

Appendices

Appendix 1. Basic design principles to maximise biodiversity conservation in new subdivisions

This section focuses on achieving better biodiversity outcomes on land proposed for urban, commercial and industrial land use. The basic design principles can also be applied to special rural and rural subdivision and development.

Perth has approximately 80,000 ha of land zoned urban and 8000 ha hectares of land zoned urban deferred. Across this land, there is approximately 12,000 ha of native vegetation. Approaches to subdivision and development design need to integrate new principles of design with nature and ecology if we are to achieve a higher level of biodiversity retention and maintenance of healthy native vegetation, wetlands, rivers and estuaries.

Assumptions of the design principles

The design principles promoted in this section assume that the Local Government is at the most strategic development assessment phase possible; preferably before subdivision design has been finalised. When local biodiversity objectives are considered at the Town Planning Scheme review stage or rezoning stage, there is a much greater range of options available to retain natural areas.

Developing a design for a site to conserve biodiversity firstly assumes that local and regional objectives for biodiversity conservation have been discussed and set. The fact that a regional biodiversity strategy has not been prepared for the Perth Metropolitan Area makes a Local Biodiversity Strategy even more important.

The second assumption is that biodiversity conservation objectives for the subject site are defined. They will set the performance criteria for any design proposals that are put forward. Some of these objectives may not be able to be met elsewhere, for example, protection of a certain vegetation complex or maintaining connectivity between regionally significant natural areas.

The third assumption is that information about the site's natural characteristics, including biodiversity, has been gathered to enable design to meet site biodiversity objectives. Conduct an Initial Field Assessment if this has not already been done.

Design principles

The challenge is to ensure that biodiversity objectives on the subject site are met along with the other objectives of the development. It is often a surprise to many that biodiversity conservation is an objective that can be compatible with urban development and should enhance neighbourhoods and new developments.

The following principles from Bush Forever apply equally to regionally and Locally Significant Natural Areas. Additional advice is provided to link the principles to the tools and templates in these Guidelines.

Bushland-sensitive urban design criteria

The following urban design criteria can generally be applied for development affecting a Bush Forever Site.

- ▶ Identify areas of highest conservation value through a comprehensive survey of flora, vegetation and fauna prior to site planning and consider the site characteristics in the design.
- ▶ Avoid the loss of areas of high conservation value, including the loss of threatened ecological communities, threatened or poorly reserved floristic communities, rare and endangered species, and verified conservation category wetlands.
- ▶ Focus development within less intact portions of the bushland or, if present, in cleared and degraded portions of the block.

- ▶ Consolidate large areas for conservation open space/reserves, which provide a variety of plant communities/habitats and the transitional elements between communities.
- ▶ Carefully design the bushland development interface to minimize the problems of weed infestation and management, including the provision of hard edges (such as roads) to bushland and establishing buffer zones of less intensive land uses next to high priority conservation areas.
- ▶ Attempt to accommodate other areas of bushland within the general subdivision design or in local open space.
- ▶ Consolidate the conservation open space with, or physically connect with other natural areas wherever possible.
- ▶ Attempt to minimize boundary length and area to perimeter ratio for conservation areas by setting round and compact boundaries rather than elongated or irregular shapes and smaller fragmented areas.
- ▶ Retain stormwater runoff on the development site through treatment drains (in accord with Water Sensitive Design principles) with control standards, including traps and maintenance arrangements for sediments and pollutant (including nutrient) runoff.
- ▶ Possibly earn density bonuses by increased conservation open space provision or clustering of development nodes.
- ▶ Develop design and planning responses that conform with natural features and contours.
- ▶ Retain natural soils and bushland through sensitive site works to minimise the disturbance footprint.
- ▶ Investigate the scope for the integration of open space requirements and multi-use, but avoid co-location of Bush Forever Sites with drainage and services to minimise disturbance. If co-location is unavoidable, use common trenching systems to integrate services, sewer and water reticulation.
- ▶ Avoid housing backing onto bushland which can lead to degradation through garden refuse dumping and bushfire hazard reduction.
- ▶ Fence off areas where necessary for management, but provide for managed access on foot to avoid alienation and lack of ownership by adjoining residents, except for high-priority conservation areas.
- ▶ Apply landscaping standards and bushland retention through the site design and development stages with the use of local species in landscaping, including road reserves that abut or are in close proximity to bushland.
- ▶ Apply dieback hygiene measures in design, construction and maintenance.
- ▶ Observe other planning, fire management and access requirements, including urban design considerations relating to creating safe, convenient and liveable neighbourhoods.

Approval conditions to support the above criteria can include the development of an environmental management plan. Management Plans should address matters such as future management regimes, future uses, retention of significant individual trees, replanting with indigenous species, rehabilitation of degraded areas, buffer zones to reduce dieback risk at the edge and to avoid weed infestation, control of runoff, use or disposal of felled vegetation, and protecting or rehabilitating sensitive areas.

Appendix 2. City of Wanneroo Special Rural Zone POS Policy

Extract, City of Wanneroo Policy Manual

4.1.14 Public Open Space Requirements for Special Rural Subdivisions

Policy No.	LP7
Policy Owner	Planning and Development Services
Distribution	All employees
Implementation	1 July 1999
Scheduled Review	1 July 2001

Objective

To provide a policy in respect of public open space requirements for special rural subdivisions.

Statement

Public Open Space provision shall be evaluated on the basis of the attributes offered by each individual case. Assessment on this basis will obviate the requirement for a blanket proportionate or percentage requirement to be imposed and is more sensitive to the preservation of themes or areas of natural value.

Public Open Space in Special Rural subdivisions shall be provided by developers in sufficient amounts and configurations to reinforce the theme of the subdivision and preserve / protect such attributes as

- 1) significant topographical features and wetlands:
- 2) bridle paths and equestrian facilities:
- 3) areas of natural beauty of significance and or
- 4) historical sites and areas objects of scientific interest

Responsibility for Implementation

Manager Planning Services

Appendix 3. Shire of Serpentine-Jarrahdale Conservation Zone Guidance Sheet

Shire of Serpentine-Jarrahdale Conservation Zone

Shire infonote November 2003

1) What is the Conservation Zone initiative

Conservation zoning allows landholders with areas of high conservation value to receive reductions in Council rates. The initiative has been established by Council to reward landholders who have retained and maintained bushland and wetland. Council recognises that nature conservation on private land is essential to maintaining the quality of life all residents of the Shire and Serpentine River catchment.

