KauriKonnect 23

KEEP KAURI STANDING
STOP KAURI DIEBACK DISEASE SPREADING KIA TOITU HE KAURI

Merry Christmas!

We wish you, your whānau and your work colleagues all the very best for the festive season. May it be full of good times with family and friends...and a chance to rest up after another very busy year.

Please remember it's the season for giving rather than taking... so if you're in the kauri forest this summer, please GIVE our kauri every chance of survival by NOT TAKING any soil in or out when you visit. Make sure soil is removed from shoes, equipment and vehicles before they go in and the same before you leave. We want our magnificent taonga to be around for many more Christmases to come!

We look forward to your continued support in the New Year to encourage all forest users and communities to do everything they can to stop the spread of kauri dieback disease.

PASS IT ON. Please spread the word by sending this newsletter through your networks via email or print off hardcopies to pass onto those you meet.

Are you new to *KauriKonnect?* Email lynn.mcilveen@mpi.govt.nz to register on the database and you'll never miss a copy.

FROM THE CHAIR

Meri Kirihimete!

On behalf of the Programme Leadership Team I wish you all a safe and relaxing Christmas and New Year. In addition, on a personal note I would like to thank all of the passionate people within the partnership organisations and communities for what you have done this year. You have gone above and beyond to mobilise forest users to adopt kauri-safe behaviours and to advance our knowledge of the kauri dieback disease.

In my relatively short time with the Programme I have been overwhelmed by the dedicated work of scientists, field staff, community liaison staff and all the unpaid volunteers. It is also interesting to note how people have found a way to keep contributing to the Programme despite changes in employment, retirement and additions to family – such is the desire to save our kauri forests!

As a group we have achieved much, as the snapshot of achievements over the last three years over the page demonstrates. Yet we all know there is much more to be done. Take time over the break to refresh and recharge. Go hard in the new year. I have every confidence we will continue to excel in this challenging, but rewarding, mahi.

Nga mihi
Katherine Clift
Chair of the Kauri Dieback Programme Leadership Team

Achievements for Kauri Dieback Programme

2009-July 2012

Programme Structure

- Tāngata Whenua Roopū established, functioning effectively, and growing
- Partnership and charter developed
- Technical Advisory Group established
- Tāngata Whenua input at all levels of management/response
- Business case accepted
- Four TAG meetings were held with key recommendations implemented
- Relationship Monitoring Framework prototype completed and ready for testing with partners
- Role cards developed
- Relationship Manager - Community and Māori liaison specific person hired
- Logistics manager hired
- Operations manager hired
- Challenges of restructuring MAF (now MPI) and DOC worked through
- Effective programme planning from all work streams
- Frequent budget forecasting from work stream leads lead to accurate forecasting and budget expenditure
- Consistent weekly team leader meetings via conference call

Research

- Soil sampling technique and analysis protocol developed and proven
- Diagnostic tools refined
- Mana whenua involvement in key research and management
- Cultural Health Indicators – first phase of development completed
- Cultural effects assessment completed to determine how best to manage cultural effects and risks from the disease and/or management and response initiatives
- Aerial surveillance techniques identified and tested
- Establishment of long-term forest health monitoring plots underway
- Plantation history under investigation
- Preliminary investigation into kauri genetics
- Dry-living surfaces research initiated
- Oospore deactivation research begun
- Field trials begun with phosphite as potential control tool
- Control and management tools being identified. Sapling trials underway
- Basic biology of PTA within the kauri forest environment under investigation
- Basic physiology being investigated
- Four post graduate research students co-founded at University of Auckland
- Mātauranga Māori contribution to management/response being considered.

Operations

- Kauri Dieback Hotline (0800 NZ KAURI) established to provide advice and kauri inspections for landowners. Over 400 properties inspected. This passive surveillance is used to define rural and urban spread
- Hygiene protocols developed to stop the spread of kauri dieback
- Tree removal and pruning guidelines developed to prevent the spread of kauri dieback
- Track management guidelines developed for improved kauri health
- Database established to record GPS coordinates of infected trees (ongoing)
- Track hygiene stations (barrels, grates, trigene) and management tools for events developed. Over 200 hygiene stations installed and maintained within kauri land
- Alternative hygiene station designs trialled (eg phyto-fighter). Mountain bike station developed
- Compliance studies undertaken. Compliance not high at hygiene stations on tracks
- Field teams trained to undertake standard tree health assessments and soil sampling
- Complete surveillance of the Waitakere Ranges and Hunua Ranges; partial surveillance of Great Barrier Island and the Coromandel by plane and helicopter
- Targeted surveillance of Waipoua and Waitakere: areas of disease found
- Survelliance in Ngāti Hine land indicates area is free from kauri dieback
- Hunua ranges targeted surveillance indicates area is also free from kauri dieback
- Implemented protection areas (track and reserve closures) for kauri dieback management
- Ngāti Hine – active quarantine and pest control crews monitoring visitors and sites
- Risk assessment protocols developed and in use to manage diseased sites
- Potential vectoring issues identified. Work underway to assess the risk of spread by rural stock movement and invertebrates

