



**2016 NEW ZEALAND
EPIPHYTE WORKSHOP**

*WORKING WITH CANOPY PLANTS
ecological restoration to urban landscaping*

**AUCKLAND BOTANIC GARDENS
28-30TH APRIL 2016**

THANKS TO OUR SPONSORS



2016 NEW ZEALAND EPIPHYTE WORKSHOP

WELCOME & OVERVIEW

Tēnā koutou katoa,

Welcome to the second New Zealand Epiphyte Workshop.

Since the 2013 New Plymouth workshop, awareness of our native epiphytes, vines and mistletoes has been growing and we now have interesting opportunities to work with them in projects from ecological restoration to urban landscaping. To successfully incorporate these unique plants into such projects, we need innovative, NZ-specific approaches. This workshop will allow collaboration and refinement of practical methods and ideas as well as incorporation of the latest research findings. We hope you enjoy the collaborative environment.

Huge thanks goes to the workshop sponsors and organising team for making this event happen.

Happy epiphyting!

Catherine Kirby, Bec Stanley & Emma Bodley.

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WORKSHOP PROGRAMME

THURSDAY 28TH

10.00am Tea, coffee & welcome

CANOPY RESEARCH

10.30am	Catherine Kirby	University of Waikato
10.50am	Bruce Burns	University of Auckland
11.10am	Ranil Rajapaksha	University of Peradeniya
11.30am	Mads Thomsen	University of Canterbury
11.50am	Amanda Taylor (via C. Kirby)	Victoria University

12.10pm Lunch

CANOPY RESEARCH / WORKING WITH CANOPY PLANTS

1.10pm	Jennifer Shanks	JS Ecology
1.30pm	Graham Cleary	Natural Habitats
2.00pm	Bruce Clarkson	University of Waikato
2.20pm	Anita Benbrook	Wellington City Council
2.40pm	Rewi Elliot	Wellington City Council

3.00pm Afternoon tea

3.30pm Epiphytes, vines & mistletoes of Auckland
Botanic Gardens - guided tour

4.30pm Session close

FRIDAY 29TH

10.00am Tea, coffee & welcome

WORKING WITH CANOPY PLANTS

10.30am	Dan Blanchon	Unitec
10.50am	Bec Stanley	Auckland Botanic Gardens
11.20am	Discussion: Research priorities & opportunities	
12.20pm	Lunch	

WORKING WITH CANOPY PLANTS

1.20pm	Rebecca Jerram	Isthmus
1.40pm	Leigh Nicholson	Hanging Gardens
2.00pm	Philip Smith	O2 Landscapes

2.30pm Afternoon tea

3.00pm Tutorial session A - see page 4

3.45pm Tutorial session B - see page 4

4.30pm Keynote: Andrew Patterson - Patterson Associates

5.15pm Networking, drinks & nibbles

6.00pm Session close

SATURDAY 30TH

9.00am Field trip - see page 4

1.00pm Workshop close

FIELD TRIP

SATURDAY 30TH:

Meet 9.00am in carpark at end of Cossey Access Road.

DIRECTIONS:

Drive towards Hunua Falls on Falls Road then turn left at the giraffe statue; on a map this road is called Cossey Access Road but you'll see that the sign actually reads **Masseys Road**. Follow to Road end, please drive slowly.

WHAT TO EXPECT & BRING:

We will take our time epiphyting along the Wairoa Cosseys Track, returning to the carpark around 12.30pm to get away by 1.00pm. The track is fairly flat with small inclines. **Weather conditions are changeable**. Bring sturdy footwear, sensible clothing for all weather conditions, water, snacks/lunch, binoculars, camera, personal 1st aid kit and necessary medication (e.g. for bee sting allergies). The area can have high wasp activity so please stay on tracks and bring necessary medication.

TUTORIALS

FRIDAY 29TH

3.00pm Session A: half of the group to each tutorial

3.45pm Session B: swap over

4.30pm Regroup for keynote in Friends building

TUTORIAL 1: Characteristics and identification of canopy plants

Catherine Kirby - author of *Field Guide to NZ's Epiphytes, Vines & Mistletoes*
Learn some basic clues for identification of the canopy plants in Auckland Botanic Gardens as well as their interesting adaptations for life in the canopy (or maybe in your project!). Field guides available for sale - \$40.

