Feral Herald

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Working to stop further invasions Volume 1, Issue 2, December 2002

Will this Grass Pass?

by Tim Low

Many of the world's worst weeds are grasses, so proposals to sow new exotic species must be viewed with great concern. But Australia's salinity problems are now so pressing that proponents of new salt-tolerant grasses - and legumes - are claiming the high moral ground. Many Australians may think salinity should take precedence over weeds, but the cost of salinity is estimated at $275 million per year, whereas weeds cost Australia $3.3 billion each year. Most salinity problems can be reversed over time, but well-entrenched weeds remain forever.

Last October, the South Australian government conducted a weed risk assessment of a salt-tolerant North American grass, *Distichilis spicata*. The names by which this grass is known are alarming, suggesting great ecological versatility - 'seashore saltgrass', 'marsh spikegrass', 'inland saltgrass' and 'desert saltgrass'. An American company, NyPA International, is trialing the grass in southern Australia with a view to marketing it as a turf and pasture grass for salt-degraded lands.

An email was posted over the invasive species discussion group, Aliens-L, to solicit views about the grass. Two replies came in, one from Fern Duvall, manager of a coastal wetland in Hawaii. She described the grass as 'a serious very dominant habitat modifier' of saline wetlands. 'It can successfully replace Cynodon, and it completely crowds out the native grass *Sporobolis virginicus'*, she wrote back. 'I would recommend against it.' The native grass she mentions, saltwater couch or sand couch (*Sporobolis virginicus*), is also native to Australia, where it carpets saltmarshes and low dunes. Any grass that can displace saltwater couch must be viewed with considerable alarm.

The other reply was blunter: '*D. spicata* is extremely vigorous in North America, its home. I would be extremely chary about introducing it anywhere. Don Strong.'

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Please allow a month for replies – the editor is going overseas.

Several months earlier a weed risk assessment of the grass was conducted by the Western Australian government. It noted that the saltgrass, in its native North American environment, "has spread to the irrigated lands, and become a pest in ditches, cotton fields, and other crops in the United States…". It is extremely widespread, occurring as far north as Canada and in subtropical environments such as Hawaii. It is 'highly polymorphic', occurring in many forms, is strongly rhizomatous, and is seldom grazed when other grasses are available. The assessment further states that the grass "has adapted to a range of soil conditions ranging from intertidal river mouth deltas and hyper saline salt flats to only moldy saline of alkaline soils. The grass can, once established, survive extreme annual droughts and is extremely competitive in very wet soils but is normally associated with inundated soils…" It has become a weed in Argentina and Chile as well as North America and Hawaii.

All the evidence strongly suggests this grass should not be grown in Australia. Beyond any doubt, it is a domineering habitat-altering weed. The small trial plots in Victoria, Western Australia and South Australia could easily be removed.

In early December I phoned the South Australian Animal and Plant Control Commission and asked about the future of this grass. I was told it was a permitted plant, imported into Australia before Weed Risk Assessment was introduced in 1999, and thus could not be banned by the quarantine service. For the plant to be eradicated from Australia it would first have to be declared by the Victorian, South Australian and Western Australian governments. When I asked if this was likely, I was told the South Australian government was awaiting information on the merits of the grass. 'There is certainly a weed risk,' I was told, but said this would have to be balanced against any benefits the grass could provide. If the benefits clearly outweighed the environmental costs, the South Australian government would probably allow the grass to be grown.

The Invasive Species Council is very concerned about the prospects of this grass becoming a major environmental weed in Australia. We do not believe that planting a highly invasive grass is a satisfactory way to counter Australia's salinity problems. It merely creates a new problem in response to an old one. The grass will not be

planted to reverse salinity, rather, it will be grown to make saline land more productive. The cultivated variety called NyPA Turf will be planted on golf courses, parks and ovals

Small Hive Beetles here to stay

An invasive species attracting media attention of late is the small hive beetle (*Aethina tumida*), found in October infesting domestic bee hives around Sydney and South east Queensland. The South African beetles can kill whole hives, although the damage noted in Australia was limited. The adult beetles eat bee eggs, pollen and waste, and the larvae eat bee brood, pollen and honey. A National Management Group, which included government and beekeeper represent-atives, concluded in November that the beetles could not be eradicated. Small hive beetles are not consid-ered an environmental threat, and they could even prove environment-ally beneficial by suppressing colonies of feral honeybees.

