer and that *N. insectifurax* can provide some control of the second

generation in late summer. In previous years *E. nassaui* attacked the second generation, but the hyperparasitoid now reduces the impact of *E. nassaui* on this second generation. *N. insectifurax* (where it is present) appears able to compensate to some extent for the decline of *E. nassaui* populations.

Uraba lugens (Nolidae), which was first found in New Zealand in 1992 at Mount Maunganui and then in Auckland in 2001, is now very widespread in the latter locality and some sites have very large populations. It is now considered to have been eradicated from Mt Maunganui as it has not been found there since early 2001. *U. lugens* is now the subject of a containment strategy in Auckland and its spread is being monitored using pheromone traps, the pheromone having been identified by HortResearch.

Approval was granted by the Environmental Risk Management Authority (ERMA) to import four candidate parasitoids from Australia (*Cotesia urabae, Dolichogenidea eucalypti* (Braconidae), *Euplectrus* sp. (Eulophidae) and *Eriborus* sp. (Ichneumonidae)) which may be suitable control agents for *U. lugens*. Several collections were made in Tasmania and South Australia from November 2004 to January 2005. Hyperparisitoids have hindered culture development for three of the four parasitoids, particularly *D. eucalypti*. Generally, it has proven difficult to establish viable parastioid cultures in containment, although one species (*C. urabae*) did survive for three generations. Some host specificity tests have been conducted against *C. urabae* and *Eriborus* sp. No adverse responses to non –target species have been recorded at this stage. Additional collections are required to complete host specificity testing.

The likely impact of three existing parasitoids (*Meteorus pulchricornis* (Braconidae), *Xanthopimpla rhopaloceros* and *Anacis* sp. (Ichneumonidae)) upon *U. lugens* populations in New Zealand was also assessed. These are likely to have their greatest impact on *U. lugens* populations in the North Island. The pupal parasitoids *X. rhopaloceros* and *Anasis* sp. are unlikely to interfere directly with any of the possible host-specific control agents. However, *M. pulchricornis* has the potential to hinder the initial survival of introduced host-specific parasitoids through direct competition for hosts.

Climate modeling has determined that, subject to host availability, the potential distribution of *U. lugens* in New Zealand extends throughout most of the North Island, and in the South Island over much of the Canterbury Plains and Marlborough as well as major portions of Southland, Otago, Nelson and Tasman. This encompasses most of the eucalypt plantations in New Zealand. The phenology of *U.lugens* appears to depend upon a synchronizing factor that is as yet not understood. The behaviour of the

bivoltine form of *U.lugens* in more southern, cooler sites with temperatures able to support only a single generation each year may not be straightforward to predict, and could depend upon the interaction between seasonal weather patterns and daylength. The synchronizing factor will be investigated over the next two years.

Impact assessment studies have been carried out on 19 *Eucalyptus* and *Corymbia* species considered economically and culturally important to New Zealand. All of the commercial, shelter and ornamental *Eucalyptus* species tested were susceptible to *U. lugens* larval attack to some degree, including a number of key commercial species (*E. nitens, E. regnans and E. fastigata*). Potential threats to indigenous species were completed on 27 New Zealand indigenous species. Three species, *Metrosideros carminea, Metrosideros umbellata* and *Nothofagus truncata* were within the physiological host range for larval development. Survival in all cases was significantly less than on the *E. nitens* control. Field trials have indicated that ovipostion is unlikely on these indigenous species and therefore they will not support populations of *U. lugens.* Field tests revealed that *Metrosideros excelsa* was only attacked through spill-over larval feeding when plants were in close proximity to infested Australian hosts. It has also been found on *Lophostemom confertus, Angophora costata, A. floribunda, Tristaniopsis laurina, Quercus coccinea, Q. palustris* and *Fraxinus excelsior*.

The likely impact of *U. lugens* on eucalypt productivity was modeled for *E. nitens* and *E. fastigata*. It appears likely that significant impacts will be restricted to stand boundary zones in establishing plantations (up to 7 years old), and might require two consecutive seasons with highly favorable conditions for survival and reproduction of *U. lugens*. Growers should be vigilant for large numbers of egg batches being laid on newly planted trees. Btk has been shown to be a suitable insecticide to control *U. lugens*.

Stem injection has been demonstrated to be a reliable means of treating trees to control *U. lugens* in urban situations where other application means are undesirable or inconvenient. "Soft" chemicals were shown to be unreliable in translocating and killing *U. lugens* larvae, whereas an organophosphate (Methamidiphos, Tamaron™) proved reliable in both respects.

Diseases:

Phaeophleospora *and* Mycosphaerella *leaf disease*

Phaeophleospora eucalypti was consistently the most common foliage disease in the *Eucalyptus nitens* plantations in the central North Island. Many of the trees are also infected with *Mycosphaerella cryptica* but disease levels tend to be lower than those of *P. eucalypti*. A survey conducted in April 2005 revealed that worst affected stands occur within a 20 km coastal strip in the Bay of Plenty.

