



Shire of
Serpentine
Jarrahdale

Local Biodiversity Strategy

Update Report 2019

*Final - December 2019 prepared by the Shire of Serpentine Jarrahdale
Original Strategy (2008) prepared by Ironbark Environmental*



Contents

Executive Summary	3
1. Introduction.....	4
1.1 <i>What is a Local Biodiversity Strategy?</i>	4
1.2 <i>The Shire of Serpentine Jarrahdale’s Local Biodiversity Strategy</i>	4
2. The 2008 Strategy.....	6
2.1 <i>Summary of Findings</i>	6
2.2 <i>Goals and Targets</i>	6
2.3 <i>Action Plan</i>	8
3. Implementation of the 2008 Strategy	11
3.1 <i>Update of Mapping and Vegetation Statistics</i>	11
3.2 <i>Status of Goals and Targets</i>	13
3.3 <i>Status of Action Plan</i>	15
4. An Update for 2019	19
4.1 <i>Mapping and Statistics</i>	19
4.2 <i>Goals and Targets</i>	19
4.3 <i>Action Plan</i>	21
5. Conclusions	24
6. Glossary	25
7. References	27
Appendix 1: Threatened Ecological Communities (TECs)	28
Appendix 2: Threatened and Priority Fauna	29
Appendix 3: Threatened and Priority Flora	31
Appendix 4: Location of Vegetation Complexes	32

Executive Summary

The purpose of this report is to review the implementation of the Shire of Serpentine Jarrahdale's Local Biodiversity Strategy (the Strategy) over the last ten years, and to propose a revised set of goals, targets and actions for the next ten years.

Despite ten years of implementation of the Local Biodiversity Strategy, the loss of natural areas in the Shire has only accelerated. Given the Shire's rapid and increasing development, remnant vegetation and biodiversity is under significant threat that has not abated despite the implementation of the Strategy. An updated and relevant Local Biodiversity Strategy is therefore essential if natural areas are to be retained and the variety of nature protected.

In 2006, the Shire committed to preparing a Local Biodiversity Strategy to protect local areas of bushland, wetlands and vegetated waterways. The major driver for the preparation of the original Strategy was community concern that existing environmental laws were often not being enforced and natural areas were being cleared and damaged as a result. The Local Biodiversity Strategy was adopted by Council in 2008.

The Strategy focused on 6333 ha of local natural areas in the Shire. These were areas of bushland and vegetated wetlands and waterways on private lands and local reserves. Natural areas controlled by the State Government, such as State Forest, National and Regional Parks, and State Reserves, are not considered by the Strategy as their management is a State responsibility which the Shire has little ability to influence. The Strategy emphasized that action was urgent in order to prevent the further loss of natural areas and protect the variety of nature for the long-term.

To halt the further loss of natural areas and conserve biodiversity, the Strategy proposed four goals to retain, protect and manage Local Natural Areas. A number of targets were proposed under each goal, and an action plan was established to achieve the goals and targets.

On analysis of the available data, it was found that over a period of seven years after the Strategy was produced (2010-2016), the area of vegetation lost was nine times that in the eight years previous (2002-2009). This apparent increase in vegetation loss may be partly due to two intervening changes in mapping methodology, but still represents a greatly increased rate of clearing.

As a review of the original Strategy, new goals and targets for the next ten years are proposed. These take into account the original goals and targets of the 2008 Strategy, but reorganize them into Focus Areas with targets to retain, protect and enhance the values of the specific focus area. A new action plan is proposed, to achieve the new goals and targets.

Given that the Shire is undergoing rapid and increasing development, the Shire's remnant vegetation and biodiversity is under significant threat as this development proceeds. It is therefore essential that the Shire have an updated and relevant Local Biodiversity Strategy to guide the retention, protection and enhancement of its remnant vegetation and biodiversity into the future.

1. Introduction

The purpose of this report is to review the implementation of the Shire of Serpentine Jarrahdale's Local Biodiversity Strategy (the Strategy) over the last ten years, and to propose a revised set of goals, targets and actions for the next ten years.

This update is provided as a report rather than a revision of the entire Strategy, as the majority of the information provided in the Strategy is still current. To continue implementation of the Strategy, it is only necessary to report on and update the remnant vegetation statistics, the listing of Threatened species and communities, and the Strategy's goals, targets and actions.

The 2008 Strategy should be consulted for additional information to supplement the brief contents of this report. A map of the location of vegetation complexes is provided in Appendix 4.

1.1 What is a Local Biodiversity Strategy?

A Local Biodiversity Strategy is a non-statutory document that sets long-term targets and short-term actions to protect significant natural areas across public and private lands. It is complementary to existing environmental and planning laws, but does not replace them.

A Local Biodiversity Strategy applies to Local Natural Areas (LNAs), Bush Forever areas in private ownership, and Bush Forever areas under Council management. Local Natural Areas are the areas of native vegetation outside of the public conservation estate or Bush Forever areas, and are generally found on private land and local reserves.

Natural areas controlled by the State Government (such as State Forest, National and Regional Parks, and State Reserves) are not considered by a Local Biodiversity Strategy as their management is a State responsibility which the Shire has little ability to influence. A Local Biodiversity Strategy focuses on Local Natural Areas for which the Shire has responsibility or which are privately owned.

Local Biodiversity Strategies, however, should form part of and be set in the context of local or regional planning. State Planning Policy 2.8 Bushland Policy for the Perth Metropolitan Region (SPP2.8) provides a policy and implementation framework to ensure protection and management issues are appropriately addressed.

1.2 The Shire of Serpentine Jarrahdale's Local Biodiversity Strategy

In 2006, the Shire committed to preparing a Local Biodiversity Strategy to protect local areas of bushland, wetlands and vegetated waterways, especially where they have significant ecological features. The Strategy was developed in accordance with guidelines produced by the WA Local Government Association (WALGA) and the associated Perth Biodiversity Project (PBP).

The major driver for the preparation of the Strategy was community concern that existing environmental laws were often not being enforced and natural areas were being cleared and damaged as a result. Many of these laws are enforced by the State government according to state and regional priorities, and often do not address local concerns. Another factor was the lack of resources to enforce local laws and planning conditions. The intent of the Strategy was to set local priorities and laws that could be enforced through the Local Planning Scheme.

The Local Biodiversity Strategy was adopted by Council in 2008. It is therefore timely that a ten-year update be carried out, particularly in light of the ongoing loss of Local Natural Areas.

During the ten years in which the Local Biodiversity Strategy has been operational, a number of other Shire strategies and policies have been developed which intersect with this Strategy in terms of common goals and implementation of actions (either in terms of preparation to implement actions from other documents, or of common actions arising from different purposes). These include:

- Biodiversity Incentives Strategy
- Biodiversity Planning Policy
- Climate Change Strategy and Local Action Plan
- Natural Assets Management Plan
- Weed and Pest Management Plan
- Urban and Rural Forest Strategy
- State of the Environment Report

1.3 Structure of this Report

This report will review the implementation of the Shire's Local Biodiversity Strategy over the last ten years, and propose a revised set of goals, targets and actions for the next ten years. The structure of the report is as follows:

- Summary of the findings of the 2008 Strategy, and its goals, targets and actions (Chapter 2)
- Report on the implementation of the 2008 Strategy (Chapter 3)
- Updated statistics, goals, targets and actions for 2019 (Chapter 4)
- Updated listing of Threatened and Priority Ecological Communities, Fauna and Flora (Appendices 1 – 3)

2. The 2008 Strategy

2.1 Summary of Findings

The Local Biodiversity Strategy (the 2008 Strategy) presented a number of proposals for greater protection and management of natural areas throughout the Shire. It was developed over a 12-month process including a 3-month public comment period.

The Strategy focused on 6333 ha of natural areas in the Shire – areas of bushland and vegetated wetlands and waterways on private lands and local reserves. 5986 ha of these natural areas were on private lands, making the support of landowners critical to the implementation of the Strategy.

“The Shire is within one of the world’s 25 biodiversity hotspots, recognised because of the diversity of species, their uniqueness and the threats our bushland is under.... These biodiversity values are especially important in the corridor between Byford and Keysbrook, which forms part of the eastern side of the Swan Coastal Plain.

“Natural areas and biodiversity in the Shire have been significantly impacted since European settlement, especially on the coastal plain and foothills. On land west of South West Highway, only 4503 ha (or 11%) of the original 40,466 ha of native vegetation remains. This level of over-clearing, coupled with the impact of feral animals and other degrading processes, has resulted in significant local extinction of mammals and birds and the deterioration of bushland and wetlands. It has also contributed to the pollution of downstream rivers and the Peel-Harvey-Estuary.” Local Biodiversity Strategy, p.7

The 2008 Strategy emphasized that action was urgent in order to prevent the further loss of natural areas and protect the variety of nature for the long-term. The Shire is going through a massive growth phase and it is estimated that by 2036 the population will more than triple to 68,335 residents (having already doubled from 13,246 in 2006 to 29,361 in 2017). This phenomenal growth poses a significant challenge to the conservation of biodiversity, but also provides a number of opportunities as land use changes from rural to more intensive uses.

2.2 Goals and Targets

The 2008 Strategy proposed four goals to retain, protect and manage Local Natural Areas:

Retention

Goal 1: Prevent the further loss of Local Natural Areas. This goal aims to retain at least 4000 hectares of Local Natural Areas in the Shire.

Protection

Goal 2: Protect and manage a portion of each basic type of vegetation and ecosystem typical of the Shire. Approximately 1690 hectares of Local Natural Area would be protected to meet this goal.

Goal 3: Protect specific ecological features and processes including rare species, threatened ecological communities, wetland vegetation and ecological linkages throughout the Shire.

Management and restoration

Goal 4: Manage and restore Local Natural Areas and revegetate new areas to increase native fauna habitat.

