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Front cover: The Arthur Hoyt Scott Amphitheater. A unique architectural space within a canopy of tulip trees *Liriodendron tulipifera*. The Scott Arboretum of Swarthmore College, Pennsylvania, USA. Photo. Mike Oates

Why people visit gardens

At the RNZIH conference in Auckland last year the focus was on garden visiting and the need for the development of a garden register and the establishment of standards for gardens on the register. Two of the papers at the conference presented by Lise Hogh are published in this edition and identify the complex issues involved with garden visits and the things that motivate both garden visitors and garden hosts. They highlight the difficulties of developing standards for garden assessment. They also raise some issues for managers of public gardens, particularly the findings from a survey Hogh carried out which showed 60% of visitors thought private gardens were more interesting than botanic gardens. In his thought provoking 1999 Banks lecture (shortly to be published in the proceedings of the 1999 RNZIH conference) Rob Lucas threw down the challenge that native botanic gardens such as Otari Wilton's Bush were becoming more focussed on individual plants rather than the development of a landscape to the detriment of the visitor experience. This tends to be backed up by consistent findings from visitor surveys in botanic gardens world-wide that 90% of visitors visit because it's a nice place to relax with only 5% visiting specifically to look at plants!!

Perhaps botanic gardens have something to learn from our private gardens and have focussed too much on the botanic and too little on the garden?? Food for thought indeed.

Mike Oates, Editor, New Zealand Garden Journal.

Garden Tourism – A Historically Popular Past-Time for Visitors and Hosts Alike

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Private Garden Tourism – an emerging sector of tourism - was chosen because it merged two of the author's favourite interests – gardening and tourism whilst exploring a new area of research.

So what is garden tourism?

The promotion of private gardens for domestic and international tourists who have an interest in gardening. It is where the garden owner has opened the garden so the public may enjoy viewing it. Private garden visiting is where the visitor goes to the home of a gardener to enjoy their garden while public garden visiting is where the visitor goes to a public place which has a garden to enjoy.

Early Garden Visiting

Although people travelled throughout the centuries, many authors (Batley & Lambert 1990, Tipples and Gibbons 1992) have concluded that garden visiting originated in England as the Landed Gentry undertook the Grand Tour.

However, 'few travellers before the eighteenth century were specifically looking for gardens, but they often commented on them en passant' (Batley & Lambert 1990:12). One of the first travellers whom noted gardens was John Leland, Henry VIII's antiquary whom travelled during 1535 and 1543. He travelled widely, and his manuscripts noted the building of new mansions with 'walks, gardens and orchards' (Toulmin-Smith 1907). Many Elizabethan travellers were curious to see royal palaces and great houses and visited the extensive gardens at the same time.

As road quality improved the numbers of travellers increased. It was the foreign travellers, such as those on a pilgrimage, ambassadors or wayfarers, who noted the new garden fashions in their reports, diaries, notebooks, and letters home. Many Grand Tour participants also wrote books or papers describing the gardens. William Camden published *Britannia* which became one of the first tour guide books available for those travelling around England (Batley & Lambert 1990:12). 'The first real garden tourist ... John Evelyn, who not only wrote or translated gardening treatises but from 1654 visited gardens at home and abroad, which he noted in his diaries.' (Batley & Lambert 1990:12). He had intended to produce a garden book with scientific and practical knowledge and descriptions of gardens seen on his travels. Unfortunately this book remains unfinished.

Celia Fiennes, (who toured England on horseback between 1685 and 1703) noted 'vivid and detailed descriptions of William and Mary Gardens' which made her one of the most informative garden historian tourists (Batley

& Lambert 1990:13).

It was at this time that new plants became available, as travellers would bring seeds or young plants back from their tours. This revived the interest in horticulture, as gardeners became interested in unusual or rare plants that were unobtainable previously. These plants became features of the garden, atriiums, conservatories, and glass-houses and were good talking points.

Country house visiting became extremely popular in the eighteenth century. New architecture and landscape fashions meant that many gardens were changing constantly. Thus, many people visited more than once. Most great houses and palaces employed gardeners or guides to show visitors around the garden, as it was important to go the 'right way' around the garden.

The first guidebook to a garden was produced for Stowe in 1744 and in 1770 Thomas Whatley's *Observation on Modern Gardening* was the first gardening book to describe individual gardens in detail (Batley & Lambert 1990:14). In the 1780's gardens had to be 'picturesque'. Artists would draw or paint the garden with the great house or palace in the background – these paintings or drawings often inspiring others to copy the garden (or great house or palace) or to travel there themselves to see it. Garden scenes had to be worthy of these paintings. It became extremely popular to visit gardens and write about them.

The nineteenth century saw the formation of the Royal Horticultural Society (1804) and the publication of various gardening magazines 'opened new horizons for informed garden visiting' (Batley & Lambert 1990:15). In the late 1800s new magazines with photographs, articles on the history of old gardens, and well-informed articles on new gardens to visit, kept the gardeners interested.

The National Garden Scheme (Founded in 1927) and *The National Trust* (founded 1948) have played an important part in developing garden tours in England in later days (Thomas, Porteous and Simmons 1994). The National garden Scheme's sole purpose was to enable private garden tours. The scheme is now a year round operation which publishes a guide-book containing more than seventeen hundred gardens on its register. The National Trust mainly emphasises historic buildings although it also 'manages and maintains a number of gardens, because many of the stately homes and historic buildings are surrounded by lavish gardens.' In addition,

'The National Trust and the Royal Horticulture Society jointly developed

a plan to enable the Trust to hold and preserve gardens which by reason of their plants, history, and design were worthy of preservation in their own right.'

In the twentieth century the National Trust now leads 'the way with guides to individual gardens and today's visitors can be well provided with information on most of the important historic gardens' (Bately & Lambert 1990:13). There are now many smaller private gardens open and many great houses or palaces are being restored or recreated resulting in an upsurge in the popularity of England's house and garden heritage.

'The art of gardening has flourished in Europe for almost two thousand years, and in no other part of the world is there such a rich profusion of gardens to be visited' (Hobhouse and Taylor 1990). Unlike English gardens that followed garden fashions closely, many European gardens have remained relatively unchanged since they were first planted. As a result many gardens in Europe are considered 'living museums' as they are preserved in the original state (Johnson in Hobhouse and Taylor 1990). Consequently thousands of people flock to various sites every year to learn about garden design in a particular era, for example, the Renaissance garden in France or a Roman garden in Italy.

Show-gardening began its spectacular career as the landowners sense of security increased (Johnson in Hobhouse and Taylor 1990). Because the threat of war was less, many previous small-enclosed gardens were expanded outside the castle walls. Broken down into many interconnected smaller gardens, these gardens were enlarged and geometrically repeated throughout the whole garden. As a result these gardens were shown off at every possible occasion.

So while England and the rest of Europe have been showing their gardens for centuries it has only been in the last 10 – 15 years that Australia and New Zealand gardeners have opened their garden gates for public viewing.

In Australia, many gardens have been promoted through the Australia's Open Garden Scheme which commenced in the 1987/88 season in Victoria. Inspired by the success of this scheme other states also adopted it and a National Committee was appointed. As of 2 November 1992, the Open Garden Scheme became a non-profit limited liability company with a board of directors that has an emphasis on sharing knowledge and experience with fellow enthusiasts as well as for charity and fundraising reasons. 'The expansion of the scheme will make available to more and more Australians this practical and enjoyable way of enhancing their gardening knowledge by observing at first hand the work of other gardeners and being able to communicate directly with them' (Australia's Open Garden Scheme 1993).

In addition, Melbourne has been described as the garden city of Australia with its splendid botanical gardens, many private gardens, and its famous annual international flower and garden show. "The Melbourne International Flower and Garden Show is the state of Victoria's most beautiful event. Attended by over 350,000 people, it has more than 300 exhibits in and

around the Royal Exhibition Building and Charlton Gardens." (New Zealand Gardener 1999 p 42)

In New Zealand, the garden has become an extension of the home over the last 20 utilising the garden 'as another room, a place to entertain and to relax in on warm evenings' (Hallinan 1999) while adding value to property. In addition, garden style has developed to include the use of natives. Jellicoe et al (1986 p399) noted that "the increased interest in gardens and gardening, coupled with a growing awareness of the unique qualities of native as well as imported plants, is leading slowly towards the realisation of a truly New Zealand Garden".

While Cook could be considered New Zealand's first international garden tourist when he observed the vegetable gardens of the Maori, private garden tourism, in its present form, only began in the late 1980's as a result of increased popularity of gardening. With interest in gardening growing, people wanted to see other gardens to meet kindred spirits, to discuss gardening, to share ideas and plants. Thus Garden visiting was born.

Julian Matthews (in Stirling 1991), editor of the *New Zealand Gardener* Magazine, noted that "Three years ago when I started as editor the idea of opening your garden to the public and charging them was a bit of a no-no. Now it's just taken off." Indeed, in the last 10 – 15 years many gardening schemes, festivals and guide-books have been created. Some, however, have not lasted, for example, The New Zealand Open Garden Scheme, launched in 1995, is no longer in operation (Reeves 1998). Other events have had much higher success rate, particularly the Ellerslie Flower Show, held annually in Auckland, which has been going from strength to strength with visitor numbers increasing each year.

In its fifth year, The Ellerslie Flower Show has been acknowledged as the largest garden festival in the Southern Hemisphere (Otago Daily Times 1999, Tibby 1999). Statistics from the 1998 festival show that 61,000 people visited the 5 day event resulting in an extra \$10 million for the Auckland region. 71 new jobs were created and 43% of visitors came from outside the Auckland region. Needless to say, the event was now considered 'a key event on the city cultural and festival calendar' (Otago Daily Times 1999). The show has a growing international reputation that is 'attracting more and more exhibitors and visitors from all around the world every year, who come to marvel at our lush native plants and unique New Zealand Style' (Tibby 1999).

The Study

Part of a larger study, the aim was to find out the extent of private garden tourism in New Zealand. Budgetary constraints meant that the subject area had to be narrowed down to the South Island only.

Methodology

The study was conducted during the summer of 1999. 350 four page surveys were sent to garden hosts throughout the South Island. Enclosed were two copies of a 4 page visitor questionnaire whom the host could distribute to their garden visitors – 700 in total.

190 garden host questionnaires were sent back indicat-

ing a 51% adjusted response rate and 143 visitor questionnaires indicating a 35% adjusted response rate.

Size, Fee, Style, Development

The garden styles were varied with specialist gardens being the most frequent yet they specialised in different plants for example, iris, peonies, roses, trees bulbs etc. The next popular was the cottage garden followed by the formal, themed, alpine and coastal garden.

The size of the gardens varied between .05 and 20 acres. The most frequent size was 2 acres (17%) followed by 1 acre (14%). Half-acre and quarter-acre gardens were next with 7% each. Over half had large lawn areas and the age of the gardens ranged from 3 years to 140 years old. The most frequent age was between 18 and 25 years (25%). 21% of gardens were over 50 years old and 9% were over 100 years old. Many respondents noted, however, that the garden was always changing and developing, thus, some parts were quite new in an old garden.

