# Environment Network A threatened species & habitat conservation strategy Wodonga

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Albury-Wodonga Corporation 🛠

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Wodonga Retained Environment Network



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# Wodonga Retained Environment Network

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### A threatened species & habitat conservation strategy

Prepared for the Albury-Wodonga Corporation and The Rural City of Wodonga

> Ian Davidson Glenda Datson John Alker-Jones Tony Bush Darren Rudd

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Albury-Wodonga Corporation

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#### **Executive Summary**

"The more we get out of the world the less we leave, and in the long run we shall have to pay our debts at a time that may be

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very inconvenient for our own survival."

\_\_Norbert Weiner, The Human Use of Human Beings, 1954. From "REIMBURSING THE FUTURE", Commonwealth Department of Environment

Sport & Territories, 1996.

This Strategy stems from a number of urban development issues and the confronting challenge of having to give consideration to environmental needs. Often these needs are in direct contrast to the need to provide urban housing and infrastructure and to allow for commercial development.

For some time the Albury-Wodonga Corporation (the Corporation), conscious of its corporate and community responsibilities, endeavoured to define the meaning of 'sustainability' and to develop indicators of its best practice.

Leneva Valley has long been identified as a major urban development growth corridor. Early Corporation structure plans took account of its natural features as well as the need for future urban elements such as roads, schools, shops, services, housing and recreational facilities. The land needed for a projected population of more than 36 000 had been tested against an expected future urban form and all its complexities – including transport networks, employment distribution and infrastructure needs - but not against the requirements of its natural systems.

Traditionally, the first time most urban development proposals were tested against the natural systems was in the statutory planning phase when an application for approval required a variety of consents from various government departments and agencies. This was, by its very nature, a fragmented and incremental process due to the ownership patterns, servicing availability, and the market pressures and opportunities. This was when and where most developer and agency disagreements and conflicts occurred and approval delays originated. Typically, at this point in the process, developers had incurred considerable planning costs, and in many eleventh-hour scenarios, were reluctant to modify plans to accommodate the flora and fauna protection requirements of State and Federal governments.

Thus the Corporation together with the Wodonga City Council and the Victorian Department of Sustainability and Environment accepted the challenge to address and formulate the means by which corporate, community and environmental responsibilities could be integrated in a mutually beneficial manner.

Understanding and support from stakeholders who traditionally had opposing views was required to achieve a meaningful, measurable and supportable outcome. With the goodwill of all parties, a collaborative approach was undertaken over a two year period. The main purpose was to overcome last-minute delays and piecemeal approaches.

By identifying important conservation areas, these areas and the unconstrained development areas have been defined concurrently and this has provided a level of certainty for both developers and government agencies which was previously believed to be unobtainable.

The Strategy creates a process that can identify suitable offset areas should they be required and, equally importantly, ensure offset areas are managed in a manner that satisfies the policy requirements set out in 'Victoria's Native Vegetation Management – A Framework for Action'\*.

\*Policy document published by The State of Victoria, Department of Natural Resources and Environment, 2002 describing the Government's goals and aspirations for native vegetation management in Victoria.

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The study identified key biodiversity features and values, and from this a strategy has been developed that retains these assets in what is the major urban development corridor for one of Victoria's fastest growing regional rural cities. The strategy supports and strengthens the primary objective of sustainable land use in the development corridor and merges conservation and urban design requirements into an effective planning framework.

The study area extends from the southern edges of urban Wodonga to the Baranduda township, and is generally contained by Drapers Hill, Bears Hill and Baranduda Range. There are three main ownership groups in this area: the Department of Defence, the Corporation and a cluster of some 30 private land owners.

The primary research for the strategy involved systematic in-situ flora and fauna surveys over all of the Corporation land and much of the private land in the study area.

The ecological values for each site included the ecological vegetation class (EVC), the conservation status for each EVC, the vegetation category and site condition which was based on habitat ratings, flora diversity and linkage values.

Site surveys including habitat assessments were conducted between 2003 and 2005 to coincide with spring flowering. Key values and features included the recording of 19 threatened species along with seven endangered ecological communities (two listed under Commonwealth legislation and five listed under Victorian State legislation). Of particular note was the diversity of wildlife populations using natural habitats in the Leneva Valley where 126 bird, 14 mammal, 11 reptile and 5 frog species were recorded. The main habitat features were numerous large hollow bearing trees, extensive tree plantings undertaken on Corporation lands in the past 30 years, and the significant arrays of waterways and timbered roadsides.

The Wodonga Retained Environment Network (WREN) proposals acknowledge these features and recommend their connection to larger adjoining habitats including Baranduda Range, Bears Hill, Federation Hill and the Kiewa River floodplain, to form a sustainable natural framework for the long-term health of the native flora and fauna. Management objectives have been formulated, with actions and land use zonings included, to reinforce the relative values of each site and thus satisfy the core requirements of Victoria's Native Management Framework.

The WREN Strategy is, in essence, a pilot Victorian project that involves the identification and application of methods to protect the native vegetation within an urban growth corridor. This is a stage which precedes the zoning of land for urban development. The processes initially provided for the study were unclear and followed a relatively loose methodology. On evaluation this, combined with the pioneering nature of the task being undertaken, has contributed to a protracted study. However, the collaborative planning process that has evolved - despite the complexities, uncertainties and the conflicts between development needs and the environment (in addition to different stakeholder expectations) - provides a model understood to be unique in Victoria.

Consensus through the voluntary input of the stakeholders was achieved through the use of a mutually respected consultant. This approach, using (if unintentionally) the consultant as the facilitator, combined with a growing understanding of the contrasting needs of urban development and environmental protection, generated the formation of a cohesive group. Mutual understanding and trust has developed despite the original polarised views and positions. This has led to a thoroughly tested and robust report that will ensure that the majority of the functional habitat is retained. This outcome was not thought possible in the beginning. Equally, the report helps to provide a clear and certain urban development area strategy that will allow for a viable and sustainable suburb of Wodonga to be developed.

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#### **1.0** Introduction

#### I.I Background

Albury–Wodonga adjoins the Murray River floodplain, and is part of a rapidly growing region in Australia. This growth manifests itself in an increased demand for residential and industrial land for development. In 1973 the Commonwealth government designated Albury-Wodonga as a national growth centre. The Albury-Wodonga Development Corporation (The Corporation) was established on the 30th May 1974 to ensure that the city be built "in an orderly, efficient and proper way". Numerous environmental studies have shown that Albury-Wodonga's natural setting is vital to the survival and welfare of many threatened species of wildlife, plants and vegetation communities. The Corporation owns much of the land earmarked for future development. To ensure that development occurs in an ecologically sound way, and that the natural biodiversity of the area is conserved, the Corporation has undertaken the development of a strategy, known as the Wodonga Retained Environmental Network (WREN) Strategy, to deal with the lands to the south east of Wodonga in Victoria. To ensure consistencies across land tenures the Wodonga City Council (WCC) arranged for the majority of the private land within the Leneva Valley to be part of this process. The Corporation has undertaken similar strategies for its lands in Albury (Thurgoona Threatened Species Conservation Strategy (TTSCS) 2004, and the Albury Ranges Threatened Species Conservation

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The need for the (WREN) Strategy has also been driven by the challenge of ensuring that the protection of the environment and habitat areas within the proposed growth corridor of the Leneva Valley occurs in a manner that achieves an efficient and sustainable form of urban development. Equal in importance to preserving and protecting the natural environment are the objectives of achieving sustainable urban development. Rather than planning exclusively in response to environmental constraints, the project attempts to strike a balance that allows both biodiversity values and urban development to be viable and compatible.

#### 1.2 Purpose

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Strategy (ARTSCS) 2006.

The strategy aims to create a clearly delineated and environmentally and socially acceptable framework which will enable land owners to undertake future urban development in appropriately zoned areas of the Wodonga urban fringe, in an efficient and responsible manner.

The main objectives are to:

- Identify the key environmental assets relating to biodiversity conservation, including threatened species and threatened ecological communities, in the Wodonga area;
- Develop a strategy for the protection of environmental assets on Corporation and private land within the increasingly urbanized study area which protects, and where possible enhances, populations of native plants and animals, with particular emphasis on threatened species and their habitats;
- Provide a strategy for urban development by the WCC and landowners;
- Ensure that this strategy is consistent with the objectives of Victoria's Biodiversity Strategy and specifically with the principles and priorities outlined in the local Biodiversity Action Plan for the area known as the Lower Kiewa Landscape Zone (Ahern 2004);
- Ensure that that the strategy satisfies the requirements of the Victorian legislation relating to
  native vegetation management and the "Net Gain Principle" outlined in the policy document
  "Victoria's Native Vegetation Management A Framework for Action" (VNVMF), DSE 2002;
- Ensure this strategy is consistent with the objectives of the North East Regional Catchment Strategy (North East CMA 2004);
- Develop an action plan for the implementation and the on-going evaluation and management of the strategy;
- Complement and build on the Albury Ranges and Thurgoona Threatened Species Conservation Strategies;
- Ensure that the methodology applied in this strategy is applicable elsewhere; and

 Demonstrate that native vegetation removal associated with the proposed urban development of areas outside of the WREN is adequately offset by the protection and subsequent management of the WREN itself.

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#### I.3 Study Area

The WREN study area extends from the edges of the urban Wodonga area in the north to the Baranduda township in the south and includes part of the Huon Creek and Castle Creek Valleys and much of the Leneva Valley, and is generally contained by Drapers Hill, Bears Hill, the Baranduda Range and Whytes Road in the east. The majority of Albury-Wodonga is located on riverine alluvial sediments (sands, silts, clays and gravels) deposited by the Murray River and its contributory creeks. In the study area the alluvial sediments come from the Kiewa River and Middle Creek. The stony hills that rise to the north (Bears Hill Range), west (Drapers Hill) and south (Baranduda Range) consist of Ordovician sediments (gneisses and schists) (LCC 1983, 1984). The WREN consists mostly of the lower and mid-slope parts of the northern fall of the Baranduda Range and the low hills around Drapers Hill and the valleys of Huon, Castle and Middle Creeks and is chiefly between the 170 - 400 ASL metre contours (that is, the Kiewa floodplain near Whytes Road and Bears Hill respectively). The region experiences mild winters with frequent frosts and typically hot, dry summers with occasional thunderstorms. The average annual temperature ranges from  $30^\circ$  -  $12^\circ$  in the summer and 12° - 0° C in the winter (Commonwealth Bureau of Meteorology 2005). The area receives around 700 millimetres of rainfall per year accompanied by an appreciable occurrence of south and southwest winds.

Fig. I denotes the key identifying features and the AWC land in the WREN.



#### Figure I. Study Area Map\*

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#### I.4 Bioregional Context

Bioregions are the national planning units for biodiversity values and describe land areas composed of a cluster of interacting ecosystems that are repeated in similar form throughout (Thackway and Cresswell, 1995).

The WREN is overlain by two bioregions (NRE 2000): the Victorian Riverina which occupies the valley floors and gently undulating plains and the Northern Inland Slopes occupying the hills and rocky slopes (BAPDSE 2004). The WREN is located within the Lower Kiewa Landscape Zone where 92% of the original native vegetation has been cleared (the Northern Inland Slopes Bioregion is 87% cleared and the Victorian Riverina is 96% cleared (DSE 2004)). Therefore most of the remaining vegetation types, described as Ecological Vegetation Classes (EVCs), are of conservation concern, with many classified as endangered. Many of the plants, animals and the habitats upon which they rely are also threatened with extinction. As a result new land developments in this area need to meet the requirements of the relevant legislative policies.

The rocky and steeper parts of these hills (Including Bears Hill, the lower slopes of Drapers Hill Range above Whenby Grange Estate and the lower slopes of the northern fall of the Baranduda Range) are mostly covered in native vegetation. This woodland vegetation varies between natural areas with diverse ground flora and a range of tree size classes to scattered remnant trees with a mostly weedy ground layer interspersed with approximately 20 year old tree plantations. The remnant woodland is habitat for a diverse range of native plants and animals including at least nineteen species of threatened plants and animals.

There are several important waterway corridors in the study area, including Huon, Castle and Middle Creeks as well as numerous important feeder streams, providing both riparian habitat and corridors or links across the WREN. Other important linear habitat links are the numerous well timbered laneways and road reserves which provide connections between the larger remnant vegetation blocks.

There are many large hollow bearing (LHB) trees scattered across the study area, in remnant vegetation blocks, waterway and roadside corridors, and as isolated trees or clusters in paddocks. These LHB trees provide valuable nesting and roosting habitat for hollow-dependant species such as parrots, owls, bats, possums and gliders. As a rule the vegetation is not as diverse on the flats and lower slopes, as that in the timbered hills; however LHB trees are more limited in the hills than across the lower parts of the WREN because of past land management activities.

The significant vegetation in the other areas surrounding the WREN, and earmarked for urban development, is comprised mainly of remnant woodland trees in paddocks, reserves, watercourses and road reserves. A key habitat feature of these areas is the relative abundance of LHB trees, as with the lower slopes in the WREN.

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#### 1.5 Landscape

The WREN is surrounded by number of important а habitats (see Fig. 2), including the significant woodlands cloaking Baranduda Range, parts of the Drapers Hill Range and the smaller Bears Hill Range to the south, west and north respectively. The Kiewa River floodplain to the east is also a very important regional biolink which connects the major riparian habitats of the Murray and Kiewa with the extensive forests on the inland foot slopes of the Great Dividing Range. In New South Wales important remnant habitats occur in the Thurgoona area (Davidson et al. 2004) and in the lower foot slopes and hills to the north and west of Albury.



#### **I.6** Forward Tree Plantings

Unique to this district are the extensive areas of tree plantings, known as forward tree plantings. The Federal Government's "decentralization" policy which saw the establishment of the Corporation was intended to facilitate the process which encouraged the movement of businesses and householders into the area. One of the many issues addressed was a concern for the environmental impacts of increased urbanization. To help offset this impact, a strategy was implemented that involved an extensive tree planting program which eventually saw more than 3 million trees, with a total cover of more than 2000 hectares planted into the Albury-Wodonga region. Broad-scale plantings of mixed indigenous and exotic natives began in 1976 and continued until 1996. Described at the time as the biggest urban re-afforestation project ever undertaken in Australia, the program could be called 'The Greening of the Growth Centre'. In 1988 the program was recognized by the Australian Institute of Landscape Architects as a program of national significance. Its positive impact was seen as one that would increase as the trees matured.

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One of the major challenges was to preserve the quality of country living while still providing all the amenities required in a large city. The Forward Tree Planting Program was an integral part of this philosophy as its aim was to create a well treed country setting for the city. This involved the restoration of cleared grazing land to a woodland environment. The major objectives of the program were to:

- improve the urban environment;
- establish tree cover in peripheral hills areas for conservation and aesthetic reasons;
- restrict run-off for erosion control;
- lower water tables and improve riparian environments;
- provide wildlife corridors to encourage movement of birds and other fauna; and to
- provide a role model for urban and rural land users in other areas.

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The revegetation of some of the denuded and eroded surrounding hills Albury-Wodonga has improved the overall appearance of the district by providing a treed backdrop, as well as the provision of walking, bike and riding trails within treed corridors along ridgelines or drainage down easements. These are within easy walking distance for significant

proportion of the

community.

When development was to take place in areas where vegetation cover had been systematically removed for agricultural purposes, plantings took place at least five years beforehand. By the time development took place, these plantings were expected to provide a pleasant place for people to live in and to provide a suitable backdrop. It was hoped that plantings of ecological corridors between the surrounding hills, through the urban areas and down to the riverine plain would be established and largely retained throughout future developments. However it was recognized that not all of the forward tree planting would be preserved, especially in the more intense urban development areas.

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In order to ensure availability and acclimatization of the required species for planting out, the Corporation set up its own wholesale production nursery, Carramar. This nursery's clients included government departments, municipal councils, local land care groups and land holders. Large numbers of trees were given annually to local government bodies, service clubs, schools and community groups in the Albury-Wodonga development area.

Cost-efficient mass planting techniques were utilized in order to revegetate large tracts of land each year over a period of twenty years. 10mx10m grid plantings were used for future urban areas to ensure the retention of individual specimen trees, and closer spacings were used to enhance forest character on peripheral hills and woodland character in parklands. Most plantings involved the use of forestry tube stock but some areas were direct seeded. Trials included different mulch and fencing types. Ongoing maintenance methods included the eradication of noxious weeds, slashing to reduce fuel loads and fire break controls. As planned, plantings of wattles were thinned out over time and treed areas were opened out to create a more random nature to achieve the desired woodland effect. In the fourth year after planting, most areas were grazed with sheep initially and later with cattle, with monitoring to avoid substantial damage to trees. This further reduced fire hazards.

In the WREN area plantings were implemented between 1977 and 1983 in visually sensitive areas such as the west and south-west flanks of Bears Hill, a visual corridor from plain to ridge on the north-west flank of Baranduda Range, knolls off Huon Creek Road, Flagstaff Hill, the Leneva Quarry surrounds, on levees of the Kiewa River, around the Whytes Road saleyards and Baranduda Industrial Estate, the ridge adjacent to Wodonga's Waste Management Site and as buffers to the Kiewa Valley Highway as well as major works along the Huon Creek. A large block planting was established between the old Baranduda School site and a relatively intact remnant vegetation block on the Kiewa Valley Highway. From 1990 to 1994 plantings took place on Huons Hill.

Species choice was dependant on aspect, elevation and soil types. Indigenous species were mostly used in the larger block plantings but Ironbarks and other exotic native species were also included. Where buffers to roadsides were implemented, some shrubby native understorey species were also included. Based on the species composition and growth rate of trees, grazing was introduced as a

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management tool for weed control. Where fire control was a perceived issue, block plantings were grazed to provide an effective break between the ground and the highly flammable crowns.

Recent studies have found that many of the FTP blocks are providing good resources for many of our wildlife, but particularly for nectivores such as the Regent Honeyeater.

In summary, the program since its inception has undoubtedly been successful. In almost all cases, survival and growth rates have been good and the general effect has been very impressive. The basic framework for the recommended tree planting corridor system has been created and has made a major contribution towards the stated policy of the AWC and the aesthetic and environmental quality of Albury-Wodonga.

It is generally agreed that the forward tree planting program has done much to change the face of Albury-Wodonga and to enhance the biodiversity of the area.

#### 1.7 Recent Implementation Activities

Most Corporation plantings in the WREN area took place almost thirty years ago, and many were related to future development areas. More recent programs have involved the planting of waterways at the Baranduda Grove and Valley Views Estates and on the higher contours of the Wattle Glen Estate, adjacent to Streets Road.



Further to the above plantings, the Baranduda Land Care Group (along with 300 participants from schools and scouts), has conducted revegetation works in public and community owned sites including roadsides and reserve corridors. The Green Corp Program has also conducted revegetation works and woody and perennial grass weed control in high conservation sections of public land sites along the Kiewa Valley Highway and Wodonga-Yackandandah roadsides. DSE has funded a Phalaris control program and a Paterson's Curse biological control agent program has demonstrated good success in Parklands Albury-Wodonga sites in the Baranduda Range.

Wodonga Council has removed many exotic street trees in the Baranduda central urban zone and replaced these with natives to enhance wildlife corridor links.

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The Baranduda Land Care Group has also instigated a very successful nest box program targeting threatened arboreal mammals where now over 140 nest boxes have been installed and are monitored regularly.

#### 2.0 Methodology

The detailed ecological and land management information in Table 10, Appendix 2, as well as the documented vegetation and wildlife sightings in Tables 2-5 in section 3 of the report are primarily based on surveys undertaken between 2003 and 2005. Other records were provided from an arboreal fauna survey (Schedvin 2005), the regional Department of Sustainability and Environment (DSE) staff and members of the Baranduda Landcare Group. The Victorian context in which these species and habitats occurred was provided by the EVC extent on BioMap T8225-1-2-Baranduda, the Victorian Wildlife Atlas and Victorian Flora Information System 2004.

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All Corporation and private land within the study area was assessed using one methodology, being the same methodology used in the earlier Albury Ranges and Thurgoona studies. This involved assessing flora and fauna values using a rapid survey technique developed for Travelling Stock Reserves, other crown land and private land remnants in NSW (Driver and Davidson 2002). See sample survey sheets in Appendix 1.

#### 2.1 Delineation of sites

Sites chosen to be sampled were based on the results of air photo and satellite imagery analyses. Site surveys were split into areas with significant tree cover, areas with scattered trees and areas with land management problems. Where blocks of remnant vegetation were adjacent and contiguous, of similar condition and with similar amounts of tree cover (hence similar land management issues), they were combined into the one survey site. Other adjacent blocks of remnant vegetation were delineated separately if the values and issues were different.

Note: Earlier mapping undertaken for part of the Leneva Valley by DSE (2003) was used as a guide to the extent and condition of native vegetation in that part of the WREN. This provided a map of the extent and type of EVC and a Conservation Significance rating for each site, which was then compared with the field data collected during the WREN study. DSE determines Conservation Significance using the bases of the threat (Conservation Status) and the vegetation condition. The specific criteria for this are detailed in the Victorian Native Vegetation Management Framework (DNRE 2002).

#### 2.2 Site boundaries

For the future interpretation of the WREN, two types of boundaries are used on the final maps. These being:

- A solid line, used to indicate an agreed boundary which indicates the area of vegetation to be permanently protected and secured; and
- A dotted line, used to indicate that the boundary has some degree of flexibility in the interpretation on the ground. It does not mean that there can be a major change to or removal of a site. Decision making on the actual boundary location should be based on the development constraints outlined for specific sites as shown in Table 10 and, if practical, may occur at the urban design stage.

Notes:

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- The protection measures are supported by various planning instruments including Public Land Zoning, Vegetation Planning Overlays and Section 173 Agreements (see table 10).
- 2. Servicing including roads and utility provision may be permitted through these sites provided that there is minimal demonstrated disturbance to the ecological values of the site.
- 3. Drainage works on any designated waterway (see Precinct maps, Figures 3A-3L, Appendix 5) require a "Works on Waterway" permit from the Northeast CMA. Water sensitive urban design works may be permitted within the WREN provided that the ecological values of the site are maintained.

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#### 2.3 Site Surveys

Surveys were undertaken between 2003 and 2005 and were mostly timed to occur during the main spring flowering time.

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The Ecological Vegetation Classes were identified from DSE extant EVC mapping and were confirmed or modified depending on the field inspection findings.

Sampling involved traversing each site I-4 times, depending on the block size and vegetation complexity.

Areas without tree cover were visited in the field to ascertain whether floristically significant areas (those containing native grasses and forbs), were present, and if they were, they were identified as sites for retention.

The VNVMF (DNRE 2002) considered a site to be extant remnant vegetation, rather than scattered trees, if the native understorey made up greater than 10% of the projected foliage cover. This equated with the flora rating of a site being classified as medium (M) or higher.

Surveys were timed to coincide with the main spring flowering times. Plants were identified whilst traversing the sites but a full list was not recorded because of time and seasonal constraints. This methodology favored the identification of flowering or larger species, and could have resulted in small, less obvious plants being missed. There are likely to be other species in the WREN which were not recorded during the survey.

