

Big wait for Taupo plan

Important principles at stake

After five years of planning and consultation, submissions and hearings, the Lake Taupo variation to the Waikato Regional Plan is being considered by a hearings committee. This committee will make its recommendations to Environment Waikato (EW) which expects to release an amended variation in February 2007.

According to Geoff Thorp, forest operations manager for Lake Taupo Forest Management (LTFM) Ltd which manages Ngati Tuwharetoa's forestry interests, it's highly likely that appeals will be lodged with the Environment Court either by farming or forestry interests, depending on the way the council goes.

"There are very important principles at stake and whatever decisions are made will become a precedent for other councils," he says.

At issue is the nitrogen pollution of Lake Taupo. About 90 per cent of nitrogen in the lake comes from sheep and beef farms which leach an average of 13 kg/ha/yr. Leaching from plantation forestry is the same as for indigenous vegetation – around 2 kg/ha/yr.

The variation aims to reduce nitrogen discharges by 20 per cent by reducing the area and intensity of livestock farming in the catchment.

Everyone agrees this needs to happen. There's also general support for the use of \$81.5 million in local and central government funds to buy some farms and take them out of production.

In dispute are EW plans to 'grandfather' nitrogen discharge rights. This involves capping nitrogen outputs for each property at current levels based on existing land uses.

This leaves forestry as the only land use option for owners of forests and undeveloped lands. In contrast, owners of farms retain a wide range of options. They may keep farming, reduce stock numbers and sell some of their nitrogen credits, or subdivide their land for lifestyle blocks or urban development.

NZFOA chief executive David Rhodes says this is perverse.



Under Environment Waikato's proposed plan, Ngati Tuwharetoa will see the sun go down on its land development options

"It rewards those who pollute and penalises those who don't. It also conflicts with the Resource Management Act, which requires resource users to avoid, remedy or mitigate the adverse effects of their activities.

"Averaging' – the allocation of a sustainable level of nitrogen leaching rights evenly across the catchment – is an efficient alternative approach. Those with low nitrogen land uses could then sell credits to those involved in high discharge activities."

Potential compromises, he says, would be delayed allocation or providing a level of allocation to forest owners that would then allow some flexibility. Both of these have been proposed by forest owners and should be considered ahead of grandparenting. Both would allow efficient trading of nitrogen credits and this is likely to be even more important in the future given that a 20% reduction is the minimum likely to be needed.

Carter Holt Harvey supports averaging in principle but would be willing to accept a concept it calls 'delayed allocation', as an alternative. This would give time for farmers to adapt and for lower discharge farming technologies to be developed.

EW's proposed variation is totally unacceptable to Ngati Tuwharetoa, which would be prevented from using 78 per cent of its lands for any use other than forestry. The iwi has

holdings of 109,000 ha, making it the largest land owner in the catchment. (See *Forestry Bulletin*, Spring 2005.)

Thorp says the iwi has substantial farming operations, so it understands the position of farmers.

"Our main goal is to maintain flexibility in future land use options. To achieve an enduring outcome it is vital to find a way to encourage sustainable land use and you won't do that by penalising industries which are sustainable."

For six years LTFM and other forestry interests have been trying to get EW to accept averaging as the fairest and most rational policy. But Thorp says it has been like "banging our heads on a brick wall".

He says LTFM has therefore proposed a compromise – a 'flexibility' concept which would allow owners of forests and undeveloped lands to increase their leaching levels to 4 kg/ha/yr.

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NZFOA chief executive David Rhodes asks ...

Can government share our vision?

Forestry in New Zealand is potentially on the threshold of a new and prosperous era, based on a range of values which go far beyond the traditional ones – employment, wood and catchment protection.

If the government gets its emissions (carbon dioxide and nitrogen in particular) policies right we are likely to see an increasingly holistic approach to land use, where plantation forests, indigenous forests and agriculture are much more integrated within the landscape.

At present, the mixed land use practices favoured by farm foresters are far from typical. Our forests tend to be planted in large uniform blocks. Similarly, vast tracts of hill country farmland are large uniform blocks of pasture, with trees few and far between.