Just over half (52%) of the respondents charged an entrance fee with \$2-\$3 being the most popular price. The most frequent opening times were 'all year round' followed closely by 'spring, summer and autumn'. The busiest months of the year were October and November with February the next most popular time for visitors. This could be because many garden clubs timed their annual garden-visiting excursion in these months. Visitor numbers ranged from none to 1100 in the year ended March 31 1998 with the majority (23%) being between 200 and 500. Seven percent had less than 50 visitors.

Demographic Profiles

Garden Hosts

Garden hosts were mainly female (79%) and between the age of 50 and 70 years old (65%). They had been living on their property over 20 years (59%) and had opened their garden between 6 and 15 years (57%). The most frequent academic qualification is secondary schooling (40%) followed by Vocational or Trade Certificate (29%). 20% were university educated. Few had any formal gardening or horticulture qualifications although almost all belonged to a gardening or horticulture club or organisation. 16 respondents belonged to more than five gardening or horticulture clubs or organisations from throughout the world. Just over a quarter of respon-

dents were farmers (26.5%), 22% were retired and 9% were homemakers. 7% opened their gardens to help promote their nurseries. Almost 45% of garden hosts had visited gardens overseas stating that 'visiting some private gardens was part of their travel plans' (28%) or 'I had no plans to visit private garden initially but did visit some when the opportunity raised' (12%). Five percent of respondents stated that visiting private gardens was the main reason why they traveled.

Garden Visitors

Garden Visitors were also mainly female (81%) and between the age of 50 and 70 (53%). The most frequent academic qualification was also secondary schooling (38%) and vocational or Trade Certificate (27%). 18% had university qualifications. 12% had gardening or horticulture qualifications that ranged from formal tertiary qualifications to 'life experience in gardening'. A third of respondents belonged to gardening or horticulture clubs and organisations with 12% belonging to a local gardening club. Garden visitors are mainly homemakers (24%) or retired (24%) or being a farm partner (7%). Just over half (52%) of garden visitors had visited gardens overseas stating that 'visiting some private gardens was part of their travel plans' (25%) or 'I had no plans to visit private garden initially but did visit some when the opportunity raised' (23%). Five percent of respondents stated that visiting private gardens was the main reason why they traveled.

So why do gardeners open their gardens? What are the advantages and disadvantages of opening the garden?

Host Motivation.

Tipples and Gibbons (1992) researched host motivations for opening their garden during a garden festival in Canterbury. They found that reasons for opening gardens included requests by schools, fundraising, to share, get feedback, ideas and 'because we enjoy visitors and sharing plants'. They found that fundraising was the primary reason. The research conducted by Ryan and Bates (1995) also considered host motivations for participation in the Manawatu Rose and Garden Festival. Their findings included 'gaining pleasure from gardening', 'to share the pleasure of the garden', 'to derive enjoyment from meeting people', 'an opportunity to meet other gardening enthusiasts', 'because it is stimulating', and 'to support a new venture in an area of interest to me'. 'To show others what can be achieved' also rated highly. It must be noted that both these studies were conducted during a garden festival unlike the present study, which

Table 1. Host Motivations.

Why did you decide to open your garden?	Most Important %	No Strong Feelings %	Least Important %	No Response %
To share the Garden	76	7	3	14
By request of Schools, organisations, etc.	50	7	15	28
To meet people	46	11	11	32
For fundraising/charity	40	14	11	36
By request of friends or relations	30	6	21	44
For the income	30	7	27	36
To sell our own plants and crafts	22	6	31	41
To get feedback, ideas from others	14	12	24	50
Other	14	1	4	81

was carried out with all garden hosts in the South Island. Thodey (1994) also noted that 'one of the highlights of opening their gardens has been meeting so many people who share their interest'.

The results (Table 1.) of the present study indicate similar findings to the aforementioned findings. 'To share the garden' rated highest with 76% being important or most important. Followed by 'By request of schools, organisations etc.' with 50% being important or most important. Least important were 'To sell our own plants and crafts' (30%) 'to get feedback, ideas from others (23%). Other motivations included: to enable producers to sell their product, for educational purposes, approached to be part of a tour, opened garden with restaurant, shop or nursery attached, and with open house.

Satisfaction

There is a lack of garden tourism research on host and visitor satisfaction in the academic literature, therefore, the present findings represent a new area in formal research. Satisfaction arises from positive perceptions, feelings and experiences. Articles from several contributors (Munro 1994, Anthony 1994, Anon 1990) of the 'New Zealand Gardener' magazine have mentioned satisfaction, concluding that peace and quiet, renewed enthusiasm and enjoyment are important factors - the 'garden should satisfy viewers by giving them a strong simple memory to take home' (Munro 1994). In the present study when asked whether they enjoyed opening their garden 92% of garden hosts stated yes. Frequently cited reasons included: meeting interesting people (46%), sharing their garden with others (21%), enjoyment (21%), and sharing knowledge and ideas (16%). Comments made include:

- 'Meeting people and sharing a love of gardening'
- 'It is quite thrilling to feel that people enjoy and get pleasure from something one has created'
- 'Meeting interesting people and exchanging ideas on gardening'

- 'Enjoyment of sharing my 'obsession' with others'
- 'Meeting people from the world over with a common interest, sharing thoughts, ideas, tips and comparisons of environment etc.'
- 'I like meeting other gardening people, sharing my knowledge about plants and picking the brains of other gardeners.'

Of the 8 percent that did not enjoy opening their garden, reasons cited included that it is exhausting, people criticising the garden, keeping the garden up to standard all the time, and the lack of privacy. two respondents stated that they had closed their garden because of these reasons. Comments include:

- 'I get exhausted.'
- 'People are too critical.'
- 'Find it very stressful keeping the garden up to standard.'
- 'Lack of privacy by end of season'
- 'Get weary of having the public traipsing around my private garden, using toilet, looking in windows etc.'

Why do visitors want to visit gardens?

Visitor motivations

Tipples and Gibbons (1992) also studied visitor motivations with people visiting the aforementioned garden festival in Canterbury. It is their research that this part of the present study is based on. They found 'four main reasons why people were participating in a garden tour.' They are a 'love of gardens', 'interested in general ideas used in the gardens', 'they were keen to support the fundraising activities concerned' and they 'wanted to see other peoples creations.' Anthony (1994) discussed opening her garden, in the 'New Zealand Gardener' magazine, noting motivations for visiting gardens which included gaining pleasure and stimulation from looking at someone else's beautiful garden, and to meet other garden enthusiasts.

Table 2. Visitor Motivations

Why did you decide to come to this garden?	Most Important %	No Strong Feelings %	Least Important %	No Response %
My love of gardens	84	7	0	9
I am interested in gardening ideas/plans/layouts.	77	11	0	12
To gain inspiration	64	13	2	21
The opportunity to visit private gardens was irresistible.	55	13	12	20
To see what type of plants grow in this area.	45	15	15	25
For a social outing.	43	18	17	22
My friends or relatives recommended it.	42	17	17	24
To support my friend/partner who is interested in gardens.	39	7	23	31
I have visited some of the gardens before and wanted to see them again.	39	10	24	27
I have seen some of the gardens featured today on television, videos or in magazines and had to see them for real	33	9	26	32

The findings for the present study echoed these results (Table 2.). 84% of respondent motivations was their 'love of gardens' while 77% said they were 'interested in gardening ideas, plans and layouts.' Close behind was 'to gain inspiration' (65%) and 'the opportunity to visit private gardens was irresistible' (55%). Fundraising or charity openings were mentioned by 40% of respondents confirming the high correlation between fundraising and gardening. It is interesting to note that only a third of respondents were motivated through gardens shown on television, videos and in magazines where many gardens are shown.

Visitor Satisfaction

Almost all of the respondents were satisfied with their private garden experience, however, many made suggestions that can be used to improve the garden tourism industry.

- 'I enjoy being greeted in gardens and the feeling of being a welcome guest'
- 'Most enjoyable way of spending a few hours!'
- 'Needs more publicity perhaps but the sense of discovery is also part of the charm'
- 'I would like to see garden tours ... more widely promoted'
- 'Gardening interest give people a lasting bond and friendships and good will is generated very quickly.'
- 'We have learnt a lot from our garden visiting and seeing plants growing that we can grow. Our gardening knowledge has expanded greatly.'

Of the respondents that were not satisfied, comments about untidy gardens not being 'up to standard', lack of facilities, difficult vehicle access and paying fees rated highly. However these numbers were insignificant and the respondents also stated positive aspects of garden visiting in their comments. In addition respondents noted the lack of promotion nationwide and internationally of garden tourism. Comments include:

- '... quite often disappointed in the untidy state of some gardens we pay to see.'

- 'need good access for buses to be able to turn around easily'
- 'we are more likely to visit gardens as a group if they drop their fees slightly'
- 'If gardens are open to the public they must be perfect especially if there is a charge.'
- 'Garden tourism is not advertised enough to the overseas market'

The advantages and disadvantages of opening the garden

Anthony (1994), Anthony (1997) and Anon (1990) also discussed the advantages and disadvantages of 'going public' in depth. All comment on the inappropriate comments people made when visiting their garden, however, they also said that "you can't please them all". Anthony also remarked that 'going public is not without pitfalls but the satisfaction of knowing that sharing ones garden is giving others pleasure, raising funds, and making a positive contribution to the community far outweighs the negative aspects'.

There are many reasons why gardeners want to open their garden for public viewing. These benefits are described in Table 3. It was not unexpected to find that 'seeing others enjoying our garden as much as we do' and 'Meeting like minded gardeners' both rated highly with 85% and 77% respectively. Indeed, it confirms the findings of satisfaction and motivation as discussed above suggesting that the social benefits override any economic benefits of opening the garden. It is interesting to note that 'the extra income' was important to 29% of respondents, however, one has to take into account the fact that only 52% of respondents charged an entrance fee, therefore this confirms that the extra income is important. Other advantages included: 'keeping the garden up to standard', the development of tourist trade to the area, to educate visitors about gardening, and to promote the nursery.

Table 4. lists the disadvantages of opening the garden for visitors. The main disadvantage was that 'the garden had to be perfect at all times' with 39% response. The rest of the disadvantages have higher responses in the 'least important' or 'no response' categories indi-

Table 3. Advantages of opening the garden.

Advantages of opening the garden.	Most Important %	No Strong Feelings %	Least Important %	No Response %
Seeing others enjoying our garden as much as we do.	85	4	4	7
Meeting like minded gardeners	77	8	4	11
Meeting people from different backgrounds and cultures	57	10	8	25
Meeting people with specialist plant knowledge	49	12	12	27
The feedback, tips and ideas from visitors	48	12	15	25
Making lifelong friends	42	13	12	33
Opportunity to learn about gardening in other countries.	32	16	19	33
The extra income	29	6	30	35
The nursery needs little promotion for plants to sell.	18	5	28	49
We can sell our produce from home	15	4	32	49
The opportunity to sell local arts and crafts from home	6	5	37	52

Table 4. Disadvantages of opening the garden

Disadvantages of opening the garden.	Most Important %	No Strong Feelings %	Least Important %	No Response %
The garden has to be perfect at all times.	39	16	14	31
Someone has to be there all the time	21	12	24	43
I have to be neat and tidy at all times.	20	16	27	37
Un-supervised children destroying plants, property	18	6	35	41
No time on ones self in the garden	17	23	20	40
Visitors want to look through the house as well.	15	6	30	49
Always have to open - even on wet days.	15	10	27	48
Visitors always want to describe their garden to you.	12	13	30	45
Visitors want my help with designing their garden	12	10	33	45
Visitors demand too much attention	7	14	32	47
Visitors are always picking flowers, cuttings etc.	7	10	37	46
Visitors walk off the paths and stand on plants.	7	7	37	49
Having to hire extra gardeners	7	7	34	52
Visitors leave their rubbish on the ground	3	7	38	52
Visitors criticise the garden to much	1	8	40	51
Other	7	2	6	85

cating that the disadvantages are not important. Seven percent of respondents stated that they had no problems (therefore, no disadvantages) at all. Comments included: 'No real disadvantage to us', 'Don't find any of the above a problem' and 'we do not have any problems'.