Similarly, wildlife seen or heard during the surveys was recorded, along with the data from flora and fauna database records and credible records from local naturalists (Glen Johnson pers.comm.). The wildlife list is likely to be conservative, as it is with the plants. Reasons for this include the fact that some species are difficult to detect, e.g. bats, and the fact that some migratory birds would have been absent at the times the WREN area was surveyed. Habitat information such as large hollow bearing tree surveys (LHBs) could be used to aid in the identification of bat habitat but a survey deemed adequate to obtain reasonable information was beyond the scope of the study because of time and financial constraints. There are likely to be many more plant and animal species found throughout the WREN in future years.

Plants and animals identified on each site were recorded on survey sheets, as were the site characteristics, ecological values, management objectives, recommended ameliorative actions and proposed constraints on development.

#### 2.4 Values and Rating of Sites

A table summarising the values of each site was developed to document the information gathered, assist with determining the priority sites to be protected and to outline the main management objectives. (See Table 9, Appendix 2.)

For each site the following information is listed: Site Number, Site Characteristic, Vegetation Category, EVC name, EVC Conservation Status and Ecological Values. These are described as follows:

- I. The Site Numbers are sequential for each precinct.
- 2. The Site Characteristic describes the main landform.
- 3. The Vegetation Category is Remnant or Scattered Trees, or a combination of the two. A site was considered to be extant remnant vegetation, rather than scattered trees, if the native understorey made up greater than 10% of the projected foliage cover.

Note: For the purposes of this strategy if the flora rating of a site was medium or higher the site was considered to fall within the threshold of an extant EVC.

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4. The confirmed EVC of a remnant, or the likely pre-European EVC for scattered trees, was recorded. Those areas that were below the remnant vegetation threshold were assigned an EVC based on the overstorey species present, their relative location in the landscape and pre-1750 EVC mapping (DSE 2004).

- 5. The Conservation Status of the EVC was obtained from the Lower Kiewa Landscape Zone Biodiversity Action Plan (DSE 2004).
- 6. Ecological Values of each site were determined using three ecological features:
  - a habitat rating (which included age structure of trees, layers of vegetation and overall habitat diversity e.g. rock outcrop and drainage line);
  - a rating of vegetation diversity and richness; and
  - a rating for the site's connectivity value with other sites, i.e. linkage significance.
- 7. Five site ratings were applied for each of the three ecological values. The rating system was applied as follows:

Habitat

- High near natural.
- Medium/High near natural, but missing a major ecological component, e.g. no shrub layer. (A minor change in current management or time alone may move the site to a high rating).
- Medium several ecological components missing or degraded, e.g. tree cover good but ground layer dominated by pasture grasses. (Requiring active management to improve the site rating).
- Low/Medium totally modified but has some retained natural features e.g. scattered tree cover, or tree plantation.
- Low totally modified (Requiring complete restoration).

#### Flora rating

- High near natural, few weeds and high plant diversity, especially ground layer.
- Medium/High near natural, high plant diversity but weeds common.
- Medium modified, but includes some native grasses and forbs. Weeds are common. (EVC threshold).
- Low/Medium highly modified, mostly weedy but with some hardy native grasses.
- Low cleared, may contain a few isolated trees but is severely disturbed and dominated by weeds.

#### Linkage significance

- High connects 2 important remnants.
- Medium/High timbered waterway or roadside.
- Medium partial link between 2 remnants.
- Low/ Medium small patch, < 500 m from another remnant.</li>
- Low isolated patch, > 500 m from another remnant.

Note: In some cases, sites that rated medium or lower were being utilised, or had been utilised previously, by threatened wildlife. This automatically gave the site an importance, i.e. a High rating. For example, Speckled Warblers are often found where there are a high percentage of planted live and dead native shrubs, which don't rank highly using the natural system described above. But the site is rated High because of usage by the threatened species. In short, the life history of many species of wildlife is not well understood by scientists and caution should always be applied when seeking to modify habitats used by threatened species.

To ensure that the retained environment network reaches its ecological potential, information specific to the preferred management of each site is also presented in Table 9. This includes:

- 8. Management Objectives These state the key objective(s) for which this part of the retained habitat network should be managed.
- 9. Recommended Actions These are the on-ground management activities required at this site to protect and enhance the habitat values, e.g. revegetation, grazing management, etc.
- Development Constraints The key ecological attributes of the site are listed and the main constraints on adjoining development are indicated to assist with future urban and industrial design.

The zoning and environmental significance overlay for each site number is also designated.

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#### 3.0 Results

Each site's characteristics and ecological values determined by the aforementioned methodology have been detailed in Table 10, Appendix 2. The management objectives, development constraints and zoning for each of these sites have also been listed. For simplification, site survey precincts were established. Refer to Figure 3, Appendix 5.

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#### 3.1 Native Vegetation

#### Paddocks

The ground flora in the predominantly cleared paddocks consists mostly of introduced pasture grasses and flat weeds with hardy, native perennial grasses such as Wallaby Grasses (Austrodanthonia spp.) and Weeping Grass (Microlaena stipoides) being common in places.

#### Rocky Slopes

The flora on the steeper, rocky slopes is very diverse in places, with over 40 species recorded over several sites. A complete flora list is provided in Table 2. The structure of the vegetation is complex, and this is probably mainly due to past disturbances caused by clearing and grazing. It includes sparse open grassy woodland to shrubby-grassy woodland and relatively dense plantations. Where the vegetation is less disturbed it tends to vary, with aspect, altitude and depth of soil being the influencing factors. Woodlands with a southerly or easterly aspect appear to be grassier with species like Long-leaf Box (*Eucalyptus goniocalyx*), Grey Tussock Grass (*Poa sieberiana*) and many forbs including native geraniums and lilies being common. Sites with a northerly or westerly aspect tend to be shrubby-grassy woodland where species such as White Box (*Eucalyptus albens*), Blakely's Red Gum (*Eucalyptus blakelyi*), Guinea-flowers (*Hibbertia spp.*) and Kangaroo Grass (*Themeda triandra*) are common.



#### Waterways

The vegetation along waterways in the study area is generally highly degraded except for parts of Huon Creek (Precinct A3A) which has previously undergone habitat improvement works and has been fenced for a long period. The tree cover is particularly healthy on this part of Huon Creek with many LHB trees and a good range of other size classes, clusters of shrubs, areas of predominately native ground flora and an excellent development of aquatic emergent plants. Castle Creek (Precinct A5A), whilst mostly denuded of native trees and covered with weedy grasses, has many riparian shrubs, including River Bottlebrush (*Callistemon seiberi*), Silver Wattle (*Acacia dealbata*), Sweet Bursaria (*Bursaria spinosa*) and Narrow-leaf Hopbush (*Dodonea viscosa ssp. angustissima*). Middle Creek has a much wider floodplain than the other creeks in the study area and the tree cover condition varies markedly, from relatively well covered with indigenous trees, through to being dominated by introduced woody weeds such as Willows and Poplars and then, to being denuded of trees. Throughout Middle Creek the ground flora is degraded with introduced pasture grasses (including Paspalum and Phalaris) dominating. The emergent native vegetation is developing well, where the grazing of cattle is restricted.

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Apart from these three named waterways there are numerous other ephemeral waterways, many of which have been altered historically for agricultural and access purposes. The native vegetation in and adjacent to these waterways varies in tree cover amount and quality. The main tree species along waterways within the WREN are River Red Gum and Blakely's Red Gum, with Apple Box (*Eucalyptus bridgesiana*), Yellow Box (*Eucalyptus melliodora*) and White Box scattered throughout. Blakely's Red Gum is dominant along the banks of waterways above the floodplains where River Red Gum is dominant. Silver Wattle still persists along many waterways to provide some shrub cover, however where shrubs are found they often show signs of heavy grazing and would benefit from the exclusion of grazing. Native plants such as Weeping Grass are still a major component of the grassy ground cover along creeks; but in most cases the ground flora is weedy. Emergent aquatic plants including Sedge (*Carex spp.*), Rushes (*Juncus spp.*), Cumbungi (*Typha spp.*) and Reeds (*Phragmites australis*) are still common.

#### Forward Tree Plantations

The forward tree plantings throughout the study area vary from being dominated by introduced pasture grasses where the plantations have been introduced into grazed paddocks, to containing many native plants where the FTPs adjoin more intact woodlands.

It is worth noting that the VNVMF does not assign a value to planted vegetation and therefore does not recognize the ecological values of the FTPs throughout the WREN. However recent studies have found that tree plantations such as these are providing habitat for many species of native wildlife. Certainly the Corporation tree plantations have been found to be providing habitat resources for many of our native wildlife, including threatened species such as the Regent Honeyeater (TTSCS 2004) and Tuan (Kavanagh *et al.* 2001) and in many instances are providing important linkages for arboreal species such as the threatened Squirrel Glider.



In summary, the wooded upper slopes often contain diverse ground flora, grading down to the more degraded mostly cleared lower slopes, with low native plant diversity. Grazing management, aspect and soil depth play important roles in determining the overall vegetation mix possible on a given site, but the grazing history dictates the species favored. For example stock camps, regardless of aspect or soil type, were weedy with shrubs and most palatable perennial species being rare. On the other hand, seldom grazed areas were always diverse, regardless of aspect and soil type.

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Plants of Interest

Plants of particular interest recorded within or adjoining the WREN include: -

- Tick Indigo (Indigofera adesmiifolia)— Classified as Vulnerable in Victoria. Several plants were located on Bears Hill Range, Wodonga-Yackandandah roadside, & Ridge Lane.
- Small-leaved Bush-pea (Pultenaea foliolosa) -These are Rare in Victoria.
   This is locally common on ridges south of the old Wodonga Waste Management Site and also along the Wodonga-Yackandandah roadside.
- Slender Tick-trefoil (Desmodium varians) Classified as 'Poorly Known' in Victoria. This is relatively widespread in the least disturbed parts of the study area.
- Juniper Wattle (Acacia ulicifolia) -These are Rare in the Wodonga area.
   Small numbers are seen along the KiewaValley Highway, Wodonga-Yackandandah Road and also in adjoining remnants in the Baranduda area.



Acacia ulicifolia

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#### Vegetation Communities

In the WREN the status of the sites with relatively intact ground flora vegetation is of High Conservation Value because in North East Victoria their EVC status is either Endangered or Vulnerable (see Table I). The high level of conservation significance of these EVCs within the WREN is primarily due to the over clearing of these vegetation types for agriculture throughout the region (Biodiversity Action Planning for North East Victoria 2004). As such, the remnant vegetation is protected under the Native Vegetation Retention Controls established under the provisions of the Victorian Planning and Environment Act 1987 and, under VNVMF 2002, clearing is generally not permitted.

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#### Table I: Extant Ecological Vegetation Classes and their Conservation Status in the WREN

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ЕVС Туре	Victorian Conservation Status
Grassy Woodland	Endangered
Floodplain Riparian Woodland	Endangered
Rainshadow Grassy Woodland/Valley Grassy Forest Mosaic	Endangered
Valley Grassy Forest	Vulnerable
Plains Grassy Woodland/Valley Grassy Forest/Rainshadow	Endangered
Grassy Woodland Complex	
Plains Grassy Woodland	Endangered
Creekline Grassy Forest	Endangered

#### Victorian Legislative Framework

In most cases the condition of the ground flora in the WREN was below the condition rating threshold for assigning a site an Ecological Vegetation Class, as shown in the various EVC benchmark advisory notes. Those sites with a medium or higher flora condition assessment were considered to achieve the required threshold and were assigned an EVC classification. For the purposes of management and enhancement works those areas recommended to make up the WREN that were below the EVC threshold were assigned an EVC type based on their overstorey species, their relative location in the landscape and pre 1750 EVC mapping data (DSE 2004).

#### Commonwealth Legislative Framework:

Many of the remnant trees in the study area are species which characterise Grassy White Box Woodland and Yellow Box/Red Gum Grassy Woodland in the inland slopes of southeast Australia, i.e. Blakely's Red Gum (*Eucalyptus blakelyi*), White Box (*Eucalyptus albens*) and Yellow Box (*Eucalyptus melliodora*). The occurrence of these trees throughout the WREN is significant because Grassy White Box Woodlands is listed as an Endangered Ecological Community (EEC) in Australia under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act), and the Yellow Box/Red Gum Grassy Woodlands Community has a listing pending. As a result any prospective clearing of native vegetation within the WREN area needs to be considered under the EPBC Act.

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# Table 2:Plants of the WREN Study Area<br/>(Davidson 2003 - 2005)

Common Name	Botanical Name	
Apple Box	Eucalyntus hridgesiana	
Appleberry	Billardiera scandens	
Austral Bugle	Aiuga australis	
Austral Indigo	Indigofera australis	
Australian Bindweed	Convolvulus erubescens	
Australian Cranesbill	Geranium solanderi	
Beard Heath	Leucopogon virgatus	
Bitter Cryptandra	Cryntandra amara	
Black-anther Flax-lily	Dianella revoluta	
Blakely's Red Gum	Eucalyptus blakelyi	
Blue Pincushion	Brunonia australis	
Bluebell	Wahlenbergia spp.	
Box Mistletoe	Amyema miquelii	
Broad-leaf Peppermint	Eucalyptus dives	
Bulbine Lily	Bulbine bulbosa	
Chocolate Lily	Dichopogon strictus	
Cinquefoil Cranesbill	Geranium potentilloides	
Clustered Everlasting	Chrysocephalum semipapposum	
Common Buttercup	Ranunculus lappaceus	
Common Cranesbill	Geranium retrorsum	
Common Cudweed	Pseudognaphalium sphaericum	
Common Fringe Lily	Thysanotus tuberosus	
Common Hovea	Hovea linearis	
Common Raspwort	Gonocarpus tetragynus	
Common Spike-rush	Eleocharis acuta	
Common Sunray	Helipterum australe	
Common Wheat Grass	Elymus scaber	
Cotton Fireweed	Senecio quadridentatus	
Creamy Candles	Stackhousia monogyna	
Cumbungi	Typha orientale	
Curved Rice-flower	Pimelea curviflora	
Daphne Heath	Brachyloma daphnoides	
Dogwood	Cassinia aculeata	
Drooping Mistletoe	Amyema pendula	
Drooping Sheoak	Allocasuarina verticillata	
Early Nancy	Wurmbea dioica	
Erect Guinea Flower	Hibbertia stricta	
Fen Sedge	Carex gaudichaudiana	
Geebung	Persoonia rigiaa	
Grass Trigger Plant	Styliaium graminijoiium	
Handsome Flat Pea		
Hedge wattle	Acacia paradoxa	
Hoary Guinea Flower	Divisionia Intifalia	
Hop Bluer Pea	Daviesia iaijoita	
Juniner Wattle	Acacia ulicifolia	
Kangaroo Grass	Thomada australis	
Kurraiong	Brachychiton populneus	
Lightwood	Acacia implora	
Long Leaved Box	Fucalization for a second seco	
Maidenhair Fern	Adjantum spp	
Many-flowered Mat-rush	Lomandra multiflora	
Milkmaids	Burchardia umbellata	
Narrow-leaf Hopbush	Dodonaea viscosa ssp. angustissima	
Native Bramble	Rubus parvifolius	
Native Cherry	Exocarpus cupressiformis	
Native Flax	Linum marginale	
Orchids	~10 species	
Oxalis	Oxalis perennans	
Pale Sundew	Drosera peltata	
Pelargonium australe	Austral Stork's Bill	
Plantain	Plantago spp.	
Plume Grass (x2)	Dichelachne spp.	
Prickly Teatree	Leptospermum continentale	

Common Norma	Deterster I News
Common Name	Botanical Name
Purple Coral Pea	Hardenbergia violacea
Purple Wiregrass	Aristida ramosa
Raspwort	Haloragis spp (x2)
Red Anthered Wallaby Grass	Joycea pallida
Red Box	Eucalyptus polyanthemos
Red Stringybark	Eucalyptus macrorhyncha
Red-legged Grass	Bothriochloa macra
Red-stem Wattle	Acacia rubida
Rock Fern (x 2)	Austrocheilanthes spp.
River Bottlebrush	Callistemon seiberi
River Red Gum	Eucalyptus camaldulensis
Rush	Juncus spp
Scaly Buttons	Leptorhynchos squamatus
Sheep's Burr	Acaena ovina
Silver Wattle	Acacia dealbata
Slender Tick-trefoil	Desmodium varians
Small Leaf Bush Pea	Pultenaea foliolosa
Small Rice-flower	Pimelea humilis
Small St. John's Wort	Hypericum gramineum
Smooth Flax Lily	Dianella longifolia
Spear Grass (x3)	Austrostipa spp.
Spider Grass	Digitaria spp.
Spiny Mudgrass	Pseudoraphis spinescens
Sticky Everlasting	Xerochrysum viscosum
Stinking Pennywort	Hydrocotyle laxiflora
Swamp Wallaby Grass	Amphibromus nervosus
Hairy Bursaria	Bursaria spinosa subsp lasiophylla
Sweet Houndstooth	Cynoglossum suaveolens
Tall Groundsel	Senecio runcinifolius
Tall Raspwort	Gonocarpus elatus
Tall Sedge	Carex appressa
Tick Indigo	Indigofera adesmiifolia
Tiny Yellow Star	Hypoxis glabella
Tussock Grass (x2)	Poa sieberana/ labillardieri
Twining Fringe Lily	Thysanotus patersonii
Twining Glycine	Glycine clandestina
Twisted Parrot Pea	Dillwynia retorta
Urn Heath	Melichrus urceolatus
Vanilla Lily	Arthropodium strictum
Variable Sword-sedge	Lepidosperma laterale
Varnished Wattle	Acacia verniciflua
Wallaby Grass (x3)	Austrodanthonia spp.
Wattle Mat-rush	Lomandra filiformis
Weeping Grass	Microlaena stipoides
White Box	Eucalyptus albens
White Cypress Pine	Callitris glaucophylla
Woodrush	Luzula densiflora/ meridionalis
Yam	Microseris lanceolata
Yellow Box	Eucalvptus melliodora
Yellow Rush Lily	Tricoryne elatior

#### 3.2 Wildlife

A major biodiversity feature of the WREN study was the diversity of native fauna, with 125 species of birds, 14 species of mammals, 11 species of reptiles and 5 species of frogs being recorded.

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Note: The Scientific names of species are listed in the relevant tables.

#### Birds

The range of bird species recorded within the WREN study area is shown in Table 3. The range was particularly diverse when compared with other rural-urban landscapes in northern Victoria. Such diversity results from there being a wide range of habitat characteristics within the WREN and healthy bird populations in the surrounding landscape. Of the 128 species of native birds recorded in the WREN, eleven are listed by the Victorian Government as being threatened species, namely: the Brown Treecreeper, Diamond Firetail, Speckled Warbler, Swift Parrot, Regent Honeyeater, Black-chinned Honeyeater, Double-barred Finch, Australasian Shoveler, Hardhead, Great Egret and the Nankeen Night Heron. Two further species of threatened birds are known to utilize similar adjoining habitats in the Albury area. These are the Barking Owl and the Painted Honeyeater. Another two species, Latham's Snipe and the Rainbow Bee-eater, are recognized under Commonwealth legislation. In general small insectivorous birds were common throughout the WREN where the habitat was multi-layered (i.e. thickets of young trees and or shrubs as well as large trees). Hollow nesting birds including owls and parrots were most common on the more secluded dams with some aquatic fringing vegetation.

Mammals



Mammals that were commonly recorded in the WREN included the Eastern Grey Kangaroo, Black Wallaby, Common Wombat, Common Brushtail, Ringtail Possum and the Short-beaked Echidna. The threatened Squirrel Glider and Brush-tailed Phascogale (or Tuan), have been recorded by other studies (Glen Johnson; Natasha Schedvin), and both of these species have been regularly recorded in nest boxes erected for this purpose around the Baranduda area. Schedvin (2005) in her study of the area also recorded Koalas near the Kiewa River Floodplain,

along with the Sugar Glider and Feathertail Glider in areas abutting the Baranduda Range. An individual Water Rat was observed in Middle Creek. Bats were not surveyed for this report and only two species of bat have been previously recorded from within the WREN study area, these being the White-striped Free-tail Bat and the Lesser Long-eared Bat. Table 4 lists the mammal species recorded in the WREN.

#### Reptiles and Frogs

Reptile fauna was opportunistically recorded with small skinks often found where there was abundant fallen timber and sticks and exposed rock, especially where these sites abutted larger wooded remnants. An individual Lace Monitor, a vulnerable species in Victoria, was observed in a large tree abutting the Baranduda Regional Park. Five species of frogs have been recorded from within the WREN including the Common Froglet, Plains Froglet, Peron's Tree Frog, Southern Bullfrog and Spotted Marsh Frog (refer to Table 5).

