

RESPONSE TO DISTURBANCE AND LAND MANAGEMENT PRACTICES

NSW WESTERN REGIONAL ASSESSMENTS

OCTOBER 2002

**Brigalow Belt
South**

RESPONSE TO DISTURBANCE AND LAND MANAGEMENT PRACTICES

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A project undertaken for
the Resource and Conservation Assessment Council

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PROJECT SUMMARY

This report describes a project undertaken for the Resource and Conservation Assessment Council as part of the regional assessments of western New South Wales. The Resource and Conservation Assessment Council advises the State Government on broad-based land use planning and allocation issues. An essential process for the western regional assessments is to identify gaps in data information and the best ways in which to proceed with data gathering and evaluation.

Project objective/s

The overall objective of this project was to consider key species and communities and the significant disturbances and land management practices that affect them across all tenures within the Brigalow Belt South Bioregion of NSW.

Specific objectives of the project were to:

- provide a ranked list of important species, populations and ecological communities found within the bioregion;
- provide a ranked list of the most important issues/factors likely to influence (positively or negatively) them;
- review existing information on each species, population and ecological community;
- review the ecological effects and intensity of the disturbances and land management practices across the bioregion;
- produce a large scale map highlighting areas within the bioregion that are having the most significant effect on important species, populations and ecological communities;
- describe data gaps/limitations to the project;
- compile a set of 'Profiles of Response to Disturbance and Land Management Practices' for each key species, population, ecological community and ecological processes identified during the study; and,
- provide recommendations on land management and conservation that could be used in a socio-economic study looking at the costs of implementation of such recommendations.

Methods

The project proceeded in four stages:

- Stage 1: Compilation of species lists for plants and terrestrial vertebrate animals occurring in the bioregion and a list of vegetation communities;
- Stage 2: Development of criteria to rank species and communities in terms of conservation concern and the application of the criteria to the species and communities;
- Stage 3: Identification of disturbances or land management practices impacting species and communities of highest conservation concern; and
- Stage 4: Development of species and disturbance profiles for the bioregion.

Outputs from the project, such as ranked species lists and species profiles were reviewed in a series of two expert workshops.

Key results and products

Within the Brigalow Belt South Bioregion of NSW, 471 species of terrestrial vertebrates have been recorded. Based on the ranking procedures developed for this project, 94 species are considered to have the highest conservation priority.

Nineteen disturbances were identified for these key animal species. By far the greatest disturbance is Land Clearing, which has impacted 80 species in the highest conservation priority, and for 64 of these species it is considered the primary disturbance. The second highest disturbance for animals in the bioregion is Grazing followed by Inappropriate fire regimes (Figure A).

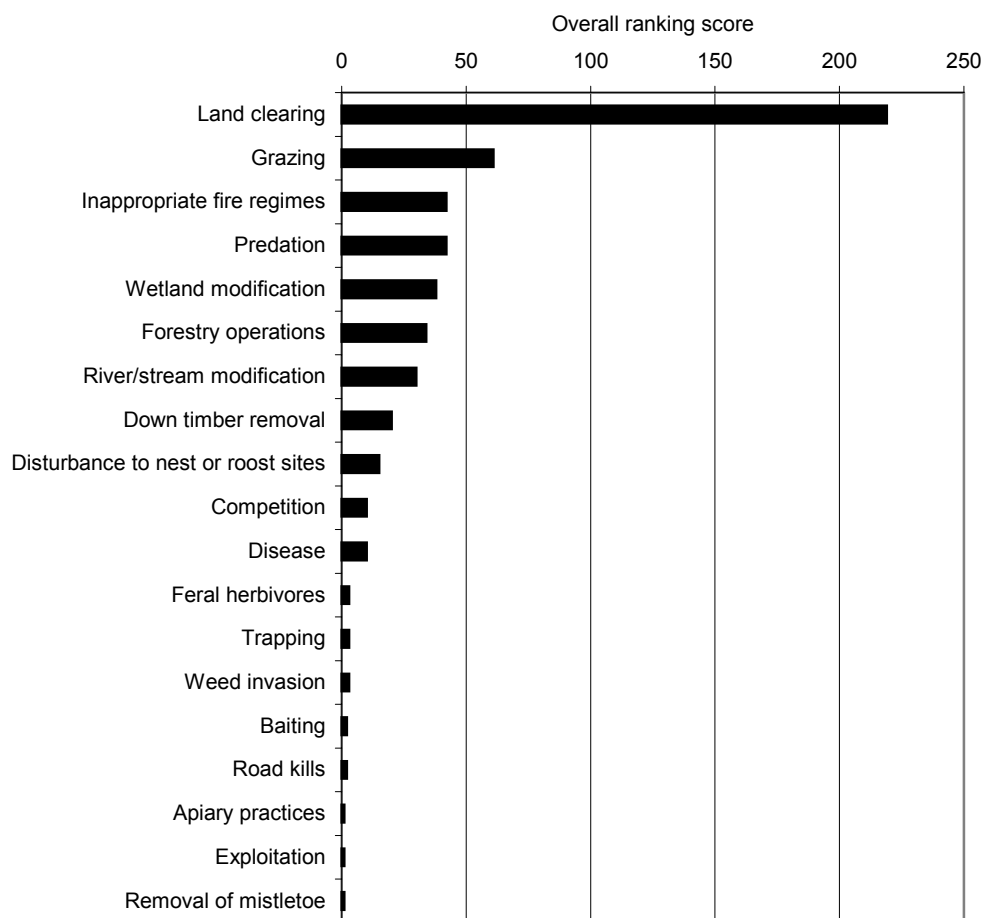


Figure A: Overall ranked disturbances for terrestrial vertebrate fauna in the Brigalow Belt South Bioregion of NSW

A total of 1823 species of plant have been recorded in the bioregion. Over 50% of these species have at least Regional significance if not State or National. Ten disturbances were identified for these plant species. By far the greatest disturbance for key species is disturbance by feral animals, followed by weed invasion and land clearing (Figure B).

A complete list of vegetation communities was not available for this project and so the list of endangered ecological communities as listed under the *Environment Protection and Biodiversity Conservation Act 1999* and the *Threatened Species Conservation Act 1995* was used to determine communities at risk. Seven endangered ecological communities are present in the bioregion.

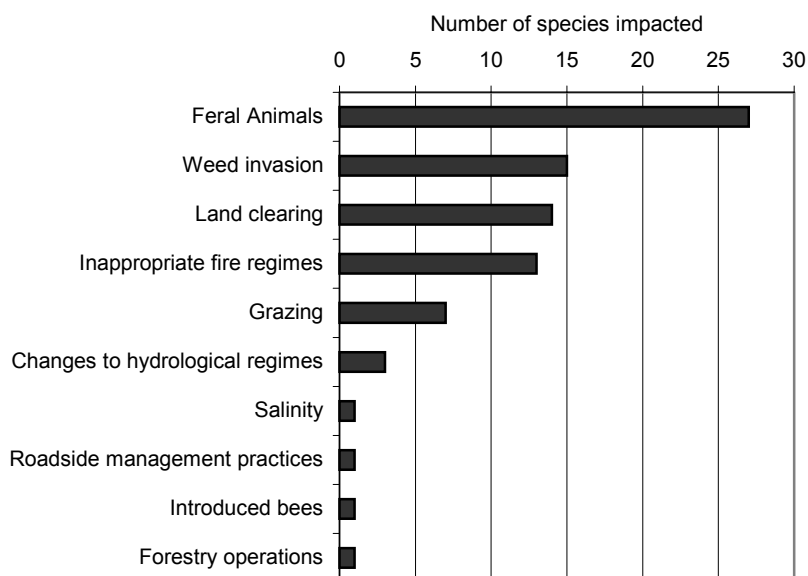


Figure B: Number of key plant species impacted by disturbances in the Brigalow Belt South Bioregion of NSW

Based on the Key Threatening Processes listed in final determinations for these endangered ecological communities, by far the greatest disturbance was land clearing, followed by grazing and inappropriate fire regimes.

Outcomes

Species profiles for each of the key species have been prepared including key disturbances and conservation areas as well as management recommendations. Disturbance profiles have also been prepared for the major disturbances and land management practices.

1. INTRODUCTION

1.1 PROJECT BACKGROUND

This report describes a project undertaken for the Resource and Conservation Assessment Council as part of the regional assessments of western New South Wales. The Resource and Conservation Assessment Council advises the State Government on broad-based land use planning and allocation issues. An essential process for the western regional assessments (WRA) is to identify gaps in data information and the best ways in which to proceed with data gathering and evaluation. The WRA involves government departments and agencies such as PlanningNSW, State Forests, National Parks and Wildlife Service, Department of Land and Water Conservation and Department of Mineral Resources, as well as local and regional stakeholders.

As part of the WRA, the Brigalow Belt South Bioregion of NSW (including Pilliga and Goonoo State Forests and nearby National Parks and Nature Reserves) was assessed, with the aim of addressing the needs for regional land use planning and conservation and resource management. Stage 1: Initial Forest Assessments has been completed. This stage focused mainly on the forests and public tenure to the south of Narrabri, including Pilliga and Goonoo State Forests. Stage 2 provides more detailed studies for the whole bioregion.

This project investigating the 'Response to Disturbance and Land Management Practices' forms part of Stage 2. Where possible, this project links with other projects that form part of Stage 2 including the flora and fauna survey, ecosystem and vegetation mapping and the data modelling exercise.

1.2 OBJECTIVES

The overall objective of this project was to:

“consider key animal and plant species, ecosystems, ecological processes and the significant disturbances and land management practices that affect them across all tenures within the Brigalow Belt South Bioregion of NSW”

It is expected that this report will assist in making land use decisions and future land management activities within the bioregion.

Specific objectives of the project were to:

- provide a ranked list of important species, populations and ecological communities found within the bioregion;
- provide a ranked list of the most important issues/factors likely to influence (positively or negatively) them;

- review existing information on each species, population and ecological community;
- review the ecological effects and intensity of the disturbances and land management practices across the bioregion;
- describe data gaps/limitations to the project
- compile a set of 'Profiles of Response to Disturbance and Land Management Practices' for each key species, population, ecological community and ecological processes identified during the study; and,
- provide recommendations on land management and conservation that could be used in a socio-economic study looking at the costs of implementation of such recommendations.

1.3 BRIGALOW BELT SOUTH BIOREGION OVERVIEW

The Brigalow Belt South Bioregion (BBSB) is one of the largest of the 80 defined bioregions (Thackway & Cresswell 1995) extending from the Queensland coast at Gladstone, south to Dubbo (Figure 1). There is only a narrow connection between the Queensland and New South Wales sections and in NSW it extends from Texas to Dubbo (Figure 2). The BBSB covers an area of 279 496 km², of which 52 409 km² (18.7%) is in NSW. The NSW portion of the bioregion makes up 6.5% of the total area of the State.

The BBSB is named after the Brigalow Tree (*Acacia harpophylla*), but in NSW this species occurs in only three of the seven provinces within the bioregion and then not as the dominant species (NSW National Parks and Wildlife Service 2000). The bioregion is quite complex and environmentally heterogeneous. It covers a large climatic range longitudinally and lies within an ecological gradient between the dry inland Eyrean zone and the wetter coastal Bassian zone. In the bioregion the mean annual rainfall ranges from 550 mm in the west at Gilgandra to 823 mm in the east. On a north-south gradient it ranges from 659 mm at Texas on the border to 587 mm at Dubbo. Substantial rains can occur at any time of year, but there tends to be a peak in the summer months. Extended periods of below average rainfall occur every 10 to 20 years and these correlate with a high frequency of fires (NSW National Parks and Wildlife Service 2000).

Elevation within the bioregion ranges from 1200 m ASL in the east in the Liverpool Ranges to 100 m ASL in the west. Soils are highly varied, partly due to a long history of erosion in the bioregion.

There are several major rivers that run through the bioregion (MacIntyre, Gwydir, Namoi, Castlereagh, Goulburn and Macquarie) all of which are tributaries of the Murray Darling System. The Liverpool Ranges form the headwaters of the Namoi and the Hunter rivers. Rising salinity levels are a major problem in the rivers of the bioregion.

The large variation in abiotic characteristics in the bioregion and the ecotone that it sits on means that there is a high biodiversity¹. Vegetation prior to European settlement has commonly been described as predominantly open woodland with some large areas of open forest and tussock grassland (Rolls 1981). However, this pattern has more recently been challenged with the suggestion that the vegetation was highly heterogeneous and that closed forests and thickets

¹ The United Nations Convention of Biodiversity defines biodiversity as "the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species and of ecosystems". The three levels of biodiversity are genetic, species and ecosystems. For the purpose of this report, unless of otherwise specifically stated, the term biodiversity refers to the native biodiversity.

were common (Mitchell 1991, Norris et al. 1991, Benson & Redpath 1997). Today, tussock grassland and sown pastures are dominant with woodland remaining in isolated patches. Both the flora and fauna of the bioregion are quite diverse, containing influences from coastal regions as well as more arid adapted species (Paull & Date 1999). Prior to the WRA assessment there had been smaller surveys of the region (eg. Coles 1995, Date & Paull 1999), but no comprehensive species lists had been compiled.

There are a number of different land-uses within the bioregion. Freehold land makes up 85% of the NSW section, forestry 11%, Crown lands make up 1.4% and formal conservation reserves² make up 2.6% (NSW National Parks and Wildlife Service 2000). It should be noted however, that disturbances can act across all tenures as can conservation actions. Any management actions aimed at conserving biodiversity, through addressing disturbances within the bioregion, must take into consideration all tenures within the bioregion.

² Formal conservation reserves fall within the International Union for the Conservation of Nature (IUCN) categories I-IV for protected areas. Protected areas are “an area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means”. This categorisation recognises the role of all areas in conservation but makes the distinction between those dedicated for conservation and those in which conservation is a secondary objective.

2. METHODS

The framework for the methods presented in this report was provided in the consultants brief written by PlanningNSW and approved by the RACAC.

2.1 STUDY AREA

The study area is the New South Wales portion of the Brigalow Belt South Bioregion (BBSB) (Figure 2, IBRA Code: BBS, IBRA Map Code: 76 (Thackway & Cresswell 1995)). This bioregion covers an area of 279 496 km², with 52 409 km² (18.7%) occurring in New South Wales and the remainder in Queensland. For the remainder of this report, unless otherwise specifically stated, the terms Brigalow Belt South Bioregion (BBSB) and bioregion will refer to the New South Wales portion of the entire bioregion.

Unless specifically stated in the report, the discussion refers to all land tenures within the Bioregion.

2.2 DATA SOURCES

2.2.1 Fauna

Species lists of animals previously recorded in the BBSB were obtained from the NPWS Atlas of NSW Wildlife (NPWS 1999). As part of the Western Region data audit and gap analysis, 100,000 new records were added to the Atlas of NSW Wildlife and this is likely to be the most comprehensive list of species recorded in the bioregion (NSW National Parks and Wildlife Service 1999), prior to completion of the WRA Stage 2 Fauna Surveys (WRA 23). Data from WRA 23 were obtained in the later stages of this current project and where possible these data were incorporated into the results.

For each species identified as having been recorded within the bioregion, basic ecological attributes were identified where possible from previous records, literature or from consultation with experts. Attributes recorded include:

- Geographic range within the bioregion;
 - Small, medium, large or unknown.
- Relative abundance within the bioregion;
 - Low, medium, high or unknown.
- Habitat specificity of the species;
 - Narrow or wide.
- Extent and nature of population change within the bioregion since the arrival of Europeans;

- Decreasing (a decrease in populations and/or distribution disproportionate to the amount of direct habitat loss) or stable/increasing (stable, increasing or decreasing in proportion to the amount of direct habitat loss).
- If the species is regionally endemic
 - Greater than 50% of the statewide distribution of the species occurs in the bioregion.
- Geographic isolate;
 - The population has a zero chance of recolonisation within 100 years if the population goes extinct in the bioregion.

Where information was not present for a species it was recorded as unknown in order to identify data gaps (see Section 3.4). All data were entered into a custom Microsoft Access database for easy retrieval, manipulation and auditing.

2.2.2 Flora

Species lists of flora previously recorded in the BBSB were obtained from the NPWS Atlas of NSW Wildlife. Additional species lists were obtained from the WRA Vegetation Survey and Mapping Stage 1 Report (WRA 13) (Beckers & Binns 2000). Data from WRA16 Vegetation Mapping were obtained in the later stages of the current project. These data were obtained too late to include in the initial ranking process, but they were used for the final mapping for the species profiles.

The nomenclature used follows PlantNet (as at April 2002, Royal Botanic Gardens Sydney 2002). This did not necessarily coincide with the taxonomy used by the Wildlife Atlas and the synonyms listed by PlantNet were used to identify the currently accepted nomenclature for outdated taxonomic entities.

In many instances PlantNet listed subspecies and/or varieties of taxa without the species on its own being a listed acceptable taxon. The Atlas of NSW Wildlife would often list just the species, leading to a data conflict that had to be resolved. Similarly, sometimes the Atlas of NSW Wildlife data would record a variety or subspecies when PlantNet acknowledged only the specific rank. These nuisance discrepancies were generally easily resolved.

Other taxa were generally accepted by the expert panel when they were aware of a taxonomic review (i.e. the genus *Dianella* is currently being reviewed by Geoff Carr) or there were entities that were clearly outside the general understanding for a specific taxon (i.e. *Corymbia* sp. (Gravesend -Matt White)).

For each species of plant recorded in the bioregion, information was compiled including:

- Number of records in the bioregion as recorded in the NPWS Atlas of NSW Wildlife;
- Number of quadrats from the WRA Vegetation Survey and Mapping Project: Stage 1 - WRA 13 (Beckers & Binns 2000);
- Number of botanical subdivisions as recorded in PlantNet of the Royal Botanic Gardens;
- Rare or Threatened Australian Plant (ROTAP) status (Briggs & Leigh 1995);
- Status under the *Threatened Species Conservation Act 1995*;
- Listings by Plants at Risk of PlantNet; and
- First and last record dates from the Atlas of NSW Wildlife.

2.2.3 Vegetation Communities

At the time of writing little comprehensive information was available on vegetation communities within the bioregion. The Joint Vegetation Mapping Project (WRA-24) of Stage 2 of the NSW WRA has investigated and mapped vegetation communities, but these data were not available during this project.

2.3 RANKING CRITERIA DEVELOPMENT

In order to rank species and ecological communities, ecological criteria/variables were developed to systematically evaluate their importance within the bioregion. Several methods have previously been used to determine importance, ranging from ad hoc listings to population viability analyses. Between these two extremes, a number of studies have used basic ecological variables and estimates of rarity to rank species and communities. For example, Lunney *et al.* (1996) used available information as well as a range of expert opinion to score criteria in order to identify endangered fauna of NSW. Similarly, the Queensland Environmental Protection Agency (EPA) has developed bioregional ecosystem ranking criteria for the bioregions in Queensland based on current and pre-1750 distributions (Sattler & Williams 1999).

Within the BBSB a variety of different data currently exists for fauna, flora, ecosystems and disturbances (NSW National Parks and Wildlife Service 1999, NSW National Parks and Wildlife Service 2000). Generally, data on flora and fauna is considered either poor and variable or is not available (NSW National Parks and Wildlife Service 1999). As such, criteria used to rank species must be broad-based and robust and must not require detailed information on the ecology of individual species. Due to the different ecological natures of species and communities, ranking criteria were developed for each group separately.

2.3.1 Fauna

Each species of animal recorded in the bioregion was assigned to one of four conservation categories based on three broad ecological characteristics (geographic range, relative abundance and habitat specificity), their change in abundance and distribution since the arrival of Europeans, and whether or not they are geographic isolates or regionally endemic (Table 1).

Using simple rules of application (see Box 2.1), each species was assigned to a final conservation category. Similar ranking criteria have previously been used on a smaller list of species of the fauna of the Eden CRA (Environment Australia 1998) and are based on the criteria for rareness proposed by Rabinowitz (1981). The ranking criteria and rules of application were reviewed and modified at the first Expert Workshop to produce the present system (see Section 2.5).

Only those species with a final conservation rank of 1 were considered further in the response profiles (see Section 3.3).

In addition to the ranking outlined above, each species was also noted for its presence on the schedules of the *NSW Threatened Species Conservation Act 1995* and the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999*. During the review of the ranked species lists during Workshop 1, consideration was given to the conservation ranking and the presence of the species on the schedules of the threatened species legislation. This secondary listing ensured that previously identified rare or threatened species were not overlooked in the ranking process and that future legislative requirements can be met.

TABLE 1: ECOLOGICAL ATTRIBUTES FOR ASSIGNING FAUNA TO CONSERVATION CATEGORIES

Ecological characteristics for primary ranking			Conservation Category	Explanation
Geographic Range	Relative Abundance	Habitat Specificity		
Small	Low	Unknown	1	High conservation concern. Considered to be at risk within the bioregion due to its small range and abundance and narrow habitat specificity.
Medium	Low	Narrow		
Small	Medium	Narrow		
Medium	Low	Wide	2	Medium conservation concern. Considered to be at medium risk within the bioregion.
Small	High	Unknown		
Medium	Medium	Unknown		
Small	Medium	Wide		
Medium	Large	Narrow		
Large	Medium	Narrow		
Large	Low	Narrow		
Large	High	Unknown	3	Currently considered stable and secure within the bioregion.
Large	Medium	Wide		
Medium	High	Wide		
Large	Low	Wide		
Unknown	-	-	9	Insufficient information to rank species.
-	Unknown	-		

BOX 2.1 RULES OF APPLICATION FOR ASSIGNING FAUNA CONSERVATION CATEGORIES

1. Based on the ecological characteristics of the species (Table 1) assign the species to a preliminary conservation category.
2. If the preliminary conservation category is "9" then it should remain in this category.
3. Move up two categories (e.g. 3 to 1) if the species has declined since the arrival of Europeans and will continue to decrease without management intervention. A decline is defined as a decrease in populations and/or distribution disproportionate to the amount of direct habitat loss.
4. Move up two categories if the species is regionally endemic (greater than 50% of the Statewide distribution of the species occurs in the Bioregion).
5. Move up one category if the species is a geographic isolate within the bioregion. This is defined as a zero chance of recolonisation within 100 years if the population goes extinct in the bioregion.
6. Move down one category (e.g. 1 to 2) if the species has remained stable or increased in the bioregion in the since the arrival of Europeans. This category is defined as a population stable, increasing or decreasing in proportion to the amount of direct habitat loss.

2.3.2 Flora

A different ranking procedure was used for the flora since expert panel members felt that there was insufficient ecological information available to apply a methodology similar to that used for the fauna. The significance of plant species was evaluated on a geographic scale with four levels: National, State, regional and local.

- Species with a ROTAP status (Briggs & Leigh 1995) were designated to be of National conservation significance.
- Species listed as vulnerable or endangered on the *Threatened Species Conservation Act 1995* were designated to be of State conservation significance. Similarly taxa listed by Plants@Risk (Royal Botanic Gardens Sydney 2002) or currently under review were considered for listing as species of State significance.
- Regional conservation significance was evaluated by sorting the data by two main criteria: the number of Botanical Subdivisions (Anderson 1961, Anderson 1968, Jacobs & Pickard 1981) and the percentage of quadrats from which a taxon was recorded.
 - Species recorded in two or fewer Botanical Subdivisions and/or in less than five percent of quadrat records were considered likely to be of regional conservation significance. After identifying the species of National and State significance, the data were sorted separately using each of these criteria. The expert panel then evaluated each species of potential regional significance using both the data and their experience within the region. Decisions were guided by the understanding that a significant proportion of the bioregion has been cleared or is otherwise utilised for agriculture and that the quadrat database available is relatively small and was not uniformly distributed over the bioregion. Numerous species were considered to be under-sampled and were more common than the data-set indicated.

2.3.3 Vegetation Communities

The current status of information regarding plant communities within the BBSB is poor. Although plant communities for the BBSB have previously been listed (Morgan & Terrey 1990), this list does not include information about the composition of understorey and groundcover species and further does not provide information suitable for ranking of conservation priorities. The Joint Vegetation Mapping Project (WRA-24) of Stage 2 of the NSW WRA has produced 1:100 000 scale maps of the existing vegetation communities within the BBSB and predictions of where communities might once have occurred. This information would be the most suitable for interrogating for criteria for ranking, but was not available at the time of writing this report.

The Stage 1 Vegetation Surveys and Mapping – WRA13 (Beckers & Binns 2000) provides limited information on ecological communities. Surveys were undertaken in State Forests, National Parks and Crown land with the BBSB south of Narrabri. This area covers approximately one third of the BBSB, but within that area only 20% of the area was mapped and sampled. It is also likely that this mapping is not an unbiased representation of all tenures across the bioregion since National Parks and Wildlife estate and other reserved lands tend to be located on infertile and steep lands (Pressey 1993).

The following information on methodology is included for completeness should further resources be available in the future to determine conservation ranks of vegetation communities.

The ranking criteria (Table 2 and Text Box 2.2) are based on those developed for the Gippsland Native Vegetation Plan (West Gippsland Catchment Management Authority 2000). These criteria include some similar to those developed for establishing a *Comprehensive Adequate and Representative Reserve System* (JANIS 1997) and those used by the Queensland EPA to rank the conservation status of bioregional ecosystems (including the Queensland portion of the Brigalow Belt South Bioregion) (Sattler & Williams 1999). An important element of this ranking procedure is knowledge of the current distribution of the community and an estimate of the pre-European distribution.

TABLE 2: CRITERIA FOR ASSIGNING VEGETATION COMMUNITIES TO CONSERVATION CATEGORIES

Threatened equivalent	Conservation category	Criteria
Presumed Extinct	X	<ul style="list-style-type: none"> Probably no longer present in the bioregion
Endangered	E1	<ul style="list-style-type: none"> Contracted to less than 10% of former range; or Less than 10% pre-European area remains;
	E2	<ul style="list-style-type: none"> Combination of depletion, degradation, current threats and rarity is comparable overall to E1: <ul style="list-style-type: none"> 10 to 30% pre-European extent remains <u>and</u> severely degraded over a majority of this area; or naturally restricted vegetation community reduced to 30% or less of former range <u>and</u> moderately degraded over a majority of this area; or rare vegetation community cleared/or moderately degraded over a majority of former area.
Vulnerable	V1	<ul style="list-style-type: none"> 10 to 30% of pre-European extent remains;
	V2	<ul style="list-style-type: none"> Combination of depletion, degradation, current threats and rarity is comparable overall to V1: <ul style="list-style-type: none"> greater than 30% and up to 50% pre-European extent remains and moderately degraded over a majority of this area; or greater than 50% pre-European extent remains and severely degraded over a majority of this area; or naturally restricted vegetation community where greater than 30% pre-European extent remains and moderately degraded over a majority of this area; or rare vegetation community cleared and/or moderately degraded over a minority of former area.
Depleted	D1	<ul style="list-style-type: none"> greater than 30% and up to 50% pre-European extent remains;
	D2	<ul style="list-style-type: none"> Combination of depletion, degradation and current threats is comparable overall to 4: greater than 50% pre-European extent remains <u>and</u> moderately degraded over a majority of this area.
Least Concern	LC	<ul style="list-style-type: none"> greater than 50% pre-European extent remains <u>and</u> subject to little or no degradation over a majority of this area.
Rare	R1	<ul style="list-style-type: none"> total range generally less than 10 000ha; or
	R2	<ul style="list-style-type: none"> pre-European extent in bioregion less than 1000ha; or
	R3	<ul style="list-style-type: none"> patch size generally less than 100 ha.
Naturally Restricted	NR	<ul style="list-style-type: none"> pre-European extent in bioregion less than 10 000 ha
Common	C	<ul style="list-style-type: none"> pre-European extent in bioregion greater than 10 000 ha
Minor	M	<ul style="list-style-type: none"> pre-European extent in bioregion less than approximately 1% of Statewide extent.

BOX 2.2 DEFINITIONS INCLUDED IN THE CRITERIA FOR RANKING ECOLOGICAL COMMUNITIES

Subject to a threatening process: includes currently acting threats that will lead to degradation (moderate or severe) or risk of significant rapid change (e.g. rising groundwater; change of land use)

Majority: greater than 50% of area

Minority: greater than 10% and up to 50% of area

Severely degraded: floristic and/or structural diversity is greatly reduced (and/or subject to a threatening process that will lead to an equivalent reduction) and unlikely to recover naturally in medium to long term

Moderately degraded: floristic and/or structural diversity is significantly reduced (and/or subject to a threatening process that will lead to an equivalent reduction) but may recover naturally with removal of threatening processes

Little or no degradation: floristic and/or structural diversity is largely intact

Range: area of smallest concave polygon that includes all occurrences

Given the lack of information on communities within the bioregion, communities were not ranked. However, those communities listed as endangered on the *Environment Protection and Biodiversity Conservation Act 1999* and the *Threatened Species Conservation Act 1995* were considered further in terms of disturbances.

2.3.4 Disturbances

Current disturbances within the BBSB were ranked in relation to the ranked lists of species. For each of the key species listed (conservation category 1 for animals and National and State for plants), the key current disturbance, threatening process or land management practice was identified where possible in consultation with the expert panel. Where the key disturbance or threatening process was not known it was recorded as such so as to identify data gaps. For each species of animal the expert panel ranked the top three disturbances.

Disturbances were ranked based on the number of key species that they are thought to be impacting. Ranks were produced using all species together as well as by splitting species into taxonomic or functional groups, for example birds versus amphibians. This ranking procedure was applied to both plants and animals.

For the fauna, disturbances were further ranked based on the sum of the scores for each disturbance position (3 point for highest disturbance, 2 for a secondary disturbance and 1 for a third placed disturbance). Plant species disturbances were not ranked within individual species on the suggestion of the expert panel, since it was felt that there was insufficient information available for individual species to assign disturbances in this manner.

2.4 RESPONSE PROFILES

Response profiles for species of major conservation concern were compiled based on information collated during the earlier stages of the project. A standard reporting proforma was produced in consultation with the Project Manager, PlanningNSW and the technical experts (through Workshop 1). These profiles contained information on:

- Status (*EPBC Act*, *TSC Act*, ROTAP, Plants@Risk, Action Plans)

- Description of the species;
- Distribution of the species (Nationally, State and within the BBSB);
- Characteristics used to determine conservation rank within the bioregion;
- Habitat description;
- Ecology;
- Disturbance and land management practices impacting the species;
- Ecological characteristics of the species related to disturbance;
- Distinct populations within the bioregion;
- Areas considered vital for survival within the bioregion; and
- Management recommendations.

Where information was not available for a species, these gaps were identified and noted. Once the draft response profiles had been prepared, technical experts reviewed these as part of Workshop 2.

At Workshop 1 it was discussed at length whether or not to include the “Equity of Persistence” formula for plants and minimum viable habitat area formula for animals as was used in the Eden Region Response to Disturbance project (Environment Australia 1998). While it was considered that these formula have some benefit in situations where the details of the species ecology and biology is very well known, it was felt that significant problems would arise for those species where information is scarce. It was generally felt that it was better not to include these formulae in the response profiles.

The profile proformas were incorporated into a custom Microsoft Access database so that they could easily be produced based on information contained in the database. This allowed the format and content of the profiles to easily be changed and updated and for new profiles to be produced as species information changed.

2.5 EXPERT WORKSHOPS

A panel of experts was invited to a series of two workshops in order for the outputs of the project to be reviewed. An initial list of experts was compiled based on their knowledge of the flora and fauna of the bioregion and was approved by the Resource and Conservation Division of PlanningNSW. The workshops were facilitated by Martin Predavec (zoologist) and Stephen Mueck (botanist), both of Biosis Research. Also in attendance at the workshops was Brian Weavers of PlanningNSW. Prior to and during the workshops, participants were asked to remember that they were invited to participate based on their knowledge of the bioregion and that their advice should be independent of any agency views. Based on their availability and willingness to attend, seven experts attended the two workshops (Table 3).

TABLE 3: EXPERT PANEL MEMBERS WHO ATTENDED THE WORKSHOPS

Name	Area of expertise	Affiliation
Doug Binns	Botany	State Forests of NSW
Geoff Carr	Botany	Consultant (Ecology Australia)
Carl Gosper	Zoology	NPWS
Roger Lembit	Botany	Consultant (Gingra Ecological Services)
Frank Lemckert	Zoology	State Forests of NSW
Ross Sadler	Zoology	Australian Museum
Matt White	Botany	NRE - Arthur Rylah Institute

2.5.1 Workshop 1

Workshop 1 was held on the 23rd and 24th of April 2002. For the majority of the workshop the participants were split into a group of botanists and a group of zoologists. Participants were provided with the ranked species lists and methodology prior to the workshop. At the workshop participants were asked to:

- arrive at a consensus on the ranked species lists based on conservation concern;
- determine possible disturbances for those species of major conservation concern and the ecological characteristics of the species that makes them vulnerable to the particular disturbance;
- determine habitat requirements of the highest ranked species; and
- review a draft template for the species response profiles.

