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'THE END OF THE GOLDEN WEATHER...?'

This issue features weed invasion of some of our most loved New Zealand habitat—the beach and the surrounding terrains of forest and reserve.

We have a very timely report from the frontline of the war of weeds. The lead

article by DOC and Landcare Research Ltd scientists is a warning to be extremely careful of exotic plants either in your garden or your rubbish. There is also a review of a useful book on weeds—*Editor*.

Invasion of coastal forest by weeds from subdivisions

The abundance and diversity of exotic plant species in coastal reserves is thought to spring in large measure from their spread from nearby settlements. The Department of Conservation (DOC) is concerned that planned coastal subdivisions will mean increasing pressure from weeds, especially to the idyllic forested bays of northern New Zealand. Hard data were lacking, but a recent study has quantified that subdivisions affect the weediness of forests. DOC now has the evidence it needs to argue against the development of subdivisions near areas of high natural biodiversity.

We surveyed 18 natural areas of coastal forest along the eastern Northland coast, recording attributes such as size, landform, dominant vegetation, and all exotic plant species present. A comparative list of exotic plants was gathered for the gardens and streets of neighbouring settlements, and their proximity to the remnants, number of houses, and age.

Growing in gardens we found 87% of the Northland Regional Council's worst forest weeds—over 20% more than in neighbouring coastal forests. But in the forests we often found piles

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Dumped garden rubbish from a coastal subdivision, Whangau Beach, Northland.



Department of Conservation
Te Papa Atawhai

LEAD ARTICLE

Coastal forest, with houses in a coastal subdivision, Woolley Bay, Northland.



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of freshly dumped garden waste containing invasive weeds.

Coastal forests near old or high-density housing were the weediest. Forest with more than 70 houses close by had, on average, two-and-a-half times as many weeds as forests with only a few nearby houses. The weediest forests were those near settlements with lots of exotic garden plants.

The settlement characteristics of housing age, density, proximity to the forests, and garden diversity explained 70% of the variation in the diversity of weeds growing in these forests. Other ecological factors were insignificant. When it comes to weeds in native forests, it is the nearby houses and gardens—people—that really matter. A recent national survey and international studies concur.

Given the major effects weeds have on the ecology of native forests, there is a clear need to assist communities to prevent weeds invading and destroying the forest remnants. A mix of

old and new initiatives can achieve this. While DOC could oppose new subdivisions outright, it may be more profitable to encourage the concepts of buffer zones and 'pest-free' communities (excluding weeds and animal pests) as an extension of the successful 'predator-free' zones already established in some areas.

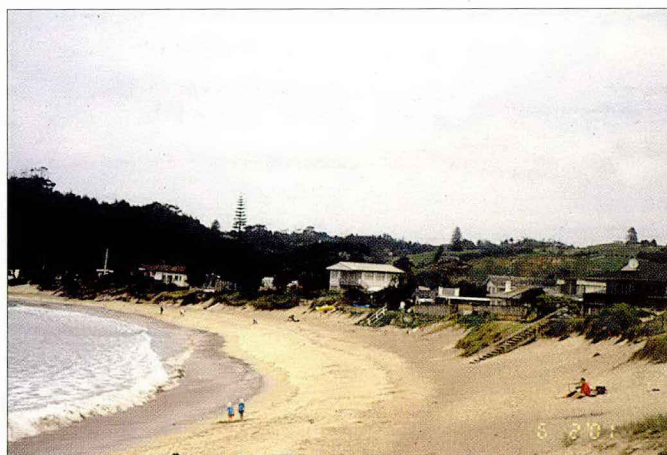
Raising public awareness of weeds is critical. Property owners nearest the reserves are the most important to educate and they should be encouraged to remove potential weeds from their gardens. These folk appear to be the greatest dumpers of weeds too—this practice must stop. DOC's recent weed surveillance and rapid response initiative should help, particularly in vulnerable areas. Co-operation between DOC and regional authorities will make the initiative the more effective. We could still make developers' optimistic claims a widespread reality—ocean and bush views, and healthy native forests too.

