

# TreeMatters

THE QUARTERLY MAGAZINE OF THE  
NEW ZEALAND ARBORICULTURAL ASSOCIATION INC.

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New Zealand **Arboricultural** Association Inc.

New Zealand Arboricultural Association Inc.,  
PO Box 1193, Nelson, 7040, New Zealand [nzarb.org.nz](http://nzarb.org.nz)

**Mission statement:** *To encourage, foster, improve and educate members and others in all aspects of arboriculture throughout New Zealand.*

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Scott Geddes  
New Arborist of the year winner 2014



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## PRESIDENT'S BRANCH



I recently returned from travels in Kenya, the land of the Acacia, and most surprising was the large number of *Eucalyptus*, *Casuarina* and *Pinus* species planted as part of internationally funded agroforestry programmes. They contribute to alleviating poverty, improving food security and conserving the environment through the use of trees, tree products and agroforestry. Driving through some highland areas, I could have thought I was in Australasia, being surrounded by production pine forests and hillsides covered in *Eucalyptus*. The locals I was working with valued these trees, as, for most of them, they were their primary source of fuel, heating (yes, it gets cold in some areas of Kenya) and building material.

The purpose of my trip was to work on an early human archaeological excavation and before going I downloaded some light holiday reading: Technical Handbook No.35 Useful trees and Shrubs for Kenya (*P. Maundu et al*). This was a vain attempt to educate myself on some of the local tree species in the area I was going to so I could talk about trees and their uses with the locals working with us. One day I saw this interesting-looking tree covered in galls and asked the one of the guys I was with what it was. He said, "it's a Mugarit, Willie." His friend then said, "no, no, no it's a Mukuruit." Another person insisted it was a "Mbalibla" which started a heated debate between them, culminating in thorn-covered galls being thrown at each other until one hit my wife who demanded we stop messing around and start working. After looking the

tree up (*Acacia drepanolobium*) I found it had over 30 different names in Kenyan and three in the local language Kipsigi. That was the end of my tree enquiries on my holiday and helps confirm the fact that all around the world, trees are contentious and lead to conflict between neighbours.

Back in New Zealand, winter is almost at an end and it has been a busy few months since the last edition of Tree Matters was delivered. Committee members of NZ Arb have been working on a variety of projects during the year to date, including preparation for the NZ Arb Annual Conference and Husqvarna NZ National Tree Climbing Competition held in Dunedin this year (8-10 November, 2018).

At this year's conference we will hold a breakfast workshop to review and discuss establishing a national arboricultural consultant-credentialing programme. Attendees will have the opportunity to submit feedback on the proposal, so if this topic is of interest be sure to attend. This year's conference will also host the biggest arboricultural trade show ever to be held in New Zealand. There is another excellent line-up of local and international speakers covering a wide variety of topics relevant to keeping our industry moving ahead. Look further into these pages for more details.

Thanks to feedback from our committee members NZ Arb has compiled a revised protected root zone definition for submission to the Ministry for the Environment and The New Zealand Utilities Advisory Group. I

want to thank Jez Partridge for bringing the National Planning Standards Draft to the executive committee's attention. Our review of arboriculture standards is also still underway. Membership involvement has been increasing which is important for the association to promote good arboricultural practice as a cohesive industry voice.

At the recent ISA International Tree Climbing Competition held in Columbus Ohio James Kilpatrick successfully defended his first place title. Chrissy Spence secured a second place, Craig Wilson made it through to the Masters' Challenge competition, and Steph White solidly represented New Zealand once more. They have all shown the world again what an excellent calibre of arborist New Zealand creates. Congrats and thank you to all who put in a great effort, including the coach and judges who attended.

In other news, the Queenstown Lakes District Council has changed their supplier requirements to include the required use of NZ Arb Approved Contractors; they are showing a commitment to arboricultural quality assurance in maintaining their tree asset. As a result, five local companies are starting the process of becoming approved contractors and are on the path to set them themselves apart. It is really encouraging to see the Approved Contractor Programme being increasingly adopted and referred to in local government contracts and specifications as a way to support professional arboriculture and to ensure top-quality work.





The arborist community we are part of is a robust and diverse group of characters who share a common thread; an interest in trees. And as we welcome spring we are nearing the date for our annual NZ tree-people get-together, the NZ Arb conference to be held in Dunedin this year at the fantastic Town Hall on the 8-10th of November. I have heard about plans being made, events that will take place, speakers on the roster and the extraordinary number of exhibitors we are expecting. Many volunteer hours have gone into creating another fantastic event for us and I am looking forward to seeing many of you there.

This issue of Tree Matters has a lot in store, from covering Kiwi attendance at the recent International Conference and Climbing

Competition in Ohio to our upcoming NZ conference, with a whole lot in between. Our arboriculture community has been busy over winter and as a result there is no shortage of good reading. An overseas theme has appeared in many of the articles submitted; it comes as little surprise that we have a community of adventurers among us. Venture to Japan, Finland, Fiji, the United States and Australia before the weather becomes too enticing to be anywhere else but here.

And just before you go flick an email to [editor@nzarb.org.nz](mailto:editor@nzarb.org.nz) and let us know what you think the organism is on page 48 is for a chance to win a copy of *The CODIT principle: Implications for Best Practices*.

## MEET YOUR REPRESENTATIVE

### Five minutes with Leon Saxon



#### **What inspired you to pursue a career in arboriculture?**

My mum and dad were always keen gardeners and lovers of the natural environment. That clearly rubbed off on me and by the time I was in secondary school I had a part-time job at the garden centre. That then led into part-time (school holiday) work at Treecare Services. Seeing guys like Dave Graham, Dean Hawkins, Gerald Collett and Nick Houghton swinging around in trees was mind-blowing to a 16-year-old lad. I couldn't believe that you could do such a fun thing for a living.

#### **What is the best part of your current job?**

When we get the opportunity to be involved in development projects early enough to have a meaningful effect on the outcome. Being involved in design tweaks that allow retention of good trees.

#### **What is the best job you have had in arboriculture?**

It's really hard to say. All jobs have good bits and bad bits. The camaraderie that you build when you're part of a tree climbing team is something special, due to the reliance on each other for your day-to-day safety. That was in my twenties. Having come "off the tools" in my thirties and working in the council and private consultancy world, I've enjoyed the little wins and the opportunity to explain the values of trees to the likes of engineers and planners who might not otherwise understand their importance.

#### **What motivated you to volunteer for NZ Arb?**

Having seen a number of people I looked up to being a part of NZ Arb made me want to be involved. I've loved my career to date and enjoy being around other arborists. If I can help make improvements for the industry in any way I would be stoked.

#### **What do you think one of the biggest challenges facing arboriculture in New Zealand is?**

The biggest challenge I see in the industry at the moment is staff shortage. All of the managers I speak to and all the ads that can be seen point to this. I think it's imperative that we attract people to this industry and NZ Arb are looking at ways to do this.

#### **If you were a tree what tree would you be and why?**

I would be a pohutakawa. There's a group up on the North Shore of Auckland and I have a real connection with these trees. The strength of their timber, their tenacity in hanging onto cliffs, the beauty of their flowers and their association with summer days at the beach.

## MEET YOUR REPRESENTATIVE

### Five minutes with... Howell Davies



#### What inspired you to pursue a career in arboriculture?

If I looked back, my grandparents both were very keen and successful vegetable gardeners and it was always something that I enjoyed doing as a child growing up. When I went to the USA in 1988, I ended up on Martha's Vineyard, off Cape Cod, Massachusetts. I had my own garden maintenance, landscaping and lawn-mowing business.

I met Dick Manley and Jonny Hoy on a property where I mowed lawns. I remember watching amazed at the skills of Jonny who scampered around the large oak trees on the property swinging a chainsaw whilst Dick shouted instruction from the ground. I got talking to Dick who owned the business and he offered me a job dragging brush and planting trees. They had both worked in tree care all of their lives and were proud of that. I worked for them part-time for two summers and had a great time. From that point on I have developed a passion for tree and landscape care. I got a start with City Parks

services as a trainee arborist when I moved to NZ and have never looked back.

#### What is the best part of your current job?

Working with a range of experts on the urban forest strategy; along with designing and developing the council's tree data collection system. These projects have tested all of my skills and I have learnt a huge amount, through many hours of research and importantly, learning the ability to listen to other experts to collectively develop solutions. All of this basically means I love the trees we work with, and the people I work with in parks and open space management; we collectively do some amazing stuff with a unique and diverse range of urban trees.

#### What is the best job you have had in arboriculture?

My current role is the best job I have had. In terms of an experience during my work career, working for Asplundh in the early 1990s trimming trees on the Crown Range Road, South Island in an old imported F700 EPV. The truck had a massive V8, was a manual and was a beast to drive. There were a few hair-raising moments manoeuvring the truck and chipper around the switch-back sections of the road. Trimming trees in a lift bucket looking out over the Remarkables, and down on Arrowtown was a memorable experience.

#### What motivated you to volunteer for NZ Arb?

I felt it was time to step up, and help push our organisation forward to become an even more valued and recognised profession. I want to help the organisation raise the

bar for our own industry standards and encourage the adoption of good sustainable tree care practices countrywide. I would like to see NZ Arb look at developing a range of initiatives; in my experience it is easy to ask others, and then complain when nothing happens. So giving up my own time to push these forward for the organisation seemed like a logical solution.

#### What do you think is one of the biggest challenges facing arboriculture in New Zealand?

Biosecurity incursions impacting amenity and commercial tree populations.

The labour force is a significant issue and it is important that we all work hard to encourage career programmes that highlight the value of arboricultural and horticultural career paths. This needs to start in schools and colleges.

We need to find better ways to help reduce compliance costs for small business, and explore the development of tools within the organisation to help members.

Health and Safety assessment and tree risk management are very challenging and require specific training and this should be ongoing.

We as an industry need to look at better ways to share knowledge, and develop consistent approaches with the advice we offer our customers about tree inspection and care.

#### If you were a tree what tree would you be and why?

A pohutukawa; he gets to spend every day at the beach!



## Complementary Credentials Certification and Qualification; the best of both worlds

I am a qualified arborist, and so I should be. I have a 'Local' (WINTEC) certificate, which I gained 28 years ago, and the qualification is 28 years old. I have a National Certificate which I gained 15 years ago, and the qualification is 15 years old, and I have an ISA Certification, which I obtained 14 years ago, and that credential is two years old.

So, how can a credential that I gained 14 years ago be only two years old? I shall come to this, and I shall try and answer the big question: which is best?

But first, let's jump back 15 or 28 years (accepting that some of you may not be able to do the latter).

The local and national arborist certificates that I have were very good at the time that I gained them. They represented everything that was good about arboriculture, and I'm

an ISA Certification once it has expired. To retain the credential, certificants must meet requirements for renewal.

So would I have an ISA Certification over a local or national qualification – no, no I would not. But would I have a local or national qualification over an ISA Certification – no, no I would not. I think you need both (I doubt anyone really needs both a local and a national).

So which of the three qualifications is the best, local, national or [ISA] International? Well, qualifications and certifications are complementary and incomparable by definition. Content-wise, they may appear very similar; however, they have quite differing purposes.

Qualifications are awarded through training programmes as a result of achievement in

Next year I may lose my ISA Certified Arborist status unless I can document that I have kept my skills current. You keep your certification alive by gaining CEUs of your choice, or you can do nothing and re-sit the exam every three years – either way you need to keep your knowledge up to date to stay certified.

Continuing Education Units are not new or confined to the ISA – many industries and professions use a version of them to maintain professional status. The number of credits (CEUs) required depends upon the credential that you hold, and if you don't gain enough CEUs, your certification lapses and you can no longer say that you hold that credential. Because I attend conferences and participate in industry events, I have easily gained the 30 CEUs that I need to retain my ISA qualification over three years, and next year I will be able to renew it. If you don't or can't attend

## "So which of the three qualifications is the best, local, national or [ISA] International?"

sure if you took them now they would be everything that is good about arboriculture, now. But mine are 15 and 28 years old, things have changed, and what was considered good then maybe isn't considered quite so good now. Knowledge is a continuum.

My local and national qualifications were awarded for an achievement at a point in time. They are relevant today because it is assumed that I have remained in the industry and that I have kept my skills current. Conceivably, I could have walked away and not touched a tree since the day of my final exam, or worse... I could have been working in a bubble, practising and perfecting the skills that I was taught, while the entire arboriculture industry evolved around me. Those qualifications are done, dusted, and date-stamped, and I still hold them.

The ISA Certification which I first gained 14 years ago (that one that is only two years old), is also date-stamped, but it's dated differently. By definition a certification grants the use of a credential to individuals for a specific period of time. All ISA Certifications are valid for three years\*, therefore the oldest it can be is three years; after that the certification expires and you can no longer say that you hold the credential – the ISA police it quite heavily, so you don't want to say you hold

specific learning objectives. Certification recognises and validates an individual's knowledge and qualification in a certain subject through the acknowledgement of the educational achievement. Certification is voluntary and earned from a professional society. It must be renewed periodically, generally through completed continuing education units (CEUs).

My ISA Certification (the ISA Certified Arborist qualification) was probably the easiest of the three to obtain, but I've also had to maintain it for the past 14 years through completing CEUs. The two New Zealand qualifications were harder to achieve initially, but require nothing to maintain.

A New Zealand, local or national\*\* qualification documents a contextualised skill set, specifically for NZ; you should have one so getting one is a given. But those qualifications mark an achievement at a point in time; an ISA Certification not only marks continued achievement over a period of time but demonstrates dedication to a profession. For an employer an ISA Certification documents long-term commitment, where a local or national qualification documents an NZ skill set – they are best together.

conferences there are also online learning activities, and article quizzes that can be submitted to the ISA – it's really not hard to attain CEUs.

I like having my ISA Certified Arborist qualification, it complements my local and national qualifications. I don't see it as a case of which is best, but the best of both worlds.

For the record:

\* All ISA Certifications are valid for three (3) years, TRAQ is a qualification, which is valid for five (5) years from the date it is earned. The ISA is quite clear about the difference between certifications and qualifications.

\*\* Note things are soon to become very complicated for NZ employers. All new National qualifications will be called New Zealand Qualifications, and Local training institutions (WINTEC, MIT and Otago etc.) will offer New Zealand Qualifications, although they will offer their Local take on that qualification – so, you will have a New Zealand Qualification from WINTEC or a New Zealand Qualification from MIT or Otago. In the context of this piece of writing Local and/or, National Qualification means, the old National Certificate which was gained through an ITO, and Local, being a qualification gained at a Polytechnic or Technical Institute.

## Certification vs. Qualification

ISA Website for reference:

### What is a Certification?

A Certification is a voluntary program administered by a non-governmental organization. It grants the use of a credential to individuals for a specific period of time. The Certification is available to those who meet predetermined and standardized criteria for knowledge, skills, or competencies.

The knowledge needed to pass a Certification assessment is learned through self-study and experience. The assessment is conducted independent of a specific class, course, or other training program. To retain the credential, certificants must meet requirements for renewal.

- Key elements of a Certification program
- Focuses on a broad body of knowledge
- Administered independent of any education or training program
- Assessment is based on a body of knowledge rather than on specific learning outcomes
- Incorporates recertification requirements to maintain the credential, such as participation in continuing education

opportunities

- Prohibits trainers from assessing their own trainees
- Forbids release of exam questions to anyone teaching preparatory courses or developing preparatory material

### What is a Qualification?

A Qualification is awarded for achievement of a narrow body of knowledge with very specific learning objectives. This type of program often takes the form of a classroom learning experience followed by an assessment to determine if the desired learning goals and objectives for the training have been met.

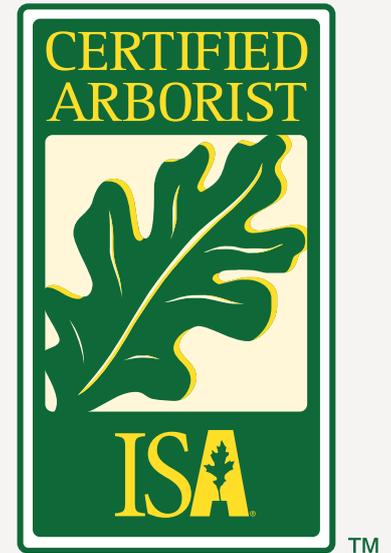
Qualifications have no recertification component. They are either valid for life or they require that the classroom learning experience and assessment be repeated for renewal.

### Key elements of a Qualifications program:

- Experience includes both instruction and assessment as part of the program
- Tests specific knowledge, skills, or competencies associated with learning outcomes
- Awards a Qualification only to those participants who meet the standards for performance, proficiency, or passing score
- Allows trainers to know and be familiar with the assessment questions
- Permits trainers to assess their own

trainees, depending on the requirements of a given program

- Requires credential holders to retrain and retest at the end of a set period of validity, unless qualification is determined to be valid for life



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## INDUSTRY NEWS



### Conference Trees - A Living Monument

In August Delta utility arborist trainee, Zane Unverferth, planted a number of trees as part of his training. The tree planting included two southern magnolia (*Magnolia grandiflora*), chosen to commemorate the New Zealand Arboricultural Association annual conference which will be held in Dunedin this November. "It has been over 25 years since the arb conference came to Dunedin" said the manager of Delta's utility tree service, David Glenn. The trees were planted as part of a collaboration between Delta and the Dunedin City Council.

To become a utility arborist, trainees must first become an arborist – "to effectively manage trees around utility lines you need to have an understanding of how they grow and how they will respond once pruned", says Peter Collingwood (*Delta tree services*). "It was a good opportunity to get Zane to complete some of his training, it's nice to work in with the DCC, and it's always a good day when you plant a tree."

The trees were planted in Littlebourne Park, just off Sligo Terrace, and it is hoped that they will serve as a living monument for years to come.





2017 quick-fire question round.



2017 tree ID test.

## New Arborist of the Year 2018 competition warms up

On 9 – 10 November this year, eight finalists representing the four tree-climbing regions of New Zealand will come together in Dunedin to compete for the prestigious title of New Arborist of the Year.

This is the fifth year of the competition and the process to select the 2018 finalists is already well under way. So far, more than 30 hopefuls have competed in the first three regional competitions, with just one more to go at the South Island regional event taking place over the 29th and 30th September at the Christchurch Botanic Gardens.

New Arborist of the Year coordinator Craig Lamb, said, "A high level of skill and knowledge was demonstrated throughout the 2018 regional comps. We've seen 30 competitors so far complete the Work Climb and a multi-choice theory test at regional climbing competitions in Auckland, Hamilton and Palmerston North. Just the two top competitors from each region will make it through to Dunedin to compete for national title."

Finalists so far include: Billy Paul and Te Riaki Hawira from the Wellington region; Ngatihau Kaihau and Kayne Prior from the Auckland region; and Joseph Newdick & Yoan Willman from the Waikato / Bay of Plenty region.

"Having witnessed these competitors in action I am really looking forward to the national competition and am expecting some big things from them," says Lamb

In Dunedin the finalists will meet five different tests that will challenge

their knowledge and skill. These include: a tree identification test of 30 species, a knot-tying test covering at least 17 knots including a practical application, a quick-fire 60 question round in front of a live audience, an aerial rescue, and a work site setup and analysis. An instructional component is incorporated with each so the competitors will have the opportunity to take away new knowledge to help them in their future careers.

On the quick-fire questions round, Lamb hints that a whole new series of questions have been developed that should test both competitors and spectators alike.

The 2018 New Arborist of the Year will be announced at the Conference & Awards Dinner on Saturday 10 November in Dunedin.

Lamb believes the New Arborist of the Year series is an excellent opportunity for new members of the industry to meet and network with the experienced ones. He says, "these competitors are the future of our industry so it's important that the industry gets behind the event and makes it an experience that they can all benefit from. Previous winners have gone on to compete at national and international levels, and others are doing great things in their workplaces and in the industry."

The New Arborist of the Year series is sponsored by committed supporters of the series and future of our industry, Hansa Chippers and Treehub. NZ Arb Major Tree Climbing sponsor, Husqvarna, support the competition with some awesome prizes.

Four of the five previous new winners at this year's Waikato competition



2017 winner Joshua Talsma during the aerial rescue.



## Waikato and Bay of Plenty TCC 2018

After an extremely wet set-up day, fortunately Saturday 26th of May dawned clear on the eastern shore of Lake Rotoroa (Hamilton Lake) – the same area but different trees to last year. Approximately 35 competitors took part with the assistance of almost as many volunteers.

New this year was the ascent event which challenged a few that hadn't had the time or the inclination to practice prior to the competition. Speed climb was in a large maroccarpa that proved a little slippery early in the day. Rescue took place in a spreading oak. Throwline was shared between two liquidambar and the work-climb was in a rather branchy oak that needed to be climbed rather than "jumped around".