Gum Tree Strippers

Each year in the United States, European gypsy moth caterpillars strip leaves off millions of acres of trees and cost the U.S. Forest Service $20 (Aust.) million to control. Eggs of the gypsy moth are sometimes found on ships entering Australia.

Quarantine entomologist Bill Crowe, based in Brisbane, recently intercepted a batch of eggs and kept them under quarantine conditions, making available a bunch of eucalypt leaves (chosen at random) as food for the emerging caterpillars. To his dismay, the caterpillars grew to maturity on a diet of pure gum leaves. This suggests

irrigated by saline water.

There are far too many examples of introduced grasses going on to become major weeds. Indeed, all of the useful tropical pasture grasses sown in northern Australia have gone on to become weeds. And in southern Australia, Cord grass (*Spartina anglica*) is a striking example of a salt-tolerant grass that is proving highly invasive. It was described in a major federal government report as one of Australia's 18 worst environmental weeds. Introduced as a pasture grass, to reclaim mudflats, and to protect banks from erosion, it is now modifying the structure of mudflats and eliminating habitat for migratory birds. In North America it grows alongside saltgrass. Another foreign pasture grass, hymenachne (*Hymenachne amplexicaulis*), was listed as a Weed of National Significance (effectively ranking it as one of Australia's 20 worst weeds) only 11 years after it became available to graziers.

The ISC will discuss the future of this grass with government weed authorities in South Australia, Victoria and Western Australia and report back to members in the next newsletter. ••••

that gypsy moths, if or when they become established in Australia, could prove as devastating a pest in forests here as they do in North America. The spraying of DDT over forests and farms to control gypsy moth was one of the issues that spurred Rachel Carson to write *Silent Spring*, the world-shattering expose of pesticide misuse.

Turfed Out

What next? In September Quarantine mail inspectors in Sydney intercepted two parcels containing fresh turf and soil excavated from Lord's cricket ground in England. The packages, labelled as 'sporting (cricket) goods', came with certificates of authenticity.

"Soil is a prohibited import into Australia because it could transport disease-causing fungi and bacteria, weed seeds, and the eggs and larvae of exotic insects, spiders, snails and frogs," said Craig Hall, AQIS NSW International Mail Manager. The exotic insects could include crickets, which would be ironical under the circumstances.

Hundreds of cricket-lovers were allowed a chance to buy some of the historic Lord's turf, which has now been replaced by an improved, faster-draining outfield. The soil and turf samples posted to Australia were replaced by a note from AQIS outlining the pest and disease risks. In the wake of foot and mouth scare AQIS now screens all of the international mail parcels entering Australia using X-ray machines and quarantine detector dogs. ••••

Tilapia in the Gulf?

After the mosquito fish (*Gambusia holbrookii*), the Mozambique tilapia (*Oreochromis mossambicus*) is probably the most widespread exotic fish on earth. It has colonised wetlands in Africa (Congo, Uganda, Egypt, Madagascar, The Seychelles, etc.), Asia (Indonesia, Thailand, Vietnam, Philippines, Sri Lanka, Pakistan, etc.), North America (USA, Mexico, Cuba, Panama, etc.), South America (Brazil, Venezuela, Peru, Bolivia, etc.) and Oceania (Australia, New Guinea, Fiji, Tonga, Vanuatu, Hawaii etc.) It earns a listing in the World Conservation Union list, *100 of the World's Worst Invasive Alien Species*. In warm sluggish wetlands it can multiply into unbelievable numbers. Twelve tonnes of tilapia were removed from a tourist resort lake at Port Douglas some years ago after a few fish were illegally stocked there.

In Australia feral populations appear to be confined to the Brisbane region, coastal catchments in north Queensland (Townsville, Cairns, Atherton Tableland) and the Gascoyne River in Western Australia.