CYPRESSES:

Diseases:

Cypress canker (Seiridium *spp*.)
Cypress canker, caused by two species of *Seridium* continued to cause damage in many cypress stands throughout the country, particularly *Cupressus macrocarpa*. The inoculation programme which is attempting to identify, and eventually utilize, genetic resistance in commercial stock continued.

2. Biosecurity:

***POST- BORDER (ERADICATION*):**

Dutch elm disease:
The eradication campaign for Dutch elm disease continued in Auckland, and was coordinated and funded by MAF supported by the local city councils. During the 2004-05 season 13 infected trees at 11 addresses were found. While most were within the infected area there was an expansion of the area to the south-west. Unfortunately, as has happened in previous years, some elms had died before they were reported to be sick and beetles had emerged from elms before they were felled and disposed of. Infected trees were found as a result of the disease detection surveys, except at one location where a special survey carried out in April successfully located infected elms. A much reduced pheromone trapping programme was carried out this season. Initially, 20 traps were deployed in high risk areas. Further traps were put in place when infected trees were identified and the number reached 47 by the end of the season. As at 20 May 2005 3,124 beetles had been caught, of which 17 For further information see:
http://www.maf.govt.nz/biosecurity/pests-diseases/forests/dutch-elm-disease/index.htm

***Fall webworm*:**
A fall webworm "web" (*Hyphantria cunea* (Arctiidae)) containing 15 caterpillars was found in Mt Wellington, Auckland in March 2003. Five large

scale ground surveys found no more insects but in 2005 six male moths were caught in pheromone traps. The moths were trapped in February (2), March, April and June. The pheromone trapping programme is continuing. For further information see:
http://www.maf.govt.nz/biosecurity/pests-diseases/forests/fall-webworm/index.htm.

***Painted apple moth*:**

The painted apple moth (*Teia anartoides* (Lymantriidae)) which was first found in Auckland in May 1999 is still the subject of an eradication campaign. Last year's report stated that the last male moth trapped was in January 2004 and that trapping and vegetation controls would probably remain in place for a further two years. Unfortunately two months have been trapped in 2005, one in May and the other in August (technically outside the scope of this report). It is unclear whether these two catches are from the existing population or represent a new incursion (s). The origins of the moths are being investigated using molecular and isotope techniques. For further details see:
http://www.maf.govt.nz/biosecurity/pests-diseases/forests/gypsy-moth/index.htm

Asian gypsy moth:

In March 2003 a single male gypsy moth (*Lymantria dispar praetrea* (Lymantriidae)) was trapped in Hamilton. After eight aerial sprays using Btk during October and November 2003 over an area of 1250 hectares, intensive pheromone trapping and ground searches the Ministry of Agriculture and Forestry was able to announce eradication in May 2005 This was two generations after the aerial treatment was completed. For further up to date information see:
http://www.maf.govt.nz/biosecurity/pests-diseases/forests/gypsy-moth/index.htm

POST-BORDER (NEW RECORDS):

The following fungi were recorded as new to New Zealand. None were considered significant and no response action was taken. There were no new forest insects recorded this year.

In December 2004 fruit bodies *Hysterographium fraxini* were found on dead branches of *Fraxinus excelsior* in Timaru. It has subsequently been found to be

quite widespread in both the North and South Islands. Overseas this fungus has been reported as being responsible for dieback of *fraxinus* although it is generally recorded as a facultative saprophyte. In New Zealand it is saprophytic.

In February 2005 *Colpoma quercinum* was found sporulating on dead twigs of *Quercus* sp. in Picton. It is a common saprophyte on *Quercus* in the Northern Hemisphere.

SURVEILLANCE

Forest condition monitoring

A revised forest health surveillance system

The New Zealand Forest Owners' Associations (NZFOA) have instigated a new forest health surveillance scheme with the intent of providing data on forest health status while still maintaining some degree of pest detection capability. The new scheme involves assessing viewpoint plots (a stand-wide assessment of predefined disorders primarily affecting crown condition, with the aid of binoculars) and temporary health plots (transect-based plotting systems used to assess current pest status and for new pest detection). A series of high risk forest surveillance plots have also been established in areas where the risk of exotic introductions is considered to be high (about 30 over the country). Intensive pest detection surveys will be carried out at these sites. The NZFOA has put on hold a decision to proceed with a forest health condition monitoring system, pending the result of a funding application made during the year.

RECENT PUBLICATIONS AND WEBSITE FEATURES:

The monthly Ensis publication *Forest Health News* can be viewed on line. See: www.foresthealth.co.nz.
To subscribe to this newsletter electronically, contact john.bain@ensisjv.com

The 4th volume of The Fungi of New Zealand series "Fungi on Trees and Shrubs in New Zealand" by peter Gardgil was published this year. It is available from Manaaki Whenua Press, P.O.Box 40, Lincoln, NZ (mwpress@landcareresearch.co.nz) from within New Zealand. People outside New Zealand can purchase it from Fungal Diversity Press, Department of

Ecology and Biodiversity, The University of Hong Kong (www.hku/ecology/mycology/FDRS/series/16.htm)