



Newsletter of the Weed Society of Victoria Inc.

volume 19 issue 3 2008

Weedscene

Achieving outcomes through strategy – Victoria's new framework for managing the environmental impacts of weeds on public land

by Stephen Platt

Often I have wondered, when driving along a road through public land, why it is that no-one seems to bother with roadside exotics so evident when emblazoned in their autumn colours. That is, until I began to work with others on understanding the issues. Would it be the most effective use of staff time to control these weeds? What risk does such an incursion pose and to what? Who is responsible? Where does a land manager seek advice? I am now much better informed about the complexity of the problem. This article explores the path we are following to some of the solutions.

Over the last few years there have been a number of significant developments in the way that we think about managing the environmental impacts of weeds on public land, which covers 8.5 million hectares of the State. A new framework is under development. It is based on taking a biosecurity approach which means placing priority on prevention and early intervention. New and emerging weeds are the highest priority for eradication. The aim is to prevent the long list of weed species from continuing to grow (over 580 species naturalised in Victoria currently and estimated to be increasing by 8–12 species per year nationally). Beyond these 'new' weeds, the strategy shifts to one focused on the protection of natural and community assets. Areas containing significant values

are given priority for defence against the wide range of established weeds affecting them. Established weeds are those that are unlikely to be eradicated in the foreseeable future given the resources and techniques available. Along with addressing the causes and pathways of invasion, this thinking enables resources to be directed most effectively at a complex problem and provides a means of achieving real gains. The focus has switched from the weed to the outcome being sought.

Specific developments in recent years have included:

- **Establishing a new policy framework**, published as *Guidelines and Procedures for Managing the Environmental Impact of Weeds on Public Land in Victoria*. By developing an approach based on prevention and the value of, and risk to, assets this work has provided a consistent approach across land tenures (park, forest, other public lands). It has documented the objectives, principles, priorities, legislation and standards that apply to managing the threat of weeds on public land.
- **Demonstrating the new approach to managing weeds outlined in the Guidelines on public land through**

a case study in the Otway region of Victoria. The Otway Weeds Case Study involved the development and implementation of innovative and practical new systems for managing weeds effectively at a landscape scale of operation across public land tenures.

New and emerging weeds were identified from public databases and with the assistance of the local community. Bronzy Hakea, Ferny Asparagus and Bluebell Creeper are in this category. These have been given highest priority for eradication.

High value asset areas were identified using a model that captured information on the conservation significance of the vegetation, threatened species and landscape context (degree of fragmentation). The Anglesea and Carpendeit heathlands were among the areas of highest significance. The weeds that threaten these asset areas were identified through local surveys. All established weeds were ranked by an expert panel according to the level of risk. These important asset areas are being protected from a wide range of established weeds with high risk species given high priority.

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The benefits of membership to WSV include:

- Weedscene: quarterly newsletter packed full of information
- Discounts to WSV seminars, workshops, conferences and other events
- Opportunities to network with others.

To apply for membership, download and print the membership application form from the WSV website, www.wsvic.org.au, complete the details and mail to the WSV Secretary.

Weedscene Newsletter of the Weed Society of Victoria Inc.

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The local community assisted in identifying weed threats and in treating some sites.

This is the first time that an approach that deals with the real world situation of hundreds of weed species has been developed. By giving priority to prevention and early intervention, public land managers have been given the opportunity to make real progress against this threat. In the first year of implementation, 33 out of 34 sites of new and emerging weed infestations were treated and, for example, in one asset area 40 of 60 established infestations were treated.

The vast quantity of new information generated is being managed through a new web-based information system called *eWeed*.

New roadside signage will encourage weed reporting. This work has led to further public investment in this approach, now being termed 'Eden' projects, in other parts of the State (e.g. Glenelg Eden, Grampians Eden).

- **Establishment of an outcome monitoring approach** that enables the determination of changes in vegetation health over time due to weed invasion. This will assist with our understanding of the real impact of weeds on the environment, which is poorly understood. This method builds on Parks Victoria's protocols for monitoring the outputs from weed management.
- **Development of a model of weed invasion** based on a new and emerging weed in the Otways, Bluebell Creeper *Billardiera heterophylla*, a native of Western Australia. The model predicts that after 23 years without management intervention infestations of *B. heterophylla* in the Otway region will occur on 3,600 hectares. The model also indicates that considerable cost savings, in the order of \$170,000 to \$15,289,000 over a 12–23 year time frame, could be achieved by early intervention.

- **Creating a process for guiding statewide investment** in environmental weed management through modeling biodiversity assets and weed risk across Victoria.
- **Updating the weed risk associated with species impacting on the environment.** This information is in the process of being published as Advisory Lists of Environmental Weeds for specific bioregions. It will provide a useful reference for all land managers looking to prioritise their activities based on the level of weed threat.