Jon Sullivan¹, Susan Timmins², and Peter Williams¹

¹*Landcare Research, Nelson,*

²*Science & Research Unit, Wellington*

Matapouri Bay, Northland, with housing development right up to and including the foredune.



NEW STAFF

Bruce Jamieson

Bruce Jamieson has been with SRU since April of last year, but so much at home is he, that we overlooked noting his arrival at the time. Because we missed him earlier, here is a report on our Finance and Administration Manager—Editor



'Managing scientists is like herding cats...'

Originally from small-town New Zealand in the beautiful central Hawkes Bay, I moved up in the world to Palmerston North in the mid eighties to attend university. Unfortunately (or fortunately) I had such a great time during my first year that the grades suffered, and I decided to find full-time employment. Thus began my career working with scientists!

Employed by DSIR at the Grasslands Division, I began life as the Invoice Filing Clerk, eventually moving into the Purchasing Officer role. The early 1990s saw the restructuring of the DSIR into Crown Research Institutes and I took the opportunity to move into a

Facility and Property Management role, still based at AgResearch Grasslands, Palmerston North.

In late 1997 I began a 'temporary' role as Site Manager for AgResearch's Animal Health Division in Upper Hutt. What started out as a 2 day-a-week assignment soon became full time and I found myself shifting to Wellington.

After surviving several restructurings, and working for the organisation for a total of 16 years, it was time to move on. I took up the position of Finance and Administration Manager for the Science & Research Unit in April 2001. Since starting with DOC I have been learning a number of new skills which go with the role—including how to set up mist nets, on a recent trip to the Eglinton Valley.

Spare-time activities revolve around socialising, a bit of mountain biking, dining out, and reading.

Carla Wilson

Carla Wilson has recently joined us in the Social Science niche formerly inhabited by Nick Hardy-Boyes. Already she is displaying a lively sense of fun that fits right in to SRU—Editor

I am the new social scientist working with Gordon Cessford and Anthony Fraser (both in the picture with me).

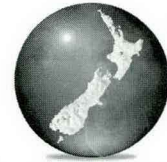
I have a Masters degree in Social Science in Geography from Waikato University, but originally hail from the depths of West Auckland. I've been in Wellington for 6 years, and most recently worked as a social researcher at the Ministry of Social Policy where the main focus of my work was the role of volunteers and the voluntary sector within New Zealand. I have also worked as a policy advisor for the Wellington Regional Council where I was responsible for developing and facilitating community consultation processes.



In my new role with the Department I am responsible for undertaking and coordinating research related to communities and conservation. This includes a wide range of topics—from environmental education issues, through public attitudes to pest control, to Maori interests and expectations in marine management.

I've recently bought my first house, so much of my time outside of work is spent thinking about painting, stripping, sanding, and polishing (not much action yet). I also fancy the idea of being a bit of a gardener—but there isn't any dirt under my fingernails yet and a wild jungle thrives which I'm too scared to touch. However, outside of work I do spend some time writing (I'm sure there is a great novel in me somewhere just waiting to be discovered), trying to be sporty (a continual struggle), and on Tuesday and Thursday evenings the rest of the world stops for Coronation Street.

'Travellin' on ...'



Protect New Zealand

Tiakina Aotearoa

A big welcome to the latest addition of the Biosecurity team—the new Regional Biosecurity Technical Officer, Andrew Harrison. Andrew started at the end of January. His task is to advise and support the Regional General Manager and lead Conservancy in handling incursions. You'll be hearing from Andrew later on. On to biosecurity conservation issues ...

An incredible variety of species have the ability to travel in ingenious ways and also to establish, thrive and dominate in new places¹. Uninvited pests and diseases of freshwater and terrestrial ecosystems are primarily the responsibility of the Ministry of Agriculture and Forestry (MAF). A number of pest species have evaded the border control systems—and MAF (in liaison with DOC) is working to respond to the pests that are trying to establish. When a new species is introduced into an ecosystem, the full impact is often not immediately apparent. A number of the invasive alien species featured in this article could potentially have terrible consequences to New Zealand's indigenous biodiversity.