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# Table 3:Birds of the WREN Study Area(Field observations and Atlas of Victorian Wildlife)

Common Name	Scientific Name
Australasian Grebe	Tachybaptus novaehollandiae
Australian Hobby	Falco longipennis
Australian Magpie	Gymnorhina tibicen
Australian Magpie-lark	Grallina cyanoleuca
Australian Pelican	Pelecanus conspicillatus
Australian Raven	Corvus coronoides
Australian Wood Duck	Chenonetta iubata
Australian Kestrel	Falco cenchroides
Barn Owl	Tyto alba
Blackbird *	Turdus merula
Black-chinned Honeyeater #	Melithrentus gularis gularis
Black-faced Cuckoo-shrike	Coracina novaehollandiae
Black-shouldered Kite	Fllanus axillaris
Blue-faced Honeveater	Enterno contis
Blue-winged Shoveler #	Angs rhynchotis
Brown Falcon	Falco berigora
Brown Coshawk	Accipitar fasciatus
Brown booded Heneycoster	Accipiter Jascialus Molithroptus huminostuis
Drown Songlark	Cinclowhamphus anuralis
Drown Thornhill	Cinciornampnus cruraiis
	Acammiza pusitia
Brown Treecreeper #+	Climacteris picumnus victoriae
Buff-rumped Thornbill	Acanthiza reguloides
Clamorous Reed-Warbler	Arocephalus stentoreus
Collared Sparrowhawk	Accipter cirrhocephalus
Common Bronze-wing	Phaps chalcoptera
Common Starling *	Sturnus vulgaris
Crescent Honeyeater	Phylidonyris pyrrhoptera
Crested Pigeon	Ocyphaps lophotes
Crested Shrike-tit +	Falcunculus frontatus
Crimson Rosella	Platycercus elegans
Diamond Firetail #+	Stagonpleura guttata
Dollarbird	Eurystomus orientalis
Double-barred Finch#	Taeniopygia bichenovii
Dusky Moorhen	Gallinula tenebrosa
Dusky Woodswallow +	Artamus cyanopterus
Eastern Rosella	Platycercus eximius
Eastern Spinebill	Acanthorhynchus tenuirostris
Eastern Yellow Robin +	Eopsaltria australis
European Goldfinch *	Carduelis carduelis
Fairy Martin	Hirundo ariel
Fan-tailed Cuckoo	Cacomantis flabelliformis
Flame Robin	Petroica phoenicea
Fuscous Honeveater	Lichenostomus fuscus
Galah	Cacatua roseicanilla
Gang Gang Cockatoo	Callocephalon fimbriatum
Golden-headed Cisticola	Cisticola orilis
Golden Whistler	Pachycenhala nectoralis
Great Farat	Ardag alba
Great Egret	Araea alba
Cray Currenting	Cracicus iorqualus Stumpur version lon
Grey Currawong	
Grey Fantail	Phipidura fuliginosa
Grey Shrike-thrush	Colluricincia harmonica
Grey Teal	Anus gracilis
Hardhead#	Aythya australis
Horsfield's Bronze-Cuckoo	Chrysococcyx basalis
House Sparrow *	Passes domesticus
Jacky Winter+	Microeca fascinans

Common Name	Scientific Name
King Parrot	Alisterus scapularis
Latham's Snipe •	Gallinago hardwickii
Laughing Kookaburra	Dacelo novaeguineae
Leaden Flycatcher	Mviagra ruhecula
Little Corella	Cacatua sanguinea
Little Fagle	Hieragetus mornhnoides
Little Frierbird	Philemon citroogularis
Little Lorikoot	Clossopsitta pusilla
Little Diad Cormorant	Dhalaaraaana malanalanaa
Little Pleu Colliolant	Compus mellori
Magkad Lapuring	Vanallus milos
Masked Lapwing Mictleton bird	Diogoum himmdingooum
Nerlean Night hann#	Nuctionary of devices
Nankeen Night-heron#	
New Holland Honeyeater	Phyliaonyris nigra
Noisy Fflarbird	Philemon corniculatus
	Manorina melanocepnala
	Oriolus sagittatus
Pacific Black Duck	Anus superciliosa
Pallid Cuckoo	Cuculus pallidus
Peaceful Dove	Geopelia striata
Pied Currawong	Strepera graculina
Rainbow Bee-eater	Merops ornatus
Red-capped Robin	Petroica goodenovii
Red-kneed Dotterel	Erythrogonys cinctus
Red Wattlebird	Anthochaera carunculata
Red-rumped Parrot	Psephotus haematonotus
Regent Honeyeater #•	Xanthomyza phrygia
Red-browed Finch	Neochmia temporalis
Restless Flycatcher +	Muiagra inquieta
Richard's Pipit	Anthus novaeseelandiae
Rock Pigeon*	Columba livia
Rufous Songlark	Cinclorhamphus mathewsi
Rufous Whistler +	Pachycephala rufiventris
Sacred Ibis	Threskiornis molucca
Sacred Kingfisher	Todiramphus sanctus
Scarlet Robin	Petroica multicolor
Satin Bowerbird	Ptilonorhynchus violaceus
Satin Flycatcher	Mviagra cvanoleuca
Shining Bronze-Cuckoo	Chrysococcyx lucidus
Silvereve	Zosterops lateralis
Singing Bushlark	Mirafra javanica
Southern Boobook	Ninox novaeseelandiae
Southern Whiteface+	Anhelocenhala nectoralis
Speckled Warbler #+	Chthonicola sagittata
Spotted Pardalote	Pardalotus nunctatus
Spotted Quail Thrush	Cinclosoma punctatum
Straw-necked Ibis	Threskiornis spinicallis
Striated Pardalote	Pardalotus striatus
Striated Thornhill	A canthiza lineata
Sulphur grasted Cookatoo	Capatua galorita
Superb Fairy Wren	Malurus manaus
Tourny Fragmouth	Dedaraus strizeides
Trae Martin	Himmedo niewiogna
Veried Sitelle	Dente a seitte characteria
We deve to ited Freedo	
Wedge-tailed Eagle	Aquila auaax
Weebill	Smicrornis brevirostris
Welcome Swallow	Hirundo neoxena
Western Gerygone	Gerygone fusca
Whistling Kite	Haliastur sphenurus
White-browed Scrubwren	Sericornis frontalis
White-browed Woodswallow +	Artamus superciliosus
White-faced Heron	Egretta novaehollandiae
White-naped Honeyeater	Melithreptus lunatus

Common Name	Scientific Name
White-necked Heron	Ardea pacifica
White-plumed Honeyeater	Lichenostomus penicillatus
White-throated Gerygone	Gerygone olivacea
White-throated Needletail	Hirundapus caudacutus
White-winged Chough	Corcorax melanorhamphos
White-winged Triller	Lalage tricolor
Willie Wagtail	Rhipidura leucophrys
Yellow-billed Spoonbill	Platalea flavipes
Yellow-faced Honeyeater	Lichenostomus chrysops
Yellow Rosella	Platycercus elegans flaveolus
Yellow-rumped Thornbill	Acanthiza chrysorrhoa
Yellow Thornbill	Acanthiza nana
Yellow-tufted Honeyeater	Lichenostomus melanops

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Introduced species. Victorian threatened species listed as Endangered or Vulnerable. #

Commonwealth listed species instead as Entangered of Vanierable. Commonwealth listed species protected under Threatened Species, Migratory Terrestrial Species, Migratory Wetland Species or Listed Marine Species' provisions under the EPBC Act 1999. Declining Woodland Bird, listed as being of Conservation Concern in Victoria. +

# Table 4:Mammals of the WREN Study Area(Atlas of Victorian Wildlife and field observations)

Scientific Name **Common Name** Common Wombat Vombatus ursinus Black Wallaby Wallabia bicolour Eastern Grey Kangaroo Macropus giganteus Koala Phascolarctos cinereus Squirrel Glider # Petaurus norfolcensis Sugar Glider Petaurus breviceps Common Brushtail Possum Trichosurus vulpecula Feather-tail Glider Acrobates pygmaeus Pseudocheirus peregrinus Common Ringtail Possum Short-beaked Echidna Tachyglossus aculeatus Water Rat Hydromys chrysogaster Brush-tailed Phascogale (Tuan) # Phascogale tapoatafa Lesser Long-eared Bat Nyctophilus geoffroyi White-striped Freetail Bat Tararida australis

# Victorian threatened species listed as Endangered or Vulnerable.

Table 5:	Reptiles and	d Frogs of tl	he Wren	Study Area
(Atlas of Vio	torian Wildlife and	field observa	itions)	

Common Name	Scientific Name
Bougainville's Skink	Lerista bougainvillii
Common Blue-tongue	Tiliqua scincoides scincoides
Cunningham's Skink	Egernia cunninghami
Eastern Brown Snake	Peudonaja textilis
Eastern Striped Skink	Ctenotus robustus
Garden Skink	Lampropholis guichenoti
Jacky Lizard	Amphibolurus muricatus
Lace Monitor #	Varanus varius
Marbled Gecko	Christinus marmoratus
Red-bellied Black Snake	Pseudechis porphyriacus
Three-toed Skink	Hemiegis decresiensis talbingoensis
Ewing's (Southern Brown) Tree Frog	Litoria ewingi
Common Froglet	Ranidella signifera
Peron's Tree Frog	Litoria peroni
Plains Froglet	Ranidella parinsignifera
Pobblebonk (Banjo) Frog	Limnodynastes dumerili
Spotted Marsh Frog	Limnodynastes tasmaniensis

Victorian threatened species listed as Endangered or Vulnerable.

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# 4.0 Status of Threatened and Declining Species and Endangered Ecological Communities in the WREN

Threatened species records are held with the statewide databases: the Victorian Flora Information System and the Atlas of Victorian Wildlife. A map of recorded sightings of threatened species in the WREN area is held by DSE.

Table 6: Threatened	species	recorded	within	WREN
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Species	Legal Status (Victoria)	Legal Status (Commonwealth)
Australasian Shovelor	Vulnerable	
Hardhead	Vulnerable	
Great Egret	Endangered	
Nankeen Night Heron	Vulnerable	
Double-barred Finch	Near threatened	
Regent Honeyeater	Endangered	Endangered
Swift Parrot	Endangered	Endangered
Speckled Warbler	Vulnerable	
Rainbow Bee-eater		Listed Migratory Terrestrial Species
Brown Treecreeper	Vulnerable	
Diamond Firetail	Vulnerable	
Black-chinned Honeyeater	Near threatened	
Tuan (Brush-tailed Phascogale)	Vulnerable	
Squirrel Glider	Endangered	
Lace Monitor	Vulnerable	
Latham's Snipe*		Listed Migratory Wetland Species
Tick Indigo	Vulnerable	
Slender Tick Tre-foil	Poorly known	
Small-leaved Bush Pea	Rare	

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\* Listed under the Japanese-Australasian Migratory Birds Agreement

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### 4.1 Threatened Species

#### Regent Honeyeater #•

This nationally endangered honeyeater, of which about 1000 birds remain, was recorded in the Chappel Road area in 1993 (Glenda Datson pers.comm.). This species has also been recorded in the West Wodonga region in remnant White Box and forward planting blocks (Glen Johnson pers.comm.). The Regent Honeyeater is more regularly recorded nearby in the Thurgoona area of Albury (Davidson *et al.* 2004) and in Chiltern National Park. Other incidental sightings occur in most Spring seasons around Albury. All breeding records of Regent Honeyeaters are important to the conservation of this species (Regent Honeyeater Recovery Plan 1998).





#### Swift Parrot #•

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The nationally endangered Swift Parrot is a regular winter visitor to the district, as it seeks out the flowering White Box and lerp upon which it feeds. This species breeds in Tasmania and over-winters on the mainland and it is estimated that only I 200 nesting pairs remain (Swift Parrot Recovery Plan 2001). Swift Parrots are regularly recorded at Mount Lady Franklin and Chiltern National Park, and were regularly recorded in the Albury area in winter 2004 (Davidson *et al.* 2006). Whilst no Swift Parrots were recorded during the WREN study period, it is likely that they would opportunistically utilise the White Box Woodlands throughout the study area in some years.

#### Brown Treecreeper (SE form – subspecies picumnus) #+

This is a recently listed species, dependent on large patches of woodland or well connected streamside vegetation, where it forages for insects on the trunks and branches of trees and on the ground below trees and on fallen logs (Walters *et al.* 1999). This resident treecreeper is sparsely distributed across the WREN district, with only four records within the WREN during the study period: Precincts A4B, D1A, J4 (near Whytes Road) and J1B. The major riparian corridors of the Kiewa and Murray Floodplains are likely to be the main habitats of this species in the district.



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#### Speckled Warbler #+

This small, sedentary ground feeding bird also nests on the ground, often at the base of shrubs or trees, and was recently listed as a threatened species in Victoria. It is dependent on patches of structurally complex shrubs or ground litter, where it can often be found foraging with thornbills and other small insect feeding birds. Speckled Warblers are relatively common in the wooded hills around the WREN study area which forms an important part of its habitat in the district.

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Diamond Firetail #+

This small grass-seed eating finch was recently listed as a threatened species in Victoria. Its prime habitat is the grassy woodlands, where it nests in dense, often prickly shrubs and forages on the ground for various native grass seeds. The core habitats in the district for this species are on the hills with a westerly or northerly aspect, where they are most commonly seen amongst the more open patches of natural grassy woodland or grasses adjoining these areas. Diamond Firetails occupy a similar habitat niche in the hills around Albury (Davidson et.al. 2006). It appears that the near absence of native grass seed (upon which the species forages) in the farmed or built up parts within the WREN greatly

limits this species' population size. The WREN forms

an important part of its habitat in the district.



#### Squirrel Glider #

The Squirrel Glider is a small-medium sized (200 -350g) gliding possum that was once common in the fertile woodlands on the inland side of the Great Dividing Range. Extensive clearing of habitat for agriculture and the decline in quality of the remaining habitats are the primary threats to the persistence of this species. Squirrel Gliders depend on abundant tree hollows within their range to den and raise young. Squirrel Gliders feed on nectar and pollen, sap and insects from a range of Eucalypts and Acacias. The minimum area required by Squirrel Gliders in high quality fertile habitat is approximately 3 - 5 ha, which increases as habitat quality decreases (van der Ree and Bennet 2003). The primary means of movement is by gliding between trees; with distances of up to 75m being regularly traversed (van der Ree et al. 2003).

Squirrel Gliders have been recorded in the WREN from several sites near Baranduda, utilising nest



boxes erected by the Baranduda Landcare Group for this purpose. Sites include the old Baranduda school (Precinct G7A), Chapple Road (L1C), Wodonga-Yackandandah Road (L4A), Ellen McDonald Drive (K2A), John Boyes Road (K2B) and the remnant Stringybark block (G7C) and also G5A, G5B, G6A, G6B and K1A. Schedvin (2005) recorded a single animal whilst spotlighting along Huon Creek. As with the population in Thurgoona (Davidson *et al.* 2004), it is likely that Squirrel Gliders occur across the WREN wherever there are abundant LHB trees which are well connected by treed corridors.

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Brush-tailed Phascogale (Tuan) # The Tuan is a rare, rat-sized carnivorous marsupial with a conspicuous black 'bottle brush' tail. Tuans are sparsely distributed across the box-ironbark region and the adjoining dry sclerophyll foothill forests in Victoria (Menkhorst and Knight 2001). This agile, nocturnal hunter forages mostly on rough-barked eucalypts where it probes for invertebrates amongst the bark and rotting wood. Tuans build nests of feathers, bark and fur in tree hollows. As with other small marsupial carnivores, all males die after mating in early winter. Tuans have been recorded in nest boxes at Baranduda, e.g. Kiewa Highway, Wodonga-Yackandandah Road, Chapples Road and remnants G6A, G7A and G7C. As well, evidence of their distinctive bark collecting has been found along a well timbered lane near Drapers Road. Their habitat requirements are similar to Squirrel Gliders but Tuans tend to be mostly associated with rough barked trees e.g. Red Stringybark and Box species. As they cannot glide between trees as Squirrel Gliders do, they prefer tree linkages without many gaps.

#### Lace Monitor#

This large (up to 2 metres long), often brightly patterned lizard is found where there are abundant LHB trees where it forages for the eggs or young of birds and mammals. The Lace Monitor lays clutches of eggs in termite mounds on the ground or in a tree (Wilson and Swan 2003). An individual animal was seen climbing a tree in habitat adjoining Baranduda Regional Park. Lace Monitors are likely to be only found within the WREN in habitats with large trees abutting or near the large wooded blocks of Baranduda Range, Drapers Road and possibly Bears Hill.

#### Great Egret

Great Egrets occur in wetlands and dams where they feed individually, stalking their prey in water up to 30 cm deep. They build stick nests in trees, often in colonies and with other waterbirds (Emison *et al.* 1987). There are few sites where Great Egrets have been recorded breeding in Victoria, with one being Ryan's Lagoon in Wodonga. Several individuals were recorded, mainly on dams associated with Middle Creek.

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#### Australasian Shoveler

Australasian Shovelers occur mainly on large, shallow lakes with fringing vegetation. They take food from or just under the water surface and nest in scrapes on the ground, usually in dense cover near water (Emison *et al.* 1987). Four birds were recorded on a secluded dam next to Middle Creek in late winter 2004.



#### Double-barred Finch

Double-barred Finches are mainly grass seed eating birds which appear to be increasing their range southward from NSW by colonizing wellwatered open short grass habitats (Emison *et al.* 1987). There appears to be several locally nomadic groups around the Baranduda area, within the WREN study area. The status of Double-barred Finches in Victoria is that of Near Threatened.

#### Hardhead Duck

In Victoria, Hardheads inhabit deep, permanent open freshwater wetlands with dense fringing vegetation (e.g. Cumbungi), with artificial impoundments being used in dry periods. Nests are built in dense vegetation over water. They feed by diving in deep water and occasionally dabbling just under the water surface. The strongholds of the Hardhead are wetland systems of inland Australia (Emison *et al.* 1987). A pair of Hardhead Ducks was observed in a large farm dam next to Streets Road in spring 2004.



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#### Nankeen Night Heron

Night Herons roost, often communally, during the day in the dense foliage of trees over water. At dusk they move to the margins of wetlands to forage, stalking their prey in shallow waters. Their stick nests are built in trees often in colonies and with other waterbirds (Emison *et.al.* 1987). Two birds were flushed from their roost in the dense foliage of trees along a waterway in Leneva Valley, not far from Streets Lagoon, in Spring 2004.



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#### Black-chinned Honeyeater

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The Black-chinned Honeyeater is regularly seen or heard, with its characteristic call, along waterways, in woodlands on the lower parts of the Baranduda Range, in large paddock trees and in gardens, coinciding with eucalyptus flowering. This honeyeater appears to be a resident in the district, probably within the WREN, with small foraging groups seeking flowering eucalypts year-round. This species utilizes the waterways, roadsides, paddock remnants and planted habitats of the study area. The status of Blackchinned Honeyeaters in Victoria is Near Threatened.

#### Latham's Snipe

Latham's Snipe are summer migrants from Japan, which are protected by the Japanese-Australian Migratory Bird Agreement under Commonwealth jurisdiction. These waders roost during the day amongst dense vegetation fringing dams and wetlands and emerge at night to forage. An individual bird was flushed from a dam near Middle Creek within the WREN study area.



#### Tick Indigo

This highly palatable shrub, greater than one metre in height, with beautiful pink pea flowers, is classified as Vulnerable in Victoria and is found on rocky slopes in North East Victoria. Several plants were located on Bears Hill Range, Wodonga -Yackandandah roadside and on Ridge Lane.



#### Rainbow Bee-eater

This species, listed under the Commonwealth EPBC Act 1999, migrates southwards into the area in Spring each year, leaving for its northerly flight in Autumn. Large numbers of this species breed along the steep eroded banks of waterways in the WREN. Their breeding is at risk during this period if banks in which they construct their nesting tunnels are disturbed, e.g. by battering back to alleviate erosion problems.



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#### Slender Tick-trefoil

This creeping native legume with purple pea flowers is often found in grassy woodlands and is classified as Poorly Known in Victoria. The plant is relatively widespread in the least disturbed parts of the study area.

#### Small-leaved Bush-pea

This shrub is a member of the pea family and grows up to two metres high. It is found on the slopes of North East Victoria and is listed as Rare in Victoria. These bush-peas are locally common on ridges south of the old Wodonga waste management site and also on the Wodonga-Yackandandah roadside.



#### 4.2 Threatened Ecological Communities in the Study Area

#### Grassy White Box Woodland

The Commonwealth of Australia has listed Grassy White Box Woodlands as a Threatened Ecological Community under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). The Grassy White Box Woodlands represents 'those distinct woodland communities where the dominant tree species is generally White Box *Eucalyptus albens* and grass species dominate the ground layer. Within this community type, White Box may form mosaics with Blakely's Red Gum *Eucalyptus blakelyi* and Yellow Box *E. melliodora* which may become locally dominant in lower topographic positions, while areas subject to waterlogging may be treeless'. The Grassy White Box Woodland in the WREN predominately occupied the northerly and westerly aspects of the lower slopes and knolls in the district and in most cases has been severely degraded such that it now consists mostly of scattered large trees with a weedy ground flora.

#### Yellow Box-Red Gum Grassy Woodland

The Commonwealth of Australia is currently considering a nomination that seeks to list the Yellow Box-Red Gum Grassy Woodland as a Threatened Ecological Community under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). This ecological community usually occurs with Yellow Box or Blakely's Red Gum in the overstorey and a mostly grassy ground layer and is found most often adjoining waterways. In the study area this endangered community is found between the White Box Woodland on the lower slopes and the floodplain with its River Red Gum woodlands. There are no intact examples of this woodland in the WREN and it now exists only as scattered remnant trees.

The state of Victoria considers the conservation or threatened status of native vegetation, or Ecological Vegetation Classes, within a bioregional context. The status of the EVCs in the WREN study area is listed in Section 3, Table 1: Extant Ecological Vegetation Classes and their Conservation Status in WREN.

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### 4.3 Other threatened species

Other threatened species which have not been recorded in the study area, but have the potential to be, are the following:

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#### Southern Bell Frog (Growling Grass Frog) #•

This species was not recorded during the surveys, even though extensive searches were made, however it is likely to occur in the adjoining Kiewa River Floodplain. The Southern Bell Frog requires large flood events for breeding and dispersal (Skye Wassens pers. comm.).



#### Giant Bull Frog

These frogs were not recorded during the surveys but have been found in similar habitat on the lower slopes around Albury.





#### Barking Owl #

Natasha Schedvin (2005) in her recent study of arboreal fauna within the WREN did not record Barking Owls and concluded that it is unlikely that Barking Owls occurred within the study area; but they may still occur along the adjoining Kiewa River riparian corridor.

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#### Painted Honeyeater #

This rare nomadic honeyeater is known to utilize foothill habitat with abundant mistletoe, similar to parts of Baranduda, although there have been no records from within the WREN. Painted Honeyeaters may occur wherever there is an abundance of mistletoe upon which it is dependant for food.



#### 4.4 Declining Woodland Birds of the WREN Study Area

A study of woodland birds in the Wheat-Sheep belt in NSW found that, as well as the recognized listed 'threatened birds', there was another group of woodland birds which appeared to be declining across their range and that may need listing in the future (Reid 1999). Woodland bird species in north east Victoria appear to be subject to similar threats to those in NSW, thus further declines in the numbers of these birds is likely if appropriate management of the remaining habitat is not undertaken. Of the list of 20 declining species from Reid's study, 11 are found in the WREN study area, including the Crested Shrike-tit, Dusky Woodswallow, Eastern Yellow Robin, Jacky Winter, Painted Button-quail, Red-capped Robin, Restless Flycatcher, Rufous Whistler, Southern Whiteface, Varied Sitella and the White-browed Woodswallow. The area, condition and isolation of remnants are important factors in the survival of bird populations, as is the total amount of habitat remaining in the landscape (Robinson and Traill 1996). In most instances the conservation requirements of the WREN threatened species will overlap that of the declining birds and thus additional planning measures are unlikely to be required.

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# 4.5 Significance of Threatened Species and Vegetation Communities in the WREN Study Area

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In summary there are a number of threatened biodiversity values known or predicted to occur in the WREN Study Area. These values include relatively intact examples of threatened Ecological Vegetation Classes which need to be protected from further threatening processes. The main species on which urban development is likely to have a significant impact are the Squirrel Glider and Tuan, because of their dependence on the larger trees at the urban-bush development interface, and the threatened woodland birds with significant local populations within the study area. This includes the Diamond Firetail, Black-chinned Honeyeater, Speckled Warbler and Brown Treecreeper. The nationally endangered Regent Honeyeater and Swift Parrot are not included as species of significance in this report because their presence in the WREN area is uncommon and therefore recommending actions for these species in this strategy is problematic. (However it is worth noting that conservation actions recommended for the Regent Honeyeater and Swift Parrot are consistent with the habitat protection and enhancement activities recommended in this report.) Obviously if either species becomes a more regular visitor to the area the significance of this species in the study area would need to be re-evaluated.

The other threatened species recorded either do not appear to have significant breeding populations in the WREN or they do not have significant numbers present in the study area and are therefore deemed to be less significant.

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# 5.0 Key Habitat Features of the WREN Study Area

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### 5.1 Waterways

Waterways are defined in this report as the creeks and the smaller drainage line systems that allow the water from rainfall to move through the study area and into the rivers. In many years, especially those associated with dry hot summers, the creeks dry completely or to a series of ponds. From a hydrological perspective the creeks and drainage lines are past degraded due to management including re-routing, of the removal riparian vegetation, the introduction of woody weeds and from overgrazing, leading to high silt deposits in-stream due to bank instability. As a result the general



biodiversity values of the in-stream habitat are low. The treed corridors of the creeks and drainage lines are however an important feature in this study area, often providing the linkages between the extensive regrowth woodland habitats of the hills with the scattered remnant habitats of the plains and the more extensive riparian corridor on the Kiewa River Floodplain. As well many of the LHB trees in the study area occur in these systems. Waterways and drainage lines provide habitat and connectivity across the landscape for many threatened species. They provide an ideal opportunity to improve the environmental values of the area whilst not greatly limiting urban development. (Note: there may be activities aimed at improving water quality and limiting the flows that occur in some waterways at the time of urban development). The Squirrel Glider and Black-chinned Honeyeater depend on these systems.

