Australian Association of Bush Regenerators (WA) Inc

Volume 16 Issue 5 NEWSLETTER March 2009

Propagating Bare Twig Rush, *Baumea juncea,* from seed

by Dave Bright, Regen4 Environmental Services

Introduction

When replanting or revegetating degraded areas, it is 'best practice' to use local provenance material with as large a genetic diversity as possible. In recent years, many tens of thousands of a few species of sedges and rushes (members of the Cyperaceae and Restionaceae) have been used extensively around Perth particularly in wetland plantings, through buffer zones and in compensation/detention basins. Unfortunately, however, because most are considered impossible to grow from seed, they have been propagated by tissue culture, used (often) without reference to provenance and with extremely narrow genetic diversity due to using a small number of clones.

This article shows how it is possible (and relatively easy) to produce large numbers of the Bare Twig Rush, *Baumea juncea*, from seed and in doing so reducing the cost of production as well as maintaining genetic diversity which should produce, in the long term, self sustaining populations without genetic decline.

Mature, one-year old seed heads with bracts retained producing few seeds (circled)

Seed Collection

Seed production is highly variable from almost nothing to >15 seeds per seed head. Seed appears to be mature when one year old and is retained for some time allowing collection over several months. The author has collected in Oct, Nov, Dec and Feb, obtaining, in a few hours of collecting, between 1g and 14g of seed.

Mature, one-year old seed heads

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in this issue:

Encl: Membership renewals
Nomination form for Committee

web/e-mail
www.aabr.com.au
aabrwa@westnet.com.au

2009
Annual General Meeting
&
Forum

Wednesday 11th March from 7.30pm
Admin Building : Kings Park and Botanic Garden
take first right turn on Fraser Avenue & proceed ahead through the roundabout

Following the AGM our Guest Speaker is

Anne Cochrane

Senior Research Scientist;
Department of Environment and Conservation

Seed collecting in the 21st century –
GPS, Aussie Explorer, & best practice

Anne has been the manager of DEC's Threatened Flora Seed Centre for over 15 years. Part of her work involves seed collection and storage for long term conservation.

Anne's talk will focus on the use of Global Positioning System (GPS) and the *Aussie Explorer* system. This geo-referencing tool is being used in all sorts of ways, and means that the exact location of plants in flower can be noted so seed can be collected later.

Anne will also be discussing the importance of collecting mature seed, doing viability tests, good documentation, and record keeping.

~ Light refreshments provided ~

Please RSVP to Dave Bright :
mobile 0412 405 730 or
e-mail aabrwa@westnet.com.au

AABR (WA)'s Management Committee

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Vice President
Dave Bright : 0412 405 730
e-mail:
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—

Non-committee members

Webmaster
Steve May

Newsletter Editor
Kirsten Tullis
ph: (08) 9271 3549
e-mail: kt500@iinet.net.au

All Committee positions will become vacant at the Annual General Meeting on March 11.

We look forward to receiving nominations for the Committee either before the AGM or on the night.

Prosecution for Turfmaster following tree deaths

In late 2006 hundreds of trees and thousands of shrubs in and around compensating basins and drains in the Cities of Stirling and Joondalup died. The deaths followed extensive weed spraying by Turfmaster Facility Management.

Both municipalities lost many of their large original Tuart, Jarrah, Banksia and other native and planted trees, and deaths spread into residents' back yards. The native trees were in many cases the last reminder of the original ecosystem, and some were estimated to be over 200 years old.

Following investigations by the two municipalities and the Department of Environment and Conservation the herbicide hexazinone was found to be the reason for the deaths.

Joondalup prosecutes

After a further extensive investigation the City of Joondalup has decided to take the weed contractor to the Supreme Court. This follows the council's action to terminate their contract with Turfmaster in August 2007.

Stirling renews contract

Turfmaster escapes prosecution by the City of Stirling, despite the significant environmental damage. The council had been satisfied with the level of tree removal, rehabilitation, and compensation the company has carried out since the poisoning.

Stirling recently awarded Turfmaster with a new weed spraying contract that will avoid natural areas and be limited to irrigated turf, footpaths and kerbs.