Two recent high-profile incursions (an 'incursion' is where an organism has been detected within New Zealand's borders) include the Red Imported Fire Ant and the Painted Apple Moth. The Red Imported Fire Ant, native to southern Brazil, is considered to be one of the top 100 of the world's worst invasive alien species. In February 2001 it was detected for the first time in Brisbane, Australia. The same month a fire ant nest was found at Auckland International Airport. The

ant is thought to have been introduced as a hitchhiker on animals from Australia. The nest was destroyed and the ants killed and, to date, there have been no further signs of the fire ant in New Zealand. Omnivorous, opportunistic and aggressive (a biter and a swarmer), the fire ant has become a significant environmental, economic and human health pest outside of its native range and has the potential to establish across much of New Zealand². If the ant were to establish, the impact on our indigenous biodiversity would be devastating. This ant prefers open areas and those species of birds (particularly ground nesters), invertebrates and reptiles that occupy habitats outside mature forests will be vulnerable. A conservative assessment suggests that this ant could establish in the North Island and upper South Island³. It's anticipated that the ant would impact on households, infrastructure and agriculture in addition to the environment costing the government at least \$665 million over a 23-year period².

The Painted Apple Moth, a native of Australia, was first discovered in the Auckland suburbs of Glendene and Mount Wellington in 1999. Initial investigation of these finds suggested that the original introductions occurred at least 12 to 18 months before their discovery. It seems likely that the moth hitchhiked on a shipping container or industrial equipment as an egg mass. Although a formal environmental impact assessment has not been done, the caterpillars have been found feeding on three native plant

species in New Zealand—kowhai, mountain ribbonwood and karaka. Indeed, the larvae completely defoliated the karaka it was found on! As this moth has a wide host range it is likely other native species will be impacted on too if the eradication programme currently underway is unsuccessful.

A particularly serious recent interception (an 'interception' is where an organism has been detected at the border by MAF Quarantine staff and prevented from entering New Zealand) as recent as January 2002 includes the Crazy Ant. This species is widely considered to be one of the worst invasive ant species world-wide. Crazy Ants were intercepted in a ceramic urn from Malaysia and have invaded native ecosystems and caused environmental damage from Hawaii to the Seychelles and Zanzibar. They are reported to form multi-queen super-colonies, foraging in all habitats including rainforest canopy. They prey on, or interfere in the reproduction of a variety of arthropods, reptiles, birds, and mammals on the forest floor and canopy¹. They farm and protect sap-sucking scale insects as a food resource, in a way similar to the Red Imported Fire

Ant. As they prefer a warm climate, northern New Zealand is potentially vulnerable to these ants.

Other interceptions for January 2002 include a Shield huntsman spider on a container of paper, a wasp in a box of socks from the USA, a wasp in a carton of books from Australia and a jumping spider in a ceramic urn from Malaysia⁴. The detrimental impact of exotic species on our native flora and fauna is expected to increase dramatically in the future with today's extensive global trade and passenger movements. 'To be forewarned is forearmed' is the take-home message from this article. Keep your eye out for suspicious looking nasties and/or symptoms in our native ecosystems. The next update will cover the procedure to follow in the event that you see an unfamiliar organism and/or symptom.

Verity Forbes

Science & Research Unit, Wellington

¹ 100 of the World's Worst Invasive Alien Species

² MAF Policy (2001). The potential economic impacts of the Red Imported Fire Ant in New Zealand

³ Garthwaite (2001). Minister of Conservation briefing. Unpublished.

⁴ MAF Interception Records (2001).

Keynote speaker

Gordon Cessford, of SRU, recently presented 2 papers at the international conference on **Monitoring and Management of Visitor Flows in Recreational and Protected Areas** which was held in Vienna, Austria, in January/February 2002.