To be eligible, landholders must demonstrate to Council that their bushland and/or wetland area is of high conservation value by meeting the criteria outlined below. All or portions of properties can be zoned conservation.

What are the benefits of being in the Conservation Zone.

Areas zoned Conservation in the Town Planning Scheme are rated at half the rate of Rural Zoned land (i.e. 50% rate reduction) where the original zoning of the land is Rural. Where original zoning is not Rural, rate relief will be assessed on a case-by-case basis.

Landholders with areas of high conservation value can seek advice on environmental planning and management from the Shire Environmental Officer and the Serpentine-Jarrahdale Community Landcare Centre.

2) How do I rezone my property to Conservation Zone ?

Areas eligible to enter into the Conservation Zone can be nominated by the landholder or by Council. Landholders must state in writing that they agree to rezone their land and Council must establish that the land meets the criteria for conservation zoning before the formal process of rezoning can proceed.

The formal rezoning process involves changing the zone name and provisions for that land within the Town Planning Scheme from the previous zone type to the new zoning of Conservation. (e.g. Rural to Conservation). Council may consider covering the cost of rezoning fees and associated advertising and will provide other assistance where possible.

The rezoning process requires the preparation of a Town Planning Scheme amendment report and an environmental management plan which documents both what is on the land and what management practices are to be used by the owner to protect these environmental values. A template for environmental management plans can be obtained from the Shire Environmental Officer. Council staff will provide advice in relation to the preparation of an environmental management plan.

The Town Planning Scheme amendment report and environmental management plan are considered by the Shire and the Western Australian Planning Commission before being approved by both the Shire and the Minister for Planning and Infrastructure.

Once the land is rezoned, Shire staff and the Community Landcare Centre may provide advice on the implementation of the environmental management plan.

When the land is sold, new owners may be able to make variations to the environmental management plan. However, because the conservation zoning remains, changes will only be permitted if they ensure the site's continued protection.

3) Criteria for selection of High Conservation Areas

These criteria have been developed to guide the selection of bushland and wetland areas which are eligible for Conservation Zoning.

Condition– the area and its vegetation are in a relatively undisturbed condition, Considerations include: weed impact, fire history and past land uses.

Representation– the level of protection provided to the natural communities present in the subject land within reserves and covenanted private lands elsewhere.

Adequacy – the likelihood that natural communities and processes will be able to sustain themselves. Considerations include the size of the conservation area (usually needs to be greater than 10 hectare), its area to perimeter ratio and intensity of management that is being committed.

Landholder's commitment and ability– the landholder must demonstrate intent, commitment and ability to conserve the environmental values on the subject land.

Special consideration may be given to areas which contain:

- ▶ 'Threatened Ecological Communities'
- ▶ rare or restricted plant species or ecological communities;
- ▶ breeding habitat for Declared Rare or Priority Listed Fauna;
- ▶ important wildlife corridors between other areas of conservation value.

4) Town Planning Scheme text related to Conservation Zone

The provisions within the Town Planning Scheme relating to the Conservation Zone:

Shire of Serpentine-Jarrahdale Town Planning Scheme No. 2

5.14 CONSERVATION ZONE

5.14.1 The purpose and intent of the Conservation Zone is described within the Council's Rural Strategy as amended and adopted by Council and the State Planning commission dated April 1994.

5.14.2 A Conservation zone is intended to identify land that has a high conservation significance which includes private land with large stands of relatively intact remnant vegetation, all recognised wetlands of significance and some areas covered by the Department of Environmental Protection System 6 recommendations.

5.14.3 The private lands identified for conservation in the rural strategy are not intended for acquisition by the Council or State Government Agencies. Rather the general aim is to encourage and make it easier for landholders to protect and manage the conservation values present.

5.14.4 Before including land within the Conservation Zone Council will require the owners of the land to prepare a submission in support of its inclusion and any submission shall include those matters set down in sub-clause 5.9.3 of this Scheme.

5.14.5 A description of the land included in the Conservation Zone together with the uses permitted and any special provisions relating to the land are set out in Appendix 4D. such uses will generally be in accordance with the Rural Zone uses but will depend upon site survey and reference to land capability and other planning data.

Land uses selected will be on the basis that they will not conflict with, or they will contribute to the significance of conservation values present.

5.14.6 In addition to the provisions contained in Appendix 4D and other such provisions of the Scheme as may affect it any land which is included in the Conservation Zone shall be subject to the following conditions:

- (a) The relevant guidelines contained within the Council Planning Guidelines for Nutrient Management dated May 1994 (as amended) shall apply to the use and development of land.
- (b) A management plan for each Conservation Zone shall be drafted to Council's satisfaction by the landholder with input from other relevant organisations and the landholder's consultant where necessary.
- (c) The management plan shall establish the limits for land use and criteria that any development will have to satisfy. The plan will form the basis for site management and future management decisions.
- (c) The management plan shall, as appropriate, identify setbacks, buffer zones, and the required conservation management practices and other measures as deemed necessary to achieve a satisfactory standard of protection relative to the significance of conservation values present.

5.14.7 The implementation of a management plan by the landholder is a means of longer-term protection for the site and will be accompanied by a reduced Council rating on the land.

The incentives for these conservation measures will be a reduction in the general rural rate which shall be set at 50% unless otherwise amended by Council.

5) Further information

For further information about the Conservation Zoning initiative contact the Shire of Serpentine-Jarrahdale, Environmental Officer on 9526 1111, write to 6 Paterson Street MUNDJONG WA 6123 or forward an Email to info@sjshire.wa.gov.au

Appendix 4. Schemes supporting nature conservation on private land in Western Australia