#### 5.2 Large Hollow Bearing (LHB) Trees

There are many LHB trees across the WREN, mostly occurring along the waterways, roadsides and as scattered paddock trees, mainly on the fertile slopes below the denser regrowth of the hills. Hollows for wildlife are a limited resource throughout the district, because most of the extensive forest and woodland on public land (e.g. Baranduda Regional Park) consists of younger trees or coppice regrowth lacking hollows. LHB trees have a high value for species of wildlife that rely fully on hollows for shelter or raising young, such as parrots, kingfishers, possums, gliders and bats.



Threatened species in the WREN which are dependent on the retention of LHB trees include the Squirrel Glider, Tuan, Lace Monitor and the Brown Treecreeper.

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#### 5.3 Forward Tree Plantings (FTPs)



Some of the larger blocks of tree cover consist of forward tree plantations, dominated by eucalypts, and as these trees are less than 30 years old they have not yet developed hollows. (The hollows take over 100 years to develop.)

The majority of FTP areas have low structural diversity (with notable exceptions being Precinct sites G6A and G5B). That is, they contain mostly an upper storey of tree species. Where FTP blocks have been enhanced with a shrub layer, the added floristic and structural diversity has improved the various foraging, roosting and breeding

opportunities for many bird species. For this reason, the habitat value of the isolated remnant trees within these blocks is now better for native wildlife (Grabham and Datson 2003).

Thirty four species of trees and shrubs have been identified in the tree blocks, of which 13 species are indigenous. This has provided a more or less continuous succession of flowering and has thus ensured a reliable supply of nectar and insects for foraging birds and animals. During mammal surveys of the Thurgoona area van der Ree (2003) observed that the strips of shed bark hanging over tree branches of smooth barked Eucalyptus species in the FTP blocks were providing habitat for the Squirrel Glider.

Many FTPs play an important role in providing wildlife corridors throughout the district by buffering around remnant patches and strips and connecting various sites, many of which contain otherwise isolated LHB trees.

#### 5.4 Dead Standing Habitat Trees (Stag Trees)

Stag trees contain hollows and crevices which provide suitable foraging habitat as well as roosting and nesting sites for many bird species, bats, reptiles, possums and the threatened Squirrel Glider and Tuan. Stag trees are scattered throughout waterways, paddocks and in some of the FTPs.



#### 5.5 Large habitat patches

Larger patches of vegetation are valuable because they can support a greater range of habitats, a greater range of species, larger populations of wildlife species and a greater core area away from edge disturbances (Platt 2002). Examples of woodland birds that require these larger woodland patches include Diamond Firetails and Speckled Warblers. Diamond Firetails are mainly found in patches of woodland >25 ha and are rarely found in sites isolated by more than 1 kilometre from other remnant vegetation, whereas Speckled Warblers are most commonly found in woodland patches >100 ha or in smaller patches that are well linked (Goulburn Broken CMA 2003).

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#### 5.6 Ground litter

Fallen logs are common beneath remnant trees and stags. Fallen logs are used by reptiles and frogs for shelter and provide an important substrate for foraging by many species including the threatened Brown Treecreeper. As well, many reptiles use the sticks as camouflage from predators and to forage amongst. Other ground cover in the form of leaf litter is also common below remnant trees and is used by many species for foraging purposes.



#### 5.7 Habitat Linkages (Wildlife Corridors)

An important concept in maintaining viable populations of wildlife involves allowing animals to move across the landscape. This ensures that: (a) gene flow between populations is maintained (i.e. populations do not become inbred); (b) areas can be recolonised following local extinction events (e.g. after a wildfire eliminates a local population); and (c) small populations can be bolstered by new immigrants (Platt, S. J. 2002). Those areas that abut the large open forest and woodlands of Baranduda and Bears Hill Ranges are often well connected to other wildlife populations; however the scattered large trees along waterways, roadsides and in small clusters in paddocks are often isolated.

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Connectivity across the landscape can be achieved through a number of things that include corridors for movement, linear habitats, and stepping-stones. If strategically designed and appropriately managed, these three components can assist in providing an effective habitat network strategy for the WREN.

(It is worth noting that other landowners, particularly those with areas of woodland, should be engaged in the development of this strategy, because they own important components of this network. See Section 7.0 Wodonga Retained Environment Network.)

The linear strips of remnant woodland along the waterways and many roadsides provide habitat for many species of plants and animals as well as potentially providing conduits for movement. In particular following the roads and waterways are important habitats and linkages: Huon and Middle Creeks and their tributaries, along with Boyes, Chapple and Howards Roads (including the treed unused laneways) and John Boyes, Whytes, Streets, Frederic Street Road, Martins and Drapers Roads, as well as the



Wodonga-Yackandandah Road (including the treed unused parts), Huon Creek Road, the Kiewa Valley Highway, parts of Castle Creek Road, and the unused lane between Drapers and Beechworth Roads and the treed lane, Precinct D4A, between Frederic Street Road and Beechworth Road. Areas of FTP that do not contain LHB trees are probably unable to support resident populations of many species, but are highly likely to be suitable as "corridors" for animals to move from one patch of habitat to the next. The FTP is particularly valuable when juvenile animals disperse from where they

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are born. Small and discrete patches of habitat may not provide continuous corridors but still provide connectivity by acting as "stepping stones" for some species from one patch of habitat to the next. Scattered trees in paddocks and small patches of habitat throughout the developed and undeveloped areas of the WREN may act as stepping stones.

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#### 5.8 Nectar Rich Resources

species of eucalypt were Nine recorded growing naturally in the study area. This represents a high degree of diversity for the catchment. This would provide a varied nectar resource throughout much of the year and it is not surprising that at least 16 species of honeyeater species have been recorded throughout the WREN recently. The planted Ironbark and Yellow Gum, though not indigenous to the Wodonga area, provide an excellent nectar source in good flowering years. This rich and diverse nectar supply helps



explain, at least in part, why rarer nectivores like the Black-chinned Honeyeater are relatively common in the WREN and why the endangered Regent Honeyeater is an occasional visitor.

Unlike similar habitat in the Albury area and the woodland remnants on farmland along the adjoining Murray Valley, resident, aggressive family groups of Noisy Miners are not common throughout the WREN. As a result the territorial defence upon the smaller less common birds (e.g. Black-chinned Honeyeater and Little Lorikeet) by Noisy Miners is not a major influence upon the variety of nectar feeding birds which utilize a site.

#### 5.9 Mistletoe

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Mistletoe is a particularly valuable habitat being common on many of the FTP eucalypt species and on some remnant trees. In flower it provides a rich nectar source for many native birds such as honeyeaters, as well as insects, possums and gliders. Mistletoe fruit is a vital part of the diet of the Mistletoe Bird and various honeyeaters including the rare Painted Honeyeater. Its complex structure provides good cover for native birds to perch and (The Regent Honeyeater nest in. successfully nested and fledged young in a mistletoe clump in Thurgoona in 2002 [Collins & Herring pers. comm.]). Possums, gliders (including the threatened Squirrel Glider) and many butterfly species feed on the foliage. At



least four species of mistletoe, including Drooping Mistletoe (*Amyema pendula*) and Box Mistletoe (*Amyema miquelii*), have been recorded in the FTP. Mistletoe often flowers and fruits when there is little other nectar or fruit available, further adding to the year round resources within the WREN.

#### 5.10 Intact woodlands

Remnant vegetation that is in good condition is extremely valuable because it often contains many species which are representative of a local area and it is generally easy to manage because it has usually had little past disturbance and doesn't have the abundance of weeds that more disturbed sites have (Platt, S. J. 2002). The intact woodland sites are the most important areas for flora conservation in the study area because they contain a diverse array of grasses and forbs. For example the western portion of Bears Hill Range (Precinct C2) contains one of the district's most intact examples of the endangered Grassy Woodland EVC and White Box Grassy Woodland EEC, whilst the slopes to the south of the old Wodonga waste management site (Precincts BIA and B3C) contain more than 50 species of native plants. The intact woodlands are also essential habitats for the three threatened plants and two threatened woodland birds (Diamond Firetail and Speckled Warbler) found within the WREN.



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### 5.11 Rocky slopes



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Rocky slopes, which generally are above the 220 metre contour, are very important areas for reptiles as the complex nature of the ground surface affords many opportunities for them to escape predation, find food and nesting sites and to locate suitable areas for basking for thermal regulation (Heatwole and Taylor 1987). Often the ground flora on rocky slopes is in good condition due mainly due to the difficulty in undertaking pasture improvement activities. This has prevented overgrazing. Examples are: Precinct G3 adjoining the Baranduda Regional Park, Precinct A4B (the knoll) and the stony western slopes of Bears Hill, Precinct C2. These sites usually have a high level of resilience wherein, so long as the grazing is managed strategically, the site will continue to flourish with few, if any, management activities. Diamond Firetails were often found on these slopes.

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# 6.0 Guiding principles for the Wodonga Retained Environmental Network

The principles expressed in this section cover the issues of importance for deriving the areas to be protected and linked, including their minimum habitat patch sizes and widths, along with the actions required to achieve the stated objectives for the WREN Strategy. Some of the key ecological principles\* guiding the decision making include:

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- Patch size predicated on extent of treecover, in particular LHB trees. Maximum bird diversity occurred in blocks >10 ha.
- Patch shape wherever possible the boundaries were "rounded-off to minimize edge effect.
- Buffering in all cases boundaries along linear strips of LHB trees (roads, minor drainage lines etc.) were placed outside the dripline of these trees i.e. 40+ metres.
- Linkages wherever possible the linkages between habitats where no LHB trees are present are 20+ metres, primarily for canopy connectivity to allow arboreal fauna movement.

To assist those involved in the implementation of this strategy a series of information sheets, consistent with this section, is provided at the rear of this document.

The guiding principles for achieving biodiversity conservation and sustainable land use are expressed in the Lower Kiewa Biodiversity Action Plan (DSE 2004). These are:

- 1. Protection of viable remnant habitats, and the flora and fauna populations they contain;
- 2. Enhancement of the condition of these habitats and populations; and
- 3. Restoration of at least some of their former extent by revegetation or reintroduction.

Another equally important consideration is that the long term urban sustainability and development goals of the Leneva Valley are met.

The Wodonga Retained Environment Network provides the practical template and is the key mechanism for protecting and maintaining the biodiversity within the study area. The WREN includes all the key environmental assets on Corporation and private land within the study area as well as buffers and connections to enhance the viability and resilience of this network. The WREN is consistent with the primary goal of 'Victoria's Native Vegetation Management – A Framework for Action' which is to achieve "a reversal, across the entire landscape, of the long-term decline in the extent and quality of native vegetation, leading to a Net Gain" (DNRE 2000). Prevention of run-off and erosion, provision of good quality habitat for flora and fauna including macro and micro-invertebrates, and prevention of salting are all desirable and achievable goals. In accordance with this the 3-step approach to achieving Net Gain was applied. That is: the avoidance of adverse impacts, particularly through vegetation clearing; where impacts could not be avoided their minimization through appropriate considerations in the planning processes; and the identification of appropriate offsets.

Mechanisms for achieving these outcomes include:

- Protection by reservations, covenants, management agreements, statutory planning and fencing;
- Enhancement by management of threats such as weeds, introduced predators, inappropriate/uncontrolled grazing by stock or native animals, and salinity; and by use of natural regeneration and revegetation with understorey plantings;
- Restoration by revegetation to create corridors, buffers or patches of habitat; and by reintroduction of individual plants and animals into depleted populations; and
- Adherence to sensitive urban design guidelines.

\*The ideal ecological outcome would be to achieve the protection and restoration of as much habitat as possible in the study area but, as stated previously, an objective of this strategy is to allow urban development. Therefore, with respect to natural habitat, the compromise applied was to retain the best habitats, enhance the strips of vegetation connecting them and undertake best practice revegetation enhancement works.

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To ensure that the WREN at least complied with the Victorian government's native vegetation targets a sampling exercise was undertaken by selecting three areas typical of the vegetation cover across the study area and comparing the Net Gain-Habitat Hectares "trade-off" model with the Wren Strategy outcome (see Appendix 4). The comparison determined that the WREN outcome was at least equal to or above the minimum outcome provided by applying the Net Gain guidelines.

#### 6.1 Waterways Management

The width of waterway corridors across the WREN varies depending on the size of the waterway (often determined by the size of the catchment it drains), its location in the landscape (waterways at higher elevations are usually deep and narrow whereas on the floodplain they are wide) and the amount of remnant vegetation along each bank. But they should be at least 50 metres wide overall to:

- Allow regeneration to occur away from the drip line of the existing trees;
- Enable open areas (for revegetation purposes) to be retained;
- Incorporate access and maintenance tracks away from the tree canopy;
- Maintain existing native tree cover, in particular LHB trees; and to
- Provide enough width to allow crash grazing to occur, for management purposes, without exacerbating the destabilization of the waterway.

In addition it is considered necessary to:

- Plant local native trees where gaps in the canopy of greater than 60 metres exist;
- Incorporate all identified LHB trees within 30 metres of the canopy of the drainage line into the corridor by fencing;
- Enhance corridors with the planting of local shrubs and understorey plants (see Revegetation Principles);
- Control long grass by slashing or periodic grazing;
- Control Phalaris grass by burning/spraying/physical removal and replacement with preferred native species;
- Remove woody weeds including Blackberry, Willows and Briar;
- Retain fallen logs and sticks for habitat purposes, where possible; and to
- Incorporate wetlands/retarding basins to improve water quality from urban development, prior to its discharge to receiving waters.

It should be noted that some waterways within the strategy area have been determined to be "designated waterways" by the North East CMA (see site maps) and as a result require a "Works on Waterways" permit for any works proposed in, on or over the waterway. Not all "designated waterways" have been retained within the WREN, mainly because they have no habitat assets (Datson 2005). However these waterways still require "Works on Waterways" approval prior to development.

#### 6.2 Large block management

There are extensive areas of native vegetation on the hills on the southern boundaries of Wodonga which are referred to as Baranduda Range, Drapers Hill and Bears Hill. These areas are the core areas for many of the native plants and animals in the Wodonga district and therefore require thoughtful management. Most of the woodland habitat on the Baranduda Range is State-owned parkland managed by Parks Victoria; whereas the bulk of the scattered woodland on Drapers Hill is privately owned. Bears Hill is owned in part by the Corporation and in part by the Department of Defence. Wodonga City Council has planning control over much of this land and through its planning scheme has protected the slopes from development. An Environmental Significance Overlay applies over all of the slopes surrounding the Leneva valley and has the effect of prohibiting development on the hills. This control is a central component of the Wodonga Planning Scheme and aims to protect landscape values of the hills that surround Wodonga and Leneva Valley.

Most of the large woodland blocks in the study area are grazed by cattle or horses. This grazing occurs either because the habitat is not separated by a fence from the adjoining cleared paddock or because there is sufficient grass in the ground layer to support some domestic stock. Wherever possible the grazing of woodland habitat should only be conducted on a strategic basis. That is, to control pasture

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grasses for weed or fire fuel control purposes. In large woodland blocks that do not have a major weed or fire fuel problem grazing should be avoided. To ensure the regeneration of trees and shrubs, year round stocking should not occur in woodland habitats (refer to Section 6.12).

#### 6.3 Retention of LHB trees and stags.

Large hollow bearing trees are the environmental asset most likely to be most impacted upon by urban development because there are many of these trees scattered in paddocks outside of the WREN. Most other valuable environmental parameters are incorporated within the retained habitat. The loss of these LHB trees will presumably take place over time as urban development occurs.

The retention and maintenance of LHB trees and stags is problematic in an urban setting because of their potential to be a danger to the public as they shed limbs. The very process of limb shedding through decay and wind damage allows hollows to develop and provides ground cover habitat by the way of logs and sticks. These habitat features are vital to the conservation of many species in the WREN.

Therefore consideration should be given to:

- Retaining and where possible incorporating all identified LHB trees within 30 metres of a wildlife corridor or block;
- Retaining all clusters of LHB trees larger than 0.5 hectare. (Note: trees are considered part
  of a cluster if they are within 2 canopy widths of the nearest tree.);
- Connecting clusters with treed corridors >20 metres wide where possible;
- Ensuring that all boundary fencing delineating the retained environmental network from the adjoining developable land occurs outside of the dripline of the canopy of LHB trees within the reserve;
- Retaining fallen logs and sticks for habitat purposes, particularly near the rocky hills where
  reptiles are plentiful;
- Discouraging public recreation use in areas containing LHB trees. (This issue is particularly
  important for the long term survival of LHB trees because land managers are required to
  undertake risk assessment and management of that risk in public spaces. Hence habitat in the
  form of hollow bearing limbs is frequently (necessarily) removed in public spaces and this
  need not occur if public access is limited.);
- Moving timber from areas to be developed into suitable parts of the retained habitat network to enhance the ground litter layer;
- Enhancing all retained LHB trees with the planting of local understorey shrubs (See Revegetation Principles); and
- The fact that where LHB trees are cleared, habitat values will be lost.

Consideration needs to be given in the WREN Action Plan\* to develop appropriate compensatory measures which may vary from the guidelines laid out in Victoria's Native Vegetation Management Framework document. For example the clearing for development of large trees which are outside the retained environmental network, where the developer does not have an offset area in which to undertake compensatory works. In these cases the developer may incur a cost which could be used to fund management works within the WREN.

(Note: tree or shrub plantings on their own do not adequately compensate for the habitat value lost by the removal of LHB trees.) The compensatory measures need to be developed by the key stakeholders ensuring that the measures are appropriate for the Wodonga area.

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\* To further the objectives of the WREN Strategy the stakeholders intend to implement an Action Plan.

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#### 6.4 Nest boxes

It is important that:

- In all cases nesting boxes should be established in retained habitat areas as close as practicable to where the LHB trees are removed. (Five boxes per tree removed are recommended; three or four for gliders and one or two for bats.);
- Wherever possible the Baranduda Landcare Group is consulted. It can play a major role not only in protecting and monitoring the boxes but also in educating the public including school children;
- Nest boxes are generally located where natural hollows are most limited;
- Nest boxes are maintained and monitored; and that
- Access, height and possible vandalism are considered when locating nest boxes.

Best Practice Management guidelines should be implemented when managing nest boxes. Refer to the Gould League of Victoria's "Nestbox Book" and Alan and Stacy Franks "Nest boxes for wildlife – a Practical Guide". (See Bibliography.)



#### 6.5 Forward tree plantings

It is important that these areas:

- Retain those aspects that provide key habitat for threatened wildlife;
- Retain corridors (>20 metres wide) of forward plantings for the movement of wildlife including Squirrel Gliders and Tuans between high value sites (these sites may be suitable for public access purposes);
- Retain forward plantings amongst sites retained for LHB tree clusters; and
- Retain strategic trees which may provide a link in an arboreal corridor.

#### 6.6 Revegetation and plantings

Revegetation works shall be conducted depending on site specific requirements. Where relatively intact EVCs are found, the enhancement of these will be via shrubby middle storey species if these are depleted and/or via herbaceous ground layer species where bare ground is exposed. Where vegetative linkages have been broken, plantings of trees in nodes will be required. Indigenous shrubs should be planted under and around large scattered trees.

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All areas in the WREN should be fenced to exclude grazing, thereby allowing natural regeneration to occur prior to revegetation works. Native vegetation varies significantly across the WREN with differences in geology, soil, elevation, drainage and aspect influencing the differences in vegetation communities. The EVC type for each site within the WREN is listed in Table 10, Appendix 2. For revegetation, purposes, this table should be referred to and species commensurate with the specific site EVC should generally be chosen. However, for revegetation to be more effective, the recognition of habitat values for wildlife and the integration of those values in the management of conservation areas must be the primary objective for revegetation activities.

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Where revegetation is to be undertaken these works will be facilitated if strategies are implemented to:

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- Prepare the planting bed adequately;
- Fence off and apply broad leaf (e.g. Paterson's Curse) weed control to the planting areas in early Autumn and Spring prior to flowering and seed set; hand pulling or chipping of weeds can be conducted where the use of sprays is not advisable (e.g. against some residential housing allotment boundaries);
- Remove Bathurst Burr by hand chipping when necessary or herbicide spraying in Spring; prevent Bathurst Burr seeding by spraying or chipping out for four to six years. Removal of hand chipped plants is required immediately to prevent further seed set by chipped plants which contain mature seeds;
- Ensure there is not a proliferation of Phalaris by spot spraying or a combination of spot burning and spraying of regrowth;
- Spot or strip spray planting areas several months beforehand;
- Mulch plants with compacted weed/seed free straw or recycled cardboard mats or similar means to a radius of 50cm preferably, leaving an air space between the stem of the plant and the mulch to avoid fungal problems for the plant;
- Protect plants using a plastic guard and 3 bamboo stakes per tree, ensuring stakes are placed correctly to avoid issues with bags blowing in on young plants (refer to Revegetation Guidelines in information sheet series); and to
- Ensure revegetation is kept free of weeds at least for the first year by follow up maintenance spraying.
- 6.6.1 Strategies for Waterway Revegetation
  - Plant indigenous riparian and understorey shrubs between June and September;
  - Plant woody shrub species in nodes to allow fire vehicle access;
  - The use of species such as Silver Wattle (Acacia dealbata), Sweet Bursaria (Bursaria spinosa), River Bottlebrush (Callistemon seiberi), Tree Violet (Hymenanthera dentata) and Long-leaved Hop Bush (Dodonea viscosa ssp. angustissima) is desired; and
  - Stock exclusion should be permanent unless there is excess grass growth, when controlled grazing methods over short periods in late Spring/early summer should be employed.

Note in some reaches woody weed control is required, often prior to revegetation, e.g. Middle Creek around Baranduda Boulevard and along Huon Creek.

- 6.6.2 Strategies for Understorey plantings amongst LHB trees
  - Hand plant in nodes around trees to improve habitat values and minimize risk of recreational use;
  - Ensure deep ripping does not occur within 2m of the drip lines of established trees and 10m from stag trees; and
  - The use of indigenous Wattles such as Hickory (Acacia implexa), and the prickly stemmed Sweet Bursaria and Hedge Wattle (Acacia paradoxa) are recommended. (For further recommendations, refer to DSE revegetation and planting density guidelines. Contact the DSE Wodonga office).
- 6.6.3 Strategies for Plantings amongst retained forward planting areas
  - Plant understorey shrubby species, such as Wattles and Bottlebrush to improve the floristic and structural diversity of these areas for wildlife habitat purposes;
  - The incorporation of some proven introduced native species is desired as they lengthen the nectar production period in some areas for a range of honeyeaters, including the Regent Honeyeater. Some bushy, shorter flowering species will also provide resting places for the Regent Honeyeater away from the more aggressive honeyeaters, such as Red Wattlebird, Noisy Miner, Noisy Friarbird and White-plumed Honeyeater; and
  - It may be necessary to plant away from tree root zones to minimize competition during initial growth stages.