The reasons for this lack of integration are historical, and in many cases are no longer valid. More trees are needed in many pastoral catchments to offset carbon emissions and nitrate leaching and, in the southern North Island, to deal with massive hill country soil loss.

Equally, in some parts of the country, plantation forests are not the most economic land-use. The rural landscape is dynamic, almost uniquely so internationally, and land users need to be able to adopt and convert to the most economic and environmentally sustainable alternative.

The main barrier to integrated land use is the lack of workable market-based systems which provide appropriate signals and the most efficient transition solution. For forestry this would include an income to tree growers for

the carbon storage and other environmental services they supply.

On the carbon front, the government's permanent forest sink initiative is a good start, but it does not lend itself to forests where a major purpose is wood production. With nitrogen, there is only one proposed trading scheme on the books – Environment Waikato's Lake Taupo catchment variation – and that appears to be fatally flawed.

Indeed, as Geoff Thorp says in our cover story, local, regional and central government have not had much success coming to grips with the economic impact of true land use sustainability.

Invariably, as forestry knows to its cost, officials opt for arbitrary rules and restrictions rather than flexible incentive-based systems. Such punitive measures are too often clumsy, costly and discriminatory.

Witness the government's proposed 10 per cent deforestation cap, Environment Waikato's decision to prevent forest owners from changing their land use, and the requirements of many district councils for forest owners to obtain resource consents to harvest their forests.

That said, there is a growing awareness of the benefits that come with forestry and a recognition that society cannot afford to be ambivalent about the impact of policy on forestry development. Hopefully this will manifest itself with forestry minister Jim Anderton shortly announcing revised policy for the sector. Ideally this would be an imaginative market-based sinks policy which

breaks the mould. Forest owners in Environment Waikato's patch hope the hearings committee considering the Lake Taupo variation will be equally constructive.

With the right incentive mechanisms, a wider variety of tree species are likely to be planted in our plantations. A diverse mosaic of land uses will result, breaking up some of the great swaths of pines and pasture which today typify much of our landscape.

The environmental and conservation benefits of this will be huge. As the feature article in this issue explains, there is a treasure trove of biodiversity in our plantation forests.

As more tree species, with varying rotation lengths, integrate into pasture-dominated landscapes, this biodiversity will be enhanced further.

It is only 15 short years since the signing of the NZ Forest Accord brought to an end the public battles between the forest industry and environmental groups over the clearing of native vegetation for exotic plantations. How the world has changed since then.

These days, a growing number of forest owners have certification from the Forest Stewardship Council for the triple-bottom-line stewardship of their forests. Staff safety and environmental care are now right up there with profit-driven silviculture as drivers of forest management and the forest sector has been among the most pro-active in this area.

We're ready and willing to embrace and promote a new forestry culture. Our biggest challenge is to get government and the public to share our vision. 🌲

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Because they couldn't trade the extra 2 kg/ha/year offered, the impact on the catchment would not be large. But farmers would have to reduce their leaching to compensate for any uptake of the extra 2 kg/ha/year.

"Even if we developed 13 per cent of our land to the 4 kg level – and that is the maximum conceivable level given the location and contour of the land – farmers would have to reduce their emissions by only 5 per cent."

Thorp says the record to date shows that local, regional and central government have

not had much success coming to grips with the economic impact of true land sustainability.

This he says is reflected in EW's Lake Taupo variation, as well as its more recent responses to pine-pasture conversions in Waikato River catchments above Lake Karapiro. Once again, the council is looking to write rules compelling forest owners to retain their current land use, rather than rewarding them for mitigating the flood risk for farm owners downstream.

"I suspect all livestock farming activity compromises the natural environment to some extent. If you accept this, it then becomes a question of how much you are willing to accept in the way of consequences – of where you draw the line.

"Then having drawn the line, there is the question of how you compensate those land owners who mitigate discharges from livestock, or whose trees enable other farmers to continue with their farming operations." 🌲

Forest Accord celebrated



Industry and environmental movers and shakers, past and present, who attended the anniversary function

The 15th anniversary of the signing of the New Zealand Forest Accord was celebrated at a function held in Wellington in mid-August.