Communications and Liaison

- Kāhui kaumātua hui to provide an update and seek further input from kaumātua held
- *Care For Kauri Guide* published for landowner/community advice
- Relationships built with key stakeholders and relevant interest groups
- Undertook 150+ public/community educational workshops and presentations
- Tāngata Whenua focused community engagement in place: high level of awareness amongst tāngata whenua communities across Northland and Auckland
- Publication/presentation of eight scientific papers at national and international conferences
- Development of KauriKonnect newsletter and extended mailing list
- Market research (with focus groups) undertaken to assess public awareness and messaging
- Review and refocus on brand and messaging consistency across Kauri Dieback Programme
- New awareness building messaging and collateral developed including. billboards, banners, flags
- Field ID guide produced for public
- Activity sheet produced to engage children
- Website new platform, strongly branded, key information regularly reviewed and updated
- Media relationships continually building including *National Radio, Māori Radio, Māori TV*
- Awareness raising articles and shows in major publications: *The Listener, Forest & Bird, 60 Minutes*
- Educational DVD to promote programme's key messages almost completed
- Community engagement contracts underway to build local awareness and solutions
- Kauri dieback team visit across the kauri lands including Aotea/GBI, Waikato (including Coromandel), Bay of Plenty
- Contract underway to develop key message upgrade via Waharoa ('information kiosk') at Waipoua Forest HQ, high volume, 24-hour site
- Sponsorships/promotional alliances being built. Strategy being developed
- 'Mobile branding' – vehicles, t-shirts, advocates on parks

Partnerships helping us spread the word

We now have even more help raising awareness of kauri dieback and encouraging kauri safe behaviours by forest users every time they're in our forests.

Soar Print

The ink is dry on an agreement with Auckland based Soar Print, who has offered us generous support for printing resources. This award-winning, environmentally sustainable printer has a long history of supporting its community and causes it believes in.

The Kauri Dieback Programme joins the New Zealand Breast Cancer Foundation, Sir Peter Blake Trust, New Zealand Yachting, The Raukatauri Music Therapy Trust, Books in Homes and Gifted Kids Programme in their portfolio of community activity.

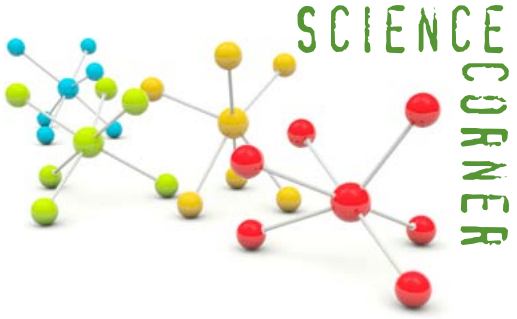
Bivouac

Bivouac outdoor are also helping to spread the word about kauri dieback through their website. The Kauri Dieback Programme is featured as a partner in the blog section of their website alongside where people can go to buy gear and equipment. Amanda Peart, part of the team from Auckland Council, has posted a number of entries recently including a general introductory piece and highlighting the new kauri protection zones in the Waitakere Ranges Regional Park.

http://www.bivouac.co.nz

Share the love...share the likes!

We have just launched a Facebook page to increase awareness about kauri dieback in communities online. Please check us out at **https://www.facebook.com/TheKauriDiebackManagementProgramme**, 'like' our page and share it through your networks.



Back to basics: **the science of kauri dieback**

Phytophthora taxon Agathis (PTA) was first discovered as a new disease to science in 2008. This organism is the cause of 'kauri dieback': responsible for the death of thousands of New Zealand kauri.

Not only is kauri dieback an 'unwanted organism' (a biosecurity classification which prompted the joint agency response) but it is also an 'unknown organism'.

Over the past four years, scientists at the University of Auckland, Landcare Research, Scion and Plant & Food have been working to define the basic biology of the disease, improving detection methods (from soil samples), investigating how it spreads (and how to contain the spread) and testing treatment options. Although we still have a lot to learn, we do know enough to protect the healthy areas of kauri and stop the spread of this fatal disease.

We now know:

1. What it is:

Kauri dieback is caused by a species of ***Phytophthora.*** ***Phytophthora*** are a group of microbes which cause disease in hundreds of different plant species throughout the world. The most famous member of the phytophthora family is ***Phytophthora infestans***, which was responsible for the great potato famine in Ireland in the 1800s. Kauri dieback (like all ***phytophthora*** species) is not a bacteria, virus or fungus but belongs to another kingdom called the 'chromist' kingdom. They are very similar to a fungus in the way they grow and feed but have cell walls composed of different materials (chitin in fungi vs cellulose).

PTA stands for ***Phytophthora*** taxon Agathis.

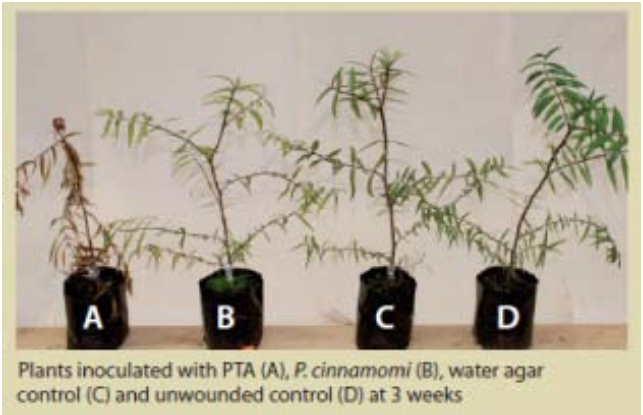
- ***Phytophthora*** (meaning 'plant destroyer' in greek) is a group of plant diseases.
- taxon Agathis – simply means, the kauri family.
- So PTA means 'a plant disease that affects the kauri family'.

There is still more to learn before we can say we know this organism well.

PTA is the temporary 'tag' name that has been given to this species until the scientists learn more about the genetics, biology and morphology of this microbe. Within the next year a formal scientific description should be completed and submitted with a new official name to the Code of Botanical Nomenclature.

2. What it does:

Some of the first research undertaken looked at what species might be affected by this disease and the impact on New Zealand kauri. A range of exotic plant species (eg. Pinus radiata and oak) and native plants (eg. tawa and Taraire) were inoculated with the disease.