In conclusion, the host and visitor motivations for participating in garden tourism are very similar. The hosts want to share the garden and meet interesting people to exchange knowledge and ideas for enjoyment and self-gratification purposes while the visitor, who has a love of gardening, wants to meet the gardener to share gardening ideas, knowledge and gain inspiration for their own gardens. Almost all respondents were satisfied with their garden tourism experience with many comments made confirming the aforementioned motivations.

The main advantages also confirm these findings with high responses to 'seeing others enjoying our garden as much as we do' and 'meeting people'. The disadvantages had low responses, and almost half of the respondents did not respond to this section at all implying that the disadvantages were insignificant. Only one disadvantage was considered important which was 'the garden has to be perfect at all times' with 39% response.

It can be noted that the main benefits of private garden tourism are the social contact and the need to get pleasure and enjoyment from sharing and viewing the garden with others. Any economic benefits are an added bonus for the hosts (this money is usually used to pay for garden supplies and equipment). Social benefits include contact with like-minded others, enrichment of lifestyles, and gaining pleasure. Friendships are made that could last a lifetime and a garden network is established. Therefore, the benefits of opening the garden are more intangible than tangible.

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The Garden Tour Operator, Issues and Recommendations for a Successful Future

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Why research the Garden Tour operator?

The author became interested in the role of the garden tour operator when she went on a tour with Louise Foord a garden tour operator based in Dunedin. Her business "Country Tours" takes people all over the country on garden tours ranging from a few hours to a week long. It was from discussions with Louise that made the author question why is she doing it, what are the advantages, and what is needed to become a garden tour operator.

An area of no previous study it was found that there was usually only one operator in each region and therefore a consensus survey was done.

Methodology

The subsequent quantitative questionnaire was sent out in June 1999 to 20 potential respondents within New Zealand. 14 surveys were posted back of which four were deemed unusable leaving 10 usable. This raised the adjusted response rate from 50% to 62.5%.

The following outlines the findings.

Demographic Profile

70 % of garden tour operators were female with all over 40 years old. 40 % of respondents were aged between 40-49 years. 40 % of respondents highest qualifications were at secondary school level whilst 40% had formal gardening qualifications. Seven respondents stated that being a garden tour operator was their main occupation

Respondents varied between small, hobby enterprises with low turnovers to full-time operations with high turnovers. The respondents came from Auckland (2), Hawkes Bay, Amberley, Dunedin, Geraldine, Gore, Lyttelton, Queenstown, and Rangiora. The respondent from Geraldine conducts Country House and Garden tours for the wealthier tourist with luxury travel and accommodation. One of the respondents from Auckland conducts tours for international tourists and has brochures in Japanese and English. Three tour operators conduct tours internationally.

It was interesting to note the variety of garden tours

Table 1. Types of Garden tours on offer

VARIOUS TOURS ON OFFER	Number of gardens	Duration	Region	Costs
Country Tours	visit 3 gardens	½ day	Dunedin area	\$40.00
Native Bush and Gardens	Visit 3 gardens	3½ hours	Auckland	\$55.00
Queenstown Garden Tour	visit 3 gardens	½ day	Whakatipu Basin	\$65.00
Country Tours	visit 10-15 gardens	3-4 days	Otago	\$450-600
Taranaki Garden Tour	visit 15-18 gardens	5 days	Taranaki	\$699.00
Spring Tour	visit 10-15 gardens	6 days	Canterbury	\$1350

available (ranging from 3 hours to over a week and for the international garden tours travelling up to a month). The price varied also with cheaper tours in the lesser tourist regions. In addition the tours with a longer duration also varied in price as some were promoted to include luxury accommodation and transportation.

Why are these people in the business of offering garden tours? Table 2 outlines the motivations. The three main motivations 'No-one was offering such a tour', 'Interest in gardens and plants' and 'To make money'. They all liked the opportunity to mix their work with their hobby - gardening.

Advantages and Disadvantages

When asked about the advantages of being a garden tour host, meeting like-minded friendly people rated highest. Other reasons included for the income, meeting overseas people, seeing different parts of the country, the easy lifestyle business, being your own boss, planning itineraries, seeing people enjoying visiting 'local' people and having the chance to arrange visits to New Zealand's best gardens.

Table 2. Tour Operators' Motivations

Motivations	%
No-one was offering such a tour	30
Interest in gardens and plants	30
To make money	30
Demand for a niche tour	20
Self-employed, independent work	20
Enjoyment of sharing my gardening knowledge	10
Interest in travelling	10
Desire or organise better tours	10
To help promote the district	10
It's less strenuous as I am getting older.	10
I was asked to do garden tours	10

One respondent noted that it "helps to get people on to our established city-sights tour".

The disadvantages included the seasonal nature of garden touring, and the "usual problems associated with running a small business". However, many respondents noted they had no problems with their garden touring operation and liked the seasonal aspect.

Table 3. Issues in garden tourism

	Issues	Host %			Visitor %		
		Agree	Neutral	Disagree	Agree	Neutral	Disagree
a.	Private gardens are more interesting than botanical gardens	27	23	11	60	22	5
b.	Visiting private gardens were the highlight of my trip	34	14	6	54	29	5
c.	Garden tours are not promoted enough in New Zealand	40	14	10	45	39	10
d.	Private gardens are where you meet the 'real' New Zealanders	45	15	7	58	22	5
e.	Some private gardens are becoming too overcrowded now	8	34	22	18	39	22
f.	There are too many private gardens open in New Zealand	7	25	35	11	23	43
g.	There are not enough private gardens open in New Zealand	18	32	15	28	30	14
h.	Entrance fees to visit private gardens are too high	8	31	28	18	32	29
i.	There should be no entrance fees to view private gardens	5	16	44	11	18	55
j.	Private gardens are no longer private when they are opened	12	15	39	19	20	39
k.	Private gardens do not cater for people with disabilities	12	29	24	21	43	13
l.	Plants should be labelled in private gardens opened to the public	17	22	28	40	24	25
m.	Access to many gardens are not adequately sign-posted	30	29	7	35	30	13
n.	Visiting private gardens gives me the chance to buy local products	37	25	6	39	31	9
o.	Visiting private gardens gives me the opportunity to try local cuisine	24	31	12	22	29	21
p.	New Zealand gardens are like many gardens throughout the world	7	15	34	7	25	41

Who go on these tours?

While three respondents had over 92% international visitors, the majority of garden visitors were from New Zealand. 4 respondents had less than 1% international visitors. The high visitation regions were Auckland, Queenstown, and Hawkes Bay. The international visitors came from Australia, United Kingdom and the United States of America with smaller numbers coming from Japan, Taiwan and other parts of Europe.

Promotion

Questions were also asked about marketing the business. Findings indicated that the most popular way of advertising was through garden magazines and with leaflets, brochures etc (70 % of respondents). 50% of respondents also advertised in the newspapers while 40 % advertised in hotels. Other outlets for advertising included information centres, other magazines, AA Guide, Booking agent, travel directories, bus companies and previous clientele databases. Many noted that word of mouth was very effective.

Comments

Respondents were given the opportunity to make comments about their business and the garden tourism industry. Many commented that garden tourism was a growth industry noting that the market can only handle one operator in each region, that the industry is difficult to break into and the turnover for operators is high. They also noted that tight schedules for international visitors makes it difficult to attract garden visitors without marketing overseas initially which is very expensive for a hobby-scale enterprise.

One respondent noted that a visitor commented "there should be a register of gardens in each region, which are worthy of promoting to overseas visitors. These gardens would ideally have a recognisable theme, style in order for the target group to be able to identify which theme/style they would be most interest to visit".

Issues in Tourism

As part of the research, questions were also asked about issues in garden tourism. These were based on various controversial gardening issues raised by Anthony (1997, 1994), Munro (1994), Thodey (1994, and Anon (1990). Using a five point likert scale, these questions are detailed in Table 3. This section brought some interesting results. In many cases the host and visitor had different views, especially regarding issue (a) – 'Private gardens are more interesting than botanical gardens', and issue (l) 'Plants should be labelled in private gardens opened to the public'. However, there were several statements that had similar results. 'Private gardens are where you meet the 'real' New Zealanders' had high percentages agreed with as did the statement 'Garden tours are not promoted enough in New Zealand' suggesting that there is a need for more awareness of gardens that are open for public viewing. It was good to see that both groups of respondents thought that entry fees were im-

portant and in their comments noted that it was only fair to pay. Another interesting response came from the statement 'Access to many gardens are not adequately sign-posted' where over 30 % in both groups agreed. This suggests that there is a need for better directions, signs etc. when opening the garden.

Recommendations regarding private garden tourism

These recommendations have been divided into four main areas – the garden host, the garden tour operator, national and regional tourism offices and regional garden tourism networks.

Garden Host

There have been many recommendations made by the respondents to the five surveys in addition to those concluded by the author. This indicates that the garden host can do a lot more to attract the garden visitor and to keep them interested in their garden enough to encourage them to repeat visit.

- a) Clearer signs and maps so visitors can find their way easily as well as to attract passing people. If expecting a tour group then indicate the garden entrance through the use of signs, balloons, etc. so the visitors know where to go.
- b) List on Internet sites, as people often look there first when researching a destination. Even better start a web page about the garden and its progress and up date it regularly making sure it has links to other gardens and regional tourism networks.
- c) If the garden is extensive provide a map and state the average walking time to cover the garden. This is particularly useful to older visitors whom want to see the 'best bits' but not necessarily want to walk over the entire garden to find them.
- d) Clearly indicate where parking is appropriate. If the host is expecting a large number of people visiting have a special area designated for parking and have it laid out well so cars can leave without having to wait for the driver of the car parked in front of them.
- e) If there is a festival – garden or other - in the locality, encourage garden tours to increase the number of people visiting the garden so word of mouth advertising is increased.
- f) Try to be home when expecting garden visitors, as part of the private garden tour experience is being able to talk to the hosts and discuss the garden and gardening in general.
- g) Keep a visitor book. Leave it outside on a table when a group visits the garden. This will enable the host to find out where the group came from and what they thought of the garden. This is helpful for remembering visitor names, and addresses may be used to send annual letters about the garden to promote an additional visit.
- h) Keep entry fees low – under \$5.00 – and return the fee if plants are bought. This is looked at positively by the visitor and encourages return visits.
- i) Invest in good brochures with colour pictures of the garden. Always include a small map of directions to get to the garden. Send these to Information Centres and Garden Clubs or Circles around New Zealand to increase public awareness of the garden.
- j) Write to garden clubs and circles, woman's institutes and horticulture groups to encourage them to visit the garden and others in the region.