This work has been influential in guiding the redevelopment of regional weed and pest plans by Catchment Management Authorities.

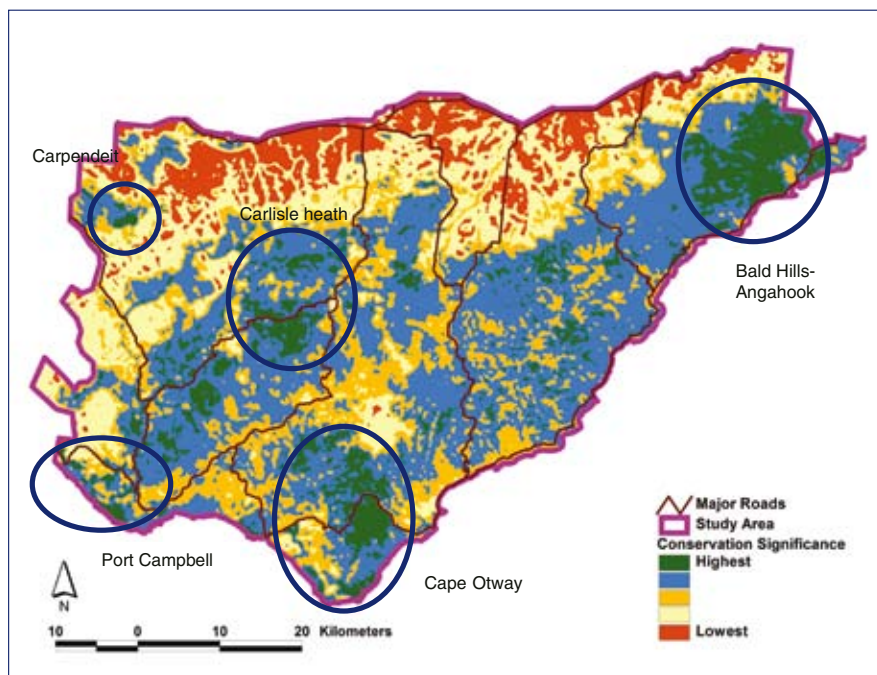
So, when next I spot a golden-leaved exotic on a bush track I will ask myself – Is it a new and emerging species? Does it pose a high risk to an area containing important values? I will expect to find public land managers politely advising me that, whilst they have listed my new record, it sits in the appropriate place on a prioritised list that determines how they direct their time and resources to most effectively protect the values that are important to our community.



New and emerging weeds, such as Bluebell Creeper *Billardiera heterophylla*, are a high priority for eradication in the Otways. (Photo: R. Richardson)

I will be open to their invitation to contribute as a weed spotter with my activity focused on high risk areas for the establishment of new and emerging weeds. Because, as all who work with weeds know, strategy is critical to a successful outcome. When it comes to the treasures on public land, the outcome benefits us all.

Further information and links to publications – www.dse.vic.gov.au/weeds [select Weeds and Pests on Public Land Initiative]. A list of publications referred to in this article can be found on page 12.



Important asset areas are a high priority for protection against the wide range of established weeds that threaten them. (Image: Matt White, DSE)



WSV News

2008 AGM Seminar

A seminar entitled 'Commercial weeds: roles, responsibilities and innovations' was presented by the Weed Society of Victoria on Thursday 17 April 2008.

Tony Grice from the CRC for Australian Weed Management and CSIRO in Queensland, did a presentation on commercial weeds, their impact and current thinking. He proposed a range of options to address containment and possible approaches that might play a role in restricting invasion in future.

This was followed by David McLaren from Biosciences Research of the Department of Primary Industry, Frankston on the historical aspects of commercial weed invasions including some perennial grass case studies. The influence of botanical garden, agricultural industries and accidental/contamination weed introductions were discussed. Mexican feather grass and brown top bent grass were used as examples and directions for dealing with weed invasion issues were presented.

After morning tea, Garry Cook from the CSIRO Sustainable Ecosystems, NT, did a presentation on deliberate introduction of weedy pasture species by Australian Government agencies during the 20th century. He highlighted the fact that a range of plants was intentionally introduced to be evaluated as pasture species, here as well as overseas.

Lynley Stone from the Future Farm Industries CRC, discussed the identification and management of weeds risk in perennial pasture research.

Belinda Riddle from Biosecurity Australia in the ACT, presented an introduction to the weed risk assessment system and the permitted seed list, the structure of the ICON database and the activities of AQIS.

John Virtue of the Weeds CRC in Adelaide highlighted the successes and lessons learnt in olive risk management.

Following lunch and an opportunity to network, it was John Burley's turn to present from Biosecurity

Victoria. He gave an overview on legislation as a tool in weed management and reasons for government to be involved in this activity. John also addressed the role of the community and economics and shared his understanding of these issues.