In both cities there has been significant community concern arising from the poisoning. In December last year an unsuccessful petition with 2,500 signatures was presented to Stirling Council to ban the use of pesticides for weed control, and to also cancel its contract with Turfmaster.

Hexazinone

Hexazinone is related to atrazine and simazine, and belongs to the highly toxic and soluble triazines group of herbicides. Hexazinone is effective on foliar contact and is also a soil active residual herbicide. Once in the soil it can be absorbed by plant roots and if incorrectly applied, is capable of killing desirable plants and trees.

The label (for at least one brand, *Velpar® DF*) warns against contaminating ponds, streams, rivers, waterways, or drains. It also advises that it should not be applied within 25 metres of a recognised waterway, or further if native riverbank vegetation may be damaged.

An article on the poisoning, and additional information on hexazinone, appeared in the AABR July 2007 newsletter.

Ecology in a Changing Climate
Two Hemispheres - One Globe

Brisbane 16-21 August

The International Association for Ecology (INTECOL) is holding the 10th International Congress of Ecology in Brisbane this August. The Ecological Society of Australia and New Zealand Ecological Society are hosting the Congress.

INTECOL was born in 1967 because ecologists from around the world were concerned by major ecological problems, and decided an International organisation was needed. In 1974, in the Hague, the first International Congress of Ecology was held. Since then congresses, conferences, and meetings have been held by the Association and its various specialist groups, with the Wetlands Working Group being among the best known.

Go to **http://www.intecol10.org/** for further information. Abstract submissions for presentations and posters are due March 4.

Snakebush & Hibbertia seed

I have been seed collecting for many years in the bush around Perth and made an exciting new find with a friend this January; some Snakebush (*Hemiandra* sp) seed. From time to time while collecting I had checked old flower heads and found nothing.

The seeds we found were in Lightning Swamp, in an area burnt about two years before and also in unburnt bush. The ground was well populated with many plants of varying size, some with quite a few old flowers. Some of these were full, and in a small number were up to four seeds. Snakebush is prickly, and wearing disposable rubber gloves makes collecting much more pleasant.

We also managed to collect a good number of *Hibbertia huegelii* seeds from around the base of plants, also in the burnt area.

I would be interested to hear if others have found seed of these two species, and whether they have germinated well.

A few years ago we had found many Common Buttercups (*Hibbertia hypericoides*) seeds in a nearby area, and following successful germination I have four plants growing in my garden.

Kirsten Tullis; Friends of Lightning Swamp Bushland

WANTED

Bush Regeneration Items

We'd love some more interesting bush regeneration items or helpful hints for the newsletter. Please send them to the Editor

see details on page 8

WANTED

19th Conference of the Society for Ecological Restoration International

Perth Convention Exhibition Centre

23 – 27 August

SERI WORLD CONFERENCE 2009 ON ECOLOGICAL RESTORATION

Making Change in a Changing World

The Society for Ecological Restoration International (SER International) is hosting its 19th conference in Perth this year from Sunday 23rd to Thursday 27th of August.

The following is adapted from the SERI website.

www.ser.or

SER International conferences provide an essential International forum for scientists and practitioners who look to restoration as a means to conserve the planet's dwindling biodiversity and failing ecosystems. These meetings provide a critical platform to assist in defining the principles of restoration, understanding goals and milestones, debating what ecosystem functions to measure, and closing the gap between the science of restoration ecology and the practise of ecological restoration.

With a focus on ***Making Change in a Changing World***, the local conference organising committee hopes to engage the debate on the impact of a changing world on our restoration capabilities. With this focus, SER International 2009 aims to accommodate as many interests as possible. The meeting will host an array of themes representing current research and global restoration practice. Themes that are relevant, of high focus, and contemporary in Australia will also be part of the SER International 2009 program.

A preliminary list of themes include:

- **Restoration ecology in a changing world**
  - status of restoration ecology
  - setting goals in a changing world
  - global climate change
  - priorities for restoration
  - investigating ecological processes - which ones and how?
  - future of restoration ecology - where do we go to from here?