Once again all climbers and technical volunteers worked (played) with professionalism and enthusiasm for the event. Everyone was safe and took their roles seriously. The team spirit of the event once again brought everyone together and the experienced helped the inexperienced where they could. It was great to see so many supporters, public and kids enjoying the show.



### Top 5 Standings were

Name	Score
Noel Galloway	159.98
Jeremy Millar	155.02
Zane Wedding	145.83
Sam Smith	138.73
Troy Sircombe	132.55

### Silky Saws Aerial Rescue

Position	Name	Score
1st	Zane Wedding	48.00
2nd	Jeremy Millar	47.00
3rd	Noel Galloway	44.00
4th	Stef Dryfhout	40.50

### AB Equipment Belayed Speed Climb

Position	Name	Score
1st	Jeremy Millar	26.17
2nd	Noel Galloway	28.19
3rd	Seb Bainbridge	29.80
4th	Dane Swney	31.35

### Ascent Events

Position	Name	Time (sec)
1st	Troy Sircombe	11.24
2nd	Jeremy Millar	14.76
3rd	Noel Galloway	14.94

### MetroGreen Throwline

Position	Name	Score
1st	Zane Wedding	23
2nd	Noel Galloway	17
3rd	Christopher Chegwin	15
4th	Troy Sircombe	14

### KASK Workclimb

Position	Name	Score
1st	Jeremy Millar	63.78
2nd	Sam Turner	63.37
3rd	Noel Galloway	62.83
4th	Seb Bainbridge	62.49

### New Aborist of the Year, Waikato/BoP regional qualifiers

Name
Joseph Newdick
Yoan Willman



## ISA International Conference, Columbus, Ohio

Following a hugely successful ITCC in Franklin Park Botanical Gardens, where team Kiwi once again did us proud-- well done to all of you, and Jimmy for retaining his world title-- the focus turned to the Greater Columbus Convention Centre. On Sunday evening all of the conference delegates and ITCC climbers and volunteers gathered together for the opening ceremony which included the announcement of the ITCC Masters' Challenge competition winner and Awards of Distinction presented to members of the society for everything from contributions to practical arboriculture through to research projects.

With the formal part of the evening over, all moved to the Trade Show floor for drinks, light refreshments and a chance to view some of the latest machinery, tree-climbing equipment including the latest bling for your harness, and a chance to chat with the people you haven't seen for a year.

Monday morning started with a welcome from ISA President Paul Reis and the local ISA chapter. Keynote speakers followed (including Mark Bays speaking on the Oklahoma City survivor tree) along with the general education sessions. On the trade show floor at the Climbers' Corner Phillip Kelley presented an entertaining look at the evolution of arboriculture over the last 25 years. Phillip is scheduled to be at our conference in 2019, and if what I heard was anything to go by we will be entertained.

The general educational sessions included subjects such as Utility, Municipal, Research, and Commercial Tree Care. They were presented

by knowledgeable experts and in symposiums. It was not hard to find something of interest. The climbers' corner had talks on a wide range of practical arboriculture from chainsaws, presented by Husqvarna staff, to working around utility lines and being asked the question – Am I qualified for this? It seems we here in NZ have the same issues and interests as the wider global industry.

There were plenty of opportunities to network with friends, vendor representatives, and browse the ISA bookstore on the trade show floor.

Wednesday saw several tours head out for the day, a highlight for some, although rumour has it the visit to the brewery was dropped from the Society of Commercial Arboriculture (SCA) tour, leaving a few punters a bit parched.

Some conference delegates spent the afternoon, including the author, meeting together to be part of The Council of Representatives (CoR). This group has representation from all ISA chapters, Professional Affiliates, and Associate Organisations. It exists to be a voice for the ISA from members to the board of directors, among other things. Many other groups had meetings as part of the conference e.g. Credentialing Council, Women in Arboriculture, ITCC, etc.

Once again the ISA conference and trade show, and all its associated activities provided a forum, learning opportunities, and times to meet like-minded tree people from all over the globe. Tip for the month – Plan to be in Knoxville, Tennessee on 11 – 14 August, 2019.





# ITCC 2018 Colombus Ohio

By Scott Forrest

As we arrived later in the evening on Monday, the warm air of Columbus Ohio hit us as soon as Stef and I walked out of the intense air-conditioning of the airport terminal. I was able to stuff my long sleeve merino top and wool beanie into the bottom of my bag until my return journey to NZ a week later.

In-between that time we stayed in a big house organised by a few of the climbers, which fit 15 of us from NZ, Australia and Germany, all under one roof!

Tuesday brought fine weather and after a slow morning it was a good opportunity to climb a few trees. Craig had scouted out a few decent trees next to the University about ten minutes drive away, Talia was kind enough to ferry us there in two trips and the climbers had at it. Fortunately the trees were out of view of the general public, people in the USA can be quite passionate about their trees and have been known to kick up a fuss if they see people climbing in a public space.

Having a few days to settle in before the comp gives the climbers a chance to make sure all of their gear is operating as it should, to work out any issues and to make small changes if necessary. The event walk-through started after the climber registration on Thursday at the 88 acre Franklin Park. The trees selected for the events were in close proximity to the Franklin Conservatory, which was originally built in 1895.

The aerial rescue took place in a medium size *Platanus* (American sycamore), and the injured climber (dummy) was wedged, with legs straddling both sides of the lowest branch union. The scenario was that the person was unresponsive and had landed in that position after an uncontrolled swing caused by a branch that broke off while being stood on.

The Speed climb took place in a large *Acer*, it was a tricky climb with wooden holds installed on the trunk with tie down straps. The transition from these holds into the canopy caught a few people out, as did a tricky section through the middle of the climb.

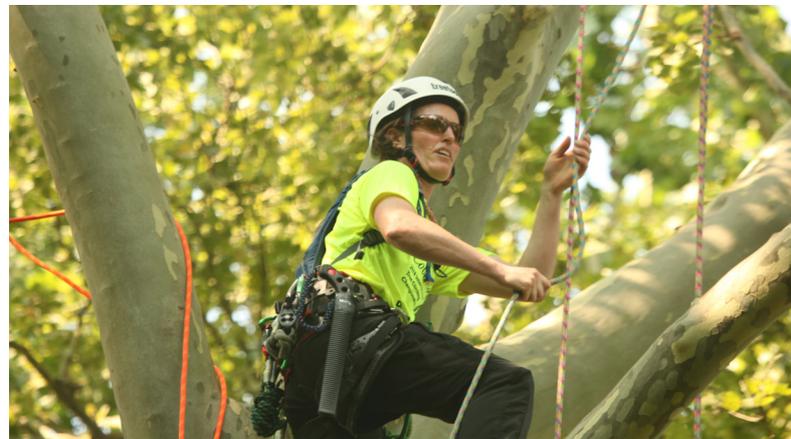
A large *Quercus* with a high canopy was the home of the Work climb. It had the possibility of a couple of good swings and quite a challenging limb walk station. This tree was easy to underestimate from the ground; this would push many competitors to their limits to complete the climb in the allocated five minutes.

The Ascent event was in another *Quercus*. There was some discussion about the event (once again) but everyone had a clearer understanding of the terminology after a few words from the head judges. The Throwline was staged in a group of *Catalpa*, the tallest and biggest that I have ever seen. As always, some easy throws and some tricky ones, which had potential to separate the field.

The preliminary rounds were split over two days due to the large number of competitors this year; 75 in total with 26 of those female, which is awesome! The gear check was Friday morning and the events started after lunch. Each group would compete in two events and have two breaks depending on their rotation. All was going well until a freak thunder and lightning storm rolled over and quite literally put a damper on things. It was decided that the events for that day would not continue as it would not be fair on some of the groups to climb wet trees after others climbed them dry.

Saturday was a beautiful calm day and the remainder of the prelims went off without any issues. Some climbers had luck on their side and some climbers didn't. The Prelims award ceremony was held at the park and the Kiwis had some great results. James K, Craig W and Chrissy S, in that order had the three fastest times in the work climb OVERALL.

Chrissy finished the day 1st in the prelims and Stef placed 15th, well



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done to both. James was 1st and Craig 2nd in the prelims. What a fantastic effort, best climbers in the prelims overall, and the first chapter ever to have three people through to the Masters Challenge, an outstanding effort.

Sunday was another cracker of a day and the Masters was set up in a Large *Platanus* with an open, spreading canopy. Chrissy was the first kiwi to climb and she was able to complete four stations and reach the ground but timed out with gear still in the tree.

James was the next climber and completed all of the stations and retrieved all his gear within the allocated time limit. Craig came out next and had a solid climb completing the four stations, reached the ground and was able to get most of his gear out, unfortunately his pulley saver stayed up in the canopy.

It was a long day of spectating and cheering on all of the Masters competitors, and then we all had to wait several more hours to find out who the winners would be. The Masters awards were held at the Greater Columbus Convention Centre Sunday evening.

In the end Chrissy placed 2nd to Krista, Josephine 3rd and Marilou 4th. James K was successful at gaining a World championship title for the 3rd consecutive year. Jeff 2nd, Johan 3rd, Michael 4th and Craig 5th. It was a privilege to be there and witness all of the amazing climbing from the Kiwi team during the ITCC long weekend. I'm extremely proud of the four of them and I would recommend to all of you to attend the event in the future.





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## ALFA's Story

Arboriculture, Land and Forestry Associates - ALFA has been established since 2011 in New Zealand.

When Asher arrived in New Zealand from Scotland to set up his arborist business he brought with him his wood chipper from the UK. This was the first Jensen Wood Chipper to enter the Land of the Long White Cloud. Asher was surprised that this brand was not already established in the Southern Hemisphere and after communicating with the family-owned German manufacturer Jensen ALFA managed to secure the distribution and dealership rights to the Southern Hemisphere for these machines.

Asher feels using the machines daily in his own arboriculture business has helped him immensely. Not only does he trust the product he knows it inside out, "You do not have to be mechanically minded to understand the workings of the Jensen Wood chipper – It has some pretty unique features and the German engineering makes it versatile with high output, but simple to work on".

"Down time is a big loss for any business and we have found this to be at a minimum with the fleet of Jensens we now have"

Ash and Oak Arborists Ltd is Asher's own arboriculture business based just outside Whakatane and he feels he is making a difference with local authorities and the public about the benefits of retaining and managing trees where possible rather than taking the easy option of removal if it's not necessary.

"It is a constant challenge educating the public and municipals to consider retaining rather than removing a tree. Obviously, there are some exceptions but overall the plusses of retaining far outweigh the minuses of removal."

Ash and Oak Arborists Ltd run an informative ad headed "We need our Trees" in the editorial part of the local paper every two weeks

promoting the benefits of trees in and around the towns, cities, schools and the wider rural areas as a way of educating and hopefully making people think before they have a tree cut down.

We also have A-frame boards up on the streets in Whakatane outside cafes with researched facts, figures and statistics around the benefits of urban forests along with educational brochures and posters for schools and medical centres.

This is not aimed at advertising a service but rather promoting the benefits of trees and the arb industry on the whole as the country leader in sensible management of the urban forests nationally.

This leads on to why ALFA was originally established, ALFA stands for – Arboriculture, Land, Forestry Associates – Like-minded people working together.

ALFA is not just about selling wood chippers. The bigger picture is that we are privileged to be in a position to sell a high quality, versatile and reputable product that is used widely around the globe in the arb industry.

Asher's goal is that ALFA can become sustainable long term, and can give back to the industry a percentage of the revenue from sales that will then help to fund education and research around the environmental, social, mental health, and economic benefits that trees provide as our urban forests.

Ash and Oaks newspaper ads is just a small example of what we do locally which has already had a positive effect in our small area.

This small example can be promoted and pushed into the wider public view nationally with the right backing.

We are working in the industry for the industry, selling to the industry and then giving back.





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## CONFERENCE WORKSHOPS ANNOUNCED

*“Ed Gilman is such a dynamic and engaging speaker. We feel very lucky to have use of his time for the NZ Arb Conference for 2018. Out of all of the Conferences I have been to, the one day that I have spared listening to Ed talk and impart his expert advice about formative tree pruning was by far the most memorable. It was great to listen to someone talk so informatively and passionately about a subject that I wanted to hear about! The material truly resonated with me and is sure to engage our Dunedin audience!”*

Testimonial 17/07/2018

David James – David James Tree Services and NZ Arb Committee Member

Don't miss out! Limited Spaces! Register online - [www.nzarbconference.co.nz](http://www.nzarbconference.co.nz)

### BRANCH ARCHITECTURE AND STRUCTURE ON PLANTED TREES: PRUNING TO RESIST FAILURE

by Ed Gilman

Saturday 10th November 9:00am - 10:30am  
Main House, Dunedin Botanical Gardens  
12 Opoho Road, North Dunedin.  
\$100 + GST or \$175 + GST for both workshops

*“Our profession is changing; are you on top of your game now and can you deliver the latest strategies designed to provide the most professional care package? Whether it's a tree with a one-inch trunk diameter or four-foot diameter, the strategies are similar.” – Ed Gilman.*

### ANCIENT TREES AND BRITS - A LAYMAN'S THOUGHTS ON ARBORICULTURE TODAY

by Ted Green

Saturday 10th November 11:00am - 12:30pm  
Main House, Dunedin Botanical Gardens  
12 Opoho Road, North Dunedin.  
\$100 + GST or \$175 + GST for both workshops

This workshop will question what you thought you knew about trees. *“I think we have arrived at a point where it's impossible to say at this moment in time what Fungi, Bacteria or other micro-organism communities are actually doing in a tree. A tree is merely an individual, unique, dynamic support system for these communities occupying a tree.” – Ted Green.*

[www.nzarbconference.co.nz](http://www.nzarbconference.co.nz)

# NZ ARBORICULTURE

Where now?  
Five minutes with...

## Scott Geddes

### New Arborist of the Year winner 2014

Four years ago, in Rotorua, a young Scott Geddes took out the NZ Arb New Arborist of the Year title. Since then Geddes hasn't looked back with a career that has taken him to the other side of the world and back. In addition to this, his passion and aptitude for competitive tree climbing has seen him become an increasingly familiar face on the competition circuit, including representing NZ at the Asia/ Pacific Tree Climbing Competition and competing in the Red Bull Branched Out tree climbing competition in Australia in 2017.

We asked Scott a bit about what he has been up to since.



**In 2014 you were named the NZ Arb New Arborist of the Year (NAOTY). What a wonderful title to take out in your chosen industry. Tell us where are you these days and what are you up to?**

Now four years on, I have worked in most areas of on-the-tools arb work- from council tree maintenance, to land clearing, finally ending up on the residential division at Treescape® in Auckland. For me, I have pretty much made it to my dream position- I get to do a lot of technical removal and pruning work in my day-to-day, involving tight spaces and complex rigging, while also getting to take part in higher profile jobs such as crane and helicopter work. I still do my fair share of hedges, long drags, and fiddly reductions in the pouring rain, but the positive attitude and work ethic of the team I work with always makes for a great work environment.

**We'd love to hear what you remember most about your NAOTY experience.**

My most memorable experience was accepting the award at the conference dinner. I was 19, nervously stood before all of the pillars of the arb community, the climbing heroes, the company owners and so on. My name was announced and everyone erupted. However, when the clapping died down I heard a voice yell out "SPEECH!", as I was about to leave the stage. Totally unprepared and caught completely off guard I had to make up a speech, desperately trying to thank everybody who I could think of on the spot, make a joke and close off before I started babbling. I returned to my seat buzzing, with beers and handshakes and job offers thrust at me from all directions. I felt like that was the moment where I really joined the arb community.

**What has been the highlight, of your career so far, aside from winning this title?**

The highlight of my career was living and working in Norway for 7 seven months in 2016. it was a job I was put onto through a friend, and I was hired on nothing more than his recommendation. I met a whole group of amazing tree climbers, all international, who between them had some of the most amazing techniques and advice you could hope to see. I made so many great friends, and came out of it with so many more skills. It was like half a year of intensive training, working in one of the most beautiful places I've ever seen. I saw a different view of tree work, how they fought so hard to preserve and protect the trees they had. I also learned how to live and work in the snow. It is, and always will be, one of the best things I have ever done, and it was made possible by my choice in career.



**Tell us what inspired you to pursue a career in arboriculture in the first place?**

Originally I wanted to study as an engineer, and chose high school subjects accordingly. However, I had a family friend who was a big part of the industry decades ago, who persuaded me to buy a chainsaw and earn some money on the weekends. He taught me how to use his ancient climbing harness, three-strand rope, and spliced Prussik loop. I took to it immediately, and loved the climbing aspect of it.

**Where did you do your training?**

I did most of my training on site at Treescape® in Auckland., However, my actual qualification was done through Wintec in Hamilton via block courses. Having both of these resources meant I was never left with unanswered questions.

**What keeps you motivated in your work?**

This is an interesting question for me. For a long time I didn't have nearly as much motivation as I should have. When I became a crew foreman, and learned more about the planning and management side of things, I started to learn to hustle, to be efficient and to stay later to finish jobs. Things can feel unfair sometimes, like you're over-worked and under-appreciated. However I found that the harder I worked and the more effort I gave, the better things got for me. I took more pride in my work, and my managers and the crews I worked with started to respect me. So in short, what keeps me motivated in work is to be the best arborist I can be, and seeing the positivity that the effort brings out.

**What do you do to relax outside of arboriculture?**

My hobbies include 4x4 off-roading, camping and milling timber. However, my favourite way to relax is to play Xbox for hours on end.

**Any big plans for arboriculture in the future?**

I would like to continue to study and gain a diploma in arboriculture. However, at this stage I have no plans for what I would use it for. I have no doubt that a new opportunity will present itself further down the track, as this industry always seems to do.

**What role models have inspired you greatly, if any, in arboriculture? And why?**

I have had a lot of great role models since I started. I think the best and most inspiring ones are those who have spent so much time teaching 'the right way', teaching professionalism and actively trying to promote and improve our industry as a whole. We are a relatively young industry in New Zealand, and we need to show that we are a professional trade, and that we can offer a respectable and promising career path.

**And finally, what advice would you give to any aspiring future arborists or NAOTY competitors?**

My advice would be to experience as many parts of arboriculture as you can, find out where you like best, and aim to get there. There are many different types of work within the industry; some you will like, many you will not. In order to get the job you want, you have to be good at the one you've got. So if you start

on a rake, rake until your abs look chiseled. If you drag, drag for longer and better than anyone else. In my experience, the more you give, the more you get back. If the company you work for does not do this, find someone else- it's a climbers market.





## Pioneer sows the seeds for New Zealand arboriculture training at Wintec

He pruned trees before chainsaws were widely used, played rugby against Italy and even dropped tree paint in Lord Jonathan Guinness' eye, but the memory Martin Herbert is most fond of is his role helping to grow arboriculture education in New Zealand.

Martin launched New Zealand's first arboriculture course at Waikato Polytechnic (now Wintec) in 1988, laying the foundation for what has become a thriving and increasingly respected profession.

"I remember those first few days very well, figuring out what we should include," he says. "We ended up starting with a 20-week course. We got about 15 students for the first intake, mostly older guys, some with forestry backgrounds and some who were working for councils doing gardening."

tree on the Luggala Estate in Dublin.

A top-level rugby flanker for Sussex, he even played an international match against Italy, with his team winning 26-10. He also played for Rugby, where, legend has it, William Webb Ellis picked up the ball and ran with it.

It was after all of this that Martin decided to make the move to New Zealand to take on a new challenge, in 1979.

"I had kept in touch with a Kiwi called Ian Crossman, and he convinced me to move to Auckland to 'sort out' the New Zealand arboriculture industry. He said he had started an arboriculture business with Alan Parker, but when I arrived, he was growing strawberries. They weren't doing very well at all, so we started an arboriculture business called The Shady Tree Company."

The business did well, and they made regular appearances on the TV series Dig This (1975-1986), where they provided helpful advice to New Zealanders about pruning, tree climbing, and tree care. They landed contracts in the Nelson area after a Parks and Recreation Conference in 1981 and went on to work in Tauranga and New Plymouth as their skill in pruning trees using harnesses, rather than the older method of ladders, began to be noticed.

In 1988 Martin really left his mark on New Zealand arboriculture. He had just returned to New Zealand with his family after a stint in Canada when he was approached by Waikato Polytechnic senior tutor Ian Gear and asked if he would establish an arboriculture course. He had gained some teaching experience in Canada working for Camosun College in Victoria, so he drew on this and his time in

*"Arboriculture has a good future if we continue to change, particularly in the sphere of consultancy."*

The Hamilton-based course sowed the seeds for New Zealand arboriculture training, which is now offered through NZQA-approved programmes at three educational institutions and via the Primary Industry Training Organisation (ITO) which uses a range of private training providers.

Martin first got into arboriculture in Sussex in 1971, at the age of 20, when he saw a job in the local newspaper for a company called Southern Tree Surgeons.