2.5.2 Workshop 2

Workshop 2 was held on the 17th of May 2002 and again the participants were divided into a group of botanists and a group of zoologists. Draft species response profiles were provided to the participants prior to the workshop. At the second workshop the participants were asked to:

- Check the final ranked species lists;
- Review and make changes to the draft species response profiles;
- Discuss and review the ranked disturbance lists for the bioregion;
- Discuss subcategories of disturbance; and
- Discuss management actions for the main disturbance categories.

2.6 LIMITATIONS

This was a desk-based assessment and as such is limited by the availability and suitability of data. As stated in the general overview of the BBSB (NSW National Parks and Wildlife Service 2000) information on the flora and fauna of the bioregion is either non-existent or of poor quality. The timing of the project meant that much of the data being produced in other Stage 2 projects, such as WRA 23 and WRA 16, were not available until the later stages of the project and as such could not be fully incorporated into the methodology and results. Data from other projects such as WRA 24 were not available at all during the project.

Due to a general lack of information and partly due to time constraints, this report considers only plants and terrestrial vertebrates, and as such aquatic organisms and terrestrial invertebrates have not been considered.

3. RESULTS

3.1 RANKED SPECIES LISTS

3.1.1 Fauna

Within the BBSB, 471 species of terrestrial vertebrates have been recorded, comprising 25 amphibians, 298 birds, 58 mammals and 90 reptiles (Figure 3). These numbers do not include species presumed extinct in New South Wales including the Eastern Hare-wallaby (*Lagorchestes leporides*), Bridled Nailtail Wallaby (*Onychogalea fraenata*), Western Quoll (*Dasyurus geoffroii*), White-footed Rabbit-rat (*Conilurus albipes*), Greater Stick-nest Rat (*Leporillus conditor*), Plains Rat (*Pseudomys australis*) and Gould's Mouse (*Pseudomys gouldii*).

Based on the ranking procedures, 95 species are considered to have the highest conservation priority (Conservation Category 1), 96 species were assigned to Conservation Category 2, 252 species are considered stable in the Bioregion, while 28 could not be assigned to a conservation category due to insufficient information (Appendix 1; Figure 4).

Based on the NPWS Atlas of NSW Wildlife there are 1084 extant species of vertebrates in NSW and 220 (20.3%) are currently³ recognised as threatened (Endangered or Vulnerable) under the *Threatened Species Conservation Act 1995*. Although conservation categories 1 and 2 do not directly correspond to Endangered and Vulnerable under the *TSC Act*, 40% of terrestrial vertebrate species recorded in the bioregion are considered to be under threat, and 20% of these are considered to be under significant threat.

Amphibians

Twenty-five amphibians have been recorded in the bioregion (Appendix 1). One species is currently listed as Endangered on the *TSC Act*. Four species were assigned to category 1, zero to category 2, 10 to category 3 and 11 to category 9 (Figure 5). Within NSW as a whole, 25% of frog species are listed as either Vulnerable or Endangered (NPWS 1999), which is higher than the 16% placed in Category 1 in the current study. However, over 40% of frog species recorded in the bioregion were considered to have insufficient information to determine conservation status (see section 5.3).

³ As at 31st May 2002.

Reptiles

Ninety species of reptile have been recorded in the bioregion (Appendix 1). One species is currently listed as Endangered and two as Vulnerable on the *TSC Act*. Of these ninety species, 16 were assigned to category 1, 21 to Category 2, 43 to category 3 and 10 to category 9 (Figure 5). Within NSW as a whole, 13% of reptile species are listed as either Vulnerable or Endangered (NPWS 1999), which is lower than the 40% placed in Category 1 and Category 2 in the current study.

Birds

Two hundred and ninety-eight species of native birds have been recorded in the bioregion (Appendix 1). Eight species are currently listed as Endangered and 25 as Vulnerable on the *TSC Act*. Of these species, 49 were assigned to Category 1, 65 to Category 2, 181 to Category 3 and 3 to Category 9 (Figure 5). Within NSW as a whole, 20% of bird species are listed as either Vulnerable or Endangered (NPWS 1999), which is lower than the 38% placed in Category 1 and Category 2 in the current study.

Mammals

Fifty-eight species of native mammal have been recorded in the bioregion (Appendix 1). One species is currently listed as Endangered and 17 as Vulnerable on the *TSC Act*. Of these species, 26 were assigned to Category 1, 10 to Category 2, 18 to Category 3 and 4 to Category 9 (Figure 5). Within NSW as a whole, 28% of mammal species are listed as either Vulnerable or Endangered (NPWS 1999), which is lower than the 60% placed in Category 1 and Category 2 in the current study.

Fauna species at the edge of their distribution

Although not included in the ranking procedure, whether or not an animal was at the edge of its range was recorded for all species recorded in the bioregion. Two hundred species (42%) are considered to be at the edge of their range within the bioregion, although the more mobile species, such as birds, tend to have a lower percentage of species at the edge (Appendix 3, Figure 6).

3.1.2 Flora

A total of 1823 species of plant has been recorded in the bioregion in 132 families (Appendix 2, Table 4). This species list is not however exhaustive, since some groups such as orchids appear to be under-represented in the list. Grasses (Poaceae) are the most prominent group with over 241 species recorded in the bioregion, followed by daisies (Asteraceae – 178 species), peas (Fabaceae – 105 species) and myrtaceous plants such as Eucalypts (Myrtaceae – 100 species).

While most species recorded in less than two percent of the quadrat database were assessed by the expert panel to be of regional conservation significance, most species recorded in more than 2.5% of quadrats were evaluated to be of local conservation value.

Comparisons between assessments of regional significance using lists ranked using the number of botanical subdivisions and quadrat frequency yielded very few inconsistencies (less than five) and where these occurred the expert panel reassessed each taxon. Thirty-one species (1.7%) were ranked as having National Conservation Significance, 21 species (1.2%) as having State Conservation Significance and 955 (52.4%) as having Regional Conservation Significance. All native species were assumed to have at least Local Significance prior to the ranking procedure.

279 species were not assigned to a conservation category since these species were added to the list from data obtained from WRA 16 after the two workshops.

In terms of species with highest conservation ranks, the Rutaceae and Euphorbiaceae both have five species ranked as either National or State significance, and the Phormiaceae and Orchidaceae both have four species included in the highest categories.

TABLE 4: PLANT FAMILIES RECORDED IN THE BIOREGION AND CONSERVATION CATEGORIES

Family	Number of species in each Conservation Rank					TOTAL
	National	State	Regional	Local	Not ranked	
Acanthaceae	-	-	-	3	-	3
Adiantaceae	-	-	4	4	4	12
Aizoaceae	-	-	5	-	-	5
Alismataceae	-	-	1	-	-	1
Amaranthaceae	-	-	12	1	3	16
Amaryllidaceae	-	-	1	1	1	3
Anthericaceae	-	-	7	7	1	15
Apiaceae	-	-	10	7	5	22
Apocynaceae	-	-	2	2	1	5
Araceae	-	-	2	-	-	2
Araliaceae	-	-	3	-	1	4
Asclepiadaceae	1	-	7	-	2	10
Asphodelaceae	-	-	-	2	2	4
Aspleniaceae	-	-	3	-	1	4
Asteraceae	1	-	95	48	34	178
Azollaceae	-	-	1	-	-	1
Bignoniaceae	-	-	1	-	-	1
Blechnaceae	-	-	5	-	-	5
Boraginaceae	-	-	5	1	1	7
Brassicaceae	2	-	8	2	2	14
Campanulaceae	-	-	3	11	1	15
Capparaceae	-	-	1	2	-	3
Caryophyllaceae	-	-	8	1	3	12
Casuarinaceae	-	-	6	5	-	11
Celastraceae	-	-	5	1	-	6
Centrolepidaceae	-	-	2	-	1	3
Chenopodiaceae	-	-	36	18	9	63
Chloanthaceae	-	-	2	1	-	3
Clusiaceae	-	-	-	2	-	2
Colchicaceae	-	-	1	-	1	2
Commelinaceae	-	-	3	1	-	4
Convolvulaceae	-	-	6	5	1	12
Crassulaceae	-	-	2	1	1	4
Cucurbitaceae	-	-	2	-	-	2
Cupressaceae	-	-	1	2	1	4
Cyatheaceae	-	-	1	-	-	1
Cyperaceae	1	2	50	12	9	74
Davalliaceae	-	-	1	-	-	1
Dennstaedtiaceae	-	-	1	1	-	2
Dicksoniaceae	-	-	1	-	-	1
Dilleniaceae	-	-	9	3	2	14

Family	Number of species in each Conservation Rank					TOTAL
	National	State	Regional	Local	Not ranked	
Droseraceae	-	-	5	-	-	5
Dryopteridaceae	-	-	3	-	-	3
Ebenaceae	-	-	-	1	-	1
Epacridaceae	-	-	12	11	8	31
Eriocaulaceae	-	-	1	-	-	1
Euphorbiaceae	2	3	20	7	7	39
Fabaceae (Caesalpinioideae)	-	-	3	3	3	9
Fabaceae (Faboideae)	1	1	55	25	23	105
Fabaceae (Mimosoideae)	1	1	37	43	13	95
Gentianaceae	-	-	1	-	-	1
Geraniaceae	-	-	6	2	-	8
Goodeniaceae	1	1	16	10	2	30
Haemodoraceae	-	-	1	-	-	1
Haloragaceae	-	-	9	5	4	18
Hydrocharitaceae	-	-	1	-	-	1
Hypoxidaceae	-	-	2	-	-	2
Icacinaceae	-	-	1	-	-	1
Iridaceae	-	-	2	1	1	4
Juncaceae	-	1	16	9	2	28
Juncaginaceae	-	-	1	-	-	1
Lamiaceae	-	1	17	5	6	29
Lauraceae	-	-	2	2	-	4
Lemnaceae	-	-	1	-	-	1
Lentibulariaceae	-	-	1	-	-	1
Linaceae	-	-	1	-	-	1
Lobeliaceae	-	-	4	3	1	8
Loganiaceae	-	-	3	-	-	3
Lomandraceae	1	-	6	7	2	16
Loranthaceae	-	-	16	2	-	18
Luzuriagaceae	-	-	1	1	-	2
Lythraceae	-	-	1	-	-	1
Malvaceae	-	-	10	12	3	25
Marsileaceae	-	-	2	1	-	3
Meliaceae	-	-	3	-	-	3
Menispermaceae	-	-	2	-	-	2
Monimiaceae	-	-	4	-	-	4
Moraceae	-	-	2	-	-	2
Myoporaceae	-	-	4	4	3	11
Myrsinaceae	-	-	2	-	-	2
Myrtaceae	2	-	50	36	12	100
Nitrariaceae	-	-	1	-	-	1
Nyctaginaceae	-	-	1	1	1	3
Olcaceae	-	-	1	-	-	1
Oleaceae	-	-	3	4	2	9
Onagraceae	-	-	5	-	-	5
Ophioglossaceae	-	-	2	-	-	2
Orchidaceae	2	2	24	6	11	45
Oxalidaceae	-	-	-	4	-	4
Papaveraceae	-	-	1	-	-	1
Philydraceae	-	-	-	1	-	1
Phormiaceae	-	4	3	10	1	18

Family	Number of species in each Conservation Rank					TOTAL
	National	State	Regional	Local	Not ranked	
Pittosporaceae	-	-	8	2	1	11
Plantaginaceae	-	-	1	3	1	5
Poaceae	2	1	91	96	51	241
Polygalaceae	-	1	2	-	-	3
Polygonaceae	-	-	10	3	1	14
Polypodiaceae	-	-	1	-	-	1
Portulacaceae	-	-	6	2	-	8
Potamogetonaceae	-	-	2	-	-	2
Proteaceae	1	1	13	8	4	27
Pteridaceae	-	-	2	-	-	2
Ranunculaceae	-	-	10	4	2	16
Rhamnaceae	1	2	7	2	2	14
Ripogonaceae	-	-	1	-	-	1
Rosaceae	-	-	8	1	-	9
Rubiaceae	1	-	11	6	4	22
Rutaceae	5	-	20	6	4	35
Sambucaceae	-	-	1	-	-	1
Santalaceae	1	-	4	2	2	9
Sapindaceae	2	-	12	9	1	24
Sapotaceae	-	-	2	-	-	2
Scrophulariaceae	1	-	8	3	3	15
Smilacaceae	-	-	1	-	-	1
Solanaceae	-	-	17	3	3	23
Stackhousiaceae	-	-	-	3	-	3
Sterculiaceae	1	-	4	2	1	8
Stylidiaceae	-	-	-	3	1	4
Surianaceae	1	-	-	-	-	1
Thymelaeaceae	-	-	10	3	3	16
Typhaceae	-	-	-	2	-	2
Ulmaceae	-	-	1	-	-	1
Urticaceae	-	-	2	1	-	3
Verbenaceae	-	-	2	-	2	4
Violaceae	-	-	2	2	1	5
Viscaceae	-	-	3	-	-	3
Vitaceae	-	-	4	-	-	4
Winteraceae	-	-	1	-	-	1
Xanthorrhoeaceae	-	-	2	4	-	6
Xyridaceae	-	-	1	-	-	1
Zamiaceae	-	-	3	3	2	8
Zygophyllaceae	-	-	4	1	1	6
TOTAL	31	21	955	534	282	1823

3.1.3 Communities

Seven endangered ecological communities, as listed under the *EPBC* and *TSC Acts*, are present in the bioregion (Table 5).

TABLE 5: ENDANGERED ECOLOGICAL COMMUNITIES LISTED UNDER THE EPBC OR TSC ACTS THAT OCCUR IN THE BIOREGION

Community	Listed under EPBC Act	Listed under TSC Act	Threatening processes ¹
Bluegrass (<i>Dichanthium</i> spp.) dominant grasslands of the Brigalow Belt Bioregions (North and South)	Yes	No	- Land clearing - Grazing - Weed invasion
Brigalow (<i>Acacia harpophylla</i> dominant and co-dominant)	Yes	Preliminary determination	- Land clearing
<i>Cadellia pentastylis</i> (Ooline) community in the Nandewar and Brigalow Belt South IBRA regions	No	Yes	- Land clearing - Grazing
Carbeen Open Forest Community in the Darling River Plains and Brigalow Belt South Bioregions	No	Yes	- Land clearing - Grazing - Inappropriate fire regimes
Native Vegetation on Cracking Clay Soils of the Liverpool Plains	No	Yes	- Land clearing - Grazing - Alteration of disturbance regimes - Salinity
Semi-evergreen Vine Thicket in the Brigalow Belt and Nandewar Bioregions	Yes	Yes	- Land clearing - Inappropriate fire regimes - Grazing - Weed invasion
White Box, Yellow Box, Blakely's Red Gum Woodland	Yes (listed as Grassy White Box Woodland)	Yes	- Land clearing - Firewood cutting - Grazing - Weed invasion - Inappropriate fire regimes

1. Threatening processes are taken from the final determinations for the listing of these species on either the EPBC or TSC Acts.

3.2 DISTURBANCES AND LAND MANAGEMENT PRACTICES

Following the expert workshops it was decided that there were sufficient differences comparing flora and fauna to warrant looking at disturbances and land management practices separately. The major disturbances and land management practices are considered separately in Section 4, while the remainder is discussed in more general terms below. Disturbances that impact only one or two species are discussed in the species profiles (Appendix 4).

3.2.1 Fauna

Nineteen disturbances were recorded for the 94 species of animal listed in Conservation Category 1 (Table 6). By far the greatest disturbance is Land Clearing, which has impacted 80 species in Conservation Rank 1, and for 64 of these species it is considered the primary disturbance (Figure 7).

Amphibians

Five disturbances were ranked as either primary, secondary or tertiary for amphibian species assigned to Conservation Category 1. The highest ranked disturbance for amphibians in the bioregion was disease, followed by inappropriate fire regimes (Figure 8, Table 7). Amphibians are unusual in that the highest ranked disturbance or threatening process is not one caused by human practices, but rather by the disease chytridiomycosis caused by the amphibian chytrid

fungus, *Batrachochytrium dendrobatidis* (Speare 2001a). This disease was only discovered in 1998, but it has been implicated in the declines and extinctions of amphibians in Australia (Berger et al. 1998). The fungus appears to be transmitted in water and all species of frog are vulnerable. There have been suggestions that infected frogs can be transported around the country in farm produce, thereby spreading the disease, but this is mainly in fruit and vegetable produce and is unlikely to be a major factor in the BBSB (Speare 2001b).

The remaining disturbances for amphibians are largely related to the modification of habitat, particularly dense lower storey vegetation, either through direct land clearing or through the inappropriate use of fire regimes, in particular large wildfires.

TABLE 6: RANKED DISTURBANCES FOR FAUNA ASSIGNED TO CONSERVATION CATEGORY 1 IN THE BIOREGION

Disturbance or land management practice	Number of species impacted ¹	Overall ranking score ($3n_1+2n_2+n_3$)	Number of species with primary disturbance (n_1) ²	Number of species with secondary distance (n_2) ²	Number of species with tertiary disturbance (n_3) ²
Land clearing	80	219	64	11	5
Inappropriate Grazing	34	61	2	23	9
Inappropriate fire regimes	24	42	1	16	7
Predation	23	42	3	13	7
Wetland modification	15	38	11	1	3
Forestry operations	20	34	0	14	6
River/stream modification	14	30	3	10	1
Down timber removal	11	20	0	9	2
Disturbance to nest and roost sites	6	15	4	1	1
Competition	5	10	2	1	2
Disease	4	10	3	0	1
Feral herbivores	1	3	1	0	0
Trapping	2	3	0	1	1
Weed invasion	2	3	0	1	1
Baiting	1	2	0	1	0
Road Kills	2	2	0	0	2
Apiary practices	1	1	0	0	1
Exploitation	1	1	0	0	1
Removal of Mistletoe	1	1	0	0	1

1: The expert panel determined the top three disturbances for each key species in Conservation Category 1.

2: For each key species the expert panel ranked the top three disturbances as primary, secondary or tertiary.

TABLE 7: DISTURBANCES AND LAND MANAGEMENT PRACTICES FOR AMPHIBIANS ASSIGNED TO CONSERVATION CATEGORY 1

Disturbance or land management practice	Number of species impacted ¹	Overall ranking score ($3n_1+2n_2+n_3$)	Number of species with primary disturbance (n_1) ²	Number of species with secondary distance (n_2) ²	Number of species with tertiary disturbance (n_3) ²
Disease	4	10	3	0	1
Inappropriate fire regimes	3	5	0	2	1
Land clearing	2	4	1	0	1
River/stream modification	2	4	0	2	0
Inappropriate Grazing	1	1	0	0	1

1: The expert panel determined the top three disturbances for each key species in Conservation Category 1.

2: For each key species the expert panel ranked the top three disturbances as primary, secondary or tertiary.

Reptiles

Eleven disturbances were ranked as either primary, secondary or tertiary for reptilian species assigned to Conservation Category 1. The highest ranked disturbance for reptiles in the Bioregion was Land Clearing, followed by Inappropriate grazing (Figure 8, Table 8). Most of the disturbances for reptiles are related to the loss of habitat, either through land clearing or through the modification of the vegetation structure (eg. through inappropriate grazing and/or fire regimes). For some rock-dwelling species land clearing or modification has resulted in the isolation of populations. Forestry operations relate to practices that do not encourage the recruitment of trees of a suitable size so as to produce corticating bark and tree hollows.

TABLE 8: DISTURBANCES AND LAND MANAGEMENT PRACTICES FOR REPTILES ASSIGNED TO CONSERVATION CATEGORY 1

Disturbance or land management practice	Number of species impacted ¹	Overall ranking score ($3n_1+2n_2+n_3$)	Number of species with primary disturbance (n_1) ²	Number of species with secondary disturbance (n_2) ²	Number of species with tertiary disturbance (n_3) ²
Land clearing	14	36	11	0	3
Inappropriate Grazing	9	17	1	6	2
Inappropriate fire regimes	5	11	1	4	0
Down timber removal	6	10	0	4	2
River/stream modification	3	7	1	2	0
Competition	1	3	1	0	0
Feral herbivores	1	3	1	0	0
Forestry operations	2	3	0	1	1
Predation	2	3	0	1	1
Trapping	1	1	0	0	1
Wetland modification	1	1	0	0	1

1: The expert panel determined the top three disturbances for each key species in Conservation Category 1.

2: For each key species the expert panel ranked the top three disturbances as primary, secondary or tertiary.

Birds

Fifteen disturbances were ranked as either primary, secondary or tertiary for avian species assigned to Conservation Category 1. The highest ranked disturbance for birds in the bioregion was Land Clearing, followed by Wetland Modification (Figure 8, Table 9). A large number of birds to be impacted in the bioregion are considered to be part of a group of small woodland birds that have suffered declines. These birds generally use forest environments including an intact shrub layer. The direct loss of habitat and the modification of the shrub layer through changes in fire regimes and inappropriate grazing, has resulted in the decline of this group (Reid 1999, Traill & Duncan 2000).

Wetland modification is also an important disturbance for birds in that a large number of birds within the bioregion are wetland specialists. The fact that there are relatively few large wetlands in the bioregion means that by the nature of their habitat specificity wetland species are likely to have a small geographic range and low relative abundance and thus are likely to be placed into Conservation Category 1.

Forestry operations relate to practices that do not encourage the recruitment of trees of a suitable size so as to produce corticating bark, tree hollows or large nectar flows.

**TABLE 9: DISTURBANCES AND LAND MANAGEMENT PRACTICES FOR BIRDS
ASSIGNED TO CONSERVATION CATEGORY 1**

Disturbance or land management practice	Number of species impacted ¹	Overall ranking score ($3n_1+2n_2+n_3$)	Number of species with primary disturbance (n_1) ²	Number of species with secondary distance (n_2) ²	Number of species with tertiary disturbance (n_3) ²
Land clearing	42	120	36	6	0
Wetland modification	14	37	11	1	2
Inappropriate Grazing	18	35	1	15	2
Inappropriate fire regimes	14	24	0	10	4
Predation	10	17	2	3	5
River/stream modification	8	16	1	6	1
Forestry operations	9	15	0	6	3
Down timber removal	5	10	0	5	0
Disturbance to nest sites	2	3	0	1	1
Weed invasion	2	3	0	1	1
Competition	1	2	0	1	0
Road kills	2	2	0	0	2
Exploitation	1	1	0	0	1
Apiary practices	1	1	0	0	1
Removal of Mistletoe	1	1	0	0	1

1: The expert panel determined the top three disturbances for each key species in Conservation Category 1.

2: For each key species the expert panel ranked the top three disturbances as primary, secondary or tertiary.

Mammals

Thirteen disturbances were ranked as either primary, secondary or tertiary for mammalian species assigned to Conservation Category 1. The highest ranked disturbance for mammals in the bioregion was Land Clearing, followed by Predation (Figure 8, Table 10). The reduction of available habitat, either directly or through modification, has a significant impact on mammalian species in the bioregion. The habitat is quite varied and ranges from native grasslands for species such as the dunnarts and planigales to forested areas for species such as possums and gliders.

Predation rates highly as a disturbance for mammalian species and this is not surprising given that predation has been implicated in the decline and extinction of many mammalian species in NSW (Dickman & Read 1992, Dickman et al. 1993, Dickman 1994, Paull & Date 1999). Predators in the bioregion include foxes and cats.

Disturbance to roost sites is restricted to bats, particularly those that roost in caves. The number and location of maternity roosts of bats species in the bioregion are poorly known, but this should be a research priority in order to identify and protect these roost sites.

**TABLE 10: DISTURBANCES AND LAND MANAGEMENT PRACTICES FOR MAMMALS
ASSIGNED TO CONSERVATION CATEGORY 1**

Disturbance or land management practice	Number of species impacted ¹	Overall ranking score ($3n_1+2n_2+n_3$)	Number of species with primary disturbance (n_1) ²	Number of species with secondary distance (n_2) ²	Number of species with tertiary disturbance (n_3) ²
Land clearing	36	95	27	5	4
Predation	13	25	1	10	2
Inappropriate Grazing	15	24	1	7	7

Disturbance or land management practice	Number of species impacted ¹	Overall ranking score ($3n_1+2n_2+n_3$)	Number of species with primary disturbance (n_1) ²	Number of species with secondary disturbance (n_2) ²	Number of species with tertiary disturbance (n_3) ²
Forestry operations	11	19	0	8	3
Inappropriate fire regimes	8	16	2	4	2
Disturbance to roost sites	4	12	4	0	0
River/stream modification	4	10	2	2	0
Down timber removal	6	10	0	4	2
Competition	4	8	2	0	2
Trapping	2	3	0	1	1
Feral herbivores	1	3	1	0	0
Baiting	1	2	0	1	0
Wetland modification	1	1	0	0	1

1: The expert panel determined the top three disturbances for each key species in Conservation Category 1.

2: For each key species the expert panel ranked the top three disturbances as primary, secondary or tertiary.

3.2.2 Flora

Ten disturbances were ranked for plant species assigned to the highest conservation categories (Figure 9). The highest ranked disturbance for key plant species in the bioregion was Feral Animals, followed by Weed Invasion and Land Clearing. It should be noted however, that although this ranking is for key species as a whole, individual species might have different primary disturbances. Disturbance by feral animals related primarily to grazing and trampling by goats and pigs. This not only causes physical damage to individual plants, but may also prohibit recolonisation (e.g. Tisdell 1982, Henzell 1992, Choquenot et al. 1996). The impact of goats in some areas is heightened because they are often considered to be a resource by some graziers (Thompson & Boyd-Law 1995), even though there is a net cost to graziers who harbour goats on their property even if the goats are commercially harvested (Parkes et al. 1996). Weed invasion can have a range of impacts on natural systems, many of which will result in major changes to ecosystem structure. However, there are few systematic studies investigating the full impacts of environmental weeds (Adair & Groves 1998) and many of the impacts will be species specific.

In addition to the disturbances listed for the key plant species, the expert botanists involved in the workshops compiled a list of threatening processes that they thought to be important in the bioregion for plants in general. This list included:

- Land clearing;
- Inappropriate fire regimes;
- Modified hydrological regimes/processes;
- Grazing/browsing – this included domestic, feral and native animals;
- Loss of commensal organisms;
- Invasive species;
- Timber harvesting and silviculture practices;
- Pollution and the application of chemicals eg. herbicides, pesticides and fertilisers;
- Mining and quarrying;
- Commercial exploitation of native flora eg. Wildflower trade;
- Honey production;
- Infrastructure development and maintenance;

- Recreational activities eg. 4WDs and rock climbing; and
- Inappropriate biodiversity conservation management.

3.2.3 Communities

For the seven endangered ecological communities (Table 5) present in the bioregion, land clearing is listed as a threatening process for all of them. Grazing is listed as a threatening process for six communities, while weed invasion and inappropriate fire regimes are listed for three communities.

3.2.4 Land management practices of benefit to key species, populations and communities

Since species considered in terms of disturbance and land management practices were all of conservation concern within the bioregion, the majority of land uses were considered to have a negative impact on these species. However, some positive results of current land management practices were noted for species of conservation concern. It should be noted however, that the majority of examples presented below are anecdotal.

For example, numbers of White-bellied Sea-eagles (*Haliaeetus leucogaster*) may have increased as a result of introduced carp in the river systems. However, it is important to consider the full impacts of these practices and disturbances on all species when considering impacts. Carp may have detrimental effects on a range of native fish species as well as other aquatic and semi-aquatic vertebrates.

In a similar manner, the provision of fire dams within forestry areas, surrounded by vegetation, may have a positive impact on Glossy Black-cockatoos (*Calyptorhynchus lathami*), which need to drink at least once per day.

Covering a broader range of impacts, the selective thinning of Cypress Pines has been found to have a positive impact on biodiversity by allowing the return of a more natural vegetation structure. By increasing the extent of thinning of Cypress there is natural regeneration of the shrub layer and a resulting increase in biodiversity.

Some species will have had large population increases in the bioregion as a result of past land management practices. For example, species that are able to utilise farmlands and grassland environments, such as the Crested Pigeon *Ocyphaps lophotes* and Galah *Cacatua roseicapilla*, will have had a significant increase in habitat as a result of land clearing and the subsequent land use (Bennett 1993).

Disturbance is an integral part of the Australian landscape and is often necessary for the proper and continual development of the ecosystems. For example, fire is vital for the survival of some species of Australian plant (Gill 1975, Noble 1986), and is thought to be important in maintaining ecosystem structure in Australian forests (Attiwill 1994). However, it is when the human-induced and natural patterns of disturbance do not match, that impacts on biodiversity can be severe.

It is often thought that changing land management practices can have a positive impact on biodiversity (e.g. Williams & Ashton 1987). For example, reducing stocking rates will often see an increase in standing biomass, a return of the shrub layer and the subsequent increase in fauna biodiversity (e.g. Wimbush & Costin 1979, Gibson & Kirkpatrick 1989, Spooner et al. 2002). While this is an important point to make in terms of land management, the starting point and end point must be made clear in such comparisons in terms of conservation. While in such cases

the biodiversity may be greater compared to a severely degraded site, it is often still considerably lower than a natural, undisturbed site and it may take many years of total cessation of the disturbance before the land may return to its natural state.

It was generally agreed at the Expert Workshops that current disturbances and land management practices are in large not having a positive impact on species of conservation concern within the bioregion.

3.3 RESPONSE PROFILES

Response profiles were completed for all animal species in Conservation Category 1 and for all plant species ranked as either National or State importance. Profiles are contained in Appendix 4.

3.4 DATA GAP ANALYSIS

Data were analysed for gaps at all stages of the project, from compilation of the species lists to the disturbance profiles. Generally, data for the species lists were of low quality and highly variable depending on the data source. For example, there were more than twice the number of plant species listed in the quadrat data of Beckers and Binns (2000) than were recorded in the Atlas of NSW Wildlife. There were also considerable inconsistencies in the taxonomy used. Difference in methodology, coverage and biases in the datasets were also an issue. The vegetation surveys (WRA 16) and the fauna surveys (WRA 23) go a long way to addressing these inconsistencies, but these data were not available at the start of the current project and as such could only partly be incorporated into the results.

3.4.1 Fauna

There was insufficient information of individual species to assign 28 species (6%) to a conservation category. This was particularly high among the amphibians where 10 species (40%) could not be assigned to a category. It was felt by the expert panel that current surveys (including WRA 23) would be insufficient to detect many frog species and that targeted surveys would be necessary. As a result it was felt that the distribution and abundance as indicated by the current records may not be a true representation.

3.4.2 Flora

The main data gaps in the flora data arose from inconsistencies in the taxonomies used in the various data sources. The nomenclature used for this project follows PlantNet (as at April 2002, Royal Botanic Gardens Sydney 2002). This taxonomy did not necessarily coincide with that used by the Atlas of NSW Wildlife and the synonyms listed by PlantNet were used to identify the currently accepted nomenclature for outdated taxonomic entities.

In many instances subspecies and/or varieties of taxa were listed by PlantNet without the species on its own being a listed acceptable taxon. The Wildlife Atlas would often list just the species leading to a data conflict that had to be resolved. Similarly, sometimes the Wildlife Atlas data would record a variety or subspecies when only the specific rank was acknowledged by PlantNet.

3.4.3 Communities

There was little information available on vegetation communities within the bioregion. Although plant communities for the BBSB have previously been listed (Morgan & Terrey 1990), they do not provide information suitable for ranking of conservation priorities. The Stage 1 Vegetation Surveys and Mapping (Beckers & Binns 2000) provides limited information on ecological communities. Surveys were undertaken in State Forests, National Parks and Crown land with the BBSB south of Narrabri. This area covers approximately one third of the BBSB, but within that area only 20% of the area was mapped and sampled. It is also likely that this mapping is not an unbiased representation of all tenures across the bioregion since National Parks and other reserved lands tend to be located on infertile and steep lands (Pressey 1993). As pointed out in the Western Data Audit and Gap Analysis (NSW National Parks and Wildlife Service 1999), pre-clearing maps, necessary to determine suitable conservation targets for plant communities, are not available.

3.4.4 Disturbances

Suitable mapping layers for all disturbances in the bioregion are not available. For example, the 15% crown timber layer gives a general impression of forested areas remaining in the bioregion, but does not give an accurate picture of the extent of land clearing since native grasslands and areas with the shrub layer removed will not be identified.

4. DISTURBANCE AND LAND MANAGEMENT PRACTICE PROFILES

This section of the report provides a summary of major disturbances and land management practices in the bioregion impacting key plants, animals and communities. Not all disturbances and land management practices identified in Section 3 are discussed below, rather those that are considered to be impacting the greatest number of key species and communities and those that for which sufficient information is available to draw conclusions regarding their impacts in the bioregion. The six disturbances considered below are: Land Clearing, Inappropriate Grazing, Inappropriate Fire Regimes, Wetland Modification, Forestry Operations and River/stream Modification.