- **Linking science with the arts – social and cultural aspects of restoration**
  - community involvement in restoration
  - indigenous ecological knowledge for restoration

- **Restoration at the landscape scale**
  - using landscape ecology in ecological restoration
  - using ecological restoration in landscape ecology

- **Ecological restoration of ecosystems**
  - wetland restoration
  - river restoration
  - coastal and mangrove restoration
  - marine restoration
  - forest restoration
  - woodland restoration
  - shrubland restoration
  - grassland restoration
  - desert restoration

- **Ecological restoration of disturbed sites**
  - agricultural landscape restoration
  - post-mine restoration
  - post-extraction restoration
  - post-contaminated soil restoration
  - road ecology and restoration

- **Ecological restoration within urban areas**
  - plant-animal interactions in urban areas
  - concepts for urban remnant restoration
  - challenges and indicators for urban remnant restoration

- **Ecological restoration of threatened species, populations and habitats**
  - linking ex-situ and in-situ conservation and restoration practices
  - linking conservation of species with habitat restoration

- **Management and technical aspects**
  - adaptive management
  - monitoring - the long and short of it!
  - remote sensing capabilities
  - modelling capabilities
  - plant provenance
  - criteria and methods for evaluating restoration

- **Disturbance ecology and management**
  - disturbance ecology
  - weed management
  - fire ecology and management
  - pest management

- **Economics and legislation of restoration**
  - restoring natural capital
  - changes in legislation

This year the conference aims to attract a wider than usual audience, to include a greater number of practitioners and scientists from Oceania and the Eastern Hemisphere regions. Perth's location provides an ideal opportunity to promote SERI and ecological restoration within these regions, particularly as India and China represent two new major global hubs for economic growth with growing restoration needs.

About SER

SER is non-profit and is based in Tucson, Arizona with a membership of 2300 individuals and organisations. Members are actively engaged in ecologically-sensitive repair and management of ecosystems through an unusually broad array of experience, knowledge sets and cultural perspectives. They include scientists, planners, administrators, ecological consultants, first peoples, landscape architects, philosophers, teachers, engineers, natural areas managers, writers, growers, community activists, and volunteers, among others.

Founded in 1988, the SER International boasts members in 37 countries and all 50 US states, with 14 chapters serving regions of North America, England, Europe, Australia and India. Recognised by public and private enterprises as the source for expertise on restoration science, practice and policy, the Society achieves its objectives through cooperation with partner organisations and the work of its worldwide membership. As well as holding its own conferences, it

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cosponsors others and its various chapters hold regional conferences and meetings.

While not engaging directly in restoration projects SER International's mission is: **"to promote ecological restoration as a means of sustaining the diversity of life on Earth and reestablishing an ecologically healthy relationship between nature and culture."** The Society thus serves the growing field of Ecological Restoration through facilitating dialogue among restorationists; encouraging research; promoting awareness of and public support for restoration and restorative management; contributing to public policy discussions; recognising those who have made outstanding contributions to the field of restoration; and, of course, promoting ecological restoration around the globe.

SER Journals

The Society produces two quarterly journals. *Restoration Ecology* was initiated in 1993 and is the Society's scientific and technical journal. It focuses on research on restoration and ecological principles that help explain restoration processes. It presents new techniques that are likely to be of use to other practitioners, and reviews articles that summarise literature on specialised aspects of restoration.

Ecological Restoration is the practitioner's guide and has been around since 1981. It summarises current projects and techniques and offers thought-provoking philosophical essays.

Restoration Networks

The Indigenous *Peoples' Restoration Network* (IPRN) was created in order to promote the appropriate uses of traditional ecological knowledge as a guiding principle in restoring the environment and culture of indigenous peoples. *The Global Restoration Network* (GRN) offers a comprehensive web portal to every aspect of ecological restoration, including case studies, databases, scientific papers, resource and expertise directories as well as podcasts and webcasts on a wide range of topics related to ecological degradation, conservation and restoration.