This landmark agreement put an end to decades of conflict between forest owners and environmental and outdoor recreational groups.

At the anniversary, the various parties reaffirmed their support for the Accord and said renewed dialogue was needed. They agreed to explore opportunities for reaching agreement on issues of common concern, including climate change policy, access and responsible outdoor recreation.

With the signing of the Accord in 1991, the signatory organisations in the forest industry stopped clearing native vegetation for the establishment of plantations.

For their part, conservation groups acknowledged the importance of plantation forestry as a means of producing wood products and energy on a sustainable basis, while promoting the protection and conservation of remaining natural forests. They also agreed to promote these understandings both within New Zealand and internationally.

Former NZFOA president Bryce Heard said negotiating the Accord was one of the best things he had been involved in throughout his long career in the forest industry.

"The industry and environmentalists had been at loggerheads for years. Many were sceptical that we could get agreement between the parties, but we did it. It wasn't easy, but it has stood the test of time." 

MB replacement looks good

For several years, the writing has been on the wall for methyl bromide. Once it was the fumigant of choice, but because it is a potent ozone-depleter it has been phased out for most uses worldwide.

One of the few hold-outs for methyl bromide is the export fumigation of logs, even though phosphine is a proven ozone-friendly alternative and is now routinely used to fumigate shipments of grain.

Wei-Young Wang, the NZFOA's phosphine research coordinator, says the biosecurity requirements of importing countries can be notoriously slow to change. With no international protocol, New Zealand has to strike deals with individual countries one at a time.

China is the first major market to have come on board. Now trials are proposed to convince authorities in India.

"Phosphine is not only environmentally friendly, it's also cheaper to use," says Wang.

"With methyl bromide the ship has to stay in port for 36-48 hours at a cost of \$37-55,000 while the cargo is fumigated. With phosphine, the pellets are simply dropped into the cargo once it leaves port.

"The only hassle is the need to have a poisons technician on board the ship for a fortnight, just to top-up phosphine levels five days into the journey. However, this arrangement may change.

"It was originally thought that phosphine levels had to stay at a minimum of 200 ppm on the 16-18 day trip to China. But trials have shown that the duration of the treatment is more important than the concentration of chemical," Wang says.

The next step is to do more research and convince Chinese quarantine authorities that the 'top-up' is not needed.

Wang has no doubts. He also says the Chinese authorities are quite pragmatic – they're not concerned about how we do it, they simply require the logs to be free of live insects.

India may be more difficult to shift, but Wang is hopeful. The phosphine pellets are made in India and the manufacturer is helping to lobby the government there to support a change.

Perches for dawn chorus

Guests at the Forest Accord's 15th anniversary function were each given a well-grown totara sapling as a symbol of the importance of sustainable forestry to New Zealand's future.

Trees which out-of-town guests could not take with them – including one in the name of Greens co-leader Jeanette Fitzsimons – were gifted to Nga Uruora-Kapiti. This project aims to restore the dawn chorus to the steep escarpment which runs along State Highway about 35 km north of Wellington City between Pukerua Bay and Paekakariki.


Before European settlement, the area was cloaked in kohekohe-dominant forest. Kohekohe, *Dysoxylum spectabile*, is unusual in that flower panicles grow out of the trunk and branches, rather than the canopy.

The restored forest is intended to create a bird-friendly area for native birds flying 5 km from Kapiti Island sanctuary which is now



The Nga Uruora-Kapiti project aims to return this area to kohekohe-dominant forest rich in birdlife following the eradication of possums and rats.

Once the 100 ha escarpment forest is restored, the project aims to create a network of bird-safe native forests running between Waikanae and Porirua, through both public and private land.

The escarpment is under a QE 2 National Trust covenant entered into by the owner, Tranz Rail, which is a sponsor of the project. 

A treasure-trove in the pines

New Zealanders tend to have a love-hate relationship with *Pinus radiata*.

This exotic pine provides jobs and wealth, is a home-grown source of construction timber, stabilises eroding hillsides, protects our water supplies, and is a highly productive crop for land which is of marginal value for farming. That's all well understood.

But on the other side of the coin, pine forestry is often seen by the public as a drab monoculture – something of an ecological desert.