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- 6.6.4 Strategies for Plantings in wildlife corridor gaps
  - Contour deep rip the ground preferably several months prior to planting;
  - Plantings of indigenous tree species such as White Box, Red Box and Blakely's Red Gum on the rises and Blakely's Red Gum on the higher reaches of the waterways with River Red Gum on the lower reaches, along with Yellow Box and Apple Box is desired. The use of some introduced native species such as Ironbark, Pink-flowering Yellow Gum and Spotted Gum is also desired as a foraging resource as they are known to be utilized by some threatened species in the Baranduda/Leneva area. The use of local and introduced native shrub species is also desirable to improve habitat values;

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- Tree species should be planted in clumps at intervals of, ideally, about 40 metres to allow successful arboreal movement of gliders; and
- Good ground preparation using methods as above should be employed.

#### 6.7 Fencing habitat retention areas and wildlife corridors

It is important to:

- Avoid the use of barbed wire in fences, to lessen the chance of Squirrel Gliders and other wildlife being "hooked up" on the barbs;
- Ensure all fenced areas have gates to allow access for maintenance purposes;
- Ensure all fenced areas include or abut (where narrow) a vehicular track for maintenance purposes;
- Ensure all fenced areas have access for fire vehicles;
- Ensure all fences are located outside of the dripline of all retained LHB trees.



Notes:

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- Where a fence abuts a used road and encloses grazing cattle, public safety is a primary consideration.
- Wherever possible old fencing within a retained site should be removed to reduce wildlife entanglement.

#### 6.8 Wildlife Corridors & Road Reserves

Important principles to be considered when developing wildlife corridors include the notion "the wider the better". The corridors should provide habitat as well as a pathway for movement and narrower corridors can be supplemented by enlarged areas of habitat or "nodes" (Platt 2002). As a general principle the longer the corridor the wider it should be, so that less mobile species traversing these corridors may shelter within them when required. Table 7 shows that the recommended width of corridors varies from those of the other conservation strategies commissioned by the Albury Wodonga Corporation i.e. Thurgoona Threatened Species Conservation Strategy and the Albury Ranges Threatened Species Conservation Strategy. This is mainly in recognition of the amount and distribution of surrounding remnant vegetation within each of the study areas. For example in the WREN and the Albury Ranges study areas there are more, larger habitat nodes than in the Thurgoona study area and therefore the corridor widths need not be so consistently wide. Similarly waterways in the WREN study area are far more variable than either the Albury Ranges or Thurgoona study areas and this is reflected in the range of recommended widths. In the WREN study area the recommended widths of roadside buffers are not as wide as those of the Albury Ranges or Thurgoona study areas because they lead, potentially, to a major loss in land for development.

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Discussions were held between the Corporation, WCC, DSE and the authors regarding the imminent rezoning and development of Streets Road north of Baranduda Boulevard, resulting in a decision to apply the rule of buffering all treed roadsides to a minimum distance of at least 10 metres wide or to the existing dripline of trees in the roadside wildlife corridor (whichever is greater). The major aim of this rule is to ensure that LHB trees are protected from being removed if their limb shedding is seen to be a risk to life, fences and buildings. It will also allow room for some regeneration and revegetation where necessary.

District Plan	Waterways	Roadside	FTP	LHB trees near corridors
WREN	50m edge to edge or increasing to floodplain width	Outside dripline or 10 m (whichever is greater)	20m+	Within 30m
Thurgoona	100m+ edge to edge	60m road reserve	20m+	Within 80m
Albury Ranges	50m+ edge to edge	60m road reserve	20m+	Within 30m

#### Table 7: Recommended widths of wildlife corridors on AWC land

It is important to:

- Retain corridors of forward plantings (>20 metres wide) that link retained clusters of LHB trees;
- Retain and where possible buffer all existing linear corridors of LHB trees, including unused and used roadsides and waterways;
- Plant trees between tree canopy gaps in habitat corridors of greater than 60 metres;
- widen corridors to include all identified LHB trees within 30 metres (see Site Precinct Map details, Appendix 5);
- Plant native plants as per revegetation section above, to enhance corridors; and to
- Consider wildlife corridors as possibly incorporating public access tracks.

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### 6.9 Weed control

Declared noxious weeds in Victoria are plants that have been proclaimed under the Catchment and Land Protection Act 1994. These plants cause environmental or economic harm or have the potential to cause such harm. They can also present risks to human health. There are four categories of noxious weeds defined under the Act:

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- State Prohibited Weeds;
- Regionally Prohibited Weeds;
- Regionally Controlled Weeds; and
- Restricted Weeds

Land owners and managers, including public authorities responsible for the management of Crown lands, are responsible for control of Regionally Prohibited weeds on their lands. Private landholders are responsible for control on private land but not on roadsides adjoining their property, which are the responsibility of Vic Roads, municipalities or DSE depending on the class of road. Further information can be obtained from local DSE/DPI offices. A list of these weeds can be obtained from the North East CMA website.

Regionally Controlled Weeds are usually widespread and are considered important in a particular region. To prevent their spread, continuing control measures are required. Land owners have the responsibility to take all reasonable steps to control and prevent the spread of these weeds on their land and onto the roadsides that adjoin their land. The Victorian government has adopted a strategic approach in the management of the risks posed by weeds. This is outlined in the *Victorian Pest Management Framework* and applied in Regional Weed Action Plans. Prevention and early intervention is the most cost effective means of weed management.

In the WREN Site Management Plan environmental weeds will be identified for each parcel of land. Subsequent management plans will need to deal with the effects of these weeds on biodiversity. It is important to:

- Ensure adequate weed control is undertaken preferably 12 months prior to tree or shrub revegetation activities, and with follow up maintenance;
- Control and where possible eradicate the following weeds, Bathurst Burr, Phalaris, Blackberry, Hawthorn, Horehound, Tree of Heaven, Sweet Briar, Willow and St Johns Wort;
- Control annual pasture grasses and flat weeds with strategic grazing; and to
- Prevent the dumping of garden waste into habitat retention areas.

Note that removal of weeds where they are providing habitat for a threatened species requires careful evaluation and possibly staged removal.

#### 6.10 Pest animal management

It is important to:

- Undertake annual rabbit and fox warren destruction in consultation with DSE, Wodonga City Council, Baranduda Landcare Group and adjoining landholders; and to
- Explore all avenues of discouraging domestic cat ownership and the confining of them to homes. The Victorian government has introduced a curfew for cats whereby they must be registered, tagged and confined to homes at night. If found wandering onto neighbouring properties and not identified they can be seized and impounded and when reclaimed a fine is payable. The Cat Management Manual (NRE 2001) provides a ready reference for Local Government, providing responses to common issues and community enquires. Domestic animal control requires an ongoing community awareness program. Wodonga Council has introduced a cat curfew however unless adequate monitoring and enforcement is undertaken some of the objectives of the strategy will be difficult to deliver. Such cat controls can only be enforced by local government.

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#### 6.11 Noisy Miner Management

It is important to:

Promote research into the impacts of Noisy Miners on threatened woodland birds; and to

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 Investigate, with DSE, the control of Noisy Miners in areas adjoining habitat suitable for threatened woodland birds (e.g. along Martins Road).

#### 6.12 Grazing of retained sites

It is important to:

- Use crash grazing where appropriate as a tool to control long grass in years with high fuel build up. Note: this will mostly involve periodic grazing of the wider, well fenced creeklines in early spring, to coincide with abundant annual grass growth;
- Ensure that retention sites are not continuously stocked;
- Ensure that grazing by domestic stock is only undertaken in habitat retention areas when grass growth is suppressing native plant regeneration or causes a potentially serious fire hazard; and to
- Manage stock in a way which prevents any spread of noxious or environmental weeds.

#### 6.13 Recreation pathways

Pathways should be located away from root zones and canopies of large hollow bearing trees and stag trees or any potentially large tree. Locating pathways on vehicle tracks is preferred.

#### 6.14 General site management

All habitat retention and wildlife areas require regular management. The type and amount of onground management will depend on the site characteristics. For example in relatively natural habitat areas a regular inspection for potential problems is all that is needed, whereas weedy waterways may require annual grazing/slashing, weed and pest animal control.

#### 6.15 Maintenance of bush rock

Wherever possible in the WREN rocks should be retained for habitat purposes. The placement of rocks from areas being developed into the retained habitat network should be promoted.

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	Activity									
Threatened Species & Endangered Ecological Community	Creek line Management	Wetland Development	Retention of LHB trees	Nest Boxes	Revegetation	Wildlife Corridors	Weed Control	Fallen log retention	Grazing Management	Cat Control
Regent Honeyeater #•	*		*		*					*
Black- chinned Honeyeater #	*		*		*					*
Swift Parrot #•	*		*		*					
Double- barred Finch#			*		*	*	*	*	*	*
Brown Treecreeper #	*		*			*	*	*		*
Speckled Warbler #					*	*	*	*	*	*
Diamond Firetail #+					*	*	*	*	*	*
Squirrel Glider #	*		*	*	*	*				*
Tuan #			*	*	*	*		*		*
Tick Indigo#					*		*		*	
Slender Tick- Trefoil#					*		*		*	
Small-leaved Bush-pea#					*		*		*	
Juniper Wattle #					*				*	
Grassy White Box Woodland•			*				*		*	
Yellow Box- Red Gum Grassy Woodland*			*				*		*	

# Table 8:Management activities for Threatened Species and Endangered<br/>Ecological Communities located in the WREN Study Area

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# Threatened Species (TS), Victoria• TS or Endangered Ecological Community (EEC), Commonwealth Listing,\* EEC, Commonwealth Listing in Progress

# 7.0 Wodonga Retained Environment Network (WREN)

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The WREN has been developed on the basis of the need for the protection of high conservation value remnant habitats and the enhancement of their functionality to wildlife by applying sound ecological principles incorporating improvements to the linkages between habitats, buffering narrow corridors and replanting with local native plants where necessary. Fig. 3 provides a map of all the precincts involved in the study. An overlay of the areas recommended to be retained and enhanced for threatened species conservation in the WREN is provided on this map. Figs. 3A-3L provide maps of each precinct. The study area contains 3850 ha of land. Of this roughly 1920 ha is currently owned by the AWC and the rest is a mix of private and public lands.

Within the study area, of the land potentially available for development, 33% of AWC owned land and 28% of privately owned land (approximately 1407 ha of remnant habitat) is being retained for biodiversity conservation purposes. Note: Of the 1407 ha designated for biodiversity conservation purposes 792 ha will be in public reserves and 615 ha will be covered by VPOs and Section '173 Agreements'.

The AWC sites with solid line boundaries are to be transferred to public ownership under the WCC or sold to a private landholder with a secure '173 Agreement' or covenant resulting in permanent protection and management of the biodiversity values.

Potentially, around 2220 ha will be available for development purposes.

The Wodonga City Council is currently liaising with key adjoining landholders in the WREN area with a view to gaining their support in managing their adjoining lands in a sympathetic manner, in keeping with the principles of this strategy. This work is particularly important for the maintenance and enhancement of the wildlife corridor networks. The maps should be viewed as indicative because the exact boundaries are difficult to define at this scale, or may be subject to slight alterations due to changing land use outcomes, eg., use of large block subdivision may mean that more LHB trees can be retained than recommended in the retained habitat network.

#### 7.1 Meeting Victoria's Native Vegetation Management Framework

The principles that must be met, under Clause 52.17 of the Victorian Planning Provisions, in order to work towards the statewide goal of Net Gain in extent and quality of native vegetation are:

- I. The avoidance of adverse impacts, particularly those caused by vegetation clearance.
- 2. For unavoidable adverse impacts, the minimization of these impacts through appropriate considerations during the planning stages that involve the input of expert knowledge that will provide appropriate project designs and management agendas.
- 3. The identification of appropriate offset options.

The sites identified in the WREN meet the intent of the first and second principles, and therefore these sites need to be securely protected.

This is to be achieved through the following steps:

- Rezoning all WREN sites on AWC land as identified in this strategy;
- Protecting sites currently on private land through using the '173 Agreements' at sale, or initially with a VPO and then at sale by the zoning of these areas as PCRZ or PPRZ, as identified in this strategy.

Appropriate offset options apply to the native vegetation, ie, the scattered trees, outside the WREN sites. Even within those areas of development, wherever possible, tree retention will be encouraged. For those trees likely to be removed the Net Gain provisions of the Native Vegetation Management Framework will be deemed to be met through the appropriate management of the WREN sites.

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## 8.0 Monitoring, evaluation and review

Regular monitoring of all areas in the WREN is required to ensure that the habitat enhancement and revegetation activities are successful. The Wodonga City Council shall oversee the monitoring with advice from DSE and the involvement of Parklands Albury-Wodonga and community groups like the Baranduda Landcare Group.

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To ensure that the objectives of the strategy are met it is important to establish permanent monitoring points across all sites to measure changes over time of habitat. This includes establishing key performance indicators (KPIs) for each site, which underpin the management performance of the WREN. KPIs may include measures such as the recruitment of new trees, a reduction in the weed layer, etc. As a result all sites within the WREN will have their environmental status benchmarked and compared over time to assess the appropriateness of their management. The KPIs will be included in Volume 2 of the WREN Strategy.

To ensure that wildlife populations within the WREN are healthy a number (10-20) of long-term bird monitoring sites should be established and benchmarked in consultation with Birds Australia. These sites can be monitored periodically (say, each one to two or three years) to track the response of birds to the habitat improvement works, and management of the WREN, and reported upon to the community.

Other monitoring actions required include:

- checking nest boxes. Nest boxes should be checked, cleaned out if inhabited by bees or starlings, repaired, or replaced twice per year. A long term monitoring contract with Parklands/Baranduda Landcare Group would be ideal because usage by Squirrel Gliders, Tuans and other wildlife could be tracked and improvements made to nest box positioning and design and numbers;
- replacing dead plants in revegetation areas;
- undertaking regular fence and track maintenance;
- destroying rabbit and fox warrens annually;
- undertaking annual inspection of grass growth in early spring for slashing and grazing purposes;
- undertaking annual inspection of problem weeds for control purposes;
- developing public awareness programs to inform residents of the biodiversity values of the WREN area and their potential role in its maintenance;
- promoting the involvement of the Baranduda Landcare group to aid in urban habitat protection; and
- undertaking regular inspections to discourage inappropriate usage of habitat retention areas and wildlife corridors. (Rubbish and garden waste dumping, for example.)

Evaluation and review of the WREN Strategy should be undertaken annually or earlier if required.

# 9.0 Funding

As with both the Thurgoona and the Albury Ranges Conservation Strategies, the success of the WREN Strategy depends substantially upon the availability of adequate funding for management purposes. The WREN is being set aside, at least in part, to comply with Commonwealth and Victorian State legislation. Whilst this may satisfy public and conservation interests, the proper maintenance of areas such as these needs to be addressed at Victorian and/or Commonwealth government levels and funded. This money should be invested in a trust fund to be used specifically for WREN habitat maintenance purposes.

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## **10.0** Conclusion

The WREN conservation strategy deals with the majority of the AWC owned land in Victoria and much of the private land in Leneva Valley. This strategy is an attempt to retain the biodiversity assets on the fringes of one of Victoria's fastest growing rural cities through the protection of an integrated holistic habitat network within an urban development framework. The strategy seeks to empower the landowners with practical advice relating to the plants and animals whose populations will only survive in the future if such a system is not only retained but also sympathetically managed.

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This strategy is unique in Victoria and is supported by Victoria's Native Vegetation Management Framework, which is encompassed by Victoria's Planning Policy Provisions and is consistent with the provisions for threatened species and ecological communities under the Commonwealth Government's Environment Protection and Biodiversity Conservation Act.

The WREN area was assessed for its key environmental values, focusing primarily on its native wildlife, plants and ecological communities. As a result 159 species of native animals (mostly birds) were identified as being present in the study area, of which 19 are listed in Victoria as threatened species. Other species of wildlife are considered likely to utilize the WREN from time to time. The native ground and shrub layer vegetation is very diverse, in particular on many of the rocky ridges where high numbers of a wide range of species was identified; whereas the lower mostly cleared paddocks have more weeds and less native plant diversity, reflecting the past and present agricultural activities in the study area. There are three threatened plants known in the study area. Much of the relict native vegetation throughout the WREN study area is comprised of the original grassy box woodland. These remnant grassy box woodlands are endangered ecological vegetation communities.

The ecological information gathered from these assessments was used to formulate a strategy for the AWC and future developers to enable urban development to take place whilst protecting and where possible enhancing native flora and fauna. The strategy focused primarily on the threatened wildlife and vegetation communities as a surrogate for biodiversity conservation, with particular emphasis on local populations of Squirrel Gliders, Tuans and four threatened woodland birds, the Diamond Firetail, Black-chinned Honeyeater, Brown Treecreeper and the Speckled Warbler, all of which breed in the study area. Sites with diverse ground flora were also accorded high significance in the strategy. This enabled the authors to develop a system of retained habitats, incorporating retention of the best remnants and enhancing them through understorey plantings, improved linkages between adjoining habitats through creekline, roadside and Forward Tree Plantation protection and revegetation. As well the important habitats nearby, not owned by the Corporation, are identified at a landscape scale to assist their owners in biodiversity conservation. The system of retained environmental network incorporates 626 ha (33%) of the land currently owned by AWC, for threatened species conservation in the WREN area. It also includes 426ha of public and private land, including reserves and road reserves.

Throughout the Strategy's development key government stake holders have been consulted to ensure that the strategy complied with the requirements of the relevant Victorian legislation, including those relating to urban development expectations. The number of large trees retained in the WREN is more than the minimum standard required under Victoria's Native Vegetation Framework although there remains the need to ensure that revegetation occurs within the WREN as recommended in the Site Management Table appended to this report. The Department of Sustainability and Environment has agreed that the WREN project satisfies the Net Gain requirements of the Native Vegetation Management Framework and that a permit to remove any trees within any development area contained within this project can be granted without the requirement of any additional Net Gain assessment, or additional offset plantings.

The development of this unique strategy was supported by an active advisory group of major stakeholders including the Albury-Wodonga Corporation, the Rural City of Wodonga, the Department of Sustainability and Environment, the North East Catchment Management Authority and the Department of Defence.

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As part of the Strategy's development the authors gave special consideration to the ongoing management of the retained habitat network, because the future survival of many of the species referred to in this document is dependent on how these habitats are managed in the long term. Section 6 of this Strategy and the attached management guidelines were developed with future management in mind. When future Wodonga residents look at the status of native wildlife in their neighbourhood what they will find will be a reflection, not only of the habitat remaining, but also of how well it has been managed.

The methodology that was applied to assess the environmental values (see Appendix I) of the WREN area (which was the same as that applied to the TTSCS and ARTSCS) is readily transferable to other urban-bush fringe areas.

The authors recognize that our state of knowledge is constantly changing and whilst this document represents the best assessment that can be made at the present time future discoveries may change the current thinking on management principles.

The cornerstone to the success of the report and the implementation of the Strategy to date has been the integration, cooperation and development of trust of the local stakeholders throughout the process.

The maintenance and enhancement of biological diversity within the WREN is a vision worth striving for. Managers will need to make a commitment to realistic and achievable environmental goals. They will also need to have a means of knowing what progress, over time, has been made and of knowing when the goals have been achieved. Thus the short and long term ecological objectives need to be accompanied by processes through which they can be evaluated. Support needs to be gained from all of those affected by the strategies employed: this will include governments and also those who may wish to exploit the opportunities. Above all the commitment required must be financed and it must be sustained. To this end a second volume of the WREN Strategy dealing with the transition from current ownership to future ownership and with the future management of the WREN estate is currently being prepared by the relevant stakeholders.

The authors recommend the adoption by the stakeholders of the WREN Conservation Strategy, the implementation of which will meet all of the proposed objectives set out in Section 1.2 thereby providing a viable, visible and valuable means of conserving and enhancing the habitats of the Wodonga region, in conjunction with sustainable urban growth.

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# 12.0 Appendices

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Appendix I: Flora and Fauna Survey Sheets

# Flora and Fauna Survey Sheets

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Values:	All	A	B	0	2			Date(s):				
Floristics								Surveyor:				
								Location.				
Habitat								Location.				
Linhaaa												
Linkage												
						(Sparse	=1, Co	mmon = 2, Abundant = 3)				
Indigenous Vege	etation S	pecies		Total	A	B	С	Indigenous Vegetation Species	Total	Α	В	С
Apple Box								Native Oxalis				
Austral Bear's Ea	ar							Native Plantain Sp.				
Austral Cranesbi	11							Tall Flax-lily				
Austral Indigo					1			Panic Grass Sp.				
Australian Bindw	veed							Ploughshare Wattle				
Australian Carrot	t				i –			Plume Grass Sp				
Beard Heath	-							Purple Coral Pea				
Black Cypress Pi	ne							Purple Wiregrass				
Black-anthered F	lav_lilv							Raspwort Sp				
Blakely's Red Gu	im							Raspwort Sp. Red-Anthered Wallaby Grass				
Blown Grass Sp								Red Box				
Diown Glass Sp.								Red Stringshort				
Diver Fileusiion								Red log Gross				
Daw Mistlataa								Red-leg Glass				
Box Mistietoe								Red-stem watte				
Bulbine Lily						_		Rice-Flower Sp.				
Carex Sp.	~				<u> </u>			River Red Gum				
Cat's Claw Albur	y Grevill	ea			ļ			Rock Fern Sp.		<u> </u>		
Chocolate Lily					<u> </u>			Scaly Buttons				
Clustered Everlas	sting							Showy Parrot Pea				
Common Butterc	eup							Showy Podolepis				
Common Correa								Silver Wattle				
Common Cranes	bill							Small St. John's Wort				
Common Fringe	Lily							Small-leaf Bush Pea *				
Common Hovea								Spear Grass Sp.				
Common Love G	irass							Sticky Everlasting				
Common Wheat	Grass							Stinking Pennywort				
Cotton Fireweed								Sundew Sp.				
Creamy Candles								Sweet Bursaria				
Daphne Heath								Tick Indigo *				
Drooping Sheoak	(							Tiny Star				
Drooping Mistlet	toe							Tussock Grass Sp.				
Early Nancy								Twiggy Bush Pea				
Erect Guinea Flo	wer							Twining Fringe Lilv				
Geebung								Twining Glycine				
Golden Everlasti	ng							Umbrella Sedge Sp				
Goodenia Sp								Urn Heath				
Grass Trigger Pla	ant							Vanilla Lily				
Handsome Flat P	lea							Variable Glycine				
Hedge Wattle	cu							Variable Sword-sedge				
Hoary Guinea El	ower							Varnish Wattle				
Hoary Supray	ower							Wallahy Grass Sn				
Hon Bitter Pea								Wattle Mat_rush				
Jarsay Cudwaad								Waaping Grass				
Juninar Wattla								White Day				
Kangaroa Crazz								White Cupress Dine				
Kangaroo Grass								Willow Horb Sp				
Kluney weed								Windwill Cross Sc				
Kurrajong	_							windmill Grass Sp.				
Lightwood								woodrush				
Long Leaved Bo	X							Y am Daisy				
Many-flowered N	vlat-rush							Y ellow Box				
Milkmaids								Y ellow buttons				
Narrow-leaf Hop	bush							Yellow Rush Lily				
Native Cherry												
Native Dock								Other including FTP				

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Key to vegetation	n abundan	ce:
1 Sparse - scattered	l occasional (	200

– scattered, occasional occurrence. on – regular occurrence throughout.

