Shire of Mundaring
Local Biodiversity Strategy

20 May 2009

A report by Ironbark Environmental and Eco Logical Australia to the Shire of Mundaring
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Abbreviations

CCW Conservation Category Wetlands
DRF Declared Rare Flora
EPA Environmental Protection Authority
LNA Local Natural Area
LRC Local Reserve for Conservation
LSIP Local Subdivision and Infrastructure Plan
PBP Perth Biodiversity Project
POS Public Open Space
RLL Rural Landscape Living zone
SPF Specially Protected Fauna
TEC Threatened Ecological Community
TPS4 Town Planning Scheme 4
WALGA WA Local Government Association
WAPC WA Planning Commission
Acknowledgements

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This is a report produced for the Shire of Mundaring. The contents do not form Council policy.

All reasonable efforts have been made by Ironbark Environmental and Eco Logical Australia to ensure the accuracy of its contents.

Statistics of Local Natural Areas

The native vegetation statistics used in this Paper are provided by the Perth Biodiversity Project and have been produced for the purposes of developing the Shire’s Local Biodiversity Strategy. Remnant native vegetation mapping was undertaken in 2007 by interpretation of 2005 aerial photography with adjustments for major clearing known to have occurred between 2005 and 2006. The mapping of vegetation complexes was undertaken at a regional scale and will need to be verified through site-specific assessments.

For ease of reading, area statistics of Local Natural Areas (LNAs) have been rounded in the report to the nearest 5 hectares. Statistics in the appendices have been left at the nearest whole number.

Remnant native vegetation mapping has not included the assessment and verification of the vegetation’s condition. As a result, statistics of remaining native vegetation in each vegetation complex are likely to be an over-estimate of the amount remaining of each complex. Any decision relating to the retention, protection or management of a Local Natural Area should be supported by site-specific assessments using standardised formats.
Executive Summary

Introduction
The Shire of Mundaring has commissioned this Local Biodiversity Strategy as a major step towards protecting or retaining most of the Local Natural Areas (LNAs) currently found in the Shire.

For the purposes of this Strategy, LNAs are the natural areas that are not currently protected in the public conservation estate or included within state forests, water catchment areas or Bush Forever sites. The focus of this Strategy is therefore to influence how LNAs (bushland, forest, watercourses, granite outcrops etc) are protected, managed or retained in local reserves and private lands, especially where land may have potential for future subdivision and development. There are 9175 ha of LNAs in the Shire, with 7075 ha in private ownership or managed by the Shire (6730 ha and 285 ha respectively).

Biodiversity status and statistics on the Shire’s native vegetation and Local Natural Areas are summarised in Appendix 1.

Vision
The Vision set for this Local Biodiversity Strategy is:

‘Protecting, managing and retaining a network of viable Local Natural Areas that support our native flora and fauna’

To achieve this vision, three main mechanisms should be adopted.

Firstly, measures will need to be put in place to give formal protection to LNAs through the Shire’s Local Planning Strategy and Town Planning Scheme 4 (TPS4). This will be achieved through assigning a protection status to all LNAs, except where they are already committed to development through zoning (Section 6).

Secondly, the Shire will need to provide landowners with assistance and conservation incentives to manage natural areas on their properties for biodiversity conservation. This will be explained further in a proposed Private Land Conservation Incentives Strategy (Eco Logical Australia & Ironbark Environmental, 2009 in prep.).

Thirdly, the Shire will need to strategically manage all of the natural areas under its care and control for biodiversity conservation. The Shire has commissioned a Reserves Assessment Project which will prioritise management needs for 141 of the Shire’s reserves with LNAs (EMRC & Shire of Mundaring, 2009, in prep.)

All LNAs in the Shire have been assigned to a preliminary Protection Category based on their conservation significance, land zoning, and other planning constraints such as structure plans and lot size. The three protection categories assigned to LNAs are Conservation, Protection and Retention.
Conservation Category LNAs are those where the natural area is:

- on Crown land vested for a conservation purpose;
- proposed to be within a Local Reserve for Conservation in the Shire’s new Town Planning Scheme No. 4; or
- included in a Conservation Covenant.

These areas will generally have high ecological values. No clearing will be permitted in Conservation Category LNAs, except for conservation-related infrastructure and compliance with fire management requirements.

Protection Category LNAs also have high ecological value but will be for those natural areas located on private lands.

LNAs assigned a status of ‘Retention’ have a relatively lower ecological value and also generally located on private lands.

In areas with a ‘Protection’ or ‘Retention’ status, there will be a strong presumption against allowing clearing, except for compliance with fire management requirements or where a residence cannot be located on an existing cleared area within a lot.

For some LNAs, the category of protection or retention is still to be determined or negotiated. These are where land use planning of a site is still in progress or where negotiations need to occur with vesting Government authorities.

Other LNAs have been assigned to a Limited Protection/Already Committed by Zoning category. These are mostly LNAs on existing or proposed small, residential zoned lots where the potential to formally protect the natural area is limited.

**Goals**

The four goals of the Strategy reflect the Protection Categories assigned to the Shire’s LNAs and the management of LNAs on private, Shire reserves and other Crown land.

**Goal 1:** To have 1065 ha of LNA included in the Conservation Category and recognised by the Shire’s Local Planning Strategy and TPS4; and to endeavour to increase the amount of LNA in the Conservation Category to up to approximately 1570 ha over time.

**Goal 2:** To have 5830 ha of LNA included in the Protection Category and recognised in the Shire’s Local Planning Strategy and TPS4; and to endeavour to increase the amount of LNA in the Protection Category to up to approximately 5865 ha over time.

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1 This is further explained in Section 5.1
**Goal 3:** To have 510 ha of LNA included in the Retention Category and recognised in the Shire’s Local Planning Strategy and TPS4; and to endeavour to increase the amount of LNA in the Retention Category to up to approximately 1190 ha overtime.

To achieve these three goals of the Strategy, actions have been recommended for the Shire’s Forthcoming Local Planning Strategy and TPS4. The fourth goal of the Strategy relates to management of Local Natural Areas.

**Goal 4:** All Council’s Local Reserves for Conservation in Town Planning Scheme No. 4 are actively managed for biodiversity conservation and half of all other Conservation Category LNAs and Protection Category (at least an estimated 2925 ha) are actively managed for conservation.

**Action Plan**

The Action Plan for this Local Biodiversity Strategy includes recommendations for the Shire’s Local Planning Strategy, policies and budget. Implementation of the Action Plan will be staged and subject to the availability of funding and resources.

Some of the Action Plan’s recommendations are:

- Incorporate the goals of this Strategy, the mapping of relative conservation priority (P1, P2, P3); and mapping of preliminary protection categories into the Shire’s forthcoming Local Planning Strategy (LPS);
- Incorporate into the LPS and Town Planning Scheme No. 4, measures to protect LNAs specific to each zone;
- Develop a mechanism such as a Local Planning Policy to provide an opportunity for proponents who disagree with the conservation priority area mapping to review the priorities and amend the mapping if appropriate;
- Review the Public Open Space Strategy to identify lands that have conservation significance using the prioritisation mapping;
- Review the Watercourse Protection Policy to ensure it is in accordance with the Shire’s Biodiversity Goals, and to make reference to the priority mapping and preliminary protection categories presented in this Strategy;

Prepare a Private Land Conservation Incentives Strategy to assist landowners to actively manage natural areas on their properties and help achieve the goals of this Local Biodiversity Strategy, and ensure adequate resources to assist with implementation of the Private Land Conservation Incentives Strategy.

For further details and a full Action Plan table, please refer to Section 7.
1. Introduction

The Shire of Mundaring has commissioned this Strategy as a major step towards protecting, managing and retaining most of the Local Natural Areas (LNAs) currently found in the Shire.

For the purposes of this Strategy, LNAs are the natural areas that are currently not protected in the public conservation estate, or included within state forests, water catchment areas or Bush Forever sites (Figure 1). The focus of the Paper is therefore to influence how LNAs (bushland, forest, watercourses, granite outcrops etc) are protected, managed and/or retained in local reserves and private lands, including where land may have potential for future subdivision and development.

This Strategy complements a number of other Shire initiatives which also aim to conserve biodiversity. Some of these initiatives are:

- A Private Land Conservation Incentives Strategy (Eco Logical Australia & Ironbark Environmental, 2009, in prep.);
- Watercourse Protection Policy;
- An ecological assessment of the Shire’s Reserves (Shire of Mundaring, 2008, unpublished) and a
- Wildlife Corridor Strategy (EMRC & Shire of Mundaring, 2000)

This Strategy has been produced for public comment in accordance with Local Government Biodiversity Planning Guidelines developed by the WA Local Government Association (WALGA & PBP, 2004).

Encouraging environmentally sustainable development is one of eight key strategic objectives of our Shire (Shire of Mundaring, 2007b). This Strategy will assist the Shire in achieving biodiversity conservation as a key element of sustainable development.

What is Biodiversity?

Biodiversity is the variety of living things naturally found in the environment. The conservation of biodiversity is an important part of local and global sustainability and is fundamental to the growth of the Shire of Mundaring. In our recent State of the Environment workshop, the community identified biodiversity conservation as the highest priority of all environmental issues (Shire of Mundaring and EMRC, 2006).

The protection and management of natural areas is important because it is a fundamental aspect of the quality of life of those who live in the Shire. The forest, creeks and bushland in the Shire make the Shire of Mundaring a special place to live and shape our sense of place. Natural areas keep our water resources clean, moderate our climate and bind our soils to prevent erosion.

Conservation of the diversity of native plants and animals in our natural areas is especially important given that we are part of the south-west eco-region, which is one of 25 recognised biodiversity hotspots in the world (Myers N, Mittermeier C, de Fonseca G & Kent J, 2000).
The Perth Biodiversity Project's Local Government Biodiversity Planning Guidelines for the Perth Metropolitan Region (June 2004) set out nine guiding principles for biodiversity planning and conservation, which should be reflected in Local Biodiversity Strategies.

These are as follows:

- Principle 1 – Retention of at least 30% of the pre-European extent of each ecological community is required to prevent an exponential loss of special and failure of ecosystem processes
- Principle 2 – Protect regionally significant and locally significant natural areas
- Principle 3 – Biodiversity is best conserved in-situ – protect what you have before revegetating
- Principle 4 – Regeneration is a higher priority than revegetation
- Principle 5 – Prioritise protection and management of the highest biodiversity value natural areas
- Principle 6 – Community involvement in helping conserve biodiversity
- Principle 7 – Biodiversity values must be made transparent in decision-making processes
- Principle 8 – Site-specific field survey is essential to understand biodiversity value
- Principle 9 – Natural area conservation is a legitimate land use
1.1 **Definition of Conservation, Protection and Retention**

The Paper establishes an important distinction between the Conservation, Protection and Retention of natural areas.

**Conservation**, as used in this Strategy means

- vesting of Crown Land for a conservation purpose;
- inclusion in a proposed Local Reserve for Conservation in the Shire’s new Town Planning Scheme No. 4; or
- inclusion in a Conservation Covenant.

**Protection**, in this strategy means that the natural area is identified as such in the Shire’s Local Planning Strategy, is given additional protection under the Scheme and is a high priority for on-ground management. There is a very strong presumption against clearing natural areas identified as ‘Protection’, or allowing rezoning which would threaten the ecological value of these natural areas. See Section 5.3.

Areas identified with a ‘Retention’ status in this Strategy, whilst usually being of lower conservation priority than the above natural areas, are still proposed to receive additional protection under the Scheme and will need to be retained to maintain the Shire’s current levels of biodiversity. There is generally a very strong presumption against allowing the clearing of areas identified as ‘retention’. And whilst these areas are a lower priority for active management, landowners should still be encouraged to manage and restore them.

These classifications are proposed to be incorporated into the Shire’s forthcoming Local Planning Strategy and Town Planning Scheme No. 4.

In summary, there is a very strong presumption against allowing clearing of any natural area identified as Conservation, Protection or Retention in this Strategy. Exceptions are discussed in Section 5.2.

1.2 **The Planning Framework**

Local Governments in the Perth Metropolitan Region are encouraged to produce local biodiversity strategies to identify significant natural areas and ways of protecting these areas (Government of Western Australia 1995, 2000) (Swan Catchment Council, 2004). Quantifiable targets should form part of these strategies to indicate the extent of natural areas that should be protected (WALGA & PBP, 2004).

Directions 2031: Draft Spatial Framework for Perth and Peel was released by the Western Australian Planning Commission in June 2009. The document provides a vision for the Perth and Peel region and key principles and
directions for its growth. One of the structural elements identified in the
document is a green network. Directions 2031 recognises the importance of
protecting and managing significant biodiversity areas and specifically
supports the implementation of the Local Government Biodiversity Planning
Guidelines, an initiative aimed at identifying and integrating local biodiversity
considerations into land use planning.

Biodiversity strategies are not statutory documents, and need to be
incorporated into the Local Planning Strategy and reflected in the Town
Planning Scheme to have a bearing on Local and State Government
decisions. This is critical as many of the decisions that impact on biodiversity
and natural areas are linked to land use planning and development.

It is the Shire’s intent, subject to public comment and Council and WA
Planning Commission approval, that this Strategy will be incorporated into the
Shire’s forthcoming Local Planning Strategy and Town Planning Scheme 4
where appropriate. This will give effect to the preliminary protection
categories for the natural areas identified in Figure 1 (Conservation,
Protection, Retention) or other management strategies.

For more details on the statutory planning framework, please see Appendix 5.

1.3 Existing regulation and policy to protect natural areas

It is important that this Strategy be read in the context of existing laws and
policies that give protection to natural areas and the species within them. Of
most relevance are the Clearing of Native Vegetation Regulations
established under the Environmental Protection Act (1986), and the
protection of significant species and ecological communities under the
Wildlife Conservation Act 1951 (WA) and the Environment Protection and
Biodiversity Conservation Act 1999 (Federal). Further information on relevant
laws and policies is included in Appendix 5.