Those who work in forests know this is not true. They see things the driving public does not see from the road – the profusion of hardwood shrubs in the understory and flocks of native and introduced birds.

But even forest managers did not know the extent to which their exotic plantations are havens of biodiversity. Only in the last decade, as researchers have begun looking for indigenous species has the true picture started to emerge.

It's a picture which is really quite extraordinary.

"Even in the clear-fells, which we have often had to defend, we are finding that invertebrates have recolonised within a matter of weeks," says Timberlands environmental manager Colin Maunder.

"My theory is that clear-felling replicates what happens in nature – the sort of catastrophic destruction which occurs as result of severe winds, volcanic activity or fire. These events provide opportunities for colonising species, as well as for species which like feeding along the margins of forests, like bats and falcons.

"The more we look at exotic forestry, the better it gets."

The search for biodiversity in exotic forests is a result of a drive among forest owners to get their forests certified by the international Forest Stewardship Council (FSC) – a process which requires biodiversity to be identified and given protective management.

Some of the most important biodiversity research has been carried out by Ecki Brockerhoff, a scientist with Scion/Ensis, who found a total of 202 native and 70 introduced plant species in 60 small study plots in Rotoehu and Kaingaroa Forests (near Rotorua), Hochstetter Forest (on the West Coast) and Eyrewell Forest (in Canterbury).

The canopies of these forests may have been made up of only one species – but the small plots were also home to 10 per cent of New Zealand's native plant species.

Graham West, Ensis, says 65 indigenous plant species were found by Chris Ecroyd, herbarium curator at Scion/Ensis, and Ecki Brockerhoff in six plots in the Puruki catchment in the central North Island, seven years after clear-felling a stand originally planted into pasture containing few native plants.

While this level of indigenous species richness is not as high as native forest, which boasts epiphytes and longer-lived climax species, it is much higher than pasture where native plants are normally found at very low levels, if at all.

Plantations as young as six years may have healthy fern populations and these often reach levels of diversity similar to adjacent native forest. John Ogden, Auckland University, found tree ferns reached densities of up to 2500/ha in mature central North Island pine plantations.

In a report last year, Ecroyd said pine forests are also home to a number of endangered or threatened plant species.

"The native woodrose, *Dactylanthus taylorii*, grows in a pine forest in north Taranaki. Pomaderris, a genus of indigenous shrub uncommon in the South Island, is found in relative abundance in Canterbury's Eyrewell Forest," he says.

"Iwitahi Orchid Reserve, a few hectare corner of the Kaingaroa Forest, is a paradise for orchid lovers. This old-growth *Pinus nigra* forest supports 36 species of native orchid, including the only known North Island population of *Chiloglottis valida*. A larch and Corsican and Austrian pine forest near Hanmer Springs is also rich in native orchids."

Steve Pawson, a University of Canterbury PhD student working with Scion/Ensis, who has been investigating invertebrate biodiversity, has found more than 350 species of native beetle alone, a number that keeps climbing, with the greatest species richness found in clear-fell areas.

Lorna Douglas, Northern Polytechnic, says the good shelter and high water quality in gullies in plantation forest are ideal habitat for Hochstetter's frogs. Monitoring in Carter Holt Harvey forests has shown that some frogs survive both wind throw and harvesting and have been found in regenerating stands after logging.

Good pest control in plantations, as well as in



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the native forest remnants within the forest, is highly beneficial to native and introduced birds. Researchers working in Kaingaroa Forest in the 1960s found the highest densities of birds ever recorded on the New Zealand mainland, with 1203 pairs per 100 ha, of which 652 were native.

The North Island kiwi is common in some plantations, with 800–1000 estimated to live in Waitangi Forest, near Kerikeri, despite normal forestry activities.

Streams running through plantation forests make good habitat for many native fish. Trees can improve bank stability, help to absorb nutrients from runoff before they reach the stream, and provide shade that controls stream temperature and the growth of nuisance plants – all of which helps improve stream health.

Several endangered species such as giant kokopu and short-jawed kokopu have been found in streams running through plantation forest.