Some years ago tilapia escaped from a fish farm on the coast flowing Barron River into Lake Tinaroo near Atherton. Water from this dam is channeled via irrigation channels, over a catchment divide into the catchments of two westward flowing rivers that enter the Gulf of Carpentaria, the Mitchell and the Walsh.

For some years the Mitchell River Watershed Management Group has been campaigning to have nets installed in irrigation channels to prevent tilapia from colonising these rivers. The Gulf rivers are exceptional in containing no exotic fish at present. Some of them contain very diverse fish faunas.

The Invasive Species Council is lending its support to the campaign to have the channels screened. On 3 December Tim Low, along with representatives of other Queensland conservation groups, attended a meeting with two officers from Sunwater, the government-owned corporation that administers the dam. Sunwater has expressed willingness to screen the channels if some kind of cost-sharing arrangement can be made. A subsequent meeting with Queensland Minister for Natural Resources and Mining Stephen Robertson was also held specifically on the issue. Negotiations are continuing.

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And you can help ...

If you are concerned about the spread of tilapia, please email Queensland Minister for Natural Resources, Stephen Robertson, requesting him to require Sunwater (the owner/operator of the Tinaroo Dam infrastructure) to put screens in place to prevent tilapia escaping from Tinaroo Dam to the Walsh catchment. The decision is urgent – screens should be installed before the wet season in 2003. The minister can be emailed on NR&Mines@ministerial.qld.gov.au

Suspended jail for a quarantine breach – the first time ever!

Tarnya Cox

A Brisbane Magistrate handed down a 14-month suspended jail sentence and a fine of more than $3,700 to a man migrating from New Zealand for attempting to smuggle 386 plant bulbs into the country. The bulbs, along with quantities of undeclared food, were found hidden throughout a container of personal effects belonging to the man. Federal Minister for Agriculture Fisheries and Forestry Warren Truss said the bulbs could have carried a number of plant viruses, bacterium, fungi and insects that could have significantly damaged the environment as well as domestic and international trade.

Mr Truss says "Australia's courts are sending a serious message to smugglers… Australia's stringent quarantine regulations are there for a reason: they are vital to protecting our $30 billion a year agriculture exports, our domestic production and our unique environment… By issuing substantial penalties for quarantine infringements, the courts are playing an important role in Australia's quarantine protection."

Over the past year, Australian courts have handed down over $200,000 worth of fines to travellers who have ignored Australia's strict quarantine regulations. The biggest penalty to date was handed down in July to a couple who tried to smuggle fresh and dried fruit into Australia. The passengers were fined a total of $9,936 for failing to declare three apples, two pears and more than eight and a half kilograms of dried apples, plums and grapes.

The Australian Quarantine Inspection Service (AQIS) now screens a minimum of 80 percent of passengers that arrive at Australian international airports and up to 38,000 items of quarantine concern are seized per month!

To find out what can be brought into Australia, visit the AQIS website at www.aqis.gov.au

More on tilapia…

Using Sex to Put a Hex on Tilapia

Carol Booth

A project proposed by the Queensland Department of Primary Industries could turn the tide against tilapia. Principal fisheries biologist John Russell wants to mass produce sterile triploid tilapia (a husbandry practice widely used overseas as a method of reducing overcrowding in aquaculture ponds) and then trial the impacts of stocking the sterile fish into an existing wild tilapia population in a self-contained dam.

Mr. Russell believes the technique of introducing sterile individuals may work against other feral fish such as mosquitofish and swordtails. It has worked against insects and triploid males have been shown to reduce successful spawning in salmonid and lamprey populations.

Although the project could provide cost-effective control of an extremely invasive and damaging feral fish, funds have not been forthcoming. If you think this project deserves support, please email the Queensland Minister for Primary Industry, Hon. Henry Palaszczuk at dpi@ministerial.qld.gov.au and ask him to provide new DPI funding for the project called "Control and management of tilapia in Australia".

Merry Christmas & a Pest-free New Year to all members!