This Local Biodiversity Strategy will complement these existing State and
Federal laws and policies and ensure that the Shire’s Town Planning Scheme
also gives appropriate consideration to biodiversity values.
2. Vision and Goals

This paper and our proposed strategy are based on the vision and goals outlined as follows:

‘Protecting, retaining and managing a network of viable Local Natural Areas that support our native flora and fauna’

CONSERVE/PROTECT

Goal 1: To have 1065 ha of LNA included in the Conservation Category and recognised by the Shire’s Local Planning Strategy and TPS4; and to endeavour to increase the amount of LNA in the Conservation Category to up to approximately 1570 ha over time.

Goal 2: To have 5830 ha of LNA included in the Protection Category and recognised in the Shire’s Local Planning Strategy and TPS4; and to endeavour to increase the amount of LNA in the Protection Category to up to approximately 5865 ha over time.

RETAIN

Goal 3: To have 510 ha of LNA included in the Retention Category and recognised in the Shire’s Local Planning Strategy and TPS4; and to endeavour to increase the amount of LNA in the Retention Category to up to approximately 1190 ha over time.

MANAGE

Goal 4: All Council’s Local Reserves for Conservation in Town Planning Scheme No. 4 are actively managed for biodiversity conservation and half of all other Conservation Category LNAs and Protection Category (at least an estimated 2925 ha) are actively managed for conservation.

The goals cover three important elements in maintaining biodiversity in the Shire of Mundaring: protection, retention and management.

The areas of LNAs included in Goals 1 to 3 have been determined by an analysis of the conservation significance of the Shire’s LNAs and the constraints of the Shire’s planning system. This is described in Section 4.

Goals 1 to 3 effectively mean that Council would identify 7405 ha of LNA in the Shire (81%) for Conservation, Protection or Retention in its Local Planning Strategy and Town Planning Scheme No. 4, and would endeavour, through the planning process and negotiation, to increase the amount of LNA in these
categories to up to as much as 8625 ha (94%) over time. It should be noted that this latter figure represents an upper target, and a lower figure may be achieved depending on the planning process, negotiations with other agencies, and needs for various uses of public land over time. Remaining LNAs are areas that are already committed by zoning for development.

Details of the implications of these goals and how they would be achieved are presented in Section 6.
3. Mundaring’s Biodiversity Status

3.1 Local Natural Areas

Local Natural Areas (LNAs) are the focus of this Paper and the Shire’s Local Biodiversity Strategy. There are 9175 ha of LNAs in the Shire, with 7075 ha in private ownership or managed by the Shire. (6730 ha and 285 ha respectively). The remainder are various other Government lands. This total figure has excluded some small fragments of natural areas, such as those in some road reserves.

LNAs are natural areas that currently have an unclear protection status given that they are not part of the public conservation estate, State Forests, proclaimed water catchments or Bush Forever sites.

LNAs are in addition to other areas of native vegetation that are either protected or retained as State Forest, Proclaimed Water Catchment or Bush Forever sites (Figure 2). 11,950 ha of the Shire’s 44,350 ha of native vegetation are protected within National Parks, Nature Reserves or Regional parks. The balance is either included in State Forest, proclaimed water catchments or Bush Forever sites, or falls within LNAs.

In total, natural areas cover 69% or 44,350 ha of the Shire’s 64,250 hectares. This compares with 40% of natural areas remaining in the Shire of Chittering and 54% in the Shire of Serpentine-Jarrahdale (similar local authorities to the Shire of Mundaring).

![Figure 2: Approximate areas of remaining native vegetation (natural and cleared areas) in Shire of Mundaring](image)

Further statistics on the Shire’s native vegetation and LNAs are summarised in Appendix 1.
3.2 Vegetation Complexes

Whilst most of the native vegetation of the Shire is often described as ‘forest’, it is made up of a variety of vegetation complexes which distinguish the vegetation changes that occur across the landscape in response to soils, landforms and rainfall.

Seventeen vegetation complexes have been mapped within the Shire which extend into other parts of the hills and Perth regions. These vegetation complexes are one of the bases for conservation targets in this Strategy. Twelve of the complexes occur in the Darling Range, one each on the Darling Scarp and Ridge Hill Shelf, and three on the Swan Coastal Plain. Statistics on the seventeen complexes are included in Appendix 3.

It is important to note that there are various types of vegetation within each of these complexes, dependent on local hydrology, position in the landscape and other factors. These differences in vegetation type can only be established by survey and mapping at the local scale.

3.3 Key threats to the Shire’s natural areas

Being a strategic document, this Paper focuses on one of the most significant threats to the Shire’s LNAs, namely the clearing and fragmentation of native vegetation from subdivision and development.

There are 6730 ha of LNAs on privately owned land. Of this, 2960 ha is within areas that are zoned for either Residential (generally 2000m² to 4000 m² lots) or Rural Landscape Living lots (generally 1 ha or 2 ha lots). Some of this land is subject of approved structure plans, known in Mundaring as Local Subdivision and Infrastructure Plans (LSIPs).

For the purposes of this Strategy, it is estimated that existing subdivision potential and development rights could lead to approximately 315 ha of clearing.

Whilst future two-hectare lots may retain some areas of native vegetation in the short-term, their biodiversity values are at high risk of deteriorating in the long-term as subsequent owners accidentally or intentionally degrade or remove the native vegetation (Gardner, 2007). The clearing or thinning of understorey for bush fire protection may be necessary for the protection of life and property under the document Planning for Bush Fire Protection, prepared by the Western Australian Planning Commission and Fire and Emergency Services Authority, or other laws or regulations relating to bush fire protection, and thus takes precedence over biodiversity protection, but can also be a factor in deterioration of biodiversity values.

Other threats to the Shire of Mundaring’s biodiversity include the impact of weeds and feral animals, Phytophthora dieback, and regional or global scale threats, such as climate change. The impact of these types of threats has been recognised by the local community through the Shire’s State of the
Environment process (Shire of Mundaring and EMRC, 2006). These are discussed in further detail in Appendix 4.

Given the potential impact of subdivision and development on local natural areas, the Strategy aims to influence the land use planning system and assessment of planning proposals. This provides the most significant opportunity to improve the protection of LNAs.
4. Ecological values and Conservation Priorities

Whilst all natural areas have numerous ecological values, it is often necessary to consider their value relative to other natural areas in the Shire for conservation purposes, or when making decisions on development proposals. This can also raise an understanding of some of the values of individual natural areas. Relative conservation significance should not automatically be used to justify the clearing of any natural area as this would result in the loss of the Shire’s current biodiversity.

4.1 Ecological values

In this Strategy, relative conservation significance was determined using a variety of ecological values to assign each LNA a conservation priority. This hierarchy of conservation significance involved a landscape classification, which is illustrated in Figure 3.

![Figure 3: Natural area values used to determine relative conservation significance](image)

Details of how these landscape classifications, including the description of Regional Linkages and Special Features were derived are provided in Appendix 6 and are summarised as follows:

- Rare - These are vegetation complexes which are considered rare as there is less than 10% remaining of their original extent across the southwest of Western Australia;
- At Risk - These are vegetation complexes which are considered at risk as there is less than 30% remaining of their original extent across the southwest of Western Australia;
- Habitat - all other LNAs, or groupings of LNAs, that are greater than 10 ha in size were classified as ‘habitat LNAs’. Habitat LNAs are made up of
individual LNAs that are within 8 metres of each other, and together make up at least a 10 ha natural area. This recognizes the importance of two or more small LNA patches that may only be separated by a small clearing such as a minor road, track or service easement. Ten hectares has been selected as the threshold given that LNAs of this size have a relatively high degree of resilience against threats such as weeds and dieback and will generally support a variety of habitats. They will also generally have a low perimeter to area ratio, thus reducing on-going maintenance levels.

- Regional Linkages – All portions of LNAs that occur within Regional Ecological Linkages defined in the Local Biodiversity Planning Guidelines for the Perth Metropolitan Region (WALGA & PBP 2004);
- Special Features – these are special features within Local Natural Areas – Declared Rare Flora, Specially Protected Fauna, Threatened Ecological Communities, Priority Ecological Communities, Priority Flora or Fauna, Conservation Category Wetlands, granite outcrops;
- 20 m within watercourse – all portions of LNAs within 20 m of a mapped watercourse (i.e. forming a 40 m band centred on the watercourse);
- 20-50 m within watercourse – that portion of a LNA that is between 20 and 50 m from a mapped watercourse; and
- Other lands – all other LNAs not meeting one of the above.

In summary, the land with the highest conservation significance has been placed in the rare or at risk category. Conservation Significance is relatively lower as you move down the triangle.

### 4.2 Prioritisation of natural areas

Using the above hierarchy of natural area values, conservation priorities have been defined so as to more clearly communicate relative conservation significance to all stakeholders and ensure that policy and resources reflect conservation significance. These priorities have been defined by classifying the landscape using the attributes described in the previous section.

All LNAs in the Shire have been assigned a Conservation Priority of Priority 1 (P1), Priority 2 (P2) or Priority 3 (P3). The three conservation priorities reflect the likely significance of the LNA. This approach not only considered the values of individual natural areas but also their relationship to other natural areas, shown as conservation assets in Table 1.

Using these criteria to determine conservation priorities, the following amount of LNA falls into each of the three priorities:

- Priority 1: 3064 hectares
- Priority 2: 5147 hectares
- Priority 3: 963 hectares

Further details on the landscape classification are included in Appendix 6.
**Table 1: Determination of conservation priorities**

<table>
<thead>
<tr>
<th>Shading on Figure 4</th>
<th>Priority</th>
<th>Aim</th>
<th>Conservation assets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green</td>
<td>1</td>
<td>To be conserved or protected and receive active management.</td>
<td>Rare vegetation complexes At Risk vegetation complexes Within 20m of a Watercourse Regional Linkage over special features Regional Linkage over Habitat</td>
</tr>
<tr>
<td>Orange</td>
<td>2</td>
<td>To be conserved or protected and receive active management.</td>
<td>Habitat Special features Regional Linkages Within 20-50m of Watercourse</td>
</tr>
<tr>
<td>Yellow</td>
<td>3</td>
<td>To be retained and where possible receive active management</td>
<td>Every other LNA</td>
</tr>
</tbody>
</table>

It is important to note that all LNAs should be retained, regardless of conservation priority. However, some LNAs are already committed to a level of subdivision and development due to existing or proposed lot sizes, zoning and subdivision potential. These have been assigned to a category of Limited Protection/Already Committed by Zoning in Section 5.

Conservation priorities will assist in focusing protection and management efforts to areas likely to be of most value from a biodiversity perspective.
5. Implementation measures

This Strategy is based on the assumption that all natural areas should be conserved, protected or retained wherever practicable to maintain the Shire’s current levels of biodiversity, unless the area is already committed to development through zoning. To achieve this, the Shire will need to act on three fronts to ensure that biodiversity is able to be conserved.

Firstly, measures will need to be put in place to give formal protection at a local level to natural areas, especially where the LNA is of conservation significance.

Secondly, landowners will need to be given incentives to manage natural areas on their properties for biodiversity conservation.

Thirdly, the Shire will need to strategically manage all of the natural areas under its care and control for biodiversity conservation.

These targets are discussed in the following sections, with recommended measures where relevant. Supporting actions are listed in Table 4.

5.1 Levels of protection for natural areas

All LNAs in the Shire have been assigned a protection category based on the following considerations:
1) Known ecological values;
2) Other environmental attributes, such as proximity to watercourses;
3) Relative Conservation Priority (See Section 4 AND Figure 4);
4) Zoning in Town Planning Scheme No. 3 (See Figure 5); and
5) Other relevant planning considerations, such as existing LSIPs or lot size (See Figure 5).

There are five preliminary protection categories:
1) Conservation
2) Protection
3) Retention
4) Limited Protection/Already Committed by Zoning
5) To Be Determined/Negotiated

The last of these categories is broken down into five sub-categories reflecting different circumstances and planning considerations, but in all cases further negotiation or determination through the planning and land management process is required. Over time, LNAs in this category will be allocated to one of the other four categories.

Following is a description of each of the preliminary protection categories and sub-categories for LNAs (except where reference is made to the Shire’s
proposed new Town Planning Scheme No. 4, all zonings refer to the Shire’s Town Planning Scheme No. 3, in operation at the time of writing):

1) **CONSERVATION** – LNAs on Crown Land vested for a conservation purpose, included in a proposed Local Reserve for Conservation in the Shire’s new Town Planning Scheme No. 4, or included in a Conservation Covenant.

2) **PROTECTION** – P1 and P2 LNAs on land zoned General Rural, P1 and P2 LNAs and LNAs near (within 20 m) watercourses on land zoned Rural Landscape Living and having an existing or proposed lot size below 2 ha, and all LNAs on other land zoned Rural Landscape Living. LNAs on rural residential lots within Special Purpose zones in Parkerville and Stoneville are also included in the Protection Category.

3) **RETENTION** – P3 LNAs on land zoned General Rural or on land zoned Rural Landscape Living and having an existing or proposed lot size below 2 ha. LNAs near (within 20 m) watercourses on land zoned Residential R2.5 are also included in the Retention Category.

4) **LIMITED PROTECTION/ ALREADY COMMITTED BY ZONING** – LNAs on land zoned Residential (except those within 20 m of watercourses on land coded R2.5) or on land zoned Special Purpose for the proposed Parkerville and Stoneville Townsite Developments and not identified in the structure plans endorsed by Council for those proposed townsites as open space or rural residential. It should be noted that residential subdivision in these proposed townsites cannot occur unless and until the land is changed from Urban Deferred to Urban in the Metropolitan Region Scheme. Where residential subdivision takes place, most LNAs will be lost, due to clearing for development or for protection and/or hazard reduction zones to reduce bushfire hazard for residences. However, some vegetation retention may be possible in some circumstances, particularly in the delineation of Public Open Space. LNAs on land zoned Light Industry or within road reserves are also included in this category. As with residential land, some small parcels of LNAs in these areas may be able to be retained.