Aquatic invertebrates upon which native fish feed, also benefit from forestry. S. M. Parkyn and M. J. Winterbourn of the Canterbury University School of Zoology found in 1997 that invertebrates did not show any pattern of preference for leaf litter of native trees over exotic trees.

Discovering that such a treasure trove exists in pine plantations raises a number of issues for forest managers – not the least of them being how to manage the forests to protect and enhance this biodiversity.

So far, research has shown that invertebrates and most bird species are not threatened by most forest management practices. Care, however, does need to be taken when ground-nesting birds are incubating eggs. Forest managers in kiwi country now routinely use kiwi-sniffing dogs to detect birds before raking, windrowing or burning clear-fell areas.

Bats are now known to be present in many old-growth pine and Douglas-fir forests (see panel), despite their declining populations elsewhere. More research will tell managers what practices they should adopt to maximise bat survival when they are most vulnerable – at harvest.

In *Planted Forests and Biodiversity*, a paper delivered by Ecki Brockerhoff and co-authors at a UNFF Experts Meeting on the Role of Planted Forests in Sustainable Forest Management in 2003, the authors said plantations play particularly important roles in buffering native forest remnants and enhancing

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Bat study for insomniacs



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If you love wildlife, ideally have your own 4WD and are happy to work in Kinleith Forest as a volunteer, then Auckland University ecologist Kerry Borkin has just the assignment for you.

Borkin is doing a PhD study into how native long-tailed bats *Chalinolobus tuberculatus* make use of radiata forest. Much of the work will be done at night, so it might help if you are an insomniac.

Awareness of bats in plantation forests has grown rapidly since 2001 when Geraldine Moore completed her Massey University masterate study which revealed that long-tailed bats were widespread in Kinleith forest, near Tokoroa.

"They use forestry roads, well, like roads," says Borkin, who believes the survival of long-tailed bats in exotic forests is potentially important for the future of the species.

Her research will build on Moore's studies which indicate that long-tailed bats seem to prefer to forage in plantation pine forest over native podocarp broadleaf forest, possibly because of the greater abundance of moths – important prey.

Moore says pest mammal control and the conservation of cave, wetland and reserve areas which occurs in many plantations may potentially benefit bat populations. Tree felling, pesticide use, transportation and quarrying may negatively affect them.

"But at the right scale, tree felling may be beneficial, creating foraging habitat and facilitating access," she says.

"Opportunities exist for bats and foresters to

work together. Long-tailed bats are potentially very efficient biocontrol agents of a range of significant forest pests."

Long- and short-tailed bats are the only land mammals native to New Zealand. Both are smaller than a mouse. They were common throughout New Zealand in the 1800s, but by 1900–1930 they were becoming scarce in many districts. The causes of this decline – which is continuing – are unknown, but habitat destruction and introduced predators are thought to be largely to blame.

Borkin's research aims to find out where the long-tailed bats feed, where they roost and as much as possible about their ecology. If there's something particularly attractive to bats about Kinleith Forest, she hopes to identify it.

"I would like to hear about bat sightings" she says. Sightings can be reported to the Forest Information Centre based at Carter Holt Harvey Forests.

Her PhD research is supported by Bat Conservation International, Environment Waikato, Carter Holt Harvey Forests, Timberlands and The Tertiary Education Commission.

Contact: Kerry Borkin, Carter Holt Harvey Forests, P.O. Box 648, Tokoroa. Tel 07 886 2799 email: forest.information@chh.co.nz

For information on the management of bats in plantation forests: <http://rarespecies.nzfoa.org.nz/>

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connectivity between areas of native ecosystems.

"In doing so, these plantation forests may help foster the overall sustainability of agriculture and other land uses across these landscapes."

However, to sustain health and productivity of the forests themselves, the authors said managers needed use of a greater variety of planted species (exotic and native). The use of alternative forest management regimes, such as the extension of rotation lengths in some stands, and adoption of a variety of harvesting approaches was also advised.

This approach may well prove to be the next step in the evolution of the New Zealand forest industry.

Rare species in plantation forests

Looking for more information on the management of native wildlife in your forest? Go to <http://rarespecies.nzfoa.org.nz> for a detailed on-line management guide.