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Key to	o vegetati	on ab	und	ance:	
1 0		1		•	

1.	Sparse - scattered, occasional occu
2.	Common - regular occurrence thro
3.	Abundant – major lifeform on site.

Fauna species	Total	A	В	С	Fauna species	Total	А	В	С
Australian Hobby					Magpie-Lark				
Australian King-Parrot					Masked Lapwing				
Australian Magpie					Mistletoe Bird				
Australian Magpie-Lark					Musk Lorikeet				
Australian Owlet-Nightjar					Nankeen Kestrel				
Australian Raven					Noisy Friarbird				
Australian Shelduck					Noisy Miner		İ		
Australian Wood Duck		· · · · · ·	1		Olive-backed Oriole		İ		
Barn Owl					Pacific Black Duck				
Black-chinned Honeveater		· · · · · ·			Painted Button-Quail		1		
Black-eared Cuckoo					Pallid Cuckoo				
Black-faced Cuckoo-Shrike					Peaceful Dove				
Black-shouldered Kite					Peregrine Falcon				
Blue-faced Honeyeater					Pied Currawong				
Blue Wren					Rainbow Bee-eater				
Brown Falcon					Red Wattlebird		1		
Brown Goshawk					Red-browed Finch				
Brown Thombill			1		Red-capped Robin				
Brown-headed Honeveater					Red-rumped Parrot				
BrownTreegreener					Restless Elycatcher				
Buff-rumped Thombill					Richard's Pipit				
Collored Sparrowhawk					Richard STipit				
Common Pronzewing					Rufous Whistler				
Common Storling					Canad This				
Common Starling					Sacred Ibis			-	
Crested Pigeon					Sacred Kinglisher				
Crested Shrike – Ilt				-	Scarlet Robin				
Diaman d Einsteil					Shining Bronze Cuckoo				
Damond Firetan					Surveye				
Dollarbird					Southern Booboolk				
Dusky woodswallow					Southern Whitelace				
Eastern Rosella					Speckled warbler				
Eastern Spinebill					Spotted Pardalote				
Eastern Yellow Robin					Striated Thornhill				
Fail-talled Cuckoo					Sublated Hioffioli				
Fairy Martin					Tarama Era ana suth				
Flame Kobin					Tawny Frogmoun				
Fuscous Honeyeater									
Galan					Varied Sitella				
Gang-gang Cockatoo					wedge-tailed Eagle				
Golden Whistler					Weebill				
Grey Butcherbird					Welcome Swallow				
Grey Fantail				-	Western Gerygone				
Grey Teal					White-throated Gerygone				
Grey Shrike-thrush					Whistling Kite				
Hooded Robin					White-plumed Honeyeater				
Horsfield's Cuckoo					White-throated Treecreeper				
Jacky Winter					White-winged Triller				
King Parrot					White-bellied Cuckoo-shrike				
Laughing Kookaburra					White-naped Honeyeater				
Leaden Flycatcher					White-winged Chough				
Little Eagle					Willie Wagtail				
Little Friarbird					Yellow Rosella				
Little Lorikeet					Yellow Thornbill				
Little Raven					Yellow-rumped Thornbill				
Magpie					Yellow-tufted Honeyeater				
Other including Mammals & reptiles:									

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Ground Layer Character	All	A	В	C	Features	All	A	В	С
Weeds sparse					Rocky outcrop				
Weeds Common in Parts					Creek/Drainage				
Weeds Common Throughout					Dam				
Weeds Abundant					Wetland				

Weed Type	Connectiveness
Annual pasture grass and flat weeds	Part of Larger Remnant
Perennial pasture grass	Linked (linear link)
Woody weeds	Clustered
	Cleared

List main weed species if known:

Overstorey	Ground Layer		
Open Forest	Grassy		
Woodland	Shrubby		
Sparse – occasional tree	Rush/Sedge		
Some clumps	Herb		
	Bare		

Structural Characteristics

Tree regrowth		
Shrub layer <1m		
Shrub layer>1m		
Tree hollows		
Fallen timber		

Key to Rating System:

Habitat

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High - near natural.

Medium/High – near natural, but missing a major ecological component, e.g. no shrub layer. (A minor change in current management or just time may move the site to a high rating).

**Medium** – several ecological components missing or degraded, e.g. tree cover good but ground layer dominated by pasture grasses. (This will take active management to improve the site rating).

**Low/Medium** – totally modified but has some retained natural features e.g. scattered tree cover or tree plantation. **Low** – totally modified (this will require complete restoration).

Flora

High - near natural, few weeds and high plant diversity, especially ground layer.

Medium/High - near natural, high plant diversity but weeds common.

Medium - modified, but includes some native grasses and forbs. Weeds are common.

Low/Medium – highly modified, mostly weedy but with some hardy native grasses.

Low - cleared, may contain a few isolated trees but is severely disturbed and dominated by weeds.

Linkage significance

High – connects 2 important remnants.

Medium/High - timbered creekline or roadside.

Medium – partial link between 2 remnants.

Low/ Medium – small patch, < 500 m from another remnant.

**Low** - isolated patch, > 500 m from another remnant.

Note 1: In some cases, sites that rated medium or lower were being utilised by, or had been utilised previously by, threatened wildlife. This automatically gave the site an importance, i.e. a High rating.

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# Summary of Habitat and Rating:

Summary of Linkage Significance and Rating:

Summary of Flora Significance including EECs:

Summary of Wildlife (include species of special interest):

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Fire hazard vegetation type (refer to map):

Specific management recommendations:

- *Clearing/retention:*
- Grazing/Fencing:
- Revegetation/Type: (Refer to Strategy)
- Weed management:
   e.g. Creeklines, refer to Strategy
- *Pest animals/Control:*
- Threatened species management:
- Other:

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Appendix 2: WREN Site Table

# WREN Site Table

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 Table 9:
 WREN Site Results.

 N.B. I.To simplify site numbering, precincts were established. Refer to Figure 3, Appendix 5.

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pendix 5.	
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Figures	
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refer	
nformation,	-
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site	ŀ
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Precinct/Site	Site					Ecological Va	alues, Managemen	t Objectives & Development Co	nstraints		
Ö	Characteristics	Habitat	Flora Rating	Linkage Value	EVC	Vegetation Category	Conservation Status of EVC	Management Objective & Manager	Recommended Actions	Development Constraints	Zone/Overlay
A											
1A	Relict woodland and deep gully	×	Σ	H/W	Grassy Woodland(175)	Remnant	Endangered	Riparian Reserve to be managed by Parklands/MCC	Retain and enhance	Gully boundary outside dripline of trees - upslope retained habitat area (rha) should include LHB trees	PCRZ
6	Treed Lane	Σ	L/M	H/W	Grassy Woodland (175)	Scattered trees	Endangered	Manage as part of a wildlife corridor, with low level public access. WCC/Parklands	Retain and enhance	Eastern part (LHB trees) boundary outside dripline of trees	PPRZ
10	FTP lane	L/M	_	H/W	Grassy Woodland (175)	Scattered trees	Endangered	Retain treed corridor within urban design. WCC/Private	Retain	Corridor should be at least 50 metres	VPO 2
2A	Fenceline patch	≥		≥	Grassy Woodland (175)	Scattered trees	Endangered	Retain treed corridor and buffer within urban design. WCC	Retain and enhance	Boundary of WREN should be outside the drip line of all LHB trees	PPRZ
28	L shape including drainage line and roadside buffer	Þ	L/M	H/M	Valley Grassy Forest (47)	Scattered trees	Vulnerable	Manage as roadside buffer (WCC) and retain remnant trees in private blocks with 173 Agreement	Retain and enhance	Roadside buffer should include drainage line and grazing should be controlled to allow tree regeneration	VPO 2
2C	Shallow Drainage Line	≥	L/M	Þ	GW/VGF complex	Scattered trees	Endangered	Manage as habitat reserve in the WREN. WCC/Parklands	Retain and enhance	WREN boundary should be outside dripline of LHB trees and remnant ground cover	PPRZ
3A	Huon Creek	H/W	Þ	H/W	Creekline Grassy Woodland (68)	Remnant	Endangered	Habitat Reserve. WCC/Parklands	Retain and enhance	Incorporate all of the floodplain in the WREN and exclude grazing except for fuel control	PCRZ

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	Zone/Overlay	PPRZ	VPO 1	PCRZ	PCRZ	PPRZ		173	VPO 2
	Development Constraints	Reserve should be wide enough to adequately protect trees and rocky gully	Boundaries of LHB tree clusters outside dripline, link to NE remnant variable	WREN boundary should be outside dripline of LHB trees and remnant ground cover	Incorporate all of the floodplain in the WREN and exclude grazing except for fuel control	Corridor should include all LHB trees and be at least 50 metres		Grazing should be excluded except for fuel control	Minimize tree removal in roadside
onstraints	Recommended Actions	Retain and Enhance- NECMA/AWC inspect preferred course of drainage line to Huon Creek (see Datson 2005, Waterways Values Assessment )	Retain and link small clusters of LHB trees with 4B and 2C through urban design	Retain and enhance	Fence, control grazing and revegetate	Enhance gully connecting hilltop with Castle Creek		Retain and establish grazing controls with 173 agreement	Where possible retain trees
tt Objectives & Development Cc	Management Objective & Manager	Protect rocky gully head and treed upper parts within waterway reserve. WCC	Retain treed corridors and buffer within urban design. WCC	Manage as habitat reserve in the WREN. WCC/Parklands	Informal Parkland/Riparian Reserve. WCC	Retain gully corridor and buffer within urban design. WCC		Management should be consistent with a habitat reserve in the WREN. Private (with advice from DSE)	Retain roadside FTP. Private
alues, Managemen	Conservation Status of EVC	Vulnerable	Endangered	Endangered	Endangered	Endangered		Endangered	Endangered
Ecological V	Vegetation Category	Scattered trees	Scattered trees	Remnant	Remnant	Scattered trees		Remnant	Scattered trees
	EVC	Valley Grassy Forest (47)	Grassy Woodland (175)	Grassy Woodland (175)	Floodplain Riparian Woodland (56)	GW/V GF complex		Grassy Woodland (175)	Grassy Woodland (175)
	Linkage Value	×	≥	H/W	H/W	≥		W/H	Σ
	Flora Rating	LM	ΓW	Σ	Þ			W/H	L/M
	Habitat	×	≥	≥	L/M	_		W/H	Σ
Site	Characteristics	Rocky slope and drainage line	Small Remnants	Hilltop woodland	Castle Creek	Gully corridor		Timbered gullies and ridges	Roadside FTP
Precinct/Site	No.	8	4A	8	5A	ß	0	P1A	<b>91B</b>

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ecinct/Site No.	Site Characteristics	Habitat	Flora	Linkage	EVC	Ecological Va Vegetation	alues, Management Conservation	t Objectives & Development Co Management Objective	nstraints Recommended	Development	Zone/Overlay
			Rating	Value		Cătegory	Status of EVC	& Manager	Actions	Constraints	
	Timbered lane (southern section)	т	H/M	т	Grassy Woodland (175)	Remnant	Endangered	Manage as wildlife corridor, with low level public access. WCC/Parklands	Retain and buffer, no vehicle use	Retain track for pedestrian and management vehicle access only	PPRZ
	Timbered lane (middle section)	H/W	≥	т	Grassy Woodland (175)	Remnant	Endangered	Manage as wildlife corridor, with low level public access. WCC/Parklands	Retain and buffer, no vehicle use	Retain track for pedestrian and management vehicle access only	PPRZ
	Timbered lane (wide northern section)	H/M	Σ	т	Grassy Woodland (175)	Remnant	Endangered	Manage as wildlife corridor, with low level public access. WCC/Parklands	Retain and buffer, no vehicle use	Grazing should be excluded except for fuel control	PPRZ
	Ridge line FTP and open woodland	≥	L/M	H/W	Grassy Woodland (175)	Scattered trees	Endangered	Manage as part of a wildlife corridor, with low level public access. WCC/Parklands/Private	Retain and enhance	Maximize the retention of LHB trees within the retained area	PPRZ
	Rocky knob and linear link	z	LM	≥	Grassy Woodland (175)	Scattered trees	Endangered	Manage as part of a wildlife corridor, with low level public access. WCC/Parklands/Private. Develop roadside buffer along Castle Creek Road	Retain and enhance	Maximize the retention of LHB trees within the retained area	VPO 2 in roadside buffer and VPO 1 progressing to PPRZ
	Land abutting Old Waste Management Site	H/W	H/W	т	Grassy Woodland (175)	Remnant	Endangered	Manage as habitat reserve in the WREN. DSE/Parklands	Retain	WREN- exclude grazing	PCRZ
	FTP and gully system	×	Γ/W	H/W	Grassy Woodland (175) and Floodplain Riparian Woodland (56)	Scattered trees	Endangered	Manage as part of a wildlife corridor, with low level public access. DSE/Parklands	Retain drainage lines and adjoining LHB trees	Boundary of WREN should be outside the drip line of all LHB trees and the drainage lines	PCRZ
	Old Tip Site	Γ/W	<b>_</b>	Σ	Grassy Woodland (175)	Scattered trees	Endangered	Revegetate to provide habitat values. WCC/Parklands	Undertake extensive revegetation using local native trees, shrubs and ground layer species	Exclude grazing during restoration	PPRZ

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Precinct/Site	Site					Ecological Va	alues, Managemeni	t Objectives & Development Co	instraints		
No.	Characteristics	Habitat	Flora Rating	Linkage Value	EVC	Vegetation Category	Conservation Status of EVC	Management Objective & Manager	Recommended Actions	Development Constraints	Zone/Overla
5A	Triangle block east of unused lane	H/W	Σ	H/W	Grassy Woodland (175) and RGW/VGF (251) Endangered	Remnant and FTP	Endangered	Manage as habitat reserve in the WREN. DSE/Parklands	Retain	Grazing should be excluded except for fuel control	PCRZ
P5B	Drainage corridor	L/M	L/M	≥	Valley Grassy Forest (47) Vulnerable and RGW/VGF (251)	Scattered trees	Endangered	Fence drainage line and manage as an informal Parkland/Riparian Reserve. WCC/Parklands	Fence and enhance drainage line and buffer adjoining 7A	Boundary of WREN below dam should be outside the drip line of all LHB trees	VPO 1
6A	Open woodland	×	Σ	H/W	Grassy Woodland (175)	Remnant	Endangered	Manage as habitat reserve in the WREN. DSE/Parklands	Retain and enhance	WREN boundary should be outside dripline of LHB trees and remnant ground cover	PCRZ
6B	Roadside buffers	_	_	Þ	RGW/VGF Mosaic (251)	Scattered trees	Endangered	Protect roadside trees and promote tree and shrub	Retain and revegetate	Roadside buffers should be outside	VPO 2

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should be outside the dripline of the LHB trees Protect Protect Protect Protect Buffer, utilising the FTP where possible Retain and buffer revegetate Buffer Buffer Manage as habitat reserve in the WREN. WCC/Parklands Manage as habitat reserve in the WREN. WCC Manage as habitat reserve in the WREN. WCC promote tree and shrub regeneration. WCC/Private Manage as habitat reserve in the WREN. WCC Endangered Endangered Endangered Endangered Remnant Remnant Remnant Remnant trees RGW/VGF Mosaic (251) RGW/VGF Mosaic (251) RGW/VGF Mosaic (251) RGW/VGF Mosaic (251) Mosaic (251) т т т т H/M MH ≥ т H/M H/M M/H H/M

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PCRZ

Use strategic grazing to manage fuel levels

Retain and enhance upper parts

Manage as habitat reserve in the WREN. WCC/Parklands

Endangered

Remnant

Grassy Woodland (175)

≥

Σ

≥

SW portion of Bear's Hill

ပ –

Northern portion of Beechworth Road

2

Unused portion of Beechworth Road

Unused portion of Old Beechworth Road

7A

Beechworth

78 2

Road

**VPO 1** 

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**VPO 1** 

VP01 **VPO 1** 

Precinct/Site	Site					Ecological Va	alues, Management	t Objectives & Development Co	onstraints		
No.	Characteristics	Habitat	Flora Rating	Linkage Value	EVC	Vegetation Category	Conservation Status of EVC	Management Objective & Manager	Recommended Actions	Development Constraints	Zone/Overlay
53	Western face of Bear's Hill	H/W	H/M	H/W	Grassy Woodland (175)	Remnant	Endangered	Manage as habitat reserve in the WREN. WCC/Parklands	Retain and exclude grazing: ensure a link at least 40 metres wide is retained to connect with the stock route to the north	Northern boundary of WREN should be located to retain LHB trees and good ground cover- exclude grazing	PCRZ
<del>ر</del>	Bears Hill above Martins Road	×	×	х.	Valley Grassy Forest (47)	Remnant	Vulnerable	Manage as habitat reserve in the WREN. DSE/Parklands	Retain and limit grazing	Southern boundary of WREN should be located to retain LHB trees and good ground cover- use strategic grazing to control weeds and fuel levels	PCRZ
4A	Remnant open woodland west of Martins Road	H/W	L/M	т	RGW/VGF Mosaic (251)	Scattered trees	Endangered	Consolidate wide treed corridor adjoining Martins Road and manage as habitat reserve in the WREN. WCC	Retain and enhance wide corridor with LHB trees and significant drainage line	WREN boundaries should be outside dripline of LHB trees	PCRZ & PPRZ
P4B	Upper slope	L/M	L/M	Σ	RGW/VGF Mosaic (251)	Scattered trees	Endangered	Manage as part of Bears Hill Reserve. WCC/Parklands	Fence and exclude grazing	No development	VPO 1 progressing to PCRZ
P4C	Upper slope	L/M	L/M	×	RGW/VGF Mosaic (251)	Scattered trees	Endangered	Manage as part of Bears Hill Reserve. WCC/Parklands	Fence and exclude grazing	No development	VPO 1 progressing to PCRZ
5A	Streets Road	H/W	Σ	H/W	RGW/VGF Mosaic (251)	Remnant	Endangered	Manage as wildlife corridor. WCC	Buffer	Extend roadside tree corridor to Wattle Glen in north	VPO 1

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Precinct/Site	Site					Ecological V	alues, Managemen	tt Objectives & Development Co	nstraints		
No.	Characteristics	Habitat	Flora Rating	Linkage Value	EVC	Vegetation Category	Conservation Status of EVC	Management Objective & Manager	Recommended Actions	Development Constraints	Zone/Overlay
ß	Tree clusters	Z	L	×	RGW/VGF Mosaic (251)	Scattered treas	Endangered	Retain treed patches in corridors and buffer within urban design. WCC	Enhance corridor b/n Streets and Beechworth Roads and retain clusters of LHB trees where possible	Incorporate most LHB trees into 2 corridors, connecting Streets and Beechworth Roads	PPRZ
Δ											
1A	Large timbered paddock off Drapers Road	Σ	×	H/M	Valley Grassy Forest (47) Vulnerable and Grassy Woodland (175)	Remnant	Endangered	Management should be consistent with a habitat reserve in the WREN. Private (with advice from Parklands/DSE)	Implement 173 agreement to retain habitat values	Use strategic grazing to manage fuel levels	173 & DSE
18	Timbered unused lane	H/W	Γ/W	H/M	Grassy Woodland (175)	Scattered trees	Endangered	Manage as wildlife corridor, key site for woodland birds. DSE	DSE review licence, exclude grazing	No development	VPO 1
2	Treed corridor and drainage lines	≥	L/M	H/W	RGW/VGF Mosaic (251)	Scattered trees	Endangered	Retain treed corridors and enhance drainage line. WCC	Retain, re-direct drainage line and enhance	Buffer either side of the tree covered laneways and the drainage line should be at least 50 m wide	PPRZ & VPO1 progressing to PPRZ
3	Frederic Street Road	H/W	Σ	H/W	RGW/VGF Mosaic (251)	Remnant	Endangered	Manage as wildlife corridor. WCC	Buffer	Buffer roadside to protect all LHB trees	VPO 1
4A	Timbered lane	≥	L/M	H/M	Valley Grassy Forest (47) Vulnerable and Grassy Woodland (175)	Scattered trees	Endangered	Manage as part of a wildlife corridor, with low level public access. WCC/Private	Retain and buffer and reconnect with Beechworth Road	Major wildlife corridor buffer should be at least 60 m wide, include LHB trees whorever cossible	PPRZ

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	Zone/Overlay	PPRZ	PPRZ & VPO1 progressing TO PPRZ		PPRZ, & VPO1 progressing to PPRZ	PCRZ	4P0 1
	Development Constraints	WREN reserve should include maximum number of LHB trees and a treed corridor connection with Frederic Street Road and the wildlife corridor 4C	Review		Incorporate all of the floodplain in the WREN and exclude grazing except for fuel and weed control purposes	Exclude grazing	WREN boundaries along drainage lines should be at least 40 m wide
onstraints	Recommended Actions	Retain and enhance	Retain and reconnect with 4A, 4B & Middle Creek		Retain, undertake woody weed control and revegetate	Retain within P1A creekline corridor and undertake weed control (including Blackberry)	Retain and complete revegetation
t Objectives & Development Co	Management Objective & Manager	Manage as habitat reserve in the WREN with low level public access. WCC/Private	Retain tree clusters within urban design. WCC/Private		Manage as informal parkland by WCC	Informal Parkland/Riparian Reserve. WCC	Manage as habitat reserve in the WREN. WCC/Private
alues, Managemen	Conservation Status of EVC	Endangered	Endangered		Endangered	Endangered	Endangered
Ecological V	Vegetation Category	Remnant	Remnant and scattered trees		Scattered trees	Remnant	Scattered trees
	EVC	Valley Grassy Forest (47) Vulnerable and Grassy Woodland (175)	Valley Grassy Forest (47) Vulnerable and Floodplain Riparian Woodland (56)		Floodplain Riparian Woodland (56)	Plains Grassy Woodland (55) and Floodplain Riparian Woodland (56)	Plains Grassy Woodland (55)
	Linkage Value	×	H/W		H/W	H/W	H/W
	Flora Rating	Σ	L/M		LM	H/W	LM
	Habitat	Σ	×		Σ	H/W	Σ
Site	Characteristics	Hilltop and scattered LHB trees	Wildlife corridor incorporating isolated woodlot and dam		Middle Creek b/n Beechworth and Frederic Street Roads	Intact seepage area	Drainage lines north of Boyes Road
Precinct/Site	O	4B	4C P4C	ш	1A P1A	<b>6</b>	P1C