5) **TO BE DETERMINED/ NEGOTIATED** – These LNAs are in areas where decisions on conserving, protecting or retaining LNAs will be made over time through the planning and land management processes and by negotiations. There are five sub-categories of land within this category:

   i) **Land Reserved for Public Purposes and vested in an agency other than the Shire** (Conservation/Retention where practicable) – This is land in a Public Purposes Reserve under the Shire of Mundaring Scheme or the Metropolitan Region Scheme and vested in another agency, such as the Department of Justice or Department of Education and Training. In some cases there is significant potential to formally protect (perhaps by Conservation Covenant) or retain LNAs on such land, though this will be subject
to the land use requirements of the managing authority. Site specific assessment and negotiations with the managing agency will be required.

ii) Proposed open space within the Parkerville and Stoneville Townsite Developments (Conservation/Retention where practicable) - This land has been identified for open space in structure plans endorsed by Council for the proposed townsites. Should development in those townsites proceed and this land be transferred to management control of Council, it should be possible for nearly all LNAs on such land to be retained and, subject to further assessment and management processes, conserved. Much of the LNAs could be subsequently included in a Local Reserve for Conservation under Town Planning Scheme No. 4.

iii) Residential zone: Priority or Declared Rare Flora, Priority Fauna or granite outcrops (Protection/Retention) - Only a very small amount of Residential zoned land has been identified in this Strategy based on available data, but as information becomes available over time, for example through individual site assessments, more land may be included in this sub-category. It will be important for LNAs on this land to be protected or retained through the planning process. In some cases, other legislation already provides some protection for these LNAs.

iv) Special Purpose zones (other than Parkerville and Stoneville Townsite Developments) (Protection/Retention where practicable) - In addition to the Special Purpose zones for the proposed Parkerville and Stoneville Townsite Developments, there are many other Special Purpose zones in the Shire's Town Planning Scheme No. 3, setting land aside for a specific land use. The size of these zones and the amount of LNA remaining varies. Some clearing of LNAs may be required in some cases to allow the specified land use to take place, but wherever practicable the LNA should be retained or protected. LNA protection or retention will be determined through the planning process and/or by negotiation with owners.

v) Local Reserve for Recreation (in TPS 4), Local Centre zone or road reserve (Retention where practicable) - The Shire's Public Open Space is proposed to be divided into Local Reserves for Conservation and Local Reserves for Recreation in Town Planning Scheme No. 4, with the respective Local Reserve purposes (Conservation or Recreation) indicating the primary emphasis for each reserve. However, there are still many areas of LNAs within proposed Local Reserves for Recreation which, despite a relatively lower level of conservation significance, should still be retained if management and recreational needs allow. A very
small amount of LNA is located within the Local Centre zone. Retention of this LNA, where possible, can be pursued through the planning process, although some clearing may be required to enable development to proceed. There are also some LNAs remaining within road reserves, some of which are unconstructed. These should be retained wherever possible, subject to road construction and safety and bushfire access requirements.

A map showing the preliminary protection status categories of all LNAs is included in Figure 6. This mapping should be included in the Shire’s forthcoming Local Planning Strategy and referenced in TPS4 to give recognition to the protection status of all LNAs in the Shire.

Table 2 provides the area of LNAs which are assigned to each of the nine categories and an estimation of the area of LNA that will ultimately be Conserved/Protected or Retained. The specific ecological and planning criteria used to assign each LNA in the Shire to one of nine protection categories is included in Appendix 7. The protection categories have been assigned using a GIS analysis and existing GIS datasets, such as known locations of Priority Flora. Accordingly, the protection status of some LNAs may change as new ecological information becomes available.
Table 2: Protection categories proposed for LNAs in the Shire of Mundaring

<table>
<thead>
<tr>
<th>Protection category</th>
<th>Estimated LNA area in category (ha)</th>
<th>Conservation (ha)</th>
<th>Protection (ha)</th>
<th>Retention (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PROTECTION CATEGORY IDENTIFIED IN PROPOSED LOCAL PLANNING STRATEGY</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Conservation</td>
<td>1065</td>
<td>1065</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Protection</td>
<td>5829</td>
<td>5829</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Retention</td>
<td>511</td>
<td>511</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>POSSIBLE FUTURE ADDITIONS</strong></td>
<td><strong>Assumptions regarding possible future additions</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Limited protection / already committed by zoning</td>
<td>579</td>
<td></td>
<td>58</td>
<td>10% retained</td>
</tr>
<tr>
<td>5. To be determined/ negotiated:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5A) Land Reserved for Public Purposes and vested in an agency other than the Shire</td>
<td>837</td>
<td>419</td>
<td>419</td>
<td>50% Conservation, 50% Retention</td>
</tr>
<tr>
<td>5B) Proposed open space within the Parkerville and Stoneville Townsite Developments</td>
<td>169</td>
<td>85</td>
<td>85</td>
<td>50% Conservation, 50% Retention</td>
</tr>
<tr>
<td>5C) Residential Zone: Priority or Declared Rare Flora, Priority Fauna, or Granite outcrops</td>
<td>1(^2)</td>
<td>1</td>
<td>1</td>
<td>50% Protection, 50% Retention</td>
</tr>
<tr>
<td>5D) Special Purpose zones (other than Parkerville and Stoneville Townsite Developments)</td>
<td>75</td>
<td>38</td>
<td>38</td>
<td>50% Protection, 50% Retention</td>
</tr>
<tr>
<td>5E) Local Reserve for Recreation (in TPS4), Local Centre zone or road reserves.</td>
<td>108</td>
<td></td>
<td>81</td>
<td>75% Retention</td>
</tr>
<tr>
<td><strong>TOTAL (ha) (rounded)</strong></td>
<td>9175</td>
<td>1570</td>
<td>5865</td>
<td>1190</td>
</tr>
</tbody>
</table>

\(^2\) Does not included granite outcrops as these have not been mapped
5.2 Conservation Category Local Natural Areas

**Goal 1:** To have 1065 ha of LNA included in the Conservation Category and recognised by the Shire’s Local Planning Strategy and TPS4; and to endeavour to increase the amount of LNA in the Conservation Category to up to approximately 1570 ha over time.

The intent and purpose of Conservation Category LNAs is for those natural areas to be actively managed for conservation under a formal conservation arrangement. Conservation category LNAs are those on Crown land vested for a conservation purpose, proposed to be within a Local Reserve for Conservation in the Shire’s new Town Planning Scheme No. 4, or public/private land under a Conservation Covenant. There are 1065 ha of LNAs that have been identified in this Strategy and should be incorporated in the Shire’s Local Planning Strategy and reflected in Town Planning Scheme No. 4. There is the potential for the amount of LNA in this category to increase over time to up to 1570 ha, subject to planning and land management processes and negotiation with managing authorities.

LNAs on private land may be assigned to this category in the future as the result of Public Open Space created through subdivision, or Conservation Covenants over new lots created in the future. In the case of new subdivisions/developments, the possible inclusion of LNAs in the Conservation category would be considered as part of the proposal’s assessment.

Clearing in a Conservation Category LNA would not be permitted except in exceptional circumstances. These may include the installation of infrastructure which is directly linked to the site’s conservation values, and then only if it could occur with minimal impact on the site’s ecological values. Clearing in covenanted areas is generally not acceptable, unless specified in the covenant.

All LNAs in the Conservation category would be managed for conservation under a plan for the reserve or covenanted area. Other uses compatible with conservation of the site’s ecological values would be acceptable.

5.3 Protection Category Local Natural Areas

**Goal 2:** To have 5830 ha of LNA included in the Protection Category and recognised in the Shire’s Local Planning Strategy and TPS4; and to endeavour to increase the amount of LNA in the Protection Category to up to approximately 5865 ha over time.

The intent and purpose of the Protection Category is to protect these LNAs in perpetuity and encourage landowners to actively manage them for biodiversity conservation. 5830 ha of the Shire’s LNAs have been identified as falling within this category, and there is the potential for this amount to
increase marginally over time. Almost all Protection Category LNAs are on private land and will remain so. It is therefore important that the Shire give priority to assisting private landowners with these LNAs. A Private Land Conservation Incentives Strategy will outline ways in which the Shire can provide this assistance.

There is a very strong presumption against clearing LNAs identified in the Protection Category, with the exception of:

- the construction of a single house and associated structures (including outbuilding(s)) nearby, where there is no viable alternative location on a lot that would not result in clearing of a LNA identified for Protection; and
- unavoidable clearing necessary for approved fencing or vehicular access or required for bushfire safety purposes.

There is also a very strong presumption against rezoning of land containing LNAs identified for Protection where such rezoning would confer additional development potential that would necessitate further clearing of LNAs.

Goals 1 and 2 will mean that almost all P1 and P2 LNAs will be covered by either a Conservation or Protection Category in the Shire’s Local Planning Strategy.

### 5.4 Retention Category Local Natural Areas

**Goal 3:** To have 510 ha of LNA included in the Retention Category and recognised in the Shire’s Local Planning Strategy and TPS4, and to endeavour to increase the amount of LNA in the Retention Category to up to approximately 1190 ha over time.

The intent and purpose of the Retention Category is to ensure that all other LNAs are retained where that is practicable under the current TPS. 510 ha of LNA have been assigned to a preliminary category of Retention, and there is the potential for this to increase substantially over time, possibly up to 1190 ha, subject to planning and land management processes and negotiation with vesting agencies. These LNAs still have important ecological values, but are of lower ecological significance than P1 and P2 LNAs. They are usually small and isolated from other natural areas, but should be able to be retained in perpetuity given the current zoning or reservation of the land. Most LNAs assigned to the Retention Category have a Priority 3 conservation significance level and occur in the General Rural or Rural Landscape Living Zones.

Even though Priority 3 LNAs have relatively lower ecological value, there is still a strong presumption against allowing clearing, with the exception of:
• the construction of a single house and associated structures (including outbuilding(s)) nearby, where there is no viable alternative location on a lot that would not result in clearing of a LNA; and
• unavoidable clearing necessary for approved fencing or vehicular access or required for bushfire safety purposes.

There is also a strong presumption against rezoning of land containing LNAs identified for Retention where such rezoning would confer additional development potential that would necessitate further clearing of LNAs.

Note that many P3 LNAs may be up to 10 ha in size and have ecological values that are as yet unidentified. Whilst Retention Category LNAs are a lower priority for Private Land Conservation Incentives, landowners should still be encouraged to restore and manage these LNAs.

5.5 Other Local Natural Areas

579 ha of the Shire’s 9175 ha of LNA have been identified within a category of Limited Protection/Already Committed by Zoning. It is likely to be difficult to retain this LNA in the long-term as these areas are on Residential Zoned land or land identified for future residential areas. Most of these LNAs will be cleared for residential subdivision and development or for bushfire protection requirements. However, there may be the opportunity to secure some of these LNAs in Public Open Space. Also, there should still remain a requirement for approval and a presumption against clearing of native vegetation where such clearing is not required for residential subdivision and development or for bushfire protection requirements.

5.6 Management of Local Natural Areas

| Goal 4: All Council’s Local Reserves for Conservation in Town Planning Scheme No. 4 are actively managed for biodiversity conservation and half of all other Conservation Category LNAs and Protection Category (at least an estimated 2925 ha) are actively managed for conservation. |

Conservation of biodiversity often requires active management to ensure ecological values are protected from threatening processes such as environmental weeds, dieback and physical disturbance.

Active management is a priority for all LNAs assigned a category of Conservation or Protection, covering almost all LNAs of P1 and P2 conservation significance. The following is therefore recommended to be included in the Strategy’s Action Plan:

• All LNAs under Council vesting or ownership and reserved for Conservation in TPS4 are managed for conservation in accordance with an Overall Plan

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3 The LNA is determined as one or more patches of mapped native vegetation that are within 8 metres of each other.
of Management. This should be developed from the Shire’s Reserves Assessment Project (EMRC & Shire of Mundaring, 2008, in prep.) and include:

- Ecological assessment of all reserves containing LNAs, preferably using the NAIA templates (Cullity and Clarke, 2003);
- Identification of key threatening processes in each reserve;
- Prioritization of reserves, in terms of ecological value and likely risk;
- Identification of key management actions for reserves;
- Identification of budget required to implement the actions.

- Significant development proposals that may impact on LNAs are to provide a Natural Area Protection Plan to provide management of biodiversity values on subject lands. Appendix 9 provides a sample of what should be addressed in these Plans.

- Half of all sites of privately owned and State Government owned conserved/protected LNAs are actively managed for conservation or part of a stewardship program by 2028. This will be outlined in the Shire’s forthcoming Private Land Conservation Incentives Strategy (Ecological Australia & Ironbark Environmental, 2009, in prep.)
6. **Implications for development**

6.1 **Overview**

Integration of this Strategy into the Shire’s forthcoming Local Planning Strategy and TPS4 is the most important aspect of implementation of the Local Biodiversity Strategy.

This integration will be achieved firstly through recognition in the Shire’s Local Planning Strategy and (as required) TPS4 of the:

- Ecological values of LNAs (Section 4.1);
- Relative conservation priorities assigned to each LNA (Section 4.2); and
- Preliminary Protection Status assigned to each LNA (Section 5.1); and
- Measures used to guide development proposals where LNAs may be impacted.

It is recommended that the Relative Conservation Priorities and Protection status categories be used as part of the guidance for developers preparing proposals which include LNAs.

6.2 **Future rezoning and structure planning of land**

Future subdivision of land, if poorly planned, would pose a significant threat to conservation of the Shire’s biodiversity. Therefore, there should be a very strong presumption against any future rezoning of land which confers additional development potential that would necessitate further clearing.

It is recommended that the Shire, through its Local Planning Strategy and TPS4 require all future rezoning and subsequent structure planning to protect LNAs in large intact parcels, either in a single private or common lot with conservation covenant, or a public conservation reserve. This same approach should apply, wherever practicable, to structure plans for land already zoned for subdivision under Town Planning Scheme No. 3. Further approval of new rezonings which would result in the fragmentation of LNAs should no longer be supported.