Scheme	Type	Support available	Comment	Contact
Land for Wildlife (CALM)	Voluntary, non-binding	8 regional extension officers, 2 in Perth, property assessment, technical advice and notes, newsletters, field days, links with other LfW members.	Focus in South West Agricultural Region; a few properties in north west. At May 2002, 772 properties assessed and registered with approximately 209,000 ha remnant vegetation (>100,500 ha LfW sites). 218 properties awaiting assessment.	Department of Conservation and Land Management Land for Wildlife State Coordinator
Voluntary Nature Conservation Covenant (CALM)	Voluntary, permanent or agreed period.	4 officers (shared with LfW for South West and Wheatbelt). Extension, assessment, technical and management advice. Ongoing support via LfW membership and newsletter. Visits every three years. Funds for fencing, emergency problems (eg weed control). Access to rate rebates, fencing assistance, legal advice	Program started 2000 under Transfer of Land Act 1893. At August 2003, 28 covenants (34 titles, protecting 980 ha), all permanent. 44 in negotiation (8309 ha on 51 titles). CALM booklet on covenants and joint CALM, Department of Agriculture WA and National Trust (WA) brochure on covenanting.	Department of Conservation and Land Management Covenants Coordinator
Voluntary Conservation Covenants (Department of Agriculture WA)	Voluntary, binding for 30 years to permanent	Grants to assist with fencing have been available under Remnant Vegetation Protection Scheme	Covenants under Soil and Land Conservation Act 1945. At Feb 2001, 1600 separate covenants, over 90,000 ha of bushland. Joint CALM, Department of Agriculture WA and National Trust (WA) brochure on covenanting.	Department of Agriculture Western Australia Soil and Land Conservation Council Voluntary Conservation Covenants Scheme Coordinator
National Trust (WA) Conservation Covenant	Voluntary, binding for agreed period, to permanent covenants.	Trust assists with management planning, technical advice, visits annually. Can act as an advocate if land is under threat. Regional extension network. Rate reductions possible in some circumstances. Incentive funds for fencing, restoration, weed or erosion control. 5-year free National Trust membership. Access to rate rebates. Tax deductions for permanent covenants may be possible.	Began in April, 1999. Covenants under National Trust of Australia (WA) Act. At April 2003, 67 covenants; 46 in progress over 18,000 ha. Joint CALM, Department of Agriculture WA and National Trust (WA) brochure on covenanting.	National Trust of Australia (WA) Covenanting Program
Roadside vegetation conservation (RCC)	Encouragement and assistance to road managers to protect and conserve conservation and heritage values in transport corridors.	Surveys of road networks to identify conservation and heritage values and weed issues. Vegetation mapping based on surveys. Roadside Conservation Committee provides training to road maintenance and construction staff, volunteer surveyors and community groups.	Representatives on Roadside Conservation Committee from CALM; Main Roads WA; WestNet Rail; Department of Agriculture, Western Australia; Western Australian Local Government Association; Fire and Emergency Services Authority; Western Power; Greening Australia WA; Wildflower Society of WA; Conservation Council of WA; Alinta Gas; Water Corporation; Telstra	Roadside Conservation Committee Executive Officer based at Department of Conservation and Land Management

- ▶ This table does not identify every form of assistance available to conservation activities outside reserves. It focuses on schemes in which private or public land is managed for conservation.
- ▶ Funding assistance is sometimes available for on-ground conservation works, for example, for fencing and weed or feral pest control. Assistance may be available through local government or non-government organisations such as Greening Australia, Worldwide Fund for Nature (WWF) and the Gordon Reid Foundation for Conservation (contacts below). Some grants are funded by the National Heritage Trust (NHT) under a devolved grants scheme. For information on funding assistance, contact your local Council, local Bushcare or Landcare facilitator or the WA NHT coordinator based at Department of Agriculture Western Australia.
- ▶ Greening Australia assists with many fencing and re-vegetation projects.
- ▶ WWF focuses on grassland and woodland protection, threatened species, wetlands.
- ▶ Gordon Reid Foundation for Conservation (Lotteries Commission of WA) offers small grants to community groups for rehabilitation and conservation.
- ▶ Volunteer labour for some on-ground conservation works can be sought through Conservation Volunteers Australia/ Green Corps.
- ▶ The National Heritage Trust and Envirofunds may also assist with funding support. Contact the Swan Catchment Centre for more information.

Appendix 5: Clearing Principles

(as gazetted in the Environmental Protection (Clearing of Native vegetation) Regulations 2003)

- a) Native vegetation should not be cleared if it comprises a high level of biological diversity.
- b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.
- c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.
- d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community
- e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.
- f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.
- g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.
- h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.
- i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water
- j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence of flooding.

Appendix 6: City of Cockburn Landholder Survey



CAN WE HELP

Conserve bushland and wetlands on YOUR property?

30th January 2003

Dear Landholder,

I would like to request your involvement in the COCKBURN BIODIVERSITY PROJECT, which aims to help landholders who have bushland and wetland areas on their properties.

Attached is an important survey, and I sincerely hope you can take a little time to complete and return it to Council. The objective of the survey is to obtain your ideas and suggestions on how the Council could support landholders by helping them manage their bushland and wetland areas.

Some of the benefits of retaining bushland and wetland areas on your property may include water savings, more pleasant and natural surroundings, increase in the presence of wildlife, natural pest control and a potential increase in property value to name but a few.

Many bushland and wetland areas have now been lost through clearing and infilling for development. Those that remain are under threat from problems like disease and weed invasion. Consequently, these remnants are very important to native wildlife, and our community.

We recognise that private landholders often bear all the costs of management, even though the wider community also benefits. Council is aware that maintaining remnant vegetation requires your time and effort and sometimes some special skills.

To help us to determine ways in which Council may encourage and assist landholders to protect and manage bushland and wetland areas, PLEASE FILL IN AND RETURN THIS SURVEY in the pre-paid envelope.

Note: The Council has committed to developing a biodiversity incentives strategy/package. A research officer has been employed by the Cities of Cockburn and Rockingham, and the Town of Kwinana to investigate potential financial and other incentives for private land conservation that could be implemented by Council. Seed-funding for the project has been sourced through Perth Biodiversity Project. Your response to this survey will be used by the Council to consider providing assistance to landholders who are protecting and managing bushland. Your participation in the survey is completely voluntary and the answers will be kept confidential.

Thank you.

City of Cockburn

Contact: Chris Beaton

chris@cockburn.wa.gov.au

Tel: 9411-3502

COCKBURN BIODIVERSITY PROJECT SURVEY

1. Please indicate location (e.g. suburb) and size (hectares) of your property.

2. What are the main activities / enterprises undertaken on this property?

3. What are your future aspirations for your land that may have an impact on your bushland (e.g. developments, subdivisions). _____
4. Do you have bushland / wetland areas on your property?
 Yes Bushland Approximate Size (ha) _____
 Yes Wetland Approximate Size (ha) _____
5. Do you actively manage this bushland / wetland)? (Please tick.)
 Fencing to control grazing or human impact
 Weed control Erosion control
 Pest control Burning
 Planting Other _____
6. What do you see as the main constraints to owning and managing bushland / wetlands on private property? _____
7. What incentives would motivate you to conserve this bushland / wetland?
 Please tick the most appropriate box for how useful / motivating the incentives are:
1 = Very useful; 2 = Slightly useful; 3 = Not useful

Forms of Incentives	1	2	3
Local award schemes (e.g. public recognition certificates/prizes)			
Educational information on management of bushland/wetlands			
Management agreements (e.g. government providing technical and financial assistance in return for a guarantee not to clear that land and manage for conservation)			
Non-binding agreements (voluntary involvement in nature conservation with receipt of information and advice, e.g. the Land for Wildlife program)			
Funding assistance via grants for specific purposes, e.g. fencing			
Technical assistance (advice) with management issues, eg. weed control			
Provision of materials such as plants / herbicides / fence posts			
Rate rebates proportional to the bushland/wetland area, in exchange for long term commitments for protection and management			
Taxation rebates / concessions for long term commitment / activities			
Bonus development rights in exchange for protection of conservation values, e.g. subdivision			
Other – please describe.			