Plants inoculated with PTA (A), *P. cinnamomi* (B), water agar control (C) and unwounded control (D) at 3 weeks

New Zealand kauri saplings were the only plants that died in this experiment and no obvious symptoms were shown by any other species tested. The photo below left shows how PTA had killed a kauri sapling within three weeks (compared to other controls). This finding suggested PTA is a serious threat to New Zealand kauri.

Microscopic spores in the soil infect kauri roots and damage the tissues that carry nutrients within the tree. Infected trees show a range of symptoms including yellowing of foliage, loss of leaves, canopy thinning, dead branches and lesions that bleed resin at the base of the trunk.

Kauri dieback can kill seedlings and trees of all ages. Nearly all infected kauri die. In the past 10 years, kauri dieback has killed thousands of kauri in New Zealand.

Scientists are currently working to find control tools for this disease but there is no known treatment at this time.

Kauri dieback spores are produced in the following steps:

1. Oospores (resting spores) are introduced into an area of kauri
2. Oospores germinate to form sporangia (a structure which produces zoospores)
3. These zoospores are released during and immediately after heavy rain
4. Zoospores (mobile spores) swim through soil-water to kauri roots, attach to the root surface, germinate to produce mycelia which infects the kauri root

5. The organism grows through the root system to affect tissues at the base of the trunk (damaging tissues that transport nutrients and water to canopy)
6. More sporangia are formed from areas of infected root which release more zoospores during/after heavy rain
7. Oospores form within infected tree tissue and are released into the soil as tissue decays.

The environmental movement of kauri dieback zoospores through water has been demonstrated in vitro (in the lab) but has not yet been found in the field (Randall et al. 2010).

3. How it spreads

The oospores are effectively the 'seeds' of this disease, with a hard outer shell they can sit dormant in soil for up to three years or more. These spores live in soil and are spread with soil movement. Dirty footwear, animals, equipment and vehicles are responsible for the large-scale spread of this disease – between different areas of kauri.

The introduction of spores to an area of kauri can lead to a new area of infection. We don't yet know what inoculum load/number of spores are required for an infection to occur – however, as the spores can reproduce/multiply once introduced to an area, a minute amount of soil with a tiny amount of spores can result in a new area of disease.

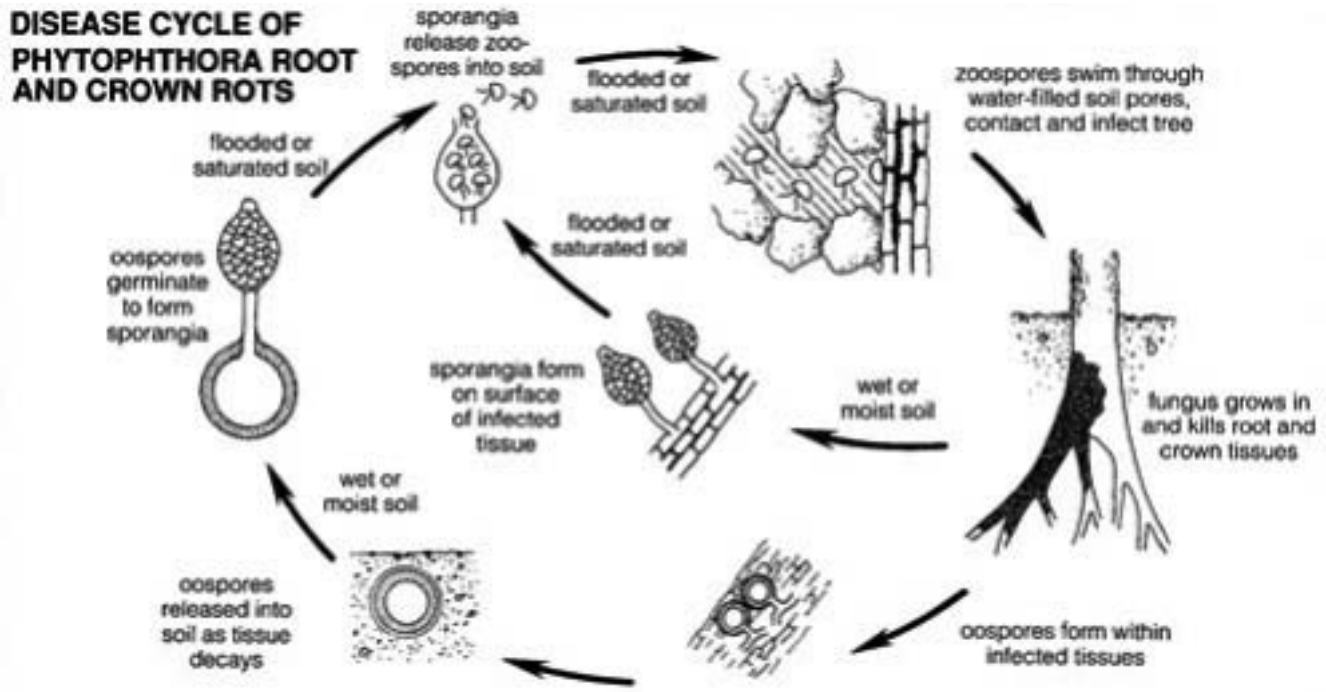
4. How to contain it

Without any treatment or control tools, the only way we can save our kauri forests is to contain the disease in its current locations and stop the spread into healthy areas.

Another of our first research projects looked at how we could disinfect boots/equipment once they had been infected with PTA.

Trigene, Phytoclean, Virkon, Janola and Citricidal solutions were tested on PTA mycelium (threads), oospores, zoospores, infected soil and infected soil on boots.