6.2.1 **Policy/Provisions for clustered subdivision/development**

At present, the Shire does not have a policy or Scheme provisions specifically supporting cluster-type green title subdivision, which would allow for better protection of LNAs while still retaining overall lot or development yields. A use class in Town Planning Scheme No. 3 of “Cluster Rural Living Dwelling” does allow for clustered strata-title subdivision in rural areas, but has not been utilised during the life of the Scheme.

It is recommended that the Shire develop a policy and/or Scheme provisions to require cluster-type subdivision where appropriate, including provisions which:
1) Identify natural area protection as a primary objective in rezoning, structure planning or subdivision.

2) Identify the circumstances in which the provisions would apply. Essentially these would be for any area which is otherwise suitable for subdivision given other planning considerations and has been identified for subdivision in the Local Planning Strategy and/or Scheme, and where large natural areas are present which would be fragmented by conventional subdivision but where such fragmentation could be avoided or minimised by cluster-type subdivision.

3) Set guidance on development performance criteria to achieve natural area protection, including, for example:
   a. protected natural areas shall be at least 3 ha in size and, if remaining in private or common ownership, subject of a Conservation Covenant;
   b. subdivision design should avoid if possible, and otherwise minimise, fragmentation of natural areas;
   c. as far as possible, fire management requirements shall be achievable within the area of clustered development, with further clearing of natural areas avoided or minimised (eg. by the use of strategic firebreaks).

4) Address long-term management of the natural areas to be protected (i.e. preparation of an appropriate Management Plan is required).

5) Include a mechanism to ensure implementation of the Management Plan (e.g. a covenanting management plan).

The Scheme provisions or policy will need to focus on encouraging development that addresses LNA protection in cases where the development could otherwise proceed on good planning grounds. It is not intended that it should be used to support development in areas where it would be poor planning to allow such development (i.e. high fire hazard areas, or areas distant from service centres).

Cluster-type subdivision may be considered on Rural Landscape Living zoned lots that already have a subdivision potential under Town Planning Scheme 3, or areas which may be considered suitable for subdivision under TPS4. There are 950 ha of natural areas on lands with subdivision potential under Town Planning Scheme 3, mostly zoned Rural Landscape Living (Perth Biodiversity Project, 2008). Cluster-type subdivision has the potential to protect the biodiversity of a significant portion of these natural areas, which could otherwise be severely fragmented through more conventional subdivision.

6.3 **Recommended measures for TPS4 zones**

It is important that guidance is provided to landowners and planners on how LNAs are to be regarded in each of the major zones and land categories. A number of these and other guidelines are summarised in Table 3 and should be included as provisions in the Shire’s forthcoming Local Planning Strategy.
and TPS4. A more comprehensive list of recommended provisions is provided in Appendix 11.

6.3.1 Special Purpose zones: Parkerville Townsite Development and Stoneville Townsite Development

The Parkerville and Stoneville Townsite proposed developments are currently zoned Special Purpose in Town Planning Scheme No. 3. For the portions of these areas which are rural residential lots, it is proposed to apply the same Scheme provisions as applied to the Rural Landscape Living zone (or TPS4 equivalents).

For those areas currently zoned Urban Deferred in the Metropolitan Region Scheme, the Shire should seek to maintain or improve the retention and protection of LNAs in any review of the Local Subdivision and Infrastructure Plans that have been adopted by Council, if and when the Urban Deferment is lifted.

Should Urban Deferment be lifted and subdivision take place, most if not all LNAs within created Public Open Space should be retained and, subject to planning and land management processes, may subsequently be included in the Local Reserve for Conservation under Town Planning Scheme No. 4.

6.4 Guidance for proponents

Where a proposed development, other than a single house and associated structures where there is no practicable alternative site on the lot which would not require clearing of LNA, may impact on, or involves clearing of, an LNA, proponents must provide information to demonstrate how these impacts may be avoided or minimised.

It is recommended that proponents be required to provide environmental information in a standard format to the Shire to allow this assessment. The Natural Area Initial Assessment templates produced for the Perth Metropolitan Region may be suitable for this purpose (Clarke and Cullity, 2003). The templates allow presentation of information on vegetation characteristics, fauna usage, ecological significance and management issues. They would assist the Shire in considering of the merits and impacts of the proposal.

In considering proposals Council should also have regard to the Conservation Priority mapping provided in this report. Where a proponent does not agree with this mapping, then a mechanism should be put in place by Council to review the priorities and amend the mapping if appropriate. This mechanism could include validation of the vegetation community and boundaries, flora survey, vegetation condition assessment and mapping of ecological values including fauna likely to use the site. (See Action 3).
Table 3: Summary of recommended strategies/provisions to protect LNAs in the Shire’s LPS and TPS4

<table>
<thead>
<tr>
<th>Land category (TPS No. 3 zonings)</th>
<th>Appendix Reference</th>
<th>Guidance/provisions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>1.1</td>
<td>Where possible Retain or Protect LNAs in new POS in ecologically viable natural areas, while maintaining adequate active recreational function.</td>
</tr>
<tr>
<td>Residential</td>
<td>1.2</td>
<td>For existing POS consider vesting for conservation purpose and reservation for Conservation in TPS4.</td>
</tr>
<tr>
<td>Rural Landscape Living (no subdivision potential)</td>
<td>2.1</td>
<td>Avoid rezoning new land which wholly or primarily comprises of LNAs.</td>
</tr>
<tr>
<td>Rural Landscape Living (no subdivision potential)</td>
<td>2.2</td>
<td>In new subdivisions, require subdivision to maximise protection of LNAs in large intact parcel or parcels. Cluster forms of subdivision are encouraged to achieve this end. Protect LNAs formally via conservation covenant, or within a Crown Reserve.4</td>
</tr>
<tr>
<td>Rural Landscape Living (has subdivision potential and approved LSIP)</td>
<td>2.3</td>
<td>Scheme provisions for all land in Rural Landscape Living (or TPS4 equivalent) will require houses to be built on cleared portions of lot where they exist. Where no such site exists, clearing is allowed for a single house and associated structures without requiring planning approval. There is a very strong presumption against other clearing.</td>
</tr>
<tr>
<td>Rural Landscape Living (has subdivision potential but no approved LSIP)</td>
<td>2.4</td>
<td>Consider vesting existing POS for conservation purpose and reservation for Conservation in TPS4.</td>
</tr>
<tr>
<td>Rural Landscape Living (has subdivision potential but no approved LSIP)</td>
<td>2.5</td>
<td>Consider offering incentives to assist landowners manage LNAs, especially P1 and P2 areas.</td>
</tr>
<tr>
<td>Rural Landscape Living (has subdivision potential but no approved LSIP)</td>
<td>2.6</td>
<td>Consider reviewing those existing LSIPs which have large LNAs to seek a better protection outcome for the LNAs. Cluster forms of subdivision are encouraged to achieve this end. Council may consider supporting a lot bonus if necessary to make subdivision viable.</td>
</tr>
<tr>
<td>Rural Landscape Living (has subdivision potential but no approved LSIP)</td>
<td>2.7</td>
<td>Where possible, protect large intact portions of LNAs through Conservation POS or covenanting privately owned LNAs.</td>
</tr>
<tr>
<td>Rural Landscape Living (has subdivision potential but no approved LSIP)</td>
<td>2.8</td>
<td>Scheme provisions for all land in Rural Landscape Living (or TPS4 equivalent) will require houses to be built on cleared portions of lot where they exist. Where no such site exists, clearing is allowed for a single house and associated structures without requiring planning approval. There is a very strong presumption against other clearing.</td>
</tr>
<tr>
<td>Rural Landscape Living (has subdivision potential but no approved LSIP)</td>
<td>2.9</td>
<td>Consider offering incentives to assist landowners manage LNAs, especially P1 and P2 areas.</td>
</tr>
<tr>
<td>Rural Landscape Living (has subdivision potential but no approved LSIP)</td>
<td>2.10</td>
<td>Require subdivision to maximise retention of LNAs in large intact parcel or parcels. Cluster forms of subdivision may be required to achieve this end.</td>
</tr>
<tr>
<td>Rural Landscape Living (has subdivision potential but no approved LSIP)</td>
<td>2.11</td>
<td>Where possible, protect large intact portions of LNAs through Conservation POS or covenanting privately owned LNAs.</td>
</tr>
</tbody>
</table>

*An action is included in the Action table to investigate the need for a specific zone or overlay in the Scheme to recognize LNAs formally protected as part of a planning decision.*
<table>
<thead>
<tr>
<th>Land category</th>
<th>Appendix Reference</th>
<th>Guidance / provisions</th>
</tr>
</thead>
<tbody>
<tr>
<td>(TPS No. 3 zonings)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LNAs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.13</td>
<td>Consider offering incentives to assist landowners manage LNAs, especially P1 and P2 areas.</td>
<td></td>
</tr>
<tr>
<td>3.1</td>
<td>Scheme provisions for all General Rural land will require houses to be built on cleared portions of lot where they exist. All other development is to be on cleared portions of lot. Where no such site exists, clearing is allowed for a single house and associated structures without requiring planning approval. There is a very strong presumption against other clearing.</td>
<td></td>
</tr>
<tr>
<td>General Rural</td>
<td>3.2</td>
<td>Consider requiring conservation covenants where development, over and above a single house, may impact on large or otherwise significant LNAs.</td>
</tr>
<tr>
<td></td>
<td>3.3</td>
<td>Where considering zoning new land for rural residential subdivision or other subdivision/development, avoid land wholly or primarily comprising Local Natural Areas.</td>
</tr>
<tr>
<td></td>
<td>3.4</td>
<td>Where considering zoning land for new RLL subdivisions, require subdivision to maximise protection of LNAs in large intact parcel or parcels. Cluster forms of subdivision may be required to achieve this end. Protect LNAs formally via conservation covenant, or within a Crown Reserve.</td>
</tr>
<tr>
<td></td>
<td>3.5</td>
<td>Consider offering incentives to assist landowners manage LNAs, especially P1 and P2 areas.</td>
</tr>
<tr>
<td>Special Purpose zones:</td>
<td>4.1 – 4.4</td>
<td>See Section 6.3.1 above.</td>
</tr>
<tr>
<td>Parkerville Stoneville Townsite Development</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Special Purpose Zones</td>
<td>4.5</td>
<td>For other Special Purpose zones, assess opportunities to protect or retain LNAs. Consider protection provisions in TPS4, or negotiation with landowners or vesting authorities regarding covenanting significant LNAs.</td>
</tr>
<tr>
<td>Reserved land</td>
<td>5.1</td>
<td>Include existing large intact LNAs in POS within a Local Reserve for Conservation in TPS4.</td>
</tr>
<tr>
<td></td>
<td>5.2</td>
<td>Retain other LNAs on land vested in or managed by the Shire except where land is definitely required for another purpose and an alternative location on cleared land is not possible or practicable.</td>
</tr>
<tr>
<td></td>
<td>5.3</td>
<td>Manage Local Natural Areas for conservation where on land vested in or managed by the Shire.</td>
</tr>
<tr>
<td></td>
<td>5.4</td>
<td>Liaise with relevant government agencies over the management of other reserved land owned, vested in or managed by them (including Public Purposes reserves). Pursue conservation covenanting over LNAs where supported by the relevant agencies.</td>
</tr>
</tbody>
</table>

5 An action is included in the Action table to investigate the need for a specific zone or overlay in the Scheme to recognize LNAs formally protected as part of a planning decision.
6.5 Guidance for assessment of clearing proposals

For all LNAs in the Conservation, Protection or Retention Categories there should be a strong presumption against allowing clearing.

In the case of Conservation Category LNAs, and as stated in Section 5.2, clearing will be an exceptional case, and should only be considered where it is directly linked to the site’s conservation values, and then only if it could occur with minimal impact on the site’s ecological values. Such an example may be a well-designed walk trail in a bushland reserve.

In the case of all land in the Protection Category and Retention Category, there should be a very strong presumption against clearing, with the exception of

- the construction of a single house and associated structures (including outbuilding(s)) nearby, where there is no viable alternative location on that lot that would avoid clearing of a Local Natural Area; and
- unavoidable clearing necessary for approved fencing or vehicular access or required for bushfire safety purposes.

An issue arises where the clearing of an LNA is unavoidable, or is considered warranted for other reasons. It is not uncommon that this situation will arise, and have implications for the maintenance of the Shire’s current biodiversity and for projected goals in this strategy. Whilst it may be premature to introduce an offsetting arrangement for such situations, the Shire should investigate how such an approach may be used in the future, to offset clearing that may be incidental to TPS4.

Consideration should therefore be given by Council in the longer term to developing an offsetting policy in accordance with principles set out by both State and Federal Governments, to guide the assessment and use of offsetting arrangements to assist in managing the impacts of clearing of habitat that is of ecological significance but is unavoidable. Such policies are now being applied in other Local Governments across Australia in recognition of the steady decline in biodiversity (e.g. Shire of Hornsby). Offsetting means that in some cases, developers may be able to carry out clearing only after all other alternatives have been considered to avoid, minimise and mitigate the loss and its impacts and only then after protecting or restoring an alternative natural area. Principles of offsetting are contained in Appendix 8 and the Environmental Protection Authority’s Position Statement No. 9 (EPA, 2006b).
7. **Action Plan**

This Action Plan has been developed to meet the vision and goals set by this strategy. The following Action Plan covers initiatives that Council proposes to implement to promote the conservation of biodiversity, which are focused in particular on planning and resourcing aspects.

Local Biodiversity Strategies are not statutory documents, and need to be incorporated into the Local Planning Strategy and reflected in the Town Planning Scheme to have a bearing on Local and State Government decisions. This is critical as many of the decisions that impact on biodiversity and natural areas are linked to land use planning and development.

The columns in Table 4 present an action number, a description of the action itself, and a performance indicator.