From the ISC President

Barry Traill

Of great interest to invasive watchers nationally is the new legislation to curb invasives introduced by the Democrats to Federal Parliament recently. The proposed legislation, prepared by Queensland Democrats staffer Jeremy Tager, seeks much stricter controls on live imports – especially new pasture grasses, ornamentals and aquarium fish.

Our lawyer and ISC councillor Lucy Vaughan is now assessing the strengths and weaknesses of the proposed legislation. We'll aim to get a report on it into the next newsletter. Anyone who would like a copy of the legislation is welcome to email me and I'll send it on as an adobe file.

Even if the legislation fails to 'get up' in Federal Parliament it should help greatly in publicising the severity of Australia's invasive species problems.

For the ISC the last couple of months have been productive as we further put down roots in establishing the organisation. We are very fortunate in taking on Paul Baddeley as Treasurer- a big gap that urgently needed filling. Paul is a financial analyst with Coles-Myer in Melbourne. He attended the Melbourne launch with friends and generously offered to take on the task of sorting out the financial systems we need. We are very fortunate in having someone with such a high level of financial skills as our first Treasurer.

To handle burgeoning memberships Kate Blood has generously agreed to go on Council and become membership officer. Kate will be known to many members for her extensive work on weeds over many years. Her current position is Victorian Coordinator, Weed Incursion Rapid Response with the Department of Natural Resources and Environment. Her meticulous approach to detail has been a boon in sorting out the initial flurry of incoming memberships.

Tim Low and I have had a productive run in the media in the last couple of months, getting a range of radio and newspaper coverage talking about the general problems of invasives and the need for stronger long term actions. On the lobbying side ISC is pursuing two significant regional issues at the moment- stopping the spread of Tilipia, the noxious African fish, into the Gulf of Carpentaria, and lobbying to stop the deliberate spread of saltgrass (*Distichlis spicata*), a major weed overseas, into salinity prone areas. See Tim's stories on these two issues elsewhere in the newsletter.

As I reiterated previously the degree to which we can have a major impact on invasives will depend on how quickly we can set up a small, efficient professional workforce. Voluntary work will inevitably limit the impact we have on tackling invasive issues. Over the summer we'll be commencing our major fundraising project seeking major donors for this purpose. **If you know of any leads please let us know!**

Foxes in Tassie
- An Update

by Craig Woodfield
Tasmanian Conservation Trust

There are documented cases of foxes being deliberately or accidentally released into Tasmania dating back to the late 19th century. None of these introductions led to a population becoming established, this being commonly attributed to predation and competition from Tasmanian Devils. Despite this, there have been periodic fox sightings around Tasmania over the years, although there have also been regular sightings of thylacines, elephants, and Elvis. All fox sightings were investigated as a matter of course, but no evidence of a resident population was ever found. However, May 2001 saw an unprecedented number of quality fox sightings, supported by anonymously supplied photographs. Sightings increased over the next few months, before a hunter at Symmons Plains in the northern Midlands provided proof in mid-September by actually shooting a fox. The gut of this young female contained endemic Tasmanian fauna. For those Tasmanians aware of the status of our state as a biodiversity 'ark', the worst conceivable environmental disaster had happened.

> "Despite the potential scale of this disaster, the Tasmanian Government was typically slow to react."

The most disturbing aspect of all this was information previously supplied to the police claiming that a small group of individuals had deliberately introduced a number of fox litters, numbering up to 19 cubs, to at least three Tasmanian locations over an 18 month period. The apparent justification for this act of staggering ignorance was to provide animals for hunting. This claim was supported when DNA testing of the shot fox, and of a fox skin anonymously supplied to authorities about the same time, revealed that the two individuals were probably closely related. The hot spots for sightings over the previous few months also corresponded with this information, leading to the inescapable conclusion that foxes had indeed been smuggled into the state. This must rank as one of the greatest ever examples of gross maliciousness in Tasmania's far from pristine environmental history.