While there are economic advantages in growing trees of a single species in forests grown or wood fibre production, this may no longer be the case in forests grown to provide other services such as carbon sequestration.

Diverse forests also tend to be healthier than monocultures and much less vulnerable to damage from species-specific exotic pests. Fruiting species, like some eucalypts, also provide a valuable food source for native birds like kereru.

In the meantime the forest industry can feel proud that its *Pinus radiata* and other forests protect such a wealth of native species. Protecting and enhancing habitats for these plants and animals is an important part of managing an FSC-certified forest.

It also makes the lives of those who work in our plantation forests that much more rewarding. 🌲

Karearea thrive in Kaingaroa



Copyright Richard Seaton

Karearea thrive in the mosaic of different age classes which make up a plantation forest

Their victims don't see them coming and researcher Richard Seaton has the scars to prove it.

Karearea, the New Zealand falcon, dive-bombs its prey – striking them in the air, or from the air, with its feet. It's a tactic it also uses to defend its nest.

But despite its talons and ability to rule the skies, the Karearea is vulnerable to stoats, cats and other mammalian predators while nesting. Its preference for ground nesting sites is its Achilles heel.

The one time when the odds tip in the bird's favour is when it is living in a well-managed plantation forest.

Thanks to predator control, sympathetic forest management and large open areas of cut-over forest, the highest known population of karearea are in Kaingaroa forest in the central North Island.

Richard Seaton, a Massey University PhD student, has completed three years of field work studying karearea in the forest and is now analysing his data and writing up his thesis. He says 40 pairs are known to have nested in Kaingaroa last spring – up from 30 in 2004 and 20 the year before.

"Until I did my study I didn't realise how much native biodiversity there is in exotic forests. I've been quite impressed – for example there are massive populations of whiteheads and quite large populations of tomtits and other species."

Small birds form 90 per cent of the diet of karearea. But Seaton says karearea are known to have killed fully-grown pheasants and three-quarter grown hares. Not bad for an adult bird which normally tips the scales at around 470 g (female) or 280 g (male).

Seaton says the aim of his research has been to come up with practical techniques to help forest managers to protect, and preferably build, karearea populations. Part of this will be determining optimum coupe sizes. Because he hasn't analysed his data, Seaton doesn't want to jump to conclusions, but the 150 ha clear-fell areas typical of Kaingaroa seem to be good.

"Having a mosaic of different forest age classes really helps. The clear-fell areas provide hunting opportunities for the females. The margins of mature forest are preferred by males, which are smaller and more manoeuvrable.

"You get only one pair for each clear-fell area, so the optimum area will be one which balances the birds' territoriality with the feed supply."

Seaton says he's enjoyed working in Kaingaroa Forest.

"Kaingaroa Timberlands, Carter Holt and NZ Forest Managers are my main sponsors and they have really gone out of their way to help me."

He says birds of prey have fascinated him since he was at school in the United Kingdom, an interest which took him to many other countries before starting his PhD at Massey. When he completes his thesis he's hoping to continue working with falcons, providing advice on how to manage forests for falcons and biodiversity.

Meanwhile, another falcon researcher is starting work in the forest looking at whether karearea will accept barrels as off-ground nesting sites. If they do, it will be a big step forward in the long-term management of the species.

Contact: Richard Seaton, Tel 06 356 9099 X 2457, 021 298 0621, email r.seaton@massey.ac.nz 🌲



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Their victims don't see karearea coming and researcher Richard Seaton has the scars to prove it

Fighting fires and pests

NZFOA forest health administrator Bill Dyck says it's a question of priorities

The comment is often made that as an industry we spend more on fire preparedness than we do dealing with insects and disease, despite the fact that the annual cost of forest health problems is in the order of \$150 million – 10 times the cost of losses by fire.