- 8. Estimated cost of maintaining your bushland / wetland area/s (for conservation purposes) per year: \$_____
- 9. Do you belong to any community group? Yes No
if yes, please name _____
- 10. Would you be interested in joining a local community conservation group?
Yes No

Thank you! Please place in prepaid envelope and post back to City of Cockburn.

Contact details are OPTIONAL so we can fill you in on progress.

Respondent's Name: _____ Date: _____
 Address: _____ Post Code: _____

 Postal Address: _____
 Telephone: (H) _____ (W) _____ (M) _____
 Email Address: _____
 (Preferred time and address to be contacted, in case of follow-up calls) _____

Other comments

On the rest of this page please include any additional comments you may like Council to consider in the development of a biodiversity incentive strategy for private land conservation in your area.

Glossary

Adequate refers to the ability of a reserve or reserve system to maintain the ecological viability and integrity of populations, species and communities (Commonwealth of Australia 1996). The interactions between reserves and surrounding areas should be taken into account in determining the reserve's ability to meet ecological viability and integrity criteria. Complementary management of the adjacent areas can play a significant role. In some instances, however, the ecological viability of the protected area itself will be paramount.

APACE is a self-supporting, community based organisation promoting appropriate technology and environmentally sustainable development.

Assisted natural regeneration is where a natural area is restored through natural regeneration processes supported by human intervention. Examples - control of drainage, weed removal, rabbit control. (Adapted from Corbyn unpub. 2003, Kaesehagen unpub. 2001 and McDonald 1996.)

Biodiversity is the variety of all life forms – the different plants, animals and micro-organisms, the genes they contain, and the ecosystems of which they form a part. Biodiversity is not static, but constantly changing; it is increased by genetic change and evolutionary processes and reduced by processes such as habitat degradation, population decline and extinction (Commonwealth of Australia 1996). Biodiversity has two key aspects:

- ▶ its intrinsic value at the genetic level, individual species level, and species assemblages levels
- ▶ its functional value at the ecosystem level.

Two species assemblages may have different intrinsic values but still have the same functional value in terms of the part they play in maintaining ecosystem processes.

Biodiversity hotspots are areas with high numbers of endemic species (that is, found nowhere else) under a high degree of threat. It is useful to focus on biodiversity hotspots because conservation planning is best done when investments centre on these areas where there is the greatest need and where the payoff from safeguard measures would also be greatest.

Twenty-five global biodiversity hotspots have been identified in a landmark paper in the journal *Nature* (Myers et al. 2000). Each priority hotspot claims at least half a per cent of the total diversity of vascular plants as endemic, that is, at least 1500 species of vascular plants are found exclusively in each of these regions. Degree of threat was determined by the percentage of remaining habitat within a region, with each hotspot retaining less than 30% of its original natural habitat. Some of the hotspots have less than 10% of their original natural habitat.

Bush Forever is a 10-year strategic plan to protect some 51,200 ha of regionally significant bushland in 287 Bush Forever Sites, representing, where achievable, a target of protecting at least 10% of each of the original 26 vegetation complexes on the Swan Coastal Plain portion of the Perth Metropolitan Region.

Bush Forever Sites are those specific localities listed in Bush Forever as endorsed by Cabinet (Government of Western Australia 2000a; 2000b).

Bush Forever Study Area is the area to which Bush Forever applies and is delineated in Figure 3.

Bushland is land on which there is vegetation which is either a remainder of the natural vegetation of the land or, if altered, is still representative of the structure and floristics of the natural vegetation, and provides the necessary habitat for fauna (Bush Forever, vols 1 & 2). 'Bushland' falls into the following condition classes: Pristine, Excellent, Very Good and Good (after Keighery 1994).

CALM Managed Estate consists of indigenous State Forest and timber reserves and formal reserves designated for the purpose of conservation. The formal conservation reserves are either national parks, nature reserves, conservation parks or Conservation and Land Management Act section 5(1)(g) or (5)(1)(h) reserves (Conservation Commission 2003). Informal conservation reserves are also maintained by CALM within the State Forest and timber reserves (Conservation Commission 2003).

Capacity building refers to increasing the skills, resources and infrastructure of community including Local Government to undertake biodiversity conservation activities.

Catchment (as in river catchment) is the area from which the river's water is collected; usually defined on maps as a surface water catchment boundary.

Clearing refers to the killing or destruction of; the removal of; the severing or ringbarking of trunks or stems; or the doing of any other substantial damage to some or all of the native vegetation in an area. It includes the draining or flooding of land, the burning of vegetation, the grazing of stock, or any other act or activity that causes the killing or substantial damage to some or all of the native vegetation in an area (adapted from Government of Western Australia, 2002c).

Comprehensive refers to the degree to which the full range of ecological communities and their biological diversity are incorporated within reserves (Commonwealth of Australia 1996).

Condition scale refers to vegetation condition as assessed using published methodologies. In the Perth Metropolitan Region, the methodologies of Keighery (1994) or Kaesehagen (1994) are often used.

Connectivity refers to the degree of connection between natural areas. Effectiveness will vary according to the type and mobility of different species.

Corridors are contiguous natural areas or revegetated areas that directly connect larger natural areas allowing the movement over time of organisms between these larger areas.

Damplands is a type of wetland described as a seasonally waterlogged basin, using the geomorphic wetland classification system (Semeniuk 1987).

Declared Rare Flora (DRF) are those species protected under the Wildlife Conservation Act 1950, as identified in the current listing. At time of, the current listing is Wildlife Conservation (Rare Flora) Notice 2001 (Government of Western Australia 2001b).