Website, Newsletter & eBulletin

The SER International website, which includes the IPRN and GRN websites, provides the general public with an invaluable and comprehensive resource on ecological restoration and related issues. The *SER News* newsletter is produced quarterly and *Restore*, the weekly eBulletin, offers annotated links to the latest news stories from around the world.

Committees & Working Groups

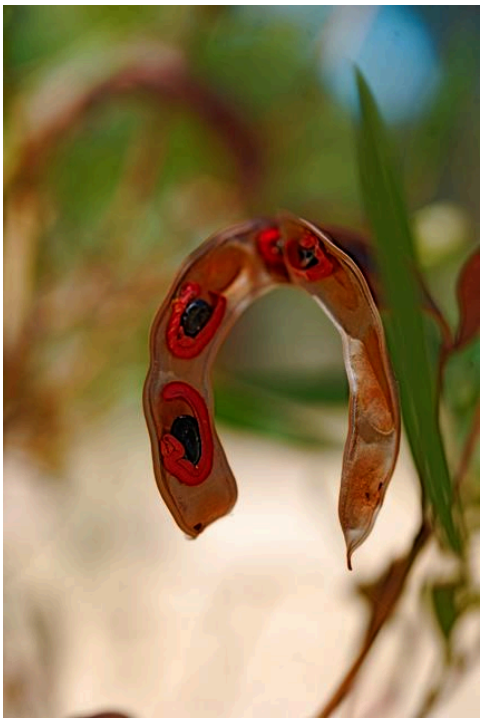
The committees and working groups organise various programs including education and training, publications, science and policy and awarding honors to those making outstanding contributions to the field.

Jewel Bugs *Coleotichus costatus*

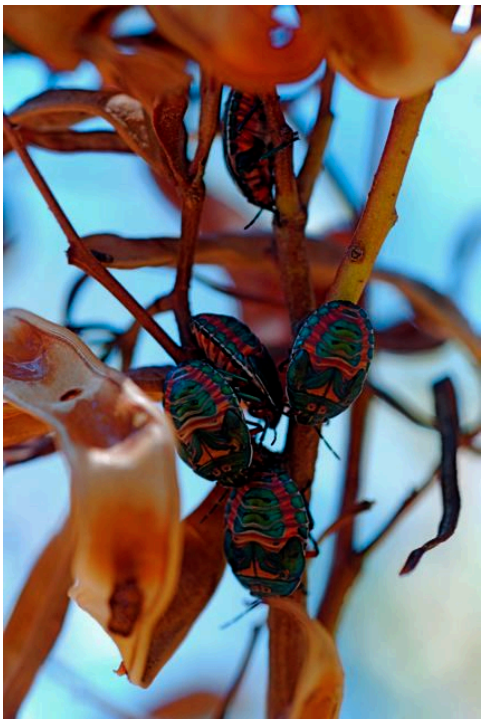
By Margaret Owen

The time of the year and the sounds of lots of small birds could be an indication that jewel bug nymphs are present in the bushland.

Although spectacularly marked and iridescent, the nymphs are surprisingly hard to see. How did the jewel bug nymphs come to have such markings? Dr Jan Taylor and others have pointed out that the seeds of *Acacia cyclops* have a red fleshy aril around them and the red circular marking on the jewel bugs' backs has evolved to mimic the acacia seed and aril.



Seeds inside *Acacia cyclops* pods



Jewel bug nymphs amongst *Acacia cyclops* seed pods

The nymphs are hard to see for humans, unless in huge quantities, but small birds are not deceived at all by the camouflage and feast on the bountiful supply of bugs.

The colouring of the adult jewel bugs is quite different from that of the nymphs. Those that survive to adulthood are a dull fawn colour and they are well camouflaged among the dark acacia pods.

Editor's comment: Bob Dixon advises that although jewel bugs are sap suckers and have been very prolific this year, don't panic. They do little damage in the natural environment, and therefore there is no need to control them.

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Immature seed heads. This photo shows considerable variation in size and form of the seed head. Poor development is due to infection by a smut disease that prevents seed production

Cleaned seed

There are approximately 200 seeds per gram and a single germination trial has shown a germinability of greater than 27%.