No.	Target
3E	Waterways and riparian vegetation: Protect 10% of Verified Riparian Natural Areas within 5 years and 20% within 10 years.
3F	Regional and Local Ecological Linkages: Protect 15% of natural areas on Regional Ecological Linkages within 5 years. All other rivers and creeks in the Shire are to be regarded as Local Ecological Linkages.
Management and restoration	
Goal 4: Manage and restore Local Natural Areas and revegetate new areas to increase native fauna habitat.	
4	Management and restoration of Local Natural Areas.
4A	Prepare a 5-year Management Strategy for all natural areas vested or owned by Council within 3 years.
4B	All natural areas under Council vesting or ownership are actively managed for conservation in accordance with a 5-year Management Strategy within 8 years.
4C	All significant development proposals provide a Natural Area Management Plan to restore and manage biodiversity values on subject lands.
4D	Half of all LNAs are actively managed for conservation or form part of a stewardship program within 20 years (i.e. approximately 2260 ha of 4521 ha).
4E	Restore 10% of Verified Riparian Natural Areas within 5 years and 20% within 10 years.
4F	Fence 20 kilometres of coastal plain Verified Riparian Natural Areas, or 10 hectares of riparian vegetation, within 5 years, and restore and actively manage these areas.
4G	Restore and actively manage 15% of natural areas on Regional Ecological Linkages within 5 years.
4H	Where more than 500 metres exists between resilient natural areas on Regional Ecological Linkages, support ecological revegetation projects to create habitat stepping stones along Regional Ecological Linkages.

2.3 Action Plan

The 2008 Local Biodiversity Strategy established an action plan to achieve its goals and targets (Table 2).

Table 2: Action Plan for the 2008 Local Biodiversity Strategy

No.	Action	Related Goals / Resourcing
Actions 2008 - 2011		
Strategy establishment and public awareness raising		
1	Consult the Department for Planning and Infrastructure, the Department of Environment and Conservation, and other relevant State Government agencies, on appropriate mechanisms for achieving local biodiversity targets.	Goals 1, 2 and 3 and all related targets. Resources: Officer time; may require additional public consultation period.
2	Incorporate the goals, targets and actions of the Local Biodiversity Strategy into the Shire's Local Planning Strategy as it is developed.	Goals 1, 2 and 3 and all related targets. Resources: Included as part of Local Planning Strategy development.
3	Prepare a simple guide to inform the community of the Local Biodiversity Strategy once it is finalised.	Resources: Budget required for public awareness raising.
4	Establish a system to manage information collected on Local Natural Areas. Ensure information is collected using the NAIA templates and entered into an inventory.	Resources: To be achieved with the support of the WA Local Government Association and the South West Biodiversity Project.
Retention and protection of natural areas		
5	Assess all native vegetation to identify those areas that meet the definition of natural area, and those areas that are better described as 'other native vegetation'.	Goals 1, 2, 3 and all related targets. Resources: Aerial photo interpretation, with limited field verification.

No.	Action	Related Goals / Resourcing
6	Investigate developing an amendment to the Scheme to introduce a special control area over all significant natural areas, the proposed Natural Area Special Control Area.	Goals 1, 2 and 3 and all related targets. Resources: Can be achieved through a combination of new and existing funds.
7	Make any necessary changes to the Scheme to allow for subdivisions for conservation and cluster-style subdivisions with the support of the WA Planning Commission.	Goals 2 and 3 and related targets. The WAPC will need to support changes to the scheme to allow the 40 ha minimum lot size to be changed for Conservation Zone lots.
Incentives for protection and management		
8	As part of the Shire's Local Planning Strategy, progress opportunities for subdivisions for conservation in large rural lots and smaller rural lots. Develop criteria and opportunities for innovative subdivision in the rural zone to protect natural areas. This will include a desktop analysis of the size of natural areas on Rural Zoned Land, and field assessment for interested landowners.	Goals 2 and 3 and related targets. Resources: Initial external funding received for development of Local Planning Policy/ policy to cover conservation subdivisions. Consideration must be given to WAPC Development Control Policy 3.5 Rural Subdivisions.
9	Conduct formal review of the existing Conservation Zone initiative to enable its possible expansion to other natural areas of high significance.	Goals 2 and 3 and related targets. Resources: Can be achieved through re-allocation of existing resources.
10	Investigate options for delivery of a Stewardship Program, tailored to landholders in the Shire and the Strategy's targets. The program could be linked to a grants program.	Goal 4 and especially Target 4D. The program should also include provision of on-site advice to all landowners with Local Natural Areas that meet biodiversity targets / criteria.
11	Subject to a resolution to establish a Stewardship Program above, develop partnerships to arrange delivery of the program.	Goal 4 and especially Target 4D. Options include use of an existing program such as Land for Wildlife, or Wetland Watch, or development of agreement with SJ Community Landcare Centre. Extra funding will be required, and external funding may also be attracted.
12	For rural lots less than 40 hectares, the Shire should trial at least one strata cluster subdivision for conservation, possibly using a cluster-style subdivision approach.	Goals 2, 3 and related targets. Goal 4 and Target 4C. Resources: May be achieved through re-allocation of existing resources.
13	For rural lots greater than 40 hectares, the Shire should trial at least one subdivision for conservation.	Goals 2 and 3 Resources: Can be achieved through re-allocation of existing resources.
Policies and practices		
14	Investigate preparation of a Local Planning Policy (LPP) for Biodiversity Conservation. The LPP should cover all development which has the potential to impact on the Strategy's targets.	All Goals. All targets under Goals 1, 2 and 3, and Target 4C under Goal 4. Resources: External funding has been obtained to prepare a draft LPP.
15	Trial the LPP in a number of development settings where a significant impact on natural areas may occur (For example, urban structure planning, rural subdivision, and special rural subdivision).	Goals 1, 2 and 3. Resources: Can be achieved through re-allocation of existing resources. External funding has also been received to commence this action.
16	Allocate resources to implement the LPP, particularly the verification of ecological assessments.	Goals 1, 2 and 3. Resources: Can be achieved through re-allocation of existing resources.

No.	Action	Related Goals / Resourcing
17	Raise developer's awareness of the LPP's requirements.	Resources: Preparation of an Info-note or similar as part of release of draft LPP.
18	Negotiate with urban developers of the future Mundijong/Whitby area to secure Local Biodiversity targets through the District Structure Plan, for example, by including statutory provisions for protection and buffering of natural areas.	Goals 2 and 3. Resources: Can be achieved as part of Mundijong District Structure planning process and other townsite structure planning processes.
Protection and management of local reserves		
19	Assess all reserves with natural areas (28 reserves) using the Natural Area Initial Assessment (NAIA) templates.	Goal 4, Target 4A. Resources: Can be achieved through re-allocation of existing resources plus matched funding with SWBP and allocation of funds for specialist ecological assessment.
20	Determine management priorities using information collected through NAIA templates, and develop a 5-year management strategy for Council reserves. In the interim, continue to use existing information and biodiversity targets to carry out priority management actions.	Goals 4, Target 4B. Resources: Can be achieved through re-allocation of existing resources. (Note: This may require reclassification of the vested purpose for some reserves – e.g. from recreation to conservation).
Medium term priorities (Year 2012 – 2015)		
21	Review and update Local Natural Area mapping & statistics.	
22	Review the Stewardship Program and Incentives schemes strategies in the concept of a 5 year rolling plan.	
23	Report to the community on progress of the implementation of the Local Biodiversity Strategy. Use this as an opportunity to raise awareness of the Shire's high biodiversity.	
24	Re-prioritise management of all reserves in the context of a 5-year rolling plan.	
25	Prepare strategic local reserves financial plan for management and improvements to be undertaken in the context of a 5-year rolling plan.	
26	Consider rationalisation of low value natural area reserves to generate funds or allow for trade offs for protection or management of other sites.	
27	Carry out changes to vested purposes of reserves to incorporate 'conservation' where appropriate.	
28	Identify unvested reserves or Special Purpose reserves with high biodiversity values. Seek State Government support for their reclassification to Class A reserves with a Conservation purpose.	

3. Implementation of the 2008 Strategy

3.1 Update of Mapping and Remnant Vegetation Statistics

Despite ten years of implementation of the 2008 Strategy, loss of natural areas in the Shire is continuing and accelerating. Over a period of seven years after the Strategy was produced (2010-2016), the area of vegetation lost was nine times that in the eight years previous (2002-2009). This total clearing figure includes the areas of State-managed and controlled land which are not covered by the Strategy as they are the responsibility of the State government.

This analysis of clearing rates over time is accurate despite technical issues that prevent direct comparison of current remnant vegetation statistics with the statistics presented in the 2008 Strategy. The technical issues relate to two intervening changes in the way remnant vegetation is mapped and reported.

Firstly, in 2010 the department responsible for mapping native vegetation (the then Department of Agriculture and Food Western Australia) changed its mapping methodology. The accuracy of the mapping was improved, but some areas previously mapped as native vegetation were removed, while other additional areas were added, and the mapping boundaries were adjusted. Therefore, direct comparison of pre- and post-2010 data does not give the real loss of vegetation for an area. Some apparent losses of vegetation are due to declassification of areas of native vegetation or boundary adjustments, while there are also apparent gains of vegetation for the same reasons.

Secondly, in 2016 the department responsible for mapping vegetation complexes (the Department of Biodiversity, Conservation and Attractions) updated its mapping. This resulted primarily in changes to the mapped vegetation complexes in some areas, most significantly that many areas previously mapped as Darling Scarp Complex are now mapped as Forrestfield Complex. Direct comparison of pre- and post-2016 data also does not give the real loss of vegetation for an area. Some apparent losses of vegetation are due to reclassification of an area as a different vegetation complex, while there are also apparent gains of vegetation for the same reason.