One of Gordon's papers gave an update on the department's development of visitor counters. The other,

which was the keynote presentation at the User Conflict session, summarised conflict issues, featuring examples from interactions between mountain biking and walking. In his own time, Gordon also assisted on the Tourism New Zealand desk at a major international travel fair held in Zurich, Switzerland.

LETTERS

Last letter from Samoa (part 2)

Dear Friends

In a sense, my experiences have occurred at four levels: global conservation issues, regional, national, and village. Global conservation initiatives are of two types: inter-governmental conventions and agreements, and Non-Government Organisations. It is interesting that more and more NGOs are actually implementing agreements made by and funded by governments. Here in the Pacific it is the NGOs that can take most credit for externally funded conservation projects. Thank goodness I realised this early on and have been moderately successful in collaborating with NGOs—especially BirdLife International. I regret though not working more with The Nature Conservancy and Conservation International. Still there has been some contact and collaboration with these latter two, and it is breaking new ground for both parties. But I think the future for conservation in the Pacific and some other developing regions lies in the NGOs, Inter Government Organisations, and National governments collaborating. I labour this, being born, bred and trained a government man, and my realisation is that there is plenty of scope for improved co-operation between Government and NGOs in New Zealand.

The other experience with global-level conservation is with the Convention on Biological Diversity (CBD). I have now had experience at all three main stages of the process of creating implementation recommendations for action by the Convention's Secretariat. I have found the system wanting, but improving—especially the Subsidiary Body for Scientific, Technical and Technological Advice (SBSTTA; one acronym that is worth it)

which advises the Conference of Parties on what it should instruct the Secretariat. There is a 'lower' level of input, that is the ad-hoc technical working groups for access to genetic resources and benefit sharing, which I have also served on. The mistake the two advisory level bodies can make is to get involved in political games. Recommendations then become non-specific and not very useful for getting needs met. Another problem is that many of the recommendations are attempts to try and tackle all aspects of a given issue at once. There is no way every aspect of an issue can be dealt with—ever. With environmental issues one must recognise the point where further deliberation only takes one past available resources and that, at this point, it is more important to simply start practically dealing with the issue and take an iterative approach to improving methods, extending activities, etc. I think this is the secret to doing the best for conservation anywhere—not just developing countries. But things are changing. The SBSTTA is becoming more of a technical body, tabling the technical issues, and 'politicking' is being quietly discouraged. There is still some way to go though. And then there is the Conference of Parties, which is the major grouping of states. Some of the reason for the political interaction is the fear of being bound by rules of various sorts, and the possibility of being compromised in a related field such as trade. So, for example, trying to regulate the importation of living things that might become invasive species is seen also as a possible threat to that ultimate good: free trade. The constant reference to other related Conventions has a positive and a nega-

In the last issue of ConScience Greg talked about the importance of getting the village on side; in this issue he moves out to talk about the regional and national level
—Editor.

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tive side. The continual cross-referencing can slow down things but on the other hand many conventions can supplement the CBD—as long as the ultimate funding authority for the environmental conventions (the Global Environment Facility) does not see overlaps as a means of cutting funds overall.

I think there will always be a demand for regional organisations such as the South Pacific Regional Environment Programme (SPREP)—at least for the next fifty years or so. The ultimate aim is to empower the national governments to manage their affairs competently themselves, thus making organisations such as SPREP redundant. And well before then, making their

programme officers Pacific islanders instead of expatriates. But in the meantime regional organisations such as SPREP, Secretariat for the Pacific Community, Forum Fisheries Association and the like, will be essential to co-ordinate environmental management initiatives and sustainable use of natural resources. There is still a huge demand for training and the necessary infrastructure to cope with modern practices. One of the greatest needs, at least in environmental management, is for improved co-operation and collaboration between the regional organisations. There is a Committee of Regional Organisations of the Pacific (CROP) which is supposed to co-ordinate between regional or-

BIODIVERSITY CONFERENCE

October 2002 – Albany W.A.