"I thought this is about trees and the environment – things I believe in. It involved climbing and all that physical stuff I enjoyed, and I did very well at it."

At that time in the United Kingdom, tree management was in its infancy, and people were free climbing without harnesses, using handsaws instead of chainsaws, and carrying paint pots wherever they went to paint tree limbs that were pruned (as per British Standard 3998:1966).

He was promoted to foreman, studied at Merrist Wood College in Surrey, and then worked in various arboriculture roles throughout Europe, including in Germany, Denmark and Belgium. He has some colourful stories to tell from his time in the UK and Europe, including, while pruning a tree near the Berlin Wall in 1978, setting off observation post alarms and being surrounded by police and guard dogs and dropping tree paint in Lord Jonathan Guinness's eye while pruning a



Martin Herbert laid the foundation for New Zealand arboriculture education at Wintec.

the industry to develop a curriculum with the help of Treescape® founder Eddie Chignell and Doug Rowe from Hamilton City Council.

Martin says the curriculum was influenced by his time at Merrist Wood College in the UK and the works of United States biologist and forester Dr Alex Shigo, whom he calls “the real father of modern arboriculture.” However, the curriculum had to be adapted for the New Zealand environment, which has more diversity of trees than the UK.

“Getting equipment was hard in the early days because it all had to be brought in from overseas. We had no health and safety policy either, so we had to make our own safety standards from scratch.”

He continued tutoring at Waikato Polytechnic, which later became Wintec, for 22 years, before working for Treescape® for six years. After that, it was back to tutoring with the Primary ITO and Wintec, which he continues to this day, teaching students at NZ Qualifications Framework levels 3-6 in Auckland, Hamilton, Northland and New Plymouth.

Martin says the New Zealand industry has undergone dramatic changes over the past few decades, including improvements in health and safety, the introduction of nationally recognised qualifications, and the establishment of the New Zealand Arboriculture Association, of which he was one of the inaugural chairs.

He sees a bright future for the industry but acknowledges that it will need to continue to evolve.

“Global warming is now widely accepted, and arborists are playing a greater role in providing advice on how to maximise the amount of carbon dioxide that trees convert.”

“The changing climate is also leading to more plant diseases, such as myrtle rust and kauri dieback, and arborists are central to mitigating their damage and preventing their spread. Increasingly, arborists are being asked to advise on biosecurity issues, which speaks to a growing awareness of the value the profession provides.”

Other changes arborists will need to deal with in the future include the growing use of helicopters and cranes in tree care and removal, and continued scientific and technological progress. While robotics may one day be used in the industry, Martin says it's unlikely to be imminent because of the challenges of operating in trees high off the ground.

“It would take a lot of investment and right now I can't see any robots being able to do what an arborist does. I think a more immediate change will be a move away from petrol chainsaws – there are more and more electric chainsaws offering good power-to-weight ratios and good battery life. They are environmentally friendly and have a switch instead of a starter cord, which makes them safer.”

The lack of skilled labour is another major challenge, both at entry level and also at management and consultancy level. Addressing that will take education and a willingness from those in the industry to play a leadership role, he says.

“Arboriculture has a good future if we continue to change, particularly in the sphere of consultancy. Working as a consultant means only about 30-40 per cent of the job is pure arboriculture – you now need good IT skills as well as an understanding of GIS technology, council systems, statutory law and consent processes.”

These days, Martin's tutoring is more part-time, though he remains just as passionate about the industry. His home, nestled among the trees in Auckland's Waitakere Ranges, is in a fitting location for a man dubbed “the father of New Zealand arboriculture” by many of his peers.

“I just can't stop working”, he says. “If you can share what you know with others and it's going to help their knowledge and their future, it's great. I get a real kick out of it.”

Find out more about studying arboriculture at [www.wintec.ac.nz](http://www.wintec.ac.nz)

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## Yesterday Comes Tomorrow: Marcescence and The Case for Routine Phenology

With Spring upon us, one might question the wisdom of a case study involving foliar abscission, or yet another article involving London planes! The answer lies in a comment made to (Crime) SceneNZ concerning the unexplained condition of several London planes, which retained desiccated leaves through winter (refer photograph 1) and, significantly, had been subject to works within their root zones. There was concern that the failure to abscise may have been associated with a loss of conductance and, potentially, premature death of the separation layer due to root loss and/or damage as opposed to marcescence.

Many of Auckland's historic suburbs are characterised by mature street trees. Urban intensification and infrastructure renewal of these suburbs demand the establishment of objective physiological baselines in order to assess and manage the effects of works prior to commencement. This includes the documentation of phenological stages or the timing of seasonal events which may later provide an early indication of plant stress.

### The Scene

The case at hand concerns the renewal of underground services and streetscape works within/beneath a continuous avenue of historic lapsed pollard London plane street trees by combination of traditional and trenchless technologies. The works have been challenging due to the nature and extent of rooting encountered, including large diameter roots at depths >4m.

In Winter 2018, it was observed that a number of the trees had retained desiccated leaves. Due to this observation, the decision was taken to investigate in order to account for the phenomenon.

### Abscission: The Essentials

Abscission involves the separation of a plant organ along a defined 'abscission zone'. The zone is characterised by specialised bands of cells forming separation and protection layers (Beck, 2010). Following the initiation of abscission, hydrolytic enzymes dissolve the middle lamella between cells enabling the specialised bands to enlarge and separation to occur.

The initiation of abscission is thought to involve one or more environmental factors, including pathogens, water stress, photoperiod and/or temperature.

The mechanisms regulating abscission are not fully understood, but are considered to be a function of environmental factors and the antagonism between hormones and growth regulators, including auxin and ethylene. Currently, it is considered that the formation of the abscission zone is preceded by an auxin maxima promoting the positional proliferation of specialised cells during organ development. As auxin levels decrease, differentiation of the abscission zone is thought to occur. With diminishing auxin levels, the inhibitory effect on ethylene is reduced such that expression is thought to be given to hydrolytic polygalacturonases and cellulases associated with the dissolution of the middle lamella allowing for cellular expansion of the separation layer (Jin, et al. 2015, Patharkar et. al. 2016(a) 2018(b)).

### So...What is Marcescence?

Marcescence is a term used to describe the temporary arrested development of the separation layer during dormancy, which is then completed in Spring (Rinne et al., 1992). Importantly, although the leaves appear withered (refer photograph 2), the abscission zone remains alive through dormancy.



Photograph 1: Retained leaves, considered consistent with marcescence.



Photograph 2: Desiccated leaves associated with arrested development of the abscission zone consistent with marcescence.



### Not All Leaves Are Equal

Research indicates that the position and aspect of leaves within the crown has a significant influence on marcescence. Leaves subject to a reduced photoperiod resulting from their position tend to senesce earlier in comparison to high photoperiod leaves which maintain increased chlorophyll content and functionality promoting increased assimilation and, importantly, a tendency toward marcescence. Artificial lighting promotes similar marcescent behaviour.

Leaf retention is considered to result from increased lignification associated with high photoperiod leaves which delays hydrolytic enzymatic activity.

### Assessment and Discussion

A visual assessment of thirteen trees which retained withered leaves was undertaken to determine potential correlations based on documented works within the root zone, aspect, anticipated photoperiodicity and/or proximity to artificial light sources. With the exception of three trees, the retention of leaves was consistent with patterns of marcescence outlined previously.

Samples were collected from those trees in respect of which retention could not otherwise be explained. Samples were also obtained from a control tree, unaffected by the works. Microscopic analysis of petioles from affected trees identified that abscission was largely complete (refer micrograph 1), but that bud size and development was reduced in comparison to the control tree (refer photograph 3).

Comparative IKI analysis of branches collected from the control tree and those subject to leaf retention did not identify any observable difference in starch content, indicating that affected trees had sufficient starch reserves to sustain leaf development.

As the availability of moisture is necessary for cellular enlargement (bud size) and tension differentials during abscission, impaired conductance during bud set and maturation cannot be discounted. For this reason, those trees displaying atypical retention patterns will be closely monitored during leaf extension and during Summer for early signs of water stress and, again in Autumn to determine whether the phenomena is a characteristic unique to individual trees or potentially a result of root disturbance.

### Treatment and Response

The investigation highlighted the importance of establishing objective baselines prior to the commencement of works within the root zone of trees, including the maintenance of phenological records which assist in the early detection and management of plant stress.

As a result of the investigation, additional measures have been implemented to ensure sufficient plant-available water exists during periods of irregular rainfall, including the substitution of traditional backfill for a structural soil utilising the soil conditioner and moisture aid TerraCottem Arbor to assist with soil moisture management and root re-establishment.

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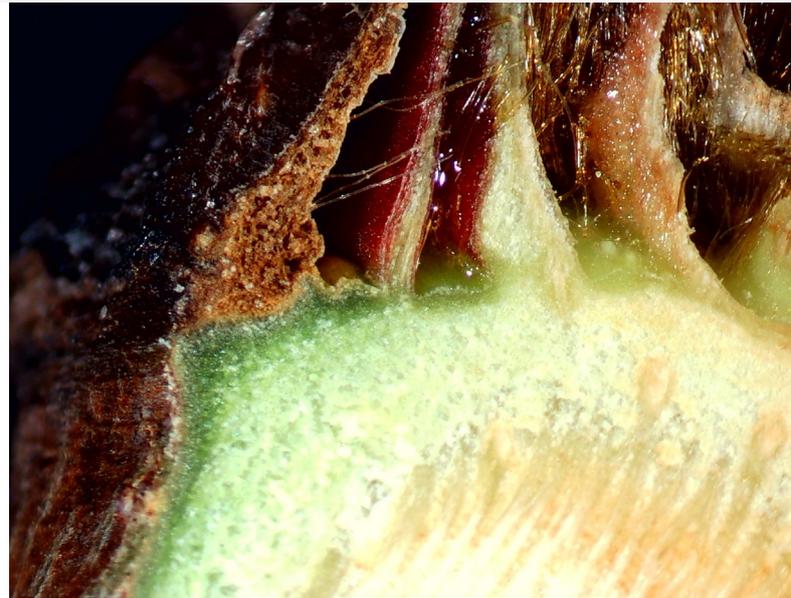
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Micrograph: 1: Suberised protection layer associated with the petiole abscission zone (left) characterised by densely packed cells (also evident in the bud scale) from an affected London plane (cortical chlorenchyma visible).



Photograph 3: Bud scale associated from an unaffected control London plane (left), with the affected bud following removal of the petiole (right).

Micrograph: 2: Axial cross section of lateral bud from an affected London plane.



# SPECIES PROFILE

## Tree Species Profile No.2 Phyllocladus toatoa & Phyllocladus trichomanoides

Compiled by Craig Webb, Consultant Arborist  
Contact: craig@cwca.co.nz



### NOMENCLATURE:

*Phyllocladus toatoa* Molloy (Podocarpaceae), formerly *P. glaucus*  
*Phyllocladus trichomanoides* D.Don (Podocarpaceae)  
Common names include: toatoa, blue celery pine (*P. toatoa*); tanekaha, celery pine (*P. trichomanoides*)  
The genus *Phyllocladus* is sometimes classified into its own family, Phyllocladaceae.

### ETYMOLOGY:

Phyllocladus: leaf branch, referring to the leaf-like stems  
trichomanoides: fern like  
glaucus: bluish-grey  
toatoa: from the Maori name

### DISTRIBUTION:

Both species are endemic to New Zealand.  
*Phyllocladus toatoa* can be found in lowlands and montane forests up to 600m in the central North Island and northwards of the 39° S parallel.  
*Phyllocladus trichomanoides* naturally occurs from sea level to about 1,000m in the North and South Island. It is widespread from Te Pahi in Northland to northern Manawatu and less frequent elsewhere in the North Island. In the South Island the natural range is confined to Marlborough Sounds, western Nelson and Kahurangi National Park.



Figure 1 - Distribution map of tanekaha

### HABITAT:

Toatoa is generally associated with relatively infertile soils on exposed ridges, around bog margins, and on other poorly drained land. Tanekaha is common in secondary regrowth forest overlying poorly draining and/or infertile soils. It can be very common in regenerating fire-induced gumland scrub. Extensive tanekaha-dominant forests occur in northern Taupo, King Country, Atimuri area on imbricent rock-derived soils.

### ASSOCIATED SPECIES:

Tanekaha is often found growing in association with kauri (*Agathis australis*) and it often regenerates in the shelter of manuka (*Leptospermum scoparium*) and kanuka (*Kunzea robusta*) scrub. Toatoa also regenerates where manuka and kanuka are present.

### DESCRIPTION:

Tanekaha is a medium-sized, narrow-pyramidal forest tree growing to 20m in height and 1m trunk diameter. Slender, horizontal branches arising in whorls. Tanekaha shed their lower branches, producing smooth straight trunks.  
Toatoa is a small, conical or bushy tree that may grow to 15m in height and 600mm in diameter at maturity. Toatoa has distinctly whorled branches with upward growing habit.

### CHARACTERISTICS:

Both species produce flattened stems that resemble leaves, called phylloclades. True leaves resemble small scales at the base of each phylloclade, though these soon turn brown, are deciduous and provide very little photosynthetic function.  
The wedge-shaped phylloclades of Toatoa are larger, thicker and more leathery than those of tanekaha. The phylloclades are blue-green when young.  
Toatoa may be dioecious or monoecious. Tanekaha is usually monoecious, with sexes separately on the tree. Male cones are borne in terminal clusters at the end of rachis on branch tips. Female cones replace phylloclades on either side of the rachis.  
Toatoa bears small cones containing 3-4 seeds that are surrounded by a fleshy white aril. Mature seeds are dispersed from the cone when swelling of the cone bracts ejects the seeds to the ground, resulting in many seeds landing on the ground under female trees.  
The seed cones of tanekaha are small, purple and berry-like, with a fleshy white aril surrounding but not fully enclosing a single seed.

Photos: University of Auckland



## PESTS AND PROBLEMS:

No significant pests.

Auckland University research suggests kauri dieback disease (*Phytophthora agathidicida*) may also threaten tanekaha trees.

## AMENITY USES:

The upright, tall, pyramid habit of tanekaha makes it an excellent specimen tree for small gardens, or for planting in groups.

## WOOD PROPERTIES:

The wood of *P. toatoa* is nearly white, straight grained and strong. It was used for furniture, but being rare it is now protected from commercial exploitation.

Tanekaha is sought after for its strength. Its wood is the strongest and most flexible of the native conifers. Its branches are very supple and do not break if bent over, making the wood ideal for any function involving bending. It is a good stable wood for carving, even when freshly cut. Knot-free timber comes from the trees' habit of shedding of lower branches.

## CULTIVATION:

*P. trichomanoides* is easily grown from fresh seed. Seedlings transplant well and this species is common in cultivation. It is often grown as a specimen tree in parks and does well in urban areas on street side verges.

*P. toatoa* is difficult to propagate and relatively slow growing and is of very limited availability commercially. Young plants of both species do better when planted in less exposed sites with partial shade.

## OTHER FACTS:

The common name of celery pine comes from the resemblance of the phylloides to celery leaves.

The bark of tanekaha is rich in tannin, from which Maori extracted a red dye. In the late 19th century tanekaha bark was exported in large quantities to Germany as a source of red and pink dyes. The dye was used in World War One to make the soldiers' khaki coloured uniforms. The tannic acid of the bark was a valuable astringent in treating dysentery and liver disorders.

Other *Phyllocladus* species exist in Tasmania (*P. aspleniifolius*) and New Guinea, Borneo and the Philippines (*P. hypophyllus*). One other species, the mountain toatoa (*P. alpinus*) is native to New Zealand. This is often referred to as a variety of either *P. trichomanoides* or *P. aspleniifolius*.

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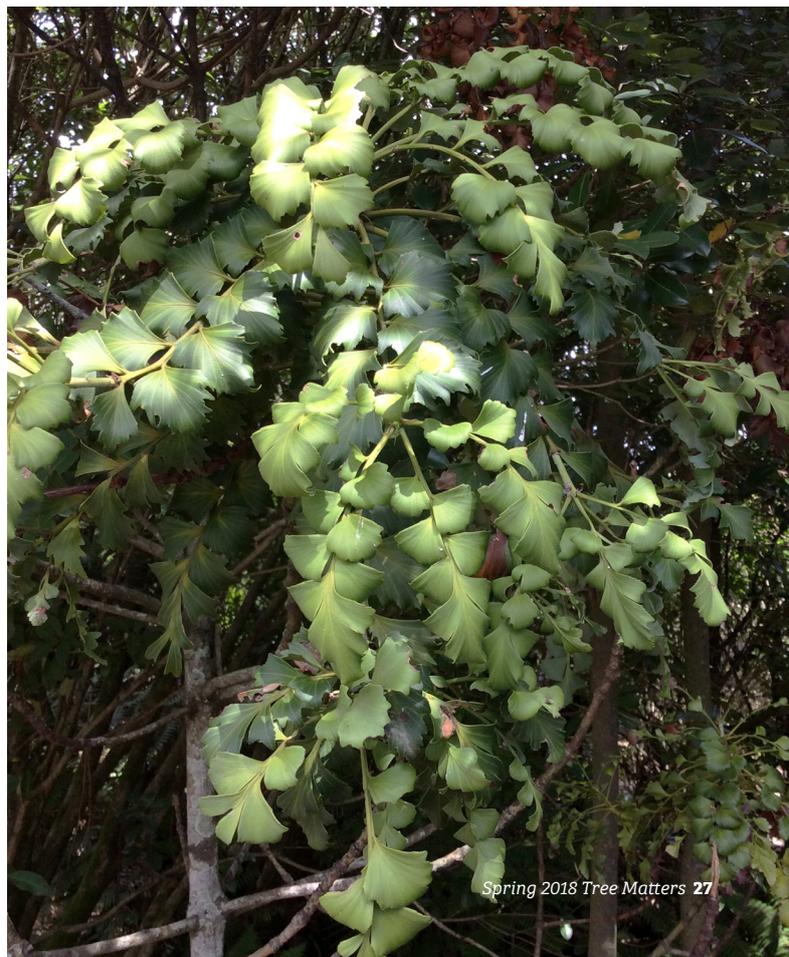
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L. Jensen



Above: *P. toatoa* mature ovule cones  
Below: *P. toatoa*



## A glimpse into Edo: the Rikugien Gardens

Representing one of Japan's 47 prefectures (an administrative jurisdiction or subdivision), Tokyo is the world's most populous metropolis and is the country's capital city with a staggering 38 million inhabitants. Tokyo is the modern name for Edo.

Nestled amongst the sprawling buildings and streets is a space cohabiting peacefully with the city, offering a relatively unchanged glimpse into Tokyo's past, in complete contrast to the sense of modernity which abounds

In such a densely populated environment where large apartment complexes increasingly occupy the city suburbs, green spaces provide a valuable respite for residents, plants and animals alike.

While the values imparted by urban green spaces have long been recognised and understood by urban planners, their significance and importance has increased, as both developed and developing nations show rapid rates of urbanisation, as the rural population moves to urban centres.

A 2014 UN report on world urbanisation suggested that as much as 54 percent of the world's current population resides in urban areas (an increase from just 30 percent in the 1950s). This is projected to rise to 66 percent by the year 2050.

Tokyo has a long history of urban park design with many fine examples. Among them are the notable Rikugien Gardens north-west of downtown Tokyo. The name is derived from a Chinese system of dividing poetry into six categories, a method also adopted in the division of 'Waka', a traditional form of Japanese poetry.

Waka poetry serves as the garden's theme and was the inspiration for the garden's creator Yanagisawa Yoshiyasu, who served as a trusted confidant to Shogun Tokugawa Tsunayoshi in 1702, the fifteenth year of the Genroku era. This era formed part of the Edo period (1603 -1867) when Japan was still ruled by the Shogunate, and the urban centre of Tokyo was yet known (until 1868) as Edo.

Visitors to Rikugien will find various species of tree, including: pine (*Pinus*), maple (*Acer palmatum*), zelkova (*Zelkova serrata*), camphor (*Cinnamomum camphora*), azalea (*Rhododendron indicum*), cherry (*Prunus*), Japanese apricot (*Prunus mume*), camellia (*Camellia japonica*), and weeping cherry (*Prunus pendula f. pendula*). The collection thoughtfully complements the garden's hard landscape features such as the Togetsukyo (a narrow stone bridge named after a famous Japanese poem) and Tsutsujichaya, the garden's Meiji-era teahouse.

Rikugien is a 'kaiyu' or circuit-style garden designed around glimpses of humanmade hills, lakes and gardens that incorporate a variety of quintessentially Japanese landscape features and tree care techniques.