Kate Gosney from the University of Ballarat discussed some commercial processes, concentrating on weed seeds in fodder and her study of this dispersal mechanism.

All the presentations were of high standard and created substantial discussion. The WSV would like to thank all speakers and attendees for their participation.

The last session of the day was allocated to a panel discussion, chaired by Lisa Minchin. All presenters were invited to participate and to respond to questions and concerns raised by the audience. A whole range of issues were discussed and the audience participation was excellent.

Proceedings of this seminar have been published in Plant Protection Quarterly Volume 23 issue 2, available from R.G. and F.J. Richardson, tel 03 5286 1533.

The seminar was followed by the 42nd Annual General Meeting of the Weed Society of Victoria. **Daniel Joubert**

Weedbuster Walk along Merri Creek

WSV, the Merri Creek Management Committee, Darebin and Hume City Councils and Melbourne Water have organised a weed walk for Tuesday 2nd September as part of Weedbuster Week. The first walk will go north along Merri Creek, Leigh Mitchell will discuss woody weeds and Roger Cook the conservation angle of the creek. After lunch (BYO) the walk will go south. Katrina Roberg will cover the Merri Park Wetlands and the restoration of native vegetation, James Booth that of Merri Park. Other topics will also be discussed. For further information contact Ros Shepherd, Secretary.

Opportunity knocks

Following on from the success of the 16th Australasian Weeds Conference in Cairns, the 17th Australasian Weeds Conference 'Together we can beat the weeds', will be held in Christchurch, New Zealand in 2010.

WSV will probably be holding the 18th Australasian Weeds Conference in 2012. Organising a regional conference is an opportunity to contribute to and learn about some of the key debates in the areas of weeds, to network and an addition to your curriculum vitae. The Committee is starting to plan now and is thinking about the key trends and what some of the themes should be. What would make a catchy conference title?! If you would like to help make the 2012 conference the best yet, please contact Ros Shepherd, Secretary.



Belinda Riddle and Lynley Stone at the WSV AGM Seminar in April



From the Editor – Friendly Advice

A friend was showing me around her garden in central Victoria, once her pride and joy and now suffering the combined effects of a busy life and the drought. She pointed to a small patch of Seaside Daisy, and I remarked that it was a weed. The response came quick and fast: 'It is the only thing that grows here and besides I have never seen it in the bush. When I see it in the bush, then I'll take it out.' I was dumbfounded, struggling with a range of emotions. Here was someone I admired for

her attempts to live in an environmentally sensitive and sustainable way adjacent to bushland, a friend who knows of my interest in weeds. I held my tongue for the moment, shocked at the level of emotion my comment had elicited.

There were a number of contradictions in her response:

- The very fact that it was the only thing growing (in fact it wasn't) could be a clue to it being a weed.
- The fact that you have never seen it

behaving as a weed doesn't mean it can't. It did indicate to me that people need proof of a plant's weediness.

- By the time she had her own personal proof it would be too late.

I have thought about photocopying information on Seaside Daisy and handing it to her, but I am not sure this would work. Any suggestions?

Lisa Minchin

CAWS Update

I am writing this at the end of a very successful 16th Australian Weeds Conference (16AWC) in Cairns. There are many tired delegates who have had an intensive week of talking, listening and reading. The 400 delegates have also had the important opportunity to build and foster networks, plan new projects and exchange ideas. The field trips demonstrated the scale of current and potential weed problems in Far North Queensland, and the advanced techniques and collaborative arrangements in place to tackle these were impressive. On behalf of CAWS, I thank the Weed Society of Queensland's 16AWC committee for their vast efforts in organising the excellent meeting, expertly led by the conference chair Dr Michael Widderick. We now look forward to the 17th Australasian Weeds Conference in Christchurch 26–30 September 2010, convened on CAWS' behalf by the Plant Protection Society of NZ.

CAWS had a face-to-face meeting at the 16AWC and a number of important decisions were made. CAWS committed \$2000 in seed funding for a new weed society based in the Northern Territory. With the advent of GM canola crops approved for commercial planting in NSW and Victoria, CAWS has agreed to fund the travel of Dr Suzanne Warwick (Eastern Cereal and Oilseed Research Center, Ontario) to Australia in November to present on the Canadian experiences with such crops. The CAWS Strategic Plan was formally ratified and directs our activities to 2010, with upcoming activities of redeveloping the

CAWS website and preparing a position paper on invasive garden plants.