The nature of the impacts in terms of flora and fauna is described for each key disturbance. In the majority of cases specific studies relating to the nature of impacts have been carried out outside of the BBSB and we have made the assumption that the findings can be applied to the bioregion. Where the studies have been specifically carried out in the BBSB this is noted.

4.1 LAND CLEARING

4.1.1 Definition

The term Land Clearing is widely recognised and there are a number of different definitions. Under the *EPBC Act* Land Clearance is listed as a Key Threatening Process and is defined as “consisting of the destruction of above ground biomass of native vegetation and its substantial replacement by non-local species or by human artefacts” (Threatened Species Scientific Committee 2001). Under the *TSC Act* Land Clearing is also listed as a Key Threatening Process and is defined as “the destruction of a sufficient proportion of one or more strata (layers) within a stand or stands of native vegetation so as to result in the loss, or long term modification, of the structure, composition and ecological function of stand or stands” (NSW Scientific Committee 2001). A more effective definition of land clearing is that used by the Department of Land and Water Conservation in their Native Vegetation Clearing Reports, since it includes the various processes that lead to land clearing.

“Clearing means any one of the following:

- Cutting down, felling, thinning, logging or removing native vegetation;
- Killing, destroying, poisoning, ringbarking, uprooting or burning native vegetation;
- Severing, topping or lopping branches, limbs, stems, or trunks of native vegetation; and

- Substantially damaging or injuring native vegetation in other ways” (DLWC 2002).

4.1.2 Status and legislation

‘Land clearance’ is listed as a Key Threatening process under the *EPBC Act*, while ‘clearing of native vegetation’ is listed on the *TSC Acts*. Threat abatement plans have not been completed under either of these Acts.

Currently the principal piece of legislation that controls the clearing of native vegetation within New South Wales is the *Native Vegetation Conservation Act 1997 (NVC Act)*, administered by the Department of Land and Water Conservation (DLWC). Under the NVC Act, Regional Vegetation Management Plans (RVMP) can be completed which will identify areas of native vegetation that can and can’t be cleared without the consent of DLWC. In areas without a RVMP then consent to clear native vegetation must be obtained from DLWC unless it falls within a number of stated exemptions. No RVMP currently applies to land within the Brigalow Belt South Bioregion.

Within New South Wales in 2001 a total of 92 094 ha of native vegetation was approved for clearing by the Department of Land and Water Conservation. By far the greatest proposed land use for areas applied to be cleared was cropping followed by woody weed burning (Figure 10).

The 2001 State of the Environment Report suggests that clearance of native vegetation remains the single most significant threat to terrestrial biodiversity (Williams et al. 2001).

4.1.3 Nature of impacts

The impacts of vegetation clearing can be both direct and indirect. The most direct impact is that there is simply a loss of the amount of natural habitat available. The amount of habitat available will set an upper limit on the maximum size of populations that can occur in an area. For example, it is estimated that for each 100 ha of woodland that is cleared, between 1000-2000 birds permanently lose their habitat (Bennett 1993). Similarly, it is estimated that clearing of mallee for wheat kills more than 85% of the resident reptiles, more than 200 individuals per hectare (Glanzig & Kennedy 2000). This has further implications for the conservation and management of threatened species since the upper limit on the population restricts the extent of recovery of the species that can be achieved without having to rehabilitate or reconstruct suitable habitat.

The pattern of land clearing within Australia has not been uniform and a similar pattern can be observed in the BBSB. There has been a selective loss of vegetation from areas that have the highest fertility and those that are most suitable for agriculture, such as plains, lower slopes and river valleys (eg. Pressey 1993). This has resulted in species that show a preference for these habitats, such as the Squirrel Glider *Petaurus norfolcensis* and Bush Stone-curlew *Burhinus grallarius* being particularly severely impacted (Bennett 1993). Patterns of soil fertility and forest biodiversity in the South-eastern forests suggest that areas of high fertility tend to have a greater diversity and abundance of certain animal species (Braithwaite et al. 1983, Braithwaite et al. 1989). As a result this suggests that the vegetation types that have been most significantly cleared are those types that originally contained the highest biodiversity.

When land is cleared of vegetation it is generally not cleared uniformly at the same time and this results in fragmentation of the remaining habitat. Habitat fragmentation is the division of a single area of habitat into two or more smaller areas, with a new habitat type occurring in the area between the fragments. This new dividing habitat type is usually artificial and inhospitable to the fauna species within the fragments. In addition to the loss of total habitat area, this process of fragmentation can impact on the fauna species within the newly created fragments in

a number of ways (eg. barrier effects, genetic isolation and edge effects). The degree to which these potential impacts affect the fauna within the newly created fragments depends on a number of variables including distance between fragments, local environmental conditions and the species present. Some of the potential impacts are summarised below:

Barrier Effects. Barrier effects occur where particular species are either unable or are unwilling to move between the suitable areas of fragmented habitat. This could result in either a complete halt to movement or a reduced level of movement between fragments. Roads through areas of native vegetation can act as barriers. Barrier effects would be greater for some species than others. Species most vulnerable to barrier effects include rare species, smaller ground-dwelling species and species with low mobility. Species least vulnerable to barrier effects are those that are highly mobile (eg. birds).

Genetic Isolation. Genetic isolation occurs where individuals from a species' population within one fragment are unable to interbreed with individuals from populations in adjoining fragments. Genetic isolation can lead to inbreeding and genetic drift problems for populations of species isolated within a fragment.

Edge Effects. A zone of changed environmental conditions (ie. altered light levels, wind speed, temperature) occurs along the edges of habitat fragments. These new environmental conditions along the edges can promote the growth of different vegetation types (including weeds) and allow the invasion by pest animals specialising in edge habitats. Edge zones can be subject to higher levels of predation by introduced mammalian predators and native avian predators. For example, Noisy Miners have been shown to utilise edge habitat and to display aggressive behaviour to other small native insectivorous birds, hence reducing species richness (Loyn et al. 1983). This new zone of habitat inside the edge of a fragment can also exacerbate barrier effects. The distance that edge effects can penetrate into a fragment can vary depending on the habitats of the fragments and the surrounding matrix, but they have been estimated at up to 100 m into forest habitat (Bennett 1990). This means that in some cases a fragment of up to 3 ha will have no effective habitat for edge affected species.

Further impacts of land clearing include:

- Expansion of dryland salinity (Greiner 1997);
- Riparian zone degradation;
- Increased greenhouse gas emissions;
- Increased habitat for invasive species;
- Loss of habitat characteristics such as leaf litter;
- Loss of ecological function; and
- Changes in soil biota (NSW Scientific Committee 2001).

It is important to note that many of the impacts of land clearing may be related to each other, and often the consequences of these actions may be irreversible or can only be dealt with through long-term mitigation and restoration strategies (MacNally 1999, Williams et al. 2001).

4.1.4 Land clearing in the bioregion

There are a number of different measures of land clearing in the Brigalow Belt South Bioregion of New South Wales, although none are specific to New South Wales or to the Bioregion in particular. The Australian Native Vegetation Assessment (Cofinas & Creighton 2001) shows that for the entire BBSB (NSW and QLD) 14,948,992 ha (55%) of land is cleared. In terms of the absolute value of hectares cleared this places the BBSB at the top of list, with absolute

clearing 1.8 time higher than the next highest bioregion (Avon Wheatbelt- 8,132,180 ha). However, in term of percentage cleared the entire BBSB is ranked 16th.

Land within the Brigalow Belt South lies within the Barwon and Central West regions of DLWC. Within the Barwon region in 2001, 9133.2 ha of native vegetation were approved for clearing of which over 80% was for cropping. In 2000, 7003 ha were approved for clearing of which 'cropping' and 'cropping and grazing' comprised 84% of the proposed land uses (DLWC 2002). Within the Central West Region 5343.7 ha was approved for clearing of which 31.83% was for 'cropping' and 28.16% was for 'cropping and grazing'. In 2000, 8965 ha were approved for clearing of which 'cropping' and 'cropping and grazing' comprised 71% of the proposed land uses (DLWC 2002).

(NB these figures cover only woody vegetation and are therefore likely to be an underestimation of total vegetation clearing).

The 15% crown cover layer clearly shows the extent and distribution of timber clearing within the bioregion (Figure 11). However, this mapping does not show clearing of native grasslands or land that still have greater than 15% crown cover in which the shrub and ground layer have been destroyed and as such may not be an accurate representation of the extent of land clearing in the bioregion. From this figure it is clear that few large patches of vegetation still remain in the bioregion. An analysis of the distribution of remaining fragment sizes (Figure 12) demonstrates clearly that the vast majority of remaining fragments within the bioregion are very small. 65% of the remaining fragments, based on the 15% Crown Cover timber layer (with a 15 km buffer around the bioregion), are less than 5 ha in size, and a further 30% are sized between 5 and 50 ha (Figure 12). The majority of land clearing appears to have taken place in the north-west and central-east of the bioregion (Figure 11). Large blocks of land remain in the Pilliga and Warrumbungles regions as well as at Coolah Tops and in the north-east of the bioregion (Figure 11).

Land capability (Figure 13) indicates that the majority of the bioregion is suitable for regular cultivation or for grazing with or without a combination of occasional cultivation. However, comparison of the 15% Crown Layer Timber (Figure 11) with land capability (Figure 13) indicates that the larger remaining fragments of natural vegetation within the bioregion, are either already reserved in National Parks or State Forest lands or are lands that are not suitable for cultivation. Lands that are suitable for cultivation within the bioregion have largely already been cleared of native vegetation. Vegetation remaining in these areas tends to be in small fragments.

Although it is clear to see where disturbance from land clearing has had the greatest impacts from the pattern of the remaining vegetation (Figure 11), future impacts of land clearing will depend on a number of different factors including:

- The size of the area to be cleared (ha);
- The size of the area to be cleared relative to the remaining habitat in the local area (the local area can be defined as within a 10 km radius);
- The distribution of sizes of remaining fragments within the local area;
- The location of the area to be cleared to ecologically sensitive area (e.g. next to a river or wetland);
- The role of the vegetation in a corridor network;
- The presence of key species in the area to be cleared and in the local area; and
- The location of the area to be cleared relative to conservation reserves.

In areas that have been extensively cleared of native vegetation and where remnant vegetation occurs only in small fragments (Figure 14), the removal of even small amounts of native vegetation can have dramatic impacts in the local area if the vegetation contains key species. Areas that have significant stands of native vegetation remaining (Figure 14) can possibly withstand small amounts of vegetation being cleared. However, these areas tend to contain a high diversity of key species and also tend to contain conservation reserves. Care should be taken in these areas to ensure that any vegetation buffers surrounding conservation reserves are not degraded and that the ecological integrity of these areas are not diminished through a “death by a thousand cuts”. Areas that contain medium sized fragments within the bioregion (Figure 14) are equally important and play an important role in the corridor network within the bioregion, connecting the larger areas of native vegetation. Hence it is difficult to say where the impacts of Land Clearing will be greatest within the bioregion. Each application for land clearing must be considered on its merit in terms of the species that will ultimately be impacted, at both the local and bioregional scale.

4.1.5 Species and communities impacted

The lists below are not exhaustive, including only those species or communities considered to be of major conservation concern in the bioregion (Category 1 for animals and National or State for plants). It is likely that other non-key species and communities will be impacted by this disturbance.

Animals

Acanthiza uropygialis (Chestnut-rumped Thornbill), *Acanthophis antarcticus* (Common Death Adder), *Acrobates pygmaeus* (Feathertail Glider), *Aepyprymnus rufescens* (Rufous Bettong), *Alcedo azurea* (Azure Kingfisher), *Alectura lathamii* (Australian Brush-turkey), *Anomalopus mackayi* (Burrowing Skink), *Aphelocephala leucopsis* (Southern Whiteface), *Burhinus grallarius* (Bush Stone-curlew), *Cacatua leadbeateri* (Major Mitchell's Cockatoo), *Calyptorhynchus lathamii* (Glossy Black-Cockatoo), *Cercartetus nanus* (Eastern Pygmy-possum), *Chalinolobus dwyeri* (Large-eared Pied Bat), *Chalinolobus picatus* (Little Pied Bat), *Christinus marmoratus* (Marbled Gecko), *Circus assimilis* (Spotted Harrier), *Climacteris picumnus* (Brown Treecreeper), *Dasyurus maculatus* (Spotted-tailed Quoll), *Denisonia devisi* (De Vis' Banded Snake), *Dicrurus bracteatus* (Spangled Drongo), *Dromaius novaehollandiae* (Emu), *Egernia cunninghami* Population 1 (Cunningham's Skink), *Egernia cunninghami* Population 2 (Cunningham's Skink), *Epthianura albifrons* (White-fronted Chat), *Falco hypoleucos* (Grey Falcon), *Falcunculus frontatus* (Crested Shrike-tit), *Falsistrellus tasmaniensis* (Eastern False Pipistrelle), *Geophaps scripta* (Squatter Pigeon), *Grantiella picta* (Painted Honeyeater), *Grus rubicunda* (Brolga), *Hamirostra melanosternon* (Black-breasted Buzzard), *Hemiaspis damelii* (Grey Snake), *Hoplocephalus bitorquatus* (Pale-headed Snake), *Lampropholis caligula* (A skink), *Lathamus discolor* (Swift Parrot), *Leipoa ocellata* (Malleefowl), *Litoria lesueuri* (Lesueur's Frog), *Litoria verreauxii* (Verreaux's Tree Frog), *Lophoictinia isura* (Square-tailed Kite), *Macropus dorsalis* (Black-striped Wallaby), *Melanodryas cucullata* (Hooded Robin), *Melithreptus gularis gularis* (Black-chinned Honeyeater), *Microeca fascinans* (Jacky Winter), *Miniopterus schreibersii* (Common Bent-wing Bat), *Myiagra inquieta* (Restless Flycatcher), *Ninox connivens* (Barking Owl), *Ninox strenua* (Powerful Owl), *Nyctophilus timoriensis* (Greater Long-eared Bat), *Oedura monilis* (Ocellated Velvet Gecko), *Oreoica gutturalis* (Crested Bellbird), *Pachycephala inornata* (Gilbert's Whistler), *Pardalotus punctatus xanthopygus* (Spotted Pardalote), *Pedionomus torquatus* (Plains-wanderer), *Perameles nasuta* (Long-nosed Bandicoot), *Petauroides volans* (Greater Glider), *Petrogale penicillata* (Brush-tailed Rock-wallaby), *Petroica goodenovii* (Red-capped Robin), *Planigale gilesi* (Paucident Planigale), *Planigale tenuirostris* (Narrow-nosed Planigale), *Polytelis swainsonii* (Superb Parrot), *Pomatostomus temporalis* (Grey-crowned Babbler), *Pseudechis guttatus* (Spotted Black Snake), *Pseudemoia pagenstecheri* (a skink), *Pseudocheirus*

peregrinus (Common Ringtail Possum), *Pseudomys pilligaensis* (Pilliga Mouse), *Pygopus lepidopodus* (Common Scaly-foot), *Rhinolophus megaphyllus* (Eastern Horseshoe-bat), *Scoteanax rueppellii* (Greater Broad-nosed Bat), *Sericornis sagittatus* (Speckled Warbler), *Sminthopsis macroura* (Stripe-faced Dunnart), *Stagonopleura guttata* (Diamond Firetail), *Stictonetta naevosa* (Freckled Duck), *Trichosurus vulpecula* (Common Brushtail Possum), *Turnix varia* (Painted Button-quail), *Tyto capensis* (Grass Owl), *Tyto novaehollandiae* (Masked Owl), *Underwoodisaurus sphyrurus* (a gecko), *Vespadelusroughtoni* (Eastern Cave Bat), *Xanthomyza phrygia* (Regent Honeyeater) and *Zoothera lunulata* (Bassian Thrush).

Plants

Bothriochloa biloba, *Cadellia pentastylis*, *Corymbia* sp. (Gravesend -Matt White), *Desmodium campylocaulon*, *Discaria pubescens*, *Eleocharis blakeana*, *Goodeni macbarronii*, *Goodenia pusilliflora*, *Homopholis belsonii*, *Juncus dolichanthus*, *Polygala linariifolia*, *Sauropus hirtellus* and *Swainsona murrayana*.

Communities

Bluegrass (*Dichanthium* spp.) dominant grasslands of the Brigalow Belt Bioregions (North and South), Brigalow (*Acacia harpophylla* dominant and co-dominant), *Cadellia pentastylis* (Ooline) community in the Nandewar and Brigalow Belt South IBRA regions, Carbeen Open Forest Community in the Darling River Plains and Brigalow Belt South Bioregions, Native Vegetation on Cracking Clay Soils of the Liverpool Plains, Semi-evergreen Vine Thicket in the Brigalow Belt and Nandewar Bioregions and White Box, Yellow Box, Blakely's Red Gum Woodland

4.1.6 Management recommendations

The management recommendations regarding land clearing are aimed at preserving and managing existing patches of vegetation, while at the same time increasing the overall extent of vegetation cover within the Bioregion. Vegetation protection can occur at all spatial scales, from single trees to large patches of native vegetation.

- Restrict land clearing in the bioregion;
- Aim for a net increase in the extent of native vegetation in terms of quantity and quality;
- Identify and protect mature woodlands in the bioregion;
- Retain large patches of native vegetation. The most significant patches of vegetation are already protected as either National Parks or State Forest estates. However, significant patches still remain under private ownership (Figure 14);
- In areas that have suffered severe land clearing in the past, protect intact and where possible enhance all patches of native vegetation that provide good quality habitat;
- Protect intact and where possible enhance areas that provide good connectivity within the bioregion. For example vegetation on the eastern boundary of the bioregion north and south of Yetman provides a corridor network in the north-south direction (Figure 14);
- Provide incentive to private land holders that have large sized or high quality patches of native vegetation in order for these to be retained. This will be particularly important in the north-west of the bioregion where only small patches of vegetation remain;
- Land management should not be restricted to only woody vegetation, but should also include other vegetation types such as native grasslands;

- Land management programs should aim for management at the landscape scale (e.g. Bennett 1993), including both reservation of lands and management of lands in non-reserved systems;
- Rehabilitation of lands should be encouraged, aiming for the primary characteristics of good quality native vegetation. There should be a focus on shrub regeneration.

4.2 INNAPROPRIATE GRAZING

4.2.1 Definition

For the purposes of this report, grazing is defined as the feeding of domestic livestock on native vegetation and modified pasture. It does not include the clearing of land for grazing. Inappropriate grazing includes grazing on lands that cannot support this activity and stocking lands at rates that are unsustainable.

Total grazing pressure includes the grazing pressure due to livestock as well as the grazing pressure of other animal such as kangaroos and feral animals (e.g. rabbits and goats). Although in some cases total grazing pressure can far exceed the grazing pressure of livestock, this section is concerned primarily with the grazing of livestock.

4.2.2 Status and legislation

Grazing is not listed as a key threatening process on either the *EPBC Act* or the *TSC Act*. However, for a number of threatened species and communities, grazing is listed as a threatening process in the final determination of the Scientific Committees. It is likely that other non-key species will be impacted by this disturbance.

4.2.3 Nature of impacts

Impacts as a result of inappropriate grazing can be both direct and indirect. They include:

- Destruction of native vegetation through direct grazing and browsing;
- Loss of ground and shrub layers and hence the structural integrity and ecological functioning of native vegetation;
- Degradation of riparian and wetland vegetation and the resulting reduction in water quality;
- Trampling of nests of ground dwelling species;
- Changes in soil moisture content (Graetz & Tongway 1986, Greenwood et al. 1996).
- Reduction in soil organic carbon levels (Greeves et al. 1995).

Although grazing is such a widespread land use throughout Australia, there are relatively few studies looking at impacts of grazing on biodiversity (Doherty et al. 2000) and most information comes from anecdotal evidence and pattern analyses rather than experimental manipulation. Long term studies of grazing in Australia have been located in subalpine vegetation (Wimbush & Costin 1979, Williams & Ashton 1987) but have demonstrated impacts such as pronounced negative effects on seed production and a reduction in biodiversity. A fence-line comparison of the influence of grazing in a semi-arid chenopod shrubland indicated a significant impact of grazing on soil structure, nutrient distribution and water infiltration (Graetz & Tongway 1986).

Artificial watering points have now extended the area of rangelands that may be exposed to sustained grazing pressure (Williams et al. 2001). Additionally, the presence of watering points also serve as a focus for grazing pressure because most grazing animals require regular access to drinking water. This has resulted in vegetation surrounding watering points being browsed and in some cases killed, soils compacted and habitat for flora and fauna modified and destroyed (Landsberg et al. 1999). The impacts of grazing are thought to be minimal beyond 9 km away from a watering point for cattle and 6 km for sheep. However, for the arid and semi-arid regions of NSW, greater than 80% of lands are less than 9 km away from a watering point. In the more coastal regions watering points were too numerous to map (Williams et al. 2001). Although not mapped specifically for the BBSB, it is likely that a similar pattern exists as in the semi-arid regions.

4.2.4 Grazing in the bioregion

Little information is available on grazing and stocking rates in the bioregion. Livestock production in the bioregion includes both cattle and sheep. The pastoral production has an average of 1.01 head of cattle per hectare (NSW National Parks and Wildlife Service 2000). Land use capability shows that land suitable for 'grazing' and 'grazing with occasional cultivation' is largely restricted to areas in the south, south-west and north-east of the bioregion (Figure 13). However, grazing will occur in other areas such as land suitable for cultivation, travelling stock routes and State Forests.

It is important to make the distinction between grazing on private lands and that which occurs on public lands such as in State Forests or Travelling Stock Routes. Often grazing on public lands occurs in areas that have a significant cover of native vegetation. These areas are likely to be sites that can more easily be rehabilitated and protected, both because of the nature of the vegetation and their public status.

4.2.5 Species and communities impacted

The lists below are not exhaustive, including only those species or communities considered to be of major conservation concern in the bioregion (Category 1 for animals and National or State for plants). It is likely that other non-key species and communities will be impacted by this disturbance.

Animals

Acanthophis antarcticus (Common Death Adder), *Acrobates pygmaeus* (Feathertail Glider), *Aepyrymnus rufescens* (Rufous Bettong), *Anomalopus mackayi* (Burrowing Skink), *Cacatua leadbeateri* (Major Mitchell's Cockatoo), *Denisonia devisi* (De Vis' Banded Snake), *Egernia cunninghami* Population 1 (Cunningham's Skink), *Egernia cunninghami* Population 2 (Cunningham's Skink), *Epthianura albifrons* (White-fronted Chat), *Geophaps scripta* (Squatter Pigeon), *Hemiaspis damelii* (Grey Snake), *Lampropholis caligula* (a skink), *Melanodryas cucullata* (Hooded Robin), *Microeca fascinans* (Jacky Winter), *Myiagra inquieta* (Restless Flycatcher), *Oreoica gutturalis* (Crested Bellbird), *Pedionomus torquatus* (Plains-wanderer), *Perameles nasuta* (Long-nosed Bandicoot), *Petroica goodenovii* (Red-capped Robin), *Planigale gilesi* (Paucident Planigale), *Planigale tenuirostris* (Narrow-nosed Planigale), *Pseudemoia pagenstecheri* (A skink), *Pygopus lepidopodus* (Common Scaly-foot), *Sericornis sagittatus* (Speckled Warbler), *Sminthopsis macroura* (Stripe-faced Dunnart), *Stagonopleura guttata* (Diamond Firetail), *Tyto capensis* (Grass Owl), *Botaurus poiciloptilus* (Australasian Bittern), *Ixobrychus minutus* (Little Bittern), *Porzana fluminea* (Australian Spotted Crake), *Porzana tabuensis* (Spotless Crake), *Pseudophryne bibronii* (Brown Toadlet), *Rallus pectoralis* (Lewin's Rail) and *Rostratula benghalensis* (Painted Snipe).

Plants

Corymbia sp. (Gravesend -Matt White), *Desmodium campylocaulon*, *Homopholis belsonii*, *Juncus dolichanthus*, *Phyllanthus maderaspatensis* and *Zieria ingramii* Armstrong and J. Briggs.

Communities

Bluegrass (*Dichanthium* spp.) dominant grasslands of the Brigalow Belt Bioregions (North and South), *Cadellia pentastylis* (Ooline) community in the Nandewar and Brigalow Belt South IBRA regions, Carbeen Open Forest Community in the Darling River Plains and Brigalow Belt South Bioregions, Native Vegetation on Cracking Clay Soils of the Liverpool Plains, Semi-evergreen Vine Thicket in the Brigalow Belt and Nandewar Bioregions and White Box, Yellow Box, Blakely's Red Gum Woodland.

4.2.6 Management recommendations

Management recommendations regarding inappropriate grazing are aimed largely at determining exactly what stocking rates are appropriate for land within the bioregion. While stocking rates may need to be reduced or varied in some areas, this should be determined through appropriate research activities.

- The distinction must be made between grazing on public lands and private lands;
- Stocking rates should be set for the land's capability at times of low productivity rather than being set to match the times of maximum productivity;
- Identify areas of importance to ground nesting species, or other species greatly impacted by grazing, and exclude grazing from these sites;
- Implement a research program, designed in conjunction with land holders, to determine the maximum sustainable stocking rates in the bioregion in order maintain biodiversity;
- The government should continue to provide incentives to land holders to destock areas where native pasture regeneration is taking place;
- Alternatives to common practices of farming should be investigated and encouraged, such as the farming of native animals for meat production.

4.3 INAPPROPRIATE FIRE REGIMES

4.3.1 Definition

Inappropriate fire regimes are defined as single or successive fire events that are of such a size (usually too large) or too close in time together so as to disrupt or limit the ability of plants and animals to recruit new individuals into a population, or for plants to build up a seedbank of sufficient size to maintain a population through to the next fire. Prolonged inappropriate fire regimes will lead to loss of plant species, a change in vegetation structure and ultimately loss of animal species.

4.3.2 Status and legislation

'High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition' is listed as a Key Threatening Process on Schedule 3 of the *Threatened Species Conservation Act* 1995. It is also listed as a threatening

process for a number of Threatened species listed on both the *EPBC* and *TSC Acts*. The management of fire operates under the *Rural Fires Act 1997*.

4.3.3 Nature of the impacts

Fire is a natural part of the Australian landscape and has played an important role in the evolution of the Australian biota (Gill et al. 1981) and thus it should be seen as a necessary part of biodiversity management. However, it is changes in the fire regime that have had the greatest impacts on biodiversity.

Impacts of fire on flora and fauna can be direct. For example high intensity fires are often observed to cause the deaths of vertebrate fauna that are unable to escape the flames (e.g. Whelan 1995). However, in most cases impacts are indirect, changing the structure and nature of vegetation and hence the ecology of the area. Catling (1991) indicated that in general terms there are three components of fire that effect vegetation; season, intensity and frequency (Table 11). Although these findings were determined in south-eastern Australia, they are likely to apply in general terms to the BBSB.

A number of studies have suggested that a mosaic of habitat types created by suitable intensity and frequency of fires is vital for the maintenance of biodiversity. For example, a study of small mammal succession post fire in southern eucalypt forests, indicated that different species reached their peak abundance at different times following fire, ranging from one year for *Pseudomys novaehollandiae* to eight years for *Rattus fuscipes* (Fox & McKay 1981, Fox 1982). Similarly, a study of the short term effects of prescribed burning, indicated that a mosaic of habitat was necessary in order to maximise biodiversity of plants and animals and reduce the risk of local extinction (Christensen & Kimber 1975, cited in Doherty et al. 2000). It further suggested that large and very frequent fires did not encourage such a habitat pattern.

TABLE 11: THE EFFECTS OF THREE COMPONENTS OF A FIRE REGIME ON VEGETATION

Fire regime	Treatment	Effect on the vegetation	References
Season	Autumn	Herbs and grasses encouraged, reduced gully vegetation and forest structure	(Baird 1977, Christensen et al. 1981)
	Spring	Shrubs encouraged, more complex forest structure	
Intensity	Low (<500 kw m ⁻¹)	Resprouters and grasses encouraged with loss of shrubs; reduced forest structure	(Fox 1978, Cheney 1981, Christensen et al. 1981)
	High (>3500 kw m ⁻¹)	Seed germinators (especially nitrogen fixers) and resprouters encouraged, increased forest structure	(Christensen & Kimber 1975, Shea & Kitt 1976, Purdie 1977)
Frequency	Low (> 20 years)	Shrubs encourages, increased forest structure and litter.	(Gilbert 1959, Baird 1977, Bradfield 1981, Bradstock 1981, Christensen et al. 1981)
	High (< 8 years)	Herbs and grasses encouraged, reduced litter and forest structure.	(Jarrett & Petrie 1929, Pidgeon 1938, Coaldrake 1961, Willis 1962b, Willis 1962a, Bradfield 1981, Christensen et al. 1981)

Table reproduced from Catling (1991).

A number of studies have looked at more species specific impacts of fire regimes. For example, a study of the impacts of wildfire on the nesting behaviour of birds in heathlands indicated that

the number of birds breeding was greatly reduced in the season directly following fire and this was attributed to a lack of nesting material and adequate food for egg production. At least two species did not nest for two years following fire and one species did not nest for up to five years (Brooker & Rowley 1991). A study of bird numbers and diversity following fire in White Cypress Pine habitat indicated that eight months after fire, burnt areas had lower species diversity and lower numbers than the unburnt area (Turner 1992). However, eight years after the fire, diversity and numbers were higher in the burnt area due to an increase in ground, shrub and foliage feeders. (Turner 1992). A study of the mammals in forested areas of south-eastern Australia has suggested these species are largely associated with forests with a dense understorey and that frequent low-intensity burns in autumn, which are often used in forest management, will reduce the dense understorey (Catling 1991).

4.3.4 Fire in the bioregion

During 1998/1999 a total of 335 km² (0.1%) was burnt within the entire Brigalow Belt South Bioregion (Queensland and NSW), while 3320 km² (1.2%) was burnt in 1999/2000 (Williams et al. 2001). More specific records have been kept of fires in specific regions. For example, records have been kept of fires in the Pilliga scrub for the last 50 years, with about 400 fires in total recorded (NSW National Parks and Wildlife Service 2001). Major fires appear to occur in the Pilliga scrub every ten years (Table 12) and appear to be associated with drought periods, when the Southern Oscillation index is either low or declining after a good period (NSW National Parks and Wildlife Service 2001).

TABLE 12: MAJOR FIRES IN THE EASTERN PILLIGA SCRUB

Fire season	Area (ha)	Location
1951/52	+350,000	The entire eastern half of the Pilliga, extending to the Oxley Highway
1957/58	65,000	East of the Newell highway, affecting the south-eastern Pilliga East State Forest and the current Pilliga Nature Reserve
1966/67	+100,000	The current Pilliga Nature Reserve and private property to the Oxley Highway
1974/75	43,000	South-eastern Pilliga East State Forest and part of the Pilliga Nature Reserve
1977/78	25,000	South-western part of the Pilliga Nature Reserve
1982/83	120,000	Pilliga East State Forest
1997/98	+140,000	Pilliga East State Forest and the western Pilliga Nature Reserve

Data from NSW National Parks and Wildlife Service (2001).

4.3.5 Species and communities impacted

The lists below are not exhaustive, including only those species or communities considered to be of major conservation concern in the bioregion (Category 1 for animals and National or State for plants). It is likely that other non-key species will be impacted by this disturbance.

Animals

Acanthiza uropygialis (Chestnut-rumped Thornbill), *Alectura lathamii* (Australian Brush-turkey), *Botaurus poiciloptilus* (Australasian Bittern), *Calyptorhynchus lathamii* (Glossy Black-Cockatoo), *Cercartetus nanus* (Eastern Pygmy-possum), *Christinus marmoratus* (Marbled Gecko), *Egernia saxatilis saxatilis* (Warrumbungle's Black Rock Skink), *Ixobrychus minutus* (Little Bittern), *Lampropholis caligula* (a skink), *Leipoa ocellata* (Malleefowl), *Litoria booroolongensis* (Booroolong Frog), *Litoria verreauxii* (Verreaux's Tree Frog), *Macropus dorsalis* (Black-striped Wallaby), *Ninox strenua* (Powerful Owl), *Oedura monilis* (Ocellated Velvet Gecko), *Oreoica gutturalis* (Crested Bellbird), *Pachycephala inornata* (Gilbert's Whistler), *Petroica goodenovii* (Red-capped Robin), *Pseudophryne bibronii* (Brown Toadlet),

Sericornis sagittatus (Speckled Warbler), *Stagonopleura guttata* (Diamond Firetail), *Turnix varia* (Painted Button-quail), *Underwoodisaurus sphyrurus* (a gecko) and *Zoothera lunulata* (Bassian Thrush).

Plants

Zieria ingramii Armstrong and J. Briggs, *Acacia jucunda*, *Bertya* sp Cobar-Coolabah (Cunningham & Milthorpe, sn 2 Aug 1973), *Cynanchum elegans*, *Grevillea molyneuxii*, *Homoranthus cernuus*, *Monotaxis macrophylla*, *Persoonia terminalis* subsp *recurva*, *Phebalium obcordatum*, *Philotheca ericifolia* and *Pomaderris queenslandica*.