There are therefore two time periods for which reporting of vegetation loss is possible. Firstly, a summary of vegetation loss (for some but not all vegetation complexes) for the period 2002 to 2009 was provided by DAFWA in 2010 that considers the altered mapping methodology. Secondly, direct comparisons between the 2010 and 2016 data can provide a subsequent summary of vegetation loss. Inclusion of more recent vegetation data (2017) provides misleading results, including an apparent gain in area of some vegetation complexes due to the reclassification in 2016.

Two tables of vegetation reporting are presented here. Table 3 compares the 2006 data used in the 2008 Strategy with the most recent available figures (2017), but as this covers the period during which the two changes in mapping methodology occurred the results are misleading. Table 4 presents vegetation loss for the periods 2002-2009 and 2010-2016, and a cumulative total of vegetation loss for 2002-2016. The cumulative total is also misleading, as it covers the period during which the first change in mapping methodology occurred. However, vegetation loss from 2010-2016 can be used as an approximation of vegetation loss since the 2008 Strategy was produced.

No conclusions can be drawn from Table 3, as the results are misleading due to the two changes in mapping methodology. This data does, however, provide a basis for future monitoring of remnant vegetation area and loss.

Table 4, however, provides a general picture of vegetation loss prior to and following the production of the 2008 Strategy. Over a period of seven years after the Strategy was produced (2010-2016), the area of vegetation lost was nine times that in the eight years previous (2002-2009). This increase in vegetation loss may be partly due to the two changes in mapping methodology, but still represents an increased rate of clearing. Given that the Shire is undergoing rapid and increasing development, the Shire's remnant vegetation and biodiversity is under significant threat as this development proceeds.

Table 3: Remnant Vegetation Extent – Comparison of 2006 Data (from 2008 Local Biodiversity Strategy) with 2017 Data (most recently available)*

Vegetation complex	Original extent in Shire before clearing (ha) (2006 data)	Remnant extent in Shire 2006 (ha)	Original extent in Shire before clearing (ha) (2017 data)	Remnant extent in Shire 2017 (ha)
<i>SWAN COASTAL PLAIN</i>	36,338	4,237 (11.7%)	36,071	4,598 (12.7%)
Bassendean Central and South Complex	9,854	2,707 (27%)	9,852	3,083 (31%)
Beermullah Complex	3,691	40 (1%)	3,683	44 (1%)
Dardanup Complex	1,113	148 (13%)	1,113	195 (17%)
Guildford Complex	13,244	611 (5%)	1,2987	525 (4%)
Serpentine River Complex	783	51 (7%)	783	80 (10%)
Southern River Complex	7,653	680 (9%)	7,653	672 (9%)
<i>FOOTHILLS</i>	4,128	266 (6%)	4,515	411 (9%)
Forrestfield Complex	4,128	266 (6%)	4,515	411 (9%)
<i>DARLING SCARP</i>	4,175	2,100 (50%)	4,046	2,323 (57%)
Darling Scarp Complex	4,175	2,100 (50%)	4,046	2,323 (57%)
<i>DARLING PLATEAU</i>	45,336	41,571 (91.7%)	45,358	39,456 (87.0%)
Cooke Complex	914	900 (99%)	919	810 (88%)
Dwellingup 1 Complex	11,030	10,536 (96%)	11,036	9,324 (84%)
Dwellingup 2 Complex	11,398	10,676 (94%)	11,397	10,141 (88%)
Goonaping Complex	304	283 (93%)	304	289 (95%)
Helena 1 Complex	599	592 (99%)	599	512 (85%)
Murray 1 Complex	8,530	6,996 (82%)	8,542	7,096 (83%)
Swamp Complex	1,797	1,670 (93%)	1,797	1,580 (89%)
Yarragil 1 Complex	4,734	4,224 (89%)	4,732	4,121 (87%)
Yarragil 2 Complex	6,030	5,694 (94%)	6,032	5,583 (92%)
Total	89,977	48,174 (53.5%)	89,989	46,788 (52.0%)

*Covers the period when the two changes in mapping methodology occurred

Table 4: Loss of Remnant Vegetation for the Period 2002 to 2016

Vegetation complex	Vegetation loss 2002-2009 (ha)	Vegetation loss 2010-2016 (ha)	Vegetation loss 2002-2016 (ha)*
<i>SWAN COASTAL PLAIN</i>	220 (0.6%)	291 (0.8%)	511 (1.4%)
Bassendean Central and South Complex	157 (1.6%)	154 (1.6%)	311 (3.2)
Beermullah Complex	4 (0.1%)	5 (0.1%)	9 (0.2%)
Dardanup Complex		4 (0.4%)	4 (0.4%)
Guildford Complex	28 (0.2%)	46 (0.3%)	74 (0.6%)
Serpentine River Complex		3 (0.4%)	3 (0.4%)
Southern River Complex	31 (0.4%)	79 (1.0%)	110 (1.4%)

FOOTHILLS	20 (0.5%)	17 (0.4%)	37 (0.9%)
Forrestfield Complex	20 (0.5%)	17 (0.4%)	37 (0.9%)
DARLING SCARP	2 (0.05%)	24 (0.6%)	26 (0.6%)
Darling Scarp Complex	2 (0.05%)	24 (0.6%)	26 (0.6%)
DARLING PLATEAU	21 (0.05%)	2,078 (4.6%)	2,099 (4.6%)
Cooke Complex		66 (7.2%)	66 (7.2%)
Dwellingup 1 Complex	21 (0.2%)	1,102 (10.0%)	1,123 (10.2%)
Dwellingup 2 Complex		613 (5.4%)	613 (5.4%)
Goonaping Complex		0 (0%)	0 (0%)
Helena 1 Complex		1 (0.2%)	1 (0.2%)
Murray 1 Complex	0.3 (0%)	57 (0.7%)	57 (0.7%)
Swamp Complex		27 (1.5%)	27 (1.5%)
Yarragil 1 Complex		89 (1.9%)	89 (1.9%)
Yarragil 2 Complex		123 (2.0%)	123 (2.0%)
Total	263 (0.3%)	2,410 (2.7%)	2,673 (3.0%)

*Covers the period when the two changes in mapping methodology occurred

3.2 Status of Goals and Targets

Progress towards achievement of the goals and targets of the 2008 Strategy is presented in Table 5.

In general, the targets under Goals 1 (retention of Local Natural Areas) and 3 (protection of specific features and processes) are considered to have been impractical with the benefit of hindsight and experience.

The targets under Goal 2 (protection of vegetation types) cannot be directly reported as the above-mentioned changes in mapping methodology affect the results, and as the area targets were set dependent on zoning under the planning scheme, changes in which have not yet been assessed.

Only the targets under Goal 4 (management and restoration of Local Natural Areas) have been assessed for achievement, and are all either fully or partially completed.

Table 5: Progress Towards Achievement of the Goals and Targets of the 2008 Local Biodiversity Strategy

No.	Target	Status / Comments
Retention		
Goal 1: Prevent the further loss of Local Natural Areas. This goal aims to retain at least 4000 hectares of Local Natural Areas in the Shire.		
1	Retain an estimated 4000 hectares (of 4522 ha) of Local Natural Areas in the Shire, and only allow clearing in exceptional circumstances. This includes retention of:	Revision required, given that the current extent of LNAs will have changed with time, loss of natural areas and the changes to mapping methodology.
1A	<ul style="list-style-type: none"> All Verified Natural Areas and parkland-treed areas that support a) Carnaby's Cockatoo, b) <i>Eucalyptus lane-poolei</i>, or c) <i>Eucalyptus laeliae</i>. These are designated locally characteristic species under the Local Biodiversity Strategy. 	Experience has shown that it is not practical to retain ALL areas, as the Shire is not the sole decision-making authority in matters of clearing. These targets need to be reworded to recognize the over-riding authority of State government agencies.
1B	<ul style="list-style-type: none"> All Verified Natural Areas and other native vegetation that occurs within Regional Ecological Linkages. 	