- k) Get together with other open garden hosts in the area and market the gardens collectively either as separate entities or as a garden tour with a specified amount of time. This will save costs while increasing awareness of the garden.

Garden Tour Operator/garden guide

There were also many suggestions made by the respondents about garden tour operators and guides.

Make sure every aspect of garden touring is covered. Include:

- a) Best of gardens – collected from your own visiting experience
- b) Toilet facilities either public facilities or asking the garden hosts.
- c) Contour – whether the garden is flat, steep etc. so the visitor knows what to expect – this is particularly important to older garden visitors.
- d) Bus – turning facilities and comfort for older passengers
- e) Food – does the cost including lunch, morning and after noon teas. If not make sure the participants are aware that there will be extra costs.
- f) Accommodation – if staying overnight – one level accommodation as older visitors do not like climbing stairs.
- g) Have an itinerary for each participant and keep to it. This is important as it shows professionalism and good organisational skills. Include hosts names and addresses so the visitors can write to them if they want after the visit. Time set aside in each garden should be stated. Also knowing the return time at the end of the day is important.

National and Regional Tourism Office

While some Regional Tourism Offices are very enthusiastic towards the promotion of gardens to visit in their region others are slow to see the benefits to the community of these visitors. In addition, many Regional Tourism Offices sometimes hinder progress rather than encourage garden visiting. For example, signs outside the host's homes stating that it is a garden to visit have restrictions to size and detail. Hence the following:

- a) Make it easier for the garden host to advertise their garden especially where signs and advertising is concerned.
- b) Become involved in local garden visiting and promote it throughout New Zealand and overseas with other regional tourism promotions.
- c) Have a register of gardens in each region, which are worthy of promoting to overseas visitors.
- d) List the gardens on the appropriate Internet sites

Regional garden tourism networks

Although a lot of garden visiting promotion is word of mouth this is a lengthy process and only involves those whom have already visited the garden. Traditional marketing and promotional methods are too expensive for the garden host and so other ways of promotion should be encouraged. The following are some suggestions for smaller garden groups to consider.

Marketing and promotion

- a) Try to encourage more travel journalists to write articles especially on gardens to visit for overseas newspaper travel sections.
- b) List on the Internet, as many people look there first when deciding what to do on holiday.
- c) Overseas advertising could be directed toward private tour operators i.e. specific types of tours
- d) Target Garden clubs, circles, and groups by sending them information about open private gardens. Make up a package that includes some meals and accommodation.

Need for additional research

There are many areas in garden tourism that require additional research. Current research has only looked at a small part of garden tourism – the study of private garden visiting. There are many other parts to garden tourism that needs study. The following outlines some areas:

Research on Garden Clubs or groups

- a) How often they go on garden trips – monthly, annually or other. For example, the Maori Hill Garden Club, in Dunedin, visits various local member's gardens throughout the year and also has an outing once a year to another region to visit gardens.
- b) Where they go? For example, to local gardens, out of the region, or overseas.
- c) Numbers of people and how much money they spend when going on these trips
- d) Why people join a garden club. For social reasons, to learn more about gardening or other.
- e) Number of garden club members – in each club, regional, and nationwide.
- f) Number of garden clubs in each region and New Zealand wide.

Research on International garden visiting

- a) How many New Zealanders are travelling overseas to visit gardens as part of their itinerary?
- b) Where the most popular gardens are for New Zealanders to visit. For example, the gardens in England, Italy or France.
- c) When New Zealanders travel to view these gardens, seasonally.

- d) How often they travel overseas to visit gardens and how many gardens are visited during the trip.
- e) Value – the costs involved in visiting other gardens throughout the world. This includes entrance fees, and other indirect costs such as accommodation, food, transportation, and souvenirs.

More research on overseas tourists visiting gardens in New Zealand.

- a) What other activities and attractions do they visit in addition to private gardens in New Zealand? For example, historic places, museums, art galleries or parks.
- b) Where they stay. For example, in the garden hosts home, farm-stays, country-stays, motels, backpackers or camping grounds.
- c) What made them decide to visit New Zealand – was the main motivation to visit gardens or were there other reasons?
- d) How they travel around New Zealand – in package tours, private hire cars, camper-vans, backpack?
- e) Where did they learn about the various gardens available to visit in New Zealand? For example, Internet, books, articles and/or advertising in garden books.

Research on Regional/local Councils attitudes towards garden tourism

- a) Their views/positions of garden tourism in their region – whether or not they are embracing garden tourism as a viable tourist attraction. Whether they think garden tourism is important to the local economy.
- b) Differences in strategies put in place to attract the private garden visitor. How they promote to the public. For example, brochures, Internet or mail-outs.
- c) The value of garden tourism to the local economy.

Continued Research on Garden festivals

- a) How often garden festivals are held – yearly, biannually, one-off.
- b) Who the participants are – in particular distances people have travelled to attend the festivals, demographics and typologies.
- c) Other activities taking place to cater for non-gardener partners, travelling companions and children. For example, attending local tourist attractions, swimming or fishing competitions.
- d) Effect on the local economy – how much money is spent during the festival on accommodation, transport, food, souvenirs and other activities and entertainment.

Study on the impacts of private garden tourism

- a) Economic impacts on the local community
- b) Social impacts
- c) Environmental impacts
- d) Physical impacts

In conclusion, This paper has shown that the garden tour operator is mainly in the business because ‘No-one was offering such a tour’, coupled with their ‘Interest in gardens and plants’ and ‘To make money’. In addition many garden issues were raised regarding plant labelling, fees, access and crowding. Finally this paper discussed various recommendations made by the author and by respondents. Garden tourism in New Zealand has great potential and with good planning and implementation it can become as popular as it is in other countries like England, Australia and other parts of Europe.

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The Joseph Banks Memorial Lecture 2000

Special characteristics of Auckland gardens

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Introduction

In his lecture I am going to summarise impressions of Auckland gardens gained from my earliest involvement in horticulture until the present time. I intend to cover how we garden, trends in what we do and how we do it, and share what insight I have as to future directions. I

also intend to consider what ordinary kiwis are doing, not just the ‘cutting edge’ efforts of the elite of Auckland gardening.

I am not a landscape designer, and do not pretend to be

an expert in this field. Most of my working life has been at the Regional Botanic Gardens, where our main stakeholders are the ratepayers of Auckland, and where our major stated objective has been to influence the Auckland landscape.

I was raised in Hamilton and moved to Auckland in my early twenties. As a child, well before I contemplated a career in horticulture, we had a bach at Bucklands Beach that we visited several times each year. Even at a relatively young age I was struck by the contrast between gardens in Auckland and Hamilton. In Hamilton our lawns seemed more manicured, hedges and edges neatly clipped, shrubs clipped to size and shape, gardens generally immaculate and with a pervading sense of order. We took great pride when our street won the 'best garden' competition.

By comparison Auckland gardens seemed relatively unkempt, and definitely lacked a sense of organisation (rather like Auckland itself). Aucklanders certainly seemed to spend less time in the garden. I put it down to the fact they have so many options about what to do with their time.

Auckland Gardens - General

In my position as Curator Manager of the Auckland Regional Botanic Gardens it has been essential to monitor trends in horticulture, particularly what's happening at other botanic gardens. This understanding enables us to plan and implement the changes we need to make to stay relevant to our market, just as any business needs to do. It seems to me that our key clients, the ratepayers of Auckland, increasingly want gardens (both public and private) that express their sense of identity.

Auckland is a unique place. It has the largest Polynesian population in the world. It is very much a city of the South Pacific. We have been mindful of this at the Botanic Gardens. We could be overtly commercial, and aim to become a major destination directed mainly at revenue generation. Butchart Gardens in British Columbia attract 1.3 million visitors a year by being sensationally colourful. We could have floral peacocks and abundant bedding plants to draw in the masses. Such displays would not of course achieve our objectives as a botanic garden, and in Auckland they do not seem appropriate anyway.

Last November I was a judge of the exhibits in the Makeover Marquee at the Ellerslie Flower Show. One garden received marginally enough points to make it as a gold award winner, but we knew it should get one. As the Japanese judge said, it was 'the only really kiwi garden'.

What was it about this display garden that made us perceive it as capturing the essence of New Zealand? The use of local materials and plants certainly helped, particularly those plants immediately recognised as being from this country. The informal but very 'user friendly' design was also in keeping with our lifestyle. I cannot fully articulate all of the factors contributing to the feel that this garden conveyed. Simply, the whole package came together in a way that made a statement about its sense of place.

Early History

Garden styles in New Zealand today are the culmination of many influences that stretch back to when Europeans arrived here and arguably even earlier. No doubt those early settlers that had time for such pursuits found comfort both in the plants they brought from 'home' and perhaps in the garden designs they remembered. The re-created settler's garden at Howick Historic Village is interesting: many of the plants featured are common weeds of today. Nostalgia must have been a huge influence then, as it is again today

My childhood memories are of roses and bedding plants out front of the house, not to mention the infamous front lawn. Pebble gardens with red chip and yellow conifers. Native plants were invariably variegated. Out the back we had the vegetable garden and compost bin. All examples of being influenced by English garden styles.

Seventies

I entered horticulture as a career in the middle of this decade. Supposedly native plants were becoming popular, but I suspect mainly with a few cutting edge designers and plant lovers. Native plants were promoted more for their low maintenance requirements rather than their beauty. Garden centres tucked their native plants away somewhere out the back. I remember one garden centre manager telling me that native plants did not sell. He had his poorly grown and presented specimens tucked away in the most remote part of his garden centre. Auckland had only one serious native plant nursery, Platts. Now there are many.

Nationally the growth in the popularity of native plants is phenomenal. Statistics from the New Zealand Native Plants Register indicate that in 1990 115 wholesale growers listed *Cordyline* cultivars, by 1999 this figure was 242.

Pebble gardens thankfully began to disappear in the seventies, hard landscape materials such as bricks and railway sleepers were in.

Eighties

Creative Home Landscaping in NZ (1986) by Julian Matthews was the first popular book I encountered that extolled the aesthetic virtues of native plants such as grasses. As native plants gradually became more respectable the nursery industry reacted with new specialist growers emerging to meet the increased demand.

Towards the end of the decade it seemed that natives declined again in popularity. I had been breeding native plants for almost 10 years, several of which sold well in the mid-eighties. I well recall that by 1989 I was so frustrated by the decline in interest that I considered cutting back the breeding programme, even abandoning it. It was the unexpected interest of Danish researchers and subsequent visits to *Hebe* growers in Denmark that restored my enthusiasm.

Nineties

Gardening really boomed at the start of this decade. After years without a gardening programme on television, suddenly we had two. Palmers Garden Show was

consistently at the top of the ratings, often vying with the Network News in popularity. As I found to my cost, the mere throwaway mention of a particular product ensured it would sell out by early the next day.

Readership of NZ Gardener magazine exceeded 300,000 per month, and every radio station in NZ seemed to have its own gardening programme. Numerous overseas experts visited these shores to impart their great wisdom and knowledge, and tours of overseas gardens were well patronised. The 'garden visit' industry peaked, only to decline as the decade wore on.