We welcome the Federal Government's budget commitment of \$15 million over four years for a national weeds research centre. There was no further detail at the 16AWC on how this centre will be realised. CAWS has previously written to the Federal Government and urged that the new centre retains the following features of the Weeds CRC model that has made it so successful:

- truly national research collaboration with all State Departments, Universities and CSIRO providing in-kind FTE investment;
- cash investment from research and development corporations;
- an independent, representative board determining research directions and delivery mechanisms;
- weed species targeted for both northern and southern Australia;
- a substantial budget proportion focused on delivery of management information to landholders;
- quality factsheets, technical publications and website;
- training of post-graduate students;
- post-doctoral research positions supervised by Australia's leading weed scientists; and
- research coverage across the weed management spectrum (prevention, detection, eradication, containment and integrated management).

CAWS will continue to advocate for national weed research and on-ground management programs. In particular, the strategic gains and partnerships that have been made

through the Weeds of National Significance program must be maintained.

Nominations are being sought for the 2008 CAWS Most Weed-Wise Nursery Award. This is a positive way of raising awareness about invasive garden plants and what the garden industry and gardeners can do to address the problem. The Award is endorsed by two key national organisations, the Nursery and Garden Industry Association of Australia and Sustainable Gardening Australia. Further details are at the Awards link on the CAWS website <http://home.vicnet.net.au/~weedss/>.

Finally, we welcome another member to the 'weeds hall of fame', the CAWS Medal winners. At the 16AWC conference dinner I was very pleased to award Dr Steve Walker with the 2008 CAWS Medal. Steve has worked in weeds for over 30 years and is currently the Weed Sciences leader at the Queensland DPI&F, based in Toowoomba. He has been instrumental in increasing our understanding about key weed management issues and has made substantial contributions toward improved weed management in Australia and more specifically the northern grain region. Steve's passion for weed research and improved weed management is evident in his contribution towards the development of skills and knowledge in others, with supervision of many PhD students and mentoring of young weed scientists. In recent years he has been the Cropping Program leader in the Weeds CRC, applying his skills and experience nationally and internationally. Congratulations Steve.

Dr John Virtue, CAWS President



Plants

State Prohibited Weed: Mexican feather grass

The Weeds CRC estimated in the year 2000 that actions like this could save Australia \$39 million over the next 60 years.

Origin and distribution Mexican feather grass is indigenous to New Mexico, Texas, Mexico, Argentina and Chile. It has been cultivated in other parts of the USA and in New Zealand and is naturalised in California, New Zealand and South Africa. Mexican feather grass was first detected in Victoria in nurseries at Mt Macedon in 1998.

Description A densely tufted perennial tussock grass in the speargrass group (Tribe Stipeae), growing to about 70 cm high; indistinguishable from serrated tussock except by the flowers and flowering heads.

Stems – culms (stems bearing the flowers) to 70 cm high, with 2–3 unthickened nodes; smooth, hairless and round in cross section between nodes. The flower-bearing section of the culm is 15–25 cm long and green or purplish in appearance due to the colour of the glumes (lowermost of the bracts around the flowers). A leaf-like sheath encloses the lower section. Unlike serrated tussock, the flowering stem apparently does not break at the uppermost stem node when mature.

Leaves – very numerous; tightly inrolled so that the edges overlap, thread-like, 0.25–0.5 mm in diameter, to about 60 cm long; the outer surface minutely roughened, with a ligule (the small appendage on the inner side of the top of that part of the leaf which sheaths the stem) 0.5–2.5 mm long, opaque, papery and usually smooth and hairless. Rolls smoothly between the fingers like a needle.

Flowers – a single bisexual floret per spikelet, surrounded by two persistent bracts or glumes (the palea and the lemma) that are unequal in size and

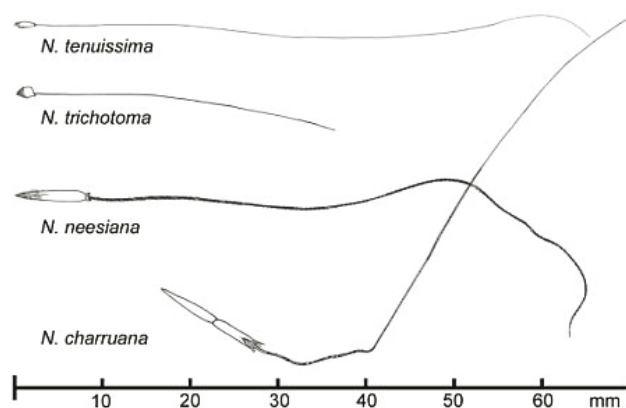
much longer than the floret (excluding the awn). The lower glume is 9–10.5 mm long (6–8.5 mm in serrated tussock, 14–24 mm in Chilean needle grass). Unlike serrated tussock, the flower head is often only partly exerted and spread from the enclosing sheath at maturity.

Seeds – the awn (the long bristle-like appendage extending from the end of the seed) is 4.5–9 cm long (2–3.5 cm in serrated tussock and 6–9 cm long in Chilean needle grass) and is not readily detached from the seed. The main body of the seed is 2–3 mm long (1.5–2 mm long in serrated tussock, 8–10 mm long in Chilean needle grass). The summit of the seed lacks a conspicuous cylindrical corona or collar around the base of the awn.