No.	Target	Status / Comments
	These are to provide ecological stepping stones throughout the Shire.	
1C	<ul style="list-style-type: none"> All riparian vegetation in the Shire. 	
Protection		
Goal 2: Protect and manage a portion of each basic type of vegetation and ecosystem typical of the Shire. Approximately 1690 hectares of Local Natural Area would be protected to meet this goal.		
2	Protection of a minimum area of each of the vegetation types found in the Shire (representational targets): These targets are designed to protect a given percentage of each of the basic types of ecological communities found in the Shire.	Retained but not protected. Given the changes to mapping methodology and zoning, new targets are needed.
2A	Bassendean Central and South Complex	266 ha (of 2,707 ha) 2017 extent 3,083 ha
2B	Beermullah Complex	20 ha (of 40 ha) 2017 extent 44 ha
2C	Dardanup Complex	12 ha (of 148 ha) 2017 extent 195 ha
2D	Guildford Complex	96 ha (of 611 ha) 2017 extent 525 ha
2E	Serpentine River Complex	8 ha (of 51 ha) 2017 extent 80 ha
2F	Southern River Complex	172 ha (of 680 ha) 2017 extent 672 ha
2G	Forrestfield Complex	101 ha (of 266 ha) 2017 extent 411 ha
2H	Darling Scarp Complex	583 ha (of 2,100 ha) 2017 extent 2,323 ha
2I	Cooke Complex Dwellingup 1 Complex Dwellingup 2 Complex Goonaping Complex Helena 1 Complex Murray 1 Complex Swamp Complex Yarragil 1 Complex Yarragil 2 Complex	0 ha (of 900 ha) 47 ha (of 10,536 ha) 122 ha (of 10,676 ha) 16 ha (of 283 ha) 1 ha (of 592 ha) 133 ha (of 6,996 ha) 15 ha (of 1,670 ha) 66 ha (of 4,224 ha) 32 ha (of 5,694 ha) 2017 extent 810 ha 2017 extent 9,324 ha 2017 extent 10,141 ha 2017 extent 289 ha 2017 extent 512 ha 2017 extent 7,096 ha 2017 extent 1,580 ha 2017 extent 4,121 ha 2017 extent 5,583 ha
Goal 3: Protect specific ecological features and processes including rare species, threatened ecological communities, wetland vegetation and ecological linkages throughout the Shire.		
3	Protection of specific biodiversity features (specific biodiversity feature targets), such as rare and threatened species and protection of wetlands and waterways.	These are good targets but are impractical.
3A	Declared Rare Flora, Specially Protected Fauna and Priority Species: Protect all Verified Natural Areas which contain <i>Declared Rare Flora, Specially Protected Fauna and Priority One or Priority Two Species</i> or significant habitat for these species.	Experience has shown that it is not practical to retain ALL areas, as the Shire is not the sole decision-making authority in matters of clearing. These targets need to be reworded to recognize the over-riding authority of State government agencies. It is inadequate to only protect Verified areas. Even Potentially Significant areas have values worth protecting.
3B	Threatened Ecological Communities (TEC): Protect all Verified Natural Areas which contain Threatened Ecological Communities (TECs).	
3C	Locally Characteristic Fauna and Flora: Protect all habitats (natural areas and parkland-treed areas) of a) Carnaby's Cockatoo, b) <i>Eucalyptus lane-poolei</i> , or c) <i>Eucalyptus laeliae</i> where such habitat occurs on properties proposed for development. These are designated locally characteristic species under the Local Biodiversity Strategy.	
3D	Wetlands and wetland vegetation: Protect all Verified Natural Areas which contain wetlands and wetland vegetation in good or better condition plus a buffer of upland vegetation.	

No.	Target	Status / Comments
3E	Waterways and riparian vegetation: Protect 10% of Verified Riparian Natural Areas within 5 years and 20% within 10 years.	
3F	Regional and Local Ecological Linkages: Protect 15% of natural areas on Regional Ecological Linkages within 5 years. All other rivers and creeks in the Shire are to be regarded as Local Ecological Linkages.	
Management and restoration		
Goal 4: Manage and restore Local Natural Areas and revegetate new areas to increase native fauna habitat.		
4	Management and restoration of Local Natural Areas.	
4A	Prepare a 5-year Management Strategy for all natural areas vested or owned by Council within 3 years.	Completed
4B	All natural areas under Council vesting or ownership are actively managed for conservation in accordance with a 5-year Management Strategy within 8 years.	Completed
4C	All significant development proposals provide a Natural Area Management Plan to restore and manage biodiversity values on subject lands.	Partially Completed – usually takes the form of a Landscape and Vegetation Management Plan that incorporates management of natural areas.
4D	Half of all LNAs are actively managed for conservation or form part of a stewardship program within 20 years (i.e. approximately 2260 ha of 4521 ha).	Partially Completed – over 500 ha managed under Healthy Habitats stewardship program, plus all 400 ha of Natural Reserves.
4E	Restore 10% of Verified Riparian Natural Areas within 5 years and 20% within 10 years.	Partially Completed – Landcare SJ Inc. has revegetated 9.42 ha and controlled weeds on 15.11 ha of Shire reserves in riparian areas, and on private property revegetated 9.4 ha and controlled weeds on 14.08 ha in riparian areas. Unclear whether target has been met as total riparian area unknown.
4F	Fence 20 kilometres of coastal plain Verified Riparian Natural Areas, or 10 hectares of riparian vegetation, within 5 years, and restore and actively manage these areas.	Partially Completed – Landcare SJ Inc. has funded the fencing of 4.78 km of creekline on private property.
4G	Restore and actively manage 15% of natural areas on Regional Ecological Linkages within 5 years.	Partially Completed – Landcare SJ Inc. has revegetated 3.3 ha and controlled weeds on 57.65 ha of Shire reserves on Regional Ecological Linkages. Unclear whether target has been met as total area unknown.
4H	Where more than 500 metres exists between resilient natural areas on Regional Ecological Linkages, support ecological revegetation projects to create habitat stepping stones along Regional Ecological Linkages.	Partially Completed – Landcare SJ Inc. has revegetated 3.3 ha and controlled weeds on 57.65 ha of Shire reserves on Regional Ecological Linkages.

3.3 Status of Action Plan

Progress towards achievement of the actions of the 2008 Strategy is presented in Table 6. The actions have all been assessed as fully or partially completed, or ongoing.

Table 6: Progress Towards Achievement of the Action Plan for the 2008 Local Biodiversity Strategy

No.	Action	Status / Comments
Actions 2008 - 2011		
Strategy establishment and public awareness raising		
1	Consult the Department for Planning and Infrastructure, the Department of Environment and Conservation, and other relevant State Government agencies, on appropriate mechanisms for achieving local biodiversity targets.	Completed – consultation has taken place with relevant agencies.
2	Incorporate the goals, targets and actions of the Local Biodiversity Strategy into the Shire's Local Planning Strategy as it is developed.	Ongoing – the Local Biodiversity Strategy has informed the development of the draft Local Planning Strategy and will be considered in the final version.
3	Prepare a simple guide to inform the community of the Local Biodiversity Strategy once it is finalised.	Completed – leaflet prepared and distributed in 2009, and available on Shire website.
4	Establish a system to manage information collected on Local Natural Areas. Ensure information is collected using the NAIA templates and entered into an inventory.	Partially Completed – some information collected but not entered into an inventory.
Retention and protection of natural areas		
5	Assess all native vegetation to identify those areas that meet the definition of natural area, and those areas that are better described as 'other native vegetation'.	Ongoing – the process of assessment has not yet covered all areas of native vegetation.
6	Investigate developing an amendment to the Scheme to introduce a special control area over all significant natural areas, the proposed Natural Area Special Control Area.	Ongoing – investigated and options floated, with the Significant Tree Register implemented and further developments planned.
7	Make any necessary changes to the Scheme to allow for subdivisions for conservation and cluster-style subdivisions with the support of the WA Planning Commission.	Partially Completed – investigated but no changes implemented.
Incentives for protection and management		
8	As part of the Shire's Local Planning Strategy, progress opportunities for subdivisions for conservation in large rural lots and smaller rural lots. Develop criteria and opportunities for innovative subdivision in the rural zone to protect natural areas. This will include a desktop analysis of the size of natural areas on Rural Zoned Land, and field assessment for interested landowners.	Ongoing – case studies have been reviewed.
9	Conduct formal review of the existing Conservation Zone initiative to enable its possible expansion to other natural areas of high significance.	Ongoing – reviewed and criteria established; two more properties zoned for Conservation.
10	Investigate options for delivery of a Stewardship Program, tailored to landholders in the Shire and the Strategy's targets. The program could be linked to a grants program.	Completed and ongoing – the "Healthy Habitats" biodiversity stewardship program has 27 current members.
11	Subject to a resolution to establish a Stewardship Program above, develop partnerships to arrange delivery of the program.	Completed and ongoing – Landcare SJ Inc. partners with the Shire to deliver Healthy Habitats.
12	For rural lots less than 40 hectares, the Shire should trial at least one strata cluster subdivision for conservation, possibly using a cluster-style subdivision approach.	Ongoing – can only encourage developers as the opportunity arises.

No.	Action	Status / Comments
13	For rural lots greater than 40 hectares, the Shire should trial at least one subdivision for conservation.	Ongoing – can only encourage developers as the opportunity arises.
Policies and practices		
14	Investigate preparation of a Local Planning Policy (LPP) for Biodiversity Conservation. The LPP should cover all development which has the potential to impact on the Strategy's targets.	Completed – endorsed by Council in 2009, most recent update 2017.
15	Trial the LPP in a number of development settings where a significant impact on natural areas may occur (For example, urban structure planning, rural subdivision, and special rural subdivision).	Ongoing – the LPP has been used to support planning recommendations for developments affecting natural areas.
16	Allocate resources to implement the LPP, particularly the verification of ecological assessments.	Ongoing – opportunistic assessments as the occasion arises.
17	Raise developer's awareness of the LPP's requirements.	Completed – leaflet prepared and distributed in 2009, and available on Shire website.
18	Negotiate with urban developers of the future Mundijong/Whitby area to secure Local Biodiversity targets through the District Structure Plan, for example, by including statutory provisions for protection and buffering of natural areas.	Ongoing – targets inform structure plans and appropriate management plans are required at subdivision stage.
Protection and management of local reserves		
19	Assess all reserves with natural areas (28 reserves) using the Natural Area Initial Assessment (NAIA) templates.	Completed – all natural area reserves have been assessed.
20	Determine management priorities using information collected through NAIA templates, and develop a 5-year management strategy for Council reserves. In the interim, continue to use existing information and biodiversity targets to carry out priority management actions.	Completed and ongoing – a ten-year management plan has been developed and implemented, informing management priorities for Shire reserves.
Medium term priorities (Year 2012 – 2015)		
21	Review and update Local Natural Area mapping & statistics.	Partially Completed – opportunistic reviews inform updates of mapping and statistics.
22	Review the Stewardship Program and Incentives schemes strategies in the concept of a 5 year rolling plan.	Partially Completed – Healthy Habitats is active and its priorities and services are regularly reviewed.
23	Report to the community on progress of the implementation of the Local Biodiversity Strategy. Use this as an opportunity to raise awareness of the Shire's high biodiversity.	Ongoing – achievements are highlighted and publicized.
24	Re-prioritise management of all reserves in the context of a 5-year rolling plan.	Ongoing – a ten-year management plan has been developed and implemented, informing management priorities for Shire reserves.
25	Prepare strategic local reserves financial plan for management and improvements to be undertaken in the context of a 5-year rolling plan.	Completed and ongoing – the ten-year management plan has a fully budgeted action plan.
26	Consider rationalisation of low value natural area reserves to generate funds or allow for trade offs for protection or management of other sites.	Partially Completed – assessments of reserves in this context have occurred and are considered in reserve management.
27	Carry out changes to vested purposes of reserves to incorporate 'conservation' where appropriate.	Partially Completed – a list of appropriate reserves has been developed for an omnibus amendment.