The big loser from an established fox population would be Tasmania's biodiversity, with terrestrial mammals weighing up to 5.5 kg, ground nesting birds, amphibians and small reptiles most at risk. There are 77 species in Tasmania that fit these criteria. Those deemed most at risk include the eastern barred bandicoot, new holland mouse, orange-bellied parrot, fairy tern, little tern, green and gold frog, tussock skink and glossy-grass skink. The eastern quoll and the spotted-tailed quoll would also likely suffer heavily from predation and/or competition from foxes, as would species no

longer found on mainland Australia such as the Tasmanian pademelon.

There would also be severe repercussions for Tasmanian primary production, as lambs and poultry are favourite targets of foxes. Nationwide it is estimated that foxes kill 5 per cent of new-born lambs each year, at a cost of approximately $40 million. Control measures and research are conservatively estimated to be around $11 milllion per year. Foxes are also vectors for diseases such as distemper and hydatids, and spread weeds such as blackberries.

"What most of the visiting experts did not know about is the widespread and indiscriminate use of 1080 in forests and on farms in Tasmania."

Despite the potential scale of this disaster, the Tasmanian Government was typically slow to react. The initial fox response group, established in June 2001, consisted of only a handful of staff, all but one of them seconded from other government divisions. The roster system adopted for these staff meant that there were a number of days each week where there were no active field staff. Neither were any of these positions permanent, each staff member being given a month by month work plan. This situation persisted for a number of months whilst the State and Commonwealth governments wrangled over funding requests. The Government finally woke from its policy slumber on January 31st 2002, announcing dedicated funding for the new Fox-free Tasmania Taskforce. As well as creating permanent and casual field staff positions, the Taskforce would also work on strengthening quarantine measures. There was, however, still some considerable reluctance at this stage to involve those outside the Government, with community involvement limited to being on the end of a 'communications strategy'.

A forum on fox control, generously supported by the Canberra-based Cooperative Research Centre for Pest Animal Control, was held in Tasmania in March 2002. A number of mainland fox experts flew in especially for this workshop, some from as far away as Western Australia. Along with updates and more detailed information from members of the local Taskforce, the mainland experts offered their experiences and opinions on fox control and eradication. There were calls for widespread use of sodium mono-fluoroacetate poison, also called 1080. What most of the visiting experts did not know about is the widespread and indiscriminate use of 1080 in forests and on farms in Tasmania. 1080-laced carrots are laid around regenerating forestry coupes or new plantations to stop wallabies and possums browsing young foliage. Community opposition is significant, and thus the use of 1080, even for something as critical as fox control, must be approached with sensitivity.

This forum helped shape the strategies that the Fox-free Taskforce would employ. 1080 will be used, but in a highly targeted and efficient manner, to avoid collateral damage to native fauna, particularly those that are fox competitors. Hunting with spotlights is generally considered ineffective, although its merits are still being debated. One of the more interesting strategies is the proposed use of 'Judas' foxes -

free-ranging, de-sexed foxes fitted with radio collars and pumped full of hormones. These 'Red Hot Mommas & Poppas' would be deployed during the breeding season to hopefully help pinpoint the location of wild foxes. 'Bitches in boxes', caged female foxes surrounded by fences that are only climbable from the outside, effectively forming a trap for male foxes, are also on the drawing board.

Mainland experience has shown that the full support of the broader community is a critical in fox control programs. It is the community that supplies most fox sightings, does the monitoring, and more often than not actually eliminates the animals. Community involvement was conspicuously absent from the initial Taskforce workplan, but this was eventually addressed with conservation, hunting and landholder positions being created on the Taskforce Steering Committee.

As we approach the first anniversary of the establishment of the taskforce, it is timely to reflect on what has changed and what has been learnt. The Tasmanian situation is unique. Large numbers of fauna and low numbers of foxes here make it the exact opposite to the mainland, and any strategies developed on the mainland must take this into account.

There have been no more actual fox carcasses produced by the Taskforce or the community since the initial pair over a year ago. However, a number of fox scats have been positively identified (one in the heart or urban Burnie) and at least one set of footprints as well. Quality sightings also continue to be come in. 1080 baiting is now in full swing, with over 6,000 hectares in three distinct areas currently baited.