One such technique is komomaki or straw-mat binding, developed during the Edo period to combat matsugareha, a defoliating pine moth (*Dendrolimus spectabilis*). The mats serve as the preferred home for the moth (still in caterpillar form) over winter, offering respite against the sometimes harsh Tokyo climate. Traditionally, the komomaki was used during the early winter months, removed in March and then burned - caterpillars and all - before being returned (in the form of ash) to the soil as fertiliser. Although the impact of the straw mat traps upon natural predators of the matsugareha has more recently called the efficiency of komomaki into question, they undoubtedly convey a sense of season in such gardens.

Overseas visitors (Gaijin or 'outside person') to the Rikugien Gardens may also notice a novel form of snow protection shrouding juvenile or venerable tree specimens in the form of cascading structures known as yukitsuri, which translates as 'snow suspension'. Yukitsuri gives extra support to trees weighed down under snow, using bamboo poles with





ropes over the tree canopy. As with the practice of komomaki, the use of yukitsuri to protect trees from snow damage likely has its origins in the late Edo period.

Perhaps a better-known feature of many Japanese gardens and formally gardened residences alike is the art of niwaki (not to be confused with bonsai, or 'potted' trees). In its most literal sense, niwaki can be interpreted quite simply as garden trees. The term niwaki does, however, imply a little more, meaning the expression of trees and landscapes through the art of Japanese topiary. In this practice, garden trees are sculpted and shaped for a particular ambience. The westernised formality of this term needs to be tempered with the far more tangible connection that the art of niwaki has with the natural landscapes of Japan. The many styles of niwaki may transcend an individual specimen or landscape and can be used to evoke feelings and re-creations of nature from mountainous forests to billowing clouds.

Floral displays are also synonymous with Japanese green spaces, and the gardens of Rikugien are no exception with an annual flowering calendar that includes camellia, plum, magnolia, rhododendron and Yoshino cherry (*Prunus × yedoensis*) from January through to May followed by hydrangea and Japanese clovers (*Lespedeza* spp.) later in the year.

The garden circuit ends where it begins, at the Naitei-daimon Gate, which is framed by a magnificent (albeit heavily propped) weeping cherry. One is then free to step out of what may be considered a brief glimpse of traditional Edo and return to modern Tokyo.

Japan is a culture of old and new and nowhere is the contrast more prominent than in Tokyo. As the country and the world continues to modernise and urbanise at an ever-increasing rate, it is wonderful to know that sanctuaries such as the Rikugien Gardens endure, their historical provenance, and importance for future generations preserved for all to see.



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# TREE OF KNOWLEDGE

## Techniques for Enhancing Structural Assessment

A recent health and structural assessment of a Blackbutt (*Eucalyptus pilularis* Sm.) in the Ku-ring-gai Municipal area, Sydney, Australia, used the combination of IML Resi' PD400, PiCUS Sonic Tomograph (SoT) and Electric Resistance Tomograph (ERT) to assess the tree for decay and the risks associated with structural decline.

The assessment concluded that the street tree was of relative sound health and structure based on the combination of three techniques despite the tree showing indications of internal decay.

The outcome would not have been the same if the assessment was limited to the PiCUS software (SoT) alone because the ERT identified the presence of adaptive growth which the Resi' confirmed as sound wood at these locations.

This technique shows promise for the assessment of older trees with decay and allows the better quantification of the internal decay based on a combination of factors.

### Risk

The street tree in this report was identified by the Ku-ring-gai Municipal Council as a potential risk to the safety of pedestrians and motorists, with potential impacts to services, adjacent residences and recreational areas. The tree is approximately 18 m high with a diameter at breast height (@1.4 m) of 121 cm. The stage of the growth of the tree was considered as mature.

The tree was dominant in the street setting and provides medium wildlife habitat value. On initial visual assessment the tree had at least one open decay cavity at 3 m Above Ground Level (AGL) in the northern stem quadrant. There were no visual signs of animal activity. The tree was relatively symmetrical in form with canopy loading in a northerly direction. The crown density was about 90% compared to that for the genus and species when in good condition and of normal vigour.



The Blackbutt (*Eucalyptus pilularis* Sm.) tree in the Ku-ring-gai Municipality.

There were some abiotic impacts including a footpath and roadway to the east and western sides of the tree. There had also been some historical pruning resulting in the regrowth of epicormic into endocormic branching.

### Methods

The tree health and structure was assessed using a Tree Risk Assessment methodology as outlined by the International Society of Arboriculture (ISA) Best Management Practices for Risk Assessment 2011. This included a visual tree assessment (VTA).

The basic level 2 assessment identified the presence of an extensive columnar, basal decay interconnecting with an open decay cavity at 3m AGL and at the crown union. Pathogenic wood decay from fungal colonisation was suspected. However, no fruiting bodies were evident. The presence of this external decay escalated the inspection to an advanced 'level 3.'

The advanced Level 3 assessment used SoT and ERT (Argus Electronic GmbH, Rostock, Germany) to assess the presence and location of decay in the tree stem as well as the size, shape and characteristics in terms of mechanical properties of the area of interest (Wang and Allison, 2008). While both these techniques are non-invasive the combination of the SoT and ERT methods can help overcome the limitations of either technique being used in isolation.

The SoT and ERT assessments were carried out at the buttress (figure 4), at the open decay cavity at 3m AGL and at the crown union, 4m AGL (figure 2b). The IML Resi' PD400 (IML Instrumenta, Mechanik Labor Systems, GmbH, Wiesloch, Germany) was only used at the crown union (at 4m AGL) (Figure 3a). While the first two tools identify the location and extent of decay, the IML tool confirms the presence of response adaptive growth by comparing the resistance (density) of adaptive growth and stem thickening at these locations against a

sample of resistance (density) from solid wood in the same tree. Response adaptive growth is interpreted as the tree's response to structural weakness, decay, stem movement and increase in wood growth thickening (additional layers of wood) or joining (welding) at branch unions. All measures were taken in January 2018.

The SoT method measures internal decay using sound waves with the principle being that sound waves travel slower through decay when compared to solid wood (Gilbert and Smiley, 2004). The ERT on the other hand uses a low electric voltage to examine the tree and provide a high-resolution electrical conductivity map of the tree's cross-section (Goncz et. al, 2017). The electric resistance of the wood is influenced by the water content and changes within the wood structure.

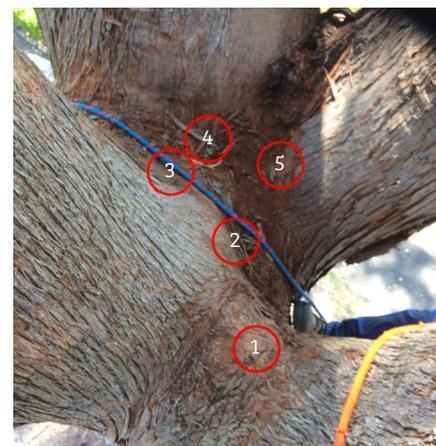


Figure 3: (a) IML Resi' PD400 resistance testing positions in the crown union of the 1st order structural stems (1st OSS) (b) Arborist with Resi' PD400 tool at test location 3.



(2b)

- 1st OSB Occluded pathogen breakout wound - Decay Indicator
- 4m agl Test level crown union  
Open decay 1st OSB attachment union
- 3m agl Test level open decay cavity  
Open decay 55 cavity 3m  
Internal cavity visibly identified termite mudding and pathogenic wood decay



Figure 4: PiCUS sonic tomograph (SoT) pins with sensors at the buttress level.



Figure 5: The red tags represent the test locations of the Sonic PiCUS Tomograph (SoT) and PiCUS Treetriconic Electric Resistance Tomograph (ERT) at the crown union assessment location at 4m agl. The Sonic PiCUS Tomograph (SoT) instrument is also shown in this figure.

The combination of electrical and sonic tomography in the PiCUS Treetriconic system provide a detailed survey, allowing more accurate differentiation of various internal defects (Brazee et al., 2011). Both the SoT and the ERT assessments were carried out at the buttress (Figure 4), at 3m AGL and crown union 4m AGL (Figure 5).

#### IML Resi' PD400

In addition to these two methods, resistance testing using an IML Resi' PD 400 was also used at five positions, at the attachment points of the 1st order structural stems within the crown union. Each drill location provides a cross-section of the resistance of the wood against the drill bit. The IML Resi' PD400 instrument assesses resistance to the drill bit of the instrument through the wood and this is then displayed as a graph. The path of the drill bit was selected from cross-sections of the crown union using the SoT and ERT tomographs.

#### Strength retention formula

In addition to these measures, the t/R ratio is described as the thickness of sound wood in the residual wall(s) of the section of the stem being measured. In this case we compare the ratio of the thickness of the wood of the stem or branch tested, at each location to the radius of the trunk or branch. A ratio of 30-35% is the minimum threshold for a tree part (trunk or branch) wall section to be considered of sound integrity (Mattheck and Breloer, 1994).

#### Limitations of the t/R formula

The conventional t/R ratio test is based on field studies of vertical, cylindrical trunks with the decay centrally located and uniform. When the stem is leaning, asymmetrical in shape, or the decay is off-centre, the guidelines for shell wall thickness should be used very cautiously. The greater the disparity in shape, away from a cylinder or decay off-centre, the greater the inaccuracy. The t/R was used as a guide only in the assessment to assist in the tree's risk rating determination.

#### Results and discussion

##### SoT and ERT

At the first location (base of tree), the cross-section of the wood shows approximately 24% of wood was solid on the circumference of the tree stem with some relatively symmetrical, internal columnar decay, representing 76% of the trunk comprised of decay and incipient wood. The results of the SoT and ERT tomograph at location 1 (the tree base) are shown in figure 6. Table 1 gives the key to interpreting figures 6, 7 and 8. The numbers

in figure 6 represent the status of the wood according to the SoT and ERT tomograph key (Table 1)

The second test location tomographs (Figure 7), show an open decay cavity at 3m displayed, presenting as an asymmetrical open internal, columnar decay. The cross-section of the wood shows 39% of solid wood on the circumference of the tree stem with some asymmetrical internal columnar decay represented by 51% of decay and 10% incipient or altered wood. The results of the SoT and ERT tomograph at test location 2 are shown in figure 7a and b. The numbers in figure 7a and b represent the status of the wood according to the SoT and ERT tomograph key (Table 1).

The third location showed an internal decay cavity at the crown union at 4m AGL. The cross-section of the wood shows 31% of solid wood with 53% of decay and 16% incipient or altered wood. The IML PD400 resi' tests at this location identified small pockets of response adaptive growth, as shown by the red areas (high ERT resistivity) in the ERT diagram in figure 8b. The results of the SoT and ERT tomograph at test location 3, at the crown union 1st OSS are shown in figure 8. The numbers in figure 8a and b represent the status of the wood according to the SoT and ERT tomograph key (Table 1).

#### IML Resi' PD400

The IML Resi' PD400 test locations were identified with reference to the ERT and SoT measuring points (mp) as areas of high ERT resistance. At the 1st OSS attachment union each of the five IML Resi' PD400 results showed wood with good resistance and adaptive growth welds which contribute to stem strengthening at this location (Figure 9).

From five IML Resi' PD400 resistograph test locations, the resulting resistograph identifies generally good resistance (compared to solid wood), potentially indicating response growth (due to branch welds or strengthening wood), with a small pocket of compromised wood at 16-17 cm.

SoT – Sonic Velocity [m/s]	ERT Resistivity [ $\Omega \cdot m$ ]	Wood status	# in Tomogram
High (brown) 	High (red) 	Sound wood, response growth	(1)
High (brown) 	Low (blue) 	Still safe, but early decay	(2)
Low (blue/purple) 	High (red) 	Cavity / crack / dead decay	(3)
Low (blue/purple) 	Low (blue) 	Decay	(4)

Table 1: The SoT and ERT type 1 decision table at test location 1 at the tree base. Each colour represents a value in each of the tomographs.

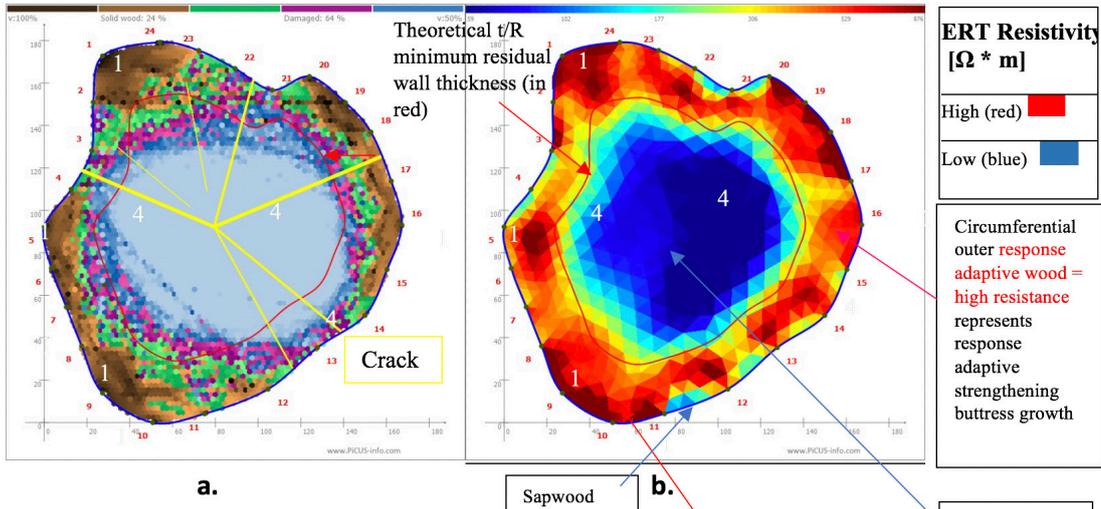


Figure 6: The combined analysis of the a. Sonic PiCUS tomograph (SoT) and the b. Treetric Electric Resistance Tomograph (ERT) at the base of a Eucalyptus pilularis (Blackbutt) at test location 1.

Figure 7: The combined analysis of the SoT and ERT at the open decay cavity 3m AGL for a Eucalyptus pilularis (Blackbutt).

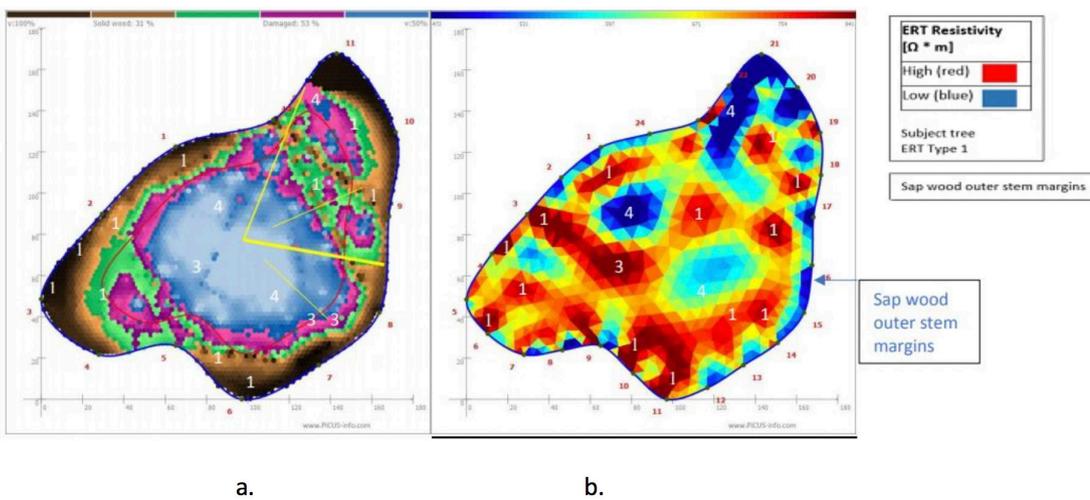
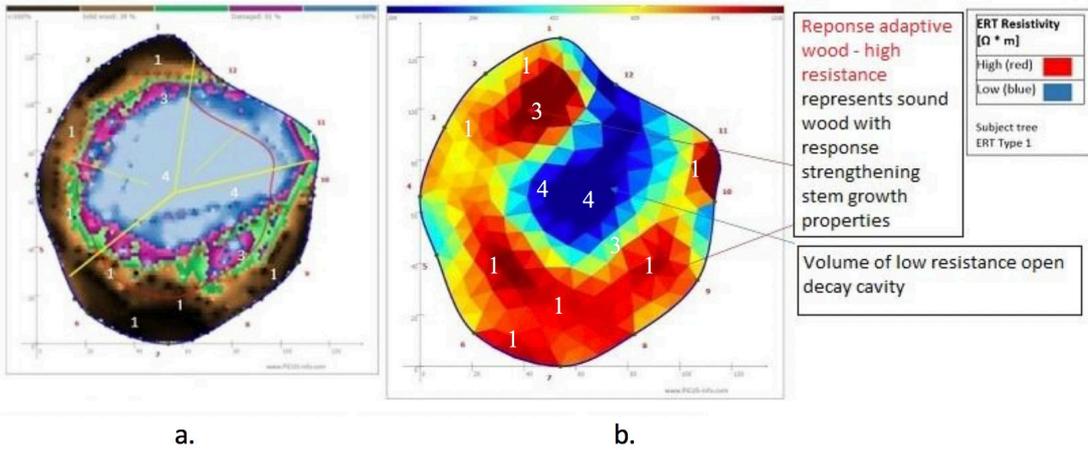
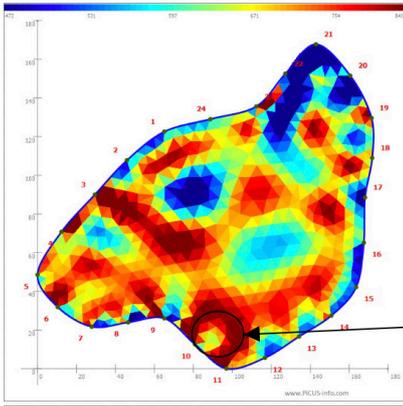


Figure 8: The combined analysis of the SoT and ERT at 4 m AGL for a Eucalyptus pilularis (Blackbutt).



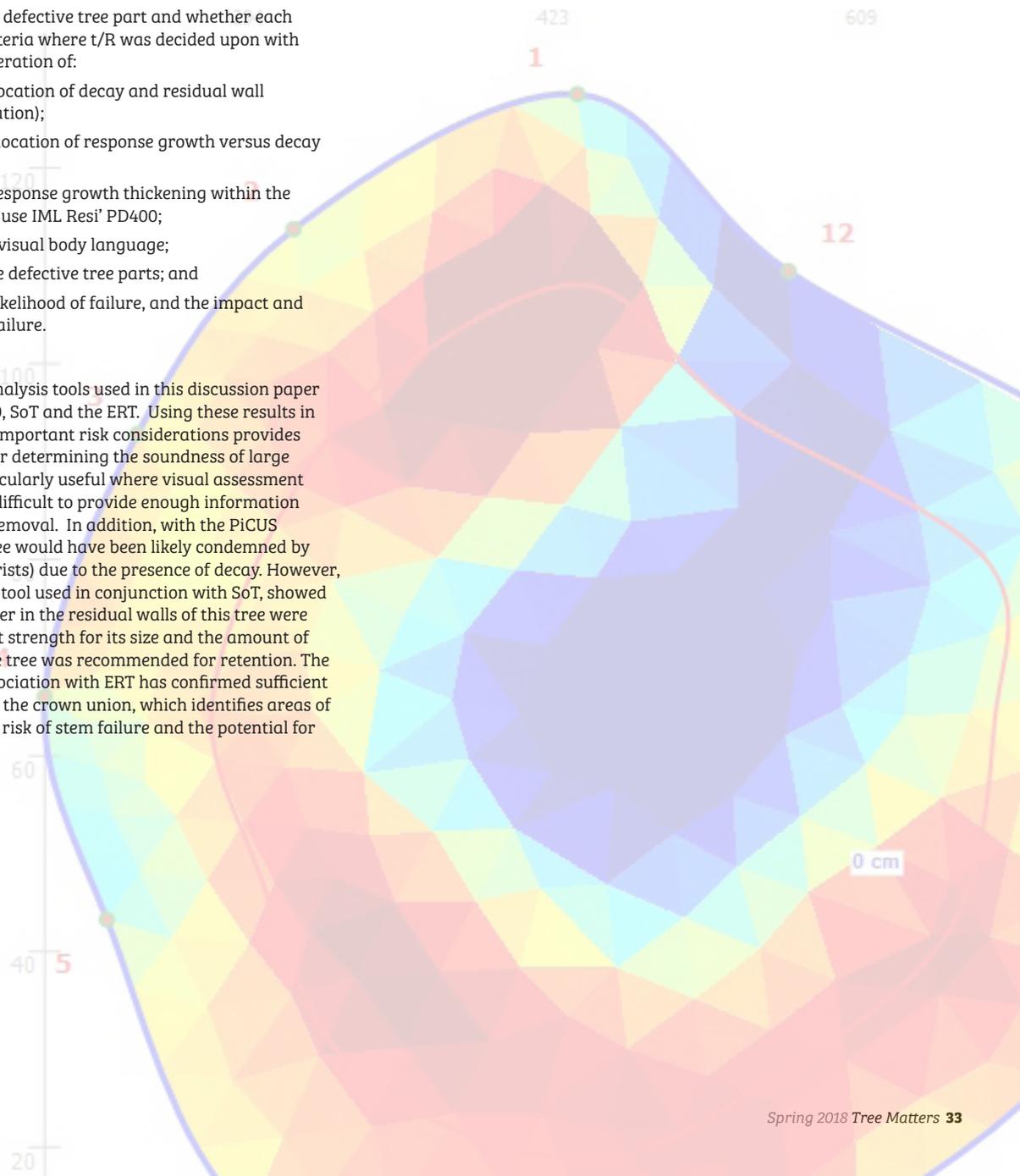
Assessment	
From 0,0 cm to 2,0 cm	: Bark
From 2,0 cm to 3,6 cm	: Appears sound wood
From 3,6 cm to 5,0 cm	: Altering wood
From 5,0 cm to 16,0 cm	: Appears sound wood
From 16,0 cm to 17,0 cm	: Compromised wood
From 17,0 cm to 19,5 cm	: Appears sound wood

The determination to retain this tree was based on a combination of the following decision-making steps:

1. An analysis of the quality of wood at each defective tree part (Basal SS, open decay cavity 3m AGL and crown union SS 4m AGL).
2. The risk rating of each defective tree part and whether each reached the failure criteria where t/R was decided upon with evaluation and consideration of:
  - PiT (Volume and location of decay and residual wall thickness and location);
  - ERT (Volume and location of response growth versus decay and location);
  - Confirmation of response growth thickening within the crown union with use IML Resi' PD400;
  - The subject tree's visual body language;
  - The loading on the defective tree parts; and
  - The target tree's likelihood of failure, and the impact and consequences of failure.