The upshot is that gardeners are increasingly, and more immediately, exposed to the latest in national and international trends. Gardeners began trying new things - Gardening was the height of fashion.

The Sissinghurst influence took off. Ingrained in my memory is the first Trinity Festival I attended in November 1991 - every garden seemed to be white, with 'Margaret Merrill' and 'Iceberg' roses underplanted with white pansies and drifts of fluffy white *Omphalodes linifolia*. One woman garden owner protested to me that she had 'invented' the cottage garden craze, and that everyone else had copied her.

In my view this phenomenon waned not just because of changes in fashion, but because such gardening is too intensive for busy modern lifestyles. Gardeners, too, need a life. In fact 'lifestyle' has been the force driving many industries in the latter part of the nineties and into the new millennium.

A plethora of different influences saw gardens become even more eclectic, paralleling trends in architecture and interior decoration. I feel that comparisons can be made with cooking in NZ, which is increasingly an amalgam of many influences. The positive aspect of an eclectic approach to gardening is that it enables freedom of expression and the challenging of boundaries, the downside being a possible lack of discipline which can in the worst cases result in chaos.

Recently I studied the gardens of a fairly modern subdivision to try and identify a particular style. I chose one near to the Regional Botanic Gardens, as any influence we have had on home gardens should, in theory, be most evident there. It's an affluent middle class suburb so lack of finance should not be a compromising factor in the quality of their gardens.

Surprisingly, very few of the messages we have been extolling at the Botanic Gardens are evident in this suburb. Every garden is different - one will feature roses, the next neatly clipped topiary, another a blaze of marigolds and golden conifers. These are the gardens of ordinary people, not the elite 'state of the art' gardens upon which we often judge trends.

Based on this example, the Botanic Gardens objective to 'influence the Auckland landscape' has failed rather miserably to have an effect on the average home garden.

During the last few decades the space available for gardening has decreased with the advent of in-fill housing and cross leasing. This is particularly the case in Auckland, where urban drift has had a huge impact. Flowers have ceased to be the single minded centrepiece

that they once were - roses and perennials have declined somewhat in popularity, subtropicals and xerophytes are in. Gardeners now consider foliage to be 'cool', so out went the roses and in came the succulents and palms.

The decline in the fascination with flowers contributed to the decline of specialist societies, except those that broadened their appeal to embrace the modern lifestyle.

Toward the end of the nineties, the now ubiquitous garden makeover took us by storm. Gardening was instant, no waiting for that gratifying mature look. Garden centres were full of potted colour, a phenomenon that grew rampantly during the nineties to promote 'impulse' plant buying and thereby maximise profitability.

Garden centre plants are now largely a commodity tailored by plant breeders to meet the expectations of modern consumers. Annuals flower as young 'pre-pubescent' seedlings so that consumers purchase the 'finished product'. Colour co-ordination has never been easier. Plants are valued by retailers according to the number of units they turned over in a period of time. Consumerism has changed the face of gardening. We still probably have more garden centres per capita than any other city in the world, but these days they are run less by plants people and more by business people (often from other industries) and accountants.

Although we may lament the absence of many plants (such as trees that take too long to grow or do not flower at point of sale) which were once prominent in garden centres, we must accept that commercial reality has created this situation. In fact consumers have more choice of product than ever before if they shop by mail order and through the Internet. Retailers also offer a daunting selection of garden products, including numerous containers, fertilisers, plant care products etc. that will supposedly enhance one's lifestyle and image.

As life has become busier, homes and gardens have become oases, an escape from the pace and pressures of everyday life. In Europe they call this cocooning. The hard landscape is what matters most to many busy people, the plants are just decoration, the garden equivalent of wallpaper.

A buoyant landscape industry took full advantage of the market demand for immediacy and convenience. If you want a garden, you simply call 'Hire a Hubby'. Sadly, specialist growers of unusual and 'choice' plants have become even more poverty stricken

Trends Today

Much has been made of the relative value and merits of native versus exotic plants. Whether we like it or not exotics are here to stay, as are the many different peoples who have migrated here from so many parts of the world who make it such a colourful and interesting place. Plants belong just as we do and, like people, they vary greatly in appearance and usefulness.

Some are more at home here than others, and we clearly have our share of plants that have overstayed their welcome. In fact Auckland can fairly claim to be one of the weediest of all cities with some 630 naturalised exotic species. Retailers in Auckland continue to sell alarming numbers of plants unsuitable for our conditions (eg.

numerous cold climate plants, such as many of the conifers and deciduous trees sold each year that are unlikely to survive.)

People increasingly realise that we live in a fragile and highly damaged environment, something also realised by many smart marketers. The environment is now a huge issue, one that increasingly drives much marketing, decision making and planning. Visiting Europe in the nineties I was taken with how widespread and successful products were when marketed with a 'green' image.

In the seventies kauri was still being logged in the Coromandel. Today remnant trees are being promoted as tourist attractions, and it would be a brave forester who took a chainsaw to a kauri today. Some would argue things have gone too far the other way. Pressure groups and individuals sometimes promote the felling of significant old exotic trees to make way for natives. Recently a planner from Manukau City Council recommended that when trees are felled on Puketutu Island each native be replaced with two native trees, and each exotic with only one native tree. Some are calling such attitudes 'tree apartheid'.

Most local bodies have embarked on revegetation programmes, and this is now spreading to private gardens. Wellington Regional Council have recently published a booklet promoting the use of locally sourced native plants to home gardeners. Some native plants are now promoted for their rarity eg *Pennantia corymbosa*, providing home gardeners with an opportunity to do something in their own backyards towards conservation. Many gardens are now planted specifically to attract birds, and packs of suitable plants are available for such a purpose.

When I began my career in horticulture chemicals were invariable the solution to any plant health problems. Now organic gardening is in, spraying is frowned upon in many quarters.

I believe that the 'Flower Carpet Rose' phenomenon is an example of clever marketing successfully taking advantage of several trends. 'Flower Carpet Pink' has sold several hundred thousand units in this country at a time when rose sales have steadily declined. The following characteristics of this rose made it such a hit with the masses in my view:

- Rose growing was demystified, made simple and accessible to everyone (remember all those writers who made careers out of 'explaining' the complications of rose growing) All that was needed was an annual 'haircut' with hedge shears.
- The public had a rose that performed despite little attention (gardeners were told their rose would flower for 10 months).
- Little or no spraying was required. An environmentally friendly rose at last.

Special characteristics of Auckland and its gardens

Auckland (at least some of it) is a garden, a South Pacific place of great character and beauty. Trying to define the essential Auckland garden would stereotype and constrain artistic expression (besides being beyond my abilities). However, defining characteristics can be

identified such as plants and hard features that immediately link the garden to its South Pacific location. One of these characteristics is 'plant signatures', those iconic native plants that are so recognisable that they immediately impart a sense of NZ. Examples include *Cordyline*, flax, tree ferns, toitoi and nikau.

Creating a more regional sense of identity can most easily be achieved by including locally occurring species that set the garden in its more immediate location. Many of the native plants that occur naturally in Auckland/Northland are descendants of the subtropical element known as Malaysian – Polynesian, or Palaeotropic. It is these that to me are essentially Auckland plants. Significant species include pohutukawa and broadleaf trees of tropical appearance such as puriri, taraire, karaka, *Meryta sinclairi*, and of course the world's most southerly palm, the Nikau

Some exotic species are also immediately associated with Auckland, *Araucaria*, *Aloe* and many palms are prime examples.

Certain natural elements are also inevitably linked with Auckland. These include wind, which we hate to admit to, but which is reflected in the shape of many coastal trees and in the range of plants many gardens can grow. Other vital elements that define Auckland are the sea, volcanoes and an apparent absence of town planning. Heavy clay soils typical of many parts of Auckland provide gardeners with an additional challenge they could well do without.

Despite these obstacles, ample rainfall and a benevolent mild climate make Auckland one of the best places in the world to grow a wide range of plants.

Private Gardens - the Future

Private gardens in Auckland can readily be put into two broad categories: those designed and implemented professionally, and those put together by owners who have little gardening and design knowledge.

A major future influence on both private and public gardens will be graduates from the Landscape Design and Landscape Architecture courses now provided by tertiary institutions. These courses are well attended, and if the talent exhibited by such graduates at the Ellerslie Flower Show is anything to go by they will have a positive influence on the future quality of gardens in the region.

Another significant influence on home gardens will be the exceptional private gardens that are open to the public and that often grace our magazines and gardening books.

Most impressive of these is Ayrilies, the wonderful Whitford garden of Bev McConnell. In my view, this garden is the supreme example of what can be created with thoughtful planning and appropriate selection of plants and materials. Many elements evocative of its northern location culminate in a paradise that I am sure touches all who visit it. Although a much larger garden than most can aspire to, it contains many ideas on design and plant combinations that can be modified for typical suburban situations. Above all else, it is an inspiration as to what can be created by this great art we call gardening.

Development of the Pukekura Park Fernery

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Introduction

Pukekura Park is the centre-piece of New Plymouth District Council's parks and reserves network. The park covers an area of approximately 49ha. (120ac.), including the adjacent garden estate area of Brooklands Park, Brooklands Zoo and the historic Gables Colonial Hospital. Pukekura has always been the "People's Park" - a site which developed with the foresight and generosity of many - from humble beginnings to a magnificent landscape. It is a source of pleasure and pride for New Plymouth in particular and Taranaki generally.

Pukekura is a nationally significant park, comprising a large exotic specimen tree collection inter-planted within a margin of native bush. The park has been continuously developed since its inception in 1876, prior to which the land was treeless and swampy. Its north-south linear shape follows the natural stream valley, where a series of artificial lakes have been created by damming the flow at various points. Several streams run through Pukekura, originating from outside the park boundary.

Geology and climate are important factors contributing to the successful establishment of plants within the park. Deep deposits of volcanic ash, combined with even annual rainfall, mild winters and warm summer temperatures, are conducive to plant growth for a range of species from around the world.

Pukekura combines nature, history and heritage and, therefore, offers interest for all visitors. Together with the variety of plant types Pukekura is unique in offering a diverse range of landscapes - from dense remnant tawa/mahoe/pukatea forest, to broad-acre lawn with annual bedding displays, to themed garden plantings. An impressive outdoor sound stage and grass amphitheatre provides a venue for summer concerts. Visitors may enjoy the busy activity of the main boating lake, the tea rooms and the children's zoo, or find quiet solitude in the upper bush tracks of the valley system.

The Fernery

Construction of the original Fernery was completed in October 1926. The idea came as part of the process for creating a new garden feature in a dell formed by damming a swampy, untidy gully. Part of an adjoining hillside was excavated to fill the low-lying region and,

together with the reclamation, this provided an ideal site. A glass roof above the in-ground fernery chambers finalised the newest attraction to the park. The project had received the go-ahead following monies made available from a queen carnival in 1924, which raised £2,500.00 - a substantial amount in those days; part of this amount was devoted to the fernery project. History records the off-hand remark by a visiting director of London's Kew Gardens at the time as being "It's a hell of a waste of money when the damn things will grow outside". This negative view did not deter Thomas Horton, the energetic curator of the day, who proceeded with the plan.