Although this area is tiny in comparison with the entire state, it is just the beginning of a three year program that can hopefully expand and adapt to the task at hand. The amount of taskforce resources that baiting ties up has led to the suggestion that landholders should be allowed to lay baits, which has created a number of concerns about compliance, safety and efficiency. However, landholder apathy may ultimately kill this proposal off, as the involvement of the State's peak farmer body in the program to date has been extremely disappointing.

"One of the more interesting strategies is the proposed use of 'Judas' foxes – free-ranging, de-sexed foxes fitted with radio collars and pumped full of hormones."

As with any Government program, funding and resources are always an issue. The Tasmanian Government is fond of crying poor and relying on the Commonwealth to top up natural resource management-related programs, and this one is no different. It has become abundantly clear that the $1.2 million from the state and the $400,000 from the commonwealth so far is nowhere near enough. Whether either party is prepared or able to contribute more is a critical issue. The recent loss of the mainland fox expert contracted to the Taskforce is another sore point, as the value of an independent observer within the Taskforce cannot be understated.

Although much has improved in 18 months, we still are standing on the very edge of the precipice. The enthusiasm, dedication and work ethic of the Taskforce staff has exceeded even the most optimistic predictions, but this has been somewhat countered by a real lack of resources and endemic bureaucratic interference and apathy.

However, some reassuring information has resulted from a Commonwealth-funded survey of the community's perceptions of this issue. Ninety-one per cent of the those surveyed thought that importing a live fox to be an issue of major concern. It may be that the Tasmanian community can attain a level of maturity and awareness that will make further fox introductions completely unacceptable. Only then will we be able to claim that Tasmania is truly 100 per cent fox-free.

Craig is a member of the Fox-free Tasmania Steering Committee. This article is updated and amended from an earlier article that appeared in Wildlife Australia magazine volume 39, No. 2, 2002.

Wildlife Australia magazine is published by the Wildlife Preservation Society of Queensland. For subscription enquiries, contact the editor.

Prolific Flowers = Prolific Weeds

Cootamundra wattle (*Acacia baileyana*) is a most unusual plant: a species with a very small natural range (centred around Cootamundra in inland New South Wales) that has gone on to become a weed on every continent (except Antarctica) and in every Australian state. Cootamundra wattle flowers prolifically and attractively and for this reason was exported to other countries as a garden plant, affording it with opportunities to escape from cultivation. A recent study published in the *Australian Journal of Botany* (2002, 50, 357-364) by Anne Morgan & colleagues suggests ecological reasons for its success. An obligatory outcrosser, maximum flower production by a 2-year old plant was over 300,000, resulting in more than 8000 seeds.

"Precocity and high flower numbers appear to be the reasons for the weed status of *A.baileyana"*, they concluded. If so, their finding has could help explain why so many garden plants go on to become serious weeds. In choosing garden plants, horticulturists want species that flower prolifically. If there is a general correlation between prolific flowering and high seed set, and between seed set and invasiveness, then the human penchant for colourful plants means we selectively favour species with a propensity to become wicked weeds. Put another way, one could say that humans often form symbiotic relationships with colourful plants. People gain colour around their homes, and the plants get dispersed widely.

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Australian wattles (and eucalypts) are widely planted by aid agencies in Third World countries with little consideration paid to the weed problems that ensue.

13th Australian Weeds Fest

Awareness about environmental weeds is growing fast. That's a conclusion to be drawn from the 13th Australian Weed Conference held in Perth on 8-13 September 2002. At earlier national weed conferences held some years ago, bushland weeds received scant attention. The talk was all about weeds of farms and other managed systems. But the profile of environmental weeds keeps growing, and many speakers in Perth delivered excellent papers on the topic and their sessions were often the best attended. A few of the 200 papers from the conference are briefly summarised here.