Trigene Advance (2% solution) was found to be a "suitable disinfectant for controlling PTA, inhibiting/killing propagules of PTA and reducing the infective capacity of soil containing PTA".



5. In summary

» Kauri dieback is spread by microscopic spores in soil.
» It is fatal to New Zealand kauri.
» Trigene and hygiene measures will prevent the spread of this disease.

Oospore within infected tissue

Film Festival special

The annual New Zealand International Film Festivals are a popular winter haven for community opinion leaders – those people who have a point of view and share it with family, friends and colleagues. So we were delighted to note 'Song of the Kauri' directed by Mathurin Mogat was appearing this year. It's the fascinating story of Laurie Williams and his talent for working with kauri to make unique instruments like guitars and violins. Within the story is the plight of kauri and its historical and contemporary destruction.

Mathurin says, "I believe that the strongest message of conservation for our native forests can be told by mixing ecology with economics and finding a balance where our forests can thrive and where we can also base an economy on the sustainable harvest of these timbers". For more about the film and the team behind this production see **http://www.songofthekauri.com**

Members of the Kauri Dieback Management Programme attended the Auckland, Hamilton and Tauranga screenings to provide information about kauri dieback to this audience. With support from Mathurin, kauri dieback information was available at subsequent screenings throughout the festival.

The 'Song of the Kauri' film is now screening across New Zealand and has gained international recognition. The general release was on Thursday 15 November at Rialto cinemas and it is screening at 18 cinemas around New Zealand. The film was recently selected for the Hot Springs International Documentary Festival in Arkansas, and the 2013 National Geographic Environmental Film Festival.

Pictured is Mathurin Molgat (director, left) and Laurie Williams (luthier, right).

Not quite a trilogy...but Peter Jackson watch out!

The nursery team at Henderson Primary school have put together a Youtube clip about the great work they've been doing.

With support from Community Waitakere, Henderson Primary school children have set up Te Pito O Te Ngahere (or green heart nursery) underneath their gym. They grow a range of native plants from seed and are helping to spread the word about kauri dieback disease. Their kauri seedlings were part of the 'kids for kauri' project which was run at three schools in West Auckland this year by the Community Waitakere Trust. This video shows the kids hard at work and a great summary of what they have learnt about kauri dieback. Brilliant work and a great watch!

http://www.youtube.com/watch?v=K6Vjd5nYet0&feature=youtu.be

A group of students from the North Shore's Kauri Park School wrote, filmed, acted and produced a brilliant film about kauri dieback disease: "STOP kauri dieback – a take-action film."

This film was entered into both the 'Outlook for Someday' and Panasonic 'Kid Witness News' film competitions and made the short list in both competitions. Great to see such enthusiasm to 'spread the word' about kauri dieback! "Oh Yeah! Job well done! Long live the kauri!"

http://www.youtube.com/watch?v=XA7zw3dhnRE&feature=youtu.be

Wake up call about kauri

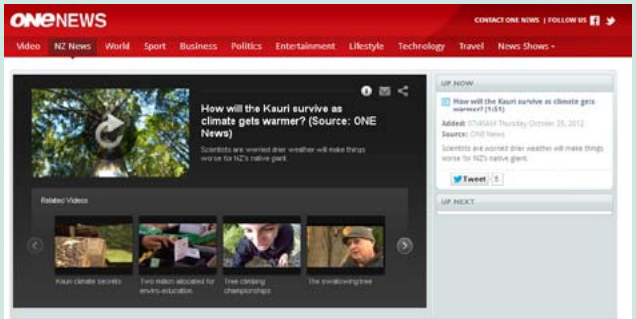
Early on 25 October ***TV1 NEWS*** ran a great cameo item about Auckland University's work monitoring the impact of climate change on kauri. The hypothesis being the kauri catchment area is likely to get warmer and drier and that the kauri's exposure to wind and shallow rooting system may make it more vulnerable. Cate MacInnis-Ng from Auckland University appeared on screen, as did Tane Mahuta.

The story featured kauri dieback as another threat to our taonga. It helpfully showed track users cleaning soil off footwear as an example of what is required and mentioned track closures as another control measure.

Unfortunately old track signage appeared in the article. This does not help us build a consistent message or 'recognition' among our public. Please ensure you do everything you can to get our new messaging out there.

(Ed – it was very, very old signage going back to 2008. See article in KK22 about the recently updated imagery featuring healthy tree–dead tree photos and 'Save Our Kauri Forest' theme).

http://tvnz.co.nz/national-news/kauri-survive-climate-gets-warmer-video-5158743



We CAN learn from Australians – honest

Ian Mitchell (Relationship Manager) and Stacey Hill (Auckland Council) both attended the IAP2 Inspire and Energise Conference in Melbourne recently. This conference brought together leaders of public participation programmes from around Australasia and those keen to learn about this process.

Living up to its name, our representatives left the conference both inspired and energised. We have had some fantastic community engagement work undertaken by community groups this year and plan to encourage more community involvement in our programme ASAP! A problem shared is a problem halved!

While over the ditch, Ian and Stacey both touched base with teams involved in the management of ***Phytophthora cinnamomi*** ("dieback") in the Australian bush. This disease wipes out over 40 percent of their native species and has been an issue for land managers for over 40 years. As a close relative to kauri dieback, the science and management tools developed by Australian teams are extremely valuable to our programme.

Ian took the opportunity to visit Perth to learn from land managers in Western Australia, while Stacey visited the Parks Victoria team, where Peter Box shared his extensive knowledge on dieback management. The protocols and hygiene tools developed by this team are similar to some of our kauri dieback management processes...however, much was learned during this visit that may be adopted to improve our programme.

We hope to continue to build a two-way relationship with Parks Victoria and other land managers in Australia to learn all we can from their experience.