Roots – wiry, fibrous.

Similar species Five *Nassella* species are naturalised in Victoria: *N. trichotoma*, serrated tussock, *N. neesiana*, Chilean needle grass, *N. hyalina*, cane needle grass, *N. leucotricha*, Texas needle grass, *N. charruana*, lobed needle grass. Serrated tussock and Mexican feather grass both lack a corona at the junction of the seed and the awn, a structure present in the other four species. The awn of Mexican feather grass attaches centrally to the seed whereas that of serrated tussock is offset in its attachment.

Based on a Landcare Note produced by DPI Victoria



Seeds (bracts removed) of Mexican feather grass (*Nassella tenuissima*), serrated tussock (*N. trichotoma*), Chilean needle grass (*N. neesiana*) and lobed needle grass (*N. charruana*)

Common names Mexican feather grass, Texas tussock grass, Texas tussock, white tussock, ponytail grass.

Botanical name *Nassella tenuissima* (Trinius) Barkworth. Family Poaceae.

Status Mexican feather grass is closely related to serrated tussock (widely regarded as the worst pasture weed in Australia) and has the potential to occupy a greater range of territory. It could spread through eastern Australia as far as southern Queensland, and has the potential to cause major economic and environmental damage. Mexican feather grass is a declared State Prohibited Weed in Victoria. Although it is not known to be naturalised in Victoria, it may be overlooked because of its close similarity to serrated tussock. In the past plants have been sold in nurseries and have been found growing as ornamental plants in private and public gardens.

Management The Department of Primary Industries (DPI) is responsible for the control of State Prohibited Weeds in Victoria. Mexican feather grass can not be cultivated, transported, propagated or sold/traded. Existing plants in gardens and nurseries must be destroyed and follow-up inspections are undertaken.

Recently DPI intercepted Mexican feather grass plants being traded in Victoria. More than 500 plants were retrieved in an operation involving more than 40 staff members. A state wide recall was implemented and received media coverage through newspapers, radio and television. Further tracing of source material is being undertaken and investigations are continuing. This plant is prohibited entry to Australia by the AQIS.

Victorian Alert Weed: Smoke bush (*Buddleja madagascariensis*)

This is the third instalment in an ongoing series, highlighting some of the Victorian Alert Weeds, brought to you by the DPI Weed Alert program.

Why is this species a Victoria Alert Weed?

Smoke bush is not an uncommon garden plant, often grown by naturalists attempting to attract small birds and butterflies a little closer to home. Pretty yellow to salmon coloured flowers that form in a mass at the end of flower spikes, combined with dark green foliage set against the pale under surface of the leaf, help it stand out in any garden. Its habit of sprawling and spreading have seen it recognised as an invasive weed, both in New South Wales and Queensland, invading native bushland from nearby urban areas. Already recognised as one of the Hawaiian Islands most invasive horticultural plants, Victoria's existing garden plantings of smoke bush clearly indicate a significant potential threat to native biodiversity.

Type of weed

A potential garden escape and a sprawling shrub.

What does it look like?

Shrubs grow from 1.5 to 10 metres in height but can grow taller if scrambling over supporting vegetation. Stems are covered in hairs, white felt-like when young and rust or yellow coloured when old. Leaves grow opposite along the stem, 40–150 mm long and 15–70 mm wide, the upper surface dark green, with white hairs and the lower surface grey with rust or yellow hairs. Small flowers are yellow, orange or salmon coloured and form in a large bunch at the ends of flower spikes about 250 mm long. Fruit form as small fleshy berries about 2–5mm in diameter, white at first, maturing to blue. Though Australian varieties are reported to be sterile, seeds are ellipsoid in shape, about 1 mm long and are brown in colour with many seeds found in each fruit.

Why is it a problem?

Smoke bush is extraordinarily fast growing, with a reputation for out competing both native and introduced shrubs in Australia and overseas. Smoke bush plants have invaded dense tropical rainforest stands and can survive and persist under a completely closed tree canopy. Plants are adapted to growing in a wide variety of conditions, from coastal belts to mountain ranges with the potential to invade in most regions of Victoria. Forming thickets, similar to other high cost weeds such as blackberry and gorse, large stands may provide harbour for unwanted pest animals, like rabbits and foxes.

Despite the fact that Australian smoke bush varieties are reported to be sterile and do not produce viable seed, populations have escaped from gardens, establishing in isolated pockets far north Queensland, south through to Bega in New South Wales. Plants can readily re-shoot from damaged root matter or will form new roots from discarded stems, so illegal dumping of garden waste is likely to see it spread. Early identification and eradication may prevent smoke bush from becoming a weed menace in Victoria.