Communities

Carbeen Open Forest Community in the Darling River Plains and Brigalow Belt South Bioregions, Semi-evergreen Vine Thicket in the Brigalow Belt and Nandewar Bioregions and White Box, Yellow Box, Blakely's Red Gum Woodland.

4.3.6 Management recommendations

Management recommendations regarding fire regimes are aimed largely at determining exactly which regimes are appropriate for land within the bioregion. This should be determined through appropriate research activities.

- Implement a research program to determine the correct regimes for the maintenance of biodiversity and habitat structure. This should be carried out focussing on grasslands and shrub layers;
- Any fire management program should be tied in with stocking rates since removal of stock is likely to increase the fuel load.

In the interim period while research is undertaken, thought should be given to the suitability of the Pilliga Nature Reserve Fire Management Plan (2001-2006) to other areas within the bioregion. This plan (NSW National Parks and Wildlife Service 2001) outlines guidelines for vegetation types in the Pilliga Nature Reserve:

- Ridgetop Eucalypt forests, woodlands and shrublands;
 - An interval between fire events of less than 15 years should be avoided
 - A high intensity may be permitted after a fire-free time interval greater than 30 years
 - Two consecutive low intensity fires should be avoided
 - Avoid two large area high intensity wildfires in a period less than 30 years
- Valley and Creek-side Woodlands
 - An interval between fire events less than 10 years should be avoided
 - A high intensity fire may be permitted after a fire-free interval greater than 30 years
 - Avoid two large and high intensity wildfires in a period less than 30 years, through the use of control burns and fuel management (NSW National Parks and Wildlife Service 2001).

The plan also outlines fire management guidelines for threatened species in the Pilliga and these should be followed where possible.

4.4 WETLAND MODIFICATION

4.4.1 Definition

The NSW Wetlands Management Policy defines wetlands as "areas that are wet for long enough periods such that the plants and animals living in them are adapted to, and often dependent on, living in wet conditions for at least part of their life cycle. Wetlands are defined as land that is:

- Inundated with water on a temporary or permanent basis.
- Inundated with water that is usually slow moving or stationary.
- Inundated with water that is shallow.
- Inundated with water that may be fresh, brackish or saline.

The inundation determines the type and productivity of the soils and the plant and animal communities" (DLWC 1996).

Modification of wetlands can occur through changes in flow regimes in the supplying waters, changing the frequency and amount of inundation, or through direct modification of habitat within the wetlands. Modification of wetlands can occur through a number of different processes including mining, forestry, grazing, recreation and alteration of water flows (DLWC 1996).

4.4.2 Status and legislation

The conservation of significant wetlands throughout the world are covered under The Convention on Wetlands (RAMSAR), which is administered under the *EPBC Act* within Australia. No Ramsar wetlands occur within the Brigalow Belt South Bioregion.

Environment Australia maintains a Directory of Important Wetlands in Australia (Environment Australia 2001) and within the Brigalow Belt South Lake Goran is listed as such a wetland.

The NSW Government has implemented the NSW Wetlands Management Policy (DLWC 1996) that provides overriding principles for the management of wetlands.

"Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands" is listed as a Key Threatening Process on Schedule 3 of the Threatened Species Conservation Act.

4.4.3 Nature of the impacts

- Direct loss of habitat for both plant and animal species, this includes feeding and nesting habitat;
- Loss of buffers between catchments and rivers, hence reducing overall water quality, particularly with regard to sediments;
- Loss of biological productivity and nutrient recycling;
- Changes in flood protection potentially resulting in increased flood peak and subsequent erosion and flood damage;
- Loss of groundwater recharge.

For further information on the nature of impacts and the functioning of wetlands see the NSW Wetlands Management Policy (DLWC 1996).

4.4.4 Wetlands in the bioregion

Five major rivers flow through the Brigalow Belt South Bioregion (Macquarie, Castlereagh, Namoi, Gwydir, and Macintyre) all of which have wetlands associated with them. However only one significant wetland is listed in the Directory of Important Wetlands in Australia as occurring in the Brigalow Belt South. Lake Goran is located on the floodplain of the Namoi River, approximately 30 km south of Gunnedah. It covers an area of 6385 ha and is located 300 m above sea level. Covering more than 6000 ha when full, it is the largest natural waterbody in the Namoi Valley. The lake is largely freehold land and is surrounded by both freehold land and State Forest. When dry, the lake is largely used for cultivation and less than 10% of the total area is regularly water logged (Environment Australia 2001). Historically the lake was full for only short periods about once every 20 years. However, since the 1970s the lake has been full for longer periods of time due to the diversion of Yarraman and Coomoo Coomoo Creeks to the lake by agricultural activities and structural works.

The lake bed was originally a closed grassland system dominated by Plains Grass (*Stipa aristiglumis*), although now much of the land is cultivated. When the lake is full it is dominated by Cumbungi (*Typha domingensis*) and Lignum (*Muehlenbeckia florulenta*) (Environment Australia 2001). The lake contains important habitat for waterbirds and due to its size may act as an important refuge for these birds when conditions are drier further west. Migratory waders also use the lake.

The small open wetlands and marshes in the Western Plains Zoo were singled out as outstanding wetlands in a review of wetlands of the Murray-Darling System, because of their role as a refuge for waterbirds, particularly during drought (Hutchinson 1996).

4.4.5 Species and communities impacted

The lists below are not exhaustive, including only those species or communities considered to be of major conservation concern in the bioregion (Category 1 for animals and National or State for plants). It is likely that other non-key species and communities will be impacted by this disturbance.

Animals

Alcedo azurea (Azure Kingfisher), *Anas rhynchotis* (Australasian Shoveler), *Aphelocephala leucopsis* (Southern Whiteface), *Botaurus poiciloptilus* (Australasian Bittern), *Ephippiorhynchus asiaticus* (Black-necked Stork), *Epthianura albifrons* (White-fronted Chat), *Grus rubicunda* (Brolga), *Haliaeetus leucogaster* (White-bellied Sea-Eagle), *Hemiaspis damelii* (Grey Snake), *Ixobrychus minutus* (Little Bittern), *Porzana fluminea* (Australian Spotted Crake), *Porzana tabuensis* (Spotless Crake), *Rallus pectoralis* (Lewin's Rail), *Rostratula benghalensis* (Painted Snipe) and *Stictonetta naevosa* (Freckled Duck).

Plants

Eleocharis blakeana and *Goodenia pusilliflora*.

4.4.6 Management recommendations

Management recommendations regarding wetlands are aimed largely at reducing current disturbances within existing wetlands and improving habitat quality.

- Monitor and manage salinity in wetlands. This should be linked to land clearing and revegetation works and also the general Salinity Strategy;
- Manage stocking rates and the timing and duration in and surrounding wetlands. This should be linked to a research program to determine sustainable stocking rates for wetlands;
- Enhance artificial wetlands for fauna through appropriate management;
- The principles of the NSW Wetland Management Policy (DLWC 1996) should be followed.

4.5 FORESTRY OPERATIONS

4.5.1 Definition

Forestry operations include the process of planting, growing and harvesting trees. Logging is a form of land clearing, that is defined as the “the harvesting of vegetation for timber production purposes” (DLWC 2002). In addition to logging, management practices associated with timber harvesting can have an impact on flora and fauna.

4.5.2 Status and legislation

Management of forests are under the control of the *Forestry Regulation* 1999, which is in force under the *Forestry Act* 1916.

4.5.3 Nature of impacts

The impacts of logging on plants and animals is not clear cut, with many species showing tolerance to current logging regimes, while others are impacted by different elements of forestry operations. In a series of wide-scale analyses of logged and unlogged sites across New South Wales, it was demonstrated that logging intensity was not a major determinant of species diversity and that factors such as elevation and geology played a more significant role (Kavanagh & Bamkin 1995, Kavanagh et al. 1995). In a similar study, Lemckert (1999) found that selective logging has little impact on many frog species, but that large forest-dependent species and territorial breeders are more likely to be negatively affected.

One of the most comprehensive studies of the impacts of logging has taken place at Kingston, Western Australia, in which plants and animals were investigated 4-5 years following logging of jarrah forests. In a comparison of two logging treatments (gap cutting and shelterwood cutting) with controls, it was found that at the coupe scale native plant species richness in unlogged buffers was similar to that of the logged patches (Burrows et al. 2001). However, at a 1m² scale, species richness in the buffers was 20-30% higher than in the logged areas. In a related study it was found that following logging there was a significant decrease in bird density and a non-significant decrease in bird species numbers (Liddlelow 2001). Mammals were also found to be impacted, with only 31% of Western Ringtail Possums remaining alive in logged areas two weeks after logging compared to 80% in control areas (Wayne et al. 2001). However, some species showed little or no impacts as a result of logging. For example, the Chuditch (*Dasyurus*

geoffroii) did not appear to be negatively impacted by logging, possibly due to its large home range relative to the scale of the logging treatments (Anon 2001).

Two of the major impacts of forestry operations in south-eastern forests relate to the reduction in numbers of tree hollows and nectar producing trees. Within the box-ironbark forests about 30% of all resident bird and mammals require tree hollows for nesting or roosting (Traill 1993, Gibbons & Lindenmayer 2002). At a landscape scale a number of factors can influence hollow formation, including climatic factors, soil type, slope, exposure and tree species (Gibbons & Lindenmayer 1997). However, within a site it is usually within mature trees that hollows form when the branches begin to die-back or termites enter the tree (Mackowski 1984).

A number of species use nectar as a food resource, with over 20% of all bird and mammals species resident in box-ironbark forests using this resource (Traill 1993). Generally large, old trees have the heaviest flowering and nectar flows (Bennett 1993).

Throughout the landscape there is generally a mosaic of different aged trees, but in forestry lands there is usually a bias towards younger aged stands, with the older trees historically removed for forest products. Within Victorian forests there are significant relationships between densities of arboreal mammals and birds and numbers of mature trees (Meredith 1984, Traill 1991). Although there is a policy of habitat tree retention with forest areas of NSW, there is little evidence that the number of trees is sufficient to maintain species diversity in logged areas within the bioregion.

4.5.4 Forestry in the Bioregion

Lands under the control of State Forests within the bioregion comprise 5772 km², or 11% of the bioregion (Figure 15). There are currently over 100 forests within the bioregion, the majority being small. Two large areas of forests dominate the forestry industry in the bioregion: Goonoo Forest and State Forests of the Pilliga.

Goonoo Forest (Figure 15) is located in the south west of the bioregion, covering an area of 62 836 ha it was dedicated in 1917. Broad and Narrow Leaf Ironbark, Black Cypress Pine, Western grey Box, Red Gum and White Cypress Pine dominate the vegetation, although there is considerable variation across the forest. The forest has a long history of ironbark harvesting, which has been used for sleepers, fencing, sawn timber and firewood. The mean hardwood yield since 1918 has been 6 231 m³ per annum. There is however no indication of the size of trees removed, rotations within the forest or the regeneration potential post harvesting (NSW National Parks and Wildlife Service 2000).

State Forests of the Pilliga cover an area of 389 589 ha and comprise 26 forests (Figure 15), most of which were dedicated in 1917. The dominant tree species are White Cypress Pine, Narrow and Broad Leaf Ironbark, Pilliga Box, Black Cypress Pine, Red Gum and Bull Oak. Currently six sawmills operate the forests producing 52 000 m³ per annum of cypress sawlogs and 6 000 – 7 000 m³ per annum of ironbark (NSW National Parks and Wildlife Service 2000).

Forests in the bioregion are important and unusual in that they include a large number of animal species requiring mature trees, yet there is relatively little information on the specific tree characteristics required.

Further information on Forestry in the Bioregion will be available from the Timber Resources project (WRA 26) and Assessment of Conservation and Forest Development Opportunities project (WRA 30).

4.5.5 Species and communities impacted

The lists below are not exhaustive, including only those species or communities considered to be of major conservation concern in the bioregion (Category 1 for animals and National or State for plants). It is likely that other non-key species and communities will be impacted by this disturbance.

Animals

Calyptorhynchus lathami (Glossy Black-Cockatoo), *Chalinolobus picatus* (Little Pied Bat), *Climacteris picumnus* (Brown Treecreeper), *Falcunculus frontatus* (Crested Shrike-tit), *Falsistrellus tasmaniensis* (Eastern False Pipistrelle), *Hoplocephalus bitorquatus* (Pale-headed Snake), *Lathamus discolor* (Swift Parrot), *Melithreptus gularis gularis* (Black-chinned Honeyeater), *Miniopterus schreibersii* (Common Bent-wing Bat), *Ninox connivens* (Barking Owl), *Ninox strenua* (Powerful Owl), *Nyctophilus timoriensis* (Greater Long-eared Bat), *Oedura monilis* (Ocellated Velvet Gecko), *Petauroides volans* (Greater Glider), *Pseudocheirus peregrinus* (Common Ringtail Possum), *Pseudomys pilligaensis* (Pilliga Mouse), *Scoteanax rueppellii* (Greater Broad-nosed Bat), *Trichosurus vulpecula* (Common Brushtail Possum), *Tyto novaehollandiae* (Masked Owl) and *Xanthomyza phrygia* (Regent Honeyeater).

Plants

Zieria ingramii Armstrong and J. Briggs.

4.5.6 Management recommendations

Management recommendations regarding forestry practices are aimed largely at determining exactly what forestry practices and logging regimes are appropriate for land within the bioregion. This should be determined through appropriate research activities.

- Retain an appropriate number of habitat trees, including those containing tree hollows, shedding bark, and significant nectar flow, which generally relates to older trees. Until further research, this number could be based on standards developed in the eastern forests;
- Implement a program of research into the number and quality of trees that should be retained during logging. This should be carried out in the BBSB, as there is likely to be variation compared with coastal forests. It should also be related to the species of most concern in the bioregion.

4.6 RIVER/STREAM MODIFICATION

4.6.1 Definition

The river/stream environment includes both the instream channel and the associated riparian vegetation. Modification of this environment can arise from a number of sources including changes in flow regimes due to damming or water diversion and direct loss of riparian habitat through clearing or degradation.

4.6.2 Status and legislation

Management and protection of NSW rivers is determined under the *Water Management Act 2000*, which replaces the *Rivers and Foreshores Improvement Act 1948*.

“Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands” is listed as a Key Threatening Process on Schedule 3 of the *Threatened Species Conservation Act 1995*.

“Installation and operation of instream structures and other mechanisms that alter natural flow regimes of rivers and streams” is listed as a Key Threatening Process in Schedule 6 of the *Fisheries Management Act 1994*.

“Degradation of native riparian vegetation along New South Wales water courses ” is listed as a Key Threatening Process in Schedule 6 of the *Fisheries Management Act 1994*.

4.6.3 Nature of impacts

- Changes in water quality due to increased amounts of sediment and nutrients reaching rivers;
- Changes in riparian vegetation, both directly through land clearing and indirectly through factors such as changes in flow regimes;
- Rising salinity levels;
- Reduction in habitat through changes in size and frequency of flooding in wetlands;
- Reduction in the input of organic carbon into the river system through the clearing of riparian vegetation.

4.6.4 Rivers in the bioregion

There are five major rivers crossing the Brigalow Belt South Bioregion (Macquarie, Castlereagh, Namoi, Gwydir and MacIntyre) all of which form part of the larger Murray-Darling River System. As with all rivers within New South Wales, the rivers of the bioregion have had major modification to their flow regime through river regulation by damming, or altered flows on flood plains through draining (NSW Scientific Committee 2002).

4.6.5 Species and communities impacted

The lists below are not exhaustive, including only those species or communities considered to be of major conservation concern in the bioregion (Category 1 for animals and National or State for plants). It is likely that other non-key species will be impacted by this disturbance.

Animals

Alcedo azurea (Azure Kingfisher), *Chelodina expansa* (Broad-shelled River Turtle), *Falco hypoleucos* (Grey Falcon), *Haliaeetus leucogaster* (White-bellied Sea-Eagle), *Hamirostra melanosternon* (Black-breasted Buzzard), *Hoplocephalus bitorquatus* (Pale-headed Snake), *Litoria booroolongensis* (Booroolong Frog), *Litoria lesueuri* (Lesueur's Frog), *Lophoictinia isura* (Square-tailed Kite), *Ninox connivens* (Barking Owl), *Ornithorhynchus anatinus* (Platypus), *Polytelis swainsonii* (Superb Parrot), *Pseudechis guttatus* (Spotted Black Snake) and *Xanthomyza phrygia* (Regent Honeyeater).

Plants

Eleocharis blakeana and *Goodenia pusilliflora*.

4.6.6 Management recommendations

Management recommendations regarding rivers and streams are aimed largely at determining exactly which flow regimes are appropriate for land within the Bioregion. This should be determined through appropriate research activities.

- Follow the “catchment blueprints” produced by the Catchment Management Committees for the Gywdir and Namoi Rivers;
- Continue research into impacts of environmental flows on river dependent organisms;
- Provide appropriate buffer zones surrounding intact riparian vegetation; and
- Implement a revegetation program in areas with degraded riparian vegetation.

5. DISCUSSION

5.1 SPECIES LISTS AND CONSERVATION CATEGORIES

The species lists for plants and animals clearly demonstrate the diversity found within the bioregion. Although it is felt that the fauna lists is a good representation of the diversity of terrestrial vertebrates, the plant species list is likely to be incomplete with some of the rarer and ephemeral species such as orchids being unrepresented. For completeness future lists should aim to include aquatic organisms and invertebrates, although further research and surveys for these groups will be necessary.

For all groups, including plants and animals, the percentage of species assigned to an “at risk” conservation category in the current study was considerably higher than the percentage of threatened species as listed under the State legislation (*TSC Act*). This may in part reflect the low number of species in general that are listed under the Act, but may also be due in part to the high level of disturbance that is both historically and currently at play in the bioregion. Comparing the current study with previous Response to Disturbance projects indicates that the 94 terrestrial vertebrate species considered at risk in the BBSB is considerably higher than the 27 fauna species considered in the Eden CRA (Environment Australia 1998) and the 69 species considered in the Southern Region CRA (Environment Australia 1999). Similarly, the 1007 (55%) plant species considered to be significant at the regional level or higher, is greater than the 189 species considered in the Eden CRA and the 135 species considered in the Southern Region CRA.

The previous Response to Disturbance projects have started with those species formally listed in the legislation as endangered or vulnerable, or those species considered to be at risk. In the case of the fauna in the current study however, during the initial ranking procedure all vertebrate species were considered and were given the same consideration. This resulted in the inclusion of some unlikely species and the exclusion of other species in the highest conservation category. For example, the Koala is listed as vulnerable on the *TSC Act*. However within the bioregion it has a large population and a wide distribution. Consultation with the experts suggested that there is no evidence that the species is declining in the bioregion. As such, it ends up in Conservation Category 3 and is considered secure and stable in the bioregion⁴. At the other extreme, Common Ringtail Possums, which are generally considered by the public to be common, were found to have a limited distribution and population and are suspected of declining in the bioregion. As a result this species was elevated to Conservation Category 1 and is considered at risk in the bioregion.

⁴ It must be remembered that this study is a comparative ranking of species within a limited geographic area. Species such as the Koala must still be considered under the Threatened Species Conservation Act 1995 and also under State Environmental Planning Policies (SEPP 44 – Koala Habitat Protection).

5.2 EDGE OF RANGE SPECIES

Two hundred animal species are considered to be at the edge of their range within the bioregion. Species at the edge of their range are considered important for a number of reasons including:

- That they may be more sensitive to disturbances;
- Their loss could result in regional extinction;
- Their loss could result in range contraction;
- Species at the edges of their environmental tolerance may in the future reveal important information about habitat requirements; and
- Their loss could result in loss of genetic diversity (NPWS 1996).

As such caution should be applied to the management of habitat of species at the edge of their range.

5.3 SPECIES WITH INSUFFICIENT INFORMATION

During the ranking procedure it became clear that there was insufficient information for some species to allow them to be placed in a conservation category. There were 28 species of animal that could not be assigned to a conservation category and this was particularly the case for frogs, where 40% of the species were assigned to Category 9 (Insufficient Information). There is a concern that these species will be forgotten in future management initiatives. However, the lack of information for these species should make them a priority within the bioregion. It is only by determining their basic ecological characteristics and distribution within the bioregion that their true status can be determined and they can appropriately be protected. It is recommended that targeted surveys for species with insufficient information be implemented as a priority within the bioregion. These surveys should be tailored for each species in terms of methodology and timing, but it is likely that a number of species can be surveyed using the same sampling methods. For example, it was felt that burrowing species of animals were undersampled in the current data and that targeted pitfall trapping surveys should be undertaken in wooded areas in order to determine the abundance and distribution of these cryptic species.

5.4 DISTURBANCES

Land Clearing is by far the greatest disturbance occurring in the bioregion. Of the species of highest conservation concern it is thought to impact 80 species of animal and 13 species of plant. However, many more species not of conservation concern are also likely to have been impacted by land clearing and the resulting modification of habitat over the years. Over 76% of the bioregion has been cleared of native vegetation or significantly modified and this will have reduced the area of available habitat and the area of occupancy for almost all species that utilise native vegetation. It is only those generalist species that are able to use modified habitats that will have increased or remained stable in the bioregion.

Despite the different methodologies used to assign disturbances to plants and animals there was remarkable similarity between the two lists, with land clearing, inappropriate fire regimes, grazing and forestry practices prominent in both. There were a number of lower ranked disturbances that appear to be impacting only one or two species, for example the removal of Mistletoe as a farming practice may have impacts on the Painted Honeyeater. While management efforts should primarily be aimed at addressing those disturbances that are having major impacts on a large number of species, attention should also be paid to the apparently minor disturbances. Often through simple education programs or minor changes in land use practices, there can be significant positive impacts on single species.

Although this project classified disturbances into fairly broad categories it should not be forgotten that a lot of the disturbances will be related. For example Land Clearing can lead to increased edge effects which will make species remaining in small fragments more vulnerable to predation and increased weed invasion and more susceptible to fires. Land clearing can also lead to changes in water flow and erosion patterns hence changing the quality of wetlands and riparian systems. In a similar manner, management actions should not be implemented until the consequences of the actions have been considered. For example, if stocking rates are reduced in an area then there is likely to be a short-term increase in the standing fuel load and hence the risk from wildfires will increase. Any changes in stocking rates should be complemented with a fire management program.

From current data it is possible to say where past disturbances have had the greatest impacts (e.g. Figure 11). However, based on current information it is not possible to say where future impacts will be greatest, since each case will need to be looked at individually in terms of the species currently present, the nature of the impacts and the temporal and spatial extent of the disturbance. Each case will have a different set of variables that must be considered (Figure 14) on its individual merits. It is important though that future decisions are based on sound biological and ecological information, which at present is largely lacking in the bioregion. Sound ecological research gaining this information should be a priority within the bioregion.

It is clear from the extent of disturbances in the bioregion, and the very small percentage of land currently formally reserved, that management actions to ameliorate the impacts can not rely solely on reserved lands and that off-reserve conservation must be included in management plans. This will include not only identifying habitat of conservation value on private lands, but also providing incentives to land holders to maintain and protect these areas. While the CAR reserve system (JANIS 1997) aims for at least 15% of the pre-European distribution of ecological communities to be reserved, this may not be possible in the bioregion. An alternative may be to look at a total land management system that aims towards a target for management and conservation, whether it be in reserves or off-reserves, rather than aiming for a reservation target. Such a system would acknowledge the importance of off-reserve conservation.

5.5 AREAS OF PARTICULAR CONSERVATION CONCERN

During the preparation of species profiles it became clear that a number of areas within the bioregion could be considered key for biodiversity conservation, including Coolah Tops, Warrumbungles and Pilliga. These areas contain a high species diversity compared to the surrounding areas and many species are restricted within the bioregion to one or more of these areas. They also represent centres for endemism within both the bioregion and the state with species such as the Pilliga Mouse and the Black-eyed Susan *Tetradlea decora* restricted to these regions. These regions represent the largest block of native vegetation remaining in the bioregion and this may in part explain the high species diversity compared to the surrounding areas, which tend to be highly modified and poorly sampled for biodiversity. However, these areas also contain unique habitats that are found nowhere else in the bioregion. Continued protection of these species strongholds should be a primary aim of future management programs in the bioregion.

APPENDIX 1 – FAUNA LIST

All known vertebrate animal species of the Brigalow Belt South Bioregion of NSW are listed in this appendix, together with an outline of the information that led to the “conservation rank” for the species. Species given a conservation rank of “1” are described in more detail in Appendix 4 “Species Profiles”.

Fauna species ranking criteria

Geographic range (in bioregion): 1 = small, 2 = medium, 3 = large, 9 = unknown.

Relative abundance (in bioregion): 1 = low, 2 = medium, 3 = high, 9 = unknown.

Habitat specificity: 1 = narrow, 2 = wide, 9 = unknown.

Population change (in bioregion): 1 = declining, 2 = stable or increasing, 9 = unknown.

Geographic isolate: a population that statistically has zero chance of repopulating if it goes extinct.

Regionally endemic: over 50% of the species entire range occurs within the bioregion.

Family	Latin Name	English Name	TSC Act	Geographic Range	Relative Abundance	Habitat Specificity	Population Change	Geographic Isolate	Regionally Endemic	Edge of Range	Conservation Rank
Conservation Category 1											
Amphibians											
Hylidae	<i>Litoria booroolongensis</i>	Booroolong Frog	E1	1	1	1	1	N	N	Y	1
Hylidae	<i>Litoria lesueuri</i>	Lesueur's Frog		1	1	2	1	Y	N	Y	1
Hylidae	<i>Litoria verreauxii</i>	-		1	1	2	9	Y	N	Y	1
Myobatrachidae	<i>Pseudophryne bibronii</i>	Brown Toadlet		2	3	2	1	N	N	Y	1
Birds											
Accipitridae	<i>Circus assimilis</i>	Spotted Harrier		3	3	2	1	N	N	N	1
Accipitridae	<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle		2	1	1	9	N	N	N	1
Accipitridae	<i>Hamirostra melanosternon</i>	Black-breasted Buzzard	V	1	1	2	1	N	N	Y	1
Accipitridae	<i>Lophoictinia isura</i>	Square-tailed Kite	V	2	1	1	1	N	N	Y	1
Alcedinidae	<i>Alcedo azurea</i>	Azure Kingfisher		3	1	1	1	N	N	Y	1
Anatidae	<i>Anas rhynchotis</i>	Australasian Shoveler		2	1	1	1	N	N	N	1
Ardeidae	<i>Ixobrychus minutus</i>	Little Bittern		1	1	1	9	N	N	N	1

Family	Latin Name	English Name	TSC Act	Geographic Range	Relative Abundance	Habitat Specificity	Population Change	Geographic Isolate	Regionally Endemic	Edge of Range	Conservation Rank
Anatidae	<i>Oxyura australis</i>	Blue-billed Duck	V	1	1	1	2	N	N	N	1
Anatidae	<i>Stictonetta naevosa</i>	Freckled Duck	V	1	1	9	1	N	N	N	1
Ardeidae	<i>Botaurus poiciloptilus</i>	Australasian Bittern	V	2	1	1	1	N	N	N	1
Burhinidae	<i>Burhinus grallarius</i>	Bush Stone-curlew	E1	2	1	2	1	N	N	N	1
Cacatuidae	<i>Cacatua leadbeateri</i>	Major Mitchell's Cockatoo	V	2	1	1	1	N	N	Y	1
Cacatuidae	<i>Calyptorhynchus lathami</i>	Glossy Black-Cockatoo	V	3	3	1	1	N	N	N	1
Casuariidae	<i>Dromaius novaehollandiae</i>	Emu		3	3	2	1	N	N	N	1
Charadriidae	<i>Charadrius australis</i>	Inland Dotterel		1	1	1	9	N	N	N	1
Ciconiidae	<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork	E1	2	1	1	1	N	N	Y	1
Climacteridae	<i>Climacteris picumnus</i>	Brown Treecreeper	V	3	3	2	1	N	N	N	1
Columbidae	<i>Geophaps scripta</i>	Squatter Pigeon	E1	1	1	1	1	N	Y	Y	1
Dicruridae	<i>Myiagra inquieta</i>	Restless Flycatcher		3	2	2	1	N	N	N	1
Falconidae	<i>Falco hypoleucos</i>	Grey Falcon	V	1	1	2	1	N	N	Y	1
Gruidae	<i>Grus rubicunda</i>	Brolga	V	1	1	1	1	N	N	Y	1
Megapodiidae	<i>Leipoa ocellata</i>	Malleefowl	E1	2	2	1	1	N	N	Y	1
Meliphagidae	<i>Epthianura albifrons</i>	White-fronted Chat		2	1	1	9	N	N	N	1
Meliphagidae	<i>Grantiella picta</i>	Painted Honeyeater	V	3	1	1	1	N	N	N	1
Meliphagidae	<i>Melithreptus gularis</i>	Black-chinned Honeyeater	V	3	2	1	1	N	N	N	1
Meliphagidae	<i>Xanthomyza phrygia</i>	Regent Honeyeater	E1	2	1	2	1	N	N	Y	1
Muscicapidae	<i>Zoothera lunulata</i>	Bassian Thrush		1	1	1	9	Y	N	Y	1
Pachycephalidae	<i>Falcunculus frontatus</i>	Crested Shrike-tit		2	2	2	1	N	N	N	1
Pachycephalidae	<i>Oreoica gutturalis</i>	Crested Bellbird		2	1	2	1	N	N	Y	1
Pachycephalidae	<i>Pachycephala inornata</i>	Gilbert's Whistler	V	2	1	1	1	N	N	Y	1
Pardalotidae	<i>Acanthiza uropygialis</i>	Chestnut-rumped Thornbill		3	2	2	1	N	N	N	1
Pardalotidae	<i>Aphelocephala leucopsis</i>	Southern Whiteface		2	1	2	1	N	N	N	1
Pardalotidae	<i>Pardalotus punctatus xanthopygus</i>	Yellow-rumped Pardalote		1	1	1	9	N	N	Y	1
Pardalotidae	<i>Sericornis sagittatus</i>	Speckled Warbler	V	3	3	2	1	N	N	Y	1
Passeridae	<i>Stagonopleura guttata</i>	Diamond Firetail	V	2	1	2	1	N	N	N	1
Pedionomidae	<i>Pedionomus torquatus</i>	Plains wanderer	E1	2	1	1	9	N	N	Y	1
Petroicidae	<i>Melanodryas cucullata</i>	Hooded Robin	V	3	2	1	1	N	N	N	1
Petroicidae	<i>Microeca fascinans</i>	Jacky Winter		3	3	2	1	N	N	N	1
Petroicidae	<i>Petroica goodenovii</i>	Red-capped Robin		3	3	2	1	N	N	N	1
Pomatostomidae	<i>Pomatostomus temporalis</i>	Grey-crowned Babbler	V	3	3	2	1	N	N	N	1
Psittacidae	<i>Lathamus discolor</i>	Swift Parrot	E1	1	1	2	1	N	N	Y	1
Psittacidae	<i>Polytelis swainsonii</i>	Superb Parrot	V	2	1	1	1	N	N	Y	1
Rallidae	<i>Porzana fluminea</i>	Australian Spotted Crake		1	1	1	9	N	N	N	1
Rallidae	<i>Porzana tabuensis</i>	Spotless Crake		1	1	1	9	N	N	N	1
Rallidae	<i>Rallus pectoralis</i>	Lewin's Rail		1	1	1	1	N	N	N	1
Rostratulidae	<i>Rostratula benghalensis</i>	Painted Snipe	V	2	1	1	1	N	N	N	1
Strigidae	<i>Ninox connivens</i>	Barking Owl	V	2	2	2	1	N	N	N	1
Strigidae	<i>Ninox strenua</i>	Powerful Owl	V	1	1	2	1	N	N	Y	1
Turnicidae	<i>Turnix varia</i>	Painted Button-quail		2	1	2	1	N	N	Y	1
Tytonidae	<i>Tyto capensis</i>	Grass Owl	V	2	1	1	1	N	N	Y	1
Tytonidae	<i>Tyto novaehollandiae</i>	Masked Owl	V	2	1	2	1	N	N	N	1