Germination

A germination trial was conducted to determine if a particular pre-treatment method was of benefit (*ref. table on page 7*). There was no significant difference between using smoke, or smoke + Gibberellic Acid (GA) - although there is an inexplicable three-month delay in the commencement of germination for the smoke + 500ppm GA treated seeds. All seeds were given the same conditions of treatment, i.e. 24hr soaking in 10% solution of a commercial smoke water + or - GA, at the same temperature, and sown at the same time. The seedling punnets were kept together throughout the trial. No 'control' was included in the trial as the author always uses smoke as a pre-treatment.

Above; first germination of seeds, nearly seven months after sowing. Below; seedlings removed from right-hand punnet

Seeds continued to germinate progressively over the succeeding months and are still continuing to do so.

One observation, of a serendipitous nature, occurred when a punnet of seeds, sown previously over a year earlier, was inadvertently drowned by winter rains (twice!) for several days. Although much of the seed-raising medium was washed out, six months later, a mass germination of seedlings occurred! This maybe suggests that one or more wet-and-dry cycles is the better germination trigger for this species!

Pers. com. from Bob Dixon has indicated that Dr Shane Turner, from Kings Park and Botanic Garden, has found a similar response in other species of rushes (Cyperaceae) which appear to germinate readily after several seasons of in situ soil storage (in punnets) and the application of smoke or smoke water in the autumn prior to regular winter watering.

Mass germination six months after seeds had been inadvertently drowned!

Seedling Division

Initial seedling growth produces a clump with multiple shoots emanating from a central 'crown' which, after six to seven months in winter can be divided to produce as many as six new plants. In summer, the growth has been faster and it looks like the first division can be made after five months.

Six-month old seedlings

Establishment and growth of the divisions has been faster than the seedlings (although this may be due to the time of year) and a second division was able to be made after only a further 3-4 months. To date a two to three-fold increase has been achieved with the first division and nearly a five-fold increase with the second (there has been less than 1% loss of plants from division).

Throughout the trial, plants have been grown in a standard tunnel house with twice-daily watering

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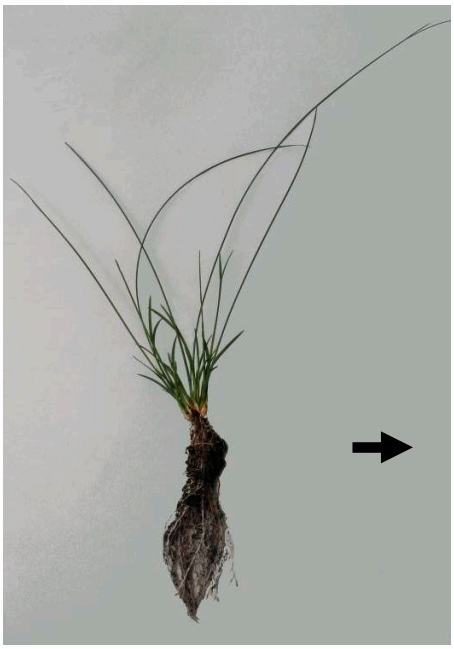

during summer and daily watering in winter.

Conclusion

With a greater than 27% germinability and the potential for increasing plant numbers by a factor of 7 or 8 by division in a single growing season, revegetating by using *Baumea juncea* raised from seed is a viable option. Therefore there is no need to use tissue-cultured plants.

Baumea juncea seed trials

2g seed Sown 3.9.07 (~400 seeds)	No seedlings pricked out				Division	
	Smoke only	Smoke + 500ppm GA	Smoke + 1000ppm GA	Total	First division after 5-6 months	Second division after further 3-4 months
Date pricked out	Early March - started germinating					
29/3/08	17	?	14	56	200	944
26/4/08	15	?	10			
7/6/08	30	20	30	80	120	620
6/9/08	16		19	51	156	
13/9/08		16				
25/10/08	23	19	15			
15/11/08	4	3	21			
12/12/08			5			
3/1/09	7	18	6			
7/2/09	1	15	2			
	=====	=====	=====	=====	=====	=====
TOTALS	113	91	122	187	476	1564

Table: '?' – no explanation can be given for the three-month delayed commencement of germination for the 'Smoke + 500ppm GA' treated seeds

Whose Coast is it? Adapting for the Future

5th WA State Coastal Conference 7 - 9 October

Perth Region Natural Resource Management is hosting the 5th Western Australian State Coastal Conference at Fremantle's Esplanade Hotel from 7th - 9th October. The theme is ***Whose Coast is it? Adapting for the Future.***

Participants have until March 27 to submit an expression of interest to present a talk or exhibit at the conference or provide sponsorship.

Keynote Speakers: Dr Stephen Leatherman (AKA Dr Beach) USA / Professor Rodger Tomlinson (Queensland)
Dr Kingsley Dixon (Western Australia) / Dr Simon Thrush (New Zealand)

http://www.keynotewa.com/wacoastal2009 gives further information on making a submission and a list of topics.

Fungimap Conference V

Thur ***21 - Tue 26 May***

Black Gold Country Cabins, Wallerawang *(near Lithgow):*
Blue Mountains region of NSW

Fungimap 5 is being organised in conjunction with the Sydney Fungal Studies Group. It will provide workshops and forays for all skill levels, to help everyone increase their knowledge of fungi and gain practical experience with identification techniques. The conference cost is $250 for Fungimap members or $300 for non-members, with a $50 discount for registering by February 27. Five nights dormitory accommodation with meals is $350.

PROGRAM

Thur	Registration and settling in
Fri	A day of talks followed by an evening presentation by keynote speaker, Dr Tom May
Sat & Sun	Two days of morning forays to surrounding forest. Afternoons workshops will led by experienced fungi people
Mon	A day trip to the Blue Mountains National Park, followed by the Conference dinner & trivia night
Tue	Breakfast is provided before people depart

For further details go to **http://www.rbg.vic.gov.au/fungimap_welcome/** For a registration form go to ***http://www.rbg.vic.gov.au/fungimap_/__data/page/1753/registration_form_FungiV_2009.doc***

28th March - 5th April
CONSERVATION WEEK 2009
Connecting Community and the Environment

The Conservation Council of WA, with sponsorship from Lotterywest, is again inviting people to join in Conservation Week activities, from March 28 to April 5.

The event celebrates the State's natural environment and the work done by many in the community to protect and care for it. Conservation Week highlights the issues faced by the environment, and promotes action towards building a sustainable future.

Register an event
Environmental and other community groups, schools, local business, and individuals can register with one of the Conservation Council events or register a new event.

The Council's activities include the:
- Biodiversity in our Backyard Photography Competition
- Conservation Council of WA Conservation Awards
- Biodiversity in our Backyard Citizen Science Project

Suggested new activities to register:
- A walk or cycle to school, or work
- A tree planting/weeding/clean up of a local bushland reserve
- An environmental themed display at a school or library
- Inviting a guest speaker to a school or library
- Hosting a guided walk/seminar or workshop with an environmental theme
- A celebration of your groups' achievements in protecting the environment

Please go to **http://www.conservationwa.asn.au/** for more information or to download a registration form. For further information about Conservation Week or to discuss ideas contact Jessie Cochrane, Community Liaison Officer on (08) 9420 7266 or email clo@conservationwa.asn.au

AABR

was established in 1986 in NSW (with the WA branch forming in 1992) out of concern for the continuing survival and integrity of bushland and its dependent fauna in or near bushland areas. AABR seeks new members and friends for promoting good work practices in natural areas. The Association's aim is to foster and encourage sound ecological practices of bushland management by qualified people, and to promote the study and practice of Bush Regeneration.

To join AABR (WA) .....

please go to our **website** for a membership form
www.aabr.com.au

For newsletter contributions:

Contact the Editor: Kirsten Tullis
Ph: (08) 9271 3549 : E-mail: kt500@iinet.net.au

COPY DEADLINE for Issue 2 – April 15

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open to appropriately qualified & experienced bush regenerators
$20.00 (includes newsletter and GST)

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