**Table 4: Proposed Action Plan to implement the Shire’s Local Biodiversity Strategy**

<table>
<thead>
<tr>
<th>No.</th>
<th>Actions</th>
<th>Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Incorporate into the Shire’s forthcoming Local Planning Strategy:</td>
<td>Provisions and maps included in Local Planning Strategy. References included in TPS4</td>
</tr>
<tr>
<td></td>
<td>o the goals of this Strategy;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o the mapping of relative conservation priority (P1, P2, P3); and</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o mapping of Preliminary Protection Categories.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The Local Planning Strategy will need to ensure that development within or adjacent to LNAs considers the Conservation, Protection and Retention Goals in this strategy.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Incorporate into the LPS/Scheme, measures to protect LNAs specific to each zone.</td>
<td>Provisions and maps included in Local Planning Strategy. References included in TPS4</td>
</tr>
<tr>
<td></td>
<td>Include relevant provisions in the Shire’s Town Planning Scheme No. 4 to recognize LNA values and the objective of development to protect these values. These provisions are summarized in Table 3 and expanded in Appendix 11.</td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Actions</td>
<td>Indicator</td>
</tr>
<tr>
<td>-----</td>
<td>-------------------------------------------------------------------------</td>
<td>------------------------------------------</td>
</tr>
<tr>
<td>3</td>
<td>Develop a mechanism, such as a Local Planning Policy, to provide an opportunity for proponents who disagree with the conservation priority area mapping to review the priorities and amend to the mapping if appropriate. This could include: • Validation of vegetation community and boundaries • Flora survey • Description of condition of vegetation • Mapping of ecological values including flora and fauna likely to use the site</td>
<td>Policy or other mechanism developed</td>
</tr>
<tr>
<td>4</td>
<td>Refer development proponents required to do initial assessments of their land to the PBP Natural Area Initial Assessment templates to ensure information is collected and presented to the standard set across the region. Develop a set of guidelines to guide the required level of additional development assessment for each priority class, focusing on any specific survey requirements.</td>
<td>Policy or other mechanism developed</td>
</tr>
<tr>
<td>5</td>
<td>In the longer term, consider the creation of an offsetting policy to offset the unavoidable loss of LNAs as part of development approvals.</td>
<td>Assessment report considered by Council.</td>
</tr>
<tr>
<td>6</td>
<td>Consider the creation of a trust fund to help finance the purchase of Priority lands. This trust could be funded by private donation, rates concessions from flexible development rights agreements, or through a revolving land purchase scheme.</td>
<td>Assessment report considered by Council.</td>
</tr>
<tr>
<td>7</td>
<td>Review the Public Open Space Strategy to identify lands that have conservation significance using the prioritization mapping. Identify opportunities in the POS to include conservation management measures for significant areas. Use native plant species of locale specific provenance in any bushland restoration, rehabilitation or landscaping works undertaken in POS. The Local Biodiversity Strategy is to be reviewed after five years. This will allow the Shire to judge the progress towards implementing its recommendations. The review can be linked to the Shire’s State of the Environment reporting process.</td>
<td>Review conducted and provided to Council</td>
</tr>
<tr>
<td>No.</td>
<td>Actions</td>
<td>Indicator</td>
</tr>
<tr>
<td>-----</td>
<td>--------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>8</td>
<td>Any addition of land into the POS system will require adequate resourcing to ensure that there is capacity within Council to manage these lands. The negotiations with proponents may include the funding for or provision of a long term management strategy for the lands that include objectives and actions for conservation. The management strategy can consider provision of recreational use in the POS, provided that it does not conflict with the objectives of the strategy.</td>
<td>Include policy statements as part of Action 8.</td>
</tr>
<tr>
<td>9</td>
<td>Review the Watercourse Protection Policy to ensure it is in accordance with the Shire’s Biodiversity Goals, and to make reference to the priority mapping and preliminary protection categories presented in this Biodiversity Strategy. Develop a hierarchy for watercourses that can be incorporated into the Watercourse Protection Policy and Local Planning Strategy and reflected in the Town Planning Scheme.</td>
<td>Review conducted and provided to Council</td>
</tr>
<tr>
<td>10</td>
<td>As an urgent priority, work with landowners with LSIPS over land with subdivision potential where large LNAs will be fragmented as a result of the LSP. Seek to achieve a better protection outcome for affected LNAs.</td>
<td>Assessments conducted by Council planning staff</td>
</tr>
<tr>
<td>11</td>
<td>Prepare a Private Land Conservation (PLC) Incentives Strategy to assist landowners to actively manage natural areas on their properties and help achieve the goals of this Strategy.</td>
<td>PLC Incentives Strategy presented and approved by Council</td>
</tr>
<tr>
<td>12</td>
<td>Ensure that any current/proposed structure planning processes give consideration to the Conservation Priority Mapping and Preliminary Protection Categories.</td>
<td>Changes made to internal staff processes</td>
</tr>
<tr>
<td>13</td>
<td>Ensure that any conservation actions related to this strategy give proper regard to bushfire hazard and the protection of life and property, in accordance with Planning for Bushfire Protection guidelines, the Local Planning Strategy and bushfire hazard mapping where available.</td>
<td>Changes made to internal staff processes</td>
</tr>
<tr>
<td>14</td>
<td>Provide active ongoing management for biodiversity conservation of Local Reserves for Conservation, where these are managed by the Shire. In particular, implement recommendations of the Shire’s Reserves Assessment report.</td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Actions</td>
<td>Indicator</td>
</tr>
<tr>
<td>-----</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>15</td>
<td>Continue to pursue community awareness and education opportunities as identified by Council, including:</td>
<td>Continued support and funding provided to programs.</td>
</tr>
<tr>
<td></td>
<td>• Technical advice regarding property planning</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Recognition events</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Provision of native plant seedlings to residents and community groups</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Supply of dieback treatment kits</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Biodiversity awareness packages</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Successfully fund a position to provide additional resourcing in the Shire for an environmental officer to assist with the implementation of this Strategy, including a Private Land Conservation Incentives Program for landowners with LNAs.</td>
<td>Funding approval granted by Council</td>
</tr>
</tbody>
</table>
8. Glossary

**Biodiversity** is the variety of all life forms - the different plants, animals and microorganisms, 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; and
- 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.

**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). There are two Bush Forever sites within the Shire of Mundaring.

**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 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).

**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 buming 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).
**Condition** 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.

**Conservation Category LNAs** – Local Natural Areas assigned to this category in this Strategy

**Conservation Covenant** is a legal agreement between a landholder and a statutory body (the ‘covenanting authority’) where both parties mutually resolve to protect and manage the conservation natural values on all or part of the land, such agreement being registered on the Title of the land and running with the property for a defined period of time (which may include “in perpetuity”), and which may be restrictive or positive in nature, and is capable of enforcement of compliance by the covenanting authority;

**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.

**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).

**Development** (according to the Planning and Development Act 2005) 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, 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.

**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; and
• 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.

**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.

**Environmentally Sustainable Development (ESD)** refers to development that uses, conserves and enhances the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future can be increased.

**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).

**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 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.

**Metropolitan Region Scheme (MRS)** means the town planning scheme for the Perth Metropolitan Area.
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 ground cover 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 watercourses (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.

Offsetting an offset is an action taken away from the development site that may seek to compensate for the loss of vegetation caused by that development site. It may take the form of monetary compensation, revegetation, regeneration etc.

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

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 Category LNAs - Local Natural Areas assigned to this category in this Strategy

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 (Mortlock 1999).
**Regionally significant**, with respect to natural areas, means of significance sufficient to warrant inclusion in 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).

**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.

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

**Retention Category LNAs** - Local Natural Areas assigned to this category in this Strategy

**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 (Mortlock 1999).

**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)

**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).

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

**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).

**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.

**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.

**Watercourses** 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).
9. References


Environmental Protection Authority (2006a) Guidance for the assessment of Environmental Factors: Level of Assessment for proposals affecting natural areas within the System Six Region and the Swan Coastal Plain portion of System 1 Region, No 10, EPA, Western Australia, Perth.

Environmental Protection Authority (2006b) Position Statement No. 9: Environmental Offsets, Environmental Protection Authority, Perth, Western Australia.


Shire of Mundaring and Eastern Metropolitan regional Council (2006) State of the Environment report (draft); Shire of Mundaring, Perth.


Appendix 1: Mundaring’s biodiversity and natural areas

Biodiversity – the variety of living things

Biodiversity is the variety of living things naturally found in the environment. The conservation of biodiversity is an important part of local and global sustainability and is fundamental to the growth of the Shire of Mundaring. In our recent, State of the Environment workshop, the community identified biodiversity conservation as the highest priority of all environmental issues (Shire of Mundaring and EMRC, 2006).

Biodiversity in Mundaring

Biodiversity is best conserved in natural areas. About 44,600 ha, or 69% of the Shire supports native vegetation, or as termed in this report, natural areas.

For the purposes of local biodiversity planning, these natural areas are either considered:
   a) Protected, either in National Parks, regional parks, nature reserves, conservation covenanted land, or Bush Forever sites;
   b) Retained in State Forest, proclaimed water catchments or other similarly managed areas; or
   c) Local Natural Areas. These are areas of native vegetation and granite outcrops on private land, local reserves and any other Government owned lands.

Geographically, native vegetation in the Shire can be described in three large precincts. The vegetation of the southern portion of the Shire has remained largely intact within public water supply catchments, but has been impacted by logging and other threats over a long period of time. Lands on the Swan Coastal Plain have been significantly cleared for rural and then urban development. East of the escarpment of the Darling Range and outside of the public water supply catchments, a large proportion of native vegetation has been cleared for town sites, rural residential living and rural land use.

Table 5: Natural areas in the Shire according to current protection status.

<table>
<thead>
<tr>
<th>Native vegetation</th>
<th>Hectares</th>
<th>% of Original</th>
<th>% of remaining</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-European</td>
<td>64,250</td>
<td>100</td>
<td>-</td>
</tr>
<tr>
<td>Total native vegetation protected (Bush Forever, CALM estate, including Regional Parks, excluding State Forest) - includes some Local Reserves</td>
<td>11,950</td>
<td>19</td>
<td>27</td>
</tr>
<tr>
<td>State Forest and other DEC reserves</td>
<td>14,760</td>
<td>23</td>
<td>33</td>
</tr>
<tr>
<td>Local Natural Areas - privately owned Vacant Crown Land, unknown, commonwealth (incl. 284 ha of Local Reserves)</td>
<td>9175</td>
<td>14</td>
<td>21</td>
</tr>
<tr>
<td>Total native vegetation retained (Includes protected, State Forest and non-protected)</td>
<td>44,350</td>
<td>69</td>
<td>100</td>
</tr>
<tr>
<td>Total cleared</td>
<td>19,900</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NB: Water catchments are included in state forests and other DEC reserves
Figure 1 shows the occurrence of this native vegetation in the above categories.

**Further information on vegetation complexes in the Shire of Mundaring**

Retention and protection of vegetation complexes ensures that the broad ecological communities in the Shire are retained and protected. Vegetation complexes are used to describe ecological communities as they have been mapped for the entire Perth Metropolitan Region and ensure equity between Local Government areas. The representational criteria can then be used to set targets for the amount of natural areas that should be protected within the Shire.

Table 6 and Figure 8 show the amount and location of each vegetation complex found in the Shire. Table 4 also shows how much of each of these complexes is already protected in conservation reserves.

Table 6 shows that three complexes on the Swan Coastal Plain (Forrestfield, Guildford and Southern River) are regionally significant and are the highest priorities for protection. The condition of vegetation in these natural areas needs to be confirmed, but may be poor to fair given past grazing. The fourth coastal plain complex, Swan is also a priority, given that less than 30% of the local extent remains.

Nine of the other thirteen complexes have less than 30% of their original Shire extent protected and may be priorities for protection, subject to meeting other criteria. A number of these nine complexes are confined to State Forest or proclaimed public water supply catchment. While these tenures do not formally and securely protect the areas for conservation, these do afford the forest with some protection. The Shire will need to consider this as part of setting protection targets for local natural areas within these complexes.
Table 6: Local natural areas and protection levels by vegetation complex