Desirable Criteria are the second order criteria in this report to identify Locally Significant Natural Areas. A Local Natural Area that meets any one of the Essential or Desirable Criteria is a Locally Significant Natural Area.

Development (according to the Town Planning and Development Act 1928) means the development or use of any land, including the demolition, erection, construction, alteration of or addition to any building or structure on the land and the carrying out on the land of any excavation or other works and, in the case of a place to which a Conservation Order made under section 59 of the Heritage of Western Australia Act 1990 applies, also includes any act or thing that:

- a) is likely to change the character of that place or the external appearance of any building or
- b) would constitute an irreversible alteration of the fabric of any building depicted on a subdivisional plan or diagram, whether so exhibited or deposited or not, but which is, either before or after the coming into operation of the Town Planning and Development Act Amendment Act 1956, approved by the Commission.

Disturbance factors are activities that affect the self maintenance of native plant communities (Keighery 1994). Disturbance factors are threatening processes that specifically affect the condition of native vegetation. Such activities include: partial clearing, fragmentation, selective removal of species, plant diseases (including Jarrah Dieback), altered fire regimes, inappropriate revegetation, weed invasion, feral animals, soil removal and dumping, changes in water regime, salinity, rubbish dumping, fertiliser drift or runoff, mining, grazing, proliferation of tracks, off road vehicle use and use of native vegetation as service corridors (after Keighery 1994).

Eastern side of the Swan Coastal Plain refers to the Foothills and Pinjarra Plain major landform elements. For a more comprehensive description of the Perth Metropolitan Region, see Government of Western Australia (2000b).

Ecological community is a naturally occurring biological assemblage that occurs in a particular type of habitat (English & Blyth 1997; 1999). The scale at which ecological communities are defined will often depend on the level of detail in the information source, therefore, no particular scale is specified (Environmental Protection Authority 2003a). The criteria in this document are based on using vegetation complexes as a means of interpreting ecological communities (except for threatened ecological communities).

Under the Environment Protection and Biodiversity Conservation Act 1999, ecological communities are similarly defined as assemblage of native species that:

- ▶ inhabits a particular natural area
- ▶ meets the additional criteria specified in the regulations made for the purposes of this definition.

Ecological linkages are non-contiguous natural areas that connect larger natural areas by forming stepping stones that allow the movement over time of organisms between these larger areas.

Ecosystem services the role played by organisms in creating a healthy environment for human beings, from production of oxygen to soil formation and maintenance of water quality (Williams et al 2001).

Edge effects refers to threatening processes acting at the edges of natural areas. These include weed invasion, grazing and trampling, increased sun and wind exposure, pollutant (fertiliser, pesticide, toxin, excess water) drift or runoff, air pollution from traffic or industry, noise, artificial lighting at night (affects predator-prey relationships), rubbish accumulation or dumping and exposure to feral animals, pests and diseases from surrounding land uses.

Endemic refers to a species having a natural distribution confined to a particular geographical region.

Environmental Protection Policies (EPPs) are policies prepared by the Environmental Protection Authority under their powers as set in the Environmental Protection Act. EPPs have the force of law and can cover the protection of any portion of the environment or the prevention, control or abatement of pollution.

Environmental weeds are plants that establish themselves in natural ecosystems (marine, aquatic and terrestrial) and proceed to modify natural processes, usually adversely, resulting in the decline of the communities they invade. The impacts of environmental weeds on ecosystem function include:

- ▶ resource competition
- ▶ prevention of seedling recruitment
- ▶ alteration to geomorphological processes
- ▶ alteration of hydrological cycle
- ▶ changes to soil nutrient status
- ▶ alteration of fire regime
- ▶ changes to the abundance of indigenous fauna
- ▶ genetic changes.

EPP Lakes are wetlands that are protected by the Environment Protection (Swan Coastal Plain Lakes) Policy, a policy under the Environmental Protection Act 1986 of Western Australia (Government of Western Australia 1992b).

Essential Criteria are the highest order priority criteria in this report used to identify Locally Significant Natural Areas. A Local Natural Area that meets any one of the Essential or Desirable Criteria is a Locally Significant Natural Area.

Eutrophication is the process where high levels of nutrients, especially phosphorus and/or nitrogen, encourage the growth of algae. It can occur in most wetland types, including rivers, lakes, swamps and estuaries.

Evaluation is the periodic comparison of actual results and impacts with those planned or expected, judging the overall worth of an endeavour and learning lessons to improve future action (IUCN 2000).

Fabricated (or Fabrication) is the creation of new habitat where a natural area has not existed for some time. Example, an artificial wetland (adapted from Corbyn unpub. 2003 and Kaesehagen unpub. 2001).

Floristic community type are floristic assemblages as defined by Gibson et al. (unpub. 1994) and Department of Environmental Protection (unpub. 1996). The presence or absence of individual taxa in standard areas (plots, sites, quadrats) is used to define floristic groupings based on shared species (Environmental Protection Authority 2003a).

Foredune is the first vegetated sand dune occurring immediately inland from the beach. Also termed a frontal dune or primary dune. Foredunes are vegetated with primary dune colonising plants which have special adaptations to enable them to thrive in the harsh environment of salt spray, sand movement, strong ultraviolet light and high winds and they actively trap and bind sands to create dunes. The foredune marks the seaward limit of permanent vegetation. (Adapted from Oma 1992).

Forest Site Type are site-vegetation types based on forest stand characteristics, understorey indicator species and site characteristics as defined by Havel (1975a and 1975b).

Freehold is a tenure of property by which an estate of inheritance in fee simple or fee tail or for life is held. It refers to a landholding that is owned by a landholder having certain rights over that land, for example, private land or Council-owned land that can be sold.

GIS or Geographic Information System is a system of storing, managing and manipulating mapped information using computers and computer software.

Habitat is the natural environment of an organism or community, including all biotic (living) or abiotic (non-living) elements; a suitable place for an organism or community to live (Environmental Protection Authority 2003c). This term can be applied at a range of scales (Environmental Protection Authority 2003c). Vegetation can become a reasonable surrogate for outlining habitat when its main components, structure and associated landform are also described (Environmental Protection Authority 2003c). Habitat can be occupied by an organism or community continuously, periodically or occasionally or can have once been occupied and still have the potential for organisms of that kind to be reintroduced (Williams et al 2001).

Habitat fragmentation is the process of isolating (usually by land clearing) a once continuous habitat into smaller isolated natural areas.