Brian Scanlan, in his book "Pukekura", a local history of the park, noted the project in this way:

By June 1926, work began on a design by Mrs H Lovell, a noted Hawera horticulturist who had experience in constructing fern grottoes. The plan provided for three chambers linked by tunnels. Winter rains made conditions difficult and Curator Horton's diary told of a "dirty wet job" and "a fierce storm". In October 1926, the excavations were finished, a new lake appeared upstream and the swampy ground was transformed into a pleasant lawn area with flower plots. A total of 2,340 ferns (145 varieties) were gathered and planting in the grottoes began in July 1927. The Mayor, Mr H V S Griffiths, officially opened the fernery and dell on 28 January 1928; the whole cost had been met by public subscription and fund-raising. Later begonias and orchids and other colourful subjects joined the ferns. In 1939 an extra glasshouse for begonias was brought from Brooklands where it had once sheltered a grapevine. This house was replaced in 1969 by a modern structure four times its size, a generous gift from Mr and Mrs G Kibby. Meanwhile in 1964 Mr F L Parker, a noted New Plymouth horticulturist and member of the Pukekura committee, presented a valuable collection of cymbidium orchids. The whole gully was named Stainton Dell in honor of Mr P E Stainton, whose service as secretary of the park board and administrator spanned 44 years.

The Fernery has developed progressively since those early days. The initial plantings have been enhanced, with consequent enlargements to the public display houses. Whilst retaining the unique hand-cut tunnels

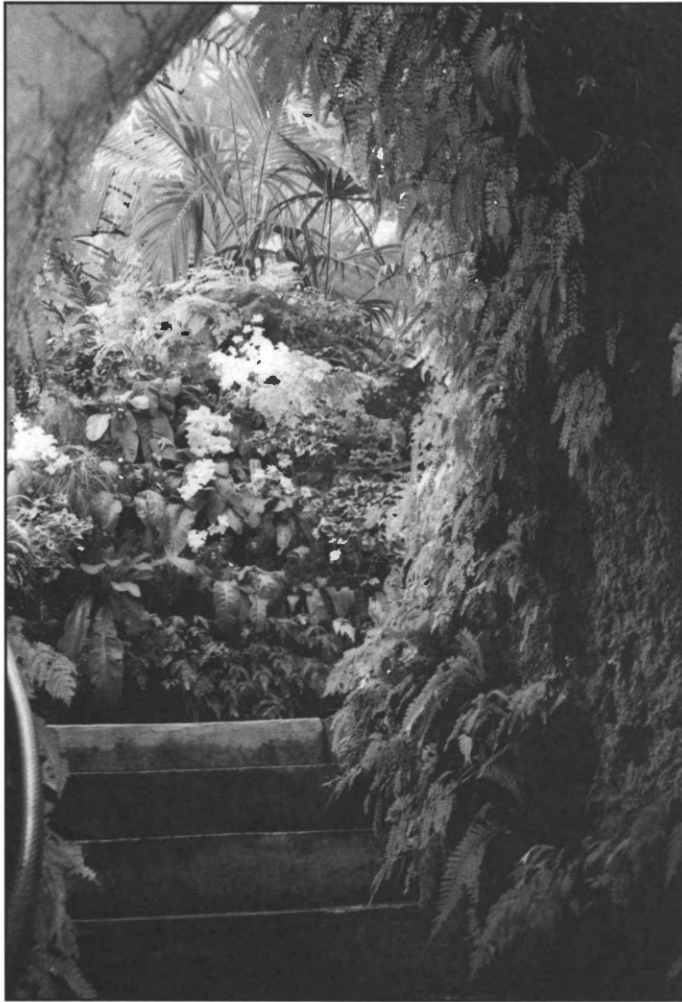


Figure 1: Looking up in to the main display area from the subterranean tunnels

as the main routes in to and through the displays (see Figure 1) the overhead buildings have changed to meet modern standards.

The Fernery display plant collection

Different levels provide a variety of environments for plant display within the Fernery complex. Three of the houses have below-ground sections, where the air is cool and moist shade provides ideal growing conditions. The steep-sided banks rise in to sunlight, ensuring a range of conditions. The display is always spectacular (Figure 2). Seasonal highlights are briefly described here:

- Spring
 - cymbidium orchids
 - vireya rhododendrons
 - streptocarpus
 - azaleas
 - spring bulbs

- Summer
 - streptocarpus



Figure 2: Variety and colour throughout the year are the hallmark of the plant displays.

- scadoxus
 - disa orchids
 - tuberous begonias
- Autumn
- fuchsias
 - vireya rhododendrons
 - streptocarpus
 - cymbidium orchids
 - masdevallia orchids
 - azaleas
- Winter
- cymbidium orchids
 - laelia orchids
 - paphiopedilum orchids
 - cinerarias
 - azaleas
 - winter bulbs

Modernisation of the display houses

A major programme of building renewal and development began in 1998 following agreement to upgrade the aging facility. New Plymouth District Council recognised the value and significance of the Fernery as a key attraction within Pukekura by funding a three year \$850,000 works programme.

The overall complex comprises four separate but inter-linked display areas: House 1 (the Fernery itself); House 2 (the cool temperate display); House 3 (the warm temperate display and House 4 (or Kibby House, the subtropical display). Non-public propagation and storage



Figure 3: Display plants are returned to the new Kibby House following completion of the reconstruction.

areas are integrated within the perimeter. The rebuilding of House 1 and 2 was completed in mid 1999. The original white wooden glasshouses were replaced with a distinctive twin chambered green steel structure, each roof covered with toughened glass panels incorporating a polycarbonate barrel vault ceiling. The effect was an impressive architecturally designed building of larger proportions, creating the opportunity for the displays to assume a greater scale. Previous issues concerning drainage, ventilation and shading were resolved through the design process. Public access and viewing were improved with the inclusion of a mezzanine floor, to allow people to see the plants from different levels.

The Fernery's unique sub-tropical display is housed in the Kibby House (Figure 3), named after its benefactor. Rebuilding commenced in late 1999 and was complete by March 2000. The overall dimensions have been increased and the roofline raised, all of which has enabled a larger number of bigger plants to be housed.

Propagation and storage facilities have been upgraded in the 2000/01 stage of the upgrade programme, creating an outstanding public facility.

Future development

Today the fernery attracts over 80,000 visitors a year, many of them from beyond New Plymouth and Taranaki. Whether from school groups, horticultural societies, cruise ships, colleges or just interested overseas holiday makers the response to the plant display and the setting is invariably the same - one of surprise and wonder that a place like New Plymouth can have such a superb showcase. Such support and enthusiasm for the Fernery is a strong driver to complete the overall upgrade with one final stage.

A final and significant section of the display facility remains unfinished - the original Fernery itself. This particular area holds special meaning - as the central and most intriguing part of the complex. Concept plans for a new roll-over roof with upper and lower viewing galleries are well advanced (Figure 4). Again, as with previous stages of the development, the main improvements will be derived from better access, viewing and display opportunities. The proposed new building will provide space for group meetings, education and discussion. Walkways - accessible by wheelchairs - will link all areas of the complex on two levels, allowing visitors the chance to explore throughout the whole area.

The enlarged chamber is designed to accommodate full-sized tree ferns and nikau palms.

The present Fernery is in urgent need of refurbishment - the old timbers and glazing are showing their age and, equally important, some of the fern specimens are outgrowing their space and attempting to lift the roof. Conditions have become cramped and a design solution is required. The upgrade of the whole Fernery complex will remain incomplete until such time as this last display house is rebuilt. Clearly there are design options, which range from a straightforward replacement roof to the full facility as shown in the artist's impression - a more intricate but effective concept which addresses the issues of plant display, public access and visitor services all in one. Associated landscaping and the resolution of existing site problems must be resolved at the time of implementing the work.

A full rebuild to meet the needs of the plants and the community will not be cheap - estimates of between \$600,000 and \$1,000,000 are likely. In this era of cost-conscious council's finding such an amount will require careful planning and presentation to promote the concept and win firm support. The commitment to pursue the right outcome lies within the Parks and Leisure Services division - and to that end preliminary planning and design is well underway.

Pukekura Park's Fernery is a unique attraction. It has delighted countless people throughout its existence and will always be a special attraction for locals and visitors. It has grown - like the plants - in size and splendour. Recent improvements have created a facility where engineering and nature are harmoniously combined. The next stage of development - possibly the most important - will secure the future of the Fernery for the next millennium.

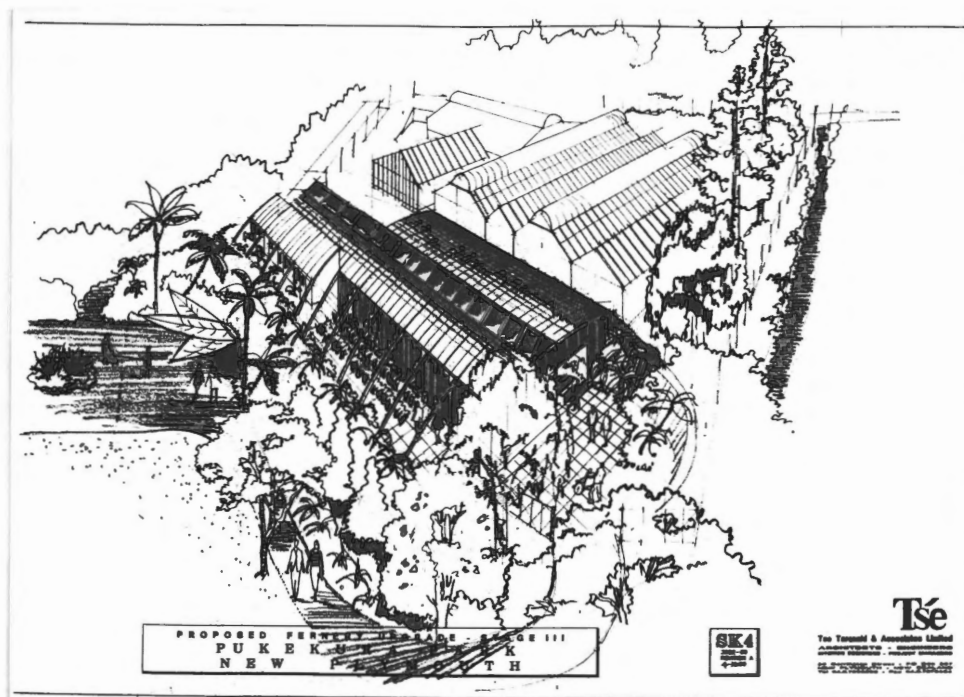


Figure 4: An artist's impression of the proposed new Fernery, House No. 1 - with a rollover roof and two-level access.

Why screen for weediness ?

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In less than 150 years, the size of the national flora of New Zealand has increased more than tenfold through the importation and establishment of alien plant species from around the globe. We currently have approximately 10% of the world's flowering plants growing here, on a land area comprising less than 0.2% of the world's total. The ratio of alien plants that have established in the wild relative to native plant species is greater than 1:1, one of the highest of any country or region in the world. The rate of entry into New Zealand of alien plant species, based on the time since European settlement and the size of the alien flora (domestic and naturalised), has been approximately one species every two days, or 144 species per year. From this pool there are likely to be 3–5 potential new agricultural or environmental weeds per year, based on the proportion of species that have naturalised so far.