Cindy Hanson of the Department of Primary Industries, Water & Environment, Tasmania, warned that the widespread planting of olive groves in Tasmania could allow this tree to become a major weed there. The olive is already a devastating weed around Adelaide, but has not yet naturalised in Tasmania, although the climate in some parts of the state appears suitable. The DPIWE has set up a Feral Olive Working Group to raise awareness among growers.

Greg Keighery of the Department of Conservation and Land Management in Perth talked about Australian plants as weeds. In Western Australia 35 species of Western Australian plants have become weeds, largely outside their original ranges, as a result of plantings. The worst invaders are the peppermint tree (*Agonis flexuosa*) and Geraldton wax (*Chamelaucium uncinatum*). Fifty four species from eastern Australia have also become weeds in the west, the worst rogues including coast teatree (*Leptospermum laevigatum*), spotted gum (*Corymbia maculata*), kurrajong (*Brachychiton populneus*), sweet pittosporum (*Pittosporum undulatum*) and various wattles (*Acacia decurrens, dealbata, pycnantha, longifolia, melanoxylon*).

Nigel Ainsworth and John Weiss of the Keith Turnbull Research Institute warned that Japanese knotweed (*Fallopia japonica*) poses an underrated threat to riparian zones. It is a major weed overseas, capable of growing 3 metres tall, and the limited infestations in south-eastern Australia should be eradicated.

A number of speakers discussed successful eradications of various weeds of limited distribution: Kochia (*Kochia scoparia*), fringed spider flower (*Cleome rutidosperma*), bitter weed (*Helenium amarum*), seroty weed (*Eupatorium serotinum*) and mouse ear hawkweed (*Hieracium pilosella* ssp. *nigrescens*). Kochia, deliberately introduced to Western Australia in 1990 to grow on saline soil, cost $176,00 in direct costs to eradicate, and $318,000 in labour and monitoring costs. Eradication of bitter weed, first detected west of Brisbane in 1953, spanned 39 years.

The South African rust fungus (*Puccinia myrsiphylli*) brought in to control bridal creeper (*Asparagus asparagoides*) is working well but spreading slowly, concluded Louise Morin and colleagues. Rust epidemics can be 'severe and destructive', but the fungus can take four months to spread 30 metres. Other speakers discussed biocontrol agents to counter bellyache bush (*Jatropha gossypiifolia*), mesquite (*Prosopis*), blackberry (*Rubus fruticosis*), and other nasty weeds.

The papers were published in, 13th Australian Weeds Conference Papers & Proceedings*, edited by H. Spafford Jacob, J. Dodd & J.H. Moore, and published by the Plant Protection Society of WA.*

Guppies in the West

Tim Low

North-west Cape is home to one of the world's most diverse cave faunas. Limestone caverns extending under the plain around Exmouth support a variety of endemic aquatic crustaceans as well as two white cave fish – the blind gudgeon (*Milyeringa veritas*) and blind cave eel (*Ophisternon candidum*). A remarkable feature of this system is the lack of obvious connections to the world above. Very few caves and wells connect the waters to the surface. Nutrients enter by filtering down through soil.

Recently, on the outskirts of Exmouth, a bulldozer broke through surface limestone and exposed a subterranean pool. I visited this pool.
in October 2001 and was appalled to find within it, as well as white cave shrimps, a thriving colony of guppies (*Poecilia reticulata*). Someone had released their pet fish into this pool.

Guppies have not been recorded before as a feral fish in western Australia. On a branch beside the pool was a large western green and golden bell frog (*Litoria moorei*). This frog does not occur naturally this far north, and someone (perhaps the same person) had presumably brought it north from Perth and later released it here.

The blind gudgeon and eel have evolved in complete isolation on North West Cape. No other freshwater fish occur in the region and these fish occur nowhere else. They could prove very susceptible to any disease or parasite introduced with aquarium fish emptied into the waters where they live. One can only hope that further releases of fish do not occur here.

Invasive Species Council *Membership application form*

(ABN 27101522829)

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Address: _____

_____

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Thank you for joining us as a founding member! **Please send this form and a cheque to the Invasive Species Council, PO Box 571, Collins St. West, Vic. 8007.**
(Sorry we do not have credit card facilities at this stage).