If you suspect you have found smoke bush, please report it to your local Weed Alert Contact Officer on 136 186. For a smoke bush fact sheet, or more information on Victorian Alert Weeds, log on to the Weeds section of the DPI website www.dpi.vic.gov.au/weeds and click on the Weed Spotters link.



Buddleja madagascariensis habit
(Photo: Richard Plant, DPI Victoria)



Flowers (Photo: Aaron Dodd, DPI Victoria)



Leaves (Photo: Richard Plant, DPI Victoria)



People

Weed IDentity: Geoff Carr, biodiversity campaigner

The only letter Geoff Carr ever wrote to a newspaper was in 1978 to 'The Age'. Although it was published without his name he could not have been happier with the outcome – a follow-up report on ABC radio news about 'environmental weeds'. The term was new at the time and this was Geoff's first public foray in what has become a lifelong passion and his greatest achievement – helping put environmental weeds on the agenda.

As a naturalist and gardener, Geoff grew up with an interest in the flora of the world. He was a member of the Geelong Field Naturalists Club from the age of eleven, and early in his career spent eight years as a horticulturalist at the Geelong Botanical Gardens. While undertaking a taxonomic revision of native orchids (which included describing 25 new species) he observed that a major threat to many of them were weed invasions. Geoff said, 'I am a botanical collector and had been for many years. I kept finding weeds which had not been previously recorded. It was really when I was working at the Botany Department at La Trobe University between 1974 and 1980 that I began to realise the threat that weed invasion posed to flora and fauna values. Today we know that approximately 70% of all weeds were introduced through horticulture.'

In 1979 Geoff became a botanical consultant for a project with ICI (now Orica). This opened the door to a career as an environmental consultant, a role which involves providing specialist advice, undertaking botanical surveys and impact assessments and developing management plans. 'About 20 years ago I set up Ecology Australia with a friend, Andrew McMahon. We now employ 12 people. In almost all the work we do we deal with weeds.' Geoff is

also currently vice-president of the Invasive Species Council (ISC) Board. The ISC was established by ecologist Dr Barry Trail after listening to Geoff talk for a number of years about his concerns about weeds and feral animals. Geoff has also been a member of the Weed Society of Victoria since 1990.

Frustrated by government inaction and the lack of information, Geoff decided to produce a book on environmental weeds. 'I remember Joan Kirner, then Premier of Victoria, waving the draft manuscript of *'Environmental weed invasions in Victoria: Conservation and management implications'* in the air at journalists to demonstrate the government's commitment to the environment, despite the fact that the government had no role except to publish the book,' Geoff recalled. Published with co-authors Jeff Yugovic and Kim Robinson in 1992 by the Department of Conservation and Environment and Ecological Horticulture (the former name of Ecology Australia), the book became a landmark resource for researchers and weed managers.

Geoff is currently working on updating the book which will include a statement about where we are at today. 'In the early days when I spoke strongly about the threat environmental weeds pose, people would say that I'd taken leave of my senses, but today there is much greater awareness,' Geoff stated. Despite this he is clearly frustrated that the political and management responses are still wholly inadequate to address the scale of the problem. 'There are rooms full of management plans, but not much effective weed management happening on the ground. Government departments and Parks Victoria are not fulfilling their responsibilities under international covenants and numerous pieces of legislation. There is also a tendency to wait for research to tell us what to do. Meanwhile more time is lost and the effort and funding required have only increased. We do not need research to know what to do with the problems we have now – it is a luxury we can ill-afford. For the most part we know enough to address the

weeds we have.' He can not bear to think that people have knowingly driven by a small patch of *Watsonia* which would take ten minutes to get rid of and that these same people in two or three years' time will be trying to contain something that is out of control and costs a lot more money.

When asked about the Land and Biodiversity Green Paper, Geoff despairs that out of a list of eleven threats to Victoria's biodiversity, weed incursions and feral animals are at number eleven. 'Climate change or no climate change, weeds remain the single biggest threat to biodiversity. Creating corridors to enable plants and animals to move and adapt with climate change will only create highways for weed dispersal. One of the corridors proposed is from the Grampians to Mildura. The Grampians has five major weeds: Bluebell Creeper, Coast Tea-tree, Coast Wattle, and Sallow Wattle (*Acacia longifolia* var. *sophorae* and var. *longifolia*) that I believe would actively spread along these corridors... Environmental weeds are overwhelmingly the most important land management issue. Victoria's entire flora and much of its fauna is at risk of disappearing.'

One of Geoff's key concerns at present is the spread of Tall Wheatgrass (*Thinopyrum ponticum*). To some it is a valuable pasture grass and tool in the fight against salinity, but a weed risk assessment estimates it could invade 10.4 m hectares of Victoria. It is currently being planted in areas of great environmental sensitivity across the state.