<table>
<thead>
<tr>
<th>Vegetation Complex</th>
<th>Pre-European extent (ha)</th>
<th>Remaining extent (ha)</th>
<th>Local % remaining</th>
<th>Regional % protected (formal reserves)</th>
<th>Total LNA</th>
<th>LNA - State or Commonwealth</th>
<th>LNA - Local Reserves</th>
<th>LNA - other</th>
<th>State Forest</th>
<th>Protected</th>
<th>Current local protection (% of pre-European)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooke</td>
<td>219</td>
<td>174</td>
<td>80%</td>
<td>28.0</td>
<td>8</td>
<td>0</td>
<td>0</td>
<td>8</td>
<td>31</td>
<td>87</td>
<td>40%</td>
</tr>
<tr>
<td>Coolakin</td>
<td>317</td>
<td>286</td>
<td>90%</td>
<td>12.0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>286</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Darling Scarp</td>
<td>1231</td>
<td>700</td>
<td>57%</td>
<td>?</td>
<td>60</td>
<td>4</td>
<td>4</td>
<td>52</td>
<td>0</td>
<td>639</td>
<td>52%</td>
</tr>
<tr>
<td>Dwellingup 2</td>
<td>10432</td>
<td>7497</td>
<td>72%</td>
<td>20.0</td>
<td>3051</td>
<td>67</td>
<td>114</td>
<td>2870</td>
<td>1223</td>
<td>3205</td>
<td>31%</td>
</tr>
<tr>
<td>Dwellingup 4</td>
<td>12074</td>
<td>9597</td>
<td>79%</td>
<td>24.0</td>
<td>1201</td>
<td>416</td>
<td>42</td>
<td>743</td>
<td>4824</td>
<td>1838</td>
<td>15%</td>
</tr>
<tr>
<td>Forrestfield Complex</td>
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<td>51</td>
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<td>0.3</td>
<td>33</td>
<td>0</td>
<td>2</td>
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<td>0</td>
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</tr>
<tr>
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<td>91%</td>
<td>?</td>
<td>4</td>
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<td>0</td>
<td>4</td>
<td>44</td>
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</tr>
<tr>
<td>Guildford Complex</td>
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<td>3</td>
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<td>0</td>
<td>3</td>
<td>0</td>
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</tr>
<tr>
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<td>983</td>
<td>903</td>
<td>92%</td>
<td>30.0</td>
<td>59</td>
<td>0</td>
<td>0</td>
<td>59</td>
<td>3</td>
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<td>Murray 2</td>
<td>19050</td>
<td>14739</td>
<td>77%</td>
<td>20.0</td>
<td>1634</td>
<td>297</td>
<td>30</td>
<td>1308</td>
<td>5063</td>
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<td>Pindalup</td>
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<td>38</td>
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<td>2811</td>
<td>658</td>
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</tr>
<tr>
<td>Southern River Complex</td>
<td>32</td>
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<td>6%</td>
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<td>2</td>
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<td>193</td>
<td>87</td>
<td>45%</td>
<td>30.0</td>
<td>23</td>
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<td>0</td>
<td>23</td>
<td>0</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Swan Complex</td>
<td>294</td>
<td>58</td>
<td>20%</td>
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<td>0</td>
<td>0</td>
<td>15</td>
<td>0</td>
<td>42</td>
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<tr>
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<td>4770</td>
<td>2372</td>
<td>50%</td>
<td>22.0</td>
<td>1246</td>
<td>486</td>
<td>7</td>
<td>753</td>
<td>85</td>
<td>121</td>
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</tr>
<tr>
<td>Yalanbee 6</td>
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<td>110</td>
<td>93%</td>
<td>18.0</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0%</td>
</tr>
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<td>2324</td>
<td>54%</td>
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<td>1032</td>
<td>39</td>
<td>47</td>
<td>946</td>
<td>650</td>
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<tr>
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<td><strong>64254</strong></td>
<td><strong>44630</strong></td>
<td><strong>69%</strong></td>
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<td><strong>1735</strong></td>
<td><strong>284</strong></td>
<td><strong>7579</strong></td>
<td><strong>15020</strong></td>
<td><strong>11952</strong></td>
<td><strong>15%</strong></td>
</tr>
</tbody>
</table>

NB: Regional refers to the natural range of the vegetation complex
NB: These figures include some minor data errors through incorrect classification of natural areas; total Local Natural Areas within the Shire is 9175 ha.
Appendix 2: Zoning of Local Natural Areas and future development in Mundaring

Zoning of land plays an important part in planning for the future of natural areas.

This Strategy is cognisant of future development, and, in turn, seeks to influence future patterns of growth. The Shire is preparing a Local Planning Strategy and a new Town Planning Scheme. Recommendations of this Strategy should be incorporated into the Local Planning Strategy and reflected in the Town Planning Scheme. Biodiversity conservation should be a key factor in considering new areas for subdivision and development.

The greater pressure for clearing and further subdivision will occur in a wide east-west band running east from the Darling Scarp and generally in the vicinity of existing townsites. New 2 ha lots and residential lots will be created where there are Local Subdivision and Infrastructure Plans (LSIPs) or where the land has been zoned but not subdivided.

Two new townsites have also been proposed for land north of Parkerville and Stoneville, which have 178 ha of native vegetation zoned to Urban Deferred in the Metropolitan Region Scheme (for residential and special residential and related use) and other vegetation contained within Rural Landscape Living Lots and Public Open Space. These proposals will need to be assessed and approved by Council and the WAPC, should the Urban Deferment be lifted and the proposed townsites developed.

The Shire’s northern corridor, including Wooroloo and Bailup, is under relatively less pressure for subdivision. Whilst this part of the Shire has been significantly cleared for agriculture there are opportunities to protect large natural areas across the landscape.
### Appendix 3: Local Natural Areas by vegetation complex and Town Planning Scheme Zone

#### Table 7: LNA statistics by vegetation complex, TPS zone, and local levels of protection

<table>
<thead>
<tr>
<th>TPS Zone</th>
<th>Cooke</th>
<th>Darling</th>
<th>Dwelling2</th>
<th>Dwelling4</th>
<th>Forrest</th>
<th>Guildford</th>
<th>Helena2</th>
<th>Murray2</th>
<th>Pindalup</th>
<th>Swamp</th>
<th>Sthn River</th>
<th>Swan</th>
<th>Yalanbee5</th>
<th>Yarralily</th>
<th>TOTAL (ha)</th>
</tr>
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<tr>
<td>Current local protection %</td>
<td>40</td>
<td>52</td>
<td>31</td>
<td>15</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>86</td>
<td>20</td>
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<td>0</td>
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<td>15</td>
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<tr>
<td>Current local protn. (ha)</td>
<td>87</td>
<td>639</td>
<td>3205</td>
<td>1838</td>
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<td>4</td>
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<td>841</td>
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<td>658</td>
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<td>42</td>
<td>121</td>
<td>642</td>
</tr>
<tr>
<td>Current regional protn. (%)</td>
<td>28%</td>
<td>?</td>
<td>20%</td>
<td>24%</td>
<td>0.3%</td>
<td>?</td>
<td>0.2%</td>
<td>30%</td>
<td>20%</td>
<td>26%</td>
<td>1.5%</td>
<td>30%</td>
<td>0%</td>
<td>22%</td>
<td>11%</td>
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<table>
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<td>15</td>
<td>1246</td>
<td>1032</td>
<td>9598</td>
</tr>
</tbody>
</table>

Note: Vertical column shading indicates a Rare or At Risk vegetation complex.
Note: These figures include some minor data errors through incorrect classification of natural areas; total Local Natural Areas within the Shire is 9175 ha.
Appendix 4: Threats to Mundaring’s Local Natural Areas

Natural areas have, over time been degraded, cleared or mismanaged in numerous ways in the Shire. Many natural areas within the Shire are now in the midst of a second wave of disturbance following the clearing and logging undertaken in the late 19th century and first half of the 20th century. Some LNAs in the Shire comprise regrowth since that initial clearing.

Threats to our biodiversity can be grouped into three general categories:

1) Development related threats - such as clearing and the introduction of dieback which can happen during and immediately after development;

2) Management related threats - such as the clearing of understorey for fire protection, impact of feral animals, inappropriate fire regimes and spread of weeds; and

3) Regional or global scale threats, such as altered water flows, and the effects of climate change.

The impact of these types of threats has been recognised by the local community through the Shire’s State of the Environment process (Shire of Mundaring and EMRC, 2006).

Dam construction and other alterations to watercourses in the Shire also pose another threat. Control of this type of development is undertaken through the Town Planning Scheme and the Shire’s Watercourse Protection Policy (Shire of Mundaring & EMRC, 2001).

There are many other management-related threats, such as weeds, feral animals, dieback, too-frequent fires, which are largely outside of the scope of this Strategy. Some of these issues are being address through other initiatives, such as the Tree Canopy and Understorey Program and the Bush Skills for the Hills Program. The Shire is also in the process of preparing a Local Reserves study (Shire of Mundaring, 2008, unpublished); and Private Land Conservation Discussion Paper (Shire of Mundaring and EMRC, 2007).

The impacts of other threats, such as climate change, on the Shire’s biodiversity, are less clear and are outside of the scope of this Paper.
Appendix 5: An outline of the relevant policy and statutory framework

Background
Development and land use in the Shire is controlled through Town Planning Scheme No. 3. The Shire is currently preparing a new Town Planning Scheme No. 4, which will supersede Town Planning Scheme No. 3, and Local Planning Strategy. The proposals in this Strategy will be considered for inclusion in the new Scheme and Planning Strategy.

Local Policy

Watercourse Protection Policy
Various policies under the Town Planning Scheme, serve to protect natural areas. A key policy is the Watercourse Protection Policy which aims to protect the zone near watercourses given their importance as wildlife corridors and the impact of understorey vegetation on water quality and erosion prevention (EMRC & Shire of Mundaring, 2001). Under this policy and sub-clause 4.17(11)(d) of Town Planning Scheme No. 3 it is Council’s intent that a minimum of 20 m of land either side of a watercourse be reserved and managed for conservation purposes.

Public Open Space Policy
The Shire has also developed a Public Open Space Policy which is used to generate POS as part of residential and Rural Landscape Living subdivisions. This policy aims to generate POS that is:
• contiguous with existing POS and/or watercourses;
• has environmental significance; or
• in the opinion of Council has special historical or cultural significance (Shire of Mundaring, 2001).

State Government Policy

Planning for Bush Fire Protection
Another significant area of Government policy that has an impact on the Shire’s natural areas is Planning for Bush Fire Protection (WAPC & FESA, 2001). This document sets out standards of subdivision and vegetation management in bushfire prone areas. Protection of property from fire is a significant issue across much of the Shire and has an impact on the levels of natural area protection that can occur in the Shire.

Bush Forever Policy
Policy to guide the protection of natural areas is also included within the State Government’s Bush Forever Policy area (Government of Western Australia, 2000) and the Federal Government’s National Targets and Objectives for Biodiversity Conservation (Commonwealth of Australia, 2001). The Bush Forever Policy covers a small part of the Shire and seeks to protect sites to achieve a 10% protection level for all of the vegetation complexes (See Section 7.1 on vegetation complexes). There are two Bush Forever sites within the Shire, in
Helena Valley, which have been afforded some additional protection as a result of Bush Forever.

**EPA Guidance Statement No. 33**

The Environmental Protection Authority’s Guidance Statement No. 33 (May 2008) provides the Environmental Protection Authority’s advice on a range of environmental factors in order to assist participants in the land use planning and development process to protect, conserve and enhance the environment. Among the comprehensive advice and direction given by the Guidance Statement, it considers the identification of locally significant natural areas essential and recommends seeking advice on identifying, protecting and managing local natural areas through the Local Government Biodiversity Planning Guidelines for the Perth Metropolitan Region.

**Federal Policy**

The Federal Government’s biodiversity conservation policy broadly applies to all wide scale biodiversity strategies and recognises the retention of 30% or more of the pre-clearing extent of each ecological community as necessary to protect the nation’s biodiversity. This 30% target has been reduced for those areas within the Perth Metropolitan region within the Bush Forever Study Area. However, most of the Shire is within the Darling Plateau, where the national 30% target is realistic and achievable. This means that the Shire could set targets to protect at least 30% of most of the vegetation complexes found in the Shire (See Table 4).

**Legislation**

Government legislation and policy which controls clearing and provides protection to specific natural areas or features includes:

- Amendments to the Environmental Protection Act made in 2004 which require proposals to clear native vegetation to obtain a permit unless an exemption applies. Applications for permits are assessed by the Department of Environment and Conservation using ten clearing principles, including consideration of how the proposed clearing impacts on local biodiversity targets. As clearing is also a form of development, it requires a Planning Approval from the Shire.

- Protection of specific species which are rare or threatened under the Wildlife Conservation Act 1950 (WA).

- Protection of threatened ecological communities listed under the Environment Protection and Biodiversity Conservation Act 1999 (Federal) or DEC policy.

- Protection of wetlands under the Environmental Protection (Swan Coastal Plain Lakes) Policy (Policy under WA EP Act).

**Ecological linkage**

There is no formal policy which supports the protection of ecological corridors or the linkage between natural areas. Regional scale ecological linkages have been identified in WALGA & PBP (2004) for the Shire, and are shown in Figure 9. These include both riparian linkages and upland forested linkages. These
Regional Ecological Linkages are being used by a number of metropolitan Local Governments and are gaining acceptance at a State Government level.

For a comprehensive list of laws and policies that relate to the conservation of biodiversity in the Perth Metropolitan Region, see WALGA & PBP (2004).

The targets and prioritisation of natural areas proposed in this paper support these policies.
Appendix 6: Classification of the Landscape and an analysis for target setting

Approach

Classification of Local Natural Areas in the landscape was undertaken in order to establish a hierarchy of conservation significance for which to base specific targets.

Vegetation was placed into categories as expressed in Table 7 before it could be assigned into one of the three Conservation priorities.

Table 8: Categories of Local Natural Areas

<table>
<thead>
<tr>
<th>Rarity of vegetation complex</th>
<th>Rare*</th>
<th>At Risk*</th>
<th>Habitat*</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;10% remaining</td>
<td></td>
<td>10-30%</td>
<td>Other</td>
</tr>
<tr>
<td>10-30% remaining</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;30% remaining</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Details of how these landscape classifications, including the description of Regional Linkages and Special Features were derived are provided in Appendix 5 and are summarised as follows:

- Rare - These are vegetation complexes which are considered rare as there is less than 10% remaining of their original extent across the south-west of W. Australia. Rare vegetation complexes found in the Shire of Mundaring are the Guildford, Forrestfield and Southern River vegetation complexes.
- At Risk - These are vegetation complexes which are considered at risk as there is less than 30% remaining of their original extent across the south-west of W. Australia. At Risk vegetation complexes found in the Shire of Mundaring are the Swan vegetation complex.
- Habitat - all other Local Natural Areas that are found in the Shire of Mundaring

An additional analysis was undertaken to look at where the vegetation was located in the landscape based on connectivity. This criterion was based on whether vegetation occurred within the following landscape context:

- Regional Linkages - All portions of Local Natural Areas that occur within Regional Ecological Linkages defined in WALGA & PBP (2004).
- 20 m within watercourse - all portions of Local Natural Areas within 20 m of a mapped watercourse (i.e. forming a 40 m band centred on the watercourse).
- 20-50 m within watercourse - that portion of a Local Natural Area that is within the 20 – 50 band from a mapped watercourse, and

Further analysis was undertaken to deal with special features in the landscape, identifying vegetation patches that contained special features that include:
• Conservation Category Wetlands (CCWs) - Significant Wetlands
• Declared Rare Flora (DRF) and Specially Protected Fauna (SPF) and Priority Flora or Fauna
• Threatened Ecological Communities (TEC) – none recorded in the Shire

Landscape classification produced a Conservation priority areas Map (Figure 4) which classifies the landscape as outlined in Table 9.