Family	Latin Name	English Name	TSC Act	Geographic Range	Relative Abundance	Habitat Specificity	Population Change	Geographic Isolate	Regionally Endemic	Edge of Range	Conservation Rank
Mammals											
Burramyidae	<i>Acrobates pygmaeus</i>	Feathertail Glider		2	1	2	1	N	N	Y	1
Burramyidae	<i>Cercartetus nanus</i>	Eastern Pygmy-possum	V	1	1	1	1	N	N	Y	1
Dasyuridae	<i>Dasyurus maculatus</i>	Spotted-tailed Quoll	V	2	1	2	1	N	N	Y	1
Dasyuridae	<i>Planigale gilesi</i>	Paucident Planigale		1	1	1	9	N	N	Y	1
Dasyuridae	<i>Planigale maculata</i>	Common Planigale	V	1	1	1	1	N	N	Y	1
Dasyuridae	<i>Planigale tenuirostris</i>	Narrow-nosed Planigale		1	2	1	9	N	N	N	1
Dasyuridae	<i>Sminthopsis macroura</i>	Stripe-faced Dunnart	V	1	1	1	1	N	N	Y	1
Macropodidae	<i>Macropus dorsalis</i>	Black-striped Wallaby	E1	2	2	1	1	N	Y	Y	1
Macropodidae	<i>Petrogale penicillata</i>	Brush-tailed Rock-wallaby	V	1	1	1	1	Y	N	Y	1
Muridae	<i>Pseudomys pilligaensis</i>	Pilliga Mouse	V	1	2	1	9	Y	Y	Y	1
Ornithorhynchidae	<i>Ornithorhynchus anatinus</i>	Platypus		1	1	1	1	N	N	Y	1
Peramelidae	<i>Perameles nasuta</i>	Long-nosed Bandicoot		1	1	2	9	Y	N	Y	1
Petauridae	<i>Petauroides volans</i>	Greater Glider		1	3	2	9	Y	N	Y	1
Petauridae	<i>Petaurus norfolcensis</i>	Squirrel Glider	V	3	1	1	1	N	N	N	1
Petauridae	<i>Pseudocheirus peregrinus</i>	Common Ringtail Possum		2	3	2	1	N	N	N	1
Phalangeridae	<i>Trichosurus vulpecula</i>	Common Brushtail Possum		3	3	2	1	N	N	N	1
Potoroidae	<i>Aepyprymnus rufescens</i>	Rufous Bettong	V	1	1	2	1	N	N	Y	1
Rhinolophidae	<i>Rhinolophus megaphyllus</i>	Eastern Horseshoe-bat		2	1	1	9	Y	N	Y	1
Vespertilionidae	<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	V	2	1	1	9	N	N	Y	1
Vespertilionidae	<i>Chalinolobus picatus</i>	Little Pied Bat	V	3	1	2	1	N	N	Y	1
Vespertilionidae	<i>Falsistrellus tasmaniensis</i>	Eastern False Pipistrelle	V	1	1	2	1	Y	N	Y	1
Vespertilionidae	<i>Miniopterus schreibersii</i>	Common Bent-wing Bat	V	1	1	1	9	N	N	Y	1
Vespertilionidae	<i>Nyctophilus timoriensis</i>	Greater Long-eared Bat	V	3	1	1	1	N	N	N	1
Vespertilionidae	<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat		1	1	1	2	Y	N	Y	1
Vespertilionidae	<i>Vespadelus troungtoni</i>	Eastern Cave Bat	V	2	1	1	9	N	N	Y	1
Reptiles											
Chelidae	<i>Chelodina expansa</i>	Broad-shelled River Turtle		1	1	1	1	N	N	Y	1
Elapidae	<i>Acanthophis antarcticus</i>	Common Death Adder		1	1	2	1	N	N	Y	1
Elapidae	<i>Denisonia devisi</i>	De Vis' Banded Snake		2	1	1	1	N	N	Y	1
Elapidae	<i>Hemiaspis damelii</i>	Grey Snake		1	1	1	1	N	N	Y	1
Elapidae	<i>Hoplocephalus bitorquatus</i>	Pale-headed Snake	V	2	1	1	1	N	N	Y	1
Elapidae	<i>Pseudechis guttatus</i>	Spotted Black Snake		3	3	2	2	N	Y	N	1
Gekkonidae	<i>Christinus marmoratus</i>	Marbled Gecko		1	2	1	2	Y	N	N	1
Gekkonidae	<i>Oedura monilis</i>	Ocellated Velvet Gecko		2	2	1	2	N	Y	Y	1
Gekkonidae	<i>Underwoodisaurus sphyrurus</i>	-	V	1	1	1	1	N	N	Y	1
Pygopodidae	<i>Pygopus lepidopodus</i>	Common Scaly-foot		2	1	2	1	N	N	Y	1
Scincidae	<i>Anomalopus mackayi</i>	-	E1	1	1	1	1	N	Y	Y	1
Scincidae	<i>Egernia cunninghami</i> Population 1	Cunningham's Skink _ North Slopes Form		1	1	9	2	Y	N	Y	1
Scincidae	<i>Egernia cunninghami</i> Population 2	Cunningham's Skink - Southern Tablelands Form		1	1	9	2	Y	N	Y	1
Scincidae	<i>Egernia saxatilis saxatilis</i>	Warrumbungle's Black Rock Skink		1	1	1	2	Y	Y	Y	1
Scincidae	<i>Lampropholis caligula</i>	-		1	2	1	2	Y	N	Y	1
Scincidae	<i>Pseudemoia pagenstecheri</i>	-		1	3	2	9	Y	N	Y	1

Family	Latin Name	English Name	TSC Act	Geographic Range	Relative Abundance	Habitat Specificity	Population Change	Geographic Isolate	Regionally Endemic	Edge of Range	Conservation Rank
Conservation Category 2											
Birds											
Accipitridae	<i>Accipiter novaehollandiae</i>	Grey Goshawk		2	1	1	2	N	N	Y	2
Accipitridae	<i>Aviceda subcristata</i>	Pacific Baza		2	1	2	9	N	N	Y	2
Accipitridae	<i>Circus approximans</i>	Swamp Harrier		3	2	1	9	N	N	N	2
Anatidae	<i>Anas castanea</i>	Chestnut Teal		2	1	1	2	N	N	N	2
Anatidae	<i>Biziura lobata</i>	Musk Duck		2	1	1	2	N	N	N	2
Anatidae	<i>Dendrocygna arcuata</i>	Wandering Whistling-Duck		1	1	1	2	N	N	N	2
Anatidae	<i>Tadorna tadornoides</i>	Australian Shelduck		1	1	2	2	N	N	Y	2
Anatidae	<i>Malacorhynchus membranaceus</i>	Pink-eared Duck		2	1	1	2	N	N	N	2
Anseranatidae	<i>Anseranas semipalmata</i>	Magpie Goose	V	1	1	2	2	N	N	Y	2
Ardeidae	<i>Ardea intermedia</i>	Intermediate Egret		2	1	1	2	N	N	N	2
Ardeidae	<i>Egretta garzetta</i>	Little Egret		1	1	1	2	N	N	N	2
Artamidae	<i>Artamus personatus</i>	Masked Woodswallow		2	1	2	9	N	N	N	2
Campephagidae	<i>Coracina maxima</i>	Ground Cuckoo-shrike		2	1	2	9	N	N	N	2
Campephagidae	<i>Coracina papuensis</i>	White-bellied Cuckoo-shrike		2	2	2	9	N	N	N	2
Caprimulgidae	<i>Eurostopodus argus</i>	Spotted Nightjar		2	1	2	9	N	N	Y	2
Centropodidae	<i>Centropus phasianinus</i>	Pheasant Coucal		1	1	1	2	N	N	Y	2
Charadriidae	<i>Charadrius ruficapillus</i>	Red-capped Plover		1	1	1	2	N	N	N	2
Charadriidae	<i>Pluvialis dominica</i>	Lesser Golden Plover		1	1	1	2	N	N	N	2
Charadriidae	<i>Pluvialis squatarola</i>	Grey Plover		1	1	1	2	N	N	N	2
Charadriidae	<i>Vanellus tricolor</i>	Banded Lapwing		3	2	1	9	N	N	N	2
Cinclosomatidae	<i>Psophodes olivaceus</i>	Eastern Whipbird		1	1	2	2	N	N	Y	2
Climacteridae	<i>Climacteris erythrops</i>	Red-browed Treecreeper		1	3	2	2	Y	N	Y	2
Columbidae	<i>Leucosarcia melanoleuca</i>	Wonga Pigeon		1	1	2	2	N	N	Y	2
Columbidae	<i>Macropygia amboinensis</i>	Brown Cuckoo-Dove		1	1	1	2	N	N	N	2
Corvidae	<i>Corvus bennetti</i>	Little Crow		1	1	2	2	N	N	Y	2
Dicruridae	<i>Dicrurus bracteatus</i>	Spangled Drongo		2	1	1	9	N	N	Y	2
Dicruridae	<i>Monarcha trivirgatus</i>	Spectacled Monarch		1	1	1	2	N	N	N	2
Glareolidae	<i>Stiltia isabella</i>	Australian Pratincole		3	2	1	9	N	N	Y	2
Halcyonidae	<i>Todiramphus macleayi</i>	Forest Kingfisher		1	1	2	2	N	N	Y	2
Halcyonidae	<i>Todiramphus pyrrhopygia</i>	Red-backed Kingfisher		2	1	2	9	N	N	N	2
Hirundinidae	<i>Cheramoeca leucosternus</i>	White-backed Swallow		3	1	1	9	N	N	N	2
Laridae	<i>Chlidonias hybridus</i>	Whiskered Tern		2	1	2	9	N	N	N	2
Laridae	<i>Sterna nilotica</i>	Gull-billed Tern		1	1	2	2	N	N	N	2
Megapodiidae	<i>Alectura lathami</i>	Australian Brush-turkey		2	1	1	2	Y	N	Y	2
Meliphagidae	<i>Lichenostomus fuscus</i>	Fuscous Honeyeater		2	2	2	9	N	N	Y	2
Meliphagidae	<i>Lichenostomus plumulus</i>	Grey-fronted Honeyeater		1	1	1	2	N	N	Y	2
Meliphagidae	<i>Manorina melanophrys</i>	Bell Miner		1	1	1	2	N	N	Y	2
Meliphagidae	<i>Meliphaga lewinii</i>	Lewin's Honeyeater		1	1	2	2	N	N	Y	2
Menuridae	<i>Menura novaehollandiae</i>	Superb Lyrebird		1	1	2	2	N	N	Y	2
Oriolidae	<i>Sphecotheres viridis</i>	Figbird		1	1	1	2	N	N	Y	2
Pardalotidae	<i>Gerygone mouki</i>	Brown Gerygone		1	1	1	2	N	N	Y	2
Pardalotidae	<i>Origma solitaria</i>	Rockwarbler		1	1	1	2	N	N	Y	2

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Pardalotidae	<i>Sericornis citreogularis</i>	Yellow-throated Scrubwren		1	1	1	2	N	N	Y	2
Pardalotidae	<i>Sericornis magnirostris</i>	Large-billed Scrubwren		1	1	2	2	N	N	N	2
Passeridae	<i>Neochmia modesta</i>	Plum-headed Finch		2	1	2	9	N	N	N	2
Petroicidae	<i>Petroica multicolor</i>	Scarlet Robin		2	2	2	9	N	N	Y	2
Petroicidae	<i>Petroica phoenicea</i>	Flame Robin		1	1	9	2	N	N	Y	2
Phasianidae	<i>Coturnix chinensis</i>	King Quail		1	1	2	2	N	N	Y	2
Podicipedidae	<i>Podiceps cristatus</i>	Great Crested Grebe		2	1	1	2	N	N	N	2
Pomatostomidae	<i>Pomatostomus ruficeps</i>	Chestnut-crowned Babbler		1	1	2	2	N	N	Y	2
Psittacidae	<i>Trichoglossus chlorolepidotus</i>	Scaly-breasted Lorikeet		1	1	2	2	N	N	Y	2
Ptilonorhynchidae	<i>Ptilonorhynchus violaceus</i>	Satin Bowerbird		1	1	2	2	N	N	Y	2
Scolopacidae	<i>Actitis hypoleucos</i>	Common Sandpiper		1	1	1	2	N	N	N	2
Scolopacidae	<i>Calidris canutus</i>	Red Knot		1	1	2	2	N	N	N	2
Scolopacidae	<i>Calidris ferruginea</i>	Curlew Sandpiper		1	1	1	2	N	N	N	2
Scolopacidae	<i>Gallinago hardwickii</i>	Latham's Snipe		1	1	2	2	N	N	N	2
Scolopacidae	<i>Numenius minutus</i>	Little Curlew		1	1	1	2	N	N	N	2
Scolopacidae	<i>Tringa nebularia</i>	Common Greenshank		2	1	1	2	N	N	N	2
Scolopacidae	<i>Tringa stagnatilis</i>	Marsh Sandpiper		1	1	2	2	N	N	N	2
Sylviidae	<i>Cisticola exilis</i>	Golden-headed Cisticola		2	1	1	2	N	N	N	2
Threskiornithidae	<i>Plegadis falcinellus</i>	Glossy Ibis		2	1	1	2	N	N	N	2
Turnicidae	<i>Turnix pyrrhotorax</i>	Red-chested Button-quail		2	1	1	2	N	N	N	2
Turnicidae	<i>Turnix velox</i>	Little Button-quail		2	1	2	9	N	N	Y	2
Mammals											
Dasyuridae	<i>Antechinus stuartii</i>	Brown Antechinus		1	3	2	2	Y	N	Y	2
Dasyuridae	<i>Antechinus swainsonii</i>	Dusky Antechinus		1	1	2	2	N	N	Y	2
Macropodidae	<i>Macropus rufus</i>	Red Kangaroo		1	1	2	2	N	N	Y	2
Molossidae	<i>Mormopterus sp. (big penis)</i>	-		2	2	9	9	N	N	Y	2
Muridae	<i>Hydromys chrysogaster</i>	Water-rat		2	1	1	2	N	N	N	2
Pteropodidae	<i>Pteropus scapulatus</i>	Little Red Flying-fox		3	2	1	9	N	N	N	2
Vespertilionidae	<i>Nyctophilus gouldi</i>	Gould's Long-eared Bat		2	2	2	9	N	N	N	2
Vespertilionidae	<i>Scotorepens balstoni</i>	Inland Broad-nosed Bat		2	2	2	9	N	N	N	2
Vespertilionidae	<i>Vespadelus darlingtoni</i>	Large Forest Bat		1	3	2	2	Y	N	Y	2
Reptiles											
Agamidae	<i>Lophognathus burnsi</i>	-		2	2	9	2	N	N	N	2
Agamidae	<i>Physignathus lesueurii</i>	Eastern Water Dragon		1	1	1	2	N	N	Y	2
Boidae	<i>Morelia spilota</i>	Carpet or Diamond Python		2	1	2	9	N	N	N	2
Colubridae	<i>Dendrelaphis punctulata</i>	Green Tree Snake		1	1	2	2	N	N	Y	2
Gekkonidae	<i>Diplodactylus tessellatus</i>	Tesselated Gecko		1	1	1	2	N	N	Y	2
Gekkonidae	<i>Oedura lesueurii</i>	Lesueur's Velvet Gecko		1	2	1	2	N	N	Y	2
Gekkonidae	<i>Oedura marmorata</i>	Marbled Velvet Gecko		1	1	1	2	N	N	Y	2
Gekkonidae	<i>Oedura tryoni</i>	Southern Spotted Velvet Gecko		1	1	1	2	N	N	Y	2
Pygopodidae	<i>Delma tincta</i>	-		1	1	2	2	N	N	Y	2
Scincidae	<i>Bassiana duperreyi</i>	-		1	1	1	2	N	N	Y	2
Scincidae	<i>Bassiana platynota</i>	Red-throated Skink		2	3	2	2	Y	N	Y	2
Scincidae	<i>Carlia pectoralis</i>	-		1	1	1	2	N	N	N	2

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Scincidae	<i>Ctenotus allotropis</i>	-		1	1	1	2	N	N	Y	2
Scincidae	<i>Eulamprus tenuis</i>	Barred-side Skink		1	1	2	2	N	N	Y	2
Scincidae	<i>Hemiergis decresiensis</i>	-		1	3	2	2	Y	N	Y	2
Scincidae	<i>Lampropholis delicata</i>	Grass Skink		1	2	2	2	Y	N	N	2
Scincidae	<i>Lerista bougainvillii</i>	Bougainville's Skink		1	1	2	2	N	N	Y	2
Scincidae	<i>Menetia greyii</i>	Grey's Skink		1	1	2	2	N	N	Y	2
Scincidae	<i>Saiphos equalis</i>	Three-toed Skink		1	1	2	2	N	N	Y	2
Scincidae	<i>Saproscincus mustelinus</i>	Weasel Skink		1	2	2	2	Y	N	N	2
Typhlopidae	<i>Ramphotyphlops ligatus</i>	-		2	1	2	9	N	N	Y	2
Conservation Category 3											
Amphibians											
Hylidae	<i>Litoria caerulea</i>	Green Tree Frog		3	3	2	9	N	N	N	3
Hylidae	<i>Litoria latopalmata</i>	-		3	3	2	2	N	N	N	3
Hylidae	<i>Litoria peronii</i>	Peron's Tree Frog		3	3	2	2	N	N	N	3
Hylidae	<i>Litoria rubella</i>	Desert Tree Frog		3	3	2	2	N	N	N	3
Myobatrachidae	<i>Crinia parinsignifera</i>	Plains Froglet		3	2	2	2	N	N	N	3
Myobatrachidae	<i>Crinia signifera</i>	Common Eastern Froglet		3	3	2	9	N	N	N	3
Myobatrachidae	<i>Limnodynastes dumerilii</i>	Eastern Banjo Frog		3	3	2	9	N	N	Y	3
Myobatrachidae	<i>Limnodynastes fletcheri</i>	Long-thumbed Frog		3	3	2	9	N	N	Y	3
Myobatrachidae	<i>Limnodynastes ornatus</i>	Ornate Burrowing Frog		3	3	2	2	N	N	N	3
Myobatrachidae	<i>Limnodynastes tasmaniensis</i>	Spotted Grass Frog		3	3	2	2	N	N	N	3
Birds											
Accipitridae	<i>Accipiter cirrhocephalus</i>	Collared Sparrowhawk		3	2	2	2	N	N	N	3
Accipitridae	<i>Accipiter fasciatus</i>	Brown Goshawk		3	3	2	9	N	N	N	3
Accipitridae	<i>Aquila audax</i>	Wedge-tailed Eagle		3	2	2	9	N	N	N	3
Accipitridae	<i>Elanus axillaris</i>	Black-shouldered Kite		3	3	2	2	N	N	N	3
Accipitridae	<i>Haliastur spheurnus</i>	Whistling Kite		3	3	2	9	N	N	N	3
Accipitridae	<i>Hieraaetus morphnoides</i>	Little Eagle		3	3	2	2	N	N	N	3
Accipitridae	<i>Milvus migrans</i>	Black Kite		3	2	2	2	N	N	N	3
Aegothelidae	<i>Aegotheles cristatus</i>	Australian Owlet-nightjar		3	3	2	2	N	N	N	3
Alaudidae	<i>Mirafra javanica</i>	Singing Bushlark		3	2	1	2	N	N	N	3
Anatidae	<i>Anas gracilis</i>	Grey Teal		3	3	2	2	N	N	N	3
Anatidae	<i>Anas superciliosa</i>	Pacific Black Duck		3	3	2	2	N	N	N	3
Anatidae	<i>Aythya australis</i>	Hardhead		3	2	1	2	N	N	N	3
Anatidae	<i>Chenonetta jubata</i>	Australian Wood Duck		3	3	2	2	N	N	N	3
Anatidae	<i>Cygnus atratus</i>	Black Swan		3	2	2	2	N	N	N	3
Anatidae	<i>Dendrocygna eytoni</i>	Plumed Whistling-Duck		3	2	1	2	N	N	Y	3
Anhingidae	<i>Anhinga melanogaster</i>	Darter		3	2	1	2	N	N	N	3
Apodidae	<i>Apus pacificus</i>	Fork-tailed Swift		3	1	2	9	N	N	N	3
Apodidae	<i>Hirundapus caudacutus</i>	White-throated Needletail		3	2	2	9	N	N	N	3
Ardeidae	<i>Ardea alba</i>	Great Egret		3	1	1	2	N	N	N	3
Ardeidae	<i>Ardea ibis</i>	Cattle Egret		2	2	2	2	N	N	N	3
Ardeidae	<i>Ardea pacifica</i>	White-necked Heron		3	3	2	2	N	N	N	3
Ardeidae	<i>Egretta novaehollandiae</i>	White-faced Heron		3	3	2	2	N	N	N	3

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Ardeidae	<i>Nycticorax caledonicus</i>	Nankeen Night Heron		3	2	1	2	N	N	N	3
Artamidae	<i>Artamus cinereus</i>	Black-faced Woodswallow		3	2	2	2	N	N	N	3
Artamidae	<i>Artamus cyanopterus</i>	Dusky Woodswallow		3	3	2	2	N	N	N	3
Artamidae	<i>Artamus leucorhynchus</i>	White-breasted Woodswallow		2	1	2	2	N	N	N	3
Artamidae	<i>Artamus minor</i>	Little Woodswallow		2	1	2	2	N	N	Y	3
Artamidae	<i>Artamus superciliosus</i>	White-browed Woodswallow		3	3	2	9	N	N	N	3
Artamidae	<i>Cracticus nigrogularis</i>	Pied Butcherbird		3	3	2	2	N	N	N	3
Artamidae	<i>Cracticus torquatus</i>	Grey Butcherbird		3	3	2	2	N	N	N	3
Artamidae	<i>Gymnorhina tibicen</i>	Australian Magpie		3	3	2	2	N	N	N	3
Artamidae	<i>Strepera graculina</i>	Pied Currawong		3	3	2	2	N	N	N	3
Cacatuidae	<i>Cacatua galerita</i>	Sulphur-crested Cockatoo		3	3	2	2	N	N	N	3
Cacatuidae	<i>Cacatua roseicapilla</i>	Galah		3	3	2	2	N	N	N	3
Cacatuidae	<i>Cacatua sanguinea</i>	Little Corella		3	2	2	2	N	N	N	3
Cacatuidae	<i>Calyptorhynchus funereus</i>	Yellow-tailed Black-Cockatoo		3	2	2	2	N	N	Y	3
Cacatuidae	<i>Nymphicus hollandicus</i>	Cockatiel		3	3	2	2	N	N	N	3
Campephagidae	<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike		3	3	2	2	N	N	N	3
Campephagidae	<i>Coracina tenuirostris</i>	Cicadabird		3	2	2	2	N	N	Y	3
Campephagidae	<i>Lalage sueurii</i>	White-winged Triller		3	2	2	2	N	N	N	3
Caprimulgidae	<i>Eurostopodus mystacalis</i>	White-throated Nightjar		3	2	2	2	N	N	Y	3
Charadriidae	<i>Eelseynis melanops</i>	Black-fronted Dotterel		3	3	2	2	N	N	N	3
Charadriidae	<i>Erythrogonys cinctus</i>	Red-kneed Dotterel		3	1	1	2	N	N	N	3
Charadriidae	<i>Vanellus miles</i>	Masked Lapwing		2	2	2	2	N	N	N	3
Cinclosomatidae	<i>Cinclosoma punctatum</i>	Spotted Quail-thrush		2	2	1	2	N	N	Y	3
Climacteridae	<i>Cormobates leucophaeus</i>	White-throated Treecreeper		3	3	2	2	N	N	Y	3
Columbidae	<i>Geopelia cuneata</i>	Diamond Dove		3	1	2	2	N	N	N	3
Columbidae	<i>Geopelia humeralis</i>	Bar-shouldered Dove		3	3	2	2	N	N	N	3
Columbidae	<i>Geopelia striata</i>	Peaceful Dove		3	3	2	2	N	N	N	3
Columbidae	<i>Ocyphaps lophotes</i>	Crested Pigeon		3	3	2	2	N	N	N	3
Columbidae	<i>Phaps chalcoptera</i>	Common Bronzewing		3	3	2	2	N	N	N	3
Coraciidae	<i>Eurystomus orientalis</i>	Dollarbird		3	3	2	2	N	N	N	3
Corcoracidae	<i>Corcorax melanorhamphos</i>	White-winged Chough		3	3	2	2	N	N	N	3
Corcoracidae	<i>Struthidea cinerea</i>	Apostlebird		3	3	2	2	N	N	Y	3
Corvidae	<i>Corvus coronoides</i>	Australian Raven		3	3	2	2	N	N	N	3
Corvidae	<i>Corvus mellori</i>	Little Raven		2	2	2	2	N	N	N	3
Corvidae	<i>Corvus orru</i>	Torresian Crow		1	2	2	2	N	N	Y	3
Cuculidae	<i>Cacomantis flabelliformis</i>	Fan-tailed Cuckoo		3	3	2	2	N	N	N	3
Cuculidae	<i>Cacomantis variolosus</i>	Brush Cuckoo		2	1	2	2	N	N	Y	3
Cuculidae	<i>Chrysococcyx basalis</i>	Horsfield's Bronze-Cuckoo		3	2	2	9	N	N	N	3
Cuculidae	<i>Chrysococcyx lucidus</i>	Shining Bronze-Cuckoo		3	2	2	2	N	N	N	3
Cuculidae	<i>Chrysococcyx osculans</i>	Black-eared Cuckoo		3	2	2	2	N	N	N	3
Cuculidae	<i>Cuculus pallidus</i>	Pallid Cuckoo		3	2	2	9	N	N	N	3
Cuculidae	<i>Eudynamys scolopacea</i>	Common Koel		2	2	2	2	N	N	Y	3
Cuculidae	<i>Scythrops novaehollandiae</i>	Channel-billed Cuckoo		3	2	2	2	N	N	N	3
Dicaeidae	<i>Dicaeum hirundinaceum</i>	Mistletoebird		3	3	1	2	N	N	N	3

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Dicruridae	<i>Grallina cyanoleuca</i>	Magpie-lark		3	3	2	2	N	N	N	3
Dicruridae	<i>Myiagra cyanoleuca</i>	Satin Flycatcher		3	1	1	2	N	N	Y	3
Dicruridae	<i>Myiagra rubecula</i>	Leaden Flycatcher		3	3	2	2	N	N	N	3
Dicruridae	<i>Rhipidura fuliginosa</i>	Grey Fantail		3	3	2	2	N	N	N	3
Dicruridae	<i>Rhipidura leucophrys</i>	Willie Wagtail		3	3	2	2	N	N	N	3
Dicruridae	<i>Rhipidura rufifrons</i>	Rufous Fantail		2	1	2	2	N	N	Y	3
Falconidae	<i>Falco berigora</i>	Brown Falcon		3	3	2	2	N	N	N	3
Falconidae	<i>Falco cenchroides</i>	Nankeen Kestrel		3	3	2	2	N	N	N	3
Falconidae	<i>Falco longipennis</i>	Australian Hobby		3	2	2	2	N	N	N	3
Falconidae	<i>Falco peregrinus</i>	Peregrine Falcon		2	2	2	2	N	N	N	3
Falconidae	<i>Falco subniger</i>	Black Falcon		2	1	2	2	N	N	N	3
Halcyonidae	<i>Dacelo novaeguineae</i>	Laughing Kookaburra		3	3	2	2	N	N	N	3
Halcyonidae	<i>Todiramphus sanctus</i>	Sacred Kingfisher		3	2	2	2	N	N	N	3
Hirundinidae	<i>Hirundo ariel</i>	Fairy Martin		3	3	2	2	N	N	N	3
Hirundinidae	<i>Hirundo neoxena</i>	Welcome Swallow		3	3	2	2	N	N	N	3
Hirundinidae	<i>Hirundo nigricans</i>	Tree Martin		3	2	2	2	N	N	N	3
Laridae	<i>Larus novaehollandiae</i>	Silver Gull		2	1	2	2	N	N	N	3
Maluridae	<i>Malurus cyaneus</i>	Superb Fairy-wren		3	3	2	2	N	N	N	3
Maluridae	<i>Malurus lamberti</i>	Variegated Fairy-wren		3	2	2	2	N	N	N	3
Maluridae	<i>Malurus leucopterus</i>	White-winged Fairy-wren		2	2	2	2	N	N	Y	3
Meliphagidae	<i>Acanthagenys rufogularis</i>	Spiny-cheeked Honeyeater		3	3	2	2	N	N	N	3
Meliphagidae	<i>Acanthorhynchus tenuirostris</i>	Eastern Spinebill		1	3	2	2	N	N	Y	3
Meliphagidae	<i>Anthochaera carunculata</i>	Red Wattlebird		2	3	2	2	N	N	Y	3
Meliphagidae	<i>Certhionyx niger</i>	Black Honeyeater		2	1	2	2	N	N	Y	3
Meliphagidae	<i>Entomyzon cyanotis</i>	Blue-faced Honeyeater		3	2	2	2	N	N	N	3
Meliphagidae	<i>Epthianura aurifrons</i>	Orange Chat		2	1	2	9	N	N	N	3
Meliphagidae	<i>Epthianura tricolor</i>	Crimson Chat		2	1	2	2	N	N	Y	3
Meliphagidae	<i>Lichenostomus chrysops</i>	Yellow-faced Honeyeater		3	3	2	2	N	N	Y	3
Meliphagidae	<i>Lichenostomus leucotis</i>	White-eared Honeyeater		3	3	2	2	N	N	Y	3
Meliphagidae	<i>Lichenostomus melanops</i>	Yellow-tufted Honeyeater		2	2	2	2	N	N	Y	3
Meliphagidae	<i>Lichenostomus ornatus</i>	Yellow-plumed Honeyeater		1	2	2	2	N	N	Y	3
Meliphagidae	<i>Lichenostomus penicillatus</i>	White-plumed Honeyeater		3	3	2	2	N	N	N	3
Meliphagidae	<i>Lichenostomus virescens</i>	Singing Honeyeater		3	2	2	9	N	N	Y	3
Meliphagidae	<i>Lichmera indistincta</i>	Brown Honeyeater		2	2	2	2	N	N	N	3
Meliphagidae	<i>Manorina flavigula</i>	Yellow-throated Miner		3	2	2	2	N	N	Y	3
Meliphagidae	<i>Manorina melanocephala</i>	Noisy Miner		3	3	2	2	N	N	N	3
Meliphagidae	<i>Melithreptus brevirostris</i>	Brown-headed Honeyeater		3	3	2	2	N	N	N	3
Meliphagidae	<i>Melithreptus lunatus</i>	White-naped Honeyeater		2	3	2	2	N	N	Y	3
Meliphagidae	<i>Myzomela sanguinolenta</i>	Scarlet Honeyeater		3	1	2	2	N	N	Y	3
Meliphagidae	<i>Philemon citreogularis</i>	Little Friarbird		3	3	2	2	N	N	N	3
Meliphagidae	<i>Philemon corniculatus</i>	Noisy Friarbird		3	3	2	2	N	N	N	3
Meliphagidae	<i>Plectorhyncha lanceolata</i>	Striped Honeyeater		3	3	2	2	N	N	N	3
Meropidae	<i>Merops ornatus</i>	Rainbow Bee-eater		3	3	2	2	N	N	N	3
Motacillidae	<i>Anthus novaeseelandiae</i>	Richard's Pipit		3	3	2	2	N	N	N	3