IBRA Bioregion or subregion as determined by the Interim Biogeographic Regionalisation for Australia (IBRA), is a region defined by a combination of biological, social and geographical criteria rather than geopolitical considerations; generally, a system of related, interconnected ecosystems (Williams et al 2001). Region descriptions seek to describe the dominant landscape scale attributes of climate, lithology, geology, landforms and vegetation (Commonwealth of Australia 2001 a). A subregion is a subdivision of a bioregion which contains distinctive

geomorphic units that closely align with land capability and development potential (Commonwealth of Australia 2001 a).

Jarrah Forest refers to the IBRA Jarrah Forest Bioregion as defined in Commonwealth of Australia (2001 a).

Local Biodiversity Strategy is a strategic plan for biodiversity conservation at a local government level.

Local bushland strategies are prepared by or for Local Governments to identify the values of bushland areas and plan for their protection and management where possible. Local Bushland Strategies focus on bushland and do not cover other types of natural areas.

Local Government functions (Binning, Young and Cripps 1999)

Core functions

- ▶ Strategic land use planning and development approvals
- ▶ Managing publicly owned lands
- ▶ Managing environmental risks
- ▶ Discretionary functions
- ▶ Facilitating community involvement
- ▶ Financial incentives and market mechanisms
- ▶ Providing financial and administrative support

Local Natural Areas (LNAs) are natural areas that exist outside of Bush Forever Sites (Swan Coastal Plain), the CALM Managed Estate and Regional Parks. In the past these areas have been referred to as Local Biodiversity Areas.

Local provenance refers to seed collected from natural populations growing in the same vegetation community and position in the landscape within a reasonable (closest possible) distance of the area being restored. **Provenance** refers to patterns of genetic variation exhibited by a species over its geographic range. The characteristics of the plants being collected from, or the area in which they are located, should sufficiently match those of the planting location or its local vegetation (Martlock 1999).

Locally Significant Natural Areas (LSNAs) are Local Natural Areas that have been field assessed by a suitable expert and meet at least one Local Significance Criteria as determined by a Local Government.

Local Significance Criteria are ecological and social criteria determined by a Local Government to identify Local Natural Areas that are locally significant.

Metropolitan Region Scheme (MRS) means the town planning scheme for the Perth Metropolitan Area.

Mitigation of impacts (or offsets, or compensation) - Mitigation includes any one or more of the following approaches with an emphasis on attempting measures in the sequence in which they are listed:

- 1) avoiding the impact altogether by not taking a certain action or parts of an action
- 2) minimizing impacts by limiting the degree or magnitude of the action and its implementation
- 3) rectifying the impact by repairing, rehabilitating, or restoring the impacted environment
- 4) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action
- 5) compensating for the impact by replacing or providing substitute resources or environments.

Mitigation measures are those that are added to a project to reduce, prevent, or correct its impact. This term is sometimes used interchangeably with “compensation” which accurately means “replacement.”

Monitoring is the regular collection and analysis of information to assist timely decision-making, ensure accountability and provide the basis for evaluation and learning (IUCN 2000).

Native vegetation is indigenous aquatic or terrestrial vegetation. It does not include vegetation that was intentionally sown, planted or propagated unless that vegetation was sown, planted or propagated as required under the Environmental Protection Act (1986) or another written law; or that vegetation is of a class declared by regulation to be included in this definition.

Native vegetation does not include dead vegetation unless that dead vegetation is of a class declared by regulation to be included in this definition. Native vegetation does include non-vascular plants (for example, mosses, fungi, algae) and marine plants (seagrass, macro algae [seaweed]). Native vegetation is more than trees and includes understorey and groundcover plants.

Natural area is used to describe an area that contains native species or communities in a relatively natural state and hence contains biodiversity. Natural areas can be areas of native vegetation, vegetated or open water bodies (lakes, swamps), or waterways (rivers, streams, creeks – often referred to as channel wetlands, estuaries), springs, rock outcrops, bare ground (generally sand or mud), caves, coastal dunes or cliffs (adapted from Environmental Protection Authority 2003a). Note that natural areas exclude parkland cleared areas, isolated trees in cleared settings, ovals and turfed areas.

Natural Area Initial Desktop Assessment template is a template developed by the Perth Biodiversity Project to assist in assessing and recording baseline information for a natural area that has been obtained using desktop tools (that is, datasets and other reference tools).

Natural area regeneration is spontaneous germination or resprouting (McDonald 1996) of indigenous native plant species.

Natural resource management is the integrated management of land-based activities to ensure the long-term health of soil, water and biodiversity.

No development zone is an area in which the building of structures or significant alterations to the topography is generally not allowed under law, for example, the floodway of rivers.

On-ground works are any activity that contributes to the reduction or removal of any threatening process affecting local biodiversity areas, or repairs damage caused by threatening processes.

Palusplains is a type of wetland described as a seasonally waterlogged flat, using the geomorphic wetland classification system of Semeniuk (1987).

Perth Metropolitan Region is the area covered by the Perth Metropolitan Region Town Planning Scheme Act 1959, as amended.

Potentially Locally Significant Natural Areas (PLSNAs) is a dataset of natural areas developed by the Perth Biodiversity Project that are likely to meet the Essential and/or Desirable Criteria for local significance as proposed in these Guidelines. The dataset was developed using regional GIS datasets and is indicative only of the values of LNAs. GIS information is not available to address all Local Significance Criteria.

Precautionary principle is that if there are threats of serious or irreversible environmental damage, the lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation (Environmental Protection Authority 2003d).

Principal Activities Planning (or Forward Financial Planning) involves the 4-year (or more) forward financial plan that all Western Australian Local Governments must prepare under the Local Government Act 1995. They specify the future plans of the Local Government and identify ways in which they may be realised, including major financial implications.

Priority flora are plant taxa that are under consideration as threatened flora but need further survey to adequately determine their status, or are adequately known but require monitoring to ensure that their security does not decline. Priority Flora lists are maintained by CALM.

Priority fauna are those 'Conservation significant' animal species listed by CALM's Threatened Species Consultative Committee but which are not currently listed under Section 14 (2) (ba) of the Wildlife Conservation Act 1950 as Specially Protected Fauna.

Protection or protected areas refer to those natural areas that are secured for conservation either as public lands vested for a biodiversity conservation purpose (e.g. nature conservation) or private lands where the biodiversity values are secured for conservation under zoning, or covenanting.