Prospects for Biodiversity & Rivers in Salinising Landscapes

An invitation

On behalf of the Organising Committee I extend to you an invitation to participate in this International Conference. We aim to share knowledge on these issues, to identify research priorities and to think creatively about options for the management of our landscapes to protect and restore biodiversity.

Our particular concern is the biodiversity from spreading salinity. However, we are also keen to learn from related experiences with threats to biodiversity that may inform our endeavours. While the conference aims to propose practical options for managing biodiversity we also wish to encourage contributions from basic research in the disciplines of ecology and natural resource management.

The Conference is jointly convened by the CRC for Plant-based Management of Dryland Salinity and the Centre of Excellence in Natural Resource Management. We are arranging a program of field trips, invited and submitted papers, workshops, and discussion groups which aims to encourage a diversity of knowledge and experience to be shared and used to formulate soundly-based management options.

Marcus Blacklow
Conference Chair

Workshops, Discussion Groups & Plenary Sessions

We are considering a number of formats and topics so that the conference can deliver the collective wisdom of the participants that can make an impact on policy and practice. We are keen to design this part of the Conference to suit the participants. To assist our planning, please let us know topics you would like to have discussed and productive formats for doing so.

mblacklo@agric.uwa.edu.au

Conference website: www.biodiversityconference.albany.uwa.edu.au

organisations. The CROP works well but its decisions tend not to result in co-operation at the project level from what I have heard and observed. The basic point is that there is still duplication of projects in the Pacific and a dire need for collaboration. Resolving this needs strong leadership at the regional organisation level and pressure from the donor countries—either one by itself will not be enough. Thus I am advocating the importance of the donor nations (especially New Zealand and Australia) to take a more pro-active role influencing the *modus operandi* of the regional organisations.

Regional organisations need more internal co-ordination between projects as well. Many projects are funded as stand-alone tasks over precise periods. Almost all projects have similar components—public awareness and education, training, infrastructure development, needs assessment, etc. So there is no reason to duplicate these functions within an organisation. SPREP is working on implementing a corporate plan, the main benefit of which, from my point of view, will be ensuring co-operation between its divisions. It must be borne in mind though that the structure and function of the regional organisations are profoundly influenced by the donor countries who still tend to fund on a project-by-project basis, and not on a basis of core area of need (requiring longer-term support). Thus under the former regime of funding, structuring the organisations for fully integrated functioning between divisions is very difficult. So once again the donor countries need to play a much more pro-active role in deciding what sort of a regional organisation they wish to support. Notwithstanding the above requirements for improvements, I think the regional organisations are of

immense value for the regions and are most effective when located within the regions and at one centre.

At national level, there are huge variations between countries in their capability and abilities to manage the environment. This in part reflects differences in commitment, their colonial history, and the size of the country relative to the population base. However, the political turmoil in the Pacific over the past three years, epitomised by Fiji and the Solomon Islands (by no means the only countries with political unrest), demonstrates an absolute need for implementing in-country environmental projects—the need for good governance. Without this, ‘tail-end Charlies’ like conservation projects (i.e. basically a luxury item social need, when the population is being threatened by violence, starvation, disease, or no education) will inevitably be the least likely to get in-country support. Thus regionally speaking, with such huge conservation demands relative to available resources, priority projects need to go to countries with good governance. Unfortunately this does not necessarily equate to the biological reality of where most threatened diversity occurs. (The Solomon Islands, for example, have many threatened bird species.) Over the three years, I have been thrilled to meet conservation officers who are deeply committed to the conservation of their native biodiversity. These people are the second vital requirement for success, because it is an individual’s commitment, often against all odds, that will get a project implemented in the Pacific. I believe this to be particularly important in a scenario where the infrastructure is often inadequate for getting things done.