Away from work Geoff enjoys spending time with friends and family and engaging in both domestic and visual arts, in particular photography. Presently he is working on a collection of photos which he is planning to exhibit. The subject is the colonisation of rotten food. Up close and with nothing to alert you to the scale, the photos reveal landscapes of amazing textures and colours as food disintegrates. Geoff mused, 'Many people view scientists as cold, rational and dispassionate but the enduring mysteries of the world are breathtaking.' **Lisa Minchin**

Research

The spread and potential impact of the exotic dune grass *Thinopyrum junceiforme* by Kris James, PhD student, Geographical & Environmental Studies, University of Adelaide

Background

Thinopyrum junceiforme, whose synonyms include *Elymus farctus* and *Agropyron junceum/junceiforme*, is a rhizomatous perennial grass native to Europe. Also known as Sea-wheat grass, it is a coastal coloniser of the upper beach and foredunes. Spreading by both seed and rhizomes (Heyligers 1985, Harris and Davy 1986), Sea-wheat grass has the capacity to initiate and build dunes (Heyligers 2006) as well as colonising existing foredunes. It prefers brackish environments, but is able to tolerate high soil salinity and some inundation by tides (Heyligers 1985). It has been observed in situations too extreme for native dune grasses such as *Austrofestuca littoralis* and *Spinifex sericeus* (Heyligers 1985, 2006).

Sea-wheat grass was first found in Victoria, where it is thought to have arrived in ballast (Heyligers 1985) some 85 years ago. It was later used in Victoria in sand stabilisation studies at Wilson's Promontory (Heyligers 1985, SCO 1960). Sea-wheat grass has also been collected from Tasmania where records compiled by Rudman (2003) show that it has spread along the northern coast, although its presence on the west coast requires further investigation (Rudman 2003). In South Australia, herbarium records of the plant begin in the early 1980s, from locations between the metropolitan Adelaide coast and the South East.

My research investigates the spread and potential impact of this introduced grass, focusing on the foredune of the Younghusband Peninsula, Coorong National Park, South Australia. Existing studies on Younghusband Peninsula and nearby Sir Richard Peninsula, have suggested that exotic species such as Sea-wheat grass may have the potential to alter the ecology and geomorphology of dune systems by reducing sand movement and displacing native foredune plants (Harvey *et al.* 2003, Hilton and Harvey 2002, Hilton *et al.* 2006, 2007).

Methods

Fieldwork has involved systematic surveys of beach-dune profiles and vegetation composition at 10 km intervals along the Younghusband Peninsula between the Murray River mouth and the southern boundary of the Coorong National Park. The surveying seeks to observe whether the topography of dunes colonised by *T. junceiforme* differ from dunes colonised by native species, and whether the vegetation communities on dunes colonised by *T. junceiforme* differ from those colonised by native species. Overall, it seeks to determine whether *T. junceiforme* has a demonstrable impact on the ecology and geomorphology of the Younghusband Peninsula foredune.

Fieldwork has also involved long term monitoring of selected sites along the southern part of the barrier to record seasonal variations in vegetation (flowering, changes in tiller density, etc.) to obtain baseline ecological data on plant population growth and development. A

metropolitan coast field study was also undertaken to monitor Sea-wheat grass colonisation in a sand replenishment area.

In addition to fieldwork studies, I am seeking to compile knowledge of Sea-wheat grass from the wider community in South Australia, Tasmania and Victoria, via participation in a short questionnaire. I am interested in determining how many people in the community work with or know of the plant (and equally as important, who don't), and their perceptions of the plant – I believe it largely 'flies below the radar', and would like to confirm this, or otherwise!

Project Outcomes

Together with the questionnaire responses, the results of this study will contribute to the stock of knowledge of *T. junceiforme* in southern Australia; provide quantitative information by which the threat of *T. junceiforme* to the Coorong National Park can be assessed, and may lead to the development of management strategies that



Sea-wheat grass on Younghusband Peninsula, near Murray River mouth, South Australia (Photo: K. James)



Sea-wheat grass on Younghusband Peninsula,
near the Granites, SA (Photo: N. Harvey)



Sea-wheat grass on Sir Richard Peninsula, SA
(Photo: K. James)

may assist in preserving the ecology and geomorphology of our unique coastal areas.

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compiled by Chris Timewell

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On the ground

Managing Chilean Needlegrass in the presence of a threatened species: Golden Sun Moth *Synemon plana* by Naomi O'Brien, Zoologist, GHD

Since European Settlement it is estimated that 99.5% of Victoria's native grasslands have been lost to processes such as agricultural expansion, urbanisation and weed invasion (DEWHA 2008b). So much loss has occurred in areas throughout Victoria, that Natural Temperate Grasslands of the Victorian Volcanic Plain have recently been listed as Critically Endangered under the Commonwealth *Environment Conservation and Biodiversity Protection (EPBC) Act 1999* (DEWHA 2008c). The modification of these grasslands, and the associated changes in vegetation composition and structure, have led to a decrease in suitable habitats and food resources that native fauna rely on (DSE 2004). One of these species is the Critically Endangered Golden Sun Moth (*Synemon plana*).