### Conclusion

The three scientific decay analysis tools used in this discussion paper included the IML Resi' PD400, SoT and the ERT. Using these results in combination with the other important risk considerations provides a new and insightful basis for determining the soundness of large landscape trees. This is particularly useful where visual assessment alone may ordinarily prove difficult to provide enough information for retention as opposed to removal. In addition, with the PiCUS assessment tool alone the tree would have been likely condemned by most PiCUS operators (arborists) due to the presence of decay. However, with the introduction of ERT tool used in conjunction with SoT, showed that the strength of the timber in the residual walls of this tree were determined to be of sufficient strength for its size and the amount of decay present, and hence the tree was recommended for retention. The use of IML Resi PD400 in association with ERT has confirmed sufficient response adaptive growth in the crown union, which identifies areas of high resistance reducing the risk of stem failure and the potential for public risk.



## The Principles of Modern Arboriculture: Sound Philosophy, Better Practice

When considering any major intervention in tree structure and physiology, it is worth considering the strength of the philosophical position that forms the basis of modern arboricultural practices (Shigo 1989; Harris 1992). For several decades, the philosophy considered most appropriate in dealing with arboriculture has been based on an improved understanding of tree biology, which can be encapsulated in the principles of modern arboriculture.

These principles can be codified as a set of criteria against which any arboricultural prescriptive practice should be judged to determine its suitability for use. The principles should be broadly applicable to all aspects of arboricultural activity, including canopy and root operations, pest and disease control, and planting and establishment. Practices that violate the principles may still be considered acceptable under certain circumstances, such as where the legal system requires it, when occupational or environmental health concerns are involved, or where action on one tree benefits several others.

Any practice that is likely to violate one of the criteria should be considered seriously to determine if it is an appropriate action. Any action that is likely to violate two or more of the principles is unlikely to be in the interests of the tree and is probably not acceptable within modern arboriculture. These principles are not intended to be prescriptive or restrictive in arboricultural activities, but provide a framework for professionalism. As a general rule, the more principles that an action violates, the more likely it is to harm the specimen, and the more likely the action is to be considered unacceptable to arborists. In short, the principles provide a means of measuring the impact of an arboricultural practice on trees. Such benchmarking may be useful when an arboricultural practice or outcome is subject to examination in a court of law.

### DEFINING THE PRINCIPLES

#### Do No Harm

The principles can be summarized and their meaning for arboricultural practice clarified (see *The Eight Principles...*). The application of Principle #1, Do no harm, does not mean that immediate harm or shorter-term adverse consequences should eliminate a practice. In some instances, violation of one or more principles may be preferred to the death or removal of a tree. However, the outcome of arboricultural work should aim to improve the condition of the specimen or of other specimens in its immediate vicinity. Some arboricultural practices, such as crown reduction or thinning, which harm a specimen but improve several others, can be justified.

The concept of implementing practices “for the greater good” is not explored further in

this article, but clearly it may have application in some arboricultural practices, where damage is done to an individual tree with the intention of providing benefit to two or more other trees or plants. Canopy thinning, which provides light to other smaller trees, may be an example, as could a root barrier installation or load reduction, which allows space for other trees to grow without competition or sustaining damage, especially when trees have been planted too closely.

#### Trees are Living Organisms

Principle #2, Trees are living organisms and all arboricultural management practices should accord with basic biological principles, recognises the common biological characteristics of all living things. Under this principle, whether you are medical practitioner, a veterinarian, or an arborist, if you must make a wound then it should be the smallest wound possible after thoughtful determination. Any pruning activity should minimise the area of an open wound and capitalise upon the tree’s natural mechanisms. Adopting this approach with trees will facilitate wound closure, reduce the risks of infection and decay, and allow more rapid recovery. Such an approach applies regardless of where wounds might be made and includes the trunk, branches, and roots.

#### Yielding to Complex Biology

According to Principle #3, Trees are sophisticated organisms with complex biology, efficient integrative systems, and effective biological defence mechanisms, which are the strongest and most effective currently available. Basic biology tells us that any organism as large and as long-lived as many tree species must have sophisticated integrative and defence systems that protect them and allow them to survive for such long periods. These systems of defence include chemical responses (e.g., polyphenols and phytoalexins), as well as physical responses (e.g., reaction wood and wound wood). Arboricultural practices must never undermine these mechanisms, but rather complement them. Furthermore, like several of the other principles, this principle suggests that if you do not know what you are doing and what the outcome of a practice is likely to be, you would be wise to leave the tree alone.

When trained and professional arborists undertake work on a tree they must know with a high degree of probability what the outcome of their action will be in the short, medium, and long term. They must be capable of doing this to ensure their own safety, the safety of other people and property, and for the health and safety of the tree. This principle is often one that distinguishes the arborist from the average home gardener—the arborist knows

what they are doing while often the amateur does not, and the amateur would be better off leaving the tree alone.

#### Understanding Tree Age

The work of Shigo (1989) and Harris (1993) emphasises that older and stressed trees are more vulnerable to pests, diseases, and environmental stresses than young trees of the same species. This is acknowledged in Principle #4, Stressed and aged trees have a reduced capacity for defence, and so are prone to attack by pests and diseases. As human beings get older, they often become increasingly intolerant of fools—old trees are the same. Poor arboricultural work, especially poor tree surgery, often results in the demise of a tree long before its natural life span has expired. The same poor practices on young, healthy, vigorous trees often pass without consequence as the trees grow on, grow over, and grow up.

The role that age plays in plant responses to arboricultural work is often forgotten. Some arborists are so used to pruning young, vigorous trees, where even poor pruning cuts and technique are of little consequence, that they are surprised that when working on an old tree, a careless cut into a collar or poor attention to the plane of the branch bark ridge can lead to massive columns of decay that lead to the death of the tree. Similar results can occur when cabling and bracing older trees or when the roots of older trees are carelessly severed.

#### Static and Dynamic Structures

As Principle #5, Trees are static and dynamic structures, suggests, trees are large and heavy structures that are subject to both static and dynamic forces. The removal of any part of a living thing elicits a response from the organism. Removal of parts of the canopy alters the physics of the crown branching structure. Such alterations can leave other parts of the canopy subject to significant forces during wind and storm events (Mattheck 1991; Mattheck 1998). A once-stable and safe canopy may be rendered prone to failure. This has profound implications for practices such as crown thinning, weight/load reduction, and topping of canopies. Prudence would suggest that as little of the branching infrastructure should be removed as is possible (Moore 2003).

James (2003; 2006) has focused on the importance of the small branches and foliage on canopy behavior. The description of the canopy from the perspective of mass damping has significant implications for arboricultural practice. Even the removal of relatively small amounts of canopy can significantly alter the capacity of the tree canopy to mass damp, and so mitigate the effects of strong winds (Moore 2003).



Figure 1: A good pruning practice recognises collars and branch bark ridges and is consistent with arboricultural principles.



Figure 2: A good pruning practice recognises collars and branch bark ridges and is consistent with arboricultural principles. Credit: G.M. Moore

## STATEMENT OF THE EIGHT PRINCIPLES OF MODERN ARBORICULTURE

Principle	Statement of Principle
1	Do no harm. Any arboricultural intervention must not do harm to the tree. No intervention should contribute to making the condition of the tree worse in the medium to long term.
2	Trees are living organisms and all arboricultural management practices should accord with basic biological principles. Any pruning activity should minimize the area of an open wound and capitalize upon the tree's natural mechanisms of wound closure and sealing off.
3	Trees are sophisticated organisms. Their large structures and longevity are the products of a complex biology, efficient integrative systems and effective biological defence mechanisms. These defence mechanisms against pests and diseases are the strongest and most effective currently available.
4	Stressed and aged trees have a reduced capacity for defence and so are prone to attack by pests and diseases and acute abiotic agents. Their management requires greater care than for young healthy vigorous trees.
5	Trees are static and dynamic structures. Arboricultural practices should recognize the impact of static and dynamic loads and forces which affect trees and the role of mass damping within the trunk and canopy.
6	'Prevention is better than cure' is the adoption of the medical model, which suggests that preventing structural deformity, disease or decay is a superior management approach than trying to remedy problems once they arise.
7	A non- or minimal-interventionist approach should be followed. Intervention in the natural growth of the tree should only occur through necessity and under conditions where the biology and the physiology of the organism are understood to such a level that intervention will have clear, rational and predictably beneficial outcomes.
8	All interventions must be done in such a way as to minimize the spread of pests and disease.

### Prevention, Prevention, Prevention

Principle #6, Prevention is better than cure, embodies the old horticultural adage that “healthy plants don’t get sick,” which also applies to trees. The meaning of the adage is often misunderstood or considered a statement of the obvious. However, its meaning for arboricultural management is quite profound. If you provide environmental conditions that allow the tree to grow and develop in full health and vigour and without restriction, then it will cope with most pests, diseases, and stresses without the need for intervention.

This is a vital and simple principle, but often arboricultural intervention is required because the principle may have been violated, ignored, or delayed. Often cities do not provide the basic requirements for healthy tree growth: space above and below ground, good soil, nutrients, air, water, and light. Every urban planner, politician, bureaucrat, and landscape designer should understand this principle.

### Minimal Intervention

The implication of Principle #7 is that a non- or minimal-interventionist approach should be followed, meaning that you do as much as you need to improve the tree and no more; or you do as little as possible to achieve the desired outcome for the specimen. There is a clear implication here, that if you do not know what you are doing, or what the outcome of the practice might be, then it bears repeating again and again: leave the tree alone as it will be better off without you.

It is of interest that under this principle you would not dead-wood trees unless there is a clear hazard and risk associated with the specimen. Habitat and environmental values are recognised by arborists, and dead branches and hollows should not be managed unless there is a good and clear safety

reason for doing so. Furthermore, urban arboricultural practices are not intended for a thoughtless application to trees in wilderness areas or wildlife refuges, where there are different sets of values applying to safety, habitat, and the calculation and acceptance of risk.

### Minimising Pests and Disease

Principle #8, All interventions must be done in such a way as to minimise the spread of pests and disease, necessitates the adoption of basic hygiene when dealing with trees that have been attacked by pests or diseases that can be spread on tools, clothing, and equipment. This principle places the onus on arborists for disinfecting chains and bars on chainsaws with solutions such as methylated spirit or hypochlorite (bleach diluted 1-in-10) after they have worked on fungal, bacterial or viral infected trees. If such treatments are applied, then human safety must be considered by managers, and rust prevention measures may be required for equipment. There will be added costs and these should be considered when estimating for arboricultural work that involves infected trees.

The principle also demands appropriate work scheduling. If, for example, you have to prune or remove a tree with a known fungal disease, organise the work schedule so that the infected tree is removed after any work that might be required on healthy specimens of the same species—preferably at the end of the day so that tools can be cleaned overnight in readiness for the next day. Refrain from pruning trees when virulent pathogens are likely to be active for that species. No arborist should be responsible for spreading pest and diseases.

### APPLYING THE PRINCIPLES

Applying these principles to some common arboricultural practices can provide valuable insight into the suitability and risks associated with a particular practice (Table 1). In the following examples, it is assumed that the arboricultural practices are professionally and hygienically implemented.

Formative pruning that is performed properly and hygienically will satisfy all of the principles, as does pruning with knowledge of collars and branch bark ridges. Canopy lopping or topping and pruning without regard to collars, ridges, branches, and buds by contractors who do not practise plant hygiene and risk spreading pests and diseases, would violate all of the principles.

Canopy thinning is against a number of the principles, but may be justified on the grounds that it allows greater light penetration of the canopy, which in turn allows other plants to grow while retaining the tree. However, if you thin the crown too much, then the tree is likely to sustain damage that is not offset by the growth of the other plants. Similarly, load or weight reduction of major limbs or portions of the canopy violates most of the principles (Table 1) but may be the only way of retaining a specimen in the face of urban development, legal action, or an unsympathetic owner. In such situations, a good arborist should explain the consequences of these violations to the client and those managing the tree.

Cavity filling with expanding foam in a cold climate where ice-shattering of cavities or cracks in trees is a possibility is consistent with most if not all of the principles. Capping a cavity which allows inspection of the hollow would meet more of the criteria. However, cavity filling with an inflexible material such as concrete, which generally shrinks and cracks as it cures, is inconsistent with most principles. Similarly, when cabling or bracing branches or co-dominant stems, the



Figure 3: Poor pruning is inconsistent with the principles of arboriculture.  
Credit: G.M. Moore



Figure 4: Canopy lopping without regard to hygiene violates the principles of arboriculture  
Credit: Joseph O'Brien, USDA Forest Service, Bugwood.org.

use of non-invasive systems, such as nylon strapping, violates fewer principles than the use of steel cable and eyebolts. However, the latter may still be used when the loads are too great for strapping systems or where legal and safety regulations require their use. None of these solutions is ideal; this is an aspect of arboriculture where future improvements are required

Careless root severance during construction also violates the principles, and while root barrier installation violates some of the principles, it may be justified, particularly if the alternative is tree removal because of major damage caused to infrastructure. Tree injection with a good cause and clear purpose may be consistent with the principles even though it wounds the specimen and may lead to chronic injury. However, injection that wounds but provides no efficacy would not.

### CONCLUSION

These principles are not intended to be prescriptive or restrictive in arboricultural activities, but rather provide a framework within which modern arboriculture can be practised. They provide basic criteria for evaluating the appropriateness and effectiveness of arboricultural practices and for deciding upon which is the better choice when alternative treatments are available.

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### Compliance of selected arboricultural practices with the principles of arboriculture

*Note: The forward slash (/) denotes a consistency with a principle, while X denotes the violation of a principle.*

Arboricultural principle	#1	#2	#3	#4	#5	#6	#7	#8
Formative pruning	/	/	/	/	/	/	/	/
Pruning using collar/branch bark ridges	/	/	/	/	/	/	/	/
Canopy thinning	X	/	/	/	X	/	X	/
Weight/Load reduction	X	X	/	X	X	/	X	/
Canopy lopping	X	X	X	X	X	X	X	X
Cavity filling (expanding foam)	/	X	/	/	X	/	/	/
Cavity filling (concrete)	X	X	X	X	X	X	X	X
Root severance in construction	X	X	X	X	X	X	X	X
Bracing with strapping	/	/	/	/	/	/	/	/
Root barrier installation	X	/	X	X	X	/	/	/
Tree injection	X	/	/	X	/	/	/	/



Figure 5: Canopy lopping without regard to hygiene violates the principles of arboriculture. Credit: Joseph O'Brien, USDA Forest Service, Bugwood.org



Figure 6: Careless root severance during construction led to immediate wilting and the need for tree removal. Credit: G.M. Moore



## The thin and the thick of it - Tree Rings

I found myself needing to very accurately age some trees. The margin of error required for the work was plus or minus months, not give or take a few years. After trying every conceivable option, including photos, sales records, comparative plantings and saying no, I found an increment borer, made some holes and pulled some cores.

When it comes to counting tree rings – ageing a tree by counting annual growth increments – generally speaking, the wood that is formed in early part of the season (early wood) appears lighter in colour compared to the wood that is formed towards the end of the season (late wood). This is because the environmental conditions are typically least limiting in the early part of the growing season, and most limiting in the latter part of the season. Less-limiting conditions tend to result in rapid growth, characterised by larger cells with smaller cells formed towards the end of the season as growing conditions become less favourable.

The contrast between small, thick-walled cells formed at the end of one season and large, thin-walled cells formed at the beginning of the next growing season results in a rather distinct line (or tree ring). So far, so good. If environmental conditions vary, it is possible that there will not be a period of rapid growth, or there may be one or more periods of rapid growth within a single growing season. It is not possible for a growth ring to be completely absent, but it is possible for more than one growth ring to be formed in a single growing season. Additional rings that are formed in a single growing season are referred to as false rings. So not every growth ring represents a year.

That's not too complicated. If all things were equal and Mother Nature didn't have a warped sense of humour, counting trees rings would be as easy as that – but it's not, it never is. Not all wood is the same.

There are three general types of wood, and these are distinguished based on the presence, absence, or types of water-conducting vessels. The wood of conifers (gymnosperms/softwoods) does not contain vessels, or pores, and is referred to as nonporous. The growth rings of many nonporous woods are characterised by a distinct colour difference between latewood and earlywood.

The wood of angiosperms (flowering plants/hardwoods) has pores. Angiosperm wood can be divided into diffuse-porous and ring-porous types. And then there is semi-ring-porous wood...in fact, consider angiosperm wood as being on spectrum, the Ring Porosity spectrum.

At one end, ring-porous woods form a band of very large pores at the beginning of the growth season and the rest of the ring (latewood) contains fewer and smaller pores. So, there can be a detectable difference between latewood and earlywood in ring-porous trees. At the other end of the spectrum, diffuse-porous woods tend to form pores of a relatively consistent size throughout the growing season, so there is often very little colour or texture variation across the entire ring. Growth rings in diffuse-porous trees can be difficult to distinguish.

So, it turns out that there is a bit of science to ageing a tree by counting annual growth increments - who would have thought? Close examination is required. For me, that meant sitting in a laboratory looking through a microscope – I must acknowledge and thank the University of Otago Botany Department. They happily let me borrow a lab-coat and gave me access to all sorts of expensive things that I couldn't remember how to use...

Through a microscope, true boundaries become easier to see. There is an abrupt change in appearance between the last-formed latewood of one year and the first-formed earlywood of the next year. The transition from rapid growth to slow growth in a false ring is much more gradual, and even though my wood was diffuse-porous, the growing environment down here in the bottom of New Zealand's South Island (the definite winters that we have) produced a detectable seasonal difference.

Job done.



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## Sharing Kiwi Tree Knowledge in Europe

In May of 2018 I attended the European Forum on Urban Forestry conference (EFUF) held in Helsinki, Finland. I had submitted an abstract to present on the redevelopment of the waterfront area known as the Wynyard Quarter in Auckland. About a month later I received an email confirming that my abstract had been accepted; a real surprise. I talked it over with my wife, as it would be self-funded, and it was decided that there was much to gain from the opportunity to talk about the great things we do in NZ on the European stage. Thanks also to Auckland Council for giving me time off to attend the conference. On the 14th of May I took off from Auckland and 35 hours later arrived in Helsinki. It was early afternoon, a warm 26 degrees and sunny. At that point I navigated to my hotel running on adrenalin, having not slept much on the three flights.

The city was an interesting mixture of older heritage buildings and cobbled streets alongside modern high rises. There are many architectural styles; some buildings date back over 800 years. Helsinki is also surprisingly green, with trees planted along walkways, cycling paths and road carriageways. On some streets there were double rows of trees flanking the paths. Trams were also running along a number of the main travel routes. The trees appeared well-maintained and diverse in age; new tree planting was evident in a number of places.

Finland has a population of 5.5 million, is 390,908 square kilometres in area and 75% covered by natural and managed forest, in addition to 188,000 lakes. They harvest around 65 million cubic metres of timber from their forests annually. The managed forests are expected to be able to produce 80 million cubic metres annually under their current growth projection modelling.