Greg Sberley

Life in gloomy holes—algae of cave entrances

The magnificent limestone cave systems of New Zealand support unique communities of animals, plants and micro-organisms. The latter include algae that form brightly coloured crusts, slippery films and gelatinous aggregates in cave entrances. We have commenced a taxonomic survey of the 'blue-green algae' (Cyanobacteria) which often dominate these growths. They can thrive in the consistently moist, calcium-rich environment. Additionally, they are capable of using very low light intensities for their photosynthesis and growth. Even well within caves, out of sight of the more brightly illuminated entrance, algal crusts occur at less than 0.1% full sunlight, beyond the depths to which ferns and mosses penetrate.

Our preliminary studies of samples from Kahurangi, Paparoa and Fiordland National Parks have revealed a diverse flora including species previously unrecorded from New Zealand. As the taxonomy of blue-green algae has received relatively little attention in New Zealand we cannot yet say whether any of those in

caves are restricted to that habitat. However, the few studies performed overseas have detected filamentous forms, which have been found only in caves. Interestingly we have not yet encountered those. Are there barriers to their dispersal to our remote caves or do features of our cave environment prevent their establishment? Whether cyanobacteria of similar appearance to those found in caves overseas, or in other habitats in New Zealand, are in fact identical will require the application of molecular genetic techniques. These are planned for future studies.

Another aspect that we will address is the distribution of algae along light gradients. Caves provide a valuable natural situation in which one environmental parameter, in this case light, decreases steadily with distance from its source. Other parameters such as temperature, moisture avail-

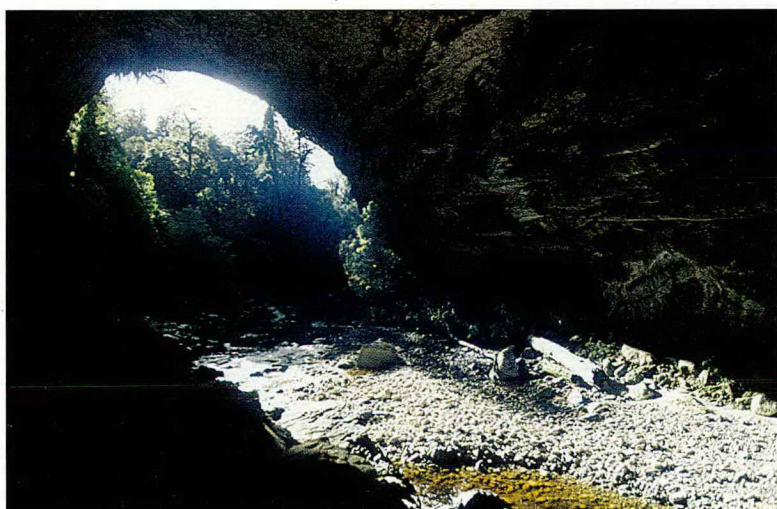


Figure 1. (Above) Entrance to the Oparara Arch, Kahurangi National Park.

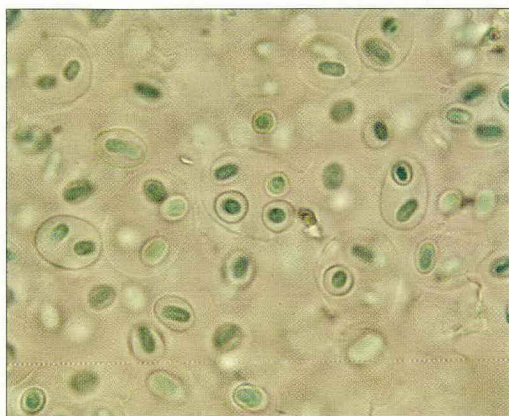


Figure 2. (Left) A unicellular blue-green alga from Oparara Arch, Kahurangi, with each cell surrounded by gelatinous layers.



Figure 3. (Right) A filamentous blue-green alga, from Oparara Arch, Kahurangi, with specialised cells which are capable of nitrogen fixation. The chains of cells are surrounded by layers of brown mucilage.

ability and nutrient supply remain more or less constant. Does the species composition of the cave wall community change along this light gradient? Which species are capable of harvesting the photons of light at the dimmest irradiant levels?