### Table 9: Determination of Conservation priorities

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<th>Action</th>
<th>Classification encompasses</th>
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<td>Protect</td>
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<td>Regional Linkage over special features</td>
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<td>Regional Linkage over Habitat</td>
</tr>
<tr>
<td>Priority 2: Orange</td>
<td>Targeted retention and</td>
<td>Habitat Special features</td>
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<td>offset higher order if</td>
<td>Regional Linkages Within 20-50m of watercourse</td>
</tr>
<tr>
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<td>applicable</td>
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<td>Priority 3: Yellow</td>
<td>Offset lower order</td>
<td>Every other LNA</td>
</tr>
</tbody>
</table>

This mapping is recommended for use in the formulation of the Action Plan for the biodiversity strategy.
Appendix 7: Criteria used to assign LNAs to protection categories

Table 10: Determination of Protection Categories

<table>
<thead>
<tr>
<th>Protection category</th>
<th>LNAs in this category</th>
<th>Estimated LNA area in category (ha)</th>
<th>Conservation (ha)</th>
<th>Protection (ha)</th>
<th>Retention (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PROTECTION CATEGORY IDENTIFIED IN PROPOSED LOCAL PLANNING STRATEGY</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>1. CONSERVATION</strong></td>
<td>• Crown land vested for a Conservation Purpose</td>
<td>1065</td>
<td>1065</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Local Reserves for Conservation in proposed TPS 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Large LNAs (5 ha and greater) on RLL zoned lots where LSIP is yet to be presented⁶</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>2. PROTECTION</strong></td>
<td>Rural Landscape Living Zoned land with no subdivision potential where:</td>
<td>5829</td>
<td>5829</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• All lots 2ha and greater</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• All P1 and P2 on lots less than 2 ha</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>All Rural Landscape Living Zoned land with subdivision potential, except where proposed lots are less than 2 ha and LNA is P3, or LNA is over</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

⁶ Large LNAs (5 ha and greater) on RLL zoned lots where LSIP is yet to be presented⁶ these are not included in statistics as the LNAs conserved will be negotiated on a case-by-case basis based on site conditions.
<table>
<thead>
<tr>
<th>Protection category</th>
<th>LNAs in this category</th>
<th>Estimated LNA area in category (ha)</th>
<th>Conservation (ha)</th>
<th>Protection (ha)</th>
<th>Retention (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3. RETENTION</strong></td>
<td>All P3 LNAs on General Rural land and Rural Landscape Living land</td>
<td>511</td>
<td>0</td>
<td>511</td>
<td></td>
</tr>
<tr>
<td><strong>4. LIMITED PROTECTION /ALREADY COMMITTED BY ZONING</strong></td>
<td>Residential and Urban zoned land with P3 LNAs and no other known ecological values listed in Section 4.1 (including North Parkerville and North Stoneville Townsites Industrial zoned land Local Road Reserves)</td>
<td>579</td>
<td>0</td>
<td>58</td>
<td>10% retained</td>
</tr>
<tr>
<td><strong>5. TO BE DETERMINED/ NEGOTIATED:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>5A)</strong> Land Reserved for Public Purposes and vested in an agency other than the Shire</td>
<td>Public Purposes land vested in other agencies (e.g. Woorooloo Prison Farm)</td>
<td>837</td>
<td>419</td>
<td>419</td>
<td>50% Conservation, 50% Retention</td>
</tr>
<tr>
<td><strong>5B)</strong>: Proposed open space within the Parkerville and Stoneville Townsite Developments</td>
<td>Natural areas within land identified for Public Open Space within LSIPS (e.g. North Parkerville and North Stoneville)</td>
<td>169</td>
<td>85</td>
<td>85</td>
<td>50% Conservation, 50% Retention</td>
</tr>
<tr>
<td><strong>5C</strong> Residential LNAs on Residential zoned land</td>
<td></td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>50% Protection,</td>
</tr>
</tbody>
</table>

7 Does not included granite outcrops as these have not been mapped
<table>
<thead>
<tr>
<th>Protection category</th>
<th>LNAs in this category</th>
<th>Estimated LNA area in category (ha)</th>
<th>Conservation (ha)</th>
<th>Protection (ha)</th>
<th>Retention (ha)</th>
<th>Note: Minor variations in figures may occur due to rounding.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone: Priority or Declared Rare Flora, Priority Fauna, or Granite outcrops</td>
<td>with Priority or Declared Rare Flora, Priority Fauna, or Granite outcrops.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>50% Retention</td>
</tr>
<tr>
<td>5D) Special Purpose zones (other than Parkerville and Stoneville Townsite Developments)</td>
<td></td>
<td>75</td>
<td>38</td>
<td>38</td>
<td></td>
<td>50% Protection, 50% Retention</td>
</tr>
<tr>
<td>5E) Local Reserve for Recreation (in TPS4), Local Centre zone or road reserve.</td>
<td>Local Centres, POS for active recreation</td>
<td>108</td>
<td>81</td>
<td></td>
<td></td>
<td>75% Retention</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>9175</td>
<td>1570</td>
<td>5865</td>
<td>1190</td>
<td></td>
</tr>
</tbody>
</table>
Appendix 8: Principles of Offsetting

What is Ecological Offsetting?
An ecological offset is one or more actions put in place to counterbalance (offset) the impacts of development on biodiversity, habitats or functions. Such offsets have potential to deliver the maintenance of both local environmental values as well as an overall improvement in environmental values across a region.

Ecological Offsetting Actions
The actions that could be taken to offset impacts on ecological values need to be determined at a local level and need to contribute to the overall environmental objectives of a region. Actions which are commonly associated with ecological offsetting include:

- **Protection of habitat** - overall aim is to contribute to the number of hectares in the most secure tenure for conservation. The greatest gain in conservation security usually comes from the protection of private lands.

- **Enhancing habitat viability** - in addition to increasing the conservation security of habitat, it is important to increase the viability of habitat that has become degraded or isolated. Ensuring the health and integrity of habitat secured for conservation is a vital part of ensuring that protecting land is a successful mechanism for protecting and enhancing biodiversity. Example improvements to habitat viability are forming reserves that are large enough to support a wide suite of biodiversity, and creation (or enhancement) of ecological corridors.

- **Creating habitat** - to increase the area of important ecological communities creating new habitat in areas that are adjacent to existing habitat or in areas where there is a sound ecological reason to do so (e.g. corridor network or creek buffers). Any habitat creation works would have to be planned, appropriate, enforced and managed over time. Risks in the time delay to achieve habitat creation also need to be recognised.

- **Recreation**: this term is used to describe advanced revegetation where the objective is to re-establish as close to the full suite of flora species and structure of a vegetation community. Tree planting alone does not provide sufficient diversity in structure, habitat and plant species to support diverse wildlife.

- **Other**: a range of other actions could be included where these will support the outcomes proposed. For example, should little be known on the ecology or response to management of a threatened species or community, then funding of research to address those questions might be included as part of the offset package. Documentation and publication of management actions proposed, difficulties encountered, and the methods utilised to resolve these issues can assist the level of knowledge, and to make management more effective, and hence may be included to support an offset package.

Ecological Offsetting Principles
The following principles have been developed from various sources and experience in developing offsets for projects across Australia including the Shire of Hornsby (New South Wales).
Overriding Principle

1. Impacts must be avoided first by using prevention and mitigation measures, offsets are then used to address remaining impacts;

Mandatory

2. Offsets must be of more than equal value (quality, quantity) than the impact being compensated
3. Offsets must not be used as a substitute for assessment requirements
4. Offsets must redress the impact of the development for the time period that the impact occurs
5. Offsets must have security of tenure
6. Offsets must adopt a precautionary approach in assessing impacts and the benefits of offsets
7. Offset sites must be sought that include the values being impacted (e.g., same vegetation types, or threatened species), on a basis of like-for-like or better conservation outcome
8. Offsets must be underpinned by sound ecological principles
9. Offsets must be targeted and their environmental benefits must be reliably estimated
10. Offsets must go beyond existing requirements of other programs and not be already funded by another scheme
11. Offsets and their actions must be legally enforceable, transparent and made publicly available
12. Offsets should complement other government conservation programs

Desirable

13. Offsets should be agreed upon prior to the impact occurring
14. Offsets should aim to deliver a net improvement in biodiversity over time
15. Offsets located in proximity to the impact are preferred (i.e. same region)
16. The anticipated benefits should be benchmarked and regularly reported on
Appendix 9: Conservation Management Plan Outline

Information to accompany proposals

Where required, a Conservation Management Plan should be accompanied by sufficient information on the natural area’s values and the potential impacts of the development on the natural area.

Some proponents should be required to submit this information as part of their proposals. Council will need to determine what level of impact, or what values of natural areas may trigger this requirement. As a general guideline, all proposals impacting on the following natural area values should be considered to have a potentially high impact on biodiversity and be required to submit supporting information:

- Rare or At Risk vegetation complexes
- Natural Areas containing Special features (DRF, Specially Protected Fauna, Priority Flora or Fauna, CCWs, granite outcrops)
- Significant proposals impacting on any other Priority One or Two LNA should also be required to submit supporting information.

The format of supporting information for the above should generally include the Perth Biodiversity Project (PBP) Natural Area Initial Assessment Templates (WALGA & PBP, 2004). In some cases, only the desktop assessment may be required with limited fieldwork.

Proposals which are likely to impact other natural area values should be required to submit information in a simpler format. This could include proponents presenting text and scaled mapping which will generally include:

a. Identification of any natural area, other native vegetation, watercourses, and wetlands on the site;

b. Identification of those areas to be:
   i. cleared or impacted by the development, the reasons for same, and the values of this area;
   ii. Retained by the development, the reasons for same, and the values of this area;
   iii. Protected as part of the development, the reasons for same, and the values of this area;

c. Details of management of natural areas, rehabilitation of degraded native vegetation or revegetation of new areas; and

d. The measures to be taken to minimise the impact of any clearing on flora and fauna

Use of the PBP Natural Area Initial Assessment form by these proponents should still be encouraged.

---

8 Significant development proposals are those which propose to clear more than 0.2 hectare of native vegetation, or a subdivision that creates 3 or more lots. However, significant development proposals exclude any single house and associated structures (including outbuildings).
For any development, the Shire should provide applicants with an indication of how the proposal relates to the recommendations of the Shire’s Local Biodiversity Strategy.

In use of the above advice, the Shire should still set the level of information provision for any proposal on a case by case basis.

**Conservation Management Plans**

Requirements to prepare Conservation Management Plans should take into consideration the significance of natural areas to be impacted, retained or protected and the scale of the proposed development. Guidelines provided in Table 12 can be tailored to proposals of low, medium and high significance. Sites that are to be vested as public lands will generally require more detailed plans with clear commitments made by the proponent.

**Table 11: Guidelines for Conservation Management Plans**

<table>
<thead>
<tr>
<th>Management issue</th>
<th>Low significance of issue or natural area</th>
<th>Moderate significance of issue or natural area</th>
<th>High significance of issue or natural area</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Resilience of protected area: perimeter to area ratio</strong></td>
<td>Identify any parts of the natural area boundary that could be rehabilitated to make the site more resilient</td>
<td>Identify any parts of the natural area boundary that could be rehabilitated to make the site more resilient</td>
<td>Design the protected area to minimise the perimeter to area ratio. Identify any parts of the natural area boundary that could be rehabilitated to make the site more resilient.</td>
</tr>
<tr>
<td><strong>Disturbance throughout area or patches of disturbance</strong></td>
<td>Identify the vegetation in best condition and worst condition. Identify any dumped rubbish or fill. Remove</td>
<td>Map weeds and identify control options</td>
<td>Map weeds and vegetation condition.</td>
</tr>
<tr>
<td><strong>Weed control</strong></td>
<td>Identify key problem weeds and address control</td>
<td>Implement weed control program and commit to implementation</td>
<td>Develop weed control program and commit to implementation</td>
</tr>
<tr>
<td><strong>Access and tracks</strong></td>
<td>Reduce tracks to minimum.</td>
<td>Reduce tracks to minimum. Rehabilitate closed tracks</td>
<td>Reduce tracks to minimum. Rehabilitate closed tracks</td>
</tr>
<tr>
<td><strong>Fencing and physical protection</strong></td>
<td>Identify fencing, or demonstrate how area will be physically protected</td>
<td>Identify fencing, or demonstrate how area will be physically protected</td>
<td>Provide fencing appropriate to the development and use (e.g. control pedestrian access and movement)</td>
</tr>
<tr>
<td><strong>Fire history &amp; habitat</strong></td>
<td>When was the last known fire? Do not remove fallen logs.</td>
<td>When was the last known fire? Do not remove fallen logs.</td>
<td>Prepare a Fire Response Plan, for local fire fighters and Shire.</td>
</tr>
<tr>
<td>Management issue</td>
<td>Low significance of issue or natural area</td>
<td>Moderate significance of issue or natural area</td>
<td>High significance of issue or natural area</td>
</tr>
<tr>
<td>------------------</td>
<td>------------------------------------------</td>
<td>-----------------------------------------------</td>
<td>-------------------------------------------</td>
</tr>
<tr>
<td><strong>Fire management</strong></td>
<td>Do not fell standing timber unless dangerous</td>
<td>Do not fell standing timber unless dangerous</td>
<td></td>
</tr>
<tr>
<td><strong>Dieback</strong></td>
<td>Are there any noticeable deaths of plants? Are these species susceptible to dieback? Ensure disturbance and access to these areas is avoided.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Granite outcrops</strong></td>
<td>Identify, and demonstrate setbacks from outcrops</td>
<td>Identify, and ensure outcrops are buffered and protected from inappropriate use.</td>
<td>Identify, and ensure outcrops are buffered and protected from inappropriate use.</td>
</tr>
<tr>
<td><strong>Riparian zones</strong></td>
<td>Erosion issues? Demonstrate how runoff will be managed</td>
<td>Erosion issues? Demonstrate how runoff will be managed</td>
<td>Erosion issues? Demonstrate how runoff will be managed. Propose restoration of vegetation where necessary</td>
</tr>
<tr>
<td><strong>Feral animals</strong></td>
<td>Ensure that major feral species are controlled as per legislation (e.g. rabbits, foxes). Remove known warrens</td>
<td>Ensure that major feral species are controlled as per legislation (e.g. rabbits, foxes). Remove known warrens</td>
<td>Identify feral animals and make commitment to their ongoing control</td>
</tr>
</tbody>
</table>
Appendix 10: Ecological viability and resilience

The concept of ecological viability is very important for effective and efficient biodiversity conservation. Ecological viability is a measure of the ability of a natural area to be self-sustaining and support and maintain the full-range of species it naturally contains over a long time-frame, or at least 50 years (WALGA & PBP, 2004).