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Precinct/Site	Site					Ecological Va	alues, Managemeni	: Objectives & Development Cc	onstraints		
No.	Characteristics	Habitat	Flora Rating	Linkage Value	EVC	Vegetation Category	Conservation Status of EVC	Management Objective & Manager	Recommended Actions	Development Constraints	Zone/Overlay
Ľ.											
P1A	Hill slopes below Baranduda Regional Park	Σ	×	H/M	PGW/VGF/RG (190)	Remnant	Endangered	Manage as habitat reserve in the WREN. WCC/ParksVic	Implement 173 agreement to control grazing and retain habitat values till development occurs	WREN boundary should be located to incorporate the maximum number of LHB trees and remnant ground cover. Exclude grazing	VPO 1 progressing to PCRZ
8	Gully	Þ	Γ\W	H/M	PGW/VGF/RG (190)	Scattered trees	Endangered	Manage as habitat reserve in the WREN. WCC/Private	Retain and enhance with shrubs in weedy parts	WREN boundary should be located to incorporate the maximum number of LHB trees and remnant ground cover. Exclude grazing	VP0 1
P1C	LHB trees and drainage line with recent revegetation	Z	L/M	H/W	PGW/VGF/RG (190)	Scattered trees	Endangered	Manage as habitat reserve in the WREN. WCC/Private	Retain and complete revegetation	Area recently fenced. Exclude grazing	VPO 1
P2A	Hill slopes below Baranduda Regional Park (west)	L/M	×	τ	PGW/VGF/RG (190)	Remnant	Endangered	Manage as habitat reserve in the WREN. WCC/Parks Vic	Implement 173 agreement to control grazing and retain habitat values till development occurs	WREN boundary should be located to incorporate the maximum number of LHB trees and remnant ground cover. Exclude grazing	VPO 1 progressing to PCRZ
P2B	Valley below Baranduda Regional Park	×	H/W	т	PGW/VGF/RG (190)	Remnant	Endangered	Manage as habitat reserve in the WREN by WCC/Private	Implement 173 agreement to control grazing and retain habitat values	WREN boundary should be outside dripline of LHB trees and remnant ground cover. Exclude grazing	VPO 1 progressing to PCRZ

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	Zone/Overlay	VPO 1 progressing to PCRZ	VPO 1		PCRZ VPO 1	PCRZ	PCRZ
	Development Constraints	WREN boundary should be outside dripline of LHB trees and remnant ground cover. Exclude grazing	WREN boundaries along drainage lines should be at least 40 m wide		WREN boundary should be located to incorporate the maximum number of LHB trees and remnant ground cover. Exclude grazing	The western boundary should be located to include most LHB trees. Exclude grazing except for fuel control purposes	WREN boundary should be outside dripline of LHB trees and remnant ground cover. Exclude grazing
onstraints	Recommended Actions	Implement 173 agreement to control grazing and retain habitat values	Retain and complete revegetation		Retain and enhance clusters of LHB trees	Retain as wildlife corridor as shown on plan	Retain as important wildlife habitat
it Objectives & Development Co	Management Objective & Manager	Manage as habitat reserve in the WREN by WCC/Private	Manage as habitat reserve in the WREN by WCC/Private		Manage as habitat reserve in the WREN. Parklands/WCC	Manage as informal parkland. WCC	Manage as habitat reserve in the WREN. Parks Vic/WCC
alues, Managemen	Conservation Status of EVC	Endangered	Endangered		Endangered	Endangered	Endangered
Ecological V	Vegetation Category	Remnant	Scattered trees		Scattered trees	Scattered trees	Remnant
	EVC	PGW/VGF/RG (190)	PGW/VGF/RG (190)		PGW/VGF/RG (190)	PGW/VGF/RG (190)	PGW/VGF/RG (190)
	Linkage Value	т	H/W		H/W	H/W	H/W
	Flora Rating	L/M	L/M		L/M	L/M	H/M
	Habitat	L/M	L/M		×	×	H/W
Site	Characteristics	Rocky gully below Baranduda Regional Park	Gullies below Baranduda Regional Park		Timbered paddock	FTP along watenway	Gully block next to Baranduda Regional Park
Precinct/Site	No.	22C	D2c	(7)		o.	

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	Zone/Overlay	PPRZ	VPO 2 progressing to PPRZ	PCRZ	VPO1 progressing to PPRZ	VPO 1 progressing to PPRZ
	Development Constraints	Wildlife corridor should be at least 50 m wide and include LHB trees and drainage lines wherever possible. Exclude grazing	Wildlife corridor should be at least 40 m wide, including LHB trees wherever possible	Exclude development and grazing	Development should be excluded between the fenceline and the road	Corridor should be at least 40 m wide
onstraints	Recommended Actions	Retain and enhance roadside buffer and link b/n gully system at site G3	Retain, revegetate and reconnect b/n clusters of LHB trees	Retain and enhance with shrubs in weedy parts	Retain and enhance with shrubs in weedy parts following targeted control works	Retain linkage through supplementary overstorey planting in gaps
t Objectives & Development Co	Management Objective & Manager	Manage as part of a wildlife corridor and roadside buffer, with low level public access. WCC	Manage as part of a wildlife corridor, linking known Tuan /Glider habitat (6A/B, 7A/C & K1A) to main Baranduda Range, with low level public access. WCC	Manage as habitat reserve in the WREN. WCC. Likely Tuan and confirmed Squirrel Glider habitat	Manage as part of a wildlife corridor, with low level public access. WCC. Known Tuan habitat (nest box activity)	Manage as wildlife corridor, along drainage line with low level public access. Private/NCC. NB: Bike path route OK outside minimum 40m retained width. Known Squirrel Glider habitat (nest box confirmation on-site)
alues, Managemen	Conservation Status of EVC	Endangered	Endangered	Endangered	Endangered	Endangered
Ecological V	Vegetation Category	Scattered trees	Scattered trees	Remnant	Remnant	Scattered trees
	EVC	PGW/VGF/RG (190)	PGW/VGF/RG (190)	PGW/VGF/RG (190)	PGW/VGF/RG (190)	PGW/VGF/RG (190)
	Linkage Value	Þ	H/W	H/W	H/W	H/M
	Flora Rating		L/M	≥	×	Г/W
	Habitat	Þ	≥	≥	H/W	H/W
Site	Characteristics	Wildlife corridor between G3 & Howards Road	Roadside buffers, links & small drainage lines	FTP block.	Triangular block abutting Baranduda Boulevard.	FTP on drainage line
Precinct/Site	O		Ą	æ	26A	968

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Precinct/Site	Site					Ecological Vé	alues, Managemen	t Objectives & Development Co	onstraints		
Ö	Characteristics	Habitat	Flora Rating	Linkage Value	EVC	Vegetation Category	Conservation Status of EVC	Management Objective & Manager	Recommended Actions	Development Constraints	Zone/Overlay
7A	Old Baranduda School Site	≥	H/W	H/W	PGW/VGF/RG (190)	Remnant	Endangered	Manage as part of a wildlife corridor, with low level public access WCC/Parklands	Retain and undertake weed control in the intact ground layer at the rear of the school	Development should be excluded except at the front of the block, away from the dripline of remnant trees	PCRZ
78	FTP buffers	Σ	Ę	H/W	PGW/VGF/RG (190)	Scattered trees	Endangered	Retain treed corridor(s) within urban design, including buffer to existing school, along Kiewa Valley Hwy (where the ground layer vegetation is in good condition) and at least 20m buffer to 7C	Retain and enhance buffers b/n 6A, 7A and 7C	Maintain treed buffers at least 20 m wide.	PPRZ & VPO 1
20	woodland	H/W	HW	HW	PGW/VGF/RG (190)	Remnant	Endangered	Manage as habitat reserve, including the LHB trees at the top of the drainage line, in the WREN. WCC/Parklands. Known extant Tuan and Squirrel Glider habitat (confirmed via Nest Box activity)	Retain and enhance with clusters of native shrubs in weedy gaps. Selective broad-leaf weed control may be required	Exclude development and grazing, except for fuel control purposes; may be dissected by a road (and bike path) which avoids the dripline of LHB trees and intact ground flora	PCRZ
H											
P1A	LHB trees abutting Fredric Street Road and Baranduda Blvd	IL/M	-	Σ	RGW/VGF Mosaic (251)	Scattered trees	Endangered	Manage wildlife corridor connecting Fredric Street Road with Martins Road. WCC	Retain and enhance corridor	WREN boundary should be located to incorporate the maximum number of LHB trees	VPO 1- progressing to PPRZ
P1B	Remnant woodland patch	Σ	L/M	H/W	RGW/VGF Mosaic (251)	Scattered trees	Endangered	Manage as informal parkland. WCC	Retain and enhance with shrubs in open weedy parts	WREN boundary should be outside dripline of LHB trees and grazing excluded	VPO 1- progressing to PPRZ

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inct/Site	Site					Ecological Va	alues, Management	: Objectives & Development Co	onstraints		
	Characteristics	Habitat	Flora Rating	Linkage Value	EVC	Vegetation Category	Conservation Status of EVC	Management Objective & Manager	Recommended Actions	Development Constraints	Zone/Overlay
	Open woodland patch adjoining Streets Road	Σ	L/M	H/W	RGW/VGF Mosaic (251)	Scattered trees	Endangered	Manage as informal parkland. WCC	Retain and enhance with shrubs in open weedy parts	WREN boundary should be outside dripline of LHB trees and grazing excluded	VPO 1- progressing to PPRZ
	Middle Creek b/n Fredric Street Road and Baranduda Blvd	Σ	L/M	H/W	Floodplain Riparian Woodland (56)	Scattered trees	Endangered	Manage as informal parkland. WCC	Retain, undertake woody weed control and revegetate	Incorporate all of the floodplain in WREN and exclude grazing except for fuel control	PPRZ & VPO1 progressing to PCRZ
	Wetland	H/W	Γ/W	H/W	Wetland			Manage as habitat reserve in the WREN. WCC/interest group	Retain. Exclude grazing, reinstate wetland control structure	Ensure boundary fence is outside the full height of the wetland; investigate the re- instatement of the control structure	PCRZ & VPO1 progressing to PCRZ
	LHB tree cluster	L/M	<b>_</b>	×	Plains Grassy Woodland (55)	Scattered trees	Endangered	Manage tree cluster as part of WREN. WCC/Private	Retain and reconnect small LHB tree cluster to Middle Creek	Fence WREN tree cluster outside tree driplines. Link location is flexible and should be > 40 m wide	VPO 2

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	Zone/Overlay	PPRZ .& VPO 2 progressing to PPRZ		VPO 1- progressing to PPRZ	VPO 1 progressing to PPRZ
	Development Constraints	Locate roadside buffer boundaries to incorporate the maximum number of LHB paddock trees possible		WREN boundary should be located to incorporate the maximum number of LHB trees and remnant ground be at least 50m wide. Exclude grazing except for fuel control.	Wildlife corridor should be at least 50 m wide and include LHB trees and drainage lines wherever possible. Exclude grazing
nstraints	Recommended Actions	Retain, revegetate and reconnect clusters of LHB trees as roadside buffers and link with creek		Retain and revegetate as major wildlife corridor along creek and between Bears Hill and HP1A Bears Hill and HP1A	Retain and enhance roadside buffer and corridor b/n gully system and Bears Hill
t Objectives & Development Co	Management Objective & Manager	Manage tree cluster in roadside buffers and a wildlife corridor as part of WREN. WCC		Informal Parkland/Riparian Reserve. WCC	Manage as part of a wildlife corridor and roadside buffer, with low level public access. WCC
alues, Managemen	Conservation Status of EVC	Endangered		Endangered	Endangered
Ecological V	Vegetation Category	Scattered trees		Scattered trees	Scattered trees
	EVC	Plains Grassy Woodland (55)		Plains Grassy Woodland (55)	RGW/VGF Mosaic (251)
	Linkage Value	Σ		H/W	H/W
	Flora Rating	Г		L/M	L/M
	Habitat	Σ		×	z
Site	Characteristics	Roadside buffers and clusters of LHB trees b/n Boyes and Fredric Street Road		Creekline north of Baranduda Blvd	Wildlife corridor and roadside buffer north of Baranduda Blvd
Precinct/Site	No.	υ	_	P1A	P1B

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	Zone/Overlay	PCRZ	VPO 1 progressing to PCRZ	VPO 1	VPO 1 progressing to PCRZ		PPRZ	PCRZ
	Development Constraints	Exclude grazing	Southern boundary of WREN should be located to retain LHB trees and good ground cover. Use strategic grazing to control weeds and fuel levels	No development	Northeast boundary should be located on the 220 metre contour		WREN boundary should be outside drip zone of remnant trees and the link should at least 40 m wide	WREN boundary should be outside dripline of LHB trees and remnant ground cover. Exclude grazing
nstraints	Recommended Actions	Retain within P1A wildlife corridor	Retain and limit grazing & revegetate where necessary near Middle Creek to connect the hill woodland with the streamside habitat	DSE to review licence. Exclude grazing	Retain and limit grazing		Retain and revegetate small remnant tree cluster and link b/n Boyes Rd and knoll	Retain, including LHB trees on western side and revegetate
alues, Management Objectives & Development Cc	Management Objective & Manager	Informal Parkland/Riparian Reserve managed by WCC	Manage as part of the Bears Hill habitat reserve in the WREN. Parklands MCC	Manage as part of the Bears Hill habitat reserve in the WREN. Parklands WCC	Manage as part of the Bears Hill habitat reserve in the WREN. Parklands /WCC		Manage tree cluster as part of Boyes Road buffer (WCC) and include link b/n buffer and J1B in urban design	Manage as habitat reserve in the WREN by WCC
	Conservation Status of EVC	Endangered	Endangered	Endangered	Endangered		Endangered	Endangered
Ecological V	Vegetation Category	Remnant	Remnant	Remnant	Remnant		Scattered trees	Remnant
	EVC	Plains Grassy Woodland (55)	RGW/VGF Mosaic (251)	Grassy Woodland (175)	Grassy Woodland (175)		Plains Grassy Woodland (55)	RGW/VGF Mosaic (251)
	Linkage Value	H/M	H/W	H/W	H/W		≥	H/M
	Flora Rating	Σ	Σ	Σ	×		L/M	Σ
	Habitat	Σ	H/W	H/M	H/W		Σ	H/W
Site	Characteristics	Intact grassy patch	Southeast part of Bears Hill Range	Timbered strip	Northeast part of Bears Hill Range		Roadside buffers and corridor with J1B	Timbered knoll
Precinct/Site	No	P1C	P2A	2B	P2C	-	1A	18

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	Zoi	ЧЧЧ	VPC PPP	Hdd	Hdd	VPO
	Development Constraints	Incorporate all of the floodplain in the WREN and exclude grazing except for fuel control	Incorporate all of the floodplain in the WREN and exclude grazing except for fuel control	Ensure that treed corridor is at least 50 metres and is maintained along the highway between Middle Creek and Baranduda	Boundary of WREN should be outside the drip line of all LHB trees and the drainage lines. Exclude development and grazing except for fuel control	Ensure that treed corridor is maintained along the highway between Middle Creek and Baranduda
onstraints	Recommended Actions	Control woody weeds, revegetate to enhance wildlife corridor	Control woody weeds, revegetate to enhance wildlife corridor	Retain where possible	Retain LHB trees and wet areas as drawn	Retain where possible
t Objectives & Development Co	Management Objective & Manager	Manage as informal parkland. WCC	Manage as informal parkland. WCC	Manage as roadside buffer. WCC/Private	Manage as habitat reserve in the WREN. WCC	Manage as roadside buffer for a wildlife corridor along the Kiewa Valley Highway. WCC/Private
/alues, Management (	Conservation Status of EVC	Endangered	Endangered	Endangered	Endangered	Endangered
Ecological V	Vegetation Category	Scattered trees	Scattered trees	Scattered trees	Scattered trees	Scattered trees
	EVC	Floodplain Riparian Woodland (56)	Floodplain Riparian Woodland (56)	Plains Grassy Woodland (55)	Plains Grassy Woodland (55)	Plains Grassy Woodland (55)
	Linkage Value	H/W	≥	Σ	H/W	Σ
	Flora Rating	L/M	W L/W	_J	L/M	FLM
	Habitat	Σ	L/M	N N N N N N N N N N N N N N N N N N N	Σ	LM
Site	Characteristics	Middle Creek b/n Baranduda Blvd and Kiewa Valley Highway	Middle Creek floodplain on private land west of Kiewa Valley Highway	FTP strip along Kiewa Valley Highway	FTP and LHB trees	FTP along Kiewa Valley Highway
Precinct/Site	No.	10	P1D	2A	28	3A

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	Zone/Overlay	PPRZ	VP0 2	PPRZ		PPRZ	PPRZ & VPO 2
	Development Constraints	Ensure boundary fence is outside the full height of the wetland and that the pre-existing overland inflow is directed into the wetland.	Ensure that treed corridor is maintained along the highway between Middle Creek and Baranduda	Use strategic grazing to manage fuel levels		WREN boundary should be outside dripline of LHB trees	Grazing should be excluded except for specific pulse grazing for fuel
lues, Management Objectives & Development Constraints	Recommended Actions	Retain, exclude grazing and revegetate high parts. The dams should be backfilled depth is mostly <1 metre, to promote aquatic macrophyte growth, the wetlands should dry out at least 1 of 3years	Retain where possible	Retain and exclude grazing		Retain and enhance with shrubs & targeted weed control	Retain and enhance with trees and shrubs.
	Management Objective & Manager	Manage as informal parkland by WCC/Private	Manage as roadside buffer for a wildlife corridor along the Kiewa Valley Highway. Private	Manage as informal parkland. WCC		Manage as part of a wildlife corridor, with low level public access. WCC. Nest box activity confirmed – likely Squirrel Glider habitat	Manage as part of a wildlife corridor, with low level public access. WCC
	Conservation Status of EVC		Endangered	Endangered		Endangered	Endangered
Ecological Va	Vegetation Category		Scattered trees	Scattered trees		Scattered trees	Scattered trees
	EVC	Wetland	Plains Grassy Woodland (55)	Plains Grassy Woodland (55)		Plains Grassy Woodland (55)	Plains Grassy Woodland (55)
	Linkage Value	Þ	Z	H/M		H/W	H/W
	Flora Rating	Г/W	LM	L/M		Ľ	L/M
	Habitat	Σ	L/M	Σ		HW	L/M
Site	Characteristics	Wetland	Existing buffers along Kiewa Valley Highway	Drainage line		Remnant woodland around dam	Drainage line
Precinct/Site	No.	B	33C		~	A	1B 1B

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Precinct/Site	Site					Ecological va	ilues, iviariagemen	r Objectives & Development Co	nsuaims		
Ö	Characteristics	Habitat	Flora Rating	Linkage Value	EVC	Vegetation Category	Conservation Status of EVC	Management Objective & Manager	Recommended Actions	Development Constraints	Zone/Overla
2A	Middle FTP along drainage line	L/M	L/M	H/W	Plains Grassy Woodland (55)	Scattered trees	Endangered	Manage as part of a wildlife corridor, with low level public access. WCC. Confirmed Squirrel Glider habitat (Nest Box monitoring) on John Boyes Rd (south end)	Retain and enhance with shrubs, incorporate new Ellen McDonald Drive Road reserve into corridor	Corridor should be at least 40 m wide	PPRZ
2B P2B	Roadside FTP	Γ/W	L/M	H/W	Plains Grassy Woodland (55)	Scattered trees	Endangered	Manage as roadside buffer. WCC/Private	Retain	Ensure any breaks > 30 m are replanted with native trees	VPO 2
3A P3A	FTP along ridge and gully	L/M	L/M	H/M	PGW/VGF/RG (190)	Remnant	Endangered	Manage as wildlife corridor, with low level public access. WCC	Retain and enhance with shrubs	Grazing should be excluded except for fuel control	PPRZ
3B	FTP and roadside buffer	L/M	L/M	H/M	Plains Grassy Woodland (55)	Scattered trees	Endangered	Manage as roadside buffer. WCC/Private	Retain where possible	Where possible exclude grazing	VPO 2
P4A	Remnant woodland surrounded by FTP	H/W	Σ	т	PGW/VGF/RG (190)	Remnant	Endangered	In private ownership – retain core remnant tree cover	Implement 173 agreement to retain habitat values	Where possible exclude grazing	VPO 1 & VPO 2
4B P4B	Drainage lines	H/W	Σ	H/W	PGW/VGF/RG (190)	Remnant	Endangered	Manage as wildlife corridor in the WREN. WCC/Parklands/ Baranduda L/Care. Note: this site has gliders and bats using nest boxes	Retain and enhance through targeted weed control and supplementary planting	Grazing should be excluded	PPRZ & VPO 2
P4C	Copse	Σ	Σ	Σ	PGW/VGF/RG (190)	Remnant	Endangered	In private ownership – retain core remnant tree cover	Implement 173 agreement to retain habitat values	Where possible exclude grazing	VPO 2

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Ecological Values, Management Objectives & Development Constraints

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	Zone/Overlay	PCRZ	VPO 2	VPO 2	VP0 2	PCRZ
	Development Constraints	Exclude development and grazing	Wildlife corridor should be at least 40 m wide, including LHB trees wherever possible and drainage lines	Ensure buffer is outside drip zone of roadside trees	WKEN boundary should be located to incorporate the maximum number of LHB trees and remnant ground cover. Exclude grazing (Note many of the trees are being ringbarked in these paddocks) Ensure buffers are outside trees and plant link between 18 and 2A	exclude grazing except for fuel control purposes
	Recommended Actions	Retain with Chapple Road wildlife corridor and enhance with shrubs in open parts following weed control	Fence and revegetate	Fence and revegetate	Ketain and enhance this major wildlife corridor, incorporating LHB trees into corridor. Broom control on eastern length of reserve. Supplementary plant under storey following weed control Buffer roadside corridors	Retain
	Management Objective & Manager	Manage as informal parkland. WCC. Likely Tuan and Squirrel Glider habitat	Manage as informal parkland by WCC	Manage as informal parkland. WCC	Manage as informal parkland. WCC. Known Glider habitat (Nest Box monitoring confirmed) confirmed) Manage as roadside buffer. WCC/Private	Manage as informal parkland. WCC
	Conservation Status of EVC	Endangered	Endangered	Endangered	Endangered Endangered	Endangered
>	Vegetation Category	Scattered trees	Scattered trees	Scattered trees	Scattered Scattered trees	Scattered trees
	EVC	PGW/VGF/RG (190)	PGW/VGF/RG (190)	PGW/VGF/RG (190)	PGW/VGF/RG (190) PGW/VGF/RG (190)	PGW/VGF/RG (190)
	Linkage Value	Þ	z		LM N	H/W
	Flora Rating	L/M	ΓW		L/M	L/M
	Habitat	Þ	Γ/W		A La	L/M
Site	Characteristics	FTP and remnant patch next to Chapple Road.	Drainage lines	Chapple Road buffer	F I P along waterway. Roadside buffers	FTP along a drainage line
Precinct/Site	No.	 1A	1B	10	2B 2B	3A

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	Zone/Overl	PCRZ	VPO 2	VPO 2	PPRZ
	Development Constraints	exclude grazing except for fuel control purposes	exclude grazing except for fuel control purposes	exclude grazing except for fuel control purposes	WREN boundary should be located to incorporate the maximum number of LHB trees and remnant ground cover and grazing be excluded
onstraints	Recommended Actions	Retain where possible	Retain a roadside buffer	Retain/incorporate into a roadside buffer	Retain and enhance with shrubs in open weedy parts
t Objectives & Development Co	Management Objective & Manager	Manage as informal parkland. Private/WCC	Manage as informal parkland. Private	Manage as informal parkland to increase wildlife corridor viability. Private	Manage as informal parkland. WCC
alues, Management (	Conservation Status of EVC	Endangered	Endangered	Endangered	Endangered
Ecological V	Vegetation Category	Scattered trees	Scattered trees	Scattered trees	Scattered trees
	EVC	PGW/VGF/RG (190)	PGW/VGF/RG (190)	PGW/VGF/RG (190)	PGW/VGF/RG (190)
	Linkage Value	×	L/M	Σ	Σ
	Flora Rating	L/M	_	J	Γ/W
	Habitat	L/M	L/M	Z	Σ
Site	Characteristics	Triangular FTP	FTPs along Boundary Road	FTP buffer along Yackandandah Road	Gully
Precinct/Site	No.	3B	30	4A	48

Notes: I.