In total, these alien plants cost the country approximately \$60m per year in indirect costs such as monitoring the border, implementing regional pest management strategies, and controlling weeds, and a further \$40m in direct costs associated with loss of production, mainly of agricultural and forestry products. These figures do not include intangible costs such as loss of amenity in parks,

or loss of biodiversity.

New Zealand native species are not totally benign either, for several have become major weeds in other parts of the world, ranging from flax (*Phormium tenax*) on the remote island of St Helena, to pohutukawa (*Metrosideros excelsa*) on the South African Cape, and karaka (*Corynocarpus laevigatus*) in Hawaii. Just recently, the South African authorities have become concerned about the introduction of New Zealand *Coprosma* species for horticulture. The trade in plants and the resulting spread of weeds is thus an international issue in which New Zealand is deeply involved. We have a responsibility for the preservation of our own indigenous biota and productive systems, and to the rest of the world, not to import or export species that may become weeds. The spread of alien plants is one aspect of global change where an individual can minimise her or his impact. For an individual traveller, this may simply mean not distributing seeds of invasive species, including the invasive species offered for sale in small packets at our airports. For those involved in the nursery trade, or with one of the numerous specialist plant societies, there needs to be a greater understanding of why plants became invasive, and the

systems and protocols needed for importing and exporting plant species to effectively reduce the probability of new weeds.

There are many reasons why species become invasive in new countries. Alien plants are successful in New Zealand because many lack the natural predators and competitors that control population sizes in their regions of origin. For example, seed-eating insect larvae are rare on naturalised European Asteraceae in New Zealand, but common in their native habitats. Some alien plant species are better adapted than native species to elements of the New Zealand environment. Northern hemisphere conifers, such as *Pinus contorta*, tolerate cold better than native trees, and consequently grow well above the upper limit of beech and podocarp species, where they threaten native shrubs and grassland. Many alien plant species are specialist disturbance tolerators, with large persistent seed-banks, rapid growth rates, and grazing-tolerant shoots, features that are rare in the native flora. They may also represent new functional types in the New Zealand environment such as the huge forest-invading herb, wild ginger (*Hedychium* spp.), or the nitrogen fixing Russell lupins (*Lupinus polyphyllus*) that smother river beds.

Apart from these sometimes esoteric explanations for why one species has spread, and not another, successful invasion may simply be a function of the extent of horticultural or forestry plantings. These create enormous propagule pressure, or seed rain, that facilitates their establishment in natural habitats. Such events are often random in time and space for individual species, and often reflect the vagaries of human activity as much as the ecology of individual plant species. This can lead to conclusions about site preferences and future invasion directions that may not be valid over the whole country. The abundance of firethorn (*Pyracantha angustifolia*) in the vicinity of Turangi in the North Island is not necessarily because this is the favourite habitat of the species in New Zealand, but because firethorn was intensively used locally as an amenity planting when the township was developed as a hydro town.

In many cases, invasions occur in habitats that have been weakened by humans, either directly through fragmentation and loss, or indirectly through the introduction of mammalian grazers. Time also can be a critical determinant of invasion success, for “if at first you don’t succeed, try, try again”. Most of the current naturalised alien flora is either established locally (c.500 spp.) or is in the initial (c. 1500 spp.) or accelerated (c. 200 spp.) stage of spreading. Importantly, probably fewer than 50 alien plant species currently occupy anywhere near their full environmental range, and none would occur throughout at levels approaching maximum abundance. Overall, alien flora in New Zealand is at a very early stage of invasion, with most species having

local distributions and small populations. In these circumstances, it is understandable that for most species, the impact of their populations has hardly been noticed. The impact of native weeds such as bracken, on productive systems, was obvious to the first settlers, but they could not foresee the effects of gorse (*Ulex europaeus*), brier (*Rosa rubiginosa*), hawthorn (*Crataegus monogyna*) or many other plants that quickly spread from early plantings. The impacts of such plants are clearly evident in production losses that contribute to the annual total of \$40 m. Less obvious are the impacts of weeds on “non-productive” systems, of which we are slowly gaining a scientific understanding. Weeds can displace native species, but the major long-term threats are associated with modifications that induce changes at the ecosystem level. Weeds reduce the resources, such as light, available to other plants. Readily visible are smothering vines such as old man’s beard (*Clematis vitalba*), which may kill an existing stand of vegetation. Less obvious are the effects of forest floor herbs such as wandering jew (*Tradescantia fluminensis*), which prevent the full complement of plant species regenerating on the forest floor, thereby permanently altering future forest composition. Weeds can literally alter the shape of the land, as in the case of marram grass (*Ammophila arenaria*) on fore-dunes, making the habitat unsuitable for native species. All ecosystems are dependent on disturbance for rejuvenation at some point, but weeds can change the frequency of such disturbances. Gorse, for example, has a higher fire frequency than original native vegetation, and as a consequence vegetation succession is repeatedly halted, as can be seen on many hills around the Wellington region. Biogeochemical cycles can be altered by, for example, alien nitrogen-fixing plants (all legumes), especially when they establish on surfaces otherwise virtually devoid of organic matter, such as sand dunes. Finally, there is a whole suite of plant and animal interactions where we often see quite unpredictable impacts. For example, important dispersal agents such as kereru (native pigeon) may develop a preference for fruits of introduced species in some environments, and reduce the dispersal chances for large-fruited native species such as tawa (*Beilschmiedia tawa*). An interesting example comes from Canberra, where there are widespread amenity plantings of colourful fruiting shrubs such as *Cotoneaster* spp. and *Pyracantha* spp. These provide additional over-wintering food for small native birds, as well as large currawongs (crows), which in turn prey on the nestlings of small birds to a greater extent.

Alien plants are not universally detrimental to the indigenous biota, and at least two types of benefit have been detected. Firstly, alien shrubs may facilitate succession to indigenous forest in previously deforested areas through rapid site occupancy and displacement of the dense ground-cover of herbs. In many environments, alien shrubs such as gorse and heather (*Calluna*

vulgaris) can eventually be succeeded by native trees, at rates faster than would occur under seral native shrubs. Secondly, some elements of the native biota, notably some invertebrates and orchids, appear to thrive under alien shrubs and trees, respectively. Overall, however, the disadvantages of alien species escaping into the wild seem to far outweigh the advantages, and the introduction of species that may escape should be prevented. Knowledge of where they have come from in the past can help allocate resources to detect them.

Knowledge of the time of first detection in New Zealand, and country or region of origin of the naturalised flora, can help predict the source and pathway for the arrival of potential new weeds. Data recently analysed from seed material seized at the border indicate that most (70%) arrives as air baggage, and (25%) by mail, mostly from Australia, South-east Asia, and Europe. Approximately 35% of seizures made at the border are undeclared. Nursery stock, including cuttings and rooted plants, are less commonly intercepted, with Australia and the Pacific Islands being the most frequent source area. Overall, in the last 30 years, the proportion of imports of naturalised plant species arriving from east Asia and South America has increased, while the proportion from Europe has declined. These trends reflect historical reasons for plant introductions and the countries with whom we trade, growth of new commercial relations with other regions, and the ease with which material can be sent around the globe. An analysis of plant species submitted for importation before the HSNO Act (Hazardous Substances and New Organisms Act 1996), revealed the major drivers for new introductions. Private collectors and commercial nurseries comprised over 90% of the groups legally wanting to import new plant species. Agricultural interests, including horticulture and forestry, were less numerically significant. In contrast, the potential impact on the economy of a single new agricultural species may be many orders of magnitude greater than for a single horticultural importer introducing many non-commercial species, or for commercial urban horticulture.

There are several widely recognised protocols and principles that must be borne in mind when assessing the weediness of these proposed imports. In order to facilitate trade and comply with international trade conventions, the assessment method must be built on explicit assumptions and must use scientific data. Ideally, it should yield scores for individual species to enable comparisons and be decisive. This is to prevent plant species in what ever form (seeds, cut flowers, food) from being refused entry for spurious reasons. Since the impacts of many alien species are unpredictable, any intentional introductions should be based on the precautionary principle. In other words, unless there is a reasonable likelihood that an introduction will be harmless,

it should be treated as likely to be harmful. Finally, the intentional introduction of an alien species should be permitted only if the positive effects outweigh the actual and potential adverse effects on the environment, and or, the economy. Note that this decision is a value judgement quite distinct from attempting to predict the weediness of a new species.

Several weed risk assessment systems (WRA) have evolved in recent years to assess the potential weediness of proposed plant imports. Originally they were based on the concept of the perfect weed, that is, a plant species that had all the characteristics present amongst invasive plants. This view has proved to be false, and weeds, like all plants, tend to be matched for particular environments. This means that different sets of attributes will be advantageous to an invading species in different environments. The potential environment/new species combinations are innumerable, and also unpredictable, and so too are the attributes that make a new species invasive. Furthermore, the habitats they might occupy, the native species they may interact with, and therefore their precise impacts, can be only generally assessed. The one attribute that has proved the most reliable indicator of weediness in a new country is the history of weediness elsewhere, in environments at least similar to the prospective new country. Of course, the strength of this correlation is improved if a species has had the opportunity to become invasive by being planted widely elsewhere. One of the cornerstones of WRA models, therefore, is that the intentional introduction of an alien species should not be permitted if its history elsewhere indicates the probable result will be a loss of economic or biodiversity values. This has been a key attribute in identifying weeds in proposed plant imports, and has been easy to assess when plant species have had a lengthy residence in several other countries en route to New Zealand. Because New Zealand has a wide range of climates and soil conditions, it is most likely that any species from the subtropical or temperate region of the world that has shown weed potential is likely to become a weed here. However, circumstances are changing with the increase to many countries of direct access for trade and travel. As a result, for weeds of conservation areas, for example, an increasing proportion (currently 30%) have no weed history, having first been recorded as weeds in New Zealand. Thus, for many plant species that have come directly from Asia and South America, we have to predict weediness at the border *de novo*.

One problem inherent in the very attempt to predict weediness is that, in general terms, the chance of new species becoming a weed is low. In brief, this means that considering all plant species together, there is as much chance of getting it wrong as getting it right! The odds can be narrowed, however, by focussing the assessment on a plant species' immediate relatives. Be-

cause species biological and ecological attributes tend to be clustered within families and genera, the weediness of a relative may give at least an indication of the invasive potential of an unknown species. New Zealand is one of the few countries in the world with databases of its entire flora, both cultivated and wild, including the important stage of naturalising, i.e. forming self-maintaining populations in the wild. An analysis of nursery catalogues indicating when a plant species was first offered for sale in New Zealand, and the time a species was first collected as an established population in the wild, gives an indication of the time between importation and establishment. The average period for bird-dispersed woody species, e.g., *Prunus* spp. *Rosa* spp., was about 50 years after introduction. Once a species has naturalised, anything is possible, and in time a great many will be perceived as having undesirable effects and will need to be controlled. From our databases we have calculated the chance of any new species naturalising, based on the history of its relatives to date. For many families, this is more than one chance in 10, e.g., Salicaceae (willows), Solanaceae (potato), Asteraceae (daisies). To place this figure in perspective, 10 percent from an insurance assessor's point of view would be considered "almost certain". In contrast, members of some other families have (so far) less than one chance in 100, of naturalising e.g., Orchidaceae (orchids) and Bromeliaceae (bromeliads). These figures give us an indication of the invasion probability, but other attributes apart from history and region of origin must also be taken into account.