Family	Latin Name	English Name	TSC Act	Geographic Range	Relative Abundance	Habitat Specificity	Population Change	Geographic Isolate	Regionally Endemic	Edge of Range	Conservation Rank
Neosittidae	<i>Daphoenositta chrysoptera</i>	Varied Sittella		3	2	2	2	N	N	N	3
Oriolidae	<i>Oriolus sagittatus</i>	Olive-backed Oriole		3	3	2	2	N	N	N	3
Otididae	<i>Ardeotis australis</i>	Australian Bustard	E1	3	1	2	2	N	N	N	3
Pachycephalidae	<i>Colluricincla harmonica</i>	Grey Shrike-thrush		3	3	2	2	N	N	N	3
Pachycephalidae	<i>Pachycephala pectoralis</i>	Golden Whistler		3	3	2	2	N	N	N	3
Pachycephalidae	<i>Pachycephala rufiventris</i>	Rufous Whistler		3	3	2	2	N	N	N	3
Pardalotidae	<i>Acanthiza apicalis</i>	Inland Thornbill		3	3	2	2	N	N	Y	3
Pardalotidae	<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill		3	3	2	2	N	N	N	3
Pardalotidae	<i>Acanthiza lineata</i>	Striated Thornbill		3	3	2	2	N	N	Y	3
Pardalotidae	<i>Acanthiza nana</i>	Yellow Thornbill		3	3	2	2	N	N	N	3
Pardalotidae	<i>Acanthiza pusilla</i>	Brown Thornbill		3	3	2	2	N	N	N	3
Pardalotidae	<i>Acanthiza reguloides</i>	Buff-rumped Thornbill		3	3	2	2	N	N	N	3
Pardalotidae	<i>Gerygone fusca</i>	Western Gerygone		3	2	2	9	N	N	N	3
Pardalotidae	<i>Gerygone olivacea</i>	White-throated Gerygone		3	2	2	2	N	N	N	3
Pardalotidae	<i>Hylacola pyrrhopygia</i>	Chestnut-rumped Heathwren		2	1	2	2	N	N	Y	3
Pardalotidae	<i>Pardalotus punctatus</i>	Spotted Pardalote		3	3	2	2	N	N	N	3
Pardalotidae	<i>Pardalotus striatus</i>	Striated Pardalote		3	3	2	2	N	N	N	3
Pardalotidae	<i>Sericornis frontalis</i>	White-browed Scrubwren		3	3	2	2	N	N	N	3
Pardalotidae	<i>Smicronis brevirostris</i>	Weebill		3	3	2	2	N	N	N	3
Passeridae	<i>Neochmia temporalis</i>	Red-browed Finch		2	3	2	2	N	N	Y	3
Passeridae	<i>Taeniopygia bichenovii</i>	Double-barred Finch		3	3	2	9	N	N	N	3
Passeridae	<i>Taeniopygia guttata</i>	Zebra Finch		2	1	2	2	N	N	N	3
Pelecanidae	<i>Pelecanus conspicillatus</i>	Australian Pelican		3	1	2	2	N	N	N	3
Petroicidae	<i>Eopsaltria australis</i>	Eastern Yellow Robin		3	3	2	2	N	N	N	3
Petroicidae	<i>Petroica rosea</i>	Rose Robin		3	1	2	2	N	N	Y	3
Phalacrocoracidae	<i>Phalacrocorax carbo</i>	Great Cormorant		3	1	2	2	N	N	N	3
Phalacrocoracidae	<i>Phalacrocorax melanoleucos</i>	Little Pied Cormorant		3	3	2	2	N	N	N	3
Phalacrocoracidae	<i>Phalacrocorax sulcirostris</i>	Little Black Cormorant		3	2	2	2	N	N	N	3
Phalacrocoracidae	<i>Phalacrocorax varius</i>	Pied Cormorant		3	1	2	2	N	N	N	3
Phasianidae	<i>Coturnix pectoralis</i>	Stubble Quail		2	2	2	2	N	N	N	3
Phasianidae	<i>Coturnix ypsilophora</i>	Brown Quail		3	1	2	9	N	N	N	3
Podargidae	<i>Podargus strigoides</i>	Tawny Frogmouth		3	3	2	2	N	N	N	3
Podicipedidae	<i>Poliocephalus poliocephalus</i>	Hoary-headed Grebe		2	1	2	2	N	N	N	3
Podicipedidae	<i>Tachybaptus novaehollandiae</i>	Australasian Grebe		3	2	2	2	N	N	N	3
Pomatostomidae	<i>Pomatostomus superciliosus</i>	White-browed Babbler		2	3	2	2	N	N	N	3
Psittacidae	<i>Alisterus scapularis</i>	Australian King-Parrot		3	3	2	2	N	N	Y	3
Psittacidae	<i>Aprosmictus erythropterus</i>	Red-winged Parrot		3	3	2	2	N	N	Y	3
Psittacidae	<i>Barnardius zonarius</i>	Australian Ringneck		2	1	2	2	N	N	N	3
Psittacidae	<i>Glossopsitta concinna</i>	Musk Lorikeet		2	2	2	2	N	N	Y	3
Psittacidae	<i>Glossopsitta pusilla</i>	Little Lorikeet		3	3	2	2	N	N	Y	3
Psittacidae	<i>Melopsittacus undulatus</i>	Budgerigar		2	1	2	2	N	N	N	3
Psittacidae	<i>Neophema pulchella</i>	Turquoise Parrot	V	3	3	1	2	N	N	N	3
Psittacidae	<i>Northiella haematogaster</i>	Blue Bonnet		3	2	2	2	N	N	Y	3
Psittacidae	<i>Platycercus adscitus</i>	Pale-headed Rosella		3	2	2	2	N	N	Y	3

Family	Latin Name	English Name	TSC Act	Geographic Range	Relative Abundance	Habitat Specificity	Population Change	Geographic Isolate	Regionally Endemic	Edge of Range	Conservation Rank
Psittacidae	<i>Platycercus elegans</i>	Crimson Rosella		3	3	2	2	N	N	Y	3
Psittacidae	<i>Platycercus eximius</i>	Eastern Rosella		3	3	2	2	N	N	Y	3
Psittacidae	<i>Psephotus haematonotus</i>	Red-rumped Parrot		3	3	2	2	N	N	N	3
Psittacidae	<i>Psephotus varius</i>	Mulga Parrot		2	1	2	2	N	N	Y	3
Psittacidae	<i>Trichoglossus haematodus</i>	Rainbow Lorikeet		3	2	2	2	N	N	Y	3
Ptilonorhynchidae	<i>Chlamydera maculata</i>	Spotted Bowerbird		2	2	2	2	N	N	Y	3
Rallidae	<i>Fulica atra</i>	Eurasian Coot		3	2	2	2	N	N	N	3
Rallidae	<i>Gallinula tenebrosa</i>	Dusky Moorhen		3	2	2	2	N	N	N	3
Rallidae	<i>Gallinula ventralis</i>	Black-tailed Native-hen		2	1	2	2	N	N	Y	3
Rallidae	<i>Gallirallus philippensis</i>	Buff-banded Rail		2	1	2	2	N	N	N	3
Rallidae	<i>Porphyrio porphyrio</i>	Purple Swamphen		3	2	2	2	N	N	N	3
Rallidae	<i>Porzana pusilla</i>	Baillon's Crake		3	1	2	2	N	N	N	3
Recurvirostridae	<i>Himantopus himantopus</i>	Black-winged Stilt		3	1	1	2	N	N	N	3
Recurvirostridae	<i>Recurvirostra novaehollandiae</i>	Red-necked Avocet		3	1	1	2	N	N	N	3
Scolopacidae	<i>Calidris acuminata</i>	Sharp-tailed Sandpiper		3	1	2	2	N	N	N	3
Scolopacidae	<i>Calidris ruficollis</i>	Red-necked Stint		2	1	2	2	N	N	N	3
Strigidae	<i>Ninox novaeseelandiae</i>	Southern Boobook		3	3	2	9	N	N	N	3
Sylviidae	<i>Acrocephalus stentoreus</i>	Clamorous Reed-Warbler		3	2	2	2	N	N	N	3
Sylviidae	<i>Cinclorhamphus cruralis</i>	Brown Songlark		2	2	2	2	N	N	N	3
Sylviidae	<i>Cinclorhamphus mathewsi</i>	Rufous Songlark		3	3	2	2	N	N	N	3
Sylviidae	<i>Megalurus gramineus</i>	Little Grassbird		3	1	2	2	N	N	N	3
Threskiornithidae	<i>Platalea flavipes</i>	Yellow-billed Spoonbill		3	2	2	2	N	N	N	3
Threskiornithidae	<i>Platalea regia</i>	Royal Spoonbill		2	2	2	2	N	N	N	3
Threskiornithidae	<i>Threskiornis molucca</i>	Australian White Ibis		3	3	2	2	N	N	N	3
Threskiornithidae	<i>Threskiornis spinicollis</i>	Straw-necked Ibis		3	3	2	2	N	N	N	3
Tytonidae	<i>Tyto alba</i>	Barn Owl		3	3	2	2	N	N	N	3
Zosteropidae	<i>Zosterops lateralis</i>	Silvereye		3	3	2	2	N	N	N	3
Mammals											
Dasyuridae	<i>Antechinus flavipes</i>	Yellow-footed Antechinus		3	3	2	2	N	N	N	3
Dasyuridae	<i>Sminthopsis crassicaudata</i>	Fat-tailed Dunnart		2	1	2	2	N	N	Y	3
Dasyuridae	<i>Sminthopsis murina</i>	Common Dunnart		3	3	2	2	N	N	N	3
Macropodidae	<i>Macropus giganteus</i>	Eastern Grey Kangaroo		3	3	2	2	N	N	N	3
Macropodidae	<i>Macropus robustus</i>	Common Wallaroo		3	3	2	2	N	N	N	3
Macropodidae	<i>Macropus rufogriseus</i>	Red-necked Wallaby		3	3	2	2	N	N	Y	3
Macropodidae	<i>Wallabia bicolor</i>	Swamp Wallaby		3	3	2	2	N	N	N	3
Molossidae	<i>Tadarida australis</i>	White-striped Mastiff-bat		3	2	2	2	N	N	N	3
Muridae	<i>Rattus fuscipes</i>	Bush Rat		2	1	2	2	N	N	Y	3
Petauridae	<i>Petaurus breviceps</i>	Sugar Glider		3	2	2	2	N	N	Y	3
Phascolarctidae	<i>Phascolarctos cinereus</i>	Koala	V	3	3	1	2	N	N	N	3
Tachyglossidae	<i>Tachyglossus aculeatus</i>	Short-beaked Echidna		3	3	2	2	N	N	N	3
Vespertilionidae	<i>Chalinolobus gouldii</i>	Gould's Wattled Bat		3	2	2	2	N	N	N	3
Vespertilionidae	<i>Chalinolobus morio</i>	Chocolate Wattled Bat		2	2	2	2	N	N	Y	3
Vespertilionidae	<i>Nyctophilus geoffroyi</i>	Lesser Long-eared Bat		3	3	2	2	N	N	N	3
Vespertilionidae	<i>Scotorepens greyii</i>	Little Broad-nosed Bat		3	2	2	9	N	N	N	3

Family	Latin Name	English Name	TSC Act	Geographic Range	Relative Abundance	Habitat Specificity	Population Change	Geographic Isolate	Regionally Endemic	Edge of Range	Conservation Rank
Vespertilionidae	<i>Vespadelus vulturnus</i>	Little Forest Bat		3	3	2	9	N	N	N	3
Vombatidae	<i>Vombatus ursinus</i>	Common Wombat		2	3	2	2	N	N	Y	3
Reptiles											
Agamidae	<i>Amphibolurus muricatus</i>	Jacky Lizard		3	2	2	2	N	N	N	3
Agamidae	<i>Amphibolurus nobbi</i>	Nobbi		3	2	2	2	N	N	N	3
Agamidae	<i>Pogona barbata</i>	Bearded Dragon		3	2	2	2	N	N	N	3
Agamidae	<i>Tympanocryptis tetraporophora</i>	-		2	1	2	2	N	N	N	3
Chelidae	<i>Chelodina longicollis</i>	Eastern Long-necked Tortoise		2	1	2	2	N	N	N	3
Elapidae	<i>Furina diadema</i>	Red-naped Snake		3	3	2	2	N	N	N	3
Elapidae	<i>Pseudechis porphyriacus</i>	Red-bellied Black Snake		3	2	2	2	N	N	N	3
Elapidae	<i>Pseudonaja textilis</i>	Eastern Brown Snake		3	2	2	2	N	N	N	3
Elapidae	<i>Rhinoplocephalus nigrescens</i>	Eastern Small-eyed Snake		2	1	2	2	N	N	Y	3
Elapidae	<i>Simoselaps australis</i>	Coral Snake		3	2	2	2	N	N	N	3
Elapidae	<i>Suta spectabilis dwyeri</i>	-		3	2	2	2	N	N	N	3
Elapidae	<i>Vermicella annulata</i>	Bandy Bandy		3	2	2	2	N	N	N	3
Gekkonidae	<i>Diplodactylus vittatus</i>	Stone Gecko		3	2	2	2	N	N	Y	3
Gekkonidae	<i>Diplodactylus williamsi</i>	Soft-tailed Gecko		3	2	1	2	N	N	N	3
Gekkonidae	<i>Gehyra dubia</i>	-		3	2	2	2	N	N	Y	3
Gekkonidae	<i>Gehyra variegata</i>	Tree Dtella		3	2	2	2	N	N	Y	3
Gekkonidae	<i>Heteronotia binoei</i>	Bynoe's Gecko		3	3	2	2	N	N	N	3
Gekkonidae	<i>Oedura robusta</i>	Robust Velvet Gecko		2	1	2	2	N	N	Y	3
Gekkonidae	<i>Underwoodisaurus milii</i>	Thick-tailed Gecko		2	3	2	2	N	N	Y	3
Pygopodidae	<i>Delma inornata</i>	Olive Legless Lizard		2	1	2	2	N	N	N	3
Pygopodidae	<i>Delma plebeia</i>	-		2	1	2	2	N	N	Y	3
Pygopodidae	<i>Lialis burtonis</i>	Burton's Legless Lizard		3	2	1	2	N	N	N	3
Pygopodidae	<i>Pygopus nigriceps</i>	Hooded Scaly-foot		3	1	2	2	N	N	Y	3
Scincidae	<i>Carlia tetradactyla</i>	Southern Rainbow Skink		2	1	2	2	N	N	Y	3
Scincidae	<i>Cryptoblepharus carnabyi</i>	Carnaby's Wall Skink		3	1	2	2	N	N	Y	3
Scincidae	<i>Cryptoblepharus virgatus</i>	Wall Lizard		3	1	2	2	N	N	Y	3
Scincidae	<i>Ctenotus robustus</i>	Striped Skink		3	3	2	2	N	N	N	3
Scincidae	<i>Ctenotus taeniolatus</i>	Copper-tailed Skink		2	3	2	2	N	N	Y	3
Scincidae	<i>Egernia modesta</i>	-		3	1	1	2	N	N	Y	3
Scincidae	<i>Egernia striolata</i>	Tree Skink		3	3	2	2	N	N	N	3
Scincidae	<i>Egernia whitii</i>	White's Skink		2	2	2	2	N	N	Y	3
Scincidae	<i>Eulamprus quoyii</i>	Eastern Water Skink		2	2	2	2	N	N	N	3
Scincidae	<i>Lampropholis guichenoti</i>	Garden Skink		2	1	2	2	N	N	N	3
Scincidae	<i>Lerista muelleri</i>	-		3	2	2	2	N	N	N	3
Scincidae	<i>Lerista punctatovittata</i>	-		3	1	2	2	N	N	N	3
Scincidae	<i>Lygisaurus foliorum</i>	-		2	2	2	2	N	N	Y	3
Scincidae	<i>Morethia boulengeri</i>	Boulenger's Skink		3	2	2	2	N	N	N	3
Scincidae	<i>Tiliqua scincoides</i>	Eastern Blue-tongued Lizard		3	2	2	2	N	N	N	3
Scincidae	<i>Trachydosaurus rugosus</i>	Shingleback		3	1	2	2	N	N	Y	3
Typhlopidae	<i>Ramphotyphlops bituberculatus</i>	-		2	2	2	2	N	N	Y	3
Typhlopidae	<i>Ramphotyphlops wiedii</i>	-		3	2	2	2	N	N	N	3

Family	Latin Name	English Name	TSC Act	Geographic Range	Relative Abundance	Habitat Specificity	Population Change	Geographic Isolate	Regionally Endemic	Edge of Range	Conservation Rank
Varanidae	<i>Varanus gouldii</i>	Gould's Goanna		3	1	2	2	N	N	Y	3
Varanidae	<i>Varanus varius</i>	Lace Monitor		3	2	2	2	N	N	N	3
Conservation Category 9											
Amphibians											
Hylidae	<i>Cyclorana novaehollandiae</i>	-		9	9	2	9	N	N	Y	9
Hylidae	<i>Cyclorana platycephala</i>	Water-holding Frog		9	9	2	9	N	N	Y	9
Hylidae	<i>Cyclorana verrucosa</i>	-		9	9	2	9	N	N	Y	9
Hylidae	<i>Litoria alboguttata</i>	Striped Burrowing Frog		9	9	2	9	N	N	Y	9
Myobatrachidae	<i>Crinia sloanei</i>	Sloane's Toadlet		9	9	2	9	N	N	Y	9
Myobatrachidae	<i>Limnodynastes interioris</i>	Giant Banjo Frog		9	9	2	9	N	N	Y	9
Myobatrachidae	<i>Limnodynastes salmini</i>	Salmon-striped Frog		9	9	2	9	N	N	N	9
Myobatrachidae	<i>Limnodynastes terraereginae</i>	Northern Banjo Frog		3	9	2	9	N	N	Y	9
Myobatrachidae	<i>Neobatrachus sudelli</i>	Common Spadefoot Toad		9	9	2	9	N	N	N	9
Myobatrachidae	<i>Notaden bennettii</i>	Crucifix Frog		9	9	2	9	N	N	Y	9
Myobatrachidae	<i>Uperoleia rugosa</i>	-		9	9	2	9	N	N	N	9
Accipitridae	<i>Elanus scriptus</i>	Letter-winged Kite		2	9	1	9	N	N	N	9
Ardeidae	<i>Ixobrychus flavicollis</i>	Black Bittern	V	9	9	1	1	N	N	Y	9
Meliphagidae	<i>Certhionyx variegatus</i>	Pied Honeyeater	V	1	1	2	9	N	N	Y	9
Mammals											
Emballonuridae	<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheathtail Bat	V	3	9	1	9	N	N	N	9
Molossidae	<i>Mormopterus sp. (little penis)</i>	-		1	2	9	9	N	N	Y	9
Molossidae	<i>Mormopterus Sp. 6</i>	-		9	1	9	9	N	N	Y	9
Pteropodidae	<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	V	9	9	2	1	N	N	Y	9
Vespertilionidae	<i>Scotorepens sp 1</i>	undescribed broad-nosed bat		9	9	9	9	N	N	Y	9
Reptiles											
Chelidae	<i>Emydura macquarii</i>	Murray Turtle		9	9	2	9	N	N	N	9
Elapidae	<i>Demansia psammophis</i>	Yellow-faced Whip Snake		2	9	2	2	N	N	N	9
Elapidae	<i>Pseudechis australis</i>	Mulga Snake		9	1	2	2	N	N	N	9
Elapidae	<i>Pseudonaja nuchalis</i>	Western Brown Snake		1	9	2	2	N	N	Y	9
Elapidae	<i>Suta suta</i>	Curl Snake		1	9	2	2	N	N	Y	9
Scincidae	<i>Anomalopus leuckartii</i>	-		3	9	2	2	N	N	Y	9
Scincidae	<i>Eulamprus martini</i>	-		1	9	9	9	N	N	Y	9
Scincidae	<i>Pseudemoia entrecasteauxii</i>	Tussock Skink		1	9	9	9	N	N	Y	9
Typhlopidae	<i>Ramphotyphlops nigrescens</i>	-		9	9	2	2	N	N	Y	9
Typhlopidae	<i>Ramphotyphlops proximus</i>	-		2	9	9	9	N	N	N	9

APPENDIX 2 – FLORA LIST

All known terrestrial plant species of the Brigalow Belt South Bioregion of NSW are listed in this appendix, together with their conservation rank. Species given a conservation rank of either National or State are described in more detail in Appendix 4 “Species Profiles”.

Name	Conservation Rank
<i>Acacia forsythii</i>	National
<i>Asperula charophyton</i>	National
<i>Asterolasia hexapetala</i>	National
<i>Bertya</i> sp. Cobar-Coolabah (Cunningham & Milthorpe, sn 2 Aug 1973)	National
<i>Bothriochloa biloba</i>	National
<i>Cadellia pentastylis</i>	National
<i>Corymbia</i> sp. (Gravesend -Matt White)	National
<i>Cynanchum elegans</i>	National
<i>Derwentia arenaria</i>	National
<i>Discaria pubescens</i>	National
<i>Diuris tricolor</i>	National
<i>Dodonaea macrossanii</i>	National
<i>Dodonaea rhombifolia</i>	National
<i>Eleocharis blakeana</i>	National
<i>Goodenia macbarronii</i>	National
<i>Homopholis belsonii</i>	National
<i>Homoranthus cernuus</i>	National
<i>Leionema viridiflorum</i>	National
<i>Lepidium aschersonii</i>	National
<i>Lepidium monoplocoides</i>	National
<i>Lomandra patens</i>	National
<i>Ozothamnus adnatus</i>	National
<i>Persoonia terminalis</i> subsp. <i>recurva</i>	National
<i>Phebalium obcordatum</i>	National
<i>Philotheca ericifolia</i>	National
<i>Pseudanthus divaricatissimus</i>	National
<i>Pterostylis woollsii</i>	National
<i>Rulingia procumbens</i>	National
<i>Swainsona murrayana</i>	National
<i>Thesium australe</i>	National
<i>Zieria ingramii</i> J.A. Armstr & D. Briggs ms (Briggs 2388)	National
<i>Acacia jucunda</i>	state
<i>Cyperus conicus</i>	state
<i>Desmodium campylocaulon</i>	state
<i>Dianella</i> aff. <i>longifolia</i> (Scone)	state
<i>Dianella</i> aff. <i>longifolia</i> (Tambar Springs)	state
<i>Dianella</i> aff. <i>longifolia</i> (Warrumbungle Range)	state
<i>Dianella</i> sp. aff. <i>tarda</i> (Pilliga)	state

Name	Conservation Rank
<i>Dichanthium setosum</i>	State
<i>Dipodium hamiltonianum</i>	state
<i>Genoplesium pedersonii</i>	state
<i>Goodenia pusilliflora</i>	state
<i>Juncus dolichanthus</i>	state
<i>Monotaxis macrophylla</i>	state
<i>Phyllanthus maderaspatensis</i>	state
<i>Plectranthus aff. parviflora</i> (Pilliga)	state
<i>Polygala linariifolia</i>	state
<i>Pomaderris queenslandica</i>	state
<i>Sauropus hirtellus</i>	state
<i>Schoenus centralis</i>	state
<i>Grevillea molyneuxii</i>	state/dubious record
<i>Pomaderris cocoparrana</i>	state/dubious record
<i>Dianella aff. revoluta</i> (Coolah Tops)	regional+
<i>Dianella aff. revoluta</i> (Scone)	regional+
<i>Acacia filicifolia</i>	regional
<i>Acacia flexifolia</i>	regional
<i>Acacia floribunda</i>	regional
<i>Acacia gunnii</i>	regional
<i>Acacia harpophylla</i>	regional
<i>Acacia havilandiorum</i>	regional
<i>Acacia homalophylla</i>	regional
<i>Acacia irrorata</i> subsp. <i>irrorata</i>	regional
<i>Acacia ixiophylla</i>	regional
<i>Acacia juncifolia</i>	regional
<i>Acacia lanigera</i>	regional
<i>Acacia leiocalyx</i> subsp. <i>leiocalyx</i>	regional
<i>Acacia leptoclada</i>	regional
<i>Acacia leucoclada</i>	regional
<i>Acacia linearifolia</i>	regional
<i>Acacia lineata</i>	regional
<i>Acacia lunata</i>	regional
<i>Acacia maidenii</i>	regional
<i>Acacia maitlandii</i>	regional
<i>Acacia melanoxylon</i>	regional
<i>Acacia muelleriana</i>	regional
<i>Acacia murrayana</i>	regional
<i>Acacia myrtifolia</i>	regional
<i>Acacia neriifolia</i>	regional
<i>Acacia obtusifolia</i>	regional
<i>Acacia oswaldii</i>	regional
<i>Acacia paradoxa</i>	regional
<i>Acacia pendula</i>	regional
<i>Acacia pravifolia</i>	regional
<i>Acacia rigens</i>	regional
<i>Acacia sertiformis</i>	regional
<i>Acacia sparsiflora</i>	regional
<i>Acacia stenophylla</i>	regional
<i>Acacia subulata</i>	regional
<i>Acacia ulicifolia</i>	regional
<i>Acacia venulosa</i>	regional
<i>Acaena agnipila</i>	regional
<i>Acaena echinata</i>	regional
<i>Acaena ovina</i>	regional
<i>Acalypha capillipes</i>	regional
<i>Acianthus collinus</i>	regional
<i>Acianthus fornicatus</i>	regional

Name	Conservation Rank
<i>Acmena smithii</i>	regional
<i>Acrotriche rigida</i>	regional
<i>Acrotriche serrulata</i>	regional
<i>Actinobole uliginosum</i>	regional
<i>Adiantum aethiopicum</i>	regional
<i>Adiantum formosum</i>	regional
<i>Adriana tomentosa</i> var <i>tomentosa</i>	regional
<i>Agrostis venusta</i>	regional
<i>Alectryon diversifolius</i>	regional
<i>Alectryon oleifolius</i>	regional
<i>Alectryon oleifolius</i> subsp. <i>elongatus</i>	regional
<i>Alectryon subcinereus</i>	regional
<i>Alectryon subdentatus</i> f <i>subdentatus</i>	regional
<i>Allocasuarina distyla</i>	regional
<i>Allocasuarina inophloia</i>	regional
<i>Allocasuarina littoralis</i>	regional
<i>Allocasuarina torulosa</i>	regional
<i>Allocasuarina verticillata</i>	regional
<i>Alloteropsis semialata</i>	regional
<i>Alternanthera angustifolia</i>	regional
<i>Alternanthera nana</i>	regional
<i>Alternanthera nodiflora</i>	regional
<i>Amaranthus macrocarpus</i>	regional
<i>Amaranthus macrocarpus</i> var <i>macrocarpus</i>	regional
<i>Ammobium alatum</i>	regional
<i>Amphibromus nervosus</i>	regional
<i>Amyema bifurcatum</i> var <i>bifurcatum</i>	regional
<i>Amyema cambagei</i>	regional
<i>Amyema congener</i> subsp. <i>congener</i>	regional
<i>Amyema maidenii</i> subsp. <i>angustifolium</i>	regional
<i>Amyema miraculosum</i> subsp. <i>boormanii</i>	regional
<i>Amyema pendulum</i>	regional
<i>Amyema pendulum</i> subsp. <i>longifolium</i>	regional
<i>Amyema pendulum</i> subsp. <i>pendulum</i>	regional
<i>Amyema quandang</i>	regional
<i>Amyema quandang</i> var <i>quandang</i>	regional
<i>Anacampseros australiana</i>	regional
<i>Aneilema acuminatum</i>	regional
<i>Angophora costata</i>	regional
<i>Aotus subglaucous</i> var <i>filiiformis</i>	regional
<i>Aotus subglaucous</i> var <i>subglaucous</i>	regional
<i>Aphanes australiana</i>	regional
<i>Aristida acuta</i>	regional
<i>Aristida behriana</i>	regional
<i>Aristida benthamii</i> var <i>benthamii</i>	regional
<i>Aristida blakei</i>	regional
<i>Aristida calycina</i>	regional
<i>Aristida calycina</i> var <i>calycina</i>	regional
<i>Aristida gracilipes</i>	regional
<i>Aristida helicophylla</i>	regional
<i>Aristida holathera</i> var <i>holathera</i>	regional
<i>Aristida latifolia</i>	regional
<i>Aristida leichhardtiana</i>	regional
<i>Aristida leptopoda</i>	regional
<i>Aristida muricata</i>	regional
<i>Aristida obscura</i>	regional
<i>Aristida platychaeta</i>	regional
<i>Aristida psammophila</i>	regional

Name	Conservation Rank
<i>Aristida ramosa</i> var <i>scaberula</i>	regional
<i>Arthropodium</i> species B sensu Harden (1993)	regional
<i>Asperula cunninghamii</i>	regional
<i>Asplenium flabellifolium</i>	regional
<i>Asplenium trichomanes</i>	regional
<i>Astrebla squarrosa</i>	regional
<i>Astrotricha longifolia</i>	regional
<i>Atalaya hemiglauca</i>	regional
<i>Atriplex pseudocampanulata</i>	regional
<i>Atriplex spinibractea</i>	regional
<i>Atriplex suberecta</i>	regional
<i>Atriplex vesicaria</i>	regional
<i>Australina pusilla</i>	regional
<i>Austrocynoglossum latifolium</i>	regional
<i>Austrodanthonia monticola</i>	regional
<i>Austrodanthonia richardsonii</i>	regional
<i>Austrostipa acrociliata</i>	regional
<i>Austrostipa pubescens</i>	regional
<i>Austrostipa ramosissima</i>	regional
<i>Austrostipa rudis</i> subsp. <i>rudis</i>	regional
<i>Azolla filiculoides</i>	regional
<i>Babingtonia cunninghamii</i>	regional
<i>Babingtonia densifolia</i>	regional
<i>Babingtonia pluriflora</i>	regional
<i>Backhousia myrtifolia</i>	regional
<i>Banksia marginata</i>	regional
<i>Baumea juncea</i>	regional
<i>Bertya cunninghamii</i>	regional
<i>Bertya gummifera</i>	regional
<i>Bertya oblonga</i>	regional
<i>Bertya oleifolia</i>	regional
<i>Billardiera scandens</i> var <i>scandens</i>	regional
<i>Blechnum cartilagineum</i>	regional
<i>Blechnum minus</i>	regional
<i>Blechnum nudum</i>	regional
<i>Boerhavia repleta</i>	regional
<i>Bolboschoenus fluviatilis</i>	regional
<i>Boronia anethifolia</i>	regional
<i>Boronia ledifolia</i>	regional
<i>Boronia microphylla</i>	regional
<i>Boronia warrumbunglensis</i>	regional
<i>Bossiaea foliosa</i>	regional
<i>Bossiaea obcordata</i>	regional
<i>Bossiaea rhombifolia</i> subsp. <i>rhombifolia</i>	regional
<i>Bossiaea scortechinii</i>	regional
<i>Bothriochloa bladhii</i> subsp. <i>bladhii</i>	regional
<i>Bothriochloa ewartiana</i>	regional
<i>Botrychium australe</i>	regional
<i>Brachyscome aculeata</i>	regional
<i>Brachyscome angustifolia</i>	regional
<i>Brachyscome ciliaris</i> var <i>subintegrifolia</i>	regional
<i>Brachyscome curvicaarpa</i>	regional
<i>Brachyscome dissectifolia</i>	regional
<i>Brachyscome diversifolia</i>	regional
<i>Brachyscome diversifolia</i> var <i>dissecta</i>	regional
<i>Brachyscome formosa</i>	regional
<i>Brachyscome gracilis</i>	regional
<i>Brachyscome heterodonta</i> var <i>heterodonta</i>	regional

Name	Conservation Rank
<i>Brachyscome microcarpa</i>	regional
<i>Brachyscome nova-anglica</i>	regional
<i>Brachyscome readeri</i>	regional
<i>Brachyscome trachycarpa</i>	regional
<i>Brachyscome whitei</i>	regional
<i>Breynia oblongifolia</i>	regional
<i>Bromus arenarius</i>	regional
<i>Bulbostylis barbata</i>	regional
<i>Bulbostylis densa</i>	regional
<i>Bursaria spinosa</i>	regional
<i>Bursaria spinosa subsp. spinosa</i>	regional
<i>Caesia calliantha</i>	regional
<i>Caesia parviflora</i> var <i>parviflora</i>	regional
<i>Caesia parviflora</i> var <i>vittata</i>	regional
<i>Caladenia fuscata</i>	regional
<i>Calandrinia balonensis</i>	regional
<i>Calandrinia calyptrata</i>	regional
<i>Calandrinia ptychosperma</i>	regional
<i>Caleana minor</i>	regional
<i>Callistemon brachyandrus</i>	regional
<i>Callistemon linearis</i>	regional
<i>Callistemon pinifolius</i>	regional
<i>Callistemon pityoides</i>	regional
<i>Callistemon viminalis</i>	regional
<i>Callitris verrucosa</i> x <i>glaucohylla</i>	regional
<i>Calocephalus sonderi</i>	regional
<i>Calochlaena dubia</i>	regional
<i>Calostemma purpureum</i>	regional
<i>Calotis ancyrocarpa</i>	regional
<i>Calotis cuneata</i> var <i>cuneata</i>	regional
<i>Calotis dentex</i>	regional
<i>Calotis hispidula</i>	regional
<i>Calotis scabiosifolia</i>	regional
<i>Calotis scabiosifolia</i> var <i>integrifolia</i>	regional
<i>Calotis scabiosifolia</i> var <i>scabiosifolia</i>	regional
<i>Calotis scapigera</i>	regional
<i>Calystegia marginata</i>	regional
<i>Canthium latifolium</i>	regional
<i>Capparis lasiantha</i>	regional
<i>Cardamine microthrix</i>	regional
<i>Carex bichenoviana</i>	regional
<i>Carex chlorantha</i>	regional
<i>Carex declinata</i>	regional
<i>Carex fascicularis</i>	regional
<i>Carex incomitata</i>	regional
<i>Carex tereticaulis</i>	regional
<i>Carissa ovata</i>	regional
<i>Cassine australis</i>	regional
<i>Cassine australis</i> var <i>angustifolia</i>	regional
<i>Cassinia compacta</i>	regional
<i>Cassinia cunninghamii</i>	regional
<i>Cassinia quinquefaria</i>	regional
<i>Cassinia trinerva</i>	regional
<i>Cassinia uncata</i>	regional
<i>Cassytha melantha</i>	regional
<i>Cassytha racemosa</i> f <i>muelleri</i>	regional
<i>Casuarina cunninghamiana</i> subsp. <i>cunninghamiana</i>	regional
<i>Cayratia clematidea</i>	regional