No.	Action	Status / Comments
28	Identify unvested reserves or Special Purpose reserves with high biodiversity values. Seek State Government support for their reclassification to Class A reserves with a Conservation purpose.	Ongoing – consultation occurs on a regular basis with the management authorities for a number of high value reserves.

4. An Update for 2019

4.1 Mapping and Statistics

The vegetation loss from 2010-2016 shown above in Table 4 can be used as an approximation of vegetation loss since the 2008 Strategy was produced. This provides a general picture of vegetation loss prior to and after the production of the 2008 Strategy. Over a period of seven years after the Strategy was produced (2010-2016), the area of vegetation lost was nine times that in the eight years previous (2002-2009). This increase in vegetation loss may be partly due to the two changes in mapping methodology, but still represents a greatly increased rate of clearing.

Ongoing monitoring of remnant vegetation and vegetation loss will rely on the 2017 remnant vegetation figures presented in Table 3 and the vegetation loss from 2010 to 2016 in Table 4.

4.2 Goals and Targets

The original four goals of the 2008 Strategy have been retained. New targets for the next ten years are proposed in Table 7. These take into account the original targets of the 2008 Strategy, but reorganize them into Focus Areas with targets to retain, protect and enhance the values of the specific focus area.

Table 7: Goals and Targets for the 2019 Update of the Local Biodiversity Strategy

No.	Target
Focus Area 1: Natural Areas	
1.1	<i>Retain</i>
1.1.1	Prevent the further loss of Local Natural Areas, and retain at least 4000 hectares of Local Natural Areas in the Shire.
1.2	<i>Protect</i>
1.2.1	Protect Local Natural Areas in the Shire, and seek to prevent all clearing by enforcing Shire and/or State vegetation protection regulations.
1.3	<i>Enhance</i>
1.3.1	Manage and restore Local Natural Areas and revegetate new areas to increase native fauna habitat.
1.3.2	Regularly update the ten-year Management Plan for all natural areas vested or owned by Council.
1.3.3	Actively manage for conservation all natural areas under Council vesting or ownership in accordance with the Management Plan.
1.3.4	Ensure that all development proposals that impact on natural areas provide a Management Plan to restore and manage biodiversity values on subject lands.
1.3.5	Progressively increase the number of Local Natural Areas that are actively managed for conservation or form part of a stewardship program.
Focus Area 2: Locally Characteristic Species	
2.1	<i>Retain</i>
2.1.1	Retain Potentially Significant and Verified Local Natural Areas and Verified Local Native Vegetation that support Black Cockatoos, <i>Eucalyptus lane-poolei</i> , or <i>Eucalyptus laeliae</i> . These are designated locally characteristic species under the Local Biodiversity Strategy.
2.2	<i>Protect</i>
2.2.1	Protect Potentially Significant and Verified Local Natural Areas and Verified Local Native Vegetation that support locally characteristic species, and seek to prevent all clearing of these areas by enforcing Shire and/or State vegetation protection regulations.
2.3	<i>Enhance</i>

No.	Target	
2.3.1	Actively manage for conservation Potentially Significant and Verified Local Natural Areas and parkland-treed areas that support locally characteristic species.	
Focus Area 3: Vegetation Complexes		
3.1	<i>Retain</i>	
3.1.1	Retain the identified minimum portion of each basic type of vegetation and ecosystem ("vegetation complex") typical of the Shire, consisting of approximately 1690 hectares of Local Natural Area.	
3.2	<i>Protect</i>	
3.2.1	Protect a minimum area of each of the vegetation types and ecological communities found in the Shire.	
3.2.2	Bassendean Central and South Complex	266 ha (of 2,707 ha)
3.2.3	Beermullah Complex	20 ha (of 40 ha)
3.2.4	Dardanup Complex	12 ha (of 148 ha)
3.2.5	Guildford Complex	96 ha (of 611 ha)
3.2.6	Serpentine River Complex	8 ha (of 51 ha)
3.2.7	Southern River Complex	172 ha (of 680 ha)
3.2.8	Forrestfield Complex	101 ha (of 266 ha)
3.2.9	Darling Scarp Complex	583 ha (of 2,100 ha)
3.2.10	Cooke Complex	0 ha (of 900 ha)
3.2.11	Dwellingup 1 Complex	47 ha (of 10,536 ha)
3.2.12	Dwellingup 2 Complex	122 ha (of 10,676 ha)
3.2.13	Goonaping Complex	16 ha (of 283 ha)
3.2.14	Helena 1 Complex	1 ha (of 592 ha)
3.2.15	Murray 1 Complex	133 ha (of 6,996 ha)
3.2.16	Swamp Complex	15 ha (of 1,670 ha)
3.2.17	Yarragil 1 Complex	66 ha (of 4,224 ha)
3.2.18	Yarragil 2 Complex	32 ha (of 5,694 ha)
3.3	<i>Enhance</i>	
3.3.1	Actively manage for conservation the identified minimum portion of each basic type of vegetation and its associated ecosystem typical of the Shire.	
Focus Area 4: Specific Features		
4.1	<i>Retain</i>	
4.1.1	Retain Potentially Significant and Verified Local Natural Areas and Verified Local Native Vegetation that occurs within Regional Ecological Linkages, to provide ecological stepping stones throughout the Shire.	
4.1.2	Retain riparian vegetation in the Shire, and seek to prevent all clearing of these areas by enforcing Shire and/or State vegetation protection regulations.	
4.1.3	Retain Potentially Significant and Verified Local Natural Areas and Verified Local Native Vegetation that contains specific ecological features and processes including rare species, threatened ecological communities, wetland and waterway vegetation and ecological linkages throughout the Shire.	
4.2	<i>Protect</i>	
4.2.1	Protect specific ecological features and processes including rare species, threatened ecological communities, wetland and waterway vegetation and ecological linkages throughout the Shire.	
4.2.2	Protect Potentially Significant and Verified Local Natural Areas that contain <i>Threatened and Priority Flora and Fauna</i> or significant habitat for these species.	
4.2.3	Protect Potentially Significant and Verified Local Natural Areas that contain Threatened Ecological Communities (TECs).	
4.2.4	Protect Potentially Significant and Verified Local Natural Areas that contain wetlands and wetland vegetation plus a buffer of upland vegetation.	
4.2.5	Protect Potentially Significant and Verified Riparian Natural Areas.	
4.2.6	Protect natural areas on Regional Ecological Linkages. All other rivers and creeks in the Shire are to be regarded as Local Ecological Linkages and protected.	
4.3	<i>Enhance</i>	

No.	Target
4.3.1	Restore Potentially Significant and Verified Riparian Natural Areas.
4.3.2	Fence coastal plain Potentially Significant and Verified Riparian Natural Areas, and restore and actively manage these areas.
4.3.3	Restore and actively manage natural areas on Regional Ecological Linkages.
4.3.4	Where more than 500 metres exists between natural areas on Regional Ecological Linkages, support ecological revegetation projects to create habitat stepping stones.
Focus Area 5: Consultation and Education	
5.1.1	Conduct a consultation, communication and education program.

4.3 Action Plan

A new action plan is proposed for the next ten years, to achieve the proposed targets (Table 8).

Table 8: Action Plan for the 2019 Update of the Local Biodiversity Strategy

No.	Action	Related Targets and Resourcing
Theme 1 – Assessment and Registration		
1	Assess all native vegetation to identify those areas that meet the definition of Verified Local Natural Area, and those areas that are better described as Verified Local Native Vegetation.	1.1.1 Staff time
2	Place all identified significant Verified Local Native Vegetation on the Significant Tree Register.	1.2.1 Staff time
Theme 2 – Recording, Mapping and GIS		
3	Record in GIS and a spreadsheet: (a) The status of native vegetation as Verified Local Natural Area or Verified Local Native Vegetation. (b) All known occurrences of designated locally characteristic species and their habitats, and expand as new occurrences are recorded. (c) All Potentially Significant and Verified Local Natural Areas and Verified Local Native Vegetation that occurs within Regional Ecological Linkages. (d) All known occurrences of riparian vegetation in the Shire. (e) All Potentially Significant and Verified Local Natural Areas and Verified Local Native Vegetation that contains rare species, threatened ecological communities, wetland and waterway vegetation, and ecological linkages throughout the Shire.	1.1.1 2.1.1 4.1.1 4.1.2 4.1.3 Staff time
4	Annually review and update Local Natural Area mapping and statistics.	3.1.1 Staff time
5	Establish a system to manage information collected on Local Natural Areas, including a database and GIS.	5.1.1 Staff time
6	Review and update mapping of Bush Forever Areas, Regional Ecological Linkages and other relevant biodiversity features.	4.1.1 Staff time
Theme 3 – Policy and Legislation		
7	Update, implement and allocate resources for the Biodiversity Planning Policy to: (a) Recognize and protect Verified Local Natural Areas through the Scheme. (b) Cover all development where a significant impact on natural areas may occur, and verify assessments associated with such development.	1.2.1 1.3.4 Staff time May require funding to implement policy
8	Investigate developing an amendment to the Scheme to introduce a special control area over all Verified Local Natural Areas.	1.2.1 Staff time Funding required