The manner of escape and spread of a little-known species new to New Zealand would be difficult to predict. However, it is important to estimate how readily the species could be detected and eradicated if it did escape and spread. Relatively cryptic species that are virtually indistinguishable from native species at a distance, would be very difficult to detect in the wild. In contrast, a species of the Australian grass tree (*Xanthorrhoea*) would be widely recognised as an alien species and therefore easily detected. Rapid growth to maturity, a high reproductive capacity, including reproduction by vegetative means, and specialised below-ground organs, generally indicates a species will be persistent and more difficult to control.

Despite all the difficulties outlined, weed risk assessments have to be made at the border on a regular basis. As well as providing useful aids for the detection of potentially invasive weed species, weed risk-assessment models are also important for prioritizing weeds for control, and the development of control strategies. Ideally, WRA models should also be interactive, to allow assessors to measure the influence of different attribute values on the final scores generated.

The WRA system developed for New Zealand, and cur-

rently used as part of border biosecurity, is based on a system originally constructed for Australia. The assessment sheet for each plant species being considered involves entering information on two major areas. Each question is given a score and the total score for weediness places a species in one of three classes: reject, accept, or requiring further evaluation. The biogeographical and historical information focusses on the characteristics of its native range, particularly climate, and its history of domestication, spread and weediness elsewhere. Factors such as a species origins and history, weediness of its relatives, and its own biological characteristics are all taken into consideration when assessing weed potential in New Zealand. The biological and ecological information uses attributes known to be associated with competitive ability, persistence, and reproductive vigour. In early tests, the WRA model clearly placed all current major weed species in New Zealand in the reject/evaluate further category. Currently, much of our research is focussed on improving the attribute information to detect weeds amongst species not yet in New Zealand, or weeds present only in cultivation/low population densities. This involves comparative investigations of weedy/non-weedy species in several large families renowned for weed species (Pinaceae, Fabaceae, Rosaceae).

The potential weediness of a new species must then be weighed against the economic or environmental benefits, not just to the individual importer concerned, but to the country as a whole. This is the risk assessment, and risk management, component of the importation process, where much more than biogeography and botany are involved. Probability or chance, and its relationship to reward, is one way of looking at the issue. Imagine you are standing on the kerb of a busy street where 1 pedestrian in 100 has been knocked over attempting to cross the road. This is about the average chance for plant species selected at random to become a weed in New Zealand. Across the road there is \$5000 and if you cross, you can have it. Would you cross? Now imagine the risk of being knocked over (becoming a weed) remains exactly the same, but the stakes are raised to \$10 m (a new export plant with the potential of kiwifruit). Maybe you would not run out straight away, but the difference is clear. This is the Environmental Risk Management Authorities (ERMA)'s job—to assess the risks and benefits, not just to the applicant, but to the nation as a whole, while preferably keeping our pedestrian alive (not allowing in new weeds). It is also very important that, in the case of a horticultural species of potentially high value, the assessment system does not make a false positive assessment (excluding a species when in fact it would not have become a weed) because there may be long-term economic consequences for the country. In contrast, there is less effect of a false positive assessment in the case of most horticultural species that individually may have little economic value. In aggregate, of course, the introduction of many new species for "urban horticulture"

would make a significant contribution to the economy, as traditionally measured, if everybody rushed to buy them. At the moment, we have no system of putting a bond in place, just in case something goes wrong, as we would for someone wanting to open a new gold mine (which has economic benefit) and store toxic waste (which might damage the environment). One potential solution to this problem of not allowing in new high value crop plants with some weed potential, is to have

the species pay for their own control, should this be necessary. For example, just one cent deducted from every tray of export kiwi fruit would be sufficient to control the invasive populations of this species in the Bay of Plenty. This would need to be spent on the very first outliers of the escaped populations. But then—managing incipient weed populations is a topic in itself, and perhaps the content of a future article.

Book News and Reviews

Wellington's Heritage, plants, gardens and landscape; Winsome Shepherd; Te Papa Press; 2000

Humanity's greatest impact on the surface of this planet has been its manipulation of the land and the landscape. This predates the advent of village settlements, city-states, and empires, in fact it was a precondition that made these possible, and all cultures which participated in the neolithic revolution have played a part in this process. There have been disasters. Some of the planet's distinctive geographical features are the ruins of past human landscapes. In Syria there are Byzantine churches, the bottom steps of which are some five feet above the present ground level, a consequence of the erosion and degradation of once productive land.

Even western culture's idea of "nature" originated within the context of some of the world's most modified landscapes. Wordsworth's Lake District had never recovered from the deprivations of neolithic farmers. Landscapes of meadows and woodland encountered by 19th century explorers in the United States, and now enshrined in national parks, were not wildernesses untouched by human intervention. These apparent "Eden's" of "nature" were the result of long interaction between the landscape, its human inhabitants and their controlled use of fire.

This tenuous relationship between the land and us is so essential to a settled culture that it is a constant wonder to me how little interest has been shown, in this country, in its origins and history. Te Papa, that great window on New Zealand and our current fantasy of a national identity, hardly mentions it, and then only implicitly in an exhibition on wool. Yet Te Papa, as a public institution, is embedded in an economy which still depends for about 50% of its GDP on agriculture. The maintenance and conservation of this source of wealth requires, I think, a knowledge of its development, of how and why it happened, and of the successes as well as the mistakes that this entailed. And in understanding this knowledge of its history is as essential as a knowledge of science, the craft of land management, and an

understanding of economics in ensuring the maintenance and survival of the human landscape and all that it supports. I therefore applaud the Museum of New Zealand in moving to redress an imbalance in its presentation of our culture by publishing Winsome Shepherd's "Wellington's Heritage" a history of the region's plants, gardens, and landscape.

I believe that this book is a pioneering work in its field, and is comparable to Louis Ward's "Early Wellington" published in 1929 and still a basic source of information on the colonial history of Wellington. Like "Early Wellington", "Wellington's Heritage" is a compilation of information from primary and secondary sources, an anthology of histories rather than an overview narrative. These histories are organised as "bites" around estates, gardens, and the people who created them. These in turn are organised in relation to the country and town sections surveyed by the New Zealand Company and within which settlers established their basic economies of survival. Early colonial farms and gardens often worked together as productive units supplying produce for local markets and export. Other histories are grouped in sections such as, for example, Gardens of special significance, Wellington's pioneer nurserymen and seedsmen, and Wellington's parks. This structure allows for the inclusion of a lot of detailed information, extracts from letters and diaries, quotes from published sources, lists and graphs. The result is that, in contrast to a generalised narrative, the reader is involved in a variety of recorded experiences from participants of different backgrounds, and establishes that this "heritage" is indeed the work of human hands.

The first part of the story is one of adaptation and discovery in the face of the failure of the grain based economic strategy insisted on by the technocratic visionaries of the New Zealand Company. The failure was no joke, and the settlement faced starvation on more than one occasion. Responding to real economic opportuni-

ties in relation to the limitations of the soil, the climate, and the market, was the medium and long term challenge for colonists working at the coal-face of settlement. Out of this situation evolved a new social structure, a different land organisation and landscape. When capitalists returned to England, or moved elsewhere to set up grazing estates, in many cases their servants took over, and it was mixed farming and gardening, not wheat, that in the short term saved the day.

The historian Eric Hobsbawm in his book "The Age of Capital" dates the origins of a modern global economy to about 1850, and New Zealand as a European settlement never experienced a period of separation from the parent culture as was the case in North America, and for a shorter period, in Australia. This is reflected in the remarkable speed with which a surprising range of plants became available to settlers. During the 1840s Wellington's first horticultural society was exhibiting an impressive range of fruit varieties and vegetables assisted no doubt, by the accumulated fertility of virgin soils. Winsome Shepherd has loaded her account with lists and information from letters, diaries, and nursery catalogues on the sources of plants, the varieties available, and how they were distributed among the colonists. Exchanges in kind were very common, while many people also sold plants grown in their gardens as a money raising sideline. Her research shows that as well as seed and plant stock brought from or sent from Britain, nurserymen in Australia were important suppliers in the early decades of the colony. But international networks were also operating which resulted in gardens with remarkable horticultural collections such as those of Ludlam and Mason in the Hutt Valley which were well established by the 1850s. These networks were used in stocking the Botanic Garden from 1869, and this was to shape the vegetation of Wellington and its hinterland during the late nineteenth and first half of the twentieth centuries. At no time was New Zealand behind the rest of the world in the international exchange of plants and plant varieties.

The rapid clearing of the land left Wellington with a treeless, pasture covered hinterland, which in combination with the endemic winds made for a harsh environment. Travellers in the early 1850s wrote of the clouds of dust in the town from which there was no escape. But it was within the city that new vegetation was established. Well furnished gardens on Wellington's town sections had, by the 1880s, provided the western side of the city with a green belt stretching from affluent Thorndon in the north to affluent upper Willis Street in the south. The ample illustrations in the book show the variety and density of these gardens which have all but vanished from the city. An example illustrated is St Ruadhan situated on a town acre, which with its neighbour, Dalmuir, was backed by 1920 with plantings on Town Belt section 48. These gardens and the reserve

must have given the intersection of Ghuznee Street with the Terrace the appearance of access to a large inner city park. Both of these gardens which were established in the 1840s vanished, along with the plantings on Town Belt section 48, in the late 1930s and 1950s. Just as the inner city has been rebuilt about six times since 1840, our city landscapes have also come and gone. As large private gardens declined, public gardens like the Town Belt provided an accessible backdrop of green to the inner city, and from the 1960s small public parks and more street trees have brought greenness back to the central city.

"Wellington's Heritage" also documents survivals of past landscapes and their vegetation. Parks may be characteristic of Wellington city, but in the Hutt Valley private suburban gardens are the descendants of the gardens of Ludlam and Mason. Among them are many old trees surviving from the gardens of the past, which include some of the nikau palms which Ludlam retained when he cleared the forest on his estate. Remains of original native forest survive in the Botanic Garden and at Wilton's Bush. An early colonial landscape with additions of conifers supplied from the Botanic Garden in the 1880s can still be seen in the Ohariu Valley area. And then there are the wild flowers and garden escapes. Some like the weeds of our lawns and roadsides have been travelling with us across the temperate world for thousands of years, the camp followers of agricultural, pasture maintaining, humanity. Others came from new lands discovered by Europeans and brought back for their gardens. One at least, the white rose Alberic barbier, was deliberately planted by the Wellington Beautifying Society in the 1920s and 30s. Today it mixes and mingles with everything else in a city where the official and unofficial vegetation blends into each other, and barriers are hidden by it.

When it comes to our landscape and its vegetation, the final message of "Wellington's Heritage" for me, is that change is the only thing that is constant. Winsome Shepherd makes us aware of our landscape heritage in all its multi layered variety, and, I believe, recognise it for the human artifact that it is. Even bringing native forest back to the western Town Belt is a human decision arising from current values and priorities held by the community.

I recommend this book to Wellingtonians in particular, but also to anyone else who is interested in the history of plants, gardens and the development and survival of the human landscape in New Zealand.

Walter Cook