Name	Conservation Rank
<i>Celastrus australis</i>	regional
<i>Celastrus subspicata</i>	regional
<i>Centaurium spicatum</i>	regional
<i>Centipeda minima</i> var <i>minima</i>	regional
<i>Centipeda racemosa</i>	regional
<i>Centrolepis eremica</i>	regional
<i>Centrolepis strigosa</i> subsp. <i>strigosa</i>	regional
<i>Chamaesyce</i> sp. A sensu James & Harden (1990)	regional
<i>Cheiranthra cyanea</i> var <i>cyanea</i>	regional
<i>Chenopodium auricomum</i>	regional
<i>Chenopodium carinatum</i>	regional
<i>Chenopodium cristatum</i>	regional
<i>Chenopodium curvispicatum</i>	regional
<i>Chenopodium desertorum</i> subsp. <i>desertorum</i>	regional
<i>Chenopodium desertorum</i> subsp. <i>microphyllum</i>	regional
<i>Chenopodium melanocarpum</i>	regional
<i>Chenopodium pumilio</i>	regional
<i>Chiloglottis trilabra</i>	regional
<i>Chloris divaricata</i> var <i>divaricata</i>	regional
<i>Choretrum candollei</i>	regional
<i>Choretrum glomeratum</i>	regional
<i>Chorizema parviflorum</i>	regional
<i>Chrysocephalum semicalvum</i> subsp. <i>semicalvum</i>	regional
<i>Chrysopogon fallax</i>	regional
<i>Cissus antarctica</i>	regional
<i>Cissus hypoglauca</i>	regional
<i>Cissus opaca</i>	regional
<i>Citrus glauca</i>	regional
<i>Claoxylon australe</i>	regional
<i>Clematis glycinoides</i>	regional
<i>Clematis glycinoides</i> var <i>glycinoides</i>	regional
<i>Clerodendrum tomentosum</i>	regional
<i>Comesperma sphaerocarpum</i>	regional
<i>Commelina ensifolia</i>	regional
<i>Commersonia fraseri</i>	regional
<i>Conospermum taxifolium</i>	regional
<i>Convolvulus remotus</i>	regional
<i>Cooperhooia barbata</i>	regional
<i>Coprosma quadrifida</i>	regional
<i>Correa glabra</i>	regional
<i>Correa glabra</i> var <i>leucoclada</i>	regional
<i>Correa reflexa</i> var <i>reflexa</i>	regional
<i>Corybas fimbriatus</i>	regional
<i>Corymbia tessellaris</i>	regional
<i>Cotula australis</i>	regional
<i>Crassula colorata</i>	regional
<i>Crassula decumbens</i> var <i>decumbens</i>	regional
<i>Crotalaria mitchellii</i>	regional
<i>Crotalaria mitchellii</i> subsp. <i>mitcheilii</i>	regional
<i>Croton insularis</i>	regional
<i>Croton phebaloides</i>	regional
<i>Cryptandra amara</i>	regional
<i>Cryptandra amara</i> var <i>amara</i>	regional
<i>Cryptandra amara</i> var <i>longiflora</i>	regional
<i>Cryptandra longistaminea</i>	regional
<i>Cuscuta australis</i>	regional
<i>Cyathea australis</i>	regional
<i>Cymbidium canaliculatum</i>	regional

Name	Conservation Rank
<i>Cymbonotus preissianus</i>	regional
<i>Cymbopogon oblectus</i>	regional
<i>Cynoglossum suaveolens</i>	regional
<i>Cyperus alterniflorus</i>	regional
<i>Cyperus betchei</i> subsp. <i>betchei</i>	regional
<i>Cyperus bifax</i>	regional
<i>Cyperus castaneus</i>	regional
<i>Cyperus clarus</i>	regional
<i>Cyperus concinnus</i>	regional
<i>Cyperus difformis</i>	regional
<i>Cyperus exaltatus</i>	regional
<i>Cyperus flaccidus</i>	regional
<i>Cyperus gunnii</i> subsp. <i>gunnii</i>	regional
<i>Cyperus gymnocaulos</i>	regional
<i>Cyperus leiocaulon</i>	regional
<i>Cyperus lucidus</i>	regional
<i>Cyperus polystachyos</i>	regional
<i>Cyperus pygmaeus</i>	regional
<i>Cyperus rigidellus</i>	regional
<i>Cyperus sanguinolentus</i>	regional
<i>Cyperus sphaeroideus</i>	regional
<i>Cyperus squarrosus</i>	regional
<i>Cyperus subulatus</i>	regional
<i>Cyperus vaginatus</i>	regional
<i>Cyperus victoriensis</i>	regional
<i>Damasonium minus</i>	regional
<i>Dampiera adpressa</i>	regional
<i>Dampiera stricta</i>	regional
<i>Daphnandra micrantha</i>	regional
<i>Davallia solida</i> var. <i>pyxidata</i>	regional
<i>Daviesia genistifolia</i>	regional
<i>Daviesia latifolia</i>	regional
<i>Daviesia mimosoides</i> subsp. <i>mimosoides</i>	regional
<i>Daviesia nova-anglica</i>	regional
<i>Daviesia pubigera</i>	regional
<i>Deeringia amaranthoides</i>	regional
<i>Dendrophthoe glabrescens</i>	regional
<i>Derwentia derwentiana</i>	regional
<i>Dianella longifolia</i> var. <i>grandis</i>	regional
<i>Dichelachne rara</i>	regional
<i>Dichopogon strictus</i>	regional
<i>Digitaria coenicola</i>	regional
<i>Digitaria divaricatissima</i>	regional
<i>Digitaria hubbardii</i>	regional
<i>Digitaria hystrichoides</i>	regional
<i>Digitaria ramularis</i>	regional
<i>Dillwynia juniperina</i>	regional
<i>Dillwynia retorta</i> (JCWendl) Druce species complex	regional
<i>Dillwynia sieberi</i>	regional
<i>Diplachne fusca</i>	regional
<i>Diplachne parviflora</i>	regional
<i>Dipodium punctatum</i>	regional
<i>Dipodium roseum</i>	regional
<i>Diuris goonooensis</i>	regional
<i>Diuris sulphurea</i>	regional
<i>Dodonaea boroniifolia</i>	regional
<i>Dodonaea sinuolata</i>	regional
<i>Dodonaea sinuolata</i> subsp. <i>sinuolata</i>	regional

Name	Conservation Rank
<i>Dodonaea triangularis</i>	regional
<i>Dodonaea triquetra</i>	regional
<i>Dodonaea truncatiales</i>	regional
<i>Doodia aspera</i>	regional
<i>Doodia caudata</i>	regional
<i>Doryphora sassafras</i>	regional
<i>Drosera auriculata</i>	regional
<i>Drosera burmanni</i>	regional
<i>Drosera glanduligera</i>	regional
<i>Drosera indica</i>	regional
<i>Drosera peltata</i>	regional
<i>Dysphania glomulifera</i>	regional
<i>Echinochloa colona</i>	regional
<i>Echinopogon caespitosus</i>	regional
<i>Echinopogon caespitosus</i> var <i>caespitosus</i>	regional
<i>Echinopogon intermedius</i>	regional
<i>Echinopogon mckiei</i>	regional
<i>Eclipta platyglossa</i>	regional
<i>Ehretia membranifolia</i>	regional
<i>Einadia trigonos</i> subsp. <i>leiocarpa</i>	regional
<i>Einadia trigonos</i> subsp. <i>stellulata</i>	regional
<i>Eleocharis acuta</i>	regional
<i>Eleocharis dietrichiana</i>	regional
<i>Eleocharis gracilis</i>	regional
<i>Eleocharis pallens</i>	regional
<i>Eleocharis plana</i>	regional
<i>Eleocharis pusilla</i>	regional
<i>Elymus scaber</i> var <i>plurinervis</i>	regional
<i>Enneapogon avenaceus</i>	regional
<i>Enneapogon gracilis</i>	regional
<i>Enneapogon nigricans</i>	regional
<i>Entolasia marginata</i>	regional
<i>Epaltes cunninghamii</i>	regional
<i>Epilobium billardioreanum</i> subsp. <i>cinereum</i>	regional
<i>Epilobium billardioreanum</i> subsp. <i>hydrophilum</i>	regional
<i>Epilobium billardierianum</i>	regional
<i>Epilobium hirtigerum</i>	regional
<i>Eragrostis australasica</i>	regional
<i>Eragrostis benthamii</i>	regional
<i>Eragrostis leptocarpa</i>	regional
<i>Eragrostis megalosperma</i>	regional
<i>Eragrostis molybdea</i>	regional
<i>Eragrostis speciosa</i>	regional
<i>Eremophila bignoniiflora</i>	regional
<i>Eremophila deserti</i>	regional
<i>Eremophila scoparia</i>	regional
<i>Eriachne mucronata</i>	regional
<i>Eriocaulon scariosum</i>	regional
<i>Eriochlamys behrii</i>	regional
<i>Eriochloa australiensis</i>	regional
<i>Eriochloa crebra</i>	regional
<i>Eriochloa procera</i>	regional
<i>Eucalyptus bakeri</i>	regional
<i>Eucalyptus beyeriana</i>	regional
<i>Eucalyptus bridgesiana</i>	regional
<i>Eucalyptus coolabah</i>	regional
<i>Eucalyptus dalrympleana</i>	regional
<i>Eucalyptus dalrympleana</i> subsp. <i>dalrympleana</i>	regional

Name	Conservation Rank
<i>Eucalyptus dalrympleana</i> subsp. <i>heptantha</i>	regional
<i>Eucalyptus dawsonii</i>	regional
<i>Eucalyptus dumosa</i>	regional
<i>Eucalyptus exserta</i>	regional
<i>Eucalyptus goniocalyx</i>	regional
<i>Eucalyptus laevopinea</i>	regional
<i>Eucalyptus largiflorens</i>	regional
<i>Eucalyptus mannifera</i>	regional
<i>Eucalyptus nobilis</i>	regional
<i>Eucalyptus nortonii</i>	regional
<i>Eucalyptus pauciflora</i>	regional
<i>Eucalyptus polyanthemus</i>	regional
<i>Eucalyptus praecox</i>	regional
<i>Eucalyptus stellulata</i>	regional
<i>Eucalyptus tereticornis</i>	regional
<i>Euphorbia eremophila</i>	regional
<i>Evolvulus alsinoides</i> var. <i>villosicalyx</i>	regional
<i>Festuca asperula</i>	regional
<i>Ficus coronata</i>	regional
<i>Ficus rubiginosa</i>	regional
<i>Fimbristylis neilsonii</i>	regional
<i>Flaveria australasica</i>	regional
<i>Flindersia maculosa</i>	regional
<i>Fuirena incrassata</i>	regional
<i>Galium binifolium</i>	regional
<i>Galium ciliare</i>	regional
<i>Galium migrans</i>	regional
<i>Galium propinquum</i>	regional
<i>Geitonoplesium cymosum</i>	regional
<i>Geranium potentilloides</i>	regional
<i>Geranium retrorsum</i>	regional
<i>Geranium solanderi</i>	regional
<i>Geranium solanderi</i> var. <i>grande</i>	regional
<i>Geranium solanderi</i> var. <i>solanderi</i>	regional
<i>Geum urbanum</i>	regional
<i>Glinus lotoides</i>	regional
<i>Glossodia major</i>	regional
<i>Glossostigma diandrum</i>	regional
<i>Glyceria latispicea</i>	regional
<i>Glycine latifolia</i>	regional
<i>Glycine tomentella</i>	regional
<i>Gnaphalium polycaulon</i>	regional
<i>Gnephosis tenuissima</i>	regional
<i>Gompholobium foliolosum</i>	regional
<i>Gompholobium virgatum</i>	regional
<i>Gompholobium virgatum</i> var. <i>aspalathoides</i>	regional
<i>Gonocarpus micranthus</i>	regional
<i>Gonocarpus micranthus</i> subsp. <i>micranthus</i>	regional
<i>Gonocarpus micranthus</i> subsp. <i>ramosissimus</i>	regional
<i>Goodenia bellidifolia</i>	regional
<i>Goodenia fascicularis</i>	regional
<i>Goodenia glauca</i>	regional
<i>Goodenia gracilis</i>	regional
<i>Goodenia havilandii</i>	regional
<i>Goodenia heteromera</i>	regional
<i>Goodenia heterophylla</i>	regional
<i>Goodenia ovata</i>	regional
<i>Goodenia pinnatifida</i>	regional

Name	Conservation Rank
<i>Gossypium sturtianum</i>	regional
<i>Gratiola pedunculata</i>	regional
<i>Gratiola peruviana</i>	regional
<i>Grevillea ramosissima</i> subsp. <i>ramosissima</i>	regional
<i>Grevillea striata</i>	regional
<i>Gymnostachys anceps</i>	regional
<i>Gypsophila tubulosa</i>	regional
<i>Haemodorum planifolium</i>	regional
<i>Hakea decurrens</i>	regional
<i>Hakea decurrens</i> subsp. <i>decurrens</i>	regional
<i>Hakea leucoptera</i>	regional
<i>Hakea microcarpa</i>	regional
<i>Halgania brachyrhyncha</i>	regional
<i>Halgania cyanea</i>	regional
<i>Haloragis glauca</i> f. <i>glauca</i>	regional
<i>Harmsiodoxa blennodioides</i>	regional
<i>Hedycarya angustifolia</i>	regional
<i>Helichrysum collinum</i>	regional
<i>Helichrysum scorpioides</i>	regional
<i>Helichrysum semifertile</i>	regional
<i>Hemigenia cuneifolia</i>	regional
<i>Hibbertia acicularis</i>	regional
<i>Hibbertia circumdans</i>	regional
<i>Hibbertia covenyana</i>	regional
<i>Hibbertia linearis</i>	regional
<i>Hibbertia monogyna</i>	regional
<i>Hibbertia pedunculata</i>	regional
<i>Hibbertia scandens</i>	regional
<i>Hibbertia serpyllifolia</i>	regional
<i>Hibbertia</i> sp. B sensu Harden (1990)	regional
<i>Hibiscus brachysiphonius</i>	regional
<i>Hibiscus krichauffianus</i>	regional
<i>Hibiscus trionum</i>	regional
<i>Hovea linearis</i>	regional
<i>Hovea longipes</i>	regional
<i>Hovea purpurea</i>	regional
<i>Hovea rosmarinifolia</i>	regional
<i>Hyalosperma glutinosum</i> subsp. <i>glutinosum</i>	regional
<i>Hyalosperma praecox</i>	regional
<i>Hyalosperma semisterile</i>	regional
<i>Hydrocotyle peduncularis</i>	regional
<i>Hydrocotyle tripartita</i>	regional
<i>Hymenanthera dentata</i>	regional
<i>Hymenosporum flavum</i>	regional
<i>Hypolepis glandulifera</i>	regional
<i>Hypoxis hygrometrica</i>	regional
<i>Hypoxis hygrometrica</i> var. <i>villosisepala</i>	regional
<i>Indigofera brevidens</i>	regional
<i>Indigofera coronillifolia</i>	regional
<i>Iseilema membranaceum</i>	regional
<i>Isolepis australiensis</i>	regional
<i>Isolepis cernua</i>	regional
<i>Isolepis hookeriana</i>	regional
<i>Isolepis inundata</i>	regional
<i>Isolepis victoriensis</i>	regional
<i>Isotoma armstrongii</i>	regional
<i>Isotoma axillaris</i>	regional
<i>Isotoma fluviatilis</i>	regional

Name	Conservation Rank
<i>Isotoma fluviatilis</i> subsp. <i>borealis</i>	regional
<i>Ixiolaena brevicompta</i>	regional
<i>Ixiolaena leptolepis</i>	regional
<i>Ixiolaena tomentosa</i>	regional
<i>Jacksonia scoparia</i>	regional
<i>Jasminum suavissimum</i>	regional
<i>Juncus alexandri</i>	regional
<i>Juncus alexandri</i> subsp. <i>melanobasis</i>	regional
<i>Juncus brevibracteus</i>	regional
<i>Juncus firmus</i>	regional
<i>Juncus flavidus</i>	regional
<i>Juncus fockei</i>	regional
<i>Juncus holoschoenus</i>	regional
<i>Juncus homalocaulis</i>	regional
<i>Juncus prismatocarpus</i>	regional
<i>Juncus psammophilus</i>	regional
<i>Juncus radula</i>	regional
<i>Juncus sandwithii</i>	regional
<i>Juncus sarophorus</i>	regional
<i>Juncus subglaucus</i>	regional
<i>Juncus vaginatus</i>	regional
<i>Kennedia procurrens</i>	regional
<i>Keraudrenia corollata</i> var. <i>corollata</i>	regional
<i>Korthalsella rubra</i>	regional
<i>Korthalsella rubra</i> subsp. <i>geijericola</i>	regional
<i>Kunzea parvifolia</i>	regional
<i>Kunzea</i> sp. D sensu Wilson (1991)	regional
<i>Lagenifera gracilis</i>	regional
<i>Lastreopsis acuminata</i>	regional
<i>Lemna trisulca</i>	regional
<i>Lepidium fasciculatum</i>	regional
<i>Lepidium muelleri-ferdinandi</i>	regional
<i>Lepidium sagittulatum</i>	regional
<i>Lepidosperma viscidum</i>	regional
<i>Leptochloa digitata</i>	regional
<i>Leptochloa divaricatissima</i>	regional
<i>Leptochloa peacockii</i>	regional
<i>Leptospermum arachnoides</i>	regional
<i>Leptospermum brevipes</i>	regional
<i>Leptospermum divaricatum</i>	regional
<i>Leptospermum gregarium</i>	regional
<i>Leptospermum polygalifolium</i> subsp. <i>montanum</i>	regional
<i>Leptospermum trinervium</i>	regional
<i>Lespedeza juncea</i> subsp. <i>sericea</i>	regional
<i>Leucopogon attenuatus</i>	regional
<i>Leucopogon biflorus</i>	regional
<i>Leucopogon hookeri</i>	regional
<i>Leucopogon lanceolatus</i>	regional
<i>Leucopogon microphyllus</i>	regional
<i>Leucopogon virgatus</i>	regional
<i>Libertia paniculata</i>	regional
<i>Lilaeopsis polyantha</i>	regional
<i>Linum marginale</i>	regional
<i>Lipocarpha microcephala</i>	regional
<i>Lissanthe strigosa</i> subsp. <i>subulata</i>	regional
<i>Logania albiflora</i>	regional
<i>Lomandra collina</i>	regional
<i>Lomandra confertifolia</i>	regional

Name	Conservation Rank
<i>Lomandra confertifolia</i> subsp. <i>pallida</i>	regional
<i>Lomandra effusa</i>	regional
<i>Lomandra glauca</i>	regional
<i>Lomandra leucocephala</i> subsp. <i>leucocephala</i>	regional
<i>Lomatia arborescens</i>	regional
<i>Lotus australis</i>	regional
<i>Lotus cruentus</i>	regional
<i>Ludwigia peploides</i> subsp. <i>montevidensis</i>	regional
<i>Luzula densiflora</i>	regional
<i>Lycium australe</i>	regional
<i>Lysiana exocarpi</i>	regional
<i>Lysiana exocarpi</i> subsp. <i>tenuis</i>	regional
<i>Lysiana subfalcata</i>	regional
<i>Lythrum hyssopifolia</i>	regional
<i>Macrozamia concinna</i>	regional
<i>Macrozamia plurinervia</i>	regional
<i>Macrozamia stenomera</i>	regional
<i>Maireana aphylla</i>	regional
<i>Maireana brevifolia</i>	regional
<i>Maireana coronata</i>	regional
<i>Maireana decalvans</i>	regional
<i>Maireana enchylaenoides</i>	regional
<i>Maireana microcarpa</i>	regional
<i>Maireana pentagona</i>	regional
<i>Malvastrum coromandelianum</i>	regional
<i>Marsdenia australis</i>	regional
<i>Marsdenia pleiadenia</i>	regional
<i>Marsdenia rostrata</i>	regional
<i>Marsdenia viridiflora</i> subsp. <i>viridiflora</i>	regional
<i>Marsilea costulifera</i>	regional
<i>Marsilea hirsuta</i>	regional
<i>Maytenus bilocularis</i>	regional
<i>Melaleuca bracteata</i>	regional
<i>Melaleuca densispicata</i>	regional
<i>Melaleuca ericifolia</i>	regional
<i>Melaleuca erubescens</i>	regional
<i>Melaleuca lanceolata</i>	regional
<i>Melaleuca trichostachya</i>	regional
<i>Melhania oblongifolia</i>	regional
<i>Melia azedarach</i>	regional
<i>Melichrus erubescens</i>	regional
<i>Melichrus procumbens</i>	regional
<i>Melicope micrococca</i>	regional
<i>Mentha diemenica</i>	regional
<i>Mentha satureioides</i>	regional
<i>Micrantheum ericoides</i>	regional
<i>Micromyrtus ciliata</i>	regional
<i>Micromyrtus striata</i>	regional
<i>Microseris lanceolata</i>	regional
<i>Microtis parviflora</i>	regional
<i>Mimulus gracilis</i>	regional
<i>Mimulus prostratus</i>	regional
<i>Minuria integerrima</i>	regional
<i>Minuria leptophylla</i>	regional
<i>Mitrasacme paludosa</i>	regional
<i>Mitrasacme polymorpha</i>	regional
<i>Muellerina bidwillii</i>	regional
<i>Muellerina eucalyptoides</i>	regional

Name	Conservation Rank
<i>Murdannia graminea</i>	regional
<i>Myoporum platycarpum</i>	regional
<i>Myriocephalus rhizocephalus</i>	regional
<i>Myriophyllum gracile</i> var <i>gracile</i>	regional
<i>Myriophyllum pedunculatum</i>	regional
<i>Myriophyllum striatum</i>	regional
<i>Myriophyllum variifolium</i>	regional
<i>Myriophyllum verrucosum</i>	regional
<i>Nematolepis squamea</i> subsp. <i>squamea</i>	regional
<i>Neptunia gracilis</i> f <i>gracilis</i>	regional
<i>Nicotiana megalosiphon</i> subsp. <i>megalosiphon</i>	regional
<i>Nicotiana suaveolens</i>	regional
<i>Nitraria billardiieri</i>	regional
<i>Notelaea linearis</i>	regional
<i>Notelaea longifolia</i>	regional
<i>Notothixos cornifolius</i>	regional
<i>Nyssanthes diffusa</i>	regional
<i>Nyssanthes erecta</i>	regional
<i>Olax stricta</i>	regional
<i>Olearia alpicola</i>	regional
<i>Olearia canescens</i>	regional
<i>Olearia decurrens</i>	regional
<i>Olearia microphylla</i>	regional
<i>Olearia pimeleoides</i>	regional
<i>Olearia ramosissima</i>	regional
<i>Olearia viscidula</i>	regional
<i>Omalthanthus populifolius</i>	regional
<i>Oncinocalyx betchei</i>	regional
<i>Opercularia aspera</i>	regional
<i>Opercularia hispida</i>	regional
<i>Opercularia varia</i>	regional
<i>Ophioglossum lusitanicum</i>	regional
<i>Oplismenus aemulus</i>	regional
<i>Oplismenus imbecillis</i>	regional
<i>Oreomyrrhis eriopoda</i>	regional
<i>Owenia acidula</i>	regional
<i>Ozothamnus diotophyllus</i>	regional
<i>Ozothamnus obcordatus</i>	regional
<i>Palmeria scandens</i>	regional
<i>Pandorea pandorana</i>	regional
<i>Panicum buncei</i>	regional
<i>Panicum laevinode</i>	regional
<i>Panicum queenslandicum</i> var <i>queenslandicum</i>	regional
<i>Panicum subxerophilum</i>	regional
<i>Papaver aculeatum</i>	regional
<i>Paractaenum novae-hollandiae</i>	regional
<i>Parietaria debilis</i>	regional
<i>Parsonsia lanceolata</i>	regional
<i>Paspalidium albovillosum</i>	regional
<i>Paspalidium caespitosum</i>	regional
<i>Paspalidium distans</i>	regional
<i>Paspalidium gausum</i>	regional
<i>Paspalidium globoideum</i>	regional
<i>Patersonia glabrata</i>	regional
<i>Pelargonium inodorum</i>	regional
<i>Pellaea falcata</i>	regional
<i>Pellaea paradoxa</i>	regional
<i>Pennantia cunninghamii</i>	regional

Name	Conservation Rank
<i>Perotis rara</i>	regional
<i>Persicaria attenuata</i>	regional
<i>Persicaria decipiens</i>	regional
<i>Persicaria hydropiper</i>	regional
<i>Persicaria maculosa</i>	regional
<i>Persicaria prostrata</i>	regional
<i>Persicaria subsessilis</i>	regional
<i>Persoonia cornifolia</i>	regional
<i>Persoonia terminalis</i>	regional
<i>Petalostigma pubescens</i>	regional
<i>Petalostigma triloculare</i>	regional
<i>Petunia axillaris</i>	regional
<i>Phebalium glandulosum</i>	regional
<i>Phebalium glandulosum</i> subsp. <i>glandulosum</i>	regional
<i>Phebalium nottii</i>	regional
<i>Phebalium squamulosum</i> subsp. <i>gracile</i>	regional
<i>Phebalium squamulosum</i> subsp. <i>squamulosum</i>	regional
<i>Philothea ciliata</i>	regional
<i>Philothea difformis</i>	regional
<i>Philothea difformis</i> subsp. <i>difformis</i>	regional
<i>Philothea myoporoides</i> subsp. <i>acuta</i>	regional
<i>Phlegmatospermum cochlearinum</i>	regional
<i>Phyllanthus carpentariae</i>	regional
<i>Phyllanthus gunnii</i>	regional
<i>Phyllanthus subcrenulatus</i>	regional
<i>Picris angustifolia</i>	regional
<i>Pimelea curviflora</i> var. <i>divergens</i>	regional
<i>Pimelea curviflora</i> var. <i>sericea</i>	regional
<i>Pimelea latifolia</i>	regional
<i>Pimelea ligustrina</i>	regional
<i>Pimelea linifolia</i> subsp. <i>collina</i>	regional
<i>Pimelea linifolia</i> subsp. <i>linifolia</i>	regional
<i>Pimelea micrantha</i>	regional
<i>Pimelea neo-anglica</i>	regional
<i>Pimelea stricta</i>	regional
<i>Pimelea trichostachya</i>	regional
<i>Pittosporum multiflorum</i>	regional
<i>Pittosporum spinescens</i>	regional
<i>Planchonella cotinifolia</i>	regional
<i>Planchonella cotinifolia</i> var. <i>pubescens</i>	regional
<i>Plantago varia</i>	regional
<i>Platysace lanceolata</i>	regional
<i>Platysace linearifolia</i>	regional
<i>Plectranthus graveolens</i>	regional
<i>Pleurosorus rutifolius</i>	regional
<i>Poa sieberiana</i> var. <i>hirtella</i>	regional
<i>Podolepis arachnoidea</i>	regional
<i>Podolepis canescens</i>	regional
<i>Podolobium ilicifolium</i>	regional
<i>Polycarpaea corymbosa</i> var. <i>minor</i>	regional
<i>Polygala japonica</i>	regional
<i>Polygonum plebeium</i>	regional
<i>Polymeria longifolia</i>	regional
<i>Polymeria pusilla</i>	regional
<i>Polyscias sambucifolia</i>	regional
<i>Polyscias sambucifolia</i> subsp. <i>A</i>	regional
<i>Polystichum fallax</i>	regional
<i>Polystichum proliferum</i>	regional

Name	Conservation Rank
<i>Pomaderris angustifolia</i>	regional
<i>Pomaderris lanigera</i>	regional
<i>Poranthera corymbosa</i>	regional
<i>Portulaca bicolor</i> var <i>rosea</i>	regional
<i>Portulaca filifolia</i>	regional
<i>Potamogeton crispus</i>	regional
<i>Potamogeton tricarinatus</i>	regional
<i>Prostanthera granitica</i>	regional
<i>Prostanthera incisa</i>	regional
<i>Prostanthera lasianthos</i>	regional
<i>Prostanthera nivea</i>	regional
<i>Prostanthera nivea</i> var <i>nivea</i>	regional
<i>Prostanthera ovalifolia</i>	regional
<i>Prostanthera ringens</i>	regional
<i>Prostanthera rotundifolia</i>	regional
<i>Prostanthera saxicola</i>	regional
<i>Pteris tremula</i>	regional
<i>Pteris umbrosa</i>	regional
<i>Pterostylis bicolor</i>	regional
<i>Pterostylis coccinea</i>	regional
<i>Pterostylis decurva</i>	regional
<i>Pterostylis laxa</i>	regional
<i>Pterostylis longicurva</i>	regional
<i>Pterostylis mutica</i>	regional
<i>Pterostylis nana</i>	regional
<i>Pterostylis obtusa</i>	regional
<i>Pterostylis setifera</i>	regional
<i>Ptilotus erubescens</i>	regional
<i>Ptilotus exaltatus</i> var <i>exaltatus</i>	regional
<i>Ptilotus macrocephalus</i>	regional
<i>Ptilotus semilanatus</i>	regional
<i>Pultenaea boormanii</i>	regional
<i>Pultenaea cunninghamii</i>	regional
<i>Pultenaea microphylla</i>	regional
<i>Pultenaea petiolaris</i>	regional
<i>Pultenaea polifolia</i>	regional
<i>Pultenaea retusa</i>	regional
<i>Pultenaea</i> sp. G sensu Weston (1991)	regional
<i>Pultenaea villosa</i>	regional
<i>Pyrrosia rupestris</i>	regional
<i>Ranunculus amphitrichus</i>	regional
<i>Ranunculus collinus</i>	regional
<i>Ranunculus inundatus</i>	regional
<i>Ranunculus pumilio</i>	regional
<i>Ranunculus pumilio</i> var <i>pumilio</i>	regional
<i>Ranunculus sessiliflorus</i>	regional
<i>Ranunculus sessiliflorus</i> var <i>sessiliflorus</i>	regional
<i>Ranunculus undosus</i>	regional
<i>Rapanea howittiana</i>	regional
<i>Rapanea variabilis</i>	regional
<i>Rhagodia parabolica</i>	regional
<i>Rhodanthe anthemoides</i>	regional
<i>Rhodanthe corymbiflora</i>	regional
<i>Rhodanthe diffusa</i> subsp. <i>leucactina</i>	regional
<i>Rhodanthe floribunda</i>	regional
<i>Rhodanthe stuartiana</i>	regional
<i>Rhodanthe troedelii</i>	regional
<i>Rhyncharrhena linearis</i>	regional

Name	Conservation Rank
<i>Rhytidosporum diosmoides</i>	regional
<i>Ripogonum album</i>	regional
<i>Rorippa eustylis</i>	regional
<i>Rubus moluccanus</i> var <i>trilobus</i>	regional
<i>Rubus parvifolius</i>	regional
<i>Rubus rosifolius</i>	regional
<i>Rulingia dasyphylla</i>	regional
<i>Rumex crystallinus</i>	regional
<i>Rumex stenoglottis</i>	regional
<i>Rumex tenax</i>	regional
<i>Sacciolepis indica</i>	regional
<i>Salsola kali</i> s.l.	regional
<i>Salsola tragus</i>	regional
<i>Sambucus gaudichaudiana</i>	regional
<i>Santalum acuminatum</i>	regional
<i>Santalum lanceolatum</i>	regional
<i>Sarcostemma australe</i>	regional
<i>Scaevola humilis</i>	regional
<i>Scaevola parvibarbata</i>	regional
<i>Scaevola spinescens</i>	regional
<i>Schoenoplectus validus</i>	regional
<i>Schoenus latelaminatus</i>	regional
<i>Schoenus moorei</i>	regional
<i>Scleranthus biflorus</i>	regional
<i>Scleranthus pungens</i>	regional
<i>Sclerolaena bicornis</i>	regional
<i>Sclerolaena bicornis</i> var <i>horrida</i>	regional
<i>Sclerolaena calcarata</i>	regional
<i>Sclerolaena convexula</i>	regional
<i>Sclerolaena decurrens</i>	regional
<i>Sclerolaena divaricata</i>	regional
<i>Sclerolaena intricata</i>	regional
<i>Sclerolaena longicuspis</i>	regional
<i>Sclerolaena stelligera</i>	regional
<i>Sclerolaena tetracuspis</i>	regional
<i>Sclerolaena tricuspidis</i>	regional
<i>Scutellaria humilis</i>	regional
<i>Scutellaria mollis</i>	regional
<i>Senecio bipinnatisectus</i>	regional
<i>Senecio biserratus</i>	regional
<i>Senecio cunninghamii</i> var <i>cunninghamii</i>	regional
<i>Senecio diaschides</i>	regional
<i>Senecio glossanthus</i>	regional
<i>Senecio hispidulus</i>	regional
<i>Senecio hispidulus</i> var <i>dissectus</i>	regional
<i>Senecio hispidulus</i> var <i>hispidulus</i>	regional
<i>Senecio linearifolius</i>	regional
<i>Senecio minimus</i>	regional
<i>Senecio runcinifolius</i>	regional
<i>Senna aciphylla</i>	regional
<i>Senna barclayana</i>	regional
<i>Senna coronilloides</i>	regional
<i>Sesbania cannabina</i> var <i>cannabina</i>	regional
<i>Setaria paspalidioides</i>	regional
<i>Sicyos australis</i>	regional
<i>Sida fibulifera</i>	regional
<i>Sida filiformis</i>	regional
<i>Sida phaeotricha</i>	regional
<i>Sida</i> sp. A sensu Harden (1990)	regional
<i>Sida subspicata</i>	regional