Vegetation on cave walls is very sensitive to physical disturbance. Trampling and rubbing of clothing against cave walls can easily dislodge plants and algal crusts. Human wastes can

drastically change the nutrient supply and composition of the flora. Our study should indicate the natural flora of relatively undisturbed caves. This knowledge should be useful for monitoring human impact and in cave management.

*Paul Broady,
Department of Plant and Microbial
Sciences, University of Canterbury,
Christchurch*

REVIEWS

Bush invaders of South-East Australia:

A guide to the identification and control of environmental weeds found in South-East Australia

by Adam Muyt

Reviewed by Ian Popay

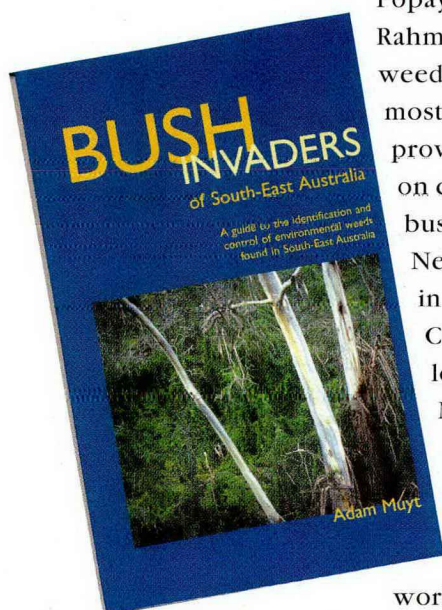
This book should be on the shelves of anybody in New Zealand who has to deal with, or is interested in, dealing with the weeds that invade and despoil areas of native bush. Although directed at the parts of Australia closest to us, almost all of the weeds described in this book are serious problems of similar areas in New Zealand, and the techniques described for controlling them can also be used here. Some of the weeds described are not yet problems in New Zealand, but may yet become so. That lovely, innocuous garden plant *Freesia* is a bush invader in Australia and may also, one day, be a problem here.

A warning, too, that our own native plants can become dangerous when they get overseas. Two of the plants described in this book are New Zealanders that are causing problems in South-East Australia. These are the toetoe *Cortaderia richardii* and *Coprosma repens*, sometimes called looking-glass bush. *Cortaderia*

richardii gets lumped in with wicked pampas and purple pampas grass, and is seen as a serious threat to World Heritage areas in south-west Tasmania. *Coprosma* has escaped from gardens and become a problem in coastal bushland, and sometimes inland.

Australian plants, too, can be dangerous if they escape from their original habitats. Several species have been widely planted outside their natural ranges, and are spreading into forests and woodland. Among those that cause problems both in parts of Australia and also here are *Racosperma baileyana* (*Acacia baileyana*), *Racosperma longifolium* (*Acacia longifolia*), and *Paraserianthes lophantha* (originally from Western Australia, widely planted and now a problem weed in coastal areas of South-East Australia).

A book to help in the identification of weeds is available in New Zealand—'An illustrated guide to common weeds of New Zealand', by Roy,



Popay, Champion, James, and Rahman—but books on controlling weeds in New Zealand are scarce and mostly out-of-date. 'Bush invaders' provides some helpful information on controlling many weeds found in bush areas in both Australia and New Zealand. For the professionals in New Zealand, the Department of Conservation has produced a large loose-leaf folder called Weed Manager, which provides descriptions and control methods for weeds of conservation areas, but this is not widely available.

The taxonomists have been at work again, and some of the species in 'Bush invaders' now carry new Latin names. Cape ivy, which we know as *Senecio angulatus*, has become *Delairea odorata*, and climbing dock, *Rumex sagittatus*, has become *Acetosa sagittata*. Cape tulip, *Homeria collina*, is now known as *Moraea flaccida*.