It was the hottest May on record for Finland when I was there. They had severe flooding in their northern territories due to early snowmelt. It was a common theme of discussion during the conference that the weather in Finland was showing some significant changes and it was the reality of climate change.

The conference took place over four days and was hosted by the University of Helsinki. It included daily field trips and presentations by delegates from 19 countries. I was the first New Zealander to present. There were a number of presenters from the city and University of Helsinki. Staff from the public works department's urban tree management team spoke about the management policy and its aim to increase urban biodiversity and recreational values to residents of Helsinki. The city has a well-developed plan; more detail of this can be found on their web site <https://www.hel.fi/kaupunkiymparisto/en>. The Helsinki University forestry programme also had a number of professors present their



The formal avenue plantings were impressive; these were *Tilia cordata*

research work on the value of urban trees and health benefits. One of the presenters aptly stated the need for connection with nature and the outdoors as a vital medicine; I like the way this presents the value of nature interaction as a health tonic that we all require. They shared some compelling data on the worth of spending time outdoors and relaxing in nature.

On the first day of the conference after a morning of talks, a bus trip took us to one of the main parks in the centre of Helsinki. From there we had a walking tour of Park Kaivopuisto and the waterfront. Avenues of common European limes (*Tilia* sp.) were planted as a formal entrance into part of the park (See photo 2). The trees were established about five years ago and receive intensive maintenance during the summer, including watering. The standard of the tree stock is impressive; these specimens were field-grown to a minimum height of two metres before planting. *Tilia* were very commonly used across the city in parks and streets; pollarding



Take a dose of nature daily for good health

is still being used in some instances to manage the trees. The park was very well maintained; it is hard to imagine the same area has three months of below-freezing temperatures and snow cover.

The two most notable presentations that I attended were by Simone Borelli of the FAO and Dr Cecil Konijnendijk of the University of British Columbia in Canada. Borelli spoke on the work that the FAO and United Nations are doing in peri-urban and urban forestry programmes to influence happier and healthier cities. His work extends to urban forestry programmes in 130 countries across the globe, many of them developing nations.

Dr Cecil Konijnendijk, a senior professor at the University of British Columbia is also a board member of the ISA. Dr. Konijnendijk's presentation included development of the Canadian national urban forest strategy and involvement in the university urban forestry programme which he has been instrumental in setting up.

It was certainly inspiring to hear about the research going on in the industry and uplifting to hear how highly valued trees are in a large number of countries across the Northern Hemisphere. A paper of note referenced from the *Journal of Environmental Psychology* revealed some interesting data showing how even short visits to natural green areas has a positive effect on psychological wellbeing: "The value of urban green environments on stress relief measures: a field experiment". The Natural Resources Institute of Finland LUKE website is a good place to find out more: <https://www.luke.fi/en/natural-resources/recreational-use-of-nature/>



Park Kaivopuisto was a mixture of formal avenue plantings and recreation spaces incorporating the rocky terrain as part of the playground complex.

Photo 4 provides an example of urban living; there are block after block of high-rise apartment complexes, which are separated by green spaces filled with a variety of trees. These areas are the apartment residents' open space areas. They are well lit at night and have a range of seating.

The main species used in urban plantings are birch, poplar, Tilia, rowan, maple, pine, spruce, yew and juniper. They provided a buffer between the buildings and continuity with street trees along this entire block. The majority of the roads I saw had cycleways and these were in the majority of cases tree-lined. The planning of the street network seemed very efficient; they had trams, trains, buses and private cars on the same roads.

Photo 5 shows a forestry harvester which is used for selective tree extraction from managed and natural forest areas. Finnish forest management involves maintaining a continuous cover verses a clear-felling approach.

In a demonstration, we watched the harvester assist ground-felling crews as part of their risk management procedures. The machine was capable of felling up to a 36cm trunk size; larger trees were felled by ground crews and the harvester then processes the log.

Other forests we visited were owned by the City of Vantaa and are administered by the urban forest team. Because Finland's soils are very thin and made up predominantly of glacial moraines, rock is very near the surface in most of the urban areas. They use a technique to capture silt washed through the system to make planting soil for their parks operations, while improving the water quality of the outflows for the ponds and lakes in the park.

The silver birch were exceptionally large compared to what grows in Auckland.

The last day of the conference was an all-day field trip. An hour north of Helsinki, we visited the Haltia nature centre at Nuuskio National Park.

It was a fantastic facility and had some amazing displays and a huge curved screen which showed the four seasons of Finland which was really impressive. The centre was timber built and used a wide range of eco designs and the latest in building materials and technology.

I took every opportunity to speak to people at the conference about NZ and the great things we do. After a jam-packed five days I headed back to the UK for some R&R with my family. During my visit to the UK I also spent a couple of days with Jeremy Barrel at his office in Fordingbridge, Hampshire. I presented to his team and a group of tree officers from England on the Auckland Council Urban Forest Strategy development process. The attendees could not believe that NZ has legislation that limits local authorities from employing tree protection rules at a local planning level.



Apartment buildings with public nature strips between blocks



Harvester



Ground crew had great PPE



Korson Keskuspuisto Park, Vantaa. A managed birch forest.



The traditional birch shelter was an amazing piece of timber work.



Impressive Silver Birch *Betula pendula*



Barrell Consultancy's offices and some of the group who attended

On our second day time was spent talking with Jeremy about industry standards and how they are being used and interpreted in the UK. He has some very good ideas and a lot of experience in tree protection and development related works. He suggested some ways in which we may be able to work in closer collaboration to benefit NZ.

I took the opportunity to promote NZ Arb and talked briefly on what we do. I was proud to mention that we also had then the current ISA world champion climbers in both women's and the men's divisions. Finally a big thank you to my wife Denise for her support and encouragement, without which I would not have been able to go to Finland and the UK.

The Golden Bridge



## Stumpmaster appeal dismissed

Terry Snow  
Freelance Journalist  
editor@nzarb.org.nz



The High Court has dismissed an appeal by Stumpmaster against the fine of \$90,000 imposed by the District Court for offences under the Health and Safety at Work Act 2015 (HASWA).

Stumpmaster, carrying out residential arborist work, put out cones to protect the danger area on the road where a tree might fall. The victim walked into that area and part of a tree fell on her. She suffered injuries requiring hospitalisation for six days. Stumpmaster had with it on the job equipment to provide a safe, obvious barrier preventing persons walking into danger, but did not use them.

Stumpmaster had pleaded guilty to the charges brought by WorkSafe but appealed to the High Court, challenging the level of fine on the basis of inability to pay, and also challenging the costs order.

Under HASWA which replaced the Health and Safety in Employment Act 1992, the maximum available fine has risen from \$250,000 to \$1.5 million. Stumpmaster's appeal was joined with appeals from The Tasman Tanning Company Limited and Niagara Sawmilling Company Limited, as High Court judges, Justices Geoffrey Venning and Simon France, reviewed existing guidelines for setting the level of fines under the new Act.

All three appeals were brought by companies fined under s 48 of HASWA for failing to comply with a workplace duty, such failures having exposed someone to risk of death, serious injury or serious illness. The judges noted that all appellants contend that the District Court has erred in the manner in which it has given effect to the statutory increase. The core proposition is that the starting point for a typical s 48 case is excessive, and misunderstands the purpose behind the statutory increase.

For Stumpmaster Ltd, Mr T J Mackenzie submitted that the increased maximum fine was to empower the court to better address the most serious cases. The inadequacy of the previous maximum was exposed by the tragedy at Pike River coal mine; a proportionate progressive response was required; the bigger increases in fines should be at the top end not the low end of culpability; and the starting point should come within the first half of the penalty range (here \$750,000).

After reviewing sentencing procedure, from calculating reparation through to the ability of the offender to pay, the judges confirmed that the new guideline bands for fines are: low culpability, up to \$250,000; medium culpability: \$250,000 to \$600,000; high culpability: \$600,000 to \$1 million; very high culpability: \$1 million plus. They were not persuaded that the primary aim of the reform was to target high-end offending and said the increase to all the bands reflects the reality that proportionality across the bands must be maintained.

Addressing the Stumpmaster case, the High Court said the starting point for the fine should have been around \$550,000, higher than the District Court's figure of \$500,000. The High Court would have also limited the discount for the good response from Stumpmaster.

The High Court agreed with the calculations by the District Court and WorkSafe which contended Stumpmaster would pay a fine of \$100,000 if spread over four to five years. Stumpmaster contended \$20,000 was the most it could afford. The Court identified an existing loan repayment obligation of \$4800 a month that was to cease in October 2018. It was considered thereafter that money could be applied to a fine. The identified fine of \$250,000 was accordingly reduced to \$90,000, payable at the rate of \$5000 per quarter, commencing on 25 October 2018. This will extend for a period of four and a half years.

The justices said the fine should be a burden. "We are satisfied a figure of \$600,000 for the top of the middle band represents a significant deterrent that reflects the statutory purposes. It is a substantial figure, and one which may well be higher depending on the degree of departure and the actual harm caused. For many businesses it will be onerous, as the legislation intends it to be. For those for whom it is not, the legislation makes clear the obligation of the court to consider uplifts to reflect the relative wealth of the offender."

The Stumpmaster appeal against costs was also dismissed. The Tasman Tanning Company appeal was allowed and the fine reduced. The Niagara Sawmill Company appeal was dismissed.

The full judgement is available here: <https://www.courtsofnz.govt.nz/cases/stumpmaster-v-worksafe-new-zealand/>



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# Standards Article #3 in series

Kia Ora fellow men and women of the ngahere. This is the last of three articles on the topic of standards. I hope to distil the options for us to move forward with more unity.

Firstly, a brief recap of the steps to date and topics previously covered; in the first article the professional need for a collective approach was highlighted. We introduced the topic and outlined three international standards. Then a five-question survey was introduced regarding standards familiarity as a starting point to work from.

The survey was well participated in and its key results were outlined in the second article. Thank you again for your participation, it is essential and helps direct the next steps. The executive committee have not yet discussed resulting next steps.

For the NZ tree care industry we would ideally use three standards. They cover:

- Tree protection amidst construction, demolition and development sites;
- Tree work, pruning and cable support systems;
- Nursery practice, tree selection, planting and establishment practices.

In 2010 Brad Cadwallader approached the New Zealand Standards Authority on behalf of NZ Arb Association. The response and explanation are provided in the adjacent panel.

There are two different standard issuing bodies; if a standard is a joint effort it is referenced as a AS/NZ xxxx standard; whereas if we work on adopting the standard as is or with some minor amendments to reflect NZ conditions and terminologies then the standard would be referred to as NZ AS xxxx standard.

The process of adopting an existing national industry standard such as an Australian Standard has an application and processing fee of >\$10K for a simple application and upwards of \$50K if the application is subject to appeals or disputes on its adoption by those consulted during the process of assessment and public notification.

The standards authorities are required under the Standards Act 1988 to consult on the formal adoption of any standard. Draft standards are available for comment for a period of 6-8 weeks. This enables any affected or interested party to make submissions. The committee then decides what, if any, changes may be needed before the standard is approved and adopted in NZ.

It may be worth a vote at the next annual meeting should there be a desire to progress this option.

Jaiden Palmer, NZ Arb vice president, has provided some valid points on the standards survey:

If we were to develop a standard where would it fit best? Under Health, Safety & Environment or Quality Management? The standards we are already familiar with likely fall into both of these categories. Jaiden also pointed out that standards are most effective when they are referenced as a regulatory requirement in legislation and employed as a means of compliance. Once a standard is referenced it becomes part of the technical regulatory framework and is therefore enforceable. It is safe to say that the survey revealed an industry desire to adopt an industry-wide approach. The results are positive and show to me the desire 'we' all have to improve and unify our approach to tree care in New Zealand. It was also evident that the response to the question of developing our own NZ standard was not supported at this stage, and that adoption of one that is already available was the preference of 48.60% of those who responded. Some 42.22% of the membership were most familiar with the British Standards, and 28.89% claimed most familiarity with the Australian Standards. Combined, these figures represent 77% of respondents who are familiar with the AS or BS standards.

In review the two documents reveal only limited differences in wording and detail. Terminology is relatively consistent and the units of measurement are metric. Both provide guidance on how to implement steps during the planning process and site development that will ensure the trees are least impacted. I encourage the use of the terminology as applied in these documents. During this review of the need for industry standards in New Zealand, it also appears that there are existing options for endorsement of NZ industry best-practice guidelines. When I was recently in the UK I spoke with Jeremy Barrell about this topic and he offered opportunities for seeking a solution. Jeremy is working with the Swedish & Canadian Arb Associations at present with an option for the adoption of a process that he has developed with site guidance notes for development and utility work.

Jeremy has offered to work with the NZ Arb Association collaboratively, with an option of adopting the process he has developed for tree care on development sites.

The key for us to focus on now is adoption of a consistent message and method moving forward. It may also provide an opportunity for us to look at how we can document and record our NZ experiences with trees and use this for case studies to inform the debate about how we can better adapt to suit our industry.

Thank you to all who participated in providing feedback toward a unified NZ approach to tree care standards that will help our industry Manage, Grow and Protect the Ngahere. Stay in the groove out there!

If you have any feedback regarding this article series please contact NZ Arb administrator@nzarb.org.nz

# CLIPPINGS

## Pruning Grass in Paradise

Draw Bristow  
Arborist  
editor@nzarb.org.nz

Denuded Coconuts overlooking the Pacific Ocean. The perfect place for getting good with traverse hook.

Coconuts are part and parcel of island life. Every resort will have signs saying "Danger!! Beware of Falling Coconuts!!" The most basic form of coconut palm work is purely de-nutting to prevent this from happening; a 5 kg coconut falling from 5-30m+ can cause a lot of damage to buildings and will result in a very nasty accident if it hits someone.

Moving on from this is the pruning of coconut palms for aesthetic purposes, removal of dead brown fronds, dead seedpods and the messy paper that is prevalent around the fronds. Care has to be taken not to over-prune; turning a palm into a huge carrot is not the right way. Ideally, the fronds should be left at a 9-3 o'clock angle. When possible, it is good to retain a pruned frond butt under the fronds to act as support; this is then removed in the next pruning schedule. It is also known that palm stems are stronger if the coco'nuts' are not pruned too often- it is thought the coco palm puts more energy into producing 'nuts' and the stem becomes weaker as a result. You can often see narrower stems where the palm has been over-pruned in the past.

It's not all hard work though; tall coconut palms are the perfect place for traversing using a traverse hook. A traverse hook enables you to work on many palms from just one anchor point. It is a lesson in trusting your traverse anchor... though it's a lot of fun.

### Different Techniques

**Traditional:** This is a free ascent with no ropes or harness that requires just grip and strength. It requires no fancy equipment but has a rather large downside in that you are at the risk of falling at any moment. It's impressive to watch but not really in the realm of modern tree practices!

**SRT rope ascent:** as with SRT tree climbing tech, this is broken down into canopy anchor and base anchor. It starts with a throwline over the fronds; for a base anchor, you want to have the rope going over the middle of the fronds and then tied off to the anchor. The main disadvantage is that you are relying on the rope not moving from the centre and if you traverse the likelihood of this happening can be high. Canopy anchor involves throwing over a few fronds but then having the rope tied around the stem when it gets pulled aloft. It can be frustrating getting the rope in place, but this is the most secure way of ascending. Both techniques require good throwline skills, especially on cocos over 25m tall and then getting the throwball back to the ground and the rope installed can be a lesson in patience and frustration!

**Spiked ascent:** The use of spikes is the most common technique of coco palm work. The norm is just spikes, harness and a flipline; it is a quick setup. The downside is that it does not allow a safe descent in an emergency such as a bee/hornet attack. My preferred take on this is to use my climbing line (set up SRT) in a choked format as my flipline. It allows you to flip your rope as usual but gives the option of descent if needed. The lanyard is just your second line when cutting. For many cocos where you cannot get a throwline up, this is the go-to option.

**Tree Stands:** Tree stands are just that. Tree stands are commonly used in deer hunting. The use of stands is widespread in Maui, Hawai'i and is a technique that requires an article in itself! It involves a platform

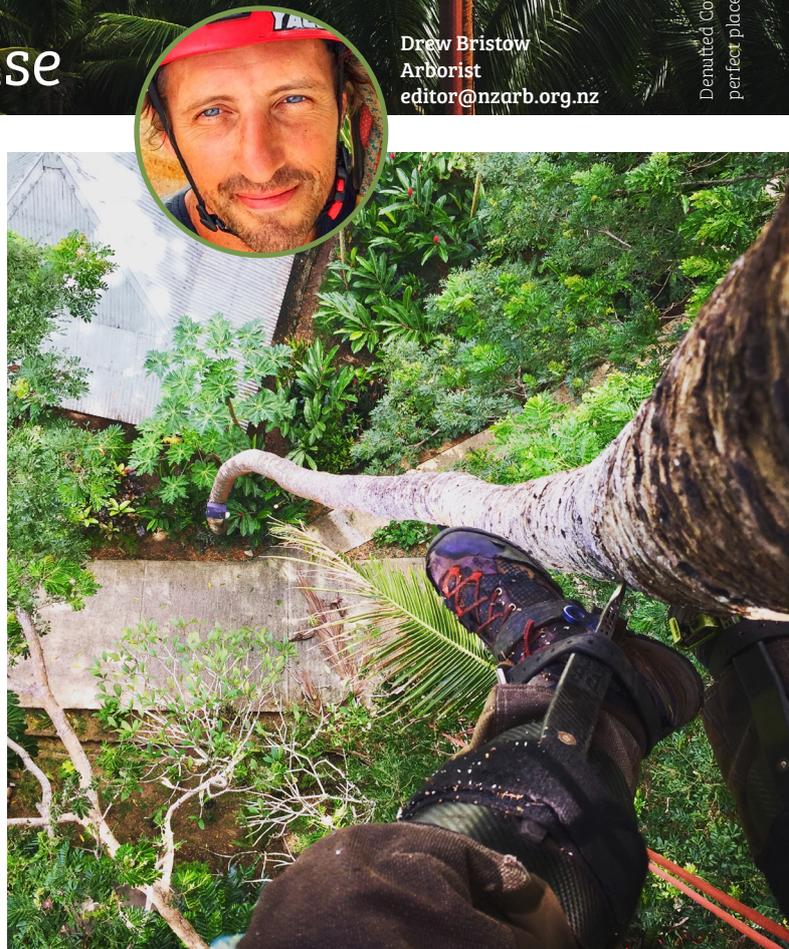


Figure 1 Using spikes on a bendy coconut palm in Fiji. Whilst the bent stem can be unnerving as it moves, it is generally as strong as a straight stem

Figure 2 Traverse line setup in tall coconuts. This technique is a huge energy saver but is reliant on hook placement and just a little bit of luck.



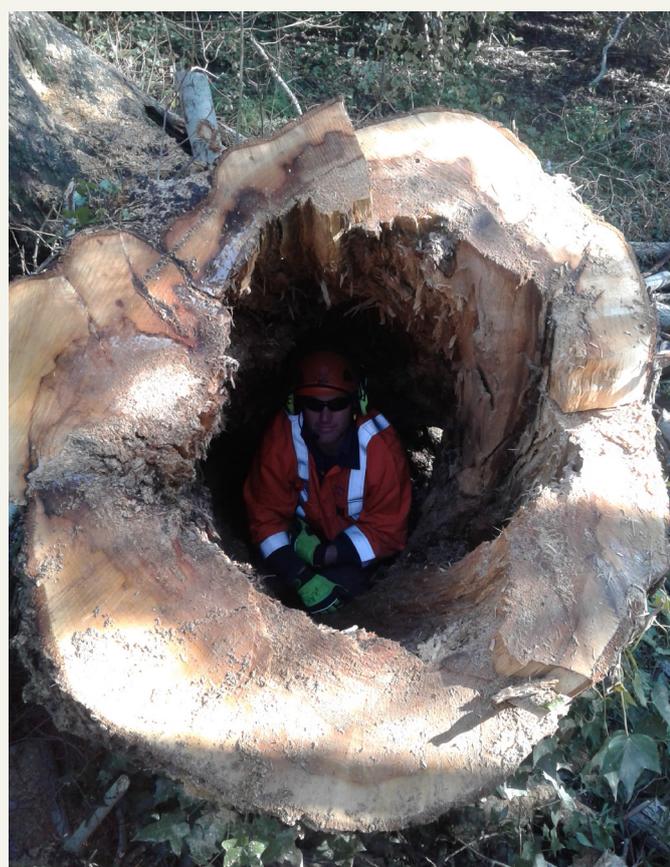
for your elbows and a platform for your feet to stand on. Lean on your elbows and drag the feet stand up. Stand up and advance the elbow stand, repeat. Almost minimal damage to the coco but a total core workout! It gives you a very stable platform to work from but feels odd as you aren't touching the coco. While ascending you either have a flipline or the (described above) SRT line as your security. Once work has finished, you can unstrap the stands and descend on the rope.