TUTORIAL 2: Living roofs at Auckland Botanic Gardens

Auckland Botanic Garden Staff

Living roof plant choices are partly directed by the adaptations of epiphytes e.g. living with virtually no soil. However roofs aren't quite the same with almost no humidity, and higher light and wind. The research and education roles of the roofs at the gardens will be discussed as well as challenging management issues such as the safety aspects of working at heights, weeds and plant selection. Star performing plants for roofs will be highlighted.

ABSTRACTS

ordered by first name

KEYNOTE ADDRESS

The Auckland Epiphytum

Andrew Patterson

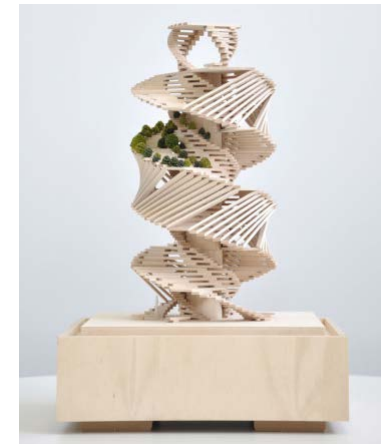
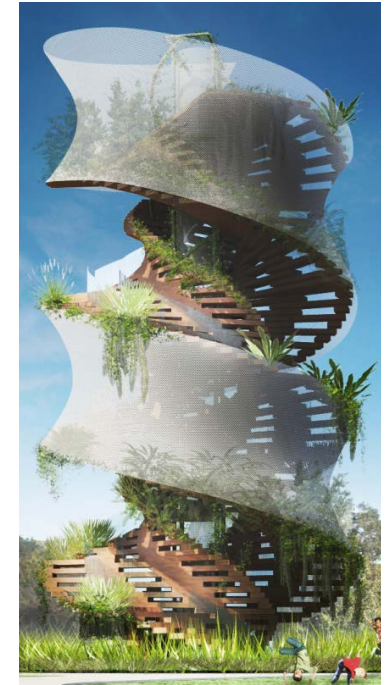
Patterson Associates

Patterson Associates Architects have been commissioned by Auckland Botanic Gardens to design the 'Auckland Epiphytum'. This significant, epiphyte-laden structure has been designed as a distinctive landmark for the garden landscape.

The sculptural 'man-made tree' is based on a geometric non-reducing Fibonacci sequence which results in an organic spiral that is partially sleeved in shade fabrics to create a distinctive pirouetting silhouette.

This Epiphytum epitomises the theme of the 2016 epiphyte workshop: "working with canopy plants" as the challenging artificial environment will require the merging of canopy science with greenwall and landscape knowledge.

This project was first envisaged in the late nineties by architect Andrew Patterson. Andrew completed a new concept design for this structure in 2013, and he completed developed designs in 2015.



Images from pattersons.com

Radial distributions of arboreal plants in response to microclimate preferences

Amanda Taylor, K.C. Burns
Victoria University of Wellington

We investigated the relationship between microclimates that differ in light and water availability with the distribution of mistletoes and epiphytes as they occur around their host trunks. Additionally, we correlated microclimate occupancy with plant physiological responses to variation in their most limiting resources. The radial distributions of mistletoes and epiphytes were highly directional, and related to the availability of light and water. Mistletoes preferentially occupied the northwest aspect of host trees, which had significantly higher photosynthetically active radiation and lower humidity than the southeast. In contrast, epiphytes preferentially occupied the southeast aspect. Our results illustrate an important new axis of resource availability affecting the distribution of arboreal plants.

Aerial restoration in action - Wellington Epiphyte Planting Trial

Anita Benbrook
Wellington City Council

Wellington City Council is undertaking a restoration trial with the epiphytes *Pittosporum cornifolium* and *Astelia hastata* in a remnant forest area. This presentation will explain site selection, methodology, lessons learnt and questions to ask.

Aerial gardens – can we reconstruct epiphytic native plant habitats in urban settings?

Bec Stanley
Auckland Botanic Gardens

The Gardens was asked to provide a description of suitable native NZ plants and environmental conditions needed by epiphytes for the architects of the epiphyte structure planned for the Botanic Gardens. I will present this information and comment on the challenges of practically meeting this vision based on what little we know of epiphyte ecology, and discuss the research that will be needed to ensure our community engagement, plant survival and sustainable gardening practice goals are met.