No.	Action	Related Targets and Resourcing
9	Update the protection targets for vegetation types and ecological communities to reflect updated natural area mapping and zoning in Local Planning Scheme No. 3.	3.2.1-18 Staff time
10	Incorporate the targets of the Local Biodiversity Strategy into the Local Planning Scheme No. 3 and other planning strategies as they are developed.	5.1.1 Staff time
Theme 4 – Landcare		
11	Support funding for and grant applications by Landcare SJ Inc. and other bodies to: (a) Restore and revegetate Local Natural Areas. (b) Restore and revegetate riparian natural areas. (c) Fence, restore and revegetate coastal plain riparian natural areas. (d) Restore and revegetate natural areas on Regional Ecological Linkages.	1.3.1 4.3.1 4.3.2 4.3.3 Staff time May require funding
12	Promote planting of <i>Eucalyptus lane-poolei</i> , <i>Eucalyptus laeliae</i> , and other cockatoo food plants.	2.3.1 Staff time
Theme 5 – Natural Reserves		
13	Assess all reserves with natural areas against management actions and results, using photopoint monitoring and annual reports.	1.3.2 Staff time
14	Update and maintain currency of ten-year Weed and Pest Management Plan for all natural areas vested or owned by Council.	1.3.2 Staff time
15	Seek funding to carry out actions in the Weed and Pest Management Plan.	1.3.3 Staff time Funding required
16	Allocate funding under the Weed and Pest Management Plan to: (a) All known occurrences of designated locally characteristic species and their habitats on Shire managed land. (b) The identified minimum portion of each basic type of vegetation and ecosystem on Shire managed land. (c) Known riparian natural areas on Shire managed land. (d) Coastal plain riparian natural areas on Shire managed land. (e) Natural areas on Regional Ecological Linkages on Shire managed land.	2.3.1 3.3.1 4.3.1 4.3.2 4.3.3 Staff time Funding required
Theme 6 – Reserve Governance		
17	Consider restoration and revegetation of poor condition natural area reserves to create an offset bank.	1.3.3 Staff time Funding required
18	Carry out changes to vested purposes of reserves to incorporate 'conservation' where appropriate.	1.3.3 Staff time Funding required
19	Identify unvested reserves or Special Purpose reserves that are Verified Local Natural Areas, and seek State Government support for their reclassification to Class A reserves with a Conservation purpose or vesting with the Shire for management.	1.3.3 Staff time May require funding
Theme 7 – Environmental Planning		
20	At subdivision stage, identify Verified Local Natural Areas, verify Potentially Significant Local Natural Areas, and seek to protect in Public Open Space, trails or development exclusion zones, adjust boundaries to avoid fragmentation, or use other appropriate and available mechanisms.	1.3.4 Staff time
21	Utilise a set of Standard Development Conditions to provide a Management Plan to restore and manage biodiversity values, on development where a significant impact on natural areas may occur.	1.3.4 Staff time
22	Prioritise biodiversity and conservation in planning assessment of development including subdivisions, and identify and/or develop criteria and opportunities for strategic, sensitive layout to protect natural areas.	1.3.5 Staff time
23	Have due regard for vegetation types and ecological communities, and their protection targets, during the planning process.	3.2.1-18 Staff time

No.	Action	Related Targets and Resourcing
24	Have due regard for the legislative status of rare species, threatened ecological communities, wetland and waterway vegetation, and ecological linkages during the planning process, following best practice advice and guidance from State and Federal government agencies.	4.2.1 Staff time
25	Through the planning process, utilize GIS to prioritise locating Public Open Space and Multiple Use Corridors on Regional Ecological Linkages where natural areas are more than 500m apart.	4.3.4 Staff time
26	Enforce Shire, State and/or Federal vegetation protection regulations during the planning process to prevent clearing of: (a) Designated locally characteristic species and their habitats. (b) Riparian vegetation. (c) Natural areas that contain rare species or their habitats. (d) Natural areas that contain Threatened Ecological Communities. (e) Natural areas that contain wetlands and wetland vegetation and/or a buffer of upland vegetation. (f) Riparian natural areas. (g) Natural areas on Regional Ecological Linkages or other rivers and creeks.	2.2.1 4.1.2 4.2.2 4.2.3 4.2.4 4.2.5 4.2.6 Staff time
Theme 8 – “Healthy Habitats”		
27	Prioritise funding allocations, “Healthy Habitats” memberships and Landcare SJ Inc. projects on Regional Ecological Linkages where natural areas are more than 500m apart.	4.3.4 Staff time
28	Review the “Healthy Habitats” biodiversity stewardship program, with consideration of: (a) Expansion of the Conservation Zone initiative to cover other natural areas of high significance, (b) Investigation of a stewardship grants program, (c) Seeking funding opportunities, and (d) Continued support for Landcare SJ Inc.’s delivery of the program.	1.3.5 Staff time Funding required
29	Target private properties for membership of the “Healthy Habitats” biodiversity stewardship program that contain: (a) Known occurrences of designated locally characteristic species and their habitats. (b) Each basic type of vegetation and ecosystem. (c) Riparian natural areas. (d) Coastal plain riparian natural areas. (e) Natural areas on Regional Ecological Linkages.	2.3.1 3.3.1 4.3.1 4.3.2 4.3.3 Staff time
Theme 9 – Consultation and Education		
30	Consult the Department of Planning, Lands and Heritage, the Department of Biodiversity, Conservation and Attractions, the Department of Water and Environmental Regulation, and other relevant State Government agencies on appropriate mechanisms for achieving local biodiversity targets.	5.1.1 Staff time
31	Prepare a simple guide to inform the community of achievements during the first ten years of the Local Biodiversity Strategy, and the action plan for the next ten years.	5.1.1 Staff time Funding required
32	Prepare and distribute a simple guide to inform developers of the achievements during the first ten years of the Local Biodiversity Strategy, the action plan for the next ten years, and the requirements of the Biodiversity Planning Policy.	5.1.1 Staff time Funding required

5. Conclusions

The Shire of Serpentine Jarrahdale is going through a massive growth phase and it is estimated that by 2036 the population will more than triple to 68,335 residents (having already doubled from 13,246 in 2006 to 29,361 in 2017). This phenomenal growth poses a significant challenge to the conservation of biodiversity, but also provides a number of opportunities as land use changes from rural to more intensive uses.

The Shire's remnant vegetation and biodiversity is under significant threat as this development proceeds. Loss of remnant vegetation is ongoing and accelerating. It is therefore essential that the Shire have an updated and relevant Local Biodiversity Strategy to guide its retention, protection and enhancement into the future. Action is urgent in order to prevent the further loss of natural areas and protect the variety of nature for the long-term.

6. Glossary

Biodiversity is the variety of all life forms – the different plants, animals and micro-organisms, the genes they contain, and the ecosystems of which they form a part.

Bush Forever is a comprehensive plan for protection of biodiversity in the Perth region, which includes Bush Forever Areas of regionally significant bushland, ecological linkages, and locally significant natural areas. The policy aims to ensure bushland protection and management issues are addressed and integrated with broader land use management and decision-making.

Ecological community is a naturally occurring biological assemblage that occurs in a particular type of habitat.

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.

Habitat is the natural environment of an organism or community, including all biotic (living) and abiotic (nonliving) elements.

Local Natural Areas (LNAs) are natural areas that exist outside of Bush Forever Sites (Swan Coastal Plain), the DPaW Managed Estate and Regional Parks.

Native vegetation is naturally occurring locally native species as opposed to revegetated areas of native species, and includes natural areas and areas of native vegetation that is degraded such that it cannot be defined as a natural area.

Natural area is an area that contains native species or communities in a relatively natural state.

Potentially Significant Local Natural Area is a Local Natural Area that has not been Verified but is likely to be Significant.

Regional Ecological Linkage is an ecological linkage that is significant on a regional scale.

Remnant vegetation is native vegetation that still exists post-clearing.

Riparian (area or vegetation) is an area of interface between land and a river or stream, and the vegetation communities along the river or stream margins and banks.

Significant Local Natural Area is a Local Natural Area that meets at least one target of the Local Biodiversity Strategy.

State Planning Policy 2.8 Bushland Policy for the Perth Metropolitan Region (SPP2.8) provides a policy and implementation framework to ensure protection and management issues are appropriately addressed and integrated with broader land use planning and decision-making. Applies to Bush Forever areas and Local Natural Areas.

Threatened Ecological Community is an ecological community that both has a small proportion of its original extent remaining, and is under a significant and ongoing level of threat to its continued existence.

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.

Vegetation condition is a rating given to vegetated natural areas to categorise disturbance related to human activities, and 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.

Verified Local Native Vegetation is native vegetation that has been assessed, either by field survey or detailed photo interpretation, to be degraded such that it cannot be defined as a natural area, but still has significant value for biodiversity and habitat.

Verified Natural Area is an area of native vegetation that has been assessed, either by field survey or detailed photo interpretation, to include a basic understorey vegetation component, and meet the criteria of natural area or a wetland that has sufficient natural values to be assessed as a Conservation Category or Resource Enhancement Wetland.

Verified Riparian Natural Area is a riparian area that has been assessed, either by field survey or detailed photo interpretation, to include a basic understorey vegetation component, and meet the criteria of natural area or have sufficient natural values to be assessed as a Conservation Category or Resource Enhancement Wetland.

7. References

The original 2008 Strategy refers to State and EPA policies and guidance that are no longer current. As part of developing a new policy framework, the EPA replaced a number of environmental guidelines, bulletins, guidance statements and position statements.

Environmental Offsets Position Statement No. 9 (EPA, 2006) has been replaced by *WA Environmental Offsets Policy* (Government of Western Australia, 2011) and *WA Environmental Offsets Guidelines* (Government of Western Australia, 2014).