There is still so much to learn!

A visit to an infested site in the Brisbane Ranges National Park showed the devastation caused by dieback (Austral grass trees are an indicator species... dead and diseased in the foreground of this photo).

Peter Box (Parks Victoria) is pictured left with their immersion style disinfection station in the Brisbane Ranges.

American intern adds huge value

Auckland council were lucky enough to host Elisabeth (Lisi) Lohre for a seven-week internship through the HECUA programme. Lisi was involved in a number of aspects of kauri dieback management in Auckland. She lent a hand filling up trigene stations in parks, assisted with soil sampling at suspected sites and compiled a comprehensive report on the work completed by summer parks advocates (2011-2012). This report summarised the results of over 300 survey forms measuring the levels of awareness of kauri dieback in visitors to the Waitakere and Hunua Regional Parks.

Notably, in the Auckland region only 56 percent of park visitors had heard of kauri dieback and only 52 percent of participants had used boot cleaning stations. These figures show that there is clearly still a lot of work to be done to spread awareness of the disease and prevention measures.

A significant percentage of park users (46 percent) did not know how kauri dieback spreads....this may partially explain why people walk past our cleaning stations. Park users who aren't aware that the disease spreads via soil are unlikely to understand the rationale behind cleaning stations.

Auckland Council and the Kauri Dieback Management Programme will use this report to direct how and where we focus our communications efforts in the future. We still have a long way to go to getting the message out there.

Summer advocates will be out in Auckland regional parks again this summer to conduct more surveys and spread the word to parks visitors. With the work that's been done this past year, we're hoping to find an increase in awareness levels this summer.

Many thanks to the advocates and Lisi for all their work!!

For the full report, email **stacey.hill@aucklandcouncil.govt.nz**

Add our banner ads to your websites!

Our online banners are now refreshed and ready to go.

You can help spread the awareness of kauri dieback by adding these banner ads to your blog or personal website. These eye catching moving banners will help us reach people that are still to hear about the issue.

You are key to helping us raise awareness of kauri dieback and save our kauri forests.

Click here **http://www.kauridieback.co.nz/home/media/web-banners.aspx** and simply copy the html code.

International *Phytophthora* experts pool knowledge in Spain

IUFRO is the world's network of forest science (check out **http://www.iufro.org**)

In September, they held the 6th International Meeting IUFRO Working Party for Phytophthora in Forests and Natural Ecosystems in Cordoba, Spain. Monique Wheat was there and thanks Auckland Council, Landcare Research and the Kauri Dieback Programme for their assistance in getting her to a fantastic and information-filled conference. She reports...

I attended the conference with representatives from Landcare Research, SCION and the Ministry for Primary Industries. Each of us battled in the Spanish heat (arriving from a cold and wet New Zealand winter) to collect, share and absorb new information on forest Phytophthora at the University of Cordoba.

In the 13 years the conference has been running, it has grown from a meeting of 44 scientists to over 120 scientists from 25 different countries. The increase in attendees demonstrates the increasing problems Phytophthora diseases are causing worldwide for our natural ecosystems, and forests. At this year's conference, there were 63 oral presentations, 89 posters, and three field trips – the conference was information packed.

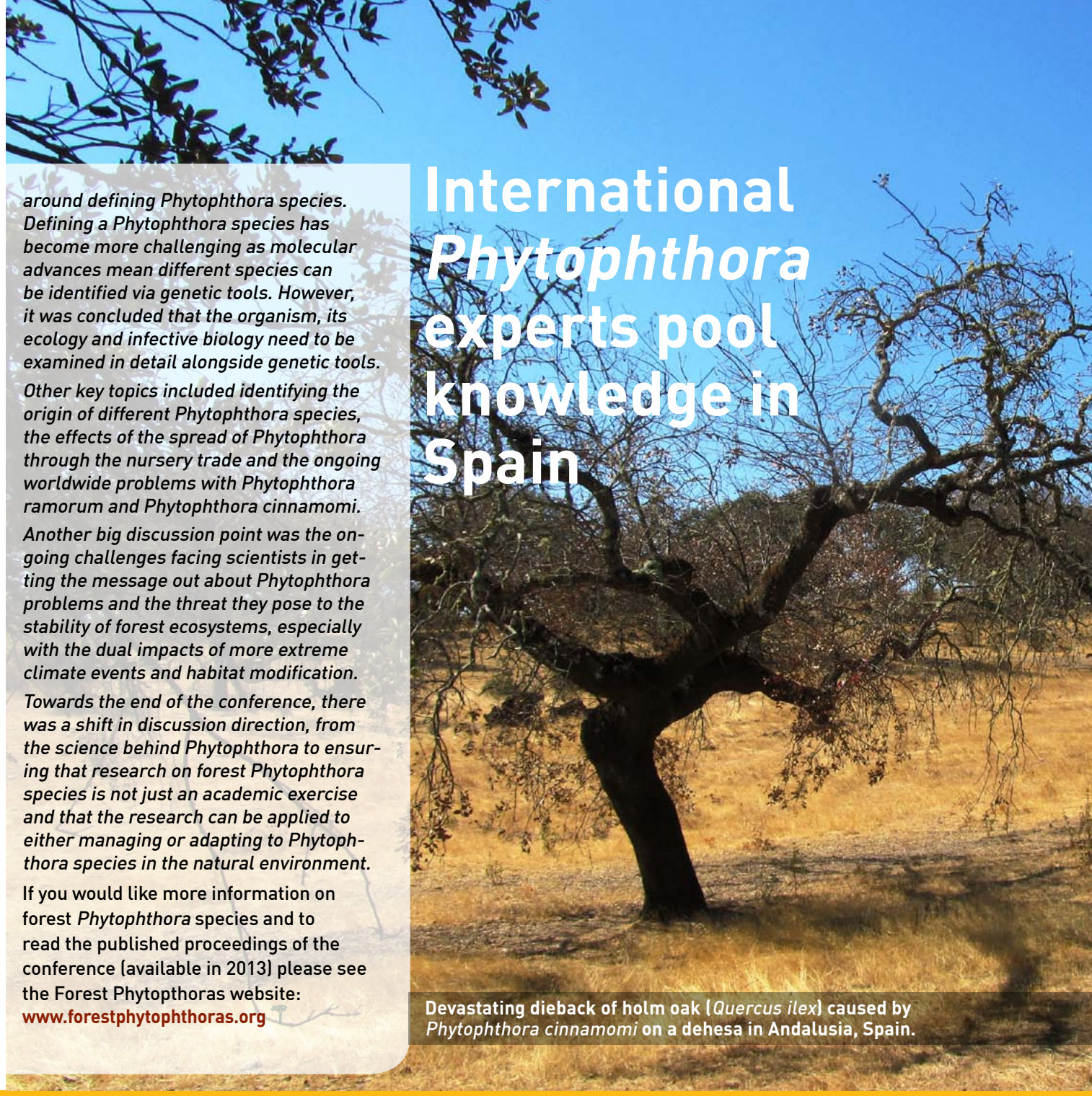
The three field trips highlighted the Spaniards problems and challenges with a number of Phytophthora diseases. The most obvious devastation of disease was at a dehesa (farm) where Phytophthora cinnamomi is causing large-scale dieback of holm oak (Quercus ilex). A number of key topics were covered in the conference. The key messages and problems that consistently arose, included challenges around defining Phytophthora species. Defining a Phytophthora species has become more challenging as molecular advances mean different species can be identified via genetic tools. However, it was concluded that the organism, its ecology and infective biology need to be examined in detail alongside genetic tools.