Hemi-epiphytes in New Zealand: a tropical lifeform in a temperate land

Bruce Burns
University of Auckland

Hemiepiphytes are plants that establish as epiphytes in forest canopies, then grow roots to the forest floor, become self-supporting, and eventually often replace their host trees in forest canopies. Almost all plants of this lifeform are tropical, typified by strangler figs, but New Zealand is unusual in having several important hemiepiphytes in its temperate forests. I review the diversity of hemiepiphytes in New Zealand and focus on their ecology and restoration. Amongst the species considered will be northern rata on trees, kamahi and towai (*Weinmannia* sp.) on tree ferns, and the proliferation of weedy figs in northern cities.

The state of play: research and engagement in New Zealand's canopies

Catherine Kirby
University of Waikato

Three years after the first epiphyte workshop we gather again to discuss the native plants of New Zealand's unique canopies. New information is now available through both scientific and non-scientific literature, more people are connected with the topic and there is plenty of promise for ongoing work. This talk will summarise the outcomes of the 2013 workshop, provide the context for the current workshop and discuss relevant resources for working with canopy plants.

Restoration of epiphytic lichens: can it be done?

Nadine Leddy¹, Dan Blanchon¹, Richelle Kahui-McConnell²,
Charmaine Bailie²
¹Unitec Institute of Technology, ²Ngāti Whātua Ōrākei

New Zealand has around 1900 native lichen species, most of which are epiphytic, growing on the trunks, branches and leaves of a range of trees and shrubs. Particular lichen species do not necessarily colonise sites that have been replanted, particularly if there is no nearby source of propagules. This talk will discuss the methods available for restoring or translocating lichens, barriers to successful restoration, and early results from one trial undertaken with Ngāti Whātua Ōrākei.

10 years of green walls with Natural Habitats

Graham Cleary
Natural Habitats

Green walls are magnificent to look at, have health benefits, contribute towards green star ratings and instantly increase the overall value of developments. This talk will share how Natural Habitats build greenwalls to succeed, especially in unusual places.

Epiphytes in forest remnants

Jennifer Shanks
JS Ecology

Epiphytes and climbers are a key botanical feature of New Zealand's old-growth lowland forests, but what happens when the forest is severely fragmented as has happened in many lowland production environments? Grazing livestock often cause the forest understorey to be severely damaged or lost, but how do the epiphytic and climbing plants fare? A study of taraire forest remnants in the highly modified production landscape near Pukekohe examines epiphyte presence and diversity within isolated forest remnants. Statistical analysis reveals some key relationships with forest patch characteristics.

The Success of NZ Plants in Vertical Gardens

Leigh Nicholson
Hanging Gardens

Hanging Gardens has undertaken numerous trials on NZ native plants in vertical gardens over the past 4 years and the results are astounding. Not only have plants performed well but in many cases, they have performed better in the vertical gardens than in the ground. This should not come as any surprise, NZ plants have evolved over millions of years to grow and flourish in vertical terrains. As our gardens are soil based, and not hydroponic, a wide variety of plants can be grown in vertical situations and the result is a sustainable, low maintenance, corridor of vegetation that takes on its own life, creates a wonderful micro-climate and provides habitats for bio-diversity while also cleaning up the environment and providing beauty in our urban environments

Epiphytes as habitats; the importance of 'cascading habitat formation' across scales and ecosystems

Mads Thomsen
University of Canterbury

For over 150 years it has been recognized that 'primary' habitat-forming species, such as trees and seagrass, enhance biodiversity. Among the species facilitated are 'secondary' habitat-formers, such as mistletoes and epiphytes. Case studies have demonstrated that epiphytes can modify the abundances of individual habitat-associated species ('inhabitants'), but the consistency and magnitude of their net effects on communities of inhabitants remains unknown. Here I review the literature to assess how inhabitants are affected by epiphytes. This analysis shows that epiphytes consistently enhance biodiversity across scales and ecosystems. Integration of epiphytes into conservation practice will therefore improve our ability to protect and enhance biodiversity.

Threatened epiphytes of Hunua

Bruce Clarkson, Rebecca Bylisma, Olivia Henwood, Catherine Kirby
University of Waikato

A botanical survey was carried out in Hunua Regional Park to search for two species of shrub epiphyte; *Brachyglottis kirkii* var. *kirkii* and *Pittosporum kirkii*. These species are classified as 'At Risk - Declining', and the survey aimed to increase knowledge of their distribution in the Hunua Ranges. The most abundant species was *B. kirkii* var. *kirkii* with 95 individual plants located. In contrast, only eight *P. kirkii* individuals were located. All *Pittosporum kirkii* and the majority (61%) of *B. kirkii* var. *kirkii* individuals were found in sites with intensive pest control. Both species were only found in mature, old growth forest with large emergent trees. Pest control is recommended to protect these species, as vulnerability to browsing mammals is the primary threat these threatened epiphytes. Observations, results and adventures from two months of Hunua epiphyting will be presented.