The first part of the book deals with environmental weeds, the problems they cause and why, and deals with the management of environmental weeds, with a very wide range of weed control methods, including herbicides, grazing and burning. The section on the use of herbicides goes into considerable detail on how to minimise risks to non-target vegetation. HortResearch's Vigilant gel herbicide has obviously not yet reached Australia, since this very useful and practical approach to herbicide use is not mentioned in this section of the book. In the second part of the book, 93 individual entries give information on over 150 species. The species discussed are divided into sections of grasses, other narrow-leaf herbs, broadleaf herbs, climbers and creepers, shrubs, trees and aquatics, which is a very useful approach.

The information presented for each species is impressive. Its common names, family, country of origin, method of introduction (most commonly for ornamental purposes!), plant form and Australian distribution appear first. Next comes an 'invasive summary', explaining where and why the plant is a problem, followed by 'diagnostic features' to help in its recognition, and 'reproduction and dispersal'. 'Control and removal' comes next, giving vital information on how to control the pest without or with herbicides. [I think I would have preferred some guidance on which herbicide to use. Glyphosate kills most, but not all, plants, and some suggestions of when it isn't so good and then what alternatives to use would have helped.] Notes on 'similar invasive species' follow, and then 'confusing indigenous species'. 'References' at the end of each species notes refer the reader to the list of nearly 400 reference works near the end of the book. The notes on each species or group of species are very comprehensive.

Each species is clearly illustrated with one or more good colour photographs, most of which show diagnostic features well. Some photographs are less clear. Balloon vine (on p. 129) for example, could be almost any climber.

The book is hardly comprehensive—I am sure there are many more species that cause problems in natural environments in South-East Australia. Some of the species described here are of limited distribution, and the impacts of the herbaceous species, like some grasses, are small by comparison with scrubweeds and creepers.

I'm not sure either that the aquatic weeds shown in this book really fit into the definition of 'bush invaders', especially in the case of the seaweed

BOOKS

Undaria. All are invaders of natural environments, but hardly bush areas. It's another attractive and well-presented book from the Rob and Fiona Richardson stable, and yet another Australian weed book. The Australians have always been much better off than we have for books about identifying

and controlling weeds. Such books are not cheap, especially this side of the Tasman. It's partly because there are more of them than there are of us of course, but I think it's also because they take their weeds much more seriously than we do, as their spending on research shows. —*Ian Popay*

Bush invaders of South-East Australia: A guide to the identification and control of environmental weeds found in South-East Australia

by Adam Muyt

Published in August 2001 by R.G. and F.J. Richardson. ISBN 0 9587439 7 5.

A sturdy paperback of 304 pages, with coloured and black-and-white plates and line drawings, retails for A\$59.95 and is available from

R.G. and F.J. Richardson,
PO Box 42,
Meredith, Vic 3333, Australia,

or at: www.weedinfo.com.au

Note that all DOC staff can buy CSIRO publications at a substantial discount.

Contact: Manaaki Whenua Press
c/o Landcare Research,
PO Box 40, Lincoln 8152

or email: mwpress@landcare.cri.nz, or www site <http://mwpress.co.nz>

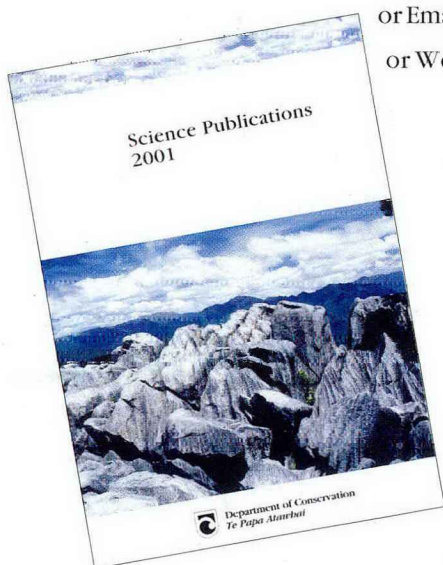
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