Other key topics included identifying the origin of different Phytophthora species, the effects of the spread of Phytophthora through the nursery trade and the ongoing worldwide problems with Phytophthora ramorum and Phytophthora cinnamomi.

Another big discussion point was the ongoing challenges facing scientists in getting the message out about Phytophthora problems and the threat they pose to the stability of forest ecosystems, especially with the dual impacts of more extreme climate events and habitat modification.

Towards the end of the conference, there was a shift in discussion direction, from the science behind Phytophthora to ensuring that research on forest Phytophthora species is not just an academic exercise and that the research can be applied to either managing or adapting to Phytophthora species in the natural environment.

If you would like more information on forest *Phytophthora* species and to read the published proceedings of the conference (available in 2013) please see the Forest Phytopthoras website: **www.forestphytophthoras.org**



Devastating dieback of holm oak (*Quercus ilex*) caused by *Phytophthora cinnamomi* on a dehesa in Andalusia, Spain.

Kauri dieback and St John Cadets

Eunice Ng, contacted us via our website to let us know that she had chosen to do a project on kauri dieback for her St John's Cadet environment badge. Here's what she got up to...

This year the South Island Region hosted the [St John Cadet] festival in Wakitipu, Queenstown, and the badge was the Environment Badge. One of the aspects our regional squad had to achieve [with] this badge was to find a local environmental issue, and to discuss how this impacts on you and the local community, New Zealand and the world.

I live in Waitakere...and really love hiking and the outdoors, so I decided to do mine [environment badge] on the Kauri dieback disease as it is quite a big thing in the Waitakere Ranges. Due to the short time we had to complete it [the project], I wasn't able to document any changes. But for the past two years, the times I've been out on day walks and 3–4 days hikes, we have been informing DOC where there are empty spray bottles at the cleaning stations.

During my research for my presentation I found out a lot of things I never knew, the one that surprised me the most was that less than 50 percent of people use the cleaning stations.

In Queenstown we had an Environmental Hui where we discussed some issues, and there was a little fun competition where each region had to do a presentation on an endangered species, and make a mascot out of materials we had to recycle and re-use. Our region decided to do it on the kauri tree and the dieback disease, we made a presentation, a song and skit that showed the cause of the dieback disease and the impact it had, and also how to help, and we also ended up winning it.

Comings and goings

Tēnā koutou katoa

Ngā mihi mo te Kirihimete me te tau hōu ki a koutou katoa.
Ko Katherine Clift tōku ingoa.
No Ahitereiria ki te Tonga ahau.
Ko Rat te maunga.
Ko Spencer Gulf te moana.
Tēnā koutou katoa.

Kia Ora,
My name is Katherine Clift and I work for the Ministry for Primary Industries as Manager Response. My husband and I moved to New Zealand in 2006 from Australia and we now have three kiwi kids. I grew up on a farm in a small rural community on the Yorke Peninsula in South Australia. Where I'm from the native bush is often described as "mallee scrub." What that means is that I can stand there and see over the top of most of the trees. So you can imagine that to me the sight of a kauri tree standing fifty metres high is still pretty amazing.

In September this year, I took up the role of Chair of the Kauri Dieback Leadership Team. I would like to recognise and thank all those who have supported me in this role, especially John Sanson, the previous Chair, and the other members of the leadership team, Hori Parata, Waitangi Wood, Will Ngakuru, Jack Craw, John Simmons, Don McKenzie and Meirene Hardy-Birch, and also Liz Clayton, the Programme Manager.

I have been so impressed by the passion and commitment of everyone who is involved in the Programme. Kauri are a taonga and an iconic species to all New Zealanders. There is no doubt this disease is devastating and the work we are doing to understand the disease, its impacts and how these can be managed, is vitally important.