Other: There are undoubtedly other techniques for climbing coconuts that are used around the world; these are just the ways I have used in Fiji and Hawai'i.

**Drew Bristow is a New Zealand arborist currently living and working in Fiji and the Pacific region.**



Large poplar felled adjacent to power lines at Palmerston in July 2018. While it presented outer peace and tranquility... It lacked inner piece and stability!! Utility Arborist, Adam Kirkman



## Senior Arboriculture & Ecological Specialist

- Opportunity to influence arboriculture and ecological restoration in Auckland
- Various levels of roles available across a diverse portfolio
- Make tangible and visible improvements to the environment

**The opportunity**  
Auckland Council's Community Facilities Department is an exceptional facilities function (for assets of both land and buildings) that is financially astute and delivers on expectations and aspirations. As kaitiaki (guardian) of facilities, we have an important role in facilitating the wider social, economic, environmental and cultural outcomes that promote the well being of our communities.

Arboriculture and Ecological Restoration Specialists work out of the Operational Management & Maintenance Unit, the remit of which is to ensure a seamless delivery of high quality management and maintenance of council assets (green, open space and built) across the Auckland region. In these roles, no two days are the same. They are hands on within a diverse portfolio across a number of different landscapes.

You will enjoy the support of experienced likeminded colleagues with a strong team ethos. Dependant on the level of your role daily duties might include managing contractors and suppliers, developing plans for the ongoing maintenance of trees and identified ecological areas in local parks and public open spaces, fostering relationships within communities, conducting safety assessments and proactively making process improvements. You will also provide technical advice and contribute to design and tree protection measures involving utility works, infrastructure and land development. Additionally, you will participate in planting programmes that provide for natural habitats and ecosystems. As the point of contact for any queries on the maintenance of arboriculture and ecological restoration programmes you will be focused on improving our natural environment while creating self-sustaining environments for the benefit of the public.

**About you**  
Because of the technical skills and experience required to successfully carry out this role, you will have a recognised arboriculture qualification and a clean driver's licence. More broadly, you will be a collaborative team player with commercial acumen who is passionate about the environment and consistently strives to improve efficiencies. Having recognised experience in maintenance delivery, you will be able to spot issues early and put maintenance plans in place. Importantly, you will also have demonstrated involvement in contract management of suppliers and contractors to achieve service deliverables.

**What we offer**  
In return, you will be immersed in a team of passionate urban foresters and environmentalists where you will have the opportunity to grow and develop your career in this truly unique role within the industry.

If you are high performing, passionate about the world around you and would like the chance to make tangible and visible improvements to the environment, then join us. Submit your expression of interest today by cover letter, addressing the key criteria, along with your CV to Laurie Sabo at [laurie.sabo@aucklandcouncil.govt.nz](mailto:laurie.sabo@aucklandcouncil.govt.nz). To discuss this opportunity confidentially please email or call Laurie (mob +6421570340).

*Auckland Council is an equal opportunity employer (EOE) and we are committed to providing a working environment that embraces and values diversity and inclusion. If you have any support or access requirements, we encourage you to advise us at the time of application to assist you through the recruitment process*



## PLANT ID CHALLENGE

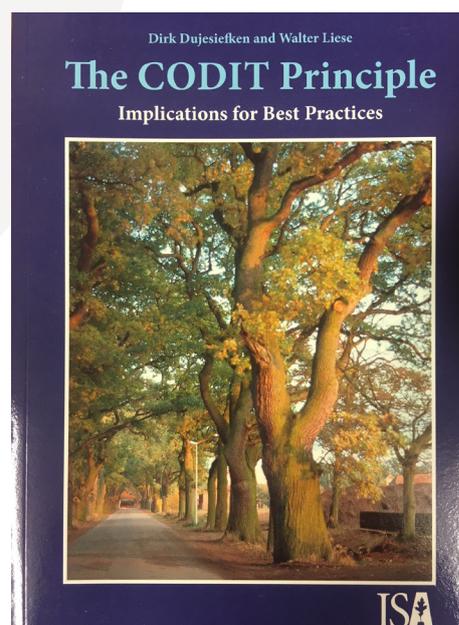
# WHAT AM I?

by Matthew Priestley

- I have piercing and sucking mouth parts
- I am most damaging during the nymph and adult stage
- I feed on fig trees; my favourite is the Moreton Bay fig
- I shed my skin in a series of moultings as I develop into an adult
- As an adult female, I lay tiny orange eggs in clusters on the underside of leaves
- I use sticky latex from the host plant to protect myself
- I am predated on by certain wasps, lacewings, ladybirds, spiders, and birds
- I can cause partial or complete loss of foliage
- I am a New Zealand introduction

Test your troubleshooting and identification skills by submitting your answer to [editor@nzarb.org.nz](mailto:editor@nzarb.org.nz). Accurate answers go in the draw to win a copy of **The Codit Principle**, courtesy of Treescape®. The correct answer and book winner will be published in the next issue of Tree Matters.

The answer to the Winter 2018 ID challenge is *Agrocybe parasitica*, commonly known as the poplar mushroom. Congrats to Sean McBride for winning a copy of Up By Roots.



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# NZ ARBORICULTURAL ASSOCIATION ANNUAL CONFERENCE

**8 - 10 NOVEMBER 2018 DUNEDIN TOWN HALL**

IN ASSOCIATION WITH



## PUTTING IT ALL TOGETHER: CONNECTING PEOPLE, IDEAS, AND COMMUNITIES

**New Zealand's annual get-together for the arboricultural industry is returning  
8-10 November 2018 at the Dunedin Town Hall.**

The programme will look at key industry trends and issues in the Arboriculture industry and will include a combination of sessions covering both professional and practical topics. This year we welcome our overseas keynote speakers, Ted Green, President of the Ancient Tree Forum and Honorary Vice President of the International Tree Foundation and Dr. Edward F. Gilman, Professor of the Environmental Horticulture Department at the University of Florida. The conference will also provide attendees with the opportunity to network with like-minded professionals and connect with fellow practitioners and suppliers. Remember to book your flights early - click here for information to plan your visit.

Keep an eye out for the conference programme which is going to be out in early August.

**You can't afford to miss New Zealand's only Arboriculture Industry Conference  
Registrations are now open. Early-bird registrations close on 30th September.**

[www.nzarbconference.co.nz](http://www.nzarbconference.co.nz)

**THU  
8 NOV**

Conference Day +  
Welcome / Exhibitors Function +  
NTCC Gear Check

**FRI  
9 NOV**

Conference Day +  
NTCC Prelim Events +  
Joint BBQ Function

**SAT  
10 NOV**

Workshop +  
NTCC Prelims & Masters +  
Conference & NTCC Awards Dinner

## SOCIAL FUNCTIONS

### WELCOME FUNCTION & GEAR CHECK

Thursday 8 November 6:15pm - 8:00pm  
Dunedin Town Hall - Main Auditorium/Exhibitor Hall  
Entry via Glenroy Theatre on Harrop Street  
Included with full registration - Extra tickets for guests - \$35.00 + GST  
An invitation is extended to all delegates to attend the Welcome Function. Enjoy light nibbles and beverages and the opportunity to relax and network.

### FOOD TRUCK FRIDAY

Friday 9 November 5:30pm - 7:00pm  
Harrop Street Trade Zone  
Included with full registration - Extra tickets for guests - \$25.00 + GST  
An invitation is extended to all delegates to attend a joint informal Function for Climbers and Delegates. Enjoy drinks and nibbles and the opportunity to relax and network.

### CONFERENCE DINNER

Saturday 10 November 7:00pm  
Dunedin Town Hall - Main Auditorium  
\$95.00 - \$125.00 + GST  
Join your fellow conference delegates at the Conference Dinner which will be held at the Dunedin Town Hall and includes a 3-course meal, drinks, and dinner entertainment.

## 2018 Student Mentor Lunch in association with Treotech

Once again, arboriculture students, trainees and apprentices will be invited to attend a special networking lunch, with a group of mentors from different sectors of the industry. Over lunch, students and trainees will get the opportunity to chat with industry representatives and learn about some of the career pathways available in arboriculture.

Treotech's Chris Walsh, 2018 Student Mentor sponsor says, *'For many it is the first intriguing encounter with arboriculture career options not involving tree climbing. For some, it can be the beginning of a developing plan for a lifelong career in arboriculture.'*

The Student Mentor Lunch, in association with Treotech, kicks-off at 12.30pm, Thursday 8 November, as part of the 2018 NZ Arb Conference, at Dunedin's Town Hall.

If you would like to register a student, trainee and apprentice for the Lunch, please email [comms@nzarb.org.nz](mailto:comms@nzarb.org.nz)



**NEW ZEALAND ARBORICULTURAL ASSOCIATION**  
ANNUAL CONFERENCE - DUNEDIN TOWN HALL  
IN ASSOCIATION WITH ASPLUNDH

**Thursday 8 November**

Conference MC: Jennie Vickers NZDIA

From 7:15am			REGISTRATION DESK OPEN - Glenroy Foyer - Harrop Street
Room	Fullwood Room - Level 3		Trade Area
8:00 - 8:15	<b>WELCOME &amp; HOUSEKEEPING - OPENING BY NZ ARB PRESIDENT</b>		
8:15 - 9:00	<b>International Keynote: Ted Green</b> <i>President of the Ancient Tree Forum</i> The importance of ageing gracefully		
9:00 - 9:45	<b>International Keynote: Ed Gilman</b> <i>University of Florida</i> Tree structure that helps trees resist failure		
9:45 - 10:30	<b>Plenary Speaker: Dr Neil de Wet</b> <i>Toi Te Ora Public Health</i> Biophilic public health: Kākā, kauri and our health expectancy		
10:30 - 11:00			<b>MORNING TEA - Exhibition Hall - Main Auditorium</b>
Room	<b>GENERAL ARB STREAM</b> Fullwood Room - Level 3	<b>PRACTITIONERS STREAM IN ASSOCIATION WITH COMMERCIAL OUTDOOR MACHINERY</b> Stage - Main Auditorium	
		<b>Chair: David Stejskal</b> <i>Auckland Council</i>	
11:00 - 11:45	<b>Lily Burrows</b> <i>Dunedin City Council</i> Assessing consent, a city planner's perspective on resource consent	<b>Andreas (Rossy) Ross</b> <i>Pro Climb Limited</i> Aerial Rescue when Confronted with Spinal Injury	
11:45 - 12:30	<b>Dr David Orlovich</b> Arboreal fungi - more fun than you can shake a stick at	<b>Andy Neverman</b> <i>Self employed, Contract Climber and Trainer to Thoughtplanters NZ Limited</i> "Tips and Tricks" Reloaded	
12:30 - 13:15			<b>LUNCH &amp; STUDENT MENTORS LUNCH IN ASSOCIATION WITH TREETECH</b> Exhibition Hall - Main Auditorium
Room	Fullwood Room - Level 3	Stage - Main Auditorium	
13:15 - 14:00	<b>Craig Webb</b> <i>CWCA Limited</i> An A-Z of report writing	<b>Andrew Harrison</b> <i>WINTEC</i> Lean - Mean - Tree Climbing Machine!	
14:00 - 14:45	<b>Jez Partridge</b> <i>Treecology Tree Consultancy</i> Amenity Tree Evaluation Methodologies in New Zealand	<b>Sam Turner</b> <i>Ropework. Education. Design. Limited</i> LogA - A Data Collection Tool for Arborists	
14:45 - 15:15			<b>AFTERNOON TEA - Exhibition Hall</b>
Room	Fullwood Room - Level 3	Stage - Main Auditorium	
15:15 - 16:00	<b>Nikole Wills</b> Trees through that ages - a civilisation fuelled by trees	<b>Menno Kluiters</b> <i>Tree Consultant</i> Myrtle Rust	
Room	Fullwood Room - Level 3		
16:00 - 16:45	<b>James Fletcher</b> <i>Treescape</i> From Compliance to Engaged Health & Safety Leadership - an Opportunity for our Industry (Sponsored by Treescape)		
16:45 - 17:05	<b>Andrew Benson</b> <i>University of Canterbury</i> The use of temporally normalised electrical resistivity profiles to track the spread of decay in trees		
17:05 - 18:00			<b>NZ ARB ANNUAL GENERAL MEETING &amp; INTRO OF CLIMBERS</b>
18:00 - 19:30			<b>WELCOME FUNCTION / GEAR CHECK (TRADE ZONE - MAIN AUDITORIUM)</b>

Trade Zone & Husqvarna Espresso Lounge

## Friday 9 November

7:30 - 8:00	REGISTRATION DESK OPEN	
Room	Botanical Gardens	Trade Area
7:30 - 8:30	CONSULTANTS WORKSHOP	
Room	Fullwood Room - Level 3	Stage - Main Auditorium
8:30 - 9:15	<b>Ted Green</b> <i>President of the Ancient Tree Forum</i> You can't become ancient without getting old first	<b>Dan Holliday</b> <i>Climbingarborist.com</i> The Internet, a good resource for Arborist training? Or could it end in disaster?
9:15 - 10:00	<b>Ed Gilman</b> <i>University of Florida</i> Pruning you wont forget	
10:00 - 10:30	MORNING TEA	
Room	GENERAL ARB STREAM Fullwood Room - Level 3	UTILITY ARB STREAM IN ASSOCIATION WITH POWERNET - Stage - Main Auditorium
		Chair: <b>Mark Way</b> <i>Otago Power</i>
10:30 - 11:00	<b>Gordon Bailey</b> <i>Central Otago District Council</i> Tree population management - where size does count	<b>Trevor Gardiner</b> <i>Thoughtplanters</i> UA Level 3 Qualifications
11:00 - 11:30	<b>Judy Gardner</b> <i>Scion Research</i> Forest and tree diagnosis at Scion	<b>Dr Selwyn McCracken</b> <i>Stantec New Zealand Ltd</i> Satellite Imagery
11:30 - 12:00	TBC	<b>Open Discussions with UA Committee</b> Discussion about Pros/Cons of Utility Arborists becoming Registered Electrical Workers
12:00 - 13:00	LUNCH	
Room	Fullwood Room - Level 3	Otago Museum Reserve 419 Great King Street, Dunedin
13:00 - 13:45	<b>Howell Davies</b> Sustainability and biodiversity of urban forests	<b>NZ Arb Husqvarna National Tree Climbing Championship Preliminary Events:</b>  <b>AB Equipment Speed Climb</b> <b>Kask Work Climb</b> <b>Silky Saws Aerial Rescue</b> <b>Donaghys' Ascent</b> <b>MetroGreen Throwlin</b>  12:00 - 5:30pm
13:45 - 14:30	<b>Alan Matchett</b> <i>Dunedin Botanical Gardens</i> Growth and timing at New Zealand's oldest botanic garden	
14:30 - 14:45	CONFERENCE CLOSE	
14:45 - 15:15	AFTERNOON TEA	
15:15 - 17:30	Notable Trees Field Trip	
17:30 - 19:00	<b>Food Truck Friday! A Joint Informal Function for Climbers and Delegates AT THE TOWN HALL (Harrop Street)</b>	
18:00	NEW ARBORIST OF THE YEAR COMPETITION KINDLY SPONSORED BY HANSA AND TREEHUB	

Trade Zone & Husqvarna Espresso Lounge

## Saturday 10 November

Room	Botanic Gardens	Otago Museum Reserve H D Skinner Annex Gallery		Otago Museum Reserve
9:00-10:30	<b>Workshop</b> <b>Ed Gilman</b> Planting and pruning to resist failure			<b>NZ Arb Husqvarna National Tree Climbing Championship Masters Challenges*:</b>  <b>Treetech Men's Masters Challenge</b> <b>Arb Innovations Women's Masters Challenge</b>  *Incomplete preliminary events will be concluded prior to start of Masters' events  <b>Venue: Otago Muesum Reserve</b> <b>Start Time: 8:00am</b> <b>Masters' Challenge: 12:00pm</b> <b>Finish: 16:30pm</b>
10:45-12:15	<b>Workshop</b> <b>Ted Green</b> Read the trees	10:30-11:15	<b>Public Lecture</b> <b>Mark Roberts</b> Critical thinking in arboriculture	
		11:15-12:00	<b>Public Lecture</b> <b>Mark Roberts</b> Trees in a Changing Environment	
19:00	<b>CONFERENCE DINNER, AWARDS &amp; AUCTION - DUNEDIN TOWN HALL</b> MC: Jennie Vickers NZDIA			

## WORKSHOPS

### BRANCH ARCHITECTURE AND STRUCTURE ON PLANTED TREES: PRUNING TO RESIST FAILURE

by Ed Gilman

Saturday 10th November 9:00am - 10:30am  
 Main House, Dunedin Botanical Gardens  
 12 Opoho Road, North Dunedin.  
 \$100 + GST or \$175 + GST for both workshops

*"Our profession is changing; are you on top of your game now and can you deliver the latest strategies designed to provide the most professional care package? Whether it's a tree with a one-inch trunk diameter or four-foot diameter, the strategies are similar."* – Ed Gilman.

This is to invite you to participate in a workshop intended to help you better understand "Designing sites to fit desirable trees" – The right tree for the right place is no longer enough, we need to be "Designing the right place for the right tree". Learn how to design spaces to support tree growth so your design vision can be fulfilled. Topics include making space for tree roots, traditional urban landscape designs vs. designs that actually work and why. And once the trees are in the ground, we need to know how to manage them. This workshop will draw on Ed's considerable knowledge of practical experience, including

- Prune at planting? I thought we didn't do that!
- Comparing pruning approaches and methods on medium aged trees
- Reducing risk on pruning mature trees
- Experienced arborists, landscapers, and beginners alike will come away with a fresh, new perspective on evaluating and pruning trees for longevity.

*"Ed Gilman is such a dynamic and engaging speaker. We feel very lucky to have use of his time for the NZ Arb Conference for 2018. Out of all of the Conferences I have been to, the one day that I have spared listening to Ed talk and impart his expert advice about formative tree pruning was by far the most memorable. It was great to listen to someone talk so informatively and passionately about a subject that I wanted to hear about! The material truly resonated with me and is sure to engage our Dunedin audience!"*

Testimonial 17/07/2018

David James – David James Tree Services and NZ Arb Committee Member

### ANCIENT TREES AND BRITS - A LAYMAN'S THOUGHTS ON ARBORICULTURE TODAY

by Ted Green

Saturday 10th November 11:00am - 12:30pm  
 Main House, Dunedin Botanical Gardens  
 12 Opoho Road, North Dunedin.  
 \$100 + GST or \$175 + GST for both workshops

This workshop will question what you thought you knew about trees. *"I think we have arrived at a point where it's impossible to say at this moment in time what Fungi, Bacteria or other micro-organism communities are actually doing in a tree. A tree is merely an individual, unique, dynamic support system for these communities occupying a tree."* – Ted Green.

The workshop will help you better understand some of the issues that surround ancient trees and how to care for them – but before you can care for them, you need to be able to answer the fundamental question; What's a tree?

Read the trees--an outdoor debate on the lines of the very successful Ancient Tree Forum gatherings in the UK. Join Ted as he shares his experiences in the ever-changing world of arboriculture. Active participation required!

# CONFERENCE SPEAKERS



## **TED GREEN**

*President of the International Tree Foundation, MBE*

Founder member and President of the Ancient Tree Forum and Honorary Vice President of the International Tree Foundation. He was awarded an MBE in recognition of his work in conservation, especially with trees and fungi. He was awarded an honorary lectureship by Imperial College, for his outstanding contribution as a technician to science and education. He was given the Arboricultural Association Annual Award for his services to arboriculture. Recently was awarded the prestigious Gold Medal by the Royal Forestry Society. Ted was named in a poll of the UK Environment Agency in 2006 as one of their "Top 100 eco-heroes as voted by their peers." Ted has worked for Natural England as Conservation Liaison Officer to the Crown Estates at Windsor and later became and remains their Conservation Consultant. Ted is a regular writer, broadcaster and speaks regularly at international conferences on ancient trees, Pollards, wood pasture and parkland and fungi.



## **DR. EDWARD F. GILMAN**

*Professor, Environmental Horticulture Department  
University of Florida*

The 2018 Conference Keynote Speaker is Dr Edward Gilman, Professor, Urban Trees & Landscape Plants in the Environmental Horticulture Dept of the University of Florida. In 1999, Dr. Gilman received the prestigious R W Harris Author's Citation Award from the International Society of Arboriculture for his books and web sites on trees and landscape plants. He has also received the ISA educator and research awards. Dr. Gilman serves the landscape industry and allied professions with his teaching and research efforts worldwide. He lives in Jacksonville, Florida with his wife of 35 years and they have two daughters. Away from the world of plants, Professor Gilman enjoys the craft of woodworking.