The Golden Sun Moth is a small diurnal (day flying) moth of the Gondwanan family *Castniidae*. Individuals of this distinctive species have clubbed antennae and are brown in colour. As the females are poor flyers, they bask on tussocks and use their bright orange hind-wings to attract patrolling males (DSE 2004, Edwards 1991 and Douglas 1993). As adults of this species lack functional mouth parts, they are only active for a short period of time (3–4 days) between November to mid-January (DEWHA 2008a) and are therefore hard to detect. Prior to European settlement, the Golden Sun Moth was widely distributed throughout Victoria, particularly within grassland and grassy-woodland habitats (Edwards 1991, DEWHA 2008b). Up until 2003, this species was only known from four records from within Victoria. Since this time, 27 new populations have been documented from habitats within and surrounding metropolitan Melbourne (Gilmore *et al.* 2008).

The decline of this species throughout Australia has been largely attributed to the clearance of native grasslands (DEWHA 2008b). Vegetation surveys conducted at known Golden Sun Moth sites (O'Dwyer

1999, O'Dwyer and Attiwill 1999) found that suitable habitat for Golden Sun Moth was dominated by a greater than 40%, and sometimes 50–75%, cover of Wallaby Grasses *Austrodanthonia* spp. Despite this, recent work conducted on the Golden Sun Moth has demonstrated that this species often occurs within grassland habitats that have been highly modified (Braby and Dunford 2006, Endersby and Koehler 2006 and Gilmore *et al.* 2008). In one of these surveys (Braby and Dunford 2006), female Golden Sun Moths were observed laying eggs on species of environmental weeds, including Chilean Needlegrass (*Nassella nessinia*). These findings may indicate that Golden Sun Moths rely more heavily on the presence of suitable vegetation structure (i.e. tussocks) rather than the composition of native species.

Chilean Needlegrass has been declared a 'Weed of National Significance' and is considered one of Australia's worst weeds due to its 'invasiveness potential to spread, and economic and environmental impacts' (DEWHA 2003). The relationship between Golden Sun Moth, an endangered species, and environmental weeds, particularly those of national significance, presents an interesting conundrum for ecologists. Whilst the presence of Golden Sun Moth in areas infested by environmental weeds in no way solicits taking no action to control pest species, it does raise some interesting questions about what appropriate weed management regimes entail for modified grasslands.

Currently, methods for the control of weeds such as Chilean Needlegrass include a combination of both short-term and long-term control methods including: slashing, spot spraying, weeding by hand and revegetation of native species (DEWHA 2003). Due to their immobile nature, Golden Sun Moth populations are often localised (DEWHA 2008a) which means that they may be more susceptible to harm when traditional control regimes, such as chemical controls, are employed. Surveys

conducted by O'Dwyer and Attiwill (1999) have found that Golden Sun Moth can be sensitive to changes in soil condition, including pH, which may occur as a result of spot spraying with chemicals used to control weeds (DSE 2004). In contrast, weed management is also possible to be achieved using extensive revegetation of native species. At present trials are being conducted within Chilean Needlegrass infestations which look at the sowing efficiency of native grasses to eventually replace weeds within native grasslands (Dawson and Prowd 2008). Theoretically, this management technique would allow Golden Sun Moth, and other grassland fauna species, continuous habitat cover throughout the restoration process. These gradual measures, teamed with techniques such as hand weeding, would seem to be preferable for grasslands known to support threatened immobile grassland species, when compared to measures such as slashing and burning, which often result in the complete removal of suitable habitat. Obviously, the benefits of using less invasive measures would need to be weighed up against their effectiveness in controlling weeds.

Whilst several questions remain unanswered regarding the preferred habitat of Golden Sun Moth, recent surveys have



Golden Sun Moth (© Rohan Clarke, 2008)

advanced our understanding of what constitutes suitable Golden Sun Moth habitat. Despite this, there remains the potential for unidentified populations of Golden Sun Moth to occur within modified grasslands throughout Victoria. Due to this uncertainty, any approach adopted to control the spread of environmental weeds throughout areas where Golden Sun Moth is known to occur, should carefully consider an appropriate management regime. Such techniques are likely to require further research into the effects of different herbicides on Golden Sun Moth larvae, or the effectiveness of native species revegetation through grassland sowing. Ultimately, as more information is gained about the distribution, habitat requirements and biology of Golden Sun Moth, more effective ways to manage their habitat, be it native or modified, should become evident.

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