Name	Conservation Rank
<i>Sigesbeckia australiensis</i>	regional
<i>Sisyrinchium</i> sp. A sensu James & Brown (1993)	regional
<i>Smilax australis</i>	regional
<i>Solanum aviculare</i>	regional
<i>Solanum brownii</i>	regional
<i>Solanum campanulatum</i>	regional
<i>Solanum cinereum</i>	regional
<i>Solanum cleistogamum</i>	regional
<i>Solanum ellipticum</i>	regional
<i>Solanum opacum</i>	regional
<i>Solanum papaverifolium</i>	regional
<i>Solanum prinophyllum</i>	regional
<i>Solanum pungetium</i>	regional
<i>Solanum semiarmatum</i>	regional
<i>Solanum tetrahectum</i>	regional
<i>Solanum vescum</i>	regional
<i>Solenogyne bellioides</i>	regional
<i>Solenogyne gunnii</i>	regional
<i>Sorghum leiocladum</i>	regional
<i>Spartothamnella juncea</i>	regional
<i>Spartothamnella puberula</i>	regional
<i>Spiranthes sinensis</i> subsp. <i>australis</i>	regional
<i>Sporobolus actinocladus</i>	regional
<i>Sporobolus elongatus</i>	regional
<i>Stellaria angustifolia</i>	regional
<i>Stellaria flaccida</i>	regional
<i>Stellaria multiflora</i>	regional
<i>Stellaria pungens</i>	regional
<i>Stemodia florulenta</i>	regional
<i>Stemodia glabella</i>	regional
<i>Stephania japonica</i>	regional
<i>Stephania japonica</i> var. <i>discolor</i>	regional
<i>Stuartina hamata</i>	regional
<i>Stuartina muelleri</i>	regional
<i>Styphelia viridis</i>	regional
<i>Swainsona affinis</i>	regional
<i>Swainsona behriana</i>	regional
<i>Swainsona cadellii</i>	regional
<i>Swainsona greyana</i>	regional
<i>Swainsona laxa</i>	regional
<i>Swainsona microphylla</i>	regional
<i>Swainsona oroboides</i>	regional
<i>Swainsona queenslandica</i>	regional
<i>Synaptantha tillaeacea</i>	regional
<i>Synoum glandulosum</i> subsp. <i>glandulosum</i>	regional
<i>Tasmannia stipitata</i>	regional
<i>Tetragonia moorei</i>	regional
<i>Tetrarrhena juncea</i>	regional
<i>Thellungia advena</i>	regional
<i>Thelymitra pauciflora</i>	regional
<i>Themeda avenacea</i>	regional
<i>Thysanotus patersonii</i>	regional
<i>Thysanotus tuberosus</i> subsp. <i>tuberosus</i>	regional
<i>Trachymene glaucifolia</i>	regional
<i>Trachymene incisa</i>	regional
<i>Trachymene incisa</i> subsp. <i>corrugata</i>	regional
<i>Trachymene ochracea</i>	regional
<i>Trema tomentosa</i> var. <i>viridis</i>	regional
<i>Trianthema triquetra</i>	regional
<i>Tribulus micrococcus</i>	regional
<i>Triglochin calcitrapum</i>	regional

Name	Conservation Rank
<i>Triodia scariosa</i> subsp. <i>scariosa</i>	regional
<i>Tylophora barbata</i>	regional
<i>Typhonium brownii</i>	regional
<i>Utricularia dichotoma</i>	regional
<i>Vallisneria gigantea</i>	regional
<i>Velleia paradoxa</i>	regional
<i>Ventilago viminalis</i>	regional
<i>Vetiveria filipes</i>	regional
<i>Viola betonicifolia</i>	regional
<i>Vittadinia cuneata</i> var. <i>hirsuta</i>	regional
<i>Vittadinia dissecta</i>	regional
<i>Vittadinia gracilis</i>	regional
<i>Vittadinia tenuissima</i>	regional
<i>Wahlenbergia graniticola</i>	regional
<i>Wahlenbergia littoricola</i>	regional
<i>Wahlenbergia tumidifructa</i>	regional
<i>Westringia eremicola</i>	regional
<i>Westringia rigida</i>	regional
<i>Wurmbea dioica</i> subsp. <i>dioica</i>	regional
<i>Xanthorrhoea glauca</i>	regional
<i>Xanthorrhoea johnsonii</i>	regional
<i>Xylomelum cunninghamianum</i>	regional
<i>Xylomelum pyriforme</i>	regional
<i>Xyris complanata</i>	regional
<i>Zaleya galericulata</i>	regional
<i>Zaleya galericulata</i> subsp. <i>australis</i>	regional
<i>Zehneria cunninghamii</i>	regional
<i>Zornia dyctiocarpa</i> var. <i>dyctiocarpa</i>	regional
<i>Zornia floribunda</i>	regional
<i>Zygophyllum apiculatum</i>	regional
<i>Zygophyllum glaucum</i>	regional
<i>Zygophyllum iodocarpum</i>	regional
<i>Callerya megasperma</i>	regional/dubious record
<i>Daviesia villifera</i>	regional/dubious record
<i>Eucalyptus bancroftii</i>	regional/dubious record
<i>Pluchea dentex</i>	regional/dubious record
<i>Abutilon cryptopetalum</i>	Local
<i>Abutilon fraseri</i>	Local
<i>Abutilon leucopetalum</i>	Local
<i>Abutilon malvifolium</i>	Local
<i>Abutilon oxycarpum</i>	Local
<i>Abutilon tubulosum</i>	Local
<i>Acacia acinacea</i>	Local
<i>Acacia amblygona</i>	Local
<i>Acacia aureocrinita</i>	Local
<i>Acacia baileyana</i>	Local
<i>Acacia betchei</i>	Local
<i>Acacia blakei</i> subsp. <i>diphylla</i>	Local
<i>Acacia brownii</i>	Local
<i>Acacia burrowii</i>	Local
<i>Acacia buxifolia</i>	Local
<i>Acacia buxifolia</i> subsp. <i>buxifolia</i>	Local
<i>Acacia buxifolia</i> subsp. <i>pubiflora</i>	Local
<i>Acacia caesiella</i>	Local
<i>Acacia calamifolia</i>	Local
<i>Acacia cardiophylla</i>	Local
<i>Acacia caroleae</i>	Local
<i>Acacia cheelii</i>	Local
<i>Acacia concurrens</i>	Local

Name	Conservation Rank
<i>Acacia conferta</i>	Local
<i>Acacia crassa</i> subsp. <i>crassa</i>	Local
<i>Acacia cultriformis</i>	Local
<i>Acacia dealbata</i>	Local
<i>Acacia deanei</i>	Local
<i>Acacia deanei</i> subsp. <i>deanei</i>	Local
<i>Acacia deanei</i> subsp. <i>paucijuga</i>	Local
<i>Acacia debilis</i>	Local
<i>Acacia decora</i>	Local
<i>Acacia doratoxylon</i>	Local
<i>Acacia dorothea</i>	Local
<i>Acacia elongata</i>	Local
<i>Acacia excelsa</i>	Local
<i>Acacia farnesiana</i>	Local
<i>Acacia gladiiformis</i>	Local
<i>Acacia hakeoides</i>	Local
<i>Acacia implexa</i>	Local
<i>Acacia longifolia</i>	Local
<i>Acacia penninervis</i>	Local
<i>Acacia pilligaensis</i>	Local
<i>Acacia polybotrya</i>	Local
<i>Acacia salicina</i>	Local
<i>Acacia spectabilis</i>	Local
<i>Acacia tindaleae</i>	Local
<i>Acacia triptera</i>	Local
<i>Acacia verniciflua</i>	Local
<i>Acaena novae-zelandiae</i>	Local
<i>Actinotus gibbonsii</i>	Local
<i>Actinotus helianthi</i>	Local
<i>Ajuga australis</i>	Local
<i>Allocasuarina diminuta</i>	Local
<i>Allocasuarina diminuta</i> subsp. <i>diminuta</i>	Local
<i>Allocasuarina gymnanthera</i>	Local
<i>Allocasuarina luehmannii</i>	Local
<i>Alphitonia excelsa</i>	Local
<i>Alstonia constricta</i>	Local
<i>Alternanthera denticulata</i>	Local
<i>Amyema linophyllum</i> subsp. <i>orientale</i>	Local
<i>Amyema miquelii</i>	Local
<i>Ancistrachne uncinulata</i>	Local
<i>Angophora floribunda</i>	Local
<i>Angophora leiocarpa</i>	Local
<i>Aotus mollis</i>	Local
<i>Apophyllum anomalum</i>	Local
<i>Arenaria leptoclados</i>	Local
<i>Aristida caput-medusae</i>	Local
<i>Aristida jerichoensis</i>	Local
<i>Aristida jerichoensis</i> var. <i>jerichoensis</i>	Local
<i>Aristida jerichoensis</i> var. <i>subspinulifera</i>	Local
<i>Aristida ramosa</i>	Local
<i>Aristida ramosa</i> var. <i>ramosa</i>	Local
<i>Aristida ramosa</i> var. <i>speciosa</i>	Local
<i>Aristida vagans</i>	Local
<i>Arthropodium milleflorum</i>	Local
<i>Arthropodium minus</i>	Local
<i>Arundinella nepalensis</i>	Local
<i>Asperula conferta</i>	Local
<i>Astrebla elymoides</i>	Local

Name	Conservation Rank
<i>Astrebla lappacea</i>	Local
<i>Astrebla pectinata</i>	Local
<i>Astroloma humifusum</i>	Local
<i>Atriplex leptocarpa</i>	Local
<i>Atriplex semibaccata</i>	Local
<i>Austrodanthonia bipartita</i>	Local
<i>Austrodanthonia caespitosa</i>	Local
<i>Austrodanthonia eriantha</i>	Local
<i>Austrodanthonia fulva</i>	Local
<i>Austrodanthonia induta</i>	Local
<i>Austrodanthonia laevis</i>	Local
<i>Austrodanthonia pilosa</i>	Local
<i>Austrodanthonia racemosa</i>	Local
<i>Austrodanthonia racemosa</i> var <i>obtusata</i>	Local
<i>Austrodanthonia racemosa</i> var <i>racemosa</i>	Local
<i>Austrodanthonia setacea</i>	Local
<i>Austrostipa aristiglumis</i>	Local
<i>Austrostipa densiflora</i>	Local
<i>Austrostipa rudis</i>	Local
<i>Austrostipa rudis</i> subsp. <i>nervosa</i>	Local
<i>Austrostipa scabra</i>	Local
<i>Austrostipa scabra</i> subsp. <i>falcata</i>	Local
<i>Austrostipa scabra</i> subsp. <i>scabra</i>	Local
<i>Austrostipa setacea</i>	Local
<i>Austrostipa verticillata</i>	Local
<i>Banksia integrifolia</i>	Local
<i>Beyeria viscosa</i>	Local
<i>Boerhavia dominii</i>	Local
<i>Boronia bipinnata</i>	Local
<i>Boronia glabra</i>	Local
<i>Bossiaea rhombifolia</i>	Local
<i>Bossiaea rhombifolia</i> subsp. <i>concolor</i>	Local
<i>Bothriochloa decipiens</i>	Local
<i>Bothriochloa macra</i>	Local
<i>Brachychiton populneus</i>	Local
<i>Brachychiton populneus</i> subsp. <i>populneus</i>	Local
<i>Brachyloma daphnoides</i>	Local
<i>Brachyloma daphnoides</i> subsp. <i>daphnoides</i>	Local
<i>Brachyloma daphnoides</i> subsp. <i>pubescens</i> JTHunter	Local
<i>Brachyscome goniocarpa</i>	Local
<i>Brachyscome multifida</i>	Local
<i>Brachyscome multifida</i> var <i>multifida</i>	Local
<i>Bracteantha bracteata</i>	Local
<i>Bracteantha viscosa</i>	Local
<i>Bromus molliformis</i>	Local
<i>Brunonia australis</i>	Local
<i>Brunoniella australis</i>	Local
<i>Bulbine bulbosa</i>	Local
<i>Bulbine semibarbata</i>	Local
<i>Calandrinia eremaea</i>	Local
<i>Callistemon pallidus</i>	Local
<i>Callitris columellaris</i>	Local
<i>Callitris endlicheri</i>	Local
<i>Calochilus robertsonii</i>	Local
<i>Calotis cuneata</i>	Local
<i>Calotis cuneifolia</i>	Local
<i>Calotis lappulacea</i>	Local
<i>Calytrix tetragona</i>	Local

Name	Conservation Rank
<i>Canthium odoratum</i>	Local
<i>Canthium oleifolium</i>	Local
<i>Capparis mitchellii</i>	Local
<i>Carex appressa</i>	Local
<i>Carex breviculmis</i>	Local
<i>Carex inversa</i>	Local
<i>Cassinia arcuata</i>	Local
<i>Cassinia laevis</i>	Local
<i>Cassytha glabella</i>	Local
<i>Cassytha pubescens</i>	Local
<i>Casuarina cristata</i>	Local
<i>Centipeda cunninghamii</i>	Local
<i>Centipeda minima</i>	Local
<i>Centipeda thespidioides</i>	Local
<i>Chamaesyce dallachyana</i>	Local
<i>Chamaesyce drummondii</i>	Local
<i>Cheilanthes austrotenuifolia</i>	Local
<i>Cheilanthes distans</i>	Local
<i>Cheilanthes sieberi</i>	Local
<i>Cheilanthes sieberi</i> subsp. <i>sieberi</i>	Local
<i>Chloanthes parviflora</i>	Local
<i>Chloris truncata</i>	Local
<i>Chloris ventricosa</i>	Local
<i>Chrysocephalum apiculatum</i>	Local
<i>Chrysocephalum semipapposum</i>	Local
<i>Cleistochloa rigida</i>	Local
<i>Clematis aristata</i>	Local
<i>Clematis microphylla</i>	Local
<i>Clematis microphylla</i> var <i>microphylla</i>	Local
<i>Commelina cyanea</i>	Local
<i>Convolvulus erubescens</i>	Local
<i>Corymbia dolichocarpa</i>	Local
<i>Corymbia maculata</i>	Local
<i>Corymbia trachyphloia</i>	Local
<i>Crassula sieberiana</i>	Local
<i>Crinum flaccidum</i>	Local
<i>Cryptandra amara</i> var <i>floribunda</i>	Local
<i>Cullen tenax</i>	Local
<i>Cyanicula caerulea</i>	Local
<i>Cymbonotus lawsonianus</i>	Local
<i>Cymbopogon refractus</i>	Local
<i>Cynodon dactylon</i>	Local
<i>Cynoglossum australe</i>	Local
<i>Cyperus fulvus</i>	Local
<i>Cyperus gracilis</i>	Local
<i>Dactyloctenium radulans</i>	Local
<i>Dampiera lanceolata</i> var <i>lanceolata</i>	Local
<i>Dampiera purpurea</i>	Local
<i>Daucus glochidiatus</i>	Local
<i>Daucus glochidiatus</i> form D	Local
<i>Daviesia acicularis</i>	Local
<i>Daviesia ulicifolia</i>	Local
<i>Desmodium brachypodum</i>	Local
<i>Desmodium varians</i>	Local
<i>Dianella 'admixta'</i>	Local
<i>Dianella caerulea</i>	Local
<i>Dianella caerulea</i> var <i>caerulea</i>	Local
<i>Dianella longifolia</i>	Local

Name	Conservation Rank
<i>Dianella longifolia</i> var <i>longifolia</i>	Local
<i>Dianella revoluta</i>	Local
<i>Dianella revoluta</i> var <i>revoluta</i>	Local
<i>Dianella revoluta</i> var <i>vinosa</i>	Local
<i>Dianella</i> sp. aff. <i>revoluta</i> 'Pilliga'	Local
<i>Dichanthium sericeum</i>	Local
<i>Dichanthium sericeum</i> subsp. <i>sericeum</i>	Local
<i>Dichelachne crinita</i>	Local
<i>Dichelachne inaequiglumis</i>	Local
<i>Dichelachne micrantha</i>	Local
<i>Dichondra repens</i>	Local
<i>Dichondra</i> sp. A sensu Harden (1992)	Local
<i>Dichopogon fimbriatus</i>	Local
<i>Digitaria ammophila</i>	Local
<i>Digitaria breviglumis</i>	Local
<i>Digitaria brownii</i>	Local
<i>Digitaria diffusa</i>	Local
<i>Digitaria longiflora</i>	Local
<i>Dillwynia sericea</i>	Local
<i>Diospyros australis</i>	Local
<i>Dodonaea falcata</i>	Local
<i>Dodonaea heteromorpha</i>	Local
<i>Dodonaea peduncularis</i>	Local
<i>Dodonaea viscosa</i>	Local
<i>Dodonaea viscosa</i> subsp. <i>angustifolia</i>	Local
<i>Dodonaea viscosa</i> subsp. <i>angustissima</i>	Local
<i>Dodonaea viscosa</i> subsp. <i>cuneata</i>	Local
<i>Dodonaea viscosa</i> subsp. <i>mucronata</i>	Local
<i>Dodonaea viscosa</i> subsp. <i>spatulata</i>	Local
<i>Echinopogon ovatus</i>	Local
<i>Einadia hastata</i>	Local
<i>Einadia nutans</i>	Local
<i>Einadia nutans</i> subsp. <i>linifolia</i>	Local
<i>Einadia nutans</i> subsp. <i>nutans</i>	Local
<i>Einadia polygonoides</i>	Local
<i>Einadia trigonos</i>	Local
<i>Elymus scaber</i>	Local
<i>Elymus scaber</i> var <i>scaber</i>	Local
<i>Enchylaena tomentosa</i>	Local
<i>Enchylaena tomentosa</i> var <i>tomentosa</i>	Local
<i>Enteropogon acicularis</i>	Local
<i>Entolasia stricta</i>	Local
<i>Epaltes australis</i>	Local
<i>Eragrostis brownii</i>	Local
<i>Eragrostis elongata</i>	Local
<i>Eragrostis lacunaria</i>	Local
<i>Eragrostis leptostachya</i>	Local
<i>Eragrostis parviflora</i>	Local
<i>Eragrostis setifolia</i>	Local
<i>Eragrostis sororia</i>	Local
<i>Eremophila debilis</i>	Local
<i>Eremophila longifolia</i>	Local
<i>Eremophila mitchellii</i>	Local
<i>Eriochloa pseudoacrotricha</i>	Local
<i>Erodium crinitum</i>	Local
<i>Eucalyptus albens</i>	Local
<i>Eucalyptus blakelyi</i>	Local
<i>Eucalyptus camaldulensis</i>	Local

Name	Conservation Rank
<i>Eucalyptus chloroclada</i>	Local
<i>Eucalyptus conica</i>	Local
<i>Eucalyptus crebra</i>	Local
<i>Eucalyptus dealbata</i>	Local
<i>Eucalyptus dwyeri</i>	Local
<i>Eucalyptus fibrosa</i>	Local
<i>Eucalyptus macrorhyncha</i>	Local
<i>Eucalyptus melanophloia</i>	Local
<i>Eucalyptus melliodora</i>	Local
<i>Eucalyptus microcarpa</i>	Local
<i>Eucalyptus nubila</i>	Local
<i>Eucalyptus pilligaensis</i>	Local
<i>Eucalyptus populnea</i> subsp. <i>bimbil</i>	Local
<i>Eucalyptus rossii</i>	Local
<i>Eucalyptus sideroxylon</i>	Local
<i>Eucalyptus sparsifolia</i>	Local
<i>Eucalyptus viridis</i>	Local
<i>Euchiton gymnocephalus</i>	Local
<i>Euchiton involucratus</i>	Local
<i>Euchiton sphaericus</i>	Local
<i>Eulalia aurea</i>	Local
<i>Euphrasia collina</i>	Local
<i>Eustrephus latifolius</i>	Local
<i>Evolvulus alsinoides</i>	Local
<i>Evolvulus alsinoides</i> var. <i>decumbens</i>	Local
<i>Exocarpos aphyllus</i>	Local
<i>Exocarpos cupressiformis</i>	Local
<i>Fimbristylis dichotoma</i>	Local
<i>Gahnia aspera</i>	Local
<i>Galium gaudichaudii</i>	Local
<i>Geijera parviflora</i>	Local
<i>Geranium homeanum</i>	Local
<i>Glossogyne tannensis</i>	Local
<i>Glycine canescens</i>	Local
<i>Glycine clandestina</i>	Local
<i>Glycine tabacina</i>	Local
<i>Gonocarpus elatus</i>	Local
<i>Gonocarpus tetragynus</i>	Local
<i>Gonocarpus teucrioides</i>	Local
<i>Goodenia cycloptera</i>	Local
<i>Goodenia glabra</i>	Local
<i>Goodenia hederacea</i>	Local
<i>Goodenia hederacea</i> subsp. <i>hederacea</i>	Local
<i>Goodenia heterophylla</i> subsp. <i>heterophylla</i>	Local
<i>Goodenia paniculata</i>	Local
<i>Goodenia rotundifolia</i>	Local
<i>Grevillea arenaria</i>	Local
<i>Grevillea floribunda</i> subsp. <i>floribunda</i>	Local
<i>Grevillea triternata</i>	Local
<i>Haloragis aspera</i>	Local
<i>Haloragis heterophylla</i>	Local
<i>Hardenbergia violacea</i>	Local
<i>Hibbertia incana</i>	Local
<i>Hibbertia obtusifolia</i>	Local
<i>Hibbertia riparia</i>	Local
<i>Hibiscus sturtii</i>	Local
<i>Hibiscus sturtii</i> var. <i>sturtii</i>	Local
<i>Homopholis proluta</i>	Local

Name	Conservation Rank
<i>Homoranthus flavescens</i>	Local
<i>Hovea lanceolata</i>	Local
<i>Hybanthus monopetalus</i>	Local
<i>Hydrocotyle laxiflora</i>	Local
<i>Hypericum gramineum</i>	Local
<i>Hypericum japonicum</i>	Local
<i>Imperata cylindrica</i> var <i>major</i>	Local
<i>Indigofera adesmiifolia</i>	Local
<i>Indigofera australis</i>	Local
<i>Indigofera signata</i>	Local
<i>Isopogon petiolaris</i>	Local
<i>Jasminum lineare</i>	Local
<i>Joycea pallida</i>	Local
<i>Juncus aridicola</i>	Local
<i>Juncus continuus</i>	Local
<i>Juncus filicaulis</i>	Local
<i>Juncus ochrocoleus</i>	Local
<i>Juncus planifolius</i>	Local
<i>Juncus remotiflorus</i>	Local
<i>Juncus subsecundus</i>	Local
<i>Juncus usitatus</i>	Local
<i>Kunzea ambigua</i>	Local
<i>Lachnagrostis filiformis</i>	Local
<i>Lagenifera stipitata</i>	Local
<i>Laxmannia compacta</i>	Local
<i>Laxmannia gracilis</i>	Local
<i>Lepidium pseudohyssopifolium</i>	Local
<i>Lepidosperma laterale</i>	Local
<i>Leptochloa ciliolata</i>	Local
<i>Leptospermum parvifolium</i>	Local
<i>Leptospermum polygalifolium</i>	Local
<i>Leptospermum polygalifolium</i> subsp. <i>transmontanum</i>	Local
<i>Leucopogon muticus</i>	Local
<i>Leucopogon parviflorus</i>	Local
<i>Levenhookia dubia</i>	Local
<i>Lissanthe strigosa</i>	Local
<i>Lissanthe strigosa</i> subsp. <i>strigosa</i>	Local
<i>Lobelia gibbosa</i>	Local
<i>Lomandra filiformis</i>	Local
<i>Lomandra filiformis</i> subsp. <i>coriacea</i>	Local
<i>Lomandra filiformis</i> subsp. <i>filiformis</i>	Local
<i>Lomandra filiformis</i> subsp. <i>flavior</i>	Local
<i>Lomandra leucocephala</i>	Local
<i>Lomandra longifolia</i>	Local
<i>Lomandra multiflora</i> subsp. <i>multiflora</i>	Local
<i>Luzula flaccida</i>	Local
<i>Macrozamia diplomera</i>	Local
<i>Macrozamia heteromera</i>	Local
<i>Macrozamia secunda</i>	Local
<i>Maireana microphylla</i>	Local
<i>Marsilea drummondii</i>	Local
<i>Maytenus cunninghamii</i>	Local
<i>Medicago sativa</i>	Local
<i>Melaleuca thymifolia</i>	Local
<i>Melaleuca uncinata</i>	Local
<i>Melichrus urceolatus</i>	Local
<i>Melilotus indicus</i>	Local
<i>Microlaena stipoides</i>	Local

Name	Conservation Rank
<i>Microlaena stipoides</i> var <i>stipoides</i>	Local
<i>Micromyrtus sessilis</i>	Local
<i>Microtis unifolia</i>	Local
<i>Mirbelia pungens</i>	Local
<i>Monotoca scoparia</i>	Local
<i>Muehlenbeckia florulenta</i>	Local
<i>Myoporum montanum</i>	Local
<i>Notelaea microcarpa</i>	Local
<i>Notelaea microcarpa</i> var <i>microcarpa</i>	Local
<i>Notelaea microcarpa</i> var <i>velutina</i>	Local
<i>Notodanthonia longifolia</i>	Local
<i>Olearia elliptica</i>	Local
<i>Olearia ramulosa</i>	Local
<i>Opercularia diphylla</i>	Local
<i>Oxalis chnoodes</i>	Local
<i>Oxalis exilis</i>	Local
<i>Oxalis perennans</i>	Local
<i>Oxalis radicata</i>	Local
<i>Ozothamnus diosmifolius</i>	Local
<i>Panicum decompositum</i>	Local
<i>Panicum effusum</i>	Local
<i>Panicum queenslandicum</i>	Local
<i>Panicum simile</i>	Local
<i>Parsonsia eucalyptophylla</i>	Local
<i>Paspalidium aversum</i>	Local
<i>Paspalidium constrictum</i>	Local
<i>Paspalidium gracile</i>	Local
<i>Paspalidium jubiflorum</i>	Local
<i>Paspalum distichum</i>	Local
<i>Patersonia sericea</i>	Local
<i>Persicaria lapathifolia</i>	Local
<i>Persoonia curvifolia</i>	Local
<i>Persoonia cuspidifera</i>	Local
<i>Persoonia sericea</i>	Local
<i>Phebalium squamulosum</i>	Local
<i>Philothea salsolifolia</i> subsp. <i>salsolifolia</i>	Local
<i>Philydrum lanuginosum</i>	Local
<i>Phragmites australis</i>	Local
<i>Phyllanthus hirtellus</i>	Local
<i>Phyllanthus virgatus</i>	Local
<i>Pimelea curviflora</i>	Local
<i>Pimelea linifolia</i>	Local
<i>Pimelea microcephala</i> subsp. <i>microcephala</i>	Local
<i>Pittosporum angustifolium</i>	Local
<i>Pittosporum undulatum</i>	Local
<i>Plantago cunninghamii</i>	Local
<i>Plantago debilis</i>	Local
<i>Plantago turrifera</i>	Local
<i>Platysace ericoides</i>	Local
<i>Platysace</i> sp. aff. <i>linearifolia</i>	Local
<i>Plectranthus parviflorus</i>	Local
<i>Poa labillardierei</i> var <i>labillardierei</i>	Local
<i>Poa sieberiana</i>	Local
<i>Poa sieberiana</i> var <i>sieberiana</i>	Local
<i>Podolepis jaceoides</i>	Local
<i>Podolepis neglecta</i>	Local
<i>Pomax umbellata</i>	Local
<i>Poranthera microphylla</i>	Local

Name	Conservation Rank
<i>Portulaca oleracea</i>	Local
<i>Prasophyllum patens</i>	Local
<i>Pratia concolor</i>	Local
<i>Pratia purpurascens</i>	Local
<i>Prostanthera howelliae</i>	Local
<i>Pseuderanthemum variable</i>	Local
<i>Pseudognaphalium luteo-album</i>	Local
<i>Pteridium esculentum</i>	Local
<i>Pterostylis boormanii</i>	Local
<i>Pterostylis parviflora</i>	Local
<i>Pultenaea cinerascens</i>	Local
<i>Pultenaea foliolosa</i>	Local
<i>Pycnosorus globosus</i>	Local
<i>Ranunculus lappaceus</i>	Local
<i>Rhagodia spinescens</i>	Local
<i>Rhynchosia minima</i>	Local
<i>Ricinocarpos bowmanii</i>	Local
<i>Rostellularia adscendens</i> var <i>adscendens</i>	Local
<i>Rumex brownii</i>	Local
<i>Schoenus apogon</i>	Local
<i>Schoenus ericetorum</i>	Local
<i>Schoenus kennyi</i>	Local
<i>Scleria mackaviensis</i>	Local
<i>Sclerolaena birchii</i>	Local
<i>Sclerolaena diacantha</i>	Local
<i>Sclerolaena muricata</i>	Local
<i>Sclerolaena muricata</i> var <i>muricata</i>	Local
<i>Sclerolaena muricata</i> var <i>semiglabra</i>	Local
<i>Sclerolaena muricata</i> var <i>villosa</i>	Local
<i>Senecio lautus</i>	Local
<i>Senecio lautus</i> subsp. <i>dissectifolius</i>	Local
<i>Senecio quadridentatus</i>	Local
<i>Senecio</i> sp. E sensu Harden (1992)	Local
<i>Senna artemisioides</i>	Local
<i>Senna</i> form taxon 'artemisioides'	Local
<i>Senna</i> form taxon 'zygophylla'	Local
<i>Sida corrugata</i>	Local
<i>Sida cunninghamii</i>	Local
<i>Sida spinosa</i>	Local
<i>Sida trichopoda</i>	Local
<i>Sigesbeckia orientalis</i> subsp. <i>orientalis</i>	Local
<i>Sisymbrium irio</i>	Local
<i>Solanum esuriale</i>	Local
<i>Solanum ferocissimum</i>	Local
<i>Solanum parvifolium</i>	Local
<i>Sporobolus caroli</i>	Local
<i>Sporobolus creber</i>	Local
<i>Sporobolus mitchellii</i>	Local
<i>Stackhousia monogyna</i>	Local
<i>Stackhousia muricata</i>	Local
<i>Stackhousia viminea</i>	Local
<i>Stylidium eglandulosum</i>	Local
<i>Stylidium graminifolium</i>	Local
<i>Stypandra glauca</i>	Local
<i>Styphelia triflora</i>	Local
<i>Swainsona galegifolia</i>	Local
<i>Templetonia stenophylla</i>	Local
<i>Teucrium racemosum</i>	Local
<i>Themeda australis</i>	Local
<i>Thyridolepis mitchelliana</i>	Local

Name	Conservation Rank
<i>Thysanotus tuberosus</i>	Local
<i>Tragus australianus</i>	Local
<i>Tribulus terrestris</i>	Local
<i>Tricoryne elatior</i>	Local
<i>Triodia mitchellii</i>	Local
<i>Triodia mitchellii</i> var <i>pubivagina</i>	Local
<i>Tripogon loliiformis</i>	Local
<i>Triptilodiscus pygmaeus</i>	Local
<i>Tristaniopsis laurina</i>	Local
<i>Typha domingensis</i>	Local
<i>Typha orientalis</i>	Local
<i>Urtica incisa</i>	Local
<i>Vernonia cinerea</i>	Local
<i>Vernonia cinerea</i> var <i>cinerea</i>	Local
<i>Veronica calycina</i>	Local
<i>Veronica plebeia</i>	Local
<i>Viola hederacea</i>	Local
<i>Vittadinia cervicalis</i>	Local
<i>Vittadinia cervicalis</i> var <i>cervicalis</i>	Local
<i>Vittadinia cervicalis</i> var <i>subcervicalis</i>	Local
<i>Vittadinia cuneata</i>	Local
<i>Vittadinia cuneata</i> var <i>cuneata</i>	Local
<i>Vittadinia cuneata</i> var <i>cuneata</i> f <i>cuneata</i>	Local
<i>Vittadinia dissecta</i> var <i>hirta</i>	Local
<i>Vittadinia muelleri</i>	Local
<i>Vittadinia pterochaeta</i>	Local
<i>Vittadinia pustulata</i>	Local
<i>Vittadinia sulcata</i>	Local
<i>Wahlenbergia communis</i>	Local
<i>Wahlenbergia fluminalis</i>	Local
<i>Wahlenbergia gracilentia</i>	Local
<i>Wahlenbergia gracilis</i>	Local
<i>Wahlenbergia luteola</i>	Local
<i>Wahlenbergia planiflora</i>	Local
<i>Wahlenbergia planiflora</i> subsp. <i>longipila</i>	Local
<i>Wahlenbergia planiflora</i> subsp. <i>planiflora</i>	Local
<i>Wahlenbergia stricta</i>	Local
<i>Wahlenbergia stricta</i> subsp. