

Shire of Mundaring

Private Landholder Information Package



Shire of Mundaring Private Landholder Information Package

Prepared by:

Eastern Metropolitan Regional Council

In partnership with:

Swan Private Landholder Incentives Project - conducted by WWF-Australia and funded by the Perth NRM Region in partnership with the Shire of Mundaring, Western Australian Government and Australian Government.

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1 Your property, your bushland, your choice



Living in the Shire of Mundaring brings with it a great lifestyle. This lifestyle is intricately linked to the bush, land and water. Mundaring is surrounded by a diversity of vegetation and wildlife. You can bird watch from your kitchen window, spend dusk down at the creek with the bandicoots, spot the fungi emerging in a different location each year, take a bushwalk in your own backyard and know every hollow in the big old gum tree out the back.

Privately managed bushland is very important for creating ecological linkages between reserves managed by councils or state government. Bushland protected by landholders contributes to the environment through the protection of the water table, erosion control, prevention or management of salinity and pest control. Importantly, bushland on private properties helps contribute to the wonderful green, natural feel of the Perth area, and makes the Perth Eastern Region a special place. The bushland on your property has importance to all Mundaring residents.

Bushland management and protection by landholders contributes to:

- healthy vegetation communities
- habitat for fauna
- long term survival of native species local to the Mundaring area
- retention of native flora
- biodiversity conservation

Private Landholders may be actively managing their land, may be living off their land or may be protecting their land. If you want to do these things but do not know how, or you have thought about these activities before, there are resources, technical expertise, advice and training available that are specifically designed to help you manage, protect, revegetate and ultimately, enjoy your property.

The Shire of Mundaring recognises that creek lines crossing more than 4,700 private properties and 6,700 hectares of private bushland are a lot to look after. The Shire wants to support landholders who are protecting and managing the bush and creeklines on their properties because this hard work benefits everyone.

2 Private Land Conservation in the Shire of Mundaring

Of the original vegetation within the Shire of Mundaring only 69% remains today. Much of this vegetation is located in Department of Environment and Conservation estate such as National and Regional Parks and is managed for conservation and includes areas managed for water catchment purposes¹. The aim of private land conservation is to strengthen off-reserve conservation where biodiversity is not protected and managed through by the State or local governments. Of the remaining vegetation within local natural areas² approximately 70% is located on private land.

The Shire of Mundaring is planning to implement a Private Land Conservation Strategy which will contribute to biodiversity protection by:

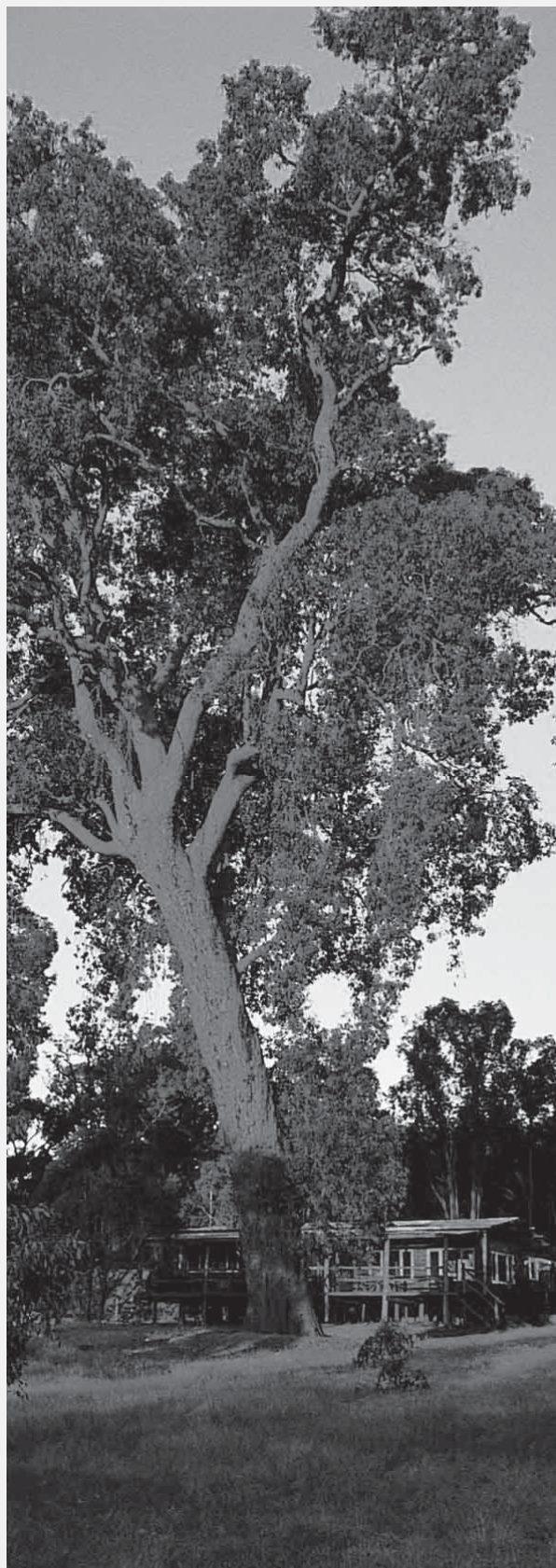
- Providing a framework for action to improve biodiversity conservation on private land within the Shire
- Establishing proactive and achievable targets to protect biodiversity values in the Shire
- Help the community and landowners to understand, appreciate and value the unique biodiversity of the local region and support collective action that is needed for its conservation
- Identifying and documenting the opportunities and constraints provided by incentives and support programs for biodiversity conservation on private land
- Guiding future planning and management in relation to biodiversity on private land in relation to Local (Town) Planning Scheme 4 (currently under review³).

The Shire recognises your efforts in bushland management and protection, and has created this information package to assist you with private land conservation initiatives on your property.

¹ Linda Kirchner, 2007, Draft Shire of Mundaring State of the Environment, unpublished report, p 21.

² Local Natural Areas (LNAs) are areas of bushland which are not protected for the purposes of conservation, management or tenure through the Department of Planning and Infrastructure's (DPI) Bush Forever policy and the Department of Environment and Conservation's managed estate (i.e state forests, national and regional parks).

³ Government of Australia. National Objectives and Targets for Biodiversity Conservation 2001-2005. 2001. Canberra: Environment Australia.



3 Support for Private Land Conservation

Conservation incentives encourage or motivate people to participate in conservation activities on private land. They can be non-financial or financial and can range from providing support through information and training, to the provision of grants to offset the cost of works used for biodiversity protection and management. The Shire's proposed PLC Strategy considers the use of these types of incentives.

Non-financial incentives are those that do not specifically provide resources, in terms of materials or funding, but work to gain commitment to conservation and build landholders' capacity to manage biodiversity. They include:

- Training and Education
- Technical advice
- Recognition and Leadership

Financial incentives are those that directly provide resources, in terms of materials or funding, to landholders to assist with management. They include:

- Grants
- Materials (i.e. trees or fencing materials)
- Rate rebates

3.1 Technical Support and Advice

The Shire of Mundaring supports conservation activities through the Shire's Environmental Management Strategy (1996). Community groups and volunteers play an active role in bushland management, catchment wide projects and landcare activities. There are approximately 76 Friends Groups within the Shire that contribute to reserve management overseen by the Shire's Bushcare Co-ordinator. The co-ordinator supports their work through technical knowledge and skills, on-ground assessment, planning and administrative assistance. Volunteers work on both public and private land.

The Shire of Mundaring's Environmental Advisory Committee (EAC) is a formalised committee of Council providing advice to Council on

environmental community issues. The EAC has been instrumental in the initiation and development of the Shire's environmental policies and projects.

The Eastern Hills Catchment Management Program (EHCMP) is a team of officers who work in partnership with the Shire of Mundaring, Shire of Kalamunda and the City of Swan to support community networks, including Friends Groups, Catchment Groups and a Land Conservation District Committee. The EHCMP officers provide support through community education programs, production of the monthly newsletter - *Greenpage*, contributing to community group meetings and assisting with funding applications. Private landholders can access technical and administrative support provided by the EHCMP by partnering with a catchment group.

Catchment Groups are groups of volunteers that help to manage natural resources across the region on Shire reserves and private property. The catchment groups are able to link landholders with on-ground projects. Association with a catchment group will also provide landowners a supportive environment where they can learn more about revegetation and conservation activities.

These groups are formed on a catchment wide basis, with five occurring within the Shire of Mundaring:

- Helena River Catchment Group
- Jane Brook Catchment Group
- Rocky Gully Catchment Group
- Blackadder Woodbridge Catchment Group
- Susannah Brook Catchment Group

The Wooroloo Brook Land Conservation District Committee (WBLCDC) provides support and advice to residents in the Wooroloo Brook catchment encompassing parts of the Shire of Mundaring, Shire of Northam and the City of Swan. The group focuses mostly on private land and their work targets salinity prevention and solutions, sustainable production and revegetation of the catchment. The WBLCDC co-ordinates an annual landcare display at Gidgegannup show, property planning courses, field walks, catchment tours, an annual breakfast and other events.



Useful Resources and Contacts:

Friends Groups

Shire of Mundaring Bushcare Co-ordinator
7000 Great Eastern Highway
Mundaring WA 6073
Phone: (08) 9290 6666
Fax: (08) 9295 3288
Email: shire@mundaring.wa.gov.au

EAC and Policies and Guidelines

Shire of Mundaring Environmental Officer
7000 Great Eastern Highway
Mundaring WA 6076
Phone: (08) 9290 6666
Fax: (08) 9295 3288
Email: shire@mundaring.wa.gov.au
Websites: www.mundaring.wa.gov.au

EHCMP, WBLCDC and Catchment Groups

Eastern Hills Catchment Management
Program Officers
Phone: (08) 9424 2222
Fax: (08) 9277 7598
Email: mail@emrc.org.au
Website: <http://www.emrc.org.au/community.asp?pg=72>

3.2 Training and Education

Training and education play an important part in ongoing management support for private landowners by providing opportunities for learning and sharing practical information. Free or low cost training and education can significantly offset the costs involved in managing land for biodiversity conservation. Within the Shire of Mundaring, a range of formal and informal training and education opportunities are available – (see Table 1). Other relevant training courses and workshops are also advertised in our local newsletter, *Greenpage*. If you would like to receive *Greenpage* via the post or email please contact EHCMP on (08) 9424 2222.



Table 1: Training and Education for Shire of Mundaring Landowners

Program Name	Description	Program Organiser	Contact
Bush Skills for the Hills Program	A series of free, hills-focussed workshops ranging from informative sessions on aspects of land, bushland, and waterways management to practical sessions or a mixture of both.	Eastern Hills Catchment Management Program (EHCMP)	Phone (08) 9424 2222 Web: http://www.emrc.org.au/community.asp?pg=73 Registration required.
Great Gardens/ Heavenly Hectares Mega Workshop	Free workshops focussing on waterwise, fertiliser-wise gardens and hobby farm advice.	Landcare Solutions	Great Gardens Phone: 1300 369 833 Web: http://www.greatgardens.info/events.html
Property Planning	Property planning and other small landholder related events and workshops.	Small Landholder Information Service	Phone: 93683807 or 97337777 Email: Small_Landholder@agric.wa.gov.au Web: http://www.agric.wa.gov.au/content/FM/SMALL/PER_SUMM.htm
Property Planning	All day workshop providing detailed 'one on one' advice to hobby farmers, focusing on specific issues or problem areas using an aerial photograph of your property to develop a property plan. Participants must have attended a Heavenly Hectares or Mega workshop before registering.	Greenskills Incorporated	Registration form available at: http://www.greenskills.green.net.au/ws.html
Apace WA	Community based organisation supporting environmentally sustainable development and appropriate technology. A community revegetation nursery and revegetation service – native plant nursery. Educational programs include: Bush Regeneration and Seed Collection of WA Native Plants	Apace WA	Apace (Western Australia) 1 Johannah Street, North Fremantle Western Australia Phone: (+61) 08 9336 1262 E-mail: apace@argo.net.au
Land management	Certificate courses	Swan TAFE	Normal TAFE fees apply www.swan.tafe.wa.edu.au
Wildflower presentations	Scheduled talks can be viewed at the following website.	Wildflower Society	Small fee applies to non-members. http://members.ozemail.com.au/~wildflowers/events.htm

3.3 Materials Support

Access to materials, for example seedlings or equipment, can also help to offset the costs of management. The Shire of Mundaring currently provides materials for landholders through two programs:

- Tree Canopy and Understorey Program; and
- DIY Dieback Injection Kits.

The Shire's Tree Canopy and Understorey Program provides native seedlings to Mundaring landholders on an application basis in autumn of each year. (Refer to section 5.3 for species list and registration details.)

DIY Dieback Injection Kits and brochures are available to Mundaring landholders to assist in the treatment of Phytophthora Dieback. Kits include equipment required to treat affected trees, or prevent healthy trees becoming affected by Dieback. (Refer to section 5.2 for brochure.)

3.4 Voluntary Agreements for Protecting your Bushland Property

Conservation covenants provides long term protection for bushland on your property and restrict activities that could potentially damage bushland. Some are registered on title, providing legal protection for conservation values in perpetuity. A covenant that restricts some activities is usually complemented by a management plan outlining how to minimise the impact of invasive species and other threats and information on how to improve the quality of bushland.

Table 2 summarises the current voluntary conservation agreements and covenants available within the Shire of Mundaring for private land conservation.

Table 2 Private Land Conservation Agreements

Property Conservation Option	Description	Duration	Implementing Agency
Voluntary conservation agreement (VCA)	Landowners enter into a voluntary conservation agreement for a set period and develop a management plan for the property	Short term (usually 3 to 10 years)	Land for Wildlife Department of Environment and Conservation
Nature Conservation Covenant Program	Voluntary, legally binding document that has provisions restricting activities that might threaten the land's conservation values. Every conservation covenant is individually negotiated between the Department and the landowner, and aims to maintain the conservation values of the bushland whilst allowing for flexibility to reflect the landowner's wishes for the land.	As agreed	Nature Conservation Covenant Program Department of Environment and Conservation
Voluntary conservation covenant (VCC)	A voluntary conservation covenant is placed on the land title to protect biodiversity assets in perpetuity	Permanent	National Trust
The Soil and Land Conservation Commissioner - Conservation Covenants	The landowner agrees with the Commissioner of Soil and Land Conservation to manage the vegetation in such a way to retain and promote its growth. Covenants under the Act are positive rather than restrictive covenants i.e. they cannot restrict activities rather they can impose positive management actions. Covenants typically limit clearing and grazing of the native vegetation but may allow uses such as removal of selected timber and seed collection. Fencing may be required to ensure livestock do not intrude into the covenanted area.	<i>Conservation Covenants</i> which are expressed as irrevocable and cannot be varied or discharged; and <i>Agreements to Reserve</i> which can be varied or revoked by mutual consent	Administered by the Department of Agriculture

Useful Resources and Contacts:

Natural Heritage Department, National Trust of Australia (WA)

Covenanting Officer

Phone: (08) 9321 6088

E-mail: trust@ntwa.com.au

Website: <http://www.heritagewa.org.au/naturalheritage/covenanting>

Department of Environment and Conservation

Wildlife Branch

Nature Conservation Covenant Program Co-ordinator

Phone: (08) 9334 0477

Fax: (08) 9334 0199

Email: covenant@dec.wa.gov.au

Website: <http://www.naturebase.net/content/view/120/453/>

Land for Wildlife Program

Land for Wildlife Co-ordinator

Department of Environment and Conservation
Species and Communities Branch

Phone: (08) 9334 0530

Fax: (08) 9334 0199

Email: claire.hall@dec.wa.gov.au

Website: <http://www.naturebase.net/content/view/118/451/>

Department of Agriculture and Food, Western Australia

Office of the Commissioner of Soil and Land Conservation

Phone: (08) 9368 3282

Email: enquiries@agric.wa.gov.au

Website: <http://www.agric.wa.gov.au/content/sust/reg/soilnland.htm>

Australian Government

Department of the Environment, Water, Heritage and the Arts

Phone: (02) 6274 1111

Website: <http://www.environment.gov.au/biodiversity/incentives/covenants.html>

3.5 Financial Support

There is limited direct financial support for undertaking conservation activities on private property. Grant funding is the main source of financial assistance currently available. It is advisable to seek funding through an incorporated⁴ group or in collaboration with other community groups such as a Catchment Group as most funding is not available at an individual level.

Before applying for a grant, talk to the organisation offering the grant to clarify your eligibility and the activities to be undertaken. Application guidelines are generally available on the organisation's website. See table 2 for examples of grants.

Most funding programs require a connection to a community or catchment group and a clear demonstration of how a project will serve a greater community purpose. Some funding bodies are supportive of providing funds to large catchment scale private landholder restoration and revegetation projects.

The Shire of Mundaring is investigating ways to provide financial support or incentives for private land conservation. These incentives will be outlined in its proposed private land conservation strategy.



⁴ Incorporation confers a legal entity to a body in its own right that is; it has a separate identity to that of its members which continues regardless of changes in membership. Community, social, sporting groups and associations can become incorporated under the Associations Incorporation Act 1987 (WA). Incorporation confers powers, obligations, duties and liabilities upon a body. See the Department of Consumer and Employment and Consumer Protection for more information: <http://www.docep.wa.gov.au/ConsumerProtection/Content/Business/Associations/index.htm>

Table 2: Examples of Grants for Biodiversity Conservation and Preservation

Grant Name and Organisation	Availability and Eligibility	Activity (not limited to)	Information
Gordon Reid Foundation Conservation of Natural Heritage Grants - LotteryWest	Ongoing Non-profit organisations, Local Government Authority, Land Conservation District Committee Non-incorporated \$1000 - \$5000 Incorporated \$1000 - \$15 000	Examples may include: Revegetation activities and the protection of remnant vegetation; Flora and fauna surveys; Management plans for reserves; Public education projects such as the production of brochures etc. and research projects which will assist in the conservation of Western Australia's biodiversity	Applicants encouraged to take a whole of catchment approach.
Threatened Species Network Community Grant - World Wildlife Fund	Incorporated Community Groups Community groups in partnership with local or state government, incorporated regional Natural Resource Management (NRM) group, schools or universities with the latter ineligible to apply for their own funding Non-incorporated community groups if supported by a local or state government or incorporated regional NRM group to administer funds	Examples may include: Habitat restoration Weeding and feral animal control Monitoring and surveying species populations Fencing Fire management	Limited to projects that benefit species or ecological communities that are listed as threatened under the <i>Environmental Protection and Biodiversity Conservation Act 1999</i> (Cmth)
Landcare Australia	Incorporated Community Groups Non-incorporated community groups if supported by a Up to \$3 300 (gst inclusive)	Environmental project Tools and equipment Education Facilitate more community members to get involved	Two funding rounds per year
Norman Wettenhall Foundation	Community groups or stakeholders in collaboration with community group/s. Up to \$20 000	Activities/projects that maintain or restore habitat; the production of education kits; and the publication and widespread dissemination of research information essential to species preservation.	Activity must support the mission and principles of the foundation. Collaborative projects with a number or partners across a region favoured. Applications accepted quarterly.
Swan Alcoa Landcare Program - Swan River Trust - Alcoa - Perth Region NRM (formerly the Swan Catchment Council)	Community groups. About \$600 000 for 2009 funding round	On-ground revegetation and rehabilitation projects	Annually EHCMP NRM Officer Shire of Mundaring Environmental Officer Perth Region NRM (formerly the Swan Catchment Council)

Useful Resources and Contacts:

General grant information

The Australian Green Grants Guide

Published annually by Molino Stewart, an environmental Consulting Company, based in New South Wales. A purchasing fee applies.

Phone: (02) 9354 0300

Fax: (02) 9893 9806

Email: info@molino-stewart.com.au

Web: <http://www.molino-stewart.com.au/products/>

Department of Local Government and Regional Development

Publish an annual Grants Directory and a downloadable Guide to Submission Writing

Phone: (08) 9217 1500

Facsimile: (08) 9217 1555

Freecall: 1800 620 511 (Country Only)

Email: grantsdirectory@dlgrd.wa.gov.au

Web: <http://grantsdirectory.dlgrd.wa.gov.au/>

Department of Infrastructure, Transport, Regional Development and Local Government

Federal government grant information portal. No individual grant advice is given.

Web: <http://www.grantslink.gov.au/>

WA's Community Grants and Funding

Web: <http://wa.gov.au/governmentservices/lifestyleenvironment/yourcommunity/grantsfunding/>

Grants Directory

Web: <http://grantsdirectory.dlgrd.wa.gov.au/>

Department of Consumer and Employment and Consumer Protection

Information given about associations and incorporation.

Phone: Consumer Protection - 1300 304 054

Administration and Corporate feedback line - 1300 136 237

Web: <http://www.docep.wa.gov.au/ConsumerProtection/Content/Business/Associations/index.htm>

Specific grant information

Shire of Mundaring Bushcare Co-ordinator

Phone: (08) 9290 6666

Eastern Hill Catchment Management Program (EHCMP)

Phone: (08) 9424 2222

Landcare Community Grants

Web: http://www.landcareonline.com/funding_opportunity_details.asp?fo_id=9

Landcare Australia

Freecall: 1800 151 105

Web: <http://www.landcareonline.com/page.asp?plD=86>

LotteryWest

Phone:

(Metro) (08) 9340 5270

(Country) 1800 655 270

Facsimile: (08) 9340 5274

Email: grants@lotterywest.wa.gov.au

Web: <http://www.lotterywest.wa.gov.au/asp/index.asp?pgid=390> (General Information)

Web: <http://www.lotterywest.wa.gov.au/asp/index.asp?pgid=444&cid=481&id=271> (Gordon Reid Conservation of Natural Heritage Grants)

Perth Region NRM (formerly the Swan Catchment Council)

Swan-Alcoa Landcare Program

Phone: 9374 3333

Email: saicc@environment.wa.gov.au

Web: <http://www.swancatchmentcouncil.org/default.aspx?MenuID=87>

World Wildlife Fund Australia

Toll Free (National): 1800 032 551

PO Box 4010

Web: <http://wwf.org.au/ourwork/species/tsngrants/>

The relief from land tax associated with a conservation covenant can significantly reduce the annual ongoing cost of owning land and provide encouragement to landholders buying land for lifestyle and conservation reasons. Land tax alleviation associated with conservation covenants may apply to Mundaring residents interested in the formal, long term protection of bush on their properties. Please refer to Section 3.4 for long term protection options.



3.6 Recognition and Celebration

Recognising and appreciating the actions of individuals, groups and families acknowledges the benefit the community receives from their efforts to conserve and enhance the bushland. Recognition is an important part of demonstrating appreciation for the positive impact that the efforts of others have on the community and our environment.

Recognition for landholders can be through both formal and informal means. Formal recognition, in the form of awards, is offered through:

National Landcare Individual Award

Landcare Australia

Web: <http://www.landcareonline.com>

WA Environment Awards

Department of Environment and Conservation
Contact WA Environment Awards Coordinator

Phone: 08 6467 5457

Banksia Awards

Banksia Environmental Foundation

Web: <http://www.banksiafdn.com/>

Wooroloo Brook LCDC Landcare Award

Contact EHCMP

Phone: (08) 9424 2222

Informal recognition, based on celebratory events rather than awards, also provides recognition to those landholders and volunteers engaged in biodiversity conservation.

Activities and events that celebrate and recognise the achievements of volunteers and landholders within the Shire of Mundaring include those listed below. Please contact the EHCMP for further information. **Phone:** (08) 9424 2222

- EHCMP End of Year Volunteer Celebration and acknowledgement gifts
- Wooroloo Brook LCDC Volunteer Breakfast
- Jane Brook Catchment Brook Inc End of Year Celebratory Dinner
- Project profiles in Greenpage newsletter; and
- Articles in local newspapers about successful funding applications and revegetation projects.

3.7 Buying and Selling your land

Bush Brokers aims to encourage the purchase of land by conservation-minded individuals and, in doing so, help protect Australian landscapes. In addition to being able to advertise or search for a property, the website includes information that will assist in tackling issues during purchase, and provide for ongoing management of bushland.

For more information see:

<http://www.bushbrokers.com.au/>

4 Technical Information for Private Land Conservation

The following section provides information on managing your bushland for biodiversity conservation from the planning stages to specific considerations such as fauna, flora, fire and waterways. There are a huge number of resources available to help you plan and manage your land. This booklet has focused on directing you to information that may be relevant to you.

4.1 Property Planning

1 Management objectives

Your management objectives should be based on what you see as your bushland's **values** (eg. biodiversity, amenity, erosion control) and **uses** (eg. nature appreciation, property value). An example of an objective may be to conserve the native flora and fauna.

2 Site Assessment

Collect relevant information such as:

- aerial photograph of the site and neighbouring areas, obtained by downloading Google Earth at <http://earth.google.com> or by contacting your EHCMP or Shire Officers.
- vegetation type(s);
- soil type(s);
- any Declared Rare Flora;
- common weeds present in local area;
- vegetation condition (use Keighery's Scale, included);
- species lists from the local area.

Undertake a general site assessment noting:

- past and current land uses;
- vegetation type and overall condition;
- threats to the site (eg. fire, weeds, pest animals, livestock)
- specific species if known
- native and introduced animals on site
- weeds, if known.

Identify the different management zones – think about the uses and values of different biodiversity areas of your property, which require different management. For example, zones may be 'cleared area requiring revegetation', 'good condition, intact bushland', 'degraded weedy bushland requiring weeding'. For each zone, mark the areas on an aerial map.

3 Action Plan

For each management zone, identify the management objective, issues and threats, actions required and resources, and a schedule for undertaking actions. For example, to conserve native flora and fauna, actions might include fencing, weed removal, feral animal control and so on. After listing all required actions, **prioritise** the most important actions to meet your objective. Determine what resources you need to undertake these actions (eg. money, amount of time needed, information, technical skills).

4 Monitoring

For each monitoring zone, set up some photo monitoring points. These are permanent sites from where you can take a series of photographs over time. The photo series can then be compared to show short or long-term vegetation change, or improvements in vegetation condition, or results of management actions. For each monitoring location, each photo should be taken from the same direction, angle, focus points and preferably camera settings.

Other records could include:

- recording survival numbers of plants from revegetation works;
- a log book of management actions and events such as fires or droughts;
- opportunistic observation notes of birds, mammal sightings, flowering periods.

5 Adaptive management

Be prepared to update your planning based on your monitoring and records.

Useful Resources and Contacts:

Department of Agriculture – Small Landholder Information Service

Phone: 93683807 or 97337777

Email: Small_Landholder@agric.wa.gov.au

Web: http://www.agric.wa.gov.au/content/FM/SMALL/PER_SUMM.htm

EHCMP

Phone: (08) 9424 2222



Topic	Publication details	Available from
Bushland regeneration	<i>Bush Regeneration: Recovering Australian Landscapes</i> . 1989. Buchanan, RA.	Available at the DEC Naturebase Bookshop. Phone: (08) 9334 0481 or go to www.naturebase.net/bookshop/
Preferred to be handed out with property planning workshops but is available for sale separately on request.	Property Planning Manual	Available for \$22.50 from Small Landholder Information Services, Department of Agriculture and Food Phone: (08) 9368 3807 Fax: (08) 9474 2405 www.agric.wa.gov.au/small_landholder
Property planning and management	<i>Managing Your Bushland</i> . 1993. Hussey, BMJ and Wallace, KJ.	Available at the DEC Naturebase Bookshop. Phone: (08) 9334 0481 or go to www.naturebase.net/bookshop/
A manual created by a local land care district committee of the Eastern Hills	Caring for your Land – A guide for small landholders (1999). Grasby, M., Western, L. and Ronalds, C. (eds) EMRC	Contact EHCMP Phone: (08) 9424 2222
Revegetation and environmental monitoring.	<i>Plant Conservation: approaches and techniques from an Australian perspective</i> . 2003. Brown, CL, Hall, F. and Mill, J (eds).	This is a book with a Available from the Australian Network for Plant Conservation. Email: anpc@anbg.gov.au or Phone: (02) 6250 9509 or go to www.anbg.gov.au/anpc

4.2 Weeds

Weeds in our bushlands include introduced grasses, bulbous plants, annuals herbs, trees, shrubs and climbers. Weeds have a number of impacts on the bushland, for example:

- weeds can out compete native understorey
- grassy weeds that die down in summer add to fire fuel levels
- woody weeds can create dense shade which prevents germination and establishment of native species
- weeds can impact native fauna, as they cause a loss of habitat and food sources.

Weeding is not just about getting rid of the weeds. It also works towards restoring and protecting native plants and natural ecosystems. The Bradley method of regeneration starts in good areas of bush first to maximise biodiversity retention. Many weeding techniques can be used depending on the type of weed, the seriousness of infestation and the resources at hand.



Effective weed management requires good knowledge and understanding of the site; knowing the natural distribution of native plants on site; patterns of disturbance; and the distribution and types of weeds. With this knowledge, your weed control can be targeted and tailored to the site.

Central to weed management are the following principles:

- Contain the spread of serious weeds and protect intact bushland.
- Prevent new weed species from establishing.
- Restore degraded edges, as they can harbour serious weeds which may spread in to the bushland.
- Keep a record of your work to monitor the outcomes of your weed management. Photographs are a great way to do this!

Weeds - What can I do now?

1. Identify your weed – it may be one identified in brochures available from the Shire
2. Find out if your neighbours have a problem with the same weed – a combined program may be the best option
3. Obtain advice about how to control the weed – use the contact list in this document
4. Implement control measures – you can do this yourself or employ a qualified contractor
5. Inspect the area frequently to monitor success or follow-up that is needed – take some before and after photos
6. Replace weeds with native vegetation – this will help reduce weeds in the long term



Useful Resources and Contacts:

Topic	Publication details	Available from
Identification and management of weed species prevalent in the Eastern Hills	NRM Fact Sheets	http://www.mundaring.wa.gov.au/residents/residents_yourenviro.asp
This website details weed identification, methods of control, management guidelines and case studies.	Environmental Weeds Action Network	http://members.iinet.net.au/~ewan/
Search for and report on weeds	Weeds Australia	http://www.weeds.org.au/
Weed identification for weeds in the Swan Region	Swan NRM Region	http://www.weeds.org.au/cgi-bin/weedident.cgi?tpl=region.tpl&state=wa&region=swan
Government website on how to identify and manage weeds	Weeds in Australia.	http://www.weeds.gov.au
Research focused website	Co-operative Research Centre (CRC) for Weed Management	http://www.weeds.crc.org.au/index_noflash.html
Provides understanding of the problems that weeds present, information of effective weed control and relevant methods and products.	Australian Weed Control Handbook. 1987. by Parsons, JM.	Copies available from the Rural Press Bookshop Phone: (07) 3826 8200 or go to www.ruralbookshop.com.au
A great book with information of impacts of weeds, how to develop a weed management plan, and techniques for weeding different types of weeds, with detailed examples from the Perth area.	Bushland Weeds: a practical guide to their management with case studies from the Swan Coastal Plain and Beyond. 2000. Brown, K. and Brooks, K	Available from the Environmental Weeds Action Network Inc Phone: (08) 9299 6816 or go to www.members.iinet.net.au/~ewan
A brief guide to weeds and weed management practices specific to the eastern plains and hills area.	Environmental Weeds: Eastern Plains and Hills Region. 2004. Wooroloo Brook Land Conservation District Committee and the City of Swan.	Copies available by contacting an Eastern Hills NRM officer (EMRC) Phone: (08) 9424 2222
An identification guide to weeds, with colour photographs and descriptions. Does not contain information on weed control.	Western Weeds: A guide to the weeds of Western Australia. 2007. Hussey, BMJ, Keighery, GJ, Dood, J, Lloyd, SG and Cousens, RD.	Available online at: http://members.iinet.net.au/~weeds/ww_update.pdf
This pocket-sized field guide on common weeds in the southwest of WA is available from the Department of Agriculture WA. It provides easy identification for more than 100 weeds. Photographs, clear descriptions and notes on similar looking native plants, allow the reader to confidently identify the weed and then apply effective control. A glossary of plant terms and short description of all the herbicides is also included.	Southern weeds and their control. John Moore and Judy Wheeler	Available for \$16.50 from Department of Agriculture and Food Phone: (08) 9368 3807 Fax: (08) 9474 2405

Case Study

Restoration on private lands in the Helena Valley

The restoration of the Helena Valley is a collaborative project that connects private landholders to the Helena River Catchment Group to enable them to receive funding and materials to complete weed control and revegetation activities on their properties. It is an on-going project aimed at restoring the Helena River in Helena Valley. The project aims to increase habitat and biodiversity, reduce the fire risk, control spreading weeds and remove rubbish from the Helena River streambed. Initially 12 landowners made a commitment to control weeds on their properties under the Fyfe Street Bushland Restoration Project. The weed infestation was assessed as being severe and in some cases the river could not be accessed due to blackberry infestation. The project area started out at being approximately 1.1 km long but has now grown to 10km of creekline being actively restored. A number of stages were developed to undertake the project in recognition of its scale.

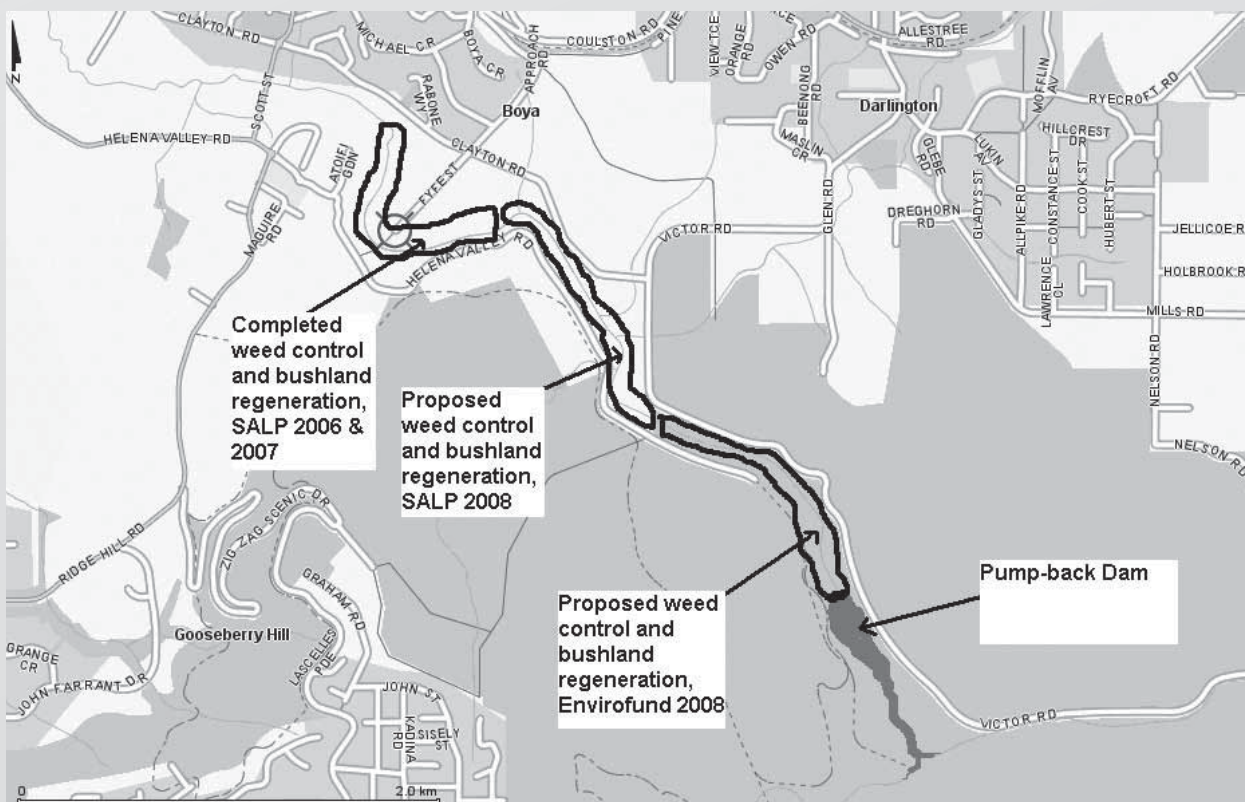
The project has been continuing for three years and has successfully gained contributions from a variety of funding bodies with a total project value of over \$100,000 to date. Funding was sourced from the Swan Alcoa Landcare Program (SALP) in 2006 and 2007 to successfully restore the Helena River around Fyfe Street in Helena Valley. SALP project funding in 2008 has been used to extend the project 1.5km upstream. Round 9 Envirofund funding (2008) further extended this restoration work 2.0km upstream to the base of the pump-back dam. In the future further funding will be sought to link the Piesse Brook weed control project and this project together. This will create one extensive site spanning 20km along the Helena River and its major tributary (Piesse Brook).

The Eastern Hills Catchment Management Program Officers have been involved in the development of this project and have provided advice and administrative support through the Helena River Catchment Group as well as technical expertise with plant species selection for future revegetation works.

The Helena River Catchment Group oversees the project in partnership with the landholders. The catchment group manages the funds for this project and provides administrative support.

Private landholders have been involved from the inception of this project and many are now actively involved with the Helena River Catchment Group. Private landholders assist with weeding and revegetation workdays and contribute whatever they can to the project including chemicals and equipment for weeding, tools to assist in planting seedlings and direct financial contributions. Private landholders have gained from being able to access technical expertise and professional weed contractor services to ensure that the job is done to a high standard. Private landholders have also learnt about weeding and revegetation techniques to enable them to carry on the legacy of the project when funding is no longer available.





4.3 Flora

The flora of Western Australia has evolved and adapted to a range of natural conditions, resulting in a large amount of diversity and uniqueness. Vegetation can be specific to soil types, climate and placement within the landscape. Depending on the condition of your bushland there are different methods to assist with bushland management (described in section in 4.3.3 and 4.3.4).

As a private landowner you can protect and enhance the conservation value of your land and thereby contribute towards the protection of the biodiversity of our unique landscapes, plants and animals.

4.3.1 Identification

It is important to gain an understanding of the type of vegetation community that you have on your property as well as some important individual species. There could be hundreds of different species on your property so it is not necessary to be able to identify them all, even a botanist probably could not do this! To gain an understanding of the vegetation community that you will have on your property you may need to refer to soil and vegetation mapping. From this broad scale mapping you can find out what are the likely individual species that exist within that particular community and then start to learn to recognise some of these species.

4.3.2 Protection

It is important to consider whether or not revegetation is actually required. As a general rule, it is best to put the most effort on managing your best areas of bushland. Before undertaking labour intensive revegetation activities it is good to look at the different natural zones of your property and think about how you may manage these zones differently (see section 4.1 for more information). For example if you have stock, fencing your remnant bushland or creeklines may lead to natural regeneration without much intervention or management. You may also be interested in long term protection options such as management agreements and covenants (see section 3.4 for more information).



4.3.3 Revegetation

Assisted regeneration involves weeding and minimal disturbance to encourage natural regeneration of the vegetation while revegetation involves re-establishment of the vegetation.

You may wish to revegetate a cleared area through either direct seeding or by planting seedlings. A very strong consideration for this is 'local provenance.' This means, only using seed or seedlings that have been sourced locally, for instance, from within 20km radius of your property. Planting times vary greatly over different sites and different years but is usually started just after the first substantial rains each year.

Care for revegetated areas includes:

- Watering may be needed in the first year if it is a very dry summer. A few good drenchings over the year will encourage a deep root system.
- Fertilising is not necessary, but you can put 1-2 slow release fertiliser tablets in the hole before planting (with a little soil over the top so as not to burn the plant roots).
- Weed control for a year before and after planting so your plants are not out-competed.
- Mulching around the plants to control soil conditions, stop water loss and weed invasion.
- Planting guards around each plant to stop predation by rabbits and protect against wind or frost.

The Shire of Mundaring offers free seedlings through the Tree Canopy and Understorey Program. The program provides approximately 52,000 native seedlings to local residents, ratepayers, and community groups for planting within the Shire. (See section 5.3 for the 2006 species list.) The 2008 Tree Canopy and Understorey Species list and a Plant Identification Brochure can be accessed from the Shire Website at: <http://www.mundaring.wa.gov.au>.

The Eastern Hills Wildflower Society also holds a native plant sale every year on the 1st Sunday in May, Phone: (08) 9383 7979.

4.3.4 Assisted Regeneration

The principles of assisted regeneration, as developed by the Bradley sisters are to:

1. work outwards from areas of good bush (i.e. good ground cover, few weeds) towards areas of weeds
2. make minimal disturbance to the environment as you weed
3. do not over clear, or leave large empty gaps for weeds to fill unless there is an opportunity for revegetation or management techniques such as fire that will stimulate rapid regeneration.



This methods aims at removing all 'foreign' influences from a natural area while causing minimal disturbance to whatever native vegetation still exists. These influences could be stock, fire that has occurred too frequently in the past, human access and invasive species including weeds and feral animals. This method allows native plants to regenerate naturally from seed and propagules contained in the soil. This technique is best used in areas that are not highly disturbed and have good quality bushland adjacent the site.

4.3.5 Vegetation Clearing

Clearing of native vegetation is prohibited under the *Environmental Protection Act 1986* and the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*. If you wish to clear native vegetation a clearing permit must be obtained from the Department of Environment and Conservation (DEC) unless an exemption applies. Clearing permits are assessed against principles in the Environmental Protection Act which consider biodiversity, water quality and land degradation. The Shire of Mundaring Town Planning Scheme and Tree Preservation Policy are useful reference for vegetation clearing.



Case Study

What area does the Wooroloo Brook catchment cover?

The Wooroloo Brook catchment covers an area of **536 km²**. It extends from its headwaters to the east of El Caballo Roadhouse in the Darling Range, to where the Swan and Avon Rivers meet to the west in Giddegannup.

Many of the upper reaches of the Brook flow only during the winter months with permanent water only occurring where there are permanent springs.

The Wooroloo Brook catchment crosses the boundaries of the **City of Swan, Shire of Northam** and **Shire of Mundaring**.



Catchment health

Rising groundwater tables is a major issue causing waterlogging and salinity in the valleys.

Salt has been spread across the landscape over thousands of years by rain. For example, rainfall records show that in Northam, close to **45 kg per hectare of salt may be deposited** in one year.

Long term landholders in the upper catchment report that **bore**s were **always salty** and that low-lying productive land became **waterlogged** and then **salt affected** within **5-10 years** after **land clearing**.

Many areas along the Wooroloo Brook itself are degraded due to erosion, clearing, salinity, grazing and weed invasion.

Remnant vegetation in the upper catchment covers approximately 36% of the catchment.



Revegetation works

Revegetation work has been undertaken since 1989 till the present day.

More than 600,000 seedlings and over **\$1 million** in grant monies have been invested in Landcare projects, voluntarily coordinated by the Wooroloo Brook LCDC.

In most revegetation project sites the ground is ripped and mounded and sprayed to control weeds.

30% of the landholders, who have done revegetation on their properties, claim that remediation measures have **halted the spread of saline areas** on their properties, but it had not led to the recovery of the affected land as it still could not be used for productive purposes.



The results of revegetation

Stock exclusion fencing has allowed many of the native plants to **recover by themselves along creek lines**. These include; sedges, rushes, herbs, native grasses and shrubs.

Native fauna has also started to return to newly planted areas as degraded land improves in health and habitat quality.

The revegetation program is complementing areas of natural remnant bushland by reestablishing new areas of native vegetation that are better suited to surviving in areas that have become waterlogged and saline .

Wooroloo brook land conservation district committee (WBLCDC)

The WBLCDC has been operating **since 1989** and comprises of a committee of up to 15 people. The committee is a mix of community volunteers, local government Councillors and state government representatives. For the past few years they have had the support of a Project Officer for one day per week.

Each year the group voluntarily coordinates the planting of **between 30-90,000 seedlings** over a number of projects across the catchment. Staff from ALCOA have been the main stay of volunteers planting tens of thousands of seedlings across the catchment each year since 1991.

The WBLCDC run a Landcare Weekend Sojourn, a Landcare Breakfast and award a Landcare Achievers prize and in 2004 produced 16,000 comprehensive weed booklets free to the community in the Eastern Hills.

The group meets bi-monthly in Gidgegannup.



Useful Resources and Contacts:

Topic	Publication details	Available from
This two-volume set includes keys and botanical descriptions, few illustrations.	Marchant, N.G. et al. Flora of the Perth Region, Parts (vols) 1 & 2. W.A. Herb., Dept. Agric., Perth, 1987.	Available from Department of Agriculture and Food Phone: (08) 9368 3807 Fax: (08) 9474 2405
Illustrated keys to genera and species for W.A. Dated, lacking many new species and name changes, but still very good for many families and regions of WA. Has a complicated structure and index.	Blackall, W.E. & B.J. Grieve How to know Western Australian wildflowers, Parts I to IV. Uni of WA Press, 1980, 1985.	Available from the University of WA Co-operative Bookshop Phone: (08) 64883653
Organised by Families, with photos	Barrett, R. and Eng Pin Tay. Perth Plants: a field guide to the bushland and coastal flora of Kings Park and Bold Park.	Available from most good bookshops
Recommended for the Mundaring region. Has photographs and descriptions	Marshall, J. Wildflowers of the West Coast Hills Region: Quality Publishing 1995.	Available from most good bookshops
Descriptive identification book for Perth local trees and large shrubs	Powell, R., 1990. Leaf and Branch: Trees and Tall Shrubs of Perth	Out of print –available in local libraries
Native Flora identification, plants in gardens, Wildflowers, birds, Bushland Surveys and Surveying , Frogs, Lizards, Snakes and Insects , Managing Bushland plus other general books	Wildflower Society of WA also lists books (and sell them)	http://members.ozemail.com.au/~wildflowers/ebooks-sorted.html
Guide to Australian Plants	Association of Societies for Growing Australian Plants (ASGAP)	http://asgap.org.au/sgap1a.html
Database where you can access information on plant names, plant images, distribution maps and interactive keys.	Department of Environment and Conservation	http://florabase.dec.wa.gov.au/
Descriptive identification book for grasses in the local area	Bell, U. Guide to Native Grasses in the Perth Hills. WA.	Available from the Wildflower Society of WA Phone: (08) 9383 7979 Fax: (08) 9383 9929
Poster for identification of common native grasses in the South West	Common Native Grasses of the South West – Una Bell in association with the Shire of Mundaring	http://www.mundaring.wa.gov.au/residents/pdf/FINAL_GRASSES_POSTER_v10.pdf
Poster for identification of common native wetland grasses in the South West	Wetland Native Grasses of the South West – Una Bell in association with the Shire of Mundaring	http://www.mundaring.wa.gov.au/residents/pdf/FINAL_WetlandsGrasses_Poster_v10c.pdf
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.	Australian Association of Bush Regenerators:	http://www.aabr.org.au
The Association promotes sound ecological practices in bushland management.	Australian Association of Bush Regenerators Incorporated (WA):	http://www.aabr.com.au/



Topic	Publication details	Available from
Some pages on 'tools and tips for revegetation,' though it is rural focused.	Department of Environment and Conservation	http://www.naturebase.net and search for 'revegetation.'
Provides publications, newsletter and events information with regard to best practice revegetation	Revegetation Industry Association of Western Australia (RIAWA)	http://www.riawa.com.au
Provides information about the local Shire of Mundaring programs that supply native plants free of charge to residents each year	Shire of Mundaring Tree Canopy and Understorey Program	http://www.mundaring.wa.gov.au/residents/residents_yourenviro.asp
Wildlife Note No 4: Seed Collection from Native Plants	Department of Environment and Conservation	http://www.naturebase.net/content/view/984/1001
Seed Notes – information on seed identification, collection, biology and germination for a range of Western Australian native species.	Department of Environment and Conservation	http://www.naturebase.net/content/view/3303/1528/
This book explains the principles of assisted regeneration.	<i>Bringing Back the bush: the Bradley Method of bush regeneration.</i> 2002. by Bradley, J.	Copies from: CSIRO Publishing Phone: 1800 645 051 or email: publishing@csiro.au or go to www.publish.csiro.au
Guidelines, factsheets, forms and data viewers (vegetation maps) can be accessed from this page.	Land – Native Vegetation Conservation	http://portal.environment.wa.gov.au/portal/page?_pageid=53,34373&_dad=portal&_schema=PORTAL
Access to Act and regulations associated with clearing in Western Australia		The Environmental Protection Act 1986 and clearing regulations

4.4 Fungi

Fungi provide a vital function in ecosystems. Fungi decompose litter and debris to enable recycling of the nutrients back into the system, particularly carbon. Fungi also partners with some plants to provide increased nutrient uptake. Beneficial partnerships with local plant species include with species of Eucalyptus, Acacia, Allocasuarina and many orchids. Some of these native plants cannot survive without fungi partners. Fungi also provide food for some small native marsupials including Woylies, Bettongs and Quendas.

The main considerations when protecting and/or restoring your bushland with regard to fungi involves documenting fungi on your property even if its just by taking photograph of the fungi and noting down where you saw it. If you would like to encourage fungi on your property then you can



start by providing a weed free, damp environment as a microhabitat that is ideal for fungi growth. Microhabitats provide a variety of niches for fungi and can include wood, litter, moss beds and specific partner plants.

Useful Resources and Contacts:

Topic	Publication details	Available from
A community based organisation that promotes an understanding of the roles of fungi in bushland. Fungi Identification	Perth Urban Bushland Fungi	http://www.fungiperth.org.au/ An identification field book is downloadable at: http://www.fungiperth.org.au/index.php?option=com_content&task=view&id=40&Itemid=60
Local fungi identification	Griffiths, K. 1985 A Field Guide to the Larger Fungi of the Darling Scarp & South West of Western Australia.	Available from most good book stores and libraries.

4.5 Fauna

Your property may harbour a number of native fauna species. As well as providing great biodiversity benefits, this also provides you with the opportunity to observe native fauna. When planning for fauna management on your property the most important aspects to consider are the provision of suitable habitat and food and protection from feral predators.

Over 300 species of birds are resident or migrating through the Perth region. The best time for bird watching is in the first few hours after dawn, as the light is good, and the birds are out as they are hungry after the night. Late spring and early summer is a good time to bird watch in Perth, as birds are feeding young and moving around a lot.

Providing a variety of suitable habitats to cater for different bird species at different stages of life including breeding, roosting and feeding sites is crucial. Large trees with hollows are a key habitat for birds. Even protecting large dead trees will provide vital roosting and nesting sites for birds.

Observing mammals is harder than birds, and the majority are only active at night. The best method is



spotlighting with a torch, to see their eye-shine. A thin film of red plastic over the torch will reduce any short term damage to mammal eyesight.

Dense undergrowth vegetation provides most small mammals that are common in the Shire with good protection from ferals. Retaining vegetation can sometimes include retaining some areas of dense weeds which may be providing suitable habitat for small mammals. Dense weedy areas should be removed strategically and slowly over a few years if these areas are inhabited by native fauna.

Most frogs are nocturnal and secretive. The best way to observe frogs is by listening for their calls. Male frogs call during breeding season, after the first autumn rains, until spring. Again, they are best spotted with a torch to see their eye-shine.

The key elements for frog habitat include shade and breeding ponds. Providing all these elements throughout the correct seasons will help to sustain and increase local frog populations on your property. Shelter is especially important for frogs, in particular for protecting them from the heat and from predators. Many large species of frogs are good diggers and require damp soil beneath thick leaf litter. Smaller species or ones that do not dig into sand prefer dense vegetation. Breeding habitat requirements are different for different species. Frogs and tadpoles also require fringing vegetation to provide protection from predators. Piles of loosely stacked litter and woody debris, rocks or logs can provide good habitat for frogs while an area is being weeded and revegetated.

Reptiles are also hard to spot. Most reptile activity is seen in spring and autumn, or in summer early in the morning or late in the evening. Reptiles tend to spot humans first, and dart away. If a reptile is caught off-guard, it will bluff 'threatening' behaviour (e.g. hissing) – so move away and let it be (Nevill, 2005)

Staging revegetation and weed control during restoration works will ensure that existing reptiles have enough time to migrate from existing covered areas to newly established revegetated areas. Other cover such as logs, leaf litter and woody debris will also be valuable to keep on site during restoration projects.



Useful Resources and Contacts:

Fauna Surveys and lecture series

Birds Australia

Phone: (08) 9383 7749

Web: www.birdswa.com.au

Western Australian Naturalists' Club

Phone: (08) 9427 2788

Web: www.wanats.iinet.net.au

Fauna tours and information sessions

Karakamia Sanctuary

Phone: (08) 9572 3169

Fax: (08) 9572 3107

4360 Lilydale Rd, Chidlow WA 6556

Web: karakamia@australianwildlife.org

Injured wildlife

Chidlow Marsupial Hospital

185 Anvil Wy, Chidlow, WA 6556

Phone: (08) 9572 4165

Topic	Publication details	Available from
Provides a chapter on principles for native fauna management, if you want more information on how you can provide/enhance food and shelter resources for native fauna at your bushland.	<i>Managing your Bushland</i> by B. Hussey and K. Wallace	Available at the DEC Naturebase Bookshop. Phone: (08) 9334 0481 or go to www.naturebase.net/bookshop/ Chapter 9: Fire Management
Provides a key to WA frogs, and a description, range, and photo for species.	Tyler, M.J., Smith, L.A. and Johnstone, R.E. 2000. <i>Frogs of Western Australia</i> . WA Museum.	Available from WA Museum Phone: (08) 9427 2776 Email: perth.shop@museum.wa.gov.au
Descriptions, range and photo for species in the south west of WA.	Bush, B., Maryan, B., Browne-Cooper, R. and Robinson, D. 2007. <i>Reptiles and Frogs in the Bush: Southwestern Australia</i> . University of Western Australia Press.	Available from the University of WA Co-operative Bookshop Phone: (08) 64883653
Short description, breeding season and a photo for species under the categories of Birds, Mammals, Bats, Reptiles and Frogs, Invertebrates (insects and others), Wildflowers and Fungi.	Nevill, S. 2005. <i>Guide to the Wildlife of the Perth Region</i> . Simon Nevill Publications	Available from the Wildflower Society http://members.ozemail.com.au/~wildflowers/Ebooks.html
A field guide section covering key points of identification using the latest classification system. Full-colour plates show all Australian bird species, revised distribution maps with all subspecies shown, line illustrations, extended breeding information and updated core library included for beginner birdwatchers.	Simpson, K. and Day, N. 2004. <i>Field Guide to the Birds of Australia</i> (7th Edition). Viking Australia.	Available from the Birds Australia – WA branch http://www.birdswa.com.au/
Describes 46 birding sites within 60 km of central Perth. Includes a list of birds regularly seen and information on endemic species. A5 size. 155pp.	Van Delft, Ron. 1997. <i>Birding Sites around Perth</i> (2nd Edition). University of WA Press.	Available from the University of WA Co-operative Bookshop Phone: (08) 64883653
Backs up the bird guide book with photos, videos, and bird song. Also, where & when to see these birds, current birding conditions. Shows other books by this author on birds, wildlife, flora, travel.	Morcombe, M. 2005. <i>Field Guide to Australian Birds</i> (compact edition).	www.mmbirds.com
Wildlife Note No: 11 Requirements for Native Mammals and others on habitat creation	Naturebase (Department of Environment and Conservation)	www.naturebase.net/content/view/984/1001/
Great resource for all things birds, includes details on identification, publications, events and other resources	Birds Australia – Western Australia	www.birdswa.com.au Phone: : (08) 93837749 Fax: (08) 9387 8412 Email: birdswa@inet.net.au
Identification of local frogs species including a sample of their calls	Frog Watch - Darling Range Frogs	http://www.museum.wa.gov.au/frogwatch/pages/sw_frogs2.asp

4.6 Waterways

Waterways play a significant part in the landscape. They provide habitat for animals, wildlife corridors between areas of remnant bushland and they play a significant role in Aboriginal culture and can be places of beauty for us to enjoy and value. Creeklines are a focal point for conservation work in the Shire of Mundaring with many community groups and individuals involved in their restoration and enhancement.

Healthy waterways have a stable channel bordered by native vegetation of various layers. Vegetation provides habitat, shade, bank stabilisation, filtering of material and can slow down water flow. Key creekline plants include Eucalypts, blackbutts, flooded gums (tree layer); Trimalium and melaleucas, (shrub layer); rushes and sedges (ground layer). Aquatic plants provide food for frogs, native fish, waterbirds; breeding habitats, shelter and protection from predators. Fast flowing areas of water over logs or rocks are known as riffles and provide habitats for macroinvertebrates. Areas of slower flow or backwaters provide habitats for native fish.

Options to pool water and slow the speed of water flowing along creeklines can be integrated

into creekline restoration projects. Some of these options may include adding and retaining large woody debris into the creek system or creating rock riffles or bunding. It is illegal to disturb watercourses so you need to contact the Shire if any creekline disturbance or major works near creekline needs to be undertaken such as earthworks, placing rocks riffles and other obstructions within creeklines.

Permission is required from the Shire of Mundaring before any works can be undertaken in a watercourse within the Shire. If you are interested in restoring a degraded creekline on your property it is best to get some technical advice beforehand.

Useful Resources and Contacts:

Department of Water

Phone: (08) 6250 8000

Swan River Trust

Phone: 08 9278 0900

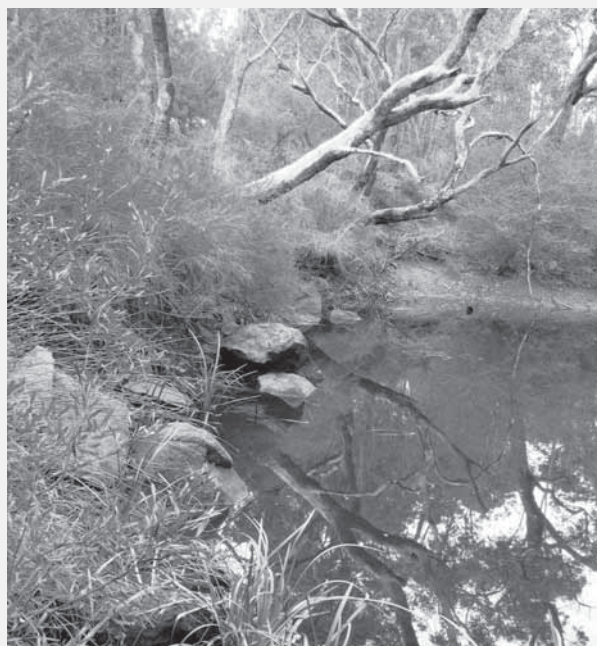
Email: info@swanrivertrust.wa.gov.au

EHCMP

Phone: (08) 9424 2222

Shire of Mundaring Environmental Officer

Phone: (08) 9290 6666



Topic	Publication details	Available from
Water Notes provide a general guide on river and wetland ecology, restoration and management for community and government officers. The Water Note series is designed to complement the more comprehensive and technical River Restoration Manual.	Water Notes are advisory notes on river and wetland restoration.	http://portal.water.wa.gov.au/portal/page/portal/WaterQuality/Publications/WaterNotes
Water Fact Sheets provide information on topics of educational and general interest (e.g. algal blooms, flooding).	Water Facts – there a number of useful information sheets on general water topics	http://portal.water.wa.gov.au/portal/page/portal/WaterQuality/Publications/WaterFacts
Technical guide for those involved in river restoration activities	River Restoration Manual, September 2002, Report No. RR1, Water and Rivers Commission	http://portal.water.wa.gov.au/portal/page/portal/WaterQuality/Publications/RiverRestoration?pAP=WaterManagement&pAS=Waterways
Waterways technical reports, brochures, policies and other information are available for download	Department of Environment and Conservation – Waterways.	Access to water publications and information http://portal.environment.wa.gov.au/portal/page?_pageid=55,34466&_dad=portal&_schema=PORTAL
To provide direction on acceptable practices relating to the environmental protection of watercourses and foreshores within the Shire of Mundaring.	Shire of Mundaring – Water Course Protection Policy	http://www.mundaring.wa.gov.au/council/pdf/Policy/PS-03%20Watercourse%20Protection%20.pdf
Provides information about the rivers, the scientific and regulatory role of the Swan River Trust, our legislation, policies, programs, and how you can get involved to help keep our rivers healthy.	Swan River Trust	http://portal.environment.wa.gov.au/portal/page?_pageid=973,1&_dad=portal&_schema=PORTAL
Contact to seek permits to interfere with bed and banks of watercourses	Department of Water	Victoria Park Regional Office 7 Ellam Street Victoria Park WA 6100 Phone: 08 6250 8000 Fax: 08 6250 8050



4.7 Salinity

Dryland salinity is caused by replacing deep rooted native perennial vegetation with introduced vegetation that tends to have shallower roots and use less water. As groundwater rises, the soil becomes water logged and the natural salts that are stored in the soils appears on, or close to, the surface. When water evaporates from the ground surface this concentrates the salts. Irrigation salinity is caused by using too much water to irrigate. This excess water is returned to the watertable which leads to the water table being drawn closer to the surface.

Salinity is apparent in the Shire of Mundaring and is of particular concern in the far east of the Shire. The EHCMP and Wooroloo Brook LCDC have been successfully implementing salinity management projects for many years and can assist in the planning and management of private properties that are affected by salt. These management practices concentrate on:

- Revegetation in areas that are referred to as recharge zones. These are areas that contribute a lot of water to the soil profile and ultimately to the groundwater below. This is usually because the areas are devoid of vegetation that can soak up a lot of the water before it gets to the water table.
- Revegetation of areas already degraded by salinity. This revegetation can be solely for conservation purposes or can be aimed at returning the land to productive capabilities in the future.

- Changes to the primary production and farming methods to enable a whole property approach to salinity. These types of changes aim to use more water before it gets to the groundwater. For example by having perennial pastures, water is being used all year rather than just one growing season.

Useful Resources and Contacts:

Department of Agriculture and Food, Small Landholder Information Service

Phone: 93683807 or 97337777

Email: Small_Landholder@agric.wa.gov.au

Website: http://www.agric.wa.gov.au/content/FM/SMALL/PER_SUMM.htm

EHCMP and Wooroloo Brook LCDC

Phone: (08) 9424 2222

Topic	Publication details	Available from
Causes of salinity Extent of the problem Knowledge of the problem Managing salinity Recent agency initiatives	Salinity at a glance Farmnote 08/2000	http://www.crcsalinity.com/landmark/documents/f00800.pdf
The Department of Water runs a broad Salinity Management Program that aims to protect and restore key water resources, and ensure salinity levels are kept to a level that permits a safe and sustainable supply of water for the benefit of present and future generations.	Department of Water - Water Management – Salinity	http://portal.water.wa.gov.au/portal/page/portal/WaterManagement/Salinity
Explains why stream salinity has increased, the impacts on our surface water resources, and what is being done to tackle the problem.	Water Facts 15 Salinity	http://portal.water.wa.gov.au/portal/page/portal/WaterQuality/Publications/WaterFacts/Content/WRCWF15.pdf
Options to return degraded valley floors (waterlogged, saline) to good production by use of earthworks, perennial grasses and trees. Tables of recommended tree and pasture species, and a calendar of operations, are presented	Managing saline, high rainfall valleys and flats Farmnote 25/1994	http://www.agric.wa.gov.au/content/LWE/SALIN/SMAN/F02594.HTM
Revegetation may be achieved by either of three alternative strategies-low cost revegetation, comprehensive revegetation and prescription revegetation.	Salt land management: revegetation Farmnote 44/86	http://www.agric.wa.gov.au/content/lwe/salin/sman/fn044_1986.htm
Details which plants can tolerate different degrees of salinity	Tolerance of plants to salty water Farmnote 71/99	http://www.agric.wa.gov.au/content/lwe/water/irr/f07199.pdf
Describes which option to use and where?	Subsurface drainage and surface water management for salinity control Farmnote 52/2003.	http://www.agric.wa.gov.au/content/lwe/water/eng/fn052_2003.pdf

Topic	Publication details	Available from
Covers the nature of recharge, recharge on farms, the impact of recharge reduction and how to measure recharge reduction.	Recharge management for salinity control Farmnote 39/2001.	http://www.agric.wa.gov.au/content/lwe/salin/sman/f03901.pdf
Covers the need to reseed; spring weed control; soil testing; annual pasture establishment; and lists the species most suitable for each of the land management units	Annual pasture establishment for small landholdings in the central Swan Coastal Plain and Hills Region Farmnote 40/2002	http://www.agric.wa.gov.au/content/past/fn040_2002.pdf

4.8 Erosion

The Shire of Mundaring has topography which is conducive to erosion. Erosion is a natural process but human activities can make erosion from both wind and water much worse if they do not plan and manage their properties correctly. Much of the time erosion occurs on sloping ground or riverbanks that have little or no vegetation cover and along firebreaks.

Soil erosion can cause land and watercourse degradation. Eroded soil (which can contain nutrients, fertilisers or pesticides) can fill creeklines and rivers and lead to an increased nutrient and silt load.

The top soil that is eroded is the most productive part of the soil profile and its loss can result in lower yields and higher costs of agricultural production.

Hillslopes are susceptible to both sheet erosion, and rill erosion (where channels form). Gully erosion is highly visible and affects soil productivity, restricts land use, and can threaten roads, fences and buildings. Tunnel erosion is the removal

of subsurface soil. Streambank erosion during flooding can also occur, streams at highest risk are those from which riparian vegetation has been removed. Floodplains may also be susceptible to erosive flooding.

Wind erosion is a problem where land management practices have stripped the ground bare. It is most likely to occur when strong winds blow over light-textured soils that have been heavily grazed. It contributes to scalding, a process that results in the formation of smooth, bare area.

To prevent and/or control erosion you need to use land in accordance with its capability, protect the soil surface with some form of cover (this applies to both natural and productive landscapes) and control runoff before it develops into an erosive force. Planning your property to minimise erosion involve techniques that slow water down and protect soil using vegetation.

Creekline erosion should be taken into consideration when protecting and revegetating creeklines (See section 4.6 – Waterways).



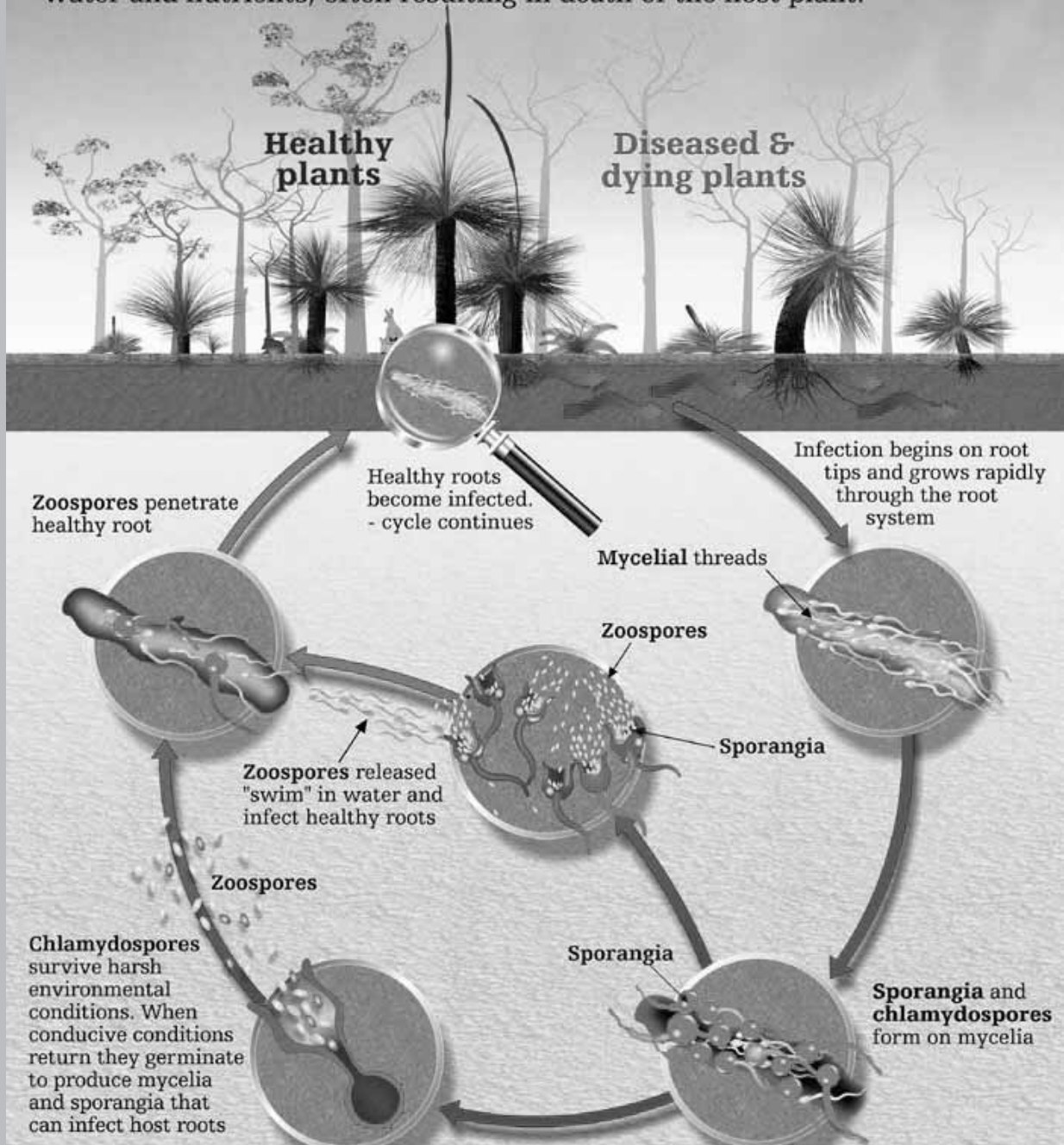
Useful Resources and Contacts:

Topic	Publication details	Available from
Discusses what land uses are appropriate for what soil type in the Darling Range and management issues that need to be taken into consideration.	King, P.D. and Wells, M.R. (1990). Darling Range land capability study. Western Australian Department of Agriculture, Land Resources Series No. 3.	Available for purchase from Department of Agriculture and Food T: (08) 9368 3807
Targeted at local governments, developers and builders but a good introduction to local erosion issues. Enables recognition of erosion issues in proposing developments throughout the Darling Range and to build in appropriate measures to tackle them.	Erosion and Sediment Control Manual for the Darling Range (2001), Perth Western Australia, Upper Canning/Southern Wungong Catchment team, Edited by Brian Lloyd and Ron Van Delft	http://www.agric.wa.gov.au/content/LWE/LAND/EROSION/mp17_2001_part1a.pdf
Provides a photograph and diagram of an example of an easy way to control erosion on firebreaks	Firebreak bunding for erosion control	Advice available from EHCMP
Describes the different soil types and how to manage these to prevent degradation and improve production	Soil Guide – A Handbook for Understanding and Managing Agricultural Soils (1998) Moore, G. (Ed.) Department of Agriculture Western Australia	Available for purchase from Department of Agriculture and Food Ph: (08) 9368 3807



Phytophthora Life Cycle

Phytophthora cinnamomi feeds on living plant roots and stems. It invades the roots of plants to get the nutrients it needs. This invasion and growth within the plant reduces the plant's ability to transport water and nutrients, often resulting in death of the host plant.



<http://www.dwg.org.au/images/dwg-lifecycle.jpg>

4.9 Dieback

Phytophthora Dieback is a disease caused by a soil-borne water mould, *Phytophthora cinnamomi*. The pathogen invades plant roots and stems to obtain nutrients for its own growth and, in doing so, kills plants cells and reduces the plant's ability to transport water and nutrients. It eventually leads to plant decline and death. The pathogen moves through ecosystems as infected plant material or soil is relocated, or it moves through water or by root to root contact. It moves faster downslope and in wet soils.

To arrest the threat, be careful to keep tools, shoes and vehicles clean between sites (i.e. if you visit other bushland areas). Ensure that plants for revegetation are brought from nationally accredited nurseries or nurseries that have good hygiene practices. If you suspect you have dieback at your property, you can investigate the use of the chemical *phosphite* to reduce the spread and impact of the disease, and increase the resistance of un-infected trees.

Useful Resources and Contacts:

Topic	Publication details	Available from
Brochure detailing how to inject bushland to assist in the treatment of trees affected by dieback	Shire of Mundaring Phosphite Injection Treatment Brochure	http://www.mundaring.wa.gov.au/residents/pdf/DIY_Phosphite_Injection_Treatment_Brochure.pdf
Department of Environment and Conservation (WA) Search for 'dieback' or ' <i>Phytophthora cinnamomi</i> '	Dieback atlas and dieback management and control	http://www.dec.wa.gov.au
Case Studies articles about dieback management and control through Western Australia	Department of the Environment, Water, Heritage and the Arts (Commonwealth) Search for 'dieback'	http://www.environment.gov.au
What is Dieback? / Where does it occur? / What does it do? / Who is fighting it? / Managing Dieback / Government Policy / Current Research / Useful Dieback Links / Latest News / Contacts	Dieback website runs by a number of organisations. Has information on dieback management.	http://www.dieback.org.au
A guide for community conservation groups and landholders and has been designed to protect bio-diversity values by controlling and reducing the spread of disease. An invaluable tool in providing community groups and private landholders with all the information required to manage Dieback disease caused by <i>Phytophthora cinnamomi</i> .	<i>Managing Phytophthora Dieback in Bushland: A Guide for Landholders and Community Conservation Groups</i> - Edition 4 (2008) Dieback Working Group. Perth	Copies available from the Perth Region NRM (formerly the Swan Catchment Council) 80 Great Northern Highway (Corner Bishop Road) MIDDLE SWAN WA 6056 Ph: (08) 9374 3333
Provides information on the impact of dieback.	<i>Arresting Phytophthora Dieback</i> , the Biological Bulldozer. Carter. R.	Available from WWF-Australia Ph: (08) 9387 6444 or go to www.wwf.org.au
Describe dieback and its treatment and how to build appropriate in the bush, lists resistant plants and describes how to be a smart nursery shopper.	<i>Dieback in the Perth Hills</i> , Roleystone Dieback Action Group, Perth	http://www.roleybushcare.com/dieback.html
This booklet contains information on dieback, how to minimise its spread and how to treat it.	Managing Phytophthora Dieback in Bushland – A guide for Landholders and Community Conservation Groups (2008) Edition 4. Dieback Working Group.	Download a copy from www.dwg.org.au/files/DWG%20Handbook.pdf or call Perth Region NRM (formerly the Swan Catchment Council) on 9374 3300

4.10 Fire Management

Western Australian plants and animals have evolved over time in association with fire and its use by humans. Plants have adapted to survive in an environment prone to fires, droughts and the nutrient poor soils of Western Australia. Animals have also adapted to exist within these environments and after a fire event the occurrence and abundance of animals depends on the composition and structure of the environment.

Fire as a management tool can be used to manage wildfire risk and to stimulate regeneration and regrowth in native bush. A fire management plan can be developed to manage wildfire risks and to address the following fire management planning issues:

- Prevention
'Stop a fire starting in the bushland'
- Preparedness
'Get ready to keep the fire small'
- Response
'Put the fire out quickly'
- Recovery
'Help the bush recover'.

Used to manage bushland, fire can stimulate regeneration in trees and shrubs in two ways:

1. the whole plant is killed and a new generation grown from seed (reseeders) or
2. only parts of the plant are killed and new growth comes from stem or rootstock (resprouters).

The effect of fire on native plant communities and native fauna depends on factors including:

- fire frequency
- the time of the year
- fire intensity
- the patchiness of the fire
- climatic events such as rainfall before or after a fire.

Disturbance can make bushland vulnerable to change. Fire is a major disturbance which can increase a bushland's susceptibility to threatening processes such as weed invasion, grazing and trampling, pollutant drift (eg: fertiliser), exposure to feral animals and pests and diseases.

As a landowner you are responsible for abiding by any provisions in the *Bushfires Act 1954* and the *Fire and Emergency Services Authority of Western Australia Act 1998*. The Shire of Mundaring have a Fire and Burning Information document available covering fire information for landowners and a fire information hotline service.

Useful Resources and Contacts:

Shire of Mundaring

Fire Information Hotline: (08) 9290 6644

General Phone: (08) 9290 6666

Fire and Emergency Services

Street Address: FESA House
480 Hay Street
Perth WA 6000

Postal Address: GPO Box P1174,
Perth, WA, 6844

Phone: (08) 9323 9300

Email: fesa@fesa.wa.gov.au





Topic	Publication details	Available from
In-depth information on the issues discussed above.	<i>Managing Your Bushland</i> . 1993. by Hussey, BMJ and Wallace, KJ.	Available at the DEC Naturebase Bookshop. Ph: (08) 9334 0481 or go to www.naturebase.net/bookshop/ Chapter 9: Fire Management
The Use of Fire in Small Remnants Available in-depth information on the issues discussed above.	Department of Environment and Conservation <i>Wildlife Note No: 17 – The Use of Fire in Small Remnants</i>	Available from: http://www.naturebase.net/content/view/984/1001/
A Guide for Landowners, Fire Officers and Bushland Friends of Reserves Groups, used as a reference in most bushland management plans for the Perth area.	Sue Davies. 2000. <i>Fire Management Planning for Urban Bushland : A Guide for Landowners, Fire Officers and Bushland 'Friends' Groups</i> . FESA and Urban Bushland Council WA Inc.	Contact the Urban Bushland Council, email ubc@inet.net.au
Downloadable brochures to inform you to make decisions about wild fires. Bush Fire Stay or Go Kit or the DVD Be Prepared ... your guide to preparing your property for the bush fire season.	<i>Bushfire Safety and Bushfire Ready Action Groups (BRAG)</i>	http://www.fesa.wa.gov.au/internet/default.aspx?MenuID=41
General information on fire in relation to biodiversity available at:	Naturebase – Department of Environment and Conservation	http://www.naturebase.net/content/view/2252/1080/
Details local fire relevant information such as burning calendar, restriction dates, regulatory information, firebreak information, defending your home from fire and useful contacts. This booklet is updated each year.	<i>Fire and Burning Information 2007-2008 Booklet</i>	Available to download at: http://www.mundaring.wa.gov.au/community/community_safety.asp



Photo by Sandra Hohloch

Case Study

Land for Wildlife

Mandalup-Auhagen, Gidgegannup

Bob and Janette Huston brought this 6.4ha bush block in 1993. It is on the Darling Plateau, with laterite builders and gravel soil, and support jarrah/marri forest in excellent condition. Apart from the house and some tracks/firebreaks, the main land use in the past was timber cutting. As with most hills properties, it has been cut over several times, and a large stump shows the slot cut for the 'peg', a projecting board on which the fallers stood to get them into clean timber above the buttresses.

In this area of small holdings, part cleared, part still bush, the management of fire is of great importance. The protection of life and property, and the maintenance of bushland health, both need to be considered. In addition, Bob had joined the Land for wildlife as one of the very first LFW Officers, as well as becoming active in the Wooroloo Brook landcare group and the local volunteer bushfire brigade. When he found he was being asked to give advice on fire management to other landholders, it became vital to experiment on his own place.

Bob and Janette had three considerations in view when formulating their fire management plan:

- To utilise fire as a means of regeneration of native vegetation;
- To utilise fire as a means of fuel reduction to reduce risk to their home; and
- To consider their neighbours' needs.

As the bush hadn't been burnt for more than 20 years, it had a high fuel load, so it was decided to burn an area adjacent to the house and to ask the local bushfire brigade to undertake the work. To have optimum management, it was also decided to have the first burn in spring. The aim was for a cool burn, leaving a mosaic pattern in the bush. The immediate desired outcomes included leaving a fine mulch layer as a covering on the earth as well as minimising the impact on unburnt logs and on the tree leaf canopy. The long term desired outcome was regeneration of the bush. Not only that, but the fire history and fuel load of the property would then

be at a known point, which would be helpful for future planning.

An area of about one hectare, close to the house and unburnt for more than 20 years, was chosen as a priority. The actual burning of the bushland was achieved in two stages.

Firstly, an edge was burnt in such a way as to keep a 3-4m edge of unburnt vegetation on the edges of the firebreak to act as a buffer against the intrusion of weeds and to provide refuge for fauna. Bob did this himself, but in retrospect said it would have been better to have this done by the brigade on the day. The main area was burnt in late October 2001. It went well. The fire was lit in the afternoon and extinguished within two hours.

Bob and Janette were pleased to see that immediately following the fire refugia logs were left mostly unburnt as was the finer leaf layer, and macro invertebrates were seen. Since the fire, healthy regeneration has occurred over all the area, verified by photographs and a nature journal.

This type of small scale control burn will be repeated in other areas of the property to create a mosaic of different fire ages. The piece burnt on the shortest rotation will be the area closest to the house. If it can be done safely, an autumn burn will also be tried, and the type of regeneration compared. Bob and Janette's priority is for bushland conservation, leaving the longest length of time as possible between burns, rather than using fire solely for fire control. They are happy to talk to other landholders about how this may be done safely.

Taken from With Wildlife in Mind (2007) Department of Environment and Conservation, Article written by Zara Kivell



5 Templates and Notes

The following templates and notes have been provided to assist landowners with biodiversity conservation strategies on their properties. There are lots of resources and publications available and if you call the Shire of Mundaring or EHCMP officers they will be able to help you understand what resources you may need. Below is a brief list of information that is available to you free of charge.

Factsheets

Managing phytophthora dieback on your block
and in your bushland
Managing phytophthora dieback in nurseries
Phytophthora Dieback
Clearing Regulations
Improving Your Block-Calendar
Improving Your Block-Fauna-Friendly Gardening
Injured Wildlife
Landscaping with Local Plants
Environmental Organizations
Friends' Groups
African Feather Grass
African Lovegrass
African Veldt Dasiy
Aquatic weeds
Arum lily
Blackberry
Bridal Creeper
Caltrop
Cape Tulips
Castor Oil
Century Plant
Cottonbush
Freesia
Giant Reed
Gladiolus
Kikuyu
Lantana
Morning Glory

Pampas Grass
Patersons Curse
Pest Plants of eastern hills
Pesticide and herbicides
Ryegrass
Tagasaste
Tambookie
Veldt Grass
Victorian Teatree
Watsonia
Weed Control
Weedy wattles
Wild oats

Brochures

Haas grass *Tribolium uniolae* identification
and control
Weeds are wrecking our bushland
DIY phosphite injection treatment
Chemjet injectors
Dieback the Biological Bulldozer
Sharp rush identification and control
Cape Tulip identification and control
Boneseed weed of national significance

Manuals

The Homeowners Bush Fire Survival
Environmental Weeds Eastern Plains and Hills

Policies and Strategies

Town Planning Scheme
Tree Preservation Policy
Environmental Management Strategy

Posters

Common native grasses of southwest WA
Wetland native grasses of southwest WA

5.1 Property and Bushland Management Plan

Date: _____

Aerial Photo Attached (Appendix 1): ☐ Yes ☐ No

Property details

Name: _____

Postal Address: _____

Phone (daytime): _____

Location of property (address or lot on plan): _____

Property size (ha): _____

Approximate area of bushland on property (ha): _____

Biodiversity goal for property

Outline your goal for the future management of your property and bushland i.e. what you want to do with the property in the future, what you want to see happen with your bushland etc

Short term goal (next few years):

Long term goal (in 10 years or more):

General Site Assessment

SITE DESCRIPTION
Historical property use:
Current use and management practices:
Vegetation description:
Estimated vegetation condition: (based on Keighery Scale, Appendix 2)
Livestock:
Time since last fire:
Native animals seen on property:
Weed and/or pest problems:
Other comments:

Management zones of the property

Steps to identify property management zones:

1. Identify the goals for each of the different areas of the property. E.g. conserving native bushland, revegetation of cleared areas, maintenance of firebreak, maintenance for livestock grazing. Areas with different goals will then become the different management zone.
2. For each zone identify any issues or problems such as weed invasion, unhealthy or dead plants, unrestricted stock access. From this it is possible to identify the actions to address these issues (Table 2)
3. On an overlay of an aerial photography mark the following (Appendix 1):
 - A north point
 - Property boundaries
 - Buildings
 - Any tracks or fences
 - Areas of native bushland
 - The different management zones
4. For each management zone complete Table 1.
5. For each management zone establish a photo monitoring point using either a distinct tree or fence post, or placing a stake. Take a photo and insert into Table 1. Re-photographing the site overtime will help to monitor improvement in the property.
6. Complete another overlay to mark the current distribution of weeds. This is helpful in the future to monitor if weed control measures have been successful.

Table 1. Photographs of monitoring sites on property

Management Zone	Insert Photograph	Date and Comments

[illegible]

Further information

For any questions about your property management plan or for further information, please contact:

Eastern Hills Catchment Management Program

Natural Resource Management Officers

Phone: (08) 9424 2222

Vegetation condition scale

Vegetation condition will be estimated from a visual assessment of the bushland, not from a detailed vegetation survey, and will be based on the categories of the Keighery Scale.

Keighery condition scale – (Keighery, 1994)	
Pristine	Pristine or nearly so, no obvious signs of disturbance.
Excellent	Vegetation structure intact; disturbance affecting individual species; weeds are non-aggressive species.
Very good	Vegetation structure altered; obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires; the presence of some more aggressive weeds; dieback; logging; grazing.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. <i>For example, disturbance to vegetation structure caused by very frequent fires; the presence of some very aggressive weeds at high density; partial clearing; dieback; grazing.</i>
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. <i>For example, disturbance to vegetation structure caused by very frequent fires; the presence of very aggressive weeds; partial clearing; dieback; grazing.</i>
Completely Degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. <i>These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.</i>

References

Components of this property management plan template have been taken from:

- Department of Environment and Conservation (NSW) (2004). *Environmental Management on the Urban Fringe*. Property management plan: A framework for environmental management. Department of Environment and Conservation (NSW), Sydney, NSW.
- Keighery, B.J. (1994). *Bushland Plant Survey. A Guide to Plant Community Survey for the Community*. Wildflower Society of WA (Inc), Nedlands, WA.
- NSW National parks and Wildlife Service (2002). *Planning for Biodiversity Management: A Two Module Workshop Series for Landholders*. NSW National parks and Wildlife Service, Hurstville, NSW.

5.2 Mundaring DIY Dieback Injection Brochure

Phosphite Preparation

- If using 20% phosphite — Dilute 1 part phosphite with 4 parts water
- If using 40% phosphite — Dilute 1 part phosphite with 7 parts water
- If using 60% phosphite — Dilute 1 part phosphite with 12 parts water
- Use a good quality water source, for example scheme water or rain water

Timing

Injecting phosphite is most effective in spring, summer and autumn on warm sunny mornings. Avoid injecting on days over 30 °C.

Repeat injection every 3 to 5 years as required.

Further Training

The Dieback Working Group conducts regular field days demonstrating how to manage *Phytophthora* dieback in bushland and on private property.

You may also wish to seek the advice of a professional dieback treatment service.



Injecting phosphite at a Dieback Working Group treatment day using the FI-11 injector system

Information & Advice

Dieback Working Group

C/- Shire of Kalamunda, PO Box 42, Kalamunda WA 6926
Phone: 08 9257 9937, Mobile: 0438 044 488
www.dwg.org.au

Shire of Mundaring

7000 Great Eastern Highway, Mundaring WA 6073
Phone: 08 9290 6666, Fax: 08 9295 3288

Department of Conservation & Land Management

Phone: 08 9474 7044
www.calm.wa.gov.au

Dieback Mapping & Management

Gleavan Dieback Consulting

Evan Brown
Phone: 08 9582 7772; Fax: 08 9582 9884

Department of Conservation & Land Management

Mike Pez
Phone: 08 9474 7046; Mobile: 0429 966 330

Phosphite Treatment

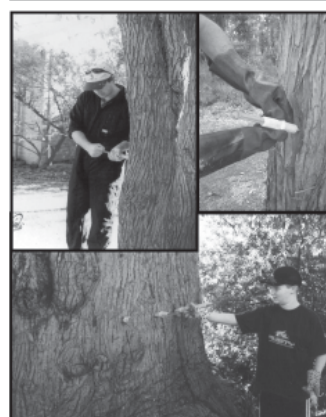
Dieback Treatment Services

Glenn Tuffnell
Phone: 1300 785 311



This is an initiative of the Shire of Mundaring, the Department of Conservation & Land Management & the Dieback Working Group

D.I.Y Phosphite Dieback Injections



Help "Stop the Dieback, the Biological Bulldozer" in our bushland



DIY Phosphite Treatment

Phosphite is an environmentally friendly and highly effective fungicide used to fight *Phytophthora* dieback. Research has shown that Phosphite increases a plant's resistance to the disease and thereby prevents the plant or tree from dying. This brochure details how you can help in the fight against this devastating plant disease.

Before commencing treatment of susceptible plant & tree species, it's important to know where the disease is and isn't. The Dieback Working Group or the Shire of Mundaring's Environmental Section are able to provide advice for identifying, mapping and demarcating areas of infested and un-infested bushland.

Phosphite is a systemic fungicide that can be sprayed on small plants (e.g. grasses) or injected into large trees. While injection of Phosphite is a little more labour intensive it lasts 3-5 years, while spraying lasts 1-2 years.



Phytophthora dieback causing devastation in the Jarrah forest © CALM

Equipment for Loan

The Department of Conservation and Land Management has gifted 100 Chemjet syringe injectors to the Shire of Mundaring for use by residents on their private property or by Friends Groups or Catchment Groups in bushland reserves.

To arrange the loan of injectors, please visit the Shire of Mundaring and fill in your details on a register. A small information pack is also available consisting of:

- A pamphlet demonstrating use of the Chemjet syringe injectors
- AgriFos Material Safety Data Sheet
- DIY Phosphite Injection Feedback Sheet

Further treatment equipment, including a 200 L spray trailer can also be hired from the Dieback Working Group for a nominal fee.

Further Equipment Required

You will need to supply:

- Cordless Drill with 4.2mm high speed drill bit
- Phosphite (e.g. AgriFos 600)
- 10 L buckets for loading and carrying syringes
- Rubber gloves & protective eyewear



Volunteers injecting a Jarrah tree during a treatment day at a local bushland reserve

Safety

Working in bushland and using injectors requires safe working practices. Here are some safe working tips:

- Wear protective clothing
- Use elbow length PVC gloves when diluting chemicals
- Use protective eyewear for drilling and injecting.
- Be careful when using sharp tools
- Be aware of uneven or slippery ground
- Wear a hat & apply sunscreen when working outdoors
- Avoid dehydration—drink lots of water
- Have a First Aid kit handy, including water to flush eyes if they come in contact with the phosphite solution
- Know how to treat tick bites and snake bites
- Always supervise young children when using equipment

Leaf Burning

In some cases stressed plants that are treated with phosphite will show signs of leaf burning (phytotoxicity). In most cases this is a short-term effect and the plant will recover with the change of the seasons.

To reduce the likelihood of any potential leaf burning, the phosphite rates described are chosen from the lower end of the prescribed range. For injecting the rate is five per cent; and for spraying one third of one percent.

5.3 Mundaring Tree & Canopy Understorey Program Species Information 2006

SHIRE OF MUNDARING - TREE CANOPY AND UNDERSTOREY PROGRAM 2006									
Note that not all Nurseries are growing the entire range - seedlings are allocated in batches of 6 per species									
Preferred species/ numbers	Botanical Name	Common Name	Dry	Ave	Damp	Wet	Approx Height (m)	Flower Colour	Comments
TALL TREES									
	<i>Eucalyptus calophylla</i>	Marri	Yes	Yes	Yes	No	30-40	cream	valuable habitat for many native fauna
	<i>Eucalyptus marginata</i>	Jarraah	Yes	Yes	No	No	30-45	cream	prone to dieback, do not plant in damp areas; plant with <i>Acacia pulchella</i>
	<i>Eucalyptus patens</i>	Blackbutt or Yarrli	No	Yes	Yes	No	30-45	cream	loamy soils; lower valley; excellent timber
	<i>Eucalyptus rudis</i>	Flooded Gum	No	Yes	Yes	Yes	25	cream	likes wet feet; plant in lighter soils if moist
	<i>Eucalyptus wandoo</i>	White Gum	Yes	Yes	Yes	No	15-30	cream	heavy clay soils & granite; shade & shelter
SMALL TO MEDIUM TREES									
	<i>Acacia acuminata</i>	Raspberry Jam	Yes	Yes	Yes	No	5 +	yellow	loamy, sandy & gravelly soils
	<i>Acacia saligna</i>	Orange Wattle	Yes	Yes	Yes	No	5	yellow	dense, often weeping; variety of soils
	<i>Allocasuarina fraseriana</i>	Jarraah Forest Sheoak	Yes	Yes	No	No	10-15	red/rust	sandy/gravelly soils; windbreaks
	<i>Casuarina obesa</i>	Salt Sheoak	No	Yes	Yes	Yes	10	red/rust	salt tolerant, waterlogging, windbreaks
	<i>Eucalyptus drummondii</i>	Drummond's Gum	No	Yes	Yes	No	6-8	cream	variety of soils; needs some protection
	<i>Melaleuca cuticularis</i>	Saltwater Paperbark	No	Yes	Yes	Yes	10	white	tolerates waterlogging and salt
	<i>Melaleuca raphiophylla</i>	Swamp Paperbark	No	Yes	Yes	Yes	5 +	cream	sands and loams; tolerates waterlogging; shade
	<i>Viminaria juncea</i>	Golden Spray	No	Yes	Yes	Yes	5	yellow	vigorous; wet sites
SHRUBS									
	<i>Acacia caelestifolia</i>	Glowing Wattle	Yes	Yes	No	No	2	yellow	tough; attractive; good screen
	<i>Acacia dentifera</i>	Toothed Wattle	No	Yes	Yes	No	2-3	yellow	various soils; good screen; granite
	<i>Acacia urophylla</i>	Net-leaved Wattle	No	Yes	Yes	No	2-3	cream	creeklines; understorey
	<i>Agonis linearifolia</i>	Sweet Swamp Peppermint	No	Yes	Yes	Yes	4	white	good garden and shelterbelt tree
	<i>Astartea fascicularis</i>	Astartea	No	Yes	Yes	No	2-3	white/pink	creeklines; screening; hedges
	<i>Callistemon phoeniceus</i>	Fiery Bottlebrush	No	Yes	Yes	Yes	3-4	red	waterlogging & salt
	<i>Calothamnus rupestris</i>	Mouse Ears	Yes	Yes	No	No	2-4	red	granite; horses won't eat
	<i>Grevillea endlicheriana</i>	Spindly Grevillea	Yes	Yes	No	No	1-3	pale pink	sand o/granite; gravelly loam; outcrops
	<i>Hakea petiolaris</i>	Sea Urchin Hakea	Yes	Yes	No	No	1-3	cream-red	wide range of soil types
	<i>Hakea undulata</i>	Wavy-leaved Hakea	Yes	Yes	No	No	2	cream	drought and frost resistant
	<i>Hakea varia</i>	Variable-leaved Hakea	No	Yes	Yes	No	3-4	cream	dry creek banks; good habitat
	<i>Kunzea recurva</i>	Purple Kunzea	No	Yes	Yes	No	1-2	mauve	hardy; versatile
	<i>Melaleuca incana</i>	Grey Honey Myrtle	Yes	Yes	No	No	2	yellow	weeping understorey
	<i>Melaleuca lateritia</i>	Robin Redbreast Bush	No	Yes	Yes	No	1.5	red	bird attracting; ornamental
	<i>Melaleuca radula</i>	Graceful Honey Myrtle	Yes	Yes	Yes	No	1-2	mauve	very versatile
LOW SHRUBS									
	<i>Acacia pulchella</i>	Golden Stardust	Yes	Yes	Yes	No	1	yellow	good understorey for dieback
	<i>Angiozanthos mangkesei</i>	Kangaroo Paw	Yes	Yes	No	No	0.5	red/green	perennial
	<i>Calothamnus hirsutus</i>	Hairy Calothamnus	Yes	Yes	No	No	1	red	understorey; likes sun
	<i>Calothamnus sanguineus</i>	Silky-leaved Blood Flower	Yes	Yes	No	No	0.5-1.5	red	heavy soils; gravel
	<i>Chorizema cordatum</i>	Heart-leaved Flame Pea	Yes	Yes	Yes	No	0.5 - 1	red/pink	watercourses and winter-wet flats
	<i>Darwinia citriodora</i>	Lemon-scented Darwinia	No	Yes	Yes	No	1	red/ yellow	long flowering; understorey
	<i>Hakea lissocarpa</i>	Honeybush	Yes	Yes	No	No	1.5	cream	widespread
	<i>Hypocalymma angustifolium</i>	White Myrtle	Yes	Yes	Yes	Yes	1.5	white/pink	ornamental: versatile soil types
	<i>Melaleuca scabra</i>	Rough Honey Myrtle	Yes	Yes	No	No	0.75	bright pink	road verges, understorey
	<i>Verticordia plumosa</i>	Plumed Featherflower	Yes	Yes	Yes	No	0.75	various	variety of soils
CLIMBERS AND GROUNDCOVERS									
	<i>Kennedia coccinea</i>	Coral Vine	Yes	Yes	No	No	N/A	coral	ground cover; well drained soils
	<i>Kennedia prostrata</i>	Running Postman	Yes	Yes	Yes	No	N/A	red	road verges; soil stabilisation
	<i>Hardenbergia comptoniana</i>	Native Wisteria	Yes	Yes	No	No	N/A	white or blue	vigorous climber
	<i>Sollya heterophylla</i>	Australian Bluebell	No	Yes	Yes	No	1	blue	understorey; fences
SEDGES									
	<i>Isolepis nodosa</i>	Knotted Clubrush	No	Yes	Yes	No	1.0	straw	creeklines; frog habitat
	<i>Juncus patulus</i>	Pale Rush	No	No	Yes	Yes	1-2	straw	damp areas; frog habitat
	<i>Juncus subsecundus</i>	Finger Rush	No	No	Yes	Yes	0.5-1	straw	creeks; dams; erosion control

6 Useful Organisations

Department	Address	Type of Information/Assistance
Aboriginal Heritage Sites Register – Department of Indigenous Affairs. Ph: 1300 651 077 www.dia.wa.gov.au/heritage	197 St. Georges Tce Perth WA 6000 PO Box 7770 Cloisters Square Perth WA 6000	<ul style="list-style-type: none"> • Detail on aboriginal significant sites
Aboriginal Lands Trust Ph: 9235 8005 www.dia.wa.gov.au	PO Box 7770, Cloister's Square, Perth, Western Australia 6850 Level 1, 197 St Georges Terrace Perth, Western Australia	<ul style="list-style-type: none"> • Responsible for the administration of lands previously held by the Native Welfare Department and a number of other State government agencies.
Agricultural Protection Board Ph: 08 9368 3333 www.agric.wa.gov.au	Baron Hay Court South Perth WA 6151	<ul style="list-style-type: none"> • Advice on controlling noxious weeds • Advice on controlling feral animals
Agriculture Western Australia (AGWEST) Ph: 08 93683333 www.agric.wa.gov.au	3 Baron Hay Court South Perth WA 6151	<ul style="list-style-type: none"> • Advice on soil conservation • Advice on use of herbicides
ALCOA Australia Ph: 08 93165111 www.alcoa.com/australia/en	Marmion St. Booragoon WA 6153	<ul style="list-style-type: none"> • Funding opportunities • Advice on rehabilitation
Appropriate Technology Development Group (APACE) Ph: 08 9336 1262 www.argo.net.au/apace	Winter House 1 Johanna St. North Fremantle WA 6159	<ul style="list-style-type: none"> • Courses in bush regeneration • Plant propagation • Nursery specializing in native plants • Lists of species specific to certain soil types
Australian Association of Bush Regenerators (AABR) Ph: 08 9336 1262 www.aabr.com.au	c- APACE 1 Johanna St. North Fremantle WA 6159 PO Box 1498 Subiaco WA 6904	<ul style="list-style-type: none"> • Network of groups/ individuals interested in urban bushland management
Birds Australia Ph: 08 9383 7749 Liz Walker (secretary) www.birdswa.com.au	167 Perry Lakes Dr Floreat WA 6014	<ul style="list-style-type: none"> • Bird surveys • Lecture program
Botanic Gardens and Parks Authority Ph: 08 9480 3600 www.bgpa.wa.gov.au	Kings Park Fraser Ave West Perth WA 6005	<ul style="list-style-type: none"> • Identifying plants • Advice on management techniques • Information on weed control • Library
Bureau of Meteorology Ph: 08 9263 2222 www.bom.gov.au/	1100 Hay St. West Perth WA 6005	<ul style="list-style-type: none"> • History of climatic conditions • Current climatic conditions and weather predictions • Storm and strong wind warnings
Conservation Council of Western Australia Ph: 08 9420 7266 www.conservationwa.asn.au	City West Lotteries House 2 Delhi Street. West Perth WA 6005	<ul style="list-style-type: none"> • List of contacts for affiliated groups • Access to West Australian Species Network coordinator
Department of Consumer and Employment Protection (DOCEP) Ph: 08 9282 0777 www.docep.wa.gov.au	219 St. Georges Terrace, Perth WA 6000	<ul style="list-style-type: none"> • Worksafe Information • Information on incorporation

Department	Address	Type of Information/Assistance
Department of Environment and Conservation (DEC) Head Office Ph: 08 6864 6500 www.dec.wa.gov.au	The Atrium 168 St Georges Tce Perth WA 6000	<ul style="list-style-type: none"> • General enquiries • Acid Sulphate Soils • Contaminated Soils • Clearance of native vegetation • Wetlands • Prescribed premises • Air Quality
Department of Environment and Conservation Local Office Ph: 08 9219 8700	Ellam St Victoria Park WA 6100	<ul style="list-style-type: none"> • Clearing of native vegetation • Reporting of illegal clearing
Department of Environment and Conservation (DEC) Parks and Conservation Services: Operations (previously CALM) Ph: 08 9334 0333 www.dec.wa.gov.au/ www.naturebase.net/	50 Haymen Rd Como WA 6152	<ul style="list-style-type: none"> • Listing of priority species • Assistance with the development of Management Plans • Advice on management techniques • Fauna and flora surveys • Library
Department of Environment and Conservation District Office Ph: 08 9295 1955	Mundaring Weir Road Mundaring WA 6073	<ul style="list-style-type: none"> • DEC managed estate (i.e. National Parks, Darling Range Regional Park) • Motorbikes/ horse riding in DEC managed estate
Department of Indigenous Affairs Ph: 08 9235 8000 www.dia.wa.gov.au	197 St. Georges Tce Perth WA 6000 PO Box 7770 Cloisters Square Perth WA 6000	<ul style="list-style-type: none"> • Advice on aboriginal significant sites
Department for Planning & Infrastructure (DPI) Ph: 08 9264 7777 www.dpi.wa.gov.au	Albert Facey House 469 Wellington St. Perth WA 6000	<ul style="list-style-type: none"> • Inventory of urban bushland • Future landuse
Department of Water (Head Office) Ph: 08 6864 7600 www.water.wa.gov.au	The Atrium 168 St Georges Tce Perth WA 6000	<ul style="list-style-type: none"> • Water Licensing (Bore licensing) • Rights in Water and Irrigation Act • Water Management • Water Quality
Department of Water (Local Office) Ph: 08 6250 8000	90 Ellam St Victoria Park WA 6100	<ul style="list-style-type: none"> • Water Licensing (Bore licensing) • Bed and Banks approval • Reporting of alteration of bed and banks without approval
Dieback Working Group Dieback Officer Steve McCabe c/o Perth Region NRM (formerly the Swan Catchment Council) Ph: 08 9374 3333 www.dwg.org.au	80 Great Northern Highway (Cnr Bishop Road) Middle Swan WA 6056 PO Box 1906 Midland WA 6936	<ul style="list-style-type: none"> • Information concerning Phytophthora infestation identification and treatment • Training opportunities • Treatment options • Spray and injection equipment hire
Eastern Hills Catchment Management Program Eastern Metropolitan Regional Council (EMRC) Ph: 08 9424 2222 www.emrc.org.au	1st Floor Ascot Place, 226 Great Eastern Hwy Belmont WA 6104 PO Box 234 Belmont WA 6984	<ul style="list-style-type: none"> • Environmental consulting • Eastern Hills Catchment Management Program (EHCMP) Officers • Bush Skills for the Hills Program • Natural Resource Management fact sheets (weeds, dieback, other bushland issues) • Local Government NRM Policy Manual Development Project • Cities for Climate Protection Program • Water Campaign • Ecologist service

Department	Address	Type of Information/Assistance
Emergency Pollution Response Ph: 1300 784 782 or 08 6364 6501		<ul style="list-style-type: none"> • Pollution incidents
Environmental Protection Authority (EPA) Ph: 08 6364 6500 www.epa.wa.gov.au	The Atrium 168 St. Georges Tce Perth WA 6000	<ul style="list-style-type: none"> • Development proposals • Environmental issues • System 6 recommendations • Library
Fire and Emergency Services Authority of WA (FESA) Ph: 08 9323 9300 www.fesa.wa.gov.au/internet	Emergency Fire & Rescue 480 Hay St Perth WA 6000	<ul style="list-style-type: none"> • Advice on preventing and controlling fires • Frequently Asked Questions (FAQ's) • Current bushfire news
Gordon Reid Grants – c/o Lotterywest Ph: 08 9340 5270 www.lotterywest.wa.gov.au	Lotteries Commission 74 Walters Dr Osborne Park WA 6017 PO Box 1113 Osborne Park WA 6917	<ul style="list-style-type: none"> • Funding opportunities
Greening Australia Ph: 08 9335 8933 www.greeningaustralia.org.au	10-12 The Terrace Fremantle WA 6160	<ul style="list-style-type: none"> • Information on sources of funding • Advice on planning projects • Information on management techniques
Herbarium of Western Australia Ph: 08 9334 0500 www.florabase.calm.wa.gov.au	Cnr of George St and Hayman Rd Kensington WA 6151	<ul style="list-style-type: none"> • Identifying plants • Public reference herbarium • Library
Indigenous Natural Resource Management Advisory Group Ph: 08 9374 3308 www.swancatchmentcouncil.org	80 Great Northern Highway (Cnr Bishop Road) PO Box 1906 Midland WA 6936	<ul style="list-style-type: none"> • Provides advice with regard to indigenous issue relating to NRM projects in the Swan region
Kalamunda Shire Ph: 08 9257 9999 www.kalamunda.wa.gov.au	2 Railway Road Kalamunda WA 6076	<ul style="list-style-type: none"> • Friends Group administration and information • Technical advice • Provision of equipment • Funding
Landgate (previously the Department of Land Information (DLI)) Ph: 08 9273 7373 www.landgate.wa.gov.au	Midland Square Morrison Rd Midland WA 6056	<ul style="list-style-type: none"> • Aerial photographs • Information on site history
Midland Landcare Centre Staffed by Eastern Hills Catchment Management Program Officers Four days per week Ph: 08 9250 3952	23/ 8 – 12 Stafford St, Midland WA 6056	<ul style="list-style-type: none"> • NRM information, grants, resources and technical advice • Meeting space and computer access for Bushcare Volunteers
Museum of Western Australia Ph: 08 9212 3700 www.museum.wa.gov.au	Perth Cultural Centre James St Perth WA 6000	<ul style="list-style-type: none"> • Identifying fauna • Fauna surveys • Identifying sites of aboriginal significance
National Trust of Australia (WA) Ph: 08 9321 6088 www.ntwa.com.au	4 Havelock St. PO Box 1162 West Perth WA 6005	<ul style="list-style-type: none"> • Assessment of areas for heritage value
Perth Urban Bushland Fungi Project (PUBF) Ph: 08 9344 0547 Roz Hart www.fungiperth.org.au/	At Herbarium of WA Cnr of George St and Hayman Rd Kensington WA 6151	<ul style="list-style-type: none"> • Fungi identification • Fungi field book available on line • Events • Training – fungi identification

Department	Address	Type of Information/Assistance
Roleystone Dieback Action Group Ph: 08 9397 6813 Ian Colquhoun	c/- Roleystone Family Centre Wygonda Rd Roleystone WA 6111	<ul style="list-style-type: none"> • Advice for dieback control
Royal Western Australian Historical Society Ph: 08 9386 3841 www.histwest.git.com.au	Stirling House 49 Broadway Nedlands WA 6009	<ul style="list-style-type: none"> • Information on the history of the area • Research advice
South East Regional Centre for Urban Landcare (SERCUL) Ph: 08 9458 5664 www.sercul.org.au	69 Horley Road Beckenham WA 6107	<ul style="list-style-type: none"> • Natural resource management in the south east region of Perth • Canning River • Southern Wungong River and their tributaries • parts of Swan River
Perth Region NRM (<i>formerly the Swan Catchment Council</i>) Ph: 08 9374 3333 www.wrc.wa.gov.au/swanavon/	80 Great Northern Highway (Cnr Bishop Road) PO Box 1906 Midland WA 6936	<ul style="list-style-type: none"> • Natural Resource Management Training Programs • Funding opportunities – SALP program • Ribbons of Blue Program • Rivercare Program • Access to environmental information and resources
Swan River Trust Ph: 08 9278 0900 (8am-5pm weekdays): Fax number: 08 9325 7149 After hours river emergency: 0419 192 845 www.swanrivertrust.wa.gov.au/	Level 1 Hyatt Business Centre 20 Terrace Road East Perth Australia 6000 Postal Address: Swan River Trust PO Box 6740 East Perth Australia 6892	<ul style="list-style-type: none"> • Rivers • Scientific and regulatory role of the Swan River Trust • Legislation, policies, programs • How you can get involved to help keep our rivers healthy
South West Aboriginal Land and Sea Council Ph: 08 9358 7400 www.noongar.org.au	HomeTown Centre 1490 Albany Highway Cannington WA 6107 Mail: South West Aboriginal Land and Sea Council PO Box 585 Cannington WA 6987	<ul style="list-style-type: none"> • Representative body of the Noongar people • works with its members to find resolution for native title claims as well as advancing the Noongar Culture, language and society.
Urban Bushland Council Ph: 08 9420 7207 http://members.iinet.net.au/~ubc	Lotteries House 2 Delhi Street. West Perth WA 6004	<ul style="list-style-type: none"> • Directory of community groups • Advice on protection and management of urban bushland
Urban Nature/ Ecoplan Department of Environment and Conservation Ph: 08 9368 4399 urbannature@dec.wa.gov.au www.naturebase.net	PO Box 1167 Bentley Delivery Centre WA 6983	<ul style="list-style-type: none"> • Bush Forever information • Best practice bushland management information • Raising public awareness of urban bushland values • Training opportunities • Ecoplan News distribution
Water Corporation Ph: 08 9420 2420 www.watercorporation.com.au	629 Newcastle St. Leederville WA 6007 PO Box 100 Leederville WA 6902	<ul style="list-style-type: none"> • Management of wetlands • Rainfall information • Waterwise plants

Department	Address	Type of Information/Assistance
Western Australian Naturalists' Club Ph: 08 9427 2788 www.wanats.iinet.net.au	1st Floor 82 Beaufort St Perth WA 6000 PO Box 8257 Perth Business Centre WA 6849	<ul style="list-style-type: none"> • Flora/fauna surveys • Lecture program
Wetlands Conservation Society (Private No) Ph: 08 9337 7113	14 Stone Court Kardinya WA 6163	<ul style="list-style-type: none"> • Management of wetlands • Lecture program
Wildflower Society of WA Ph: 08 9383 7979 http://members.ozemail.com.au/~wildflowers/	Perry House Perry Lakes Dr Floreat WA 6014 PO Box 64 Nedlands WA 6909	<ul style="list-style-type: none"> • Identifying plants • Flora surveys • Management techniques • Lecture program • Library • Books for sale

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