Analogue

Philip Smith
O2 Landscapes

The urban environment is full of situations that are comparable to the growing stations that many epiphytes and rupestrals specialise in. We approach such planting designs by looking intensively into plants from habitats that are analogous to the specific requirements at hand, whether we must provide long-term plantings within restricted root environments or cover walls and fences. Some of the habitats that we observe are not even particularly 'natural' in character, such as the occurrence of *Microsorium pustulatum* clinging to the ferry wharves. This talk will cover some of the many scenarios in which we have trialled epiphytes over the years.

Epiphytic ferns of Sri Lanka: An unexplored element of tropical biodiversity

R.H.G. Ranil¹, D.K.N.G. Pushpakumara¹, D.S.A. Wijesundara²

¹University of Peradeniya, Sri Lanka, ²National Institute of Fundamental Studies, Sri Lanka

Tropical forest canopies play a pivotal role while providing unique and specialized habitats for epiphytic ferns. Nearly 29% of worlds' fern species are considered as epiphytes. Though their ecology, nutrient and water balance, environmental adaptations and reproductive biology are poorly understood, their contribution for balance of natural ecosystems is significant. Out of the total Sri Lankan ferns species, nearly 25% is confined to forest canopies in wet zone ecosystems. Even though some species are supposed to be extinct from wild, there may be possibility to rediscover such species from tree canopy habitats. *Davallia pulchra* D. Don., *Prosaptia ceylanica* Parris and *Radiogrammitis beddomeana* (Alderw) Parris are examples for such canopy fern species extinct from wild. Hence, study on canopy fern flora is having greater importance of biodiversity conservation.

Vertigro.jar - Vertical Living wall Demonstration Project

Rebecca Jerram
Isthmus

The first installation of a large living wall in Melbourne Central shopping precinct by Patrick Blanc in 2008 inspired a small, highly experimental living wall project to be designed and built as a demonstration resource for Burnley Campus at the University of Melbourne. At the time, green wall concepts were in their infancy and many variables remained untested, as continues to be the case. This preliminary modular wall project provides real-time insight into the challenges of designing and constructing viable vertical wall systems for small urban spaces, and the practicalities of living walls as landscape and architectural features. The design and build process together with aspects of plant durability/growth, water usage, maintenance requirements and cost will be discussed.

***Brachyglottis kirkii* var. *kirkii* at Otari Native Botanic Garden**

Rewi Elliot

Otari Native Botanic Garden & Wilton's Bush Reserve, Wellington City Council

The shrub epiphyte *Brachyglottis kirkii* var. *kirkii* is regarded by the Department of Conservation as At Risk–Declining nationally and in a critical status in the Wellington region. There are records of *B. kirkii* var. *kirkii* in Otari-Wilton's Bush and surrounding suburbs from the early 1900s but no living plants have been seen for decades. Seed and cutting material from five locations in the Wellington region have been collected by WCC, GWRC and DOC staff since 2009. Seed from the wild has never germinated; cuttings strike very easily. Seed has germinated abundantly after the cutting material, from the five locations, flowered in close proximity to each other. Planting in the ground invariably fails. In an attempt to mimic an epiphyte perch we have been planting in hollowed out mamaku pots. Next steps will be to 'plant' them in trees or in *Astelia hastata* nests in Otari and at Zealandia.

LIST OF ATTENDEES

Joanne Alder
Jane Andrews
Charmaine Bailie
Stuart Barton
Sarah Beadel
Andre Bellevue
Anita Benbrook
Dan Blanchon
Emma Bodley
Michelle Boule
Sarah Budd
Bruce Burns
Simon Chamberlain
Bruce Clarkson
Graham Cleary
Janeen Collings
Georgia Cummings
Richard Davies
Sam Dixon
Te Aroha Drummond
Rewi Elliot
Tamia Eruera-Watts
Ajay Essex
Sarah Flynn
Erin Griffith
Shelley Heiss-Dunlop
Olivia Henwood
Fredrik Hjelm
Rebecca Jerram
Andrew Jinks
Wendy John
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Luitgard Schwendenmann
Jennifer Shanks
Fiona Smal
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Wendy Smith
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