Ramsar Convention refers to the Convention on Wetlands, signed in Ramsar, Iran in 1971. This international treaty focuses on the conservation of internationally important wetlands. It also promotes the wise use (defined by the Convention as "...sustainable utilisation for the benefit of humankind in a way compatible with the maintenance of natural properties of the ecosystem") of wetlands through international cooperation and action at a national level as a means of achieving global sustainability.

Reactive assessment occurs when there is a formal proposal to rezone, subdivide and or develop land that contains a natural area(s). Reactive assessment involves using information collected in the field to assess natural areas against Local Significance Criteria. A Local Planning Policy for Biodiversity Conservation can be used to formalise the reactive assessment process.

Reconstruction is the artificial rebuilding of a plant community from scratch in disturbed areas that still have some natural components present (adapted from MacDonald 1996 and Corbyn unpub. 2003). Reconstructed areas are included in the definition of natural areas for the purposes of these Guidelines only if they contain soil and some vegetation components (eg. seeds/ rhizomes/ bulbs in the soil) of the natural area originally present.

Reference plots are standard size areas for which data has previously been recorded on vegetation structure, density and condition; wetland period; topographic position; and total flora (adapted from Government of Western Australia 2000b). On the Swan Coastal Plain, data from over 1000 reference plots of 10 x 10 m has been collected (Government of Western Australia 2000b).

Reference sites are natural areas that are representative of the typical natural vegetation of the municipality which existed prior to clearing. Identifying reference sites will assist in improving local knowledge and guide species selection for revegetation projects. Note that reference sites are not necessarily a source of seed.

Regeneration describes the restoration of natural ecosystems through the natural cyclic processes of renewal and self maintenance of species and their populations. The aim of a bush regenerator is to restore conditions so that the natural regeneration capacity of the ecosystem is able to continue (Kaesehagen unpub. 2001). Methods include progressive weed removal, initiating disturbance (e.g. fire, flood, mechanical), providing better conditions for seeds to germinate and successfully establish (e.g. rubbish removal, applying smoke or smoke water, restoring the natural fire regime), erosion control, controlling pests and diseases, removing grazing pressure, preventing trampling and vehicular access, removing pollutants and restoring the natural water regime (adapted from Buchanan 1989 and Coote, Moller and Claymore 2003).

Regional NRM Strategies: Regional areas have been identified by the Federal government across the whole of Australia. Each region is now required to prepare a NRM Strategy to assist the Federal government in identifying priorities for NRM funding.

Regionally significant bushland is a component of remnant vegetation that collectively aims to form a comprehensive, adequate and representative system of conservation areas (Environmental Protection Authority 2003a). In order for bushland areas to fall into this category, they need to be part of the existing or proposed conservation system or to meet, in part or whole, a range of criteria which are outlined in Appendix 3 of Environmental Protection Authority (2003a).

Regionally significant natural areas within the Jarrah Forest portion of the PMR are those natural areas that meet one of a range of specific criteria for regional significance (outlined in Appendix 3 Environmental Protection Authority 2003a) and collectively aims to form a comprehensive, adequate and representative system of conservation areas (Environmental Protection Authority [2003a]). They may be either part of an existing or proposed conservation system or meet, in whole or in part, a range of criteria which are outlined in Appendix 3 of Guidance Statement No. 10 by the Environmental Protection Authority (2003a). Within the Swan Coastal Plain portion of the PMR bushland of regional significance is identified by the criteria in Bush Forever (Government of Western Australia 2000a & b). Regionally significant bushland that is to be protected has been designated within Bush Forever Sites or identified as any bushland of a vegetation complex with only 400 ha or 10% or less (whichever is the greater) remaining in the Bush Forever study area (Government of Western Australia, 2000a). Other natural areas of regional significance (eg. wetlands, watercourses) have not yet been formally designated by the State Government within the Bush Forever Study Area.

Rehabilitation is the restoration of a natural area that has been temporarily and grossly disturbed and no natural components are present. Example: mine site. (Adapted from Corbyn unpub. 2003 and Kaesehagen unpub. 2001.)

Representative refers to the extent to which areas selected for inclusion in the national reserves system are capable of reflecting the known biological diversity and ecological patterns and processes of the ecological community or ecosystem concerned (Commonwealth of Australia 1996).

Reserves are areas of Crown land reserved for various public purposes, for example, parks, recreation, drainage or church sites. The reserve is identified by a number, for example, Reserve No. 12345. Reserves may be vested, leased or Crown Granted in Trust. Crown Reserves have varying levels of protection depending on the purpose of the reserve.

Resilience is the degree, manner and pace of the restoration of initial structure and function of a system after disturbance (Westman 1978 as cited in McDonald 1996).

Restoration is the return of a community to its pre-disturbance or natural state in terms of abiotic (non-living) conditions, community structure and species composition (English and Blyth 1999). It is the process of, or end result of, reinstatement of the structure and dynamics of the pre-existing indigenous plant community (McDonald 1996). The aim of restoration is to reinstate a long-term self-regenerating natural ecosystem (Kaesehagen unpub. 2001).

Retention is all the processes of ensuring a natural area is retained but not necessarily afforded protection to ensure its continued existence and viability.

Revegetation is the planting or direct seeding of native species in areas that have been cleared or highly modified (Commonwealth of Australia 2001a). The mix of species may not be the same as originally occurring in that patch of vegetation (Commonwealth of Australia 2001a). In and around natural areas local native species of local provenance should be used. Revegetation should only occur in areas within or around natural areas where there is no potential for using regeneration techniques to assist natural regeneration processes.

Riparian refers to the zone along or surrounding a water body where the vegetation and natural ecosystems benefit from and are influenced by the passage and storage of water (Water and Rivers Commission 1998)

Salinisation is the increase in salinity of a soil or wetland caused by changes in land management or usage, for example, clearing, irrigation or inundation.

Secondary dunes are the dunes occurring inland of the foredune. These dunes are generally vegetated with heath to shrubland plants depending on the degree of exposure to the coast. (Adapted from Oma et al. 1992).

Significant species are species that may be significant for a range of reasons, other than statutory listing as Declared Rare Flora or Specially Protected Fauna, or listing as Priority Flora or Priority Fauna (Environmental Protection Authority 2003c). For the Bush Forever Study Area a list of significant flora (Table 13, Government of Western Australia 2000b) and significant birds (Table 15 Government of Western Australia 2000b), mammals, reptiles, amphibians and invertebrates was compiled in 2000. The reason/s for any given species being considered significant may include any of the following:

- ▶ a keystone role in a particular habitat for threatened species, or in supporting large populations representing a significant proportion of the local to regional total population of a species
- ▶ relic status
- ▶ anomalous features that indicate a potential new discovery
- ▶ being representative of the range of a species (particularly: at the extremes of range; recently discovered range extensions; or isolated outliers of the main range)
- ▶ the presence of restricted subspecies, varieties, or naturally occurring hybrids
- ▶ local endemism/a restricted distribution
- ▶ being poorly reserved (Environmental Protection Authority 2003c).