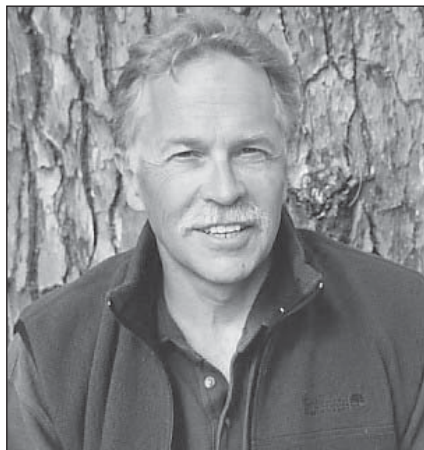
Of course the argument is made that at least you can do something constructive to prepare for high fire risk, by allocating resources to high priority sites, constructing firebreaks and other activities. Dealing with insects and diseases can be much more difficult as they are much less predictable.

Or are they? What do we really know about the relative costs and risks posed by 'biosecurity agents' versus fire?

From a recent study commissioned by the NZFOA Fire Committee we now know that forest owners spend in the order of \$8–\$10 million a year on prevention, equipment, training, and other fire protection-related costs. While this includes suppression costs for the majority of minor fire events, it excludes fire-fighting costs and damages for major fires (200+ ha) of which there have been several in the past few seasons, where suppression costs exceeded \$1 million in each case.

The impact of established fungal diseases is much more insidious than fire, as we gener-

ally don't see major areas of forest wiped out. Instead individual trees die, or more likely there is generally reduced vigour and volume growth throughout a stand or forest. New



Bill Dyck

introductions of fungal diseases are also very difficult to distinguish from other symptoms – as we know from our experience with *Nectria flute canker*, which has spread in the lower part of the South Island.

In terms of relative risk, forest owners were asked to rank both fire and wind against each other and against health threats to forests (both currently established and potential/not

yet established). The result was that foresters ranked the risk from non-established pathogens & insects > wind > fire > other abiotic > established pathogens & insects.

Hence it appears that forest owners make a clear distinction between current established forest health issues and potential problems. They also perceive wind, fire and other abiotic threats (snow, drought) as a greater risk than current forest health threats.

This is interesting, given that financial losses from established insects and pests are an order of magnitude greater than losses from fire, which have averaged 440 ha/year over the past decade.

The high risk rating for non-established pathogens and insects likely reflects the attention these organisms receive in the media, although no doubt the risk from new incursions is very real. The fact that established pathogens and insects ranked so low perhaps reflects resignation on the part of many forest owners that little more can be done to combat insects and diseases that are already established.

Currently the industry spends in the order \$3 million a year assessing and spraying *Dothistroma* and invests relatively little else

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Cyclaneusma needs answers

Cyclaneusma needle-cast is a fungal disease caused by *C. minus* which infects and sometimes kills *Pinus radiata*.

It is thought to cause average growth losses of 6.6% a year in the country's radiata plantations, and to cost about \$50 million a year.

Cyclaneusma causes browning of foliage and the heavy shedding of 1-yr old needles, normally in spring. Trees become infected in autumn-winter (May-June) when needles are about 8-9 months old.

Disease severity is highest in 11- to 20-year old stands, on the East Cape, Northland, central North Island, Dunedin and Southland and the lowest in Nelson, Central Otago and Canterbury. Severity appears to be related to micro-site, with highest severity on sites prone to mist and low cloud.

At an average disease severity of 60%, trials showed there was a 50% loss in diameter increment over six years. Projections of stand growth to age 30 for various proportions of diseased trees predicted a reduction in volume of 10–14 m³/ha for each 10% increase in the proportion of diseased trees.

For the country's radiata estate, average growth losses of 6.6% a year between was predicted for stands aged between 6 and 20 years. The

financial losses were estimated to be of the order of \$51 million a year.

Researchers concluded that the high cost of fungicide spraying could not be justified, even though some treatments were effective at reducing disease levels. Tree stocking density or pruning had no practical effect on the incidence or severity of the disease.

Thinning trials showed that, when using susceptibility to *Cyclaneusma* as a main criterion for tree selection, a delayed first thinning at age 7 or 8, followed by a second thinning at age 10 virtually eliminated the disease from the stand.

However this does not appear to be practical in a commercial situation. Normal thinning criteria is (1) even spacing, (2) good form (removing those with distorted stems, multiple leaders, large branches, and (3) vigour. Adding cyclaneusma as a criterion – especially if it was made number one priority – would likely cause problems in most forests.