## **GORDON BAILEY**

*Parks and Recreation Manager - Central Otago District Council*

**Friday 9 November | 10:30-11:00am**

### **Managing Large Tree Populations or Tree Collections**

Gordon's presentation will try and address some topical tree issues facing our ever increasing urban lifestyle and the role arborists can play in achieving a successful outcome for all concerned.



## **ANDREW BENSON**

*The University of Canterbury*

**Thursday 8 November | 4:45 - 5:05pm**

### **The use of temporally normalised electrical resistivity profiles to track the spread of decay in trees**

Minimally destructive tree decay detection techniques such as resistance drilling, or tomographic techniques using stress wave timing, thermal imaging, or electrical resistivity are often employed by urban forest managers, tree assessors and researchers of forest pathology to detect internal defects and decay in standing trees. These methods provide a useful snapshot of the internal condition of a tree, although may not fully reveal the spread of incipient stages of decay. In this study, electrical resistance profiles of wounded *Magnolia grandiflora* L trees were temporally compared by extracting spatial resistivity data in consecutive adjoining 2 mm bandwidths throughout the trees in 2016 and again in 2017. Using matched spatial data (assuming uniform lateral expansion), the resistivity profiles for 2017 were normalised against the 2016 profiles and electrical resistivity profiles were rendered by spatially interpolating the normalised resistivity data ( $\Delta\Omega$ ) using extracted spatial coordinates. Changes in electrical resistance for control trees (no wound) were consistent with heartwood formation, with an inner region of high resistivity surrounded by a ring of lower values. Changes in electrical resistance to wounded trees revealed regions of reduced resistivity which were spatially correlated with the location of the wound. The results of this research have practical benefits to tree diagnosticians who will be able to temporally monitor the spread of decay in standing trees using electrical resistance tomography.



### **LILY BURROWS**

*Planning Technician - City Planning - Dunedin City Council*

**Thursday 8 November | 11:00 - 11:45am**

#### **A City Council's role in protecting significant trees.**

Trees are a vital resource that add to a city's amenity and beauty. The Resource Management Act 1991 enabled council's the power to identify significant trees and protect them from felling. What are 'significant' trees? In this case, they are trees that have been identified by members of the public or council as being special. If the tree passes a STEM assessment, it can be listed within a schedule of a council's District Plan. This means that whenever a person wants to remove or prune a significant tree, they must go through the resource consent process.

What is the point of having a list of significant trees? Its purpose is to protect trees from people's changing values and perception of the importance of trees. While there are many benefits to protecting significant trees, there are also some negatives. For instance, if a person buys a property with a significant listed tree on the site that they do not see the benefit of, then they cannot remove it without resource consent. The resource consent process will be explained throughout the presentation, including how planners assess effects and the differences between notified and non-notified resource consents.



### **HOWELL DAVIES**

*Senior Urban Forest Advisor - Parks, Sports & Recreation, Auckland Council*

**Friday 9 November | 1:00 - 1:45pm**

#### **An Urban Forest strategy, the mechanisms and tools needed to design and deliver it – a city within a forest or a forest within a city?**

The Auckland Council Urban Ngahere Strategy was adopted by the Councils' Environment Committee in February 2018. Howell is presenting on the process of development, and adoption of the Auckland Council Urban Ngahere (Forest) Strategy. He will describe what it means, and how it is going to be potentially beneficial for the regions tree cover, and how this is going to be measured in the future.

The strategy sets targets for the long-term tree cover for the region and Howell will talk about the development, the process, the challenges and the benefits of having this strategy.

Auckland has seen major change over the last 20 years and population growth is currently averaging >60,000 new residents a year, and a need to house a projected 700,000 new residents over the next 30 years; the region's growth is impacting on the tree population. By how much is not well understood and this is important for the region's future tree cover. The strategy is going to be released later this year and will be a significant step forward as a guidance document for the management of the region's trees in urban and future urban areas. The strategy is a plan for the future, sets key objectives to better deliver our tree maintenance and management operations and is based on the need to "Know, Grow, and Protect" our urban Ngahere by managing the asset and engagement with key stakeholders. Howell will outline what is planned going forward with the strategy implementation and discuss how the council's new field data collection system will help build a better and significantly more accurate view of the region's tree cover. The presentation will cover the basics of this system and how it is planned to integrate this with I-tree once the New Zealand version is released. Howell will also provide an update on the progress of the national I Tree project and is willing to talk about the project's development at any time during the conference.



### **JAMES FLETCHER**

*Chief Executive Officer - Treescape®*

**Thursday 8 November | 4:00 - 4:45pm**

#### **From Compliance to Engaged Health & Safety Leadership – an Opportunity for our Industry**

With a number of recent high-profile incidents and prosecutions in our industry, and the primary industry in general, a major change of legislation, greater requirements for both worker participation and involvement from clients - how do we keep on top of it? And how do we ensure our front line people stay safe?

In this address, James shares the challenges of leading risky businesses, and strategies for transforming a business from merely complying with the law, to engaged health and safety leadership.

Key themes include practices that managers and owners can use to demonstrate health and safety leadership on a day-to-day basis, understanding and managing risk, a shift in thinking from the absence of harm to the presence of good, building a safety culture and monitoring what matters.



### **JUDY GARDNER**

*Diagnostic Manager in Forest Pathology - Forest Protection, Scion*

**Friday 9 November | 11:00 - 11:30am**

#### **Forest and tree diagnosis at Scion**

The Forest Health Reference Laboratory is a limb of the Forest Protection team at Scion. Its role is to diagnose and report on samples received from the High Risk Site Surveillance programme of the Ministry for Primary Industries (MPI), forest health surveillance under the umbrella of the Forest Owner's Association and from public enquiries, including those from arborists and tree specialists. The diagnostic laboratory is also closely linked to research projects being undertaken at Scion. Besides helping to protect trees and forests from existing pathogens and insect pests it also has a strong biosecurity responsibility and reports to MPI any organisms found to be new to New Zealand. In particular a watch is kept for unwanted organisms such as the agent of sudden oak death. The FH Reference laboratory is ISO accredited for the morphological identification of fungi and carries out molecular identification. DNA sequencing has become essential to the rapid identification of many fungal species. Diagnosis of fungal pathogens and abiotic disorders comprise the bulk of the work, but samples suspected to involve viruses, nematodes or bacteria are forwarded to the MPI Plant Health and Environmental Laboratory. In any one year over 700 samples are processed. This presentation will describe the work of the pathology side of the FH Reference Laboratory, including examples of some of the organisms most commonly encountered and a few of those that are less so. Particular attention will be given to those of most interest to arborists and other tree specialists.



### **DAN HOLLIDAY**

*ISA Certified Arborist & founder of ClimbingArborist.com & Grizzly Tree Experts*

**Friday 9 November | 8:30 - 10:00am**

#### **The Internet, a good resource for Arborist training? Or could it end in disaster?**

Dan will discuss the role of the internet in modern-day arboriculture, if it should be used to seek information as a training tool to progress your skills as a climber, or if this is a dangerous path where people will pick up bad information and techniques. Questions/discussion the audience will be encouraged to get real examples of good and bad information collected from the internet.

#### **Safe use of chainsaws in the canopy and optimal work positioning**

In the later half of the talk, Dan will get into the topic of the safe use of chainsaws while in the canopy coupled with optimal and efficient work positioning to make your cuts easier, put less stress and strain on your body and all while working in a safer more controlled way.



### **MENNO KLUITERS**

*Tree Consultant*

**Thursday 8 November | 3:15 - 4:00pm**

#### **Myrtle Rust**

In May 2017 a new fungal pathogen was found on mainland New Zealand: Myrtle Rust. Much is unknown on how it will affect our iconic Myrtaceous trees in the long term. At the time of writing, Myrtle Rust was recently found in the South Island, and much will change by the time of the conference. This presentation investigates the available data and latest observations from the field. There will be in-depth background information on the lifecycle and climatic preferences of Myrtle Rust as well as what hosts are most affected and how it ultimately may impact our trees. The presentation will conclude with a discussion on how we should manage Myrtle Rust.



### **JEZ PARTRIDGE**

*Treecology Tree Consultancy*

**Thursday 8 November | 2:00 - 2:45pm**

#### **Amenity Tree Evaluation Methodologies in New Zealand**

Councils have had the ability to restrict the removal and trimming of trees in their District Plans for some 25 years. However, the number of trees protected in each District Plan is highly variable. Some Plans protect no trees at all, whilst others protect hundreds. For the first time, a comprehensive database of the number of protected tree and evaluation methodologies being used by every Council in New Zealand has been compiled.

The Standard Tree Evaluation Method (STEM) remains the most commonly used methodology for evaluating trees, but new methodologies are also in use. A common thread between new and old is that they use a numerical threshold to determine whether or not a tree should be protected. This threshold has a critical influence on how many trees are ultimately protected by each District Plan, as do other factors such as whether the tree owner's consent is required to protect a tree.

For this investigation, every NZ Territorial Authority was contacted and asked to supply information on the number of protected trees, the evaluation methodology used, the numerical threshold for inclusion, whether a landowner's consent is required, and whether Councils contribute towards the cost of protected tree management.

The information obtained has been analysed using charts and infographics to compare and contrast current practice across New Zealand. Results are discussed, and conclusions are drawn as to how the variabilities discovered influence the numbers of trees protected by each Council, and implications for current and future practice.



### **CRAIG WEBB**

*Consultant Arborist - CWCA Limited*

**Thursday 8 November | 3:15 - 4:00pm**

#### **An A-Z of report writing**

Craig will present 26 fundamentals of report writing in alphabetical order. This will cover some of the do's and don'ts of professional reports. The presentation is aimed at arborists and similarly-aligned practitioners that may be starting out with report writing, or those with some experience that wish to gain more understanding of the art of report writing.



### **NIKOLE WILLS**

*University of Otago*

**Thursday 8 November | 3:15 - 4:00pm**

#### **The Archaeology of Aboriculture: Using charcoal to explore forest management in the past.**

Trees play a significant role in all societies; the dynamic process of human-induced vegetation change in forested landscapes provides information on cultural practices, management techniques, and vegetation response to disturbance. However, how can we observe this process when it took place hundreds of years in the past and without a written record? The answer is charcoal. Charcoal is the by-product of burning activity. When found in an archaeological context it becomes an ecofact which tells a story of the activities of people in the past. This talk will describe the process of identifying charcoal to species and how we can use this information to reconstruct the impact of humans on the landscape by understanding how they managed the forest taxa available to them. Charcoal, in conjunction with traditional narratives, provides information such as how wild vegetation was managed, changed and used, the role of post-disturbance successional species re-growth, and preferential selection of forest taxa. Examples from research throughout New Zealand, and specifically the Chatham Islands, Coromandel Peninsula, and Waikato, will be used to explore what we know of forest management and change in the past, and where this research can take us in the future.



### **DR NEIL DE WET**

*Medical Officer of Health - Bay of Plenty District Health Board*

**Thursday 8 November | 9:45 - 10:30am**

#### **Biophilic public health: Kākā, kauri and our health expectancy**

The possible health benefits of experiencing and interacting with trees, nature and healthy ecosystems in our daily lives are increasingly being understood and recognised. These include lowering stress hormones, improving immunity, lowering blood pressure, less depression and anxiety, less cardio-vascular disease, and possibly lower cancer risk and longer life expectancy. For children, there are likely benefits in terms of physical and social development, cognitive development and learning, less risk of obesity, and helping cope with the adverse effects of stressful experiences in childhood. There are also likely wider benefits such as improving the quality of our social interactions, helping reduce some of the harmful health effects of socio-economic disadvantage, and increasing our sense of well-being, belonging, meaning and purpose.

This presentation draws on the ideas and concepts of biophilic design and biophilic cities to describe a transformation of public health thinking and practice that is defined by our innate 'love, awe and respect' for nature. It explores how biophilic approaches that value and nurture nature in places where we live, learn, work and play can help improve health and well-being. Such a biophilic approach can not only help with current population health challenges related to preventing and managing conditions such as obesity, diabetes, cardio-vascular disease, cancers, and anxiety and depression but also help address concerns and emerging future impacts on health related to biodiversity loss, ecosystem degradation and collapse, degradation of land and water resources, and those arising from the disruption and instability of the global climate system caused by greenhouse gas emissions. In particular, it describes a 'Health for All' approach where the 'All' is understood as health for humans, other species and ecosystems, so recognising the centrality of healthy, thriving nature for our own health and well-being while also respecting the intrinsic value and worth of other species.



### **ANDREW HARRISON**

*Wintec*

**Thursday 8 November | 1:15 - 2:00pm**

#### **Lean - Mean - Tree Climbing Machine!**

*Staying fit and healthy is essential if you are planning a long and productive climbing career. Keys to maintaining good fitness and health, along with treating injuries carefully will be discussed in this interactive session. Some simple safety tips will also be up for debate. Knowing how to integrate healthy choices into your lifestyle and work could save your career and possibly more. Want to be a Lean - Mean - Tree Climbing Machine? Come along and be a part of the discussion.*

*This session will be formed with the collaboration between health professionals and sports coaches.*



### **ANDY NEVERMAN**

*Contract Climber and Trainer - Thoughtplanters NZ Ltd*

**Thursday 8 November | 11:45am - 12:30pm**

#### **"Tips and Tricks" Reloaded**

In this presentation I will share with you some of the arboricultural "tips and tricks" that I have picked up and learnt from a range of arborists in a range of countries. Simple things that can help those on the tools save time, money and effort. For the climbers and the ground workers. From knot placement to sawdust management, how long should an off-cut stub be, and possibly some SRT? Working smart is easy...



### **ANDREAS (ROSSY) ROSS**

*Managing Director of Pro Climb Limited - Tree Care Auckland*

**Thursday 8 November | 11:00 - 11:45am**

#### **Aerial Rescue when Confronted with Spinal Injury**

We all know what the legal requirements are when it comes to ensuring the safety of arborists accessing trees using arboricultural climbing techniques. One of the most basic requirements is that a second climber is on site who is capable of performing a rescue. In workshops and presentations, Rossy has shown what training and equipment the climbing teams at Pro Climb receive to ensure that a rescue can be completed successfully. He has observed that the system used is not complete but is constantly evolving. Over the past year, Rossy has identified and learned about an injury category that has not been previously identified in his company procedures. Rossy will talk about the rescue of climbers with spinal injuries and open a discussion on how we as an industry can better ensure the safety of our climbers.



### **SAM EVAN TURNER**

*Climber and Technical Consultant - RED - Ropework Education Design Ltd*

**Thursday 8 November | 11:00 - 11:45am**

#### **LogA - A Data Collection Tool for Arborists**

The recording of lift weights when removing trees via crane or helicopter is considered best practice in arboriculture. This is accepted in theory but in reality it is normally neglected. There is a clear need for an easy to use, mobile friendly, digital solution.

LogA provides a data capture solution to arborists whilst still on site, with analysis & colour coded feedback provided in real time. The package appeals to three main tiers within the industry: CLIMBERS - Looking to improve, COMPANY OWNERS/MANAGERS - Looking for hard evidence of their commitment to safety/productivity, TRAINERS/POLICYMAKERS - Looking for insight into how best practice should be developed. During the presentation the system will be described & the process of data capture demonstrated. There will be a workshop on how to read your data and we will finish with an open forum where ideas for future developments can be discussed. LogA allows us to quantify the great body of anecdotal experience that currently exists among arborists.

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## CONFERENCE EXHIBITORS



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## 2018 Trade Show largest ever!

The 2018 trade show will be the biggest the NZ Arb conference has ever experienced.

Between conference sessions delegates will be able to visit 20+ exhibitor stands, see the latest products and innovations in the arb sector, and get up close and intimate with loads of chippers and chainsaws. For the duration of the conference, the Trade Zone in Dunedin's beautiful Town Hall, will be a bustling hub of activity, including all conference catering and networking breaks and the official Welcome Function on Thursday evening.

New to the Trade Zone for 2018 will be first-time exhibitors Kask, Tree HQ, Abbot Insurance, Forestquip and Jaedon.

Also new for 2018 is the 'Husqvarna Espresso Lounge' where delegates will be able to take a break, relax and enjoy a barista made coffee compliments of NZ Arb partner Husqvarna.

# Attending Practitioner Stream will change the way you work

By Andreas Ross (Rossy)

The practitioner stream is a forum where professionals can discuss new tools, new techniques and trends in the industry. It offers the tree-worker arborist a professional development opportunity.

Take part in this industry event and ensure you are up to date with the most relevant industry topics. Be part of the discussion when critical safety issues are addressed and have your say when new working techniques are introduced.

This year we have selected five amazing speakers from around the world.

Dan Holiday, founder of ClimbingArborist.com, will discuss the role of the internet in modern-day arboriculture and whether it is a useful training tool to improve skills or if it is a dangerous path where people may pick up incorrect information.

Menno Kluiters, a Gisborne-based, Netherlands-born consulting arborist will discuss the tracking, recording and management of Myrtle Rust. There will be in-depth background information on the lifecycle and climatic preferences of Myrtle Rust as well as host susceptibility info and how it may ultimately impact our trees. Part of the presentation will be a discussion on Myrtle Rust management.

Andy Neverman, a New Zealand-born and based contract climber and legendary trainer, will share some of his “tips and tricks” that he has picked up and learnt from fellow arborists in a range of countries. The focus will be on simple things that can help you save time, money and effort.

Sam Evan Turner, UK-born and New Zealand-based, is director of Ropework Education Design Ltd, and will introduce a new way to reduce risk potential when conducting crane and helicopter-assisted tree work with his innovative LogA application. During his presentation, the process of data capture will be demonstrated along with how to then use the generated output. An open forum will follow the presentation where ideas for future developments will be discussed.

Andreas (Rossy) Ross, managing director of Pro Climb Limited – Tree Care Auckland, will talk about aerial rescue procedures he has implemented within his company to ensure the safety of the team. The primary focus will be on the rescue of climbers with spinal injuries followed by an open discussion about how we as an industry can improve safety for our climbers.

## Utility Arb Sessions Return to 2018 Conference

Last year's NZ Arb Conference programme in Tauranga saw the return of the popular Utility Arboriculture (UA) stream after several years. The 2017 discussion sessions were well received by delegates and provided the platform from which a 2018 Utility Arb programme has been designed.

“This year's UA programme, sponsored by PowerNet, includes three sessions that combine opportunities for discussion, with presentations on topics relevant to those with an interest in the Utility Arb sector,” advises Utility Arb Chair and PowerNet Arborist Services Manager, Mark Way.

The session is scheduled for Friday morning, 9 November. After an opening address from the Utility Arb Chairman, the first of the three half-hour sessions will take form of a presentation by Trevor Gardiner on the current Level 3 Utility Arb Certification, including a question and answer session. The new qualification is now being delivered and Trevor will give a precis of how it is being received by employers and employees and provide some insight into advantages or disadvantages compared to old qualifications. There will also be discussion on a national qualification for employee betterment as opposed to doing the bare minimum for compliance purposes.

Invitation speaker, Dr Selwyn McCracken, Principal Data Scientist. Stantec New Zealand Ltd, will present from 11.00am on satellite imagery as an option for data capture. Dr McCracken will look at a 2D imagery method for vegetation intelligence gathering from cheap or possibly free satellite sources.

The final half hour will be dedicated to an interactive Q&A discussion session with a panel of representatives from the NZ Arb Utility Arb Committee on the merits or otherwise of Utility Arborists becoming Registered Electrical Workers. This is an idea that has been proposed as a possible competency alternative in response to changes in Minimum Approach Distances (MADs) proposed by the Electricity Engineers' Association (EEA).

The NZ Arb Utility Arb Committee, and 2018 Utility Arb Conference sponsor PowerNet, are looking forward to seeing you at the 2018 Conference in Dunedin and hope that you'll join them for some constructive discussion, learning and networking.





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For more information on ACP, or to check latest 'Notification of Intent' companies, visit the NZ Arb website [www.nzarb.org.nz](http://www.nzarb.org.nz)

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## UPCOMING EVENTS

### NZ ARB HUSQVARNA SOUTH ISLAND TREE CLIMBING COMP

29 - 30 SEPT / CHRISTCHURCH  
BOTANIC GARDENS

### ISA TRAQ RECERTIFICATION COURSE

8 OCT / WELLINGTON

### ISA CERTIFIED TREE WORKER AND CERTIFIED ARBORIST EXAM

9 NOV / DUNEDIN TOWN HALL

### NZ ARB ANNUAL CONFERENCE + NZ ARB AGM

8 - 9 NOV / DUNEDIN TOWN HALL

### NZ ARB HUSQVARNA NATIONAL TREE CLIMBING CHAMPIONSHIP

9 - 10 NOV / MUSEUM RESERVE  
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