A locally-developed method to assess ecological viability is included in the Natural Area Initial Assessment (NAIA) Templates (Clarke & Cullity, 2003). This uses information on the natural area’s size, shape, perimeter to area ratio, condition and connectivity to determine its relative viability (Cullity & Clarke 2005).

It must be recognised that no protected natural area within the Perth Metropolitan Region is self-sustaining without some level of active human management. Therefore, it is important to consider what level of management input will be required and how the design of the protected area (and the development around it) can minimise its long-term management needs.

Whilst viability should not be used as the primary determining factor to select areas to be protected, the Shire should consider the following factors when assessing future protected areas:

- **Size** – There is no minimum size, however, larger reserves will generally require less management. Protected areas of four hectares in size will usually require a moderate level of management. There are many examples in the Shire of conservation reserves with good condition bushland which are smaller than 4 ha or with very high perimeter to area ratios; many small areas are often linked to other natural areas;

- **Perimeter to area ratio** – natural areas which are compact in size and shape, with a low perimeter to area ratio, are easier to manage than long or irregularly shaped areas;

- **Vegetation condition** – natural areas that have bushland assessed as being in Good or better condition require less management in the long-term; Bushland assessment can be using the methods of Keighery (1994) or Kaesehagen (1994); and

- **Connectivity** – natural areas which are within close proximity to other natural areas, located within a designated ecological linkage, or on a watercourse will be more ecologically viable than those that are not.
Protecting areas which may have a relatively low ecological viability will be important where:

- rare or threatened species or ecological communities must be protected;
- the vegetation complex is regionally rare and its prevailing condition is poor to fair; or
- the site is small or elongated and there are few other examples remaining of the vegetation complex.

Where the site is considered to have a low ecological viability, then works should be implemented to increase its resilience and viability. This may involve the restoration of the natural area and/or revegetation of a surrounding buffer where sites have been significantly cleared or degraded.
Appendix 11: Zone-specific guidance to protect LNAs

Table 12: Zone Specific LNA Protection Guidelines

<table>
<thead>
<tr>
<th>Land category (TPS No. 3 zonings)</th>
<th>Guidance / provisions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>1.1 Where possible, while maintaining an adequate recreational function of Public Open Space (POS), retain or protect LNAs in POS. Ecologically viable areas of Priority 1 and 2 LNAs that can be secured in POS should be included in a Local Reserve for Conservation in Town Planning Scheme No. 4.</td>
</tr>
<tr>
<td></td>
<td>1.2 For Public Open Space already created as part of subdivision, where there is sufficiently large intact Local Natural Area or a significant ecological value (e.g. Priority listed species), consider vesting for conservation purpose and reservation for Conservation in Town Planning Scheme No. 4.</td>
</tr>
<tr>
<td>Rural Landscape Living (no subdivision potential)</td>
<td>2.1 Where considering zoning new land for rural residential subdivision or other subdivision/development, avoid land wholly or primarily comprising Local Natural Areas.</td>
</tr>
<tr>
<td></td>
<td>2.2 Where considering zoning new land for rural residential subdivision, require subdivision to maximise protection of Local Natural Areas identified in the Local Planning Strategy for Protection or Retention, with such Local Natural Areas to be located, as far as practicable, in a large intact parcel or parcels. Cluster forms of subdivision may be required to achieve this end. Council may consider supporting a lot bonus for such cluster subdivision if a bonus is demonstrated to be necessary for a cluster subdivision to be viable and that the required cluster subdivision would result in a clearly improved biodiversity outcome compared to conventional subdivision. The protected LNAs are to be formally protected via conservation covenant recognised by the Scheme, or within a Crown Reserve.</td>
</tr>
<tr>
<td></td>
<td>2.3 Scheme provisions for all land in Rural Landscape Living (or TPS4 equivalent) will require that:</td>
</tr>
<tr>
<td></td>
<td>• All development is to be located outside of a Local Natural Area if possible. Approval for a Single House requiring clearing of a Local Natural Area will only be granted where an alternative location is not viable, practical or</td>
</tr>
</tbody>
</table>

9 Guidance on ecologically viable natural areas is included in Appendix 10.

10 An action is included in the Action table to investigate the need for a specific zone or overlay in the Scheme to recognize LNAs formally protected as part of a planning decision.
<table>
<thead>
<tr>
<th><strong>Rural Landscape Living (has subdivision potential and approved LSIP)</strong></th>
<th><strong>2.4</strong> For Public Open Space already created as part of subdivision, where there is sufficiently large intact Local Natural Area, consider vesting for conservation purpose and reservation for Conservation in TPS4.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2.5</strong> Consider offering Local Natural Area management assistance (private land conservation incentives), with an emphasis on P1 and P2 Local Natural Areas.</td>
<td></td>
</tr>
<tr>
<td><strong>2.6</strong> Review Local Subdivision and Infrastructure Plans (LSIPs) to identify any warranting revision to better achieve retention and protection of Local Natural Areas. For those LSIPs identified, encourage or require a revised LSIP for subdivision to maximise retention of Local Natural Areas identified in the Local Planning Strategy for Protection or Retention, with such Local Natural Areas to be located, as far as practicable, in a large intact parcel or parcels. Cluster forms of subdivision are encouraged to achieve this end. Council may consider supporting a lot bonus for such cluster subdivision if a bonus is demonstrated to be necessary for a cluster subdivision to be viable.</td>
<td><strong>2.7</strong> Achieve Conservation of large intact portions of Local Natural Areas achieved through subdivision (particularly cluster subdivision), through Public Open Space being vested for conservation purposes or through requiring covenanting of sufficiently large parcels of Local Natural Area retained intact on a privately owned lot.</td>
</tr>
<tr>
<td><strong>2.8</strong> Scheme provisions for all land in Rural Landscape Living (or TPS4 equivalent):</td>
<td></td>
</tr>
<tr>
<td>• All development is to be located outside of a Local Natural Area if possible. Approval for a Single House requiring clearing of a Local Natural Area will only be granted where an alternative location is not viable, practical or environmentally suitable.</td>
<td><strong>2.9</strong> Consider offering Local Natural Area management assistance (private land conservation incentives), with an emphasis on P1 and P2 Local Natural Areas.</td>
</tr>
<tr>
<td>• No other clearing of native vegetation shall take place within a Local Natural Area, except for unavoidable clearing necessary for fencing or vehicular access or bushfire safety purposes.</td>
<td><strong>2.10</strong> Require subdivision to maximise retention of Local Natural Areas identified in the Local Planning Strategy.</td>
</tr>
<tr>
<td>Subdivision potential but no approved LSIP</td>
<td>for Protection or Retention, with such Local Natural Areas to be located, as far as practicable, in a large intact parcel or parcels. Cluster forms of subdivision are encouraged to achieve this end. Council may consider supporting a lot bonus for such cluster subdivision if and only if a bonus is demonstrated to be necessary for a cluster subdivision to be viable and that the cluster subdivision will result in a clearly improved biodiversity outcome.</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>2.11 Achieve Conservation of large intact portions of Local Natural Areas achieved through subdivision (particularly cluster subdivision), through Public Open Space being vested for conservation purposes or through requiring covenanting of sufficiently large parcels of Local Natural Area retained intact on a privately owned lot.</td>
<td></td>
</tr>
<tr>
<td>2.12 Scheme provisions for all land in Rural Landscape Living (or TPS4 equivalent):</td>
<td><strong>Scheme provisions for all land in Rural Landscape Living (or TPS4 equivalent):</strong></td>
</tr>
<tr>
<td></td>
<td>• All development is to be located outside of a Local Natural Area if possible. Approval for a Single House requiring clearing of a Local Natural Area will only be granted where an alternative location is not viable, practical or environmentally suitable.</td>
</tr>
<tr>
<td></td>
<td>• No other clearing of native vegetation shall take place within a Local Natural Area, except for unavoidable clearing necessary for fencing or vehicular access or bushfire safety purposes.</td>
</tr>
<tr>
<td>2.13 Consider offering Local Natural Area management assistance (private land conservation incentives), with an emphasis on P1 and P2 Local Natural Areas.</td>
<td><strong>General Rural</strong></td>
</tr>
<tr>
<td>3.1 Scheme provisions for land remaining in General Rural (or TPS4 equivalent):</td>
<td><strong>Scheme provisions for land remaining in General Rural (or TPS4 equivalent):</strong></td>
</tr>
<tr>
<td></td>
<td>• All development shall be located outside of Local Natural Areas identified for Protection or Retention. Approval for a Single House requiring clearing of a Local Natural Area identified for Protection or Retention will only be granted where an alternative location is not practical or environmentally suitable.</td>
</tr>
<tr>
<td></td>
<td>• No other clearing of native vegetation shall take place within a Local Natural Area, except for unavoidable clearing necessary for fencing or vehicular access or bushfire safety purposes.</td>
</tr>
<tr>
<td>3.2 For sufficiently large and intact Local Natural Areas identified in the Local Planning Strategy for Protection or Retention, consider requiring conservation</td>
<td><strong>For sufficiently large and intact Local Natural Areas identified in the Local Planning Strategy for Protection or Retention, consider requiring conservation</strong></td>
</tr>
<tr>
<td>3.3</td>
<td>Where considering zoning new land for rural residential subdivision or other subdivision/development, avoid land wholly or primarily comprising Local Natural Areas.</td>
</tr>
<tr>
<td>3.4</td>
<td>Where considering zoning new land for rural residential subdivision, require subdivision to maximise retention of Local Natural Areas identified in the Local Planning Strategy for Protection or Retention, with such Local Natural Areas to be located, as far as practicable, in a large intact parcel or parcels. Cluster forms of subdivision are encouraged to achieve this end. Council may consider supporting a lot bonus for such cluster subdivision if and only if a bonus is demonstrated to be necessary for a cluster subdivision to be viable and that the cluster subdivision will result in a clearly improved biodiversity outcome.</td>
</tr>
<tr>
<td>3.5</td>
<td>Consider offering Local Natural Area management assistance (private land conservation incentives), with an emphasis on P1 and P2 Local Natural Areas.</td>
</tr>
</tbody>
</table>

**Special Purpose zones**

| 4.1 | Parkerville Townsite Development and Stoneville Townsite Development: For rural residential lots, apply the same Scheme provisions as applied to the Rural Landscape Living zone (or TPS4 equivalents) – see above. |
| 4.2 | Parkerville Townsite Development and Stoneville Townsite Development: For those areas currently zoned Urban Deferred in the Metropolitan Region Scheme, seek to maintain or improve the retention and protection of Local Natural Areas should any review of the Local Subdivision and Infrastructure Plans take place if and when the Urban Deferment is lifted. |
| 4.3 | Parkerville Townsite Development and Stoneville Townsite Development: Local Natural Areas within those areas currently zoned Urban Deferred have not been identified for Conservation, Protection or Retention in this Strategy at this stage. However, Local Natural Areas within the proposed Public Open Space for each townsite should be added to the Conservation and Retention categories, subject to land use planning and management processes. |
| 4.4 | Parkerville Townsite Development and Stoneville Townsite Development: If and when Urban Deferment is lifted and development and subdivision takes place, consider vesting Public Open Space primarily containing Local Natural Areas for a conservation purpose and including in the Local Reserve for Conservation in Town Planning Scheme No. 4. |
| 4.5 | For other Special Purpose zones, assess whether Local Natural Areas exist which will not be required to be... |
cleared to accommodate the development provided for by the prescribed use or purpose in the Scheme. If such Local Natural Areas exist, consider an additional Condition in Town Planning Scheme No. 4 to retain the Local Natural Area; also consider negotiation with landowners or vesting authorities to pursue conservation covenanting if there is a sufficiently large intact area of P1 or P2 Local Natural Area.

<table>
<thead>
<tr>
<th>Reserved land</th>
<th>5.1</th>
<th>Include existing large intact Local Natural Areas in Public Open Space within a Local Reserve for Conservation in TPS4.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5.2</td>
<td>Retain other Local Natural Areas on land vested in or managed by the Shire except where land is definitely required for another purpose and alternative location on cleared land not possible or practicable.</td>
</tr>
<tr>
<td></td>
<td>5.3</td>
<td>Manage Local Natural Areas for conservation where on land vested in or managed by the Shire.</td>
</tr>
<tr>
<td></td>
<td>5.4</td>
<td>Liaise with relevant government agencies over the management of other reserved land owned, vested in or managed by other government agencies (including Public Purposes reserves). Pursue possibility of conservation covenanting over Local Natural Areas where supported by the relevant agencies.</td>
</tr>
</tbody>
</table>
Appendix 12: Mapping

Figure 7: Location of Shire of Mundaring
Figure 9: Vegetation complex mapping, Shire of Mundaring
Figure 11: Development potential over Rare and At Risk Vegetation Complexes

Legend:
- Regional Ecological Linkage
- Local Ecological Linkage
- Subdivision Potential
- Local Subdivision and Infrastructure Plan
- Watercourse
- Local Natural Area
- Remnant Vegetation Complex
  - 0: Forestfield
  - 9: Guildford
  - 12: Southern River
  - 14: Swan

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