Guidance Statement No. 10 *Guidance for the assessment of environmental factors – Level of assessment for proposals affecting natural areas within the System Six region and Swan Coastal Plain portion of the System 1 region* (EPA, 2003) has been superseded with *Environmental Factor Guideline: Flora and Vegetation* (EPA, 2016).

The *Environmental Protection (Swan Coastal Plain Lakes) Policy 1992* (EPP) was repealed by the Minister for Environment in November 2015. The revocation was a reflection of the dated nature of the EPP and does not mean that these areas are not valuable. Alternative mechanisms have been identified including the Geographic Wetlands Dataset, administered by the Department of Biodiversity, Conservation and Attractions, and WAPC's Statement of Planning Policy 2.9.

Appendix 1: Threatened Ecological Communities (TECs)

The classification and conservation listing of Threatened Ecological Communities and Priority Ecological Communities occurring within the Shire of Serpentine Jarrahdale has changed since the 2008 Strategy, with updates and additions to the listings under the relevant State (*Biodiversity Conservation Act 2016*) and Federal (*Environment Protection and Biodiversity Conservation Act 1999*) legislation. A new list of TECs and PECs is therefore presented here, to replace Appendix 17.2 in the 2008 Strategy. Descriptions of the criteria for the conservation categories can be found in the legislation and the 2008 Strategy.

Community Identifier	Community Name	Conservation Category	
		WA	Federal
-	Communities of Tumulus Springs (Organic Mound Springs, Swan Coastal Plain) TEC	Critically Endangered	Endangered
SCP3a	<i>Corymbia calophylla</i> – <i>Kingia australis</i> woodlands on heavy soils of the Swan Coastal Plain TEC	Critically Endangered	Endangered
SCP3c	<i>Corymbia calophylla</i> – <i>Xanthorrhoea preissii</i> woodlands and shrublands, Swan Coastal Plain TEC	Critically Endangered	Endangered
SCP20b	<i>Banksia attenuata</i> and/or <i>Eucalyptus marginata</i> woodlands of the eastern side of the Swan Coastal Plain TEC	Endangered	-
SCP08	Rich herb shrublands in clay pans TEC	Vulnerable	Critically Endangered
SCP10a	Shrublands on dry clay flats TEC	Endangered	Critically Endangered
SCP02	Southern wet shrublands, Swan Coastal Plain TEC	Endangered	-
SCP15	Forests and woodlands of deep seasonal wetlands of the Swan Coastal Plain TEC	Vulnerable	-
SCP3b	<i>Corymbia calophylla</i> – <i>Eucalyptus marginata</i> woodlands on sandy clay soils of the southern Swan Coastal Plain TEC	Vulnerable	-
SCP07	Herb rich saline shrublands in clay pans TEC	Vulnerable	Critically Endangered
SCP09	Dense shrublands on clay flats TEC	Vulnerable	Critically Endangered
-	<i>Banksia</i> dominated woodlands of the Swan Coastal Plain IBRA Region PEC *	Priority 3	Endangered TEC (part)
SCP22	<i>Banksia ilicifolia</i> woodlands PEC *	Priority 3	Endangered TEC (part)
-	<i>Casuarina obesa</i> association PEC	Priority 1	-
SCP1a	<i>Eucalyptus haematoxylon</i> – <i>Eucalyptus marginata</i> woodlands on Whicher foothills PEC	Priority 3	-
-	Granite communities of the northern Jarrah Forest PEC	Priority 3	-
-	Litter-dependent invertebrate community PEC	Priority 2	-
SCP21c	Low lying <i>Banksia attenuata</i> woodlands or shrublands PEC *	Priority 3	Endangered TEC (part)

*A component of the Endangered *Banksia* woodlands of the Swan Coastal Plain EPBC listed TEC

Appendix 2: Threatened and Priority Fauna

The classification and conservation listing of Threatened and Priority Fauna known or likely to occur within the Shire of Serpentine Jarrahdale has changed since the 2008 Strategy, with updates and additions to the listings under the relevant State (*Biodiversity Conservation Act 2016*) and Federal (*Environment Protection and Biodiversity Conservation Act 1999*) legislation. A new list of threatened and priority fauna is therefore presented here, to replace Appendix 17.3 in the 2008 Strategy. Descriptions of the criteria for the conservation categories can be found in the legislation and the 2008 Strategy.

Scientific Name	Common Name	Conservation Category	
		WA	Federal
Birds			
<i>Botaurus poiciloptilus</i>	Australasian Bittern	Endangered	Endangered
<i>Cacatua pastinator</i> subsp. <i>pastinator</i>	Muir's Corella, Muir's Corella (Western Corella SW WA)	Conservation Dependent	-
<i>Calidris canutus</i>	Red Knot, Knot	Endangered	Endangered, Migratory
<i>Calidris ferruginea</i>	Curlew Sandpiper	Critically Endangered	Critically Endangered, Migratory
<i>Calyptorhynchus banksii naso</i>	Forest Red-tailed Black-Cockatoo, Karrak	Vulnerable	Vulnerable
<i>Calyptorhynchus baudinii</i>	Baudin's Cockatoo, Long-billed Black-Cockatoo	Endangered	Endangered
<i>Calyptorhynchus latirostris</i>	Carnaby's Cockatoo, Short-billed Black-Cockatoo	Endangered	Endangered
<i>Falco peregrinus</i>	Peregrine Falcon	Other specially protected fauna	-
<i>Leipoa ocellata</i>	Malleefowl	Vulnerable	Vulnerable
<i>Numenius madagascariensis</i>	Eastern Curlew	Critically Endangered	Critically Endangered, Migratory
<i>Oxyura australis</i>	Blue-billed Duck	Priority 4	-
<i>Rostratula australis</i>	Australian Painted-snipe, Australian Painted Snipe	Endangered	Endangered
<i>Tyto novaehollandiae</i> subsp. <i>novaehollandiae</i>	Masked Owl (southwest)	Priority 3	-
Mammals			
<i>Bettongia penicillata ogilbyi</i>	Woylie, Brush-tailed Bettong	Critically Endangered	Endangered
<i>Dasyurus geoffroi</i>	Chuditch, Western Quoll	Vulnerable	Vulnerable
<i>Pseudocheirus occidentalis</i>	Western Ringtail Possum, Ngwayir, Womp, Woder, Ngoor, Ngoolangit	Critically Endangered	Critically Endangered
<i>Setonix brachyurus</i>	Quokka	Vulnerable	Vulnerable
<i>Falsistrellus mackenziei</i>	Western False Pipistrelle, Western Falsistrelle	Priority 4	-
<i>Hydromys chrysogaster</i>	Water-rat, Rakali	Priority 4	-

Scientific Name	Common Name	Conservation Category	
		WA	Federal
<i>Isoodon fusciventer</i>	Quenda, southwestern brown bandicoot	Priority 4	-
<i>Myrmecobius fasciatus</i>	Numbat, Walpurti	Endangered	Endangered
<i>Notamacropus eugenii</i> subsp. <i>derbianus</i>	Tammar Wallaby, Tammar	Priority 4	-
<i>Notamacropus irma</i>	Western Brush Wallaby	Priority 4	-
<i>Perameles eremiana</i>	Desert Bandicoot, walilya	Extinct	Extinct
<i>Petropseudes dahli</i>	Rock Ringtail Possum, Wogoit	Priority 3	-
<i>Phascogale tapoatafa</i>	Brush-tailed Phascogale	Vulnerable	Vulnerable
<i>Phascogale tapoatafa</i> subsp. <i>wambenger</i>	South-western Brushtailed Phascogale, Wambenger	Conservation Dependent	-
<i>Potorous platyops</i>	Broad-faced Potoroo	Extinct	-
<i>Pseudocheirus occidentalis</i>	Western Ringtail Possum, ngwayir	Critically Endangered	Vulnerable
Reptiles			
<i>Acanthophis antarcticus</i>	Southern Death Adder	Priority 3	-
<i>Ctenotus delli</i>	Dell's skink, Darling Range southwest Ctenotus	Priority 4	-
<i>Lerista lineata</i>	Perth Slider, Lined Skink	Priority 3	-
Invertebrates			
<i>Leioproctus douglasiellus</i>	A short-tongued bee	Endangered	Critically Endangered
<i>Neopasiphae simplicior</i>	A native bee	Endangered	Critically Endangered
<i>Euoplos inornatus</i>	Inornate trapdoor spider (northern Jarrah Forest)	Priority 3	-
<i>Idiosoma sigillatum</i>	Swan Coastal Plain shield-backed trapdoor spider	Priority 3	-
<i>Synemon gratiosa</i>	Graceful Sunmoth	Priority 4	-
Other			
<i>Westralunio carteri</i>	Carter's Freshwater Mussel, Freshwater Mussel	Vulnerable	Vulnerable
<i>Geotria australis</i>	Pouched Lamprey	Priority 3	-
<i>Glacidorbis occidentalis</i>	Jarrah forest freshwater snail, freshwater snail	Priority 3	-
Fungi			
<i>Amanita carneiphyllo</i>	-	Priority 3	-
<i>Amanita fibrillopes</i>	-	Priority 3	-
<i>Amanita kalamundae</i>	(Kalamunda Lepidella)	Priority 3	-
<i>Amanita wadjukiorum</i>	-	Priority 3	-
<i>Xanthoparmelia darlingensis</i>	-	Priority 1	-
<i>Xanthoparmelia subimitatrix</i>	-	Priority 3	-