Indeed, a survey of forest managers at a recent workshop revealed that none was thinning for cyclaneusma. Clearly, a practical solution to this costly disease still needs to be found.

Source: *Cyclaneusma Needle-Cast in New Zealand* (Forest Research Bulletin No. 222). www.ensisjv.com/Portals/0/FRBulletin222.pdf


Pine pellets OK for Christchurch

Before winter, the Canterbury Regional Council (ECan) approved the installation of 405 wood pellet burners in Christchurch homes which did not previously have wood burners or fire places, even though the draft regional plan bans wood burners unless they are replacements for existing units.

Solid Energy submitted that each time it replaced an open fire or inefficient burner with a pellet fire in an existing home there was an offset ratio of approximately 2.5:1. In the previous year, the company had made 1014 replacements.

ECan accepted this logic, subject to flue cleaning and inspections of all the burners every two years, and granted a consent for 35 years.

Emissions from pellet fires are minute. The fires use dried and pelletised sawdust and wood shavings as a fuel source, material which has traditionally ended up in landfills.

In its summing up, ECan concluded that "pellet fires must rate very highly when compared to other heating appliances and more particularly low emission log burners. The prime reason for that is their comparatively much lower real life emission levels. Those lower emission levels can be attributed to their higher combustion temperatures, better and more consistent fuel quality and their design which reduces the scope for poor home operator use of the appliance." 

Kiwis fight US fires



The NZ team just before their return home, after 35 days in the United States

In early-September, national rural fire officer Murray Dudfield received the third request he'd had this year for fire fighters to help manage wildfires in the northwest states of the USA.

According to the US National Interagency Fire Centre, New Zealand and Australia have provided 92 fire specialists and managers to assist with suppression operations this year. Canada has provided four 20-person crews and 17 fire specialists and managers. All costs are met by US federal wildfire agencies.


The centre, which is based in Boise, Idaho, is experiencing a wildland fire season which may well rival their devastating 2000, 2002, and 2003 fire seasons.

"Weather forecasts are for continued strong winds and dry thunder storms in

many areas and this will continue to hamper firefighting efforts," says Dudfield.

On 10 September, 49 uncontrolled large fires were burning, involving some 428,000 hectares of California, Idaho, Montana, Minnesota, Nevada, Oregon, Washington, Wyoming and Hawaii. In the calendar year to date, 81,518 fires have destroyed 3.5 million hectares, well up on the 10-yr average of 60,726 fires and 1.9 million ha destroyed.

New Zealand will now have provided 28 fire managers to assist with the management of firefighters and aircraft, says Dudfield.

"Their professionalism is greatly valued by the US federal fire agencies, and it also provides them with invaluable experience which will have long-term benefits for New Zealand." 

Continued from previous page


implementing operational solutions to combat other existing fungi and insects.

An exception is the Arboguard seedling line produced by PF Olsen, which offers greater resistance to *Armillaria* root rot in field plantings. Also, research programmes provide new knowledge, such as an understanding of the ecology of *Nectria* flute canker, which can be used – often as silvicultural solutions – to reduce the potential impact of diseases.

If we spent more combating existing pests and diseases would it have much of an impact?

The answer is undoubtedly yes, in the case where we have solutions that can be implemented – such as copper spraying for *Dothistroma* and biologically enhanced seedlings for protection against *Armillaria*. However, for other debilitating diseases such as *Cyclaneusma* and what we refer to as physiological needle blight, there is still rela-

tively little that can be done to reduce losses until research discovers some solutions.

While fire has long been in the consciousness of all forest managers, forest health has often been relegated to the realm of a few specialists who are consulted when it appears things are going wrong. Given the risks associated with forest health, it is important that it becomes part of mainstream management, not a side issue. 



NEW ZEALAND
FOREST OWNERS ASSOCIATION INC.

Publication date: October 2006

New Zealand Forestry Bulletin is published quarterly by the New Zealand Forest Owners Association, 85 The Terrace, P O Box 1208, Wellington. Tel 04 473 4769, fax 04 499 8893,

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