Significant communities are communities that may be significant for a range of reasons, other than formal listing as Threatened Ecological Communities or because their extent is below a given threshold level (Environmental Protection Authority 2003c). The reason/s for any given community being considered significant may include any of the following:

- ▶ scarcity
- ▶ unusual species; novel combinations of species
- ▶ a role as a refuge
- ▶ a role as a key habitat for threatened species, or in supporting large populations representing a significant proportion of the local to regional total population of a species
- ▶ being representative of the range of a unit (particularly: a good local and/or regional example of a unit in 'prime' habitat; at the extremes of range; recently discovered range extensions; or isolated outliers of the main range)
- ▶ a restricted distribution (Environmental Protection Authority 2003c).

South West Botanical Province refers to the south west of Western Australia which forms a distinct natural region based on climate, geology, landforms, soils and vegetation as described in Beard (1990).

Specially Protected Fauna are species protected under the Wildlife Conservation Act 1950. The current listing is Wildlife Conservation (Specially Protected Fauna) Notice 2001 (Government of Western Australia 2001c).

Stepping stones are isolated habitats or areas that are used by species when moving between different parts of their range. Stepping stones are important for migratory species and the dispersal of offspring.

Strategic (or Proactive) Assessment occurs when a landholder of land containing a natural area voluntarily allows field assessment of the natural area to determine

whether the natural area is locally significant by meeting one or more Local Significance Criteria.

Swan Coastal Plain refers to the IBRA Swan Coastal Plain Bioregion as defined in Commonwealth of Australia (2001a).

Swan River Trust Management Area includes the waters of the Swan-Canning river system and adjoining parks and recreation reservation – extending upstream from the Fremantle Traffic Bridge to Moondyne Brook on the Avon River, to the lower diversion dam on the Helena River, along Southern River to the Allen Road crossing and the Canning River to its confluence with Stinton Creek (www.wrc.wa.gov.au/srt/about/index.html#areas).

System 6 region The System 6 region is one of 12 regions or systems in Western Australia. Also known as the Darling System, the System 6 region is bounded by the Moore River in the north, and encompasses the Perth, Peel and Bunbury regions. The State has been divided into 12 regions or systems by the Environmental Protection Authority (EPA), each a natural and demographic entity, for the purposes of nature conservation planning. System 6 is also the general name for the 1983 study, Conservation reserves for Western Australia as recommended by the Environmental Protection Authority (Department of Conservation and Environment 1983).

Targets are specified levels or ranges of measurable parameters that decision-makers have agreed they will try to achieve; targets are policy tools, but they have a scientific base; they may be associated with one or more indicators (Williams et al 2001).

Taxa (singl. taxon) are named classification units to which individuals or sets of individuals are assigned, such as, subspecies, species, genus, family (adapted from Williams et al 2001).

Tenure is commonly referred to as ownership. However, land differs from goods in that no one person can possess land in absolute ownership. Tenure is the system of holding land for the Crown.

Threatened ecological community (TEC) is an ecological community that has been assessed through a procedure (coordinated by CALM) and assigned to one of the following categories related to the status of the threat to the community. The categories are 'Presumed Totally Destroyed', 'Critically Endangered', 'Endangered' or 'Vulnerable' (English & Blyth 1997; 1999).

Threatened flora are plant species likely to become extinct or which are rare, and declared so, under Section 23F of the Wildlife Conservation Act 1950 (Government of Western Australia 2000b). See Declared Rare Flora.

Threatened fauna are animal species likely to become extinct or which are rare, and declared so, under Section 14(2)(ba) of the Wildlife Conservation Act 1950 (Government of Western Australia 2000b). See Specially Protected Fauna.

Threatening processes are any occurrence, activity or institutional process or structure, that threatens, or may threaten, the survival, abundance or evolutionary development of a native species or ecological community (ANZECC 2000a). Threatening processes include environmental weeds, clearing of native vegetation, and the size and distribution of the human population.

Unallocated Crown land refers to Crown land which is not subject to any interest (aside from native title interests) and which not reserved or dedicated.

Unmanaged reserve is a reserve which is not formally placed under the control of a management body.

Uplands (as opposed to wetlands) – land on which the vegetation and/or soils are characteristic of free-draining landscapes. Uplands are sometimes referred to as drylands.

Vegetation condition is a rating given to vegetated natural areas (both uplands and wetlands) to categorise disturbance related to human activities. This rating refers to the degree of change in the structure, density and species present in native vegetation in relation to undisturbed 'pristine' native vegetation of the same type. (Adapted from Government of Western Australia 2000b).

Vegetation complexes (as defined by Heddle, Loneragan & Havel 1980; Mattiske & Havel 1998). Vegetation complexes are based on the pattern of vegetation at a regional scale as they reflect the underlying key determining factors of landforms, soils and climate. In the area covered by the System 6 region and Swan Coastal Plain portion of the System 1 region, there was a reliance on the underlying landform and soils as defined and mapped by Churchward and McArthur (1980) and a major review of the forest climates by Gentilli (1989).

Viability (as in ecological viability) is the likelihood of long-term survival of a particular ecosystem or species.

Waterways are all streams, creeks, rivers, estuaries, coastal lagoons, inlets and harbours (Water and Rivers Commission 1998) and include wetland types in which the water flows in a channel landform either permanently or intermittently (streams creeks, rivers and man-made drainage features) (Environmental Protection Authority 1997).

Wetlands are "...areas of seasonally, intermittently or permanently waterlogged soils or inundated land whether natural or otherwise, fresh or saline, for example, waterlogged soils, ponds, billabongs, lakes, swamps, tidal flats, estuaries, rivers and their tributaries" (Wetlands Advisory Committee 1977). This definition is directly comparable with the definition of wetlands used in the Wetlands Conservation Policy for Western Australia (Government of Western Australia 1997b, p 5): "...areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed more than six metres". The first definition is preferred as it allows for the boundaries of the wetland to be readily determined on the basis of the vegetation (Environmental Protection Authority 2003a).

Zones are classifications of land in planning schemes that determine land use and development, excluding land in reserves.

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