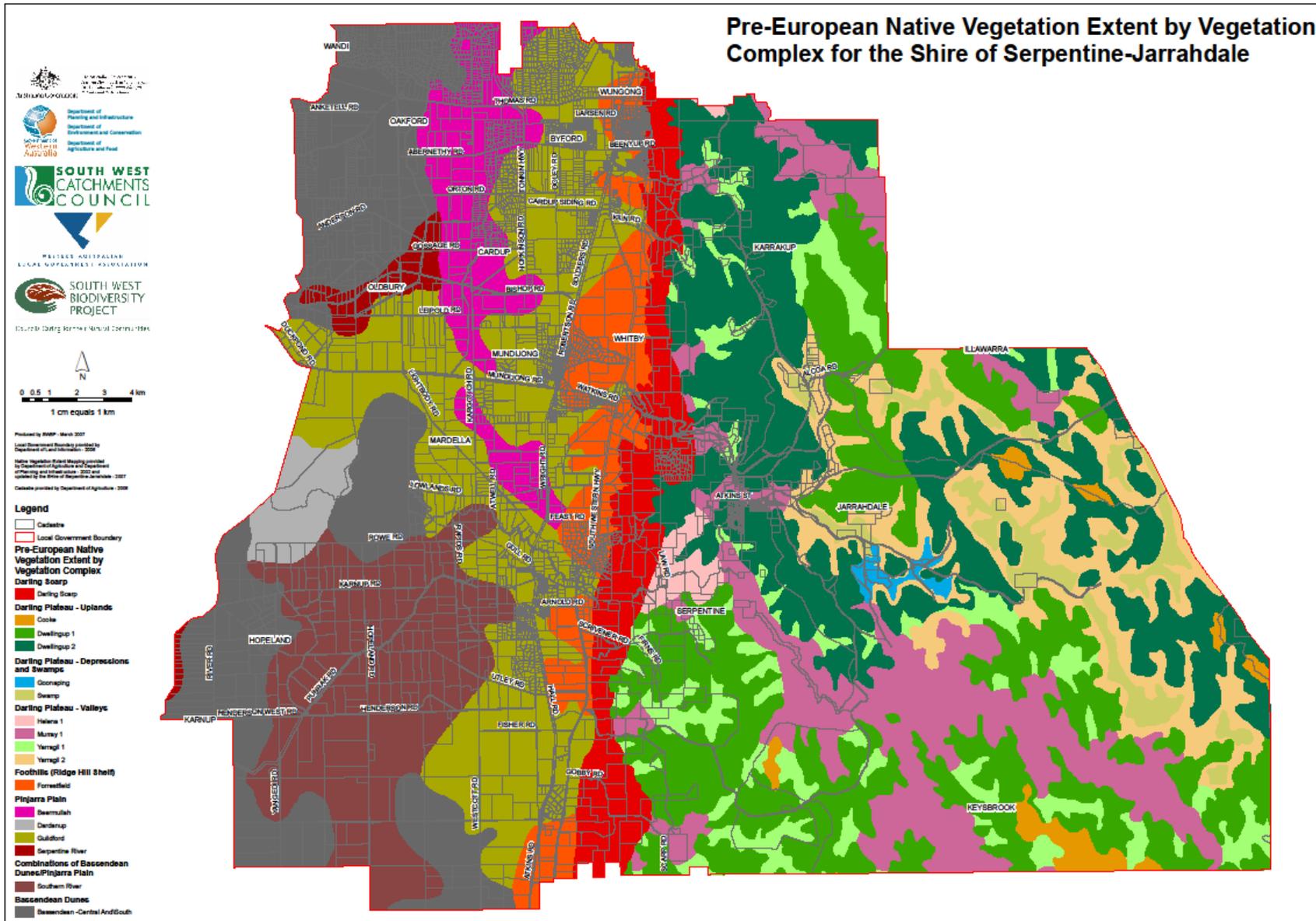
Appendix 3: Threatened and Priority Flora

The classification and conservation listing of Threatened and Priority Flora known or likely to occur within the Shire of Serpentine Jarrahdale has changed since the 2008 Strategy, with updates and additions to the listings under the relevant State (*Biodiversity Conservation Act 2016*) and Federal (*Environment Protection and Biodiversity Conservation Act 1999*) legislation. A new list of threatened and priority flora is therefore presented here, to replace Appendix 17.4 in the 2008 Strategy. Descriptions of the criteria for the conservation categories can be found in the legislation and the 2008 Strategy.

Species Name	Conservation Category	
	WA	Federal
<i>Acacia horridula</i>	Priority 3	-
<i>Acacia lasiocarpa</i> var. <i>bracteolata</i> long peduncle variant	Priority 1	-
<i>Acacia oncinophylla</i> subsp. <i>oncinophylla</i>	Priority 3	-
<i>Andersonia gracilis</i>	Vulnerable	Endangered
<i>Andersonia</i> sp. <i>Audax</i>	Priority 3	-
<i>Andersonia</i> sp. <i>Saxatilis</i>	Priority 1	-
<i>Angianthus drummondii</i>	Priority 3	-
<i>Anthocercis gracilis</i>	Vulnerable	Vulnerable
<i>Aponogeton hexatepalus</i>	Priority 4	-
<i>Austrostipa jacobiana</i>	Critically Endangered	Critically Endangered
<i>Babingtonia urbana</i>	Priority 3	-
<i>Boronia tenuis</i>	Priority 4	-
<i>Bossiaea modesta</i>	Priority 2	-
<i>Caladenia huegelii</i>	Critically Endangered	Endangered
<i>Calectasia cyanea</i>	Critically Endangered	Critically Endangered
<i>Calothamnus graniticus</i> subsp. <i>leptophyllus</i>	Priority 4	-
<i>Carex tereticaulis</i>	Priority 3	-
<i>Dillwynia dillwynioides</i>	Priority 3	-
<i>Diuris micrantha</i>	Vulnerable	Vulnerable
<i>Diuris purdiei</i>	Endangered	Endangered
<i>Drakaea elastica</i>	Critically Endangered	Endangered
<i>Drakaea micrantha</i>	Endangered	Vulnerable
<i>Drosera occidentalis</i>	Priority 4	-
<i>Eleocharis keigheryi</i>	Vulnerable	Vulnerable
<i>Eryngium pinnatifidum</i> subsp. <i>palustre</i>	Priority 3	-
<i>Eucalyptus rudis</i> subsp. <i>cratyantha</i>	Priority 4	-
<i>Eucalyptus x balanites</i>	Critically Endangered	Endangered
<i>Grevillea crowleyae</i>	Priority 2	-
<i>Grevillea curviloba</i> subsp. <i>incurva</i>	Endangered	Endangered
<i>Grevillea flexuosa</i>	Vulnerable	Vulnerable
<i>Grevillea manglesii</i> subsp. <i>ornithopoda</i>	Priority 2	-
<i>Grevillea pimeleoides</i>	Priority 4	-
<i>Halgania corymbosa</i>	Priority 3	-
<i>Hemigenia platyphylla</i>	Priority 4	-
<i>Isopogon drummondii</i>	Priority 3	-
<i>Jacksonia gracillima</i>	Priority 3	-
<i>Johnsonia pubescens</i> subsp. <i>cygnorum</i>	Priority 2	-
<i>Lasiopetalum glutinosum</i> subsp. <i>glutinosum</i>	Priority 3	-
<i>Lasiopetalum pterocarpum</i>	Critically Endangered	Endangered

Species Name	Conservation Category	
	WA	Federal
<i>Lepidosperma rostratum</i>	Endangered	Endangered
<i>Lepyrodia heleocharoides</i>	Priority 3	-
<i>Levenhookia pulcherrima</i>	Priority 2	-
<i>Meionectes tenuifolia</i>	Priority 3	-
<i>Millotia tenuifolia</i> var. <i>laevis</i>	Priority 2	-
<i>Paracaleana gracilicordata</i>	Priority 1	-
<i>Paracaleana granitica</i>	Priority 1	-
<i>Parsonsia diaphanophleba</i>	Priority 4	-
<i>Pimelea rara</i>	Priority 4	-
<i>Pithocarpa corymbulosa</i>	Priority 3	-
<i>Schoenus capillifolius</i>	Priority 3	-
<i>Schoenus pennisetis</i>	Priority 3	-
<i>Schoenus</i> sp. Waroona	Priority 3	-
<i>Senecio leucoglossus</i>	Priority 4	-
<i>Stachystemon</i> sp. Keysbrook	Priority 1	-
<i>Stackhousia</i> sp. Red-blotched corolla	Priority 3	-
<i>Stylidium aceratum</i>	Priority 3	-
<i>Stylidium longitubum</i>	Priority 4	-
<i>Styphelia filifolia</i>	Priority 3	-
<i>Synaphea odocoileops</i>	Priority 1	-
<i>Synaphea</i> sp. Fairbridge Farm	Critically Endangered	Critically Endangered
<i>Synaphea stenoloba</i>	Critically Endangered	Endangered
<i>Synaphea</i> sp. Pinjarra Plain	Endangered	Endangered
<i>Synaphea</i> sp. Serpentine	Critically Endangered	Critically Endangered
<i>Tetraria australiensis</i>	Vulnerable	Vulnerable
<i>Thysanotus anceps</i>	Priority 3	-
<i>Thelymitra dedmaniarum</i>	Critically Endangered	Endangered
<i>Thelymitra stellata</i>	Endangered	Endangered
<i>Verticordia fimbrilepis</i> subsp. <i>fimbrilepis</i>	Vulnerable	Endangered
<i>Verticordia lindleyi</i> subsp. <i>lindleyi</i>	Priority 4	-
<i>Verticordia plumosa</i> var. <i>ananeotes</i>	Critically Endangered	Endangered

Appendix 4: Location of Vegetation Complexes





Visit us

6 Paterson Street
Mundijong WA 6123

Contact us

☎ 95261111
@ info@sjshire.wa.gov.au

Connect with us

🌐 sjshire.wa.gov.au
📘 facebook.com/shireofsj
🐦 twitter.com/shireofsj
📷 instagram.com/unearthsj