My role is both to represent the Ministry for Primary Industries as one of the partners in the Kauri Dieback Programme and as Chair to bring the leadership team together.

Naku noa, na
Katherine Clift

Kaitiaki Konnecting

Meet more of the budding kauri scientists at Okaihau College

In the last edition (KK22) we covered Ian Mitchell's (our Relationship Manager) visit to the year eight class at Okaihau College in Northland. The purpose of his visit was to give the children more information on kauri dieback before their class trip to Puketi Forest which was coordinated with Helen Ough Dealy, Community Relations Ranger, Department of Conservation.

Ian was very impressed with the efforts the school had gone to in advance of his visit to prepare the children. He recalls his visit below.

"I was amazed at their openness to learning about the kauri and the kauri dieback disease. Their level of interest and motivation showed that the children already feel a strong connection and personal relationship with Puketi Forest and their taonga, the kauri.

"I was very impressed with the level of thinking and problem solving these children were demonstrating, an example being 'Perhaps we can take the sap from a healthy tree and inject it into the sick tree and make it better', and other interesting and novel approaches to curing the disease. Equally, they were keen to go home and educate their family and friends about the problem."

Here are some more examples of the work the class produced as a result of the work. These formed part of the English assessment.

Kings of the Forest Threatened?

Kyla Moffat

It's official! Our unforgettably beautiful New Zealand icon could be in danger. Scientific facts show that the cause of this possible disaster is Kauri Dieback Disease (Phytophthora).

For over 30 years Kauri Dieback Disease has been known to exist on Great Barrier Island off the coast of Auckland. It can now be found in many of the forests of Auckland and Northland. Kauri Dieback Disease is well known for its fierce effects on kauri trees.

There are many organisations, including NZ Biosecurity, Department of Conservation (DOC.) and others that have been trying to determine a system to prevent this disease from spreading any further!

In the past ten years, over one thousand kauri have fallen ill. "It's worth everything to keep our kauri standing," says Gina Williams, one of the many DOC. workers involved in trying to prevent the disease spread.

If you would like to spot kauri dieback, just go to your nearest kauri tree and look for yellow leaves, kauri gum bleeding in big globs near the base of the tree, and a thinning canopy. Those could be signs that the tree is diseased.

If you have any ideas on how we can prevent this plant-killing disease, don't hesitate to call us at **0800 695 2874** or visit our website at **www.kauridieback.co.nz**

Kauri Dieback Disease

Georgia Tilly

One of Aotearoa's national icons is dying out.

Kauri Dieback Disease is a very dangerous bug that is spread easily.

Kauri Dieback Disease (*Phytophtora* taxon Agathis) – phytopthora means "plant destroyer" – is a sickness that is spread by animals and people tramping over the roots of a sick kauri tree then walking over the roots of a healthy kauri.

Disease symptoms are: thinning foliage, bleeding globs of gum on the trunk near the base, and the tree can develop large bleeding lesions.

Kauri Dieback Disease was first discovered in the 1970s, and we only realised how dangerous it was in recent times. The illness has now spread throughout New Zealand from the Waipoua Forest to Auckland. Luckily, as far as we know, it has not reached the lovely Puketi Forest.

What you can do to help

To prevent the spread of Kauri Dieback Disease, you can do the following things:

» Stop taking your pets into the bush. Pets can run over the roots of kauri and spread the disease from tree to tree.

» Stay on the selected trail.

» Wash and scrub your shoes before going in and out of the forest.

Defend Against Dieback

Emma Hunter

In the native forest of New Zealand, there is a killer on the loose. The killer works in silence. The criminal is only killing kauri, and it is called Kauri Dieback Disease. The sickness is murdering any kauri in its path. Any person or animal who walks in a kauri forest can spread the infection. Our local Puketi forest is one of the Kauri Forests in Northland where the Kauri Dieback disease has not yet spread.

Kauri Dieback Disease was first discovered on Great Barrier Island, but there is no proven path on how it got to mainland New Zealand. Two signs of a kauri tree with this illness are the top of the tree going yellow, and an intense gum bleeding around the base of the trunk in big clumps.

There are some very simple steps you can take to prevent the spread of this sickness. You can wash your shoes before entering and after leaving a kauri forest. Use soap and water to wash off all soil and you can use a disinfectant such as Trigene. Stay on the path, and do your best to avoid standing on the roots of the kauri tree.

If you have a kauri that you think might have the disease, please contact **0800 NZKAURI (695 2874)**. For further information, log onto **www.kauridieback.co.nz**

Defenceless Dying Kauri

Olivia Walden

Our precious kauri are dying out in our native New Zealand forests. A dangerous disease was unleashed and is now lurking around the giant kauri roots, spreading throughout the kauri population and killing trees slowly and painfully.

This mortal disease is called Phytopthora, meaning "plant destroyer", but is most commonly known as Kauri Dieback Disease. This disease is spread through the roots of the kauri tree. It is a soil-borne disease, so if someone or something walked on the roots of a sick kauri then walked onto the roots of another kauri tree, it would get the disease. Scientists have yet to find a cure for killing this nasty disease, but have found a way to prevent it from spreading. By spraying and scrubbing your shoes with a solution called "trigene" (or even soapy water) before and after walking in a kauri forest, any soil carrying the disease can be removed and the bacteria destroyed.

It is very important to protect our kauri, and cleaning your shoes before and after walking in a kauri forest is one of the best ways you can help.

For more information, go to **www.kauridieback.co.nz**

The story so far...

Our treasured taonga is under threat from kauri dieback disease. It has already killed thousands of kauri trees and will spread further unless all forest users take action.