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Roadside buffers are generally designated VPO 2. Servicing and access to lots fronting these areas is usually via a rear access; however this zoning will protect the ecological values of the site when front of lot servicing and access is undertaken. Sites designated PCRZ either have very high conservation values (e.g. the presence of many scattered LHB trees)or have issues likely to conflict with public access/recreation (e.g. very steep sided gullies). The the zoning stipulates - 'progressing to PPRZ (or PCRZ)' - this will eventuate upon the development of adjacent land Private land sites with very high conservation values were recommended to be managed as public land or otherwise placed in a VPO 1. Refer to notes 2 and 3 in section 2.2 regarding service provision in WREN sites.

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- All public land is hatched on the plans except for road reserves.
  - P denotes private ownership.
- Ownership is correct on the 15 June 2006.

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Appendix 3: Priority Action Works for the WREN

# **Priority Action Works**

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Та	ble	10	):	Pri	iori	ty /	Acti	on	W	or	κs	
----	-----	----	----	-----	------	------	------	----	---	----	----	--

Precinct	FENCING	GRAZING	REVEGETATION & WEED CONTROL	PRIORITY
Α				
1A	Yes	Exclude	Plant shrubs in the open areas	High
1B	Yes	Exclude	Plant shrubs in the open areas	Med/High
1C	Yes	Exclude	Plant shrubs in the open areas	Medium
2A	Yes	Exclude	Plant shrubs in the open areas	Med/High
2B	Yes	Exclude	Plant shrubs in the open areas	Medium
2C	Yes	Exclude except occasionally for fuel control	Plant shrubs in the open areas	Med/High
3A	Northern boundary	Exclude except for fuel control	Control woody weeds & plant riparian shrubs	Med/High
3В	Yes	Exclude	Control woody weeds & plant riparian shrubs and trees in lower part	Medium
4A	Yes	Exclude	Plant shrubs around LHB trees and ensure link with 4A or 2B	Medium
4B	Yes	Exclude except occasionally for fuel control	Plant shrubs in the open areas	High
5A	Yes	Exclude except for fuel control	Control woody weeds & plant riparian shrubs and trees	Med/High
5B	Corridor between 5A & 4B, drainage buffer and roadside	Exclude	Plant shrubs and trees in the open areas	Medium
В				
1A	N/A	Exclude	N/A	High
1B	Consider fencing roadside buffer	Where possible, exclude in buffer	N/A	Medium
2A	N/A	Exclude	N/A	Med/High
2B	N/A	Exclude	N/A	Med/High
2C	N/A	Exclude	Undertake active weed control	Med/High
3A	Yes	Exclude	Plant shrubs and trees in the open areas	Med/High
3B	Yes	Exclude	Plant shrubs and trees in the open areas	Med/High
3C	Investigate	Exclude	N/A	High
4A	Investigate	Exclude	Plant shrubs in the open areas	Med/High
4B	Investigate	Exclude except for fuel control purposes	Plant trees and shrubs across site	Medium
5A	Investigate	Exclude except occasionally for fuel control	Plant shrubs in open lower parts	Med/High

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Precinct	FENCING	GRAZING	REVEGETATION & WEED CONTROL	PRIORITY
В				
5B	Yes	Exclude	Plant Shrubs and trees in open weedy parts	Med/High
6A	Yes	Exclude	Plant clumps of shrubs and some trees in weedy open patches	High
6B	Yes	Exclude	Plant shrubs in the buffer	Medium
7A	N/A	N/A	Check for woody weeds	Med/High
7B	N/A	N/A	Check for woody weeds	Med/High
7C	N/A	N/A	Check for woody weeds	Med/High
7D	N/A	N/A	Check for woody weeds	Med/High
С				<u> </u>
1	Review all fencing with DOD & WCC	Exclude, review with DOD & WCC	Plant trees and shrubs in weedy open areas	Med/High
2	Review all fencing with DOD & WCC	Exclude, review with DOD & WCC	Plant some trees and shrubs in weedy flat near western boundary and shrubs in connection with stock route	High
3	Review all fencing with DOD & WCC	Exclude, review with DOD & WCC	N/A	High
4A*	Yes	Exclude	Plant mainly shrubs in retained area with more trees along the drainage buffer	High
P4B	Yes	Exclude	Plant trees and shrubs in open, weedy parts	Medium
P4C	Yes	Exclude	Plant trees and shrubs in open, weedy parts	Medium
5A	N/A	N/A	Plant trees and shrubs to link Streets Road with Wattle Glen	Med/High
5B	Yes	Exclude	Plant trees and shrubs in buffers and gaps to link Streets Road with Beechworth Road	Med/High
D				
1A**	Investigate	Implement 173 agreement to control fuel and habitat quality	N/A	High
1B	Yes	Exclude	Plant shrubs and some trees in weedy open patches	High
2	Fence treed lane and drainage line buffers	Exclude	Plant mainly shrubs in retained area with more trees along the drainage buffer	Med/High
4A	Fence buffered treed lane and drainage lines	Exclude	Plant mainly shrubs in retained area with more trees along the drainage buffer	Med/High
4B	Yes	Exclude	Plant shrubs and some trees in open areas	Med/High

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Precinct	FENCING	GRAZING	REVEGETATION & WEED CONTROL	PRIORITY
D				
4C	Fence corridor b/n 4A-4B- Middle creek	Exclude	Plant shrubs and trees to improve link	Medium
E D14	T ( )			
PIA	fencing along floodplain boundary	control	plant riparian shrubs and trees	Med/High
P1B	Fence within P1A	Exclude	Undertake woody weed control	High
P1C	Yes	Exclude except for fuel control purposes	Plant shrubs and some trees in open areas	Medium
F	-		27/4	26.1/77.1
PIA	Investigate	Exclude	N/A	Med/High
PIB	Investigate	Exclude	Plant shrubs into weedy open areas	Med/High
P1C	Investigate	Exclude	Complete revegetation	Med/High
P2A	Investigate	Exclude	Plant trees and shrubs into weedy open parts	Med/High
P2B	Investigate	Exclude	Plant trees and shrubs into weedy open gully	High
P2C	Investigate	Exclude	Plant trees and shrubs into weedy open parts	Med/High
P2D	Fence drainage lines	Exclude	Plant riparian shrubs and trees	Medium
G				
1	Fence	Exclude	Plant shrubs into weedy open areas	High
2	Fence	Exclude except for fuel control	Plant trees and shrubs into gaps	High
3	Fence with 4 and 2	Exclude	Plant shrubs into weedy open areas	High
4	Fence wildlife corridor and roadside buffers	Exclude	Plant shrubs in buffers and trees and shrubs in link b/n 3 and Howards Road	Med/High
5A	Fence	Exclude	Plant shrubs under LHB trees as well as some trees into open areas - priority b/n 5B and Baranduda Bvld	Med/High
5B	N/A	Exclude	Undertake targeted weed control and shrub plantings	Med/High
РбА	Private	Exclude	Undertake targeted weed control and shrub plantings	Medium
РбВ	Investigate	Exclude	Plant trees and shrubs into gaps	Medium
7A	Investigate	Exclude	Undertake targeted weed control	High
7B	Investigate	Exclude	Plant shrubs and some trees into buffer	Med/High
7C	Fence northern boundary	Exclude	Undertake targeted weed control and shrub plantings into weedy, open parts	High

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Precinct	FENCING	GRAZING	REVEGETATION & WEED CONTROL	PRIORITY
Н				
P1A	Fence	Exclude	Plant shrubs and trees in gaps in the link	Medium
P1B	Fence	Exclude	Plant shrubs into weedy open areas	Med/High
P2	Fence	Exclude	Plant shrubs into weedy open areas	Med/High
3A	Investigate fencing along floodplain boundary	Exclude except for fuel control	Control woody weeds & plant riparian shrubs and trees	Med/High
3B	Fence within 3A	Exclude	Re-instate control structure	High
4	Yes	Exclude	Plant shrubs in tree cluster	Medium
5	Yes	Exclude in buffer	Plant shrubs in buffer	Med/High
Ι				
P1A	Yes	Exclude	Plant shrubs and some trees into open areas	Med/High
P1B	Investigate	Exclude	Plant shrubs and some trees in open areas	Med/High
P1C	Fence within P1A	Exclude	N/A	Med/High
P2A	Review all fencing with DOD & WCC	Exclude, review with DOD & WCC	Plant some trees and shrubs in weedy gaps near eastern boundary	High
2B	Fence	Exclude	Plant shrubs and some trees into open areas	High
P2C	Fence	Review	N/A	High
J				
1A	Fence Boyes Road buffer including corner remnant	Exclude	Plant shrubs in buffer and trees and shrubs in link b/n 1B and Boyes Road	Med/High
1B	Yes with 1C	Exclude except occasionally for fuel control	Plant shrubs into weedy open areas	High
1C	Investigate	Exclude except for fuel control	Control woody weeds & plant riparian shrubs and trees	Med/High
P1D	Investigate	Exclude where possible except for fuel control	Investigate	Medium
2A	Investigate	Exclude	N/A	Medium
2B	Fence	Exclude except occasionally for fuel control	Plant shrubs capable of handling waterlogged soils into gaps	Med/High
3A	Investigate	Exclude	N/A	Medium
3B	Fence above high water mark	Exclude	Fill in deep sections and plant shrubs on higher ground	High
P3C	Investigate	Exclude	Investigate	Medium
4	Investigate	Exclude except for fuel control	Undertake targeted weed control and shrub plantings	Medium
K				
1A	Yes with 1B	Exclude	Undertake targeted weed control and shrub plantings	Med/High

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Precinct	FENCING	GRAZING	REVEGETATION & WEED CONTROL	PRIORITY
K				
1B	Fence broad drainage line and buffers on Boyes Road	Exclude	Plant trees and shrubs capable of handling waterlogged soils	Medium
2A	Investigate	Exclude	Plant shrubs and trees into open weedy parts	Medium
2B	Investigate	Exclude	Plant trees and shrubs into gaps	Medium
3A	Fence northern boundary	Exclude	N/A	Med/High
3В	Fence FTP and buffer along Boyes Road	Exclude	Plant shrubs in roadside buffer	Medium
4A	Private	Implement 173 Agreement to allow regeneration	N/A	High
4B	N/A	Exclude	Undertake targeted weed control and plantings	Med/High
4C	Private	Implement 173 Agreement to allow regeneration	N/A	High
L				
1A	Fence FTP	Exclude	Plant shrubs into weedy open areas	Med/High
1B	Fence	Exclude	Plant riparian shrubs and trees	Medium
1C	Fence roadside buffer	Exclude	Plant shrubs in buffer	Medium
2A	Fence	Exclude except for fuel control	Plant shrubs into weedy open areas	Med/High
2B	Fence roadside buffers	Exclude	Plant trees and shrubs into gaps	Medium
3A	Investigate	Exclude	Plant trees and shrubs b/n 3A and 3B	Medium
3B	Investigate	Exclude	n/a	Medium
4A	Investigate	Exclude	Plant trees and shrubs into gaps	Medium
4B	Fence	Exclude	Plant shrubs into weedy open areas	Med/High

\* Undertake Noisy Miner control. \*\* Implement strict cat controls

Roadside Buffers are recommended for all roadsides listed in Section 10.7 of the WREN Strategy. Some buffers may have not been specifically referred to in the table above.

### Criteria

**Fencing** is often the first step in managing a site, allowing the exclusion of stock for natural regeneration or survival of planted seedlings. 'Investigate' indicates that the integrity of the boundary fence is not known or the boundary has not been finalized or the fencing involves neighbours.

Grazing should be excluded from most sites except for fuel control purposes.

**Revegetation** requires general site weed control prior to planting. The number and species of plants required at any site is determined by a specific site management plan using the principles outlined in the WREN strategy.

Priority is established based on condition of habitat, site risk and site resilience (the ability of the site to self regenerate without grazing). The priority of site works may change if works are proposed on the land adjoining or surrounding the site. In most cases the first priority is to fence the site.

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Appendix 4: Scattered Tree Offset Comparisons

# Scattered Tree Offset Comparisons

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# Appendix 4: Scattered Tree Offset comparison across 3 sample sites within the WREN

# Background

To ensure that the minimum standards outlined in Victoria's Native Vegetation Framework were being achieved throughout the WREN Strategy process a comparison at three typical sites was undertaken.

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### Results

#### Table II: Scattered Tree Offsets: Large tree numbers at 3 sample sites

	Number of trees within WREN	Number of trees outside WREN
	(therefore protected)	(therefore likely to be removed)
~	(increase protected)	(increase increase in
Sample 1 Site:		
C4A & paddock to		
wost		
WEST	50	01
VLI	50	21
LT	63	7
MT	38	2
Sample 2 Sites:		
G2 and G1 &		
paddock in		
between		
VLT	50	8
LT	50	7
MT	13	0
Sample 3 Sites:		
J1A & 1B and J2A		
& 2B and		
adjoining		
paddocks		
VLT	42	7
LT	25	2
MT	29	0

Definitions:

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VLT= Very Large Tree (>105cm diameter at breast height)

LT= Large Tree (>70cmdbh)

MT= Medium Tree (>52.5cmdbh)

In all cases the conservation significance of the sites was deemed as being high (see Table 7 of NE Native Vegetation Plan), because the relict trees belonged to endangered EVCs and had a habitat score less than 0.4.

The Offset criteria used for the comparison was from Table 8b (NE Native Vegetation Plan): Summary of Regional Offset Criteria for parcels of land > than 4ha with less than 8 scattered old trees/ha.

The offset applied was the protect and recruitment option because this most accurately described the site values.

In line with the net gain principles with native vegetation management the offset applied for tree removal is as follows: Removing I VLT = Protecting 4 LT + 20 new plants OR = 2 VLT\* + 20 new plants Removing I LT = Protecting 2 LT + 10 new plants

Removing I MT = Protecting I MT + 5 new plants

\* the offset of protecting 2 VLT for the removal of 1 VLT is not dealt with in the NE Vegetation plan, but was decided after discussions with DSE staff.

### Minimum offsets required using regional offset criteria are:

### Sample I

Removing 21 VLT = Protecting 42 VLT+ 420 new plants Removing 7 LT = Protecting 14 LT+70 new plants Removing 2 MT = Protecting 2 MT+10 new plants

The total offset required being = 42VLT+14LT+2MT+500 new plants

# <u>Sample 2</u>

Removing 8 VLT = Protecting 16 VLT+160 new plants Removing 7 LT = Protecting 14 LT+70 new plants

• The total offset required being = 16 VLT+14 LT+230new plants

### Sample 3

Removing 7 VLT = Protecting 14 VLT+140 new plants Removing 2 LT = Protecting 4 LT+20 new plants

• The total offset required being = 14 VLT+4 LT+160new plants

Comparison between WREN and NE Vegetation Plan Offset Criteria(NEVPOC)

Sample I WREN protection = 50 VLT +63 LT +38 MT

NEVPOC protection = 42 VLT+ 14 LT+2 MT+500 new trees

#### Sample 2

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WREN protection = 50 VLT +50 LT +13 MT NEVPOC protection = 16 VLT+ 14 LT+230 new trees

Sample 3 WREN protection = 42 VLT +25 LT +29 MT NEVPOC protection = 14 VLT+ 4 LT+160 new trees

#### Conclusion

Insofar as the three samples are typical of sites across the WREN study area the results show that the number of large trees retained in the WREN is more than the minimum standards required under Victoria's native vegetation framework. There is however a need to ensure that revegetation occurs within the WREN as recommended in the site management table.

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# Site Precinct Maps

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shown on this in UICE 3F	Appendix 5 - Figu				<sup>9</sup> recinct F	DRK - F	AL NETWO	NGA RETAINED ENVIRONMENT	WODON	File:04-268 Prepared By: Mike Bydder Date: 28/06/2006	AVVC
roduction of this m	What all care has been taken in the pr the AWC access to reprovibility for			500.1	1101		Insylviairain	Plan Number: BD0/DBO/3006A	1-10 000	BLIS Reference: MB1037L10A	
/PO 1	WREN boundaries along drainage lines should W	Retain and complete revegetation	Manage as habitat reserve in the WREN by	Scattered Endangered	.M M/H PGW/VGF/RG	ida L/M L	P2D Gulfies below Barandu Regional Park			00	•
/PO 1 rogressing to CRZ	WREN boundary should be outside dripline of V LHB trees and remnant ground cover. Exclude pr grazing PC	Implement 173 agreement to control grazing and retain habitat values	Manage as habitat reserve in the WREN by WCC/Private	Remnant Endangered	M H PGWIVGF/RG (190)	<sup>3</sup> ark L/M L	P2C Rocky gully below Baranduda Regional F				1 to
vPO 1 trogressing to CRZ	WREN boundary should be outside oripime or V LHB trees and remnant ground cover. Exclude pr grazing PL	Implement 11/3 agreement to control grazing and retain habitat values	Manage as nabilat reserve in the WKEN by WCC/Private	Kemnant Endangered	(190)	M N	Pzb valley below Baranou Regional Park				a King
vrogressing to VCRZ	incorporate the maximum number of LHB trees p and remnant ground cover. Exclude grazing Pt	and retain habitat values till development occurs	WCC/Parks Vic		(190)		Regional Park (west)				-
/PO 1	Area recently fenced. Exclude grazing	Retain and complete revegetation	Manage as habitat reserve in the WREN. WCC/Private	Scattered Endangered	M/H PGWIVGF/RG	yn M L	P1C LHB trees and drainag	PRC 0 08	いたいであったい		12 - Cr 11
/PO 1	WREN boundary should be located to V incorporate the maximum number of LHB trees and remnant ground cover. Exclude grazing	Retain and enhance with shrubs in weedy parts	Manage as habilat reserve in the WREN. WCC/Private	Scattered Endangered trees	LM MIH PGWIVGF/RG (190)	M	P1B Gully		「「「「「「「」」」		and the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second s
vPU 1 trogressing to CRZ	incorporate the maximum number of LHB trees pr and remnant ground cover. Exclude grazing PL	Implement 1/3 agreement to control grazing and retain habitat values till development occurs	Wanage as nabilat reserve in the WKEN. WCC/ParksVic	Remnaint	M M/H PGW/VGF/RG (190)	anduda M	P1A HIII slopes below bara Regional Park	· · · · ·	1.0	and the second	and a
Zone/Overlay	Development constraints	Recommended actions	Management Objective & Manager	Vegetation Conservation Category Status of EVC	Iora Linkage EVC	ics Habitat Ra	Site No. Site Characterist	1	and an an	No or other	N.S.
	c Park And Recreation Zone ation Protection Overlay ation Protection Overlay nt	VPO1 - Veget VPO2 - Veget VPO2 - Veget 173 Agreeme							3		
ce Zone	Conservation And Resource	ZONING OVERLAYS						2. 2. 2 2. 2 2. 2	/	air air	19.8
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## About the authors

#### Ian Davidson

lan is a wildlife biologist who has had many years of experience researching various species of threatened fauna, and he has a particular interest in their habitat requirements. He has been associated with many professional organisations including the NSW Murray Catchment Management Board, the Murray Wetlands Working Group, the Murray and Lower Darling Community Reference Committee (Environmental Water Flows), Northeast Victoria Vegetation Committee and the Regent Honeyeater National Recovery Team. As a consultant he has been called upon to assess remnant vegetation in the Victorian Box Ironbark Ecosystems and he has also provided biodiversity criteria to enable the evaluation of bushland proposed for urban development in the Albury area as well as completing strategies for conservation management of travelling stock reserves in southern NSW as well as wetlands in the Upper Murray and Murrumbidgee catchments.

lan worked for 14 years with the Department of Natural Resources and Environment in Northern Victoria and for six years with Greening Australia in southern NSW. He now works as an independent consultant.

#### Glenda Datson

Glenda is an amenity horticulturist who has been involved for over 20 years in the production of indigenous and exotic plants and with the use of these plants in amenity landscaping, large scale revegetation projects, and home gardens. As a keen field naturalist, she retains active memberships of the Bird Observers Club of Australia, Victorian and Albury-Wodonga Field Naturalists Clubs, the Australian Plants Society (APS) and the APS Northeast Garden Design Study Group. She now works as a consultant in the field of conservation and land management and has conducted flora and fauna assessments in NSW and Victoria over the past 16 years for private landowners and local government authorities. She has a particular interest in encouraging councils, developers and home gardeners to explore possibilities and provide resources which, collectively, can provide increased benefits for our wildlife.

### John Alker-Jones

John joined the Corporation in 1974, as Senior Strategic Planner, after several years working in Warrington New Town, UK. Then, as Principle Planner, John has been very conscious of the need to ensure that the physical and environmental development standards embraced by the Corporation are amongst the best in the region. Being instrumental in promoting sustainable development education principles and applying them in Corporation estates, John helped promote the Thurgoona Threatened Species Conservation Strategy to receive the Planning Institue of Australia's national award for conservation planning. Just before his retirement this year, John was pleased to see the Leneva Valley study (WREN Strategy) establish what he believes is the new benchmark for the integration of urban design and environmental protection.

#### Tony Bush

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Tony is a civil engineer with more than 35 years experience. Prior to being employed as a project engineer with the Albury Wodonga Corporation for over 20 years, Tony worked for 13 years in local government as an engineer and Deputy Shire Engineer whose duties included the role of council's planning officer. As Project Engineer with the AWC he has been responsible for the development of numerous Corporation estates of varying sizes between 10 and 1000 lots. In the development process he has seen the need for a regional rather than piecemeal approach to defining development constraints and the interaction of these constraints to produce high standard urban development. It is in this way that Tony sees that the natural environment can be better protected, enhanced, and beneficially co-exist with urban development.

## Darren Rudd

Darren is a Town Planner with 15 years experience in local government and is currently with the City of Wodonga in the position of Manager Strategic Planning. Darren has completed numerous strategy reports for Wodonga, including the current Wodonga Municipal Strategic Statement. He has been with the City of Wodonga for 10 years, initially in the dual responsibility of Statutory and Strategic Planning, shifting to a strategic planning focus 5 years ago. He has particular expertise in urban structure planning and has lead the Council's effort in the formulation of a plan preparing the Leneva Valley to provide for an urban extension of Wodonga to accommodate up to 50 000 people. He has been keen to ensure that urban development responds in a favourable manner to the natural environment and that landscape values are embedded into urban design frameworks to ensure future generations, and the environment, benefit from what he considers to be a responsible approach to planning.

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