New Zealanders see kauri as playing a huge part of who we are. Its status derives from its mythical origins and present day importance to our biodiversity, eco-tourism economics and our innate sense of what New Zealand is all about. Kauri contributes to our national identity, spiritual wellbeing, economic prosperity from tourism and our overall biodiversity and interconnected forest ecosystems.

Kauri dieback disease has emerged as a major threat, some would say the most catastrophic biosecurity threat of recent time.

Kauri dieback is a fungus-like disease specific to New Zealand kauri and can kill trees of all ages. Microscopic spores in the soil infect kauri roots and damage the tissues that carry nutrients within the tree. Infected trees show a range of symptoms including yellowing of foliage, loss of leaves, canopy thinning, dead branches and lesions that bleed resin at the base of the trunk. It is believed to have been introduced from overseas.

The disease produces both a soil-borne 'oospore' and water-borne 'zoospore' that can move on its own. Both spores can infect kauri roots.

Spores of kauri dieback were first discovered along with sick kauri on Great Barrier Island in the 1970s.

Identification methods at the time led to these samples being misclassified. Kauri dieback was formally identified in April 2008 as *Phytophthora* taxon *Agathis* (or PTA).

Phytophthoras are commonly known as "water moulds" and comprise some of the most destructive plant diseases known to man. The Greek word literally means 'plant destroyer.'

Unfortunately these destructive Phytophthora diseases have been unwittingly introduced to many native forests throughout the world where they are not only killing millions of canopy trees but also whole ecosystems that rely on the trees.

Unfortunately kauri has joined this list and kauri dieback disease has killed trees in the Waitakere Ranges, on private land throughout the Auckland region, in the forest plantations of Omahuta, Glenbervie and Russell in Northland, Department of Conservation reserves at Okura, Albany, Pakiri, Great Barrier Island, Trounson Kauri Park and the Waipoua Forest in Northland, home of our most iconic kauri - Tāne Mahuta.

There are pockets of health and resistance too, however.

At this stage, the disease has not been detected in many areas of Northland forest, the Hunua Ranges, Hauraki Gulf Islands (excluding Great Barrier) and bush in the Coromandel Peninsula. It's imperative that we protect these unaffected areas.

Since 2009, the Ministry for Primary Industries, the Department of Conservation, Auckland Council, Northland Regional Council, Waikato Regional Council and the Bay of Plenty Regional Council have joined forces to cover research into the detection and spread of kauri dieback, methods to control it and public awareness campaigns to help stop its spread.

The other programme partner is tāngata whenua. Since first learning of kauri dieback, tāngata whenua throughout the kauri catchment have been keen to be involved in an issue critical to the health and wellbeing of their taonga, the mighty kauri. One of the ways this has happened is through the establishment of a Tāngata Whenua Roopū (TWR) where interested marae, hapū, iwi and Māori-owned land blocks can nominate a representative to sit on the TWR. TWR provides advice from a tāngata whenua perspective into all aspects of the long-term management programme and nominates tāngata whenua representatives to all lead and workstream groups.

A surveillance programme is helping to assess and monitor locations of kauri dieback disease. Research is underway to improve detection methods, increase our knowledge of how the disease spreads and develop effective control methods. Trials involving the use of phosphite to treat the disease have shown promising lab results and field tests have begun.

Work is also going into improving track construction, drainage and other man-made influences that will help reduce the spread of the disease.

The story so far continued

There have also been trial closures of tracks in some parks, or re-routing tracks away from kauri.

The programme has focused on limiting the spread of the disease and protecting uninfected locations. Information is being shared with landowners, visitors, community groups, journalists, clubs and event managers to help build awareness, understanding and action around kauri dieback.

The key message being driven home is to stop the spread of the disease:

» Make sure shoes, tyres and equipment are cleaned to remove all visible soil and plant material – before AND after visiting kauri forest

» Stay on the track and off kauri roots

These messages have come from the understanding that spores of kauri dieback are found in the soil around affected kauri. Any movement of infected soil can spread the disease. Human activity involving soil movement (on footwear, machinery or equipment) is thought to be the greatest cause of spread.

We all can help - tourists, hunters, trappers, trampers, runners, bikers, walkers. We all need to make it happen, rather than hope 'someone else' will do it.

So, to spread the word rather than the disease, you can access more information at the programme's website – **www.kauridieback.co.nz**.

If you think your trees have symptoms of kauri dieback call **0800 NZ KAURI (695 2874).**

The Kauri Dieback Programme thanks the following partners for their support

If you'd like to help spread the word about kauri dieback to your customers, staff and networks then please contact Ian Mitchell on **029 894 0773** or email **imitchell@doc.govt.nz**.

Coopers Creek

Coopers Creek 'Lone Kauri' brand is an iconic Kiwi wine that has lent its support to the Kauri Dieback Programme. In an innovative messaging alliance, every Lone Kauri bottle helps raise awareness of kauri dieback and what we can all do to stop its spread. They are distributed throughout the Upper North Island and into Asian markets. We feature on their website and Facebook pages and promotional material at tastings, events and point of sale is also helping to spread the word. Cheers Coopers Creek!

SHARE THE NEWS. Got a story to share on kauri dieback? Spread the word in *KauriKonnect*.

Contact **nick.farland@paradise.net.nz** to pass on any news, updates or articles and photos.

If we all contribute we'll make this newsletter even more relevant and interesting!

Soar Print

As an environmentally sustainable printer, Soar Print is generously putting their money where their mouth is by providing discounted printing services to the Kauri Dieback Programme. We're proud to join their portfolio of community programmes which help good things happen.

Bivouac

Thanks Bivouac for getting the kauri dieback message to all your intrepid outdoorsy customers on your Facebook page. We really appreciate you letting us use your communication channels to raise awareness and encourage kauri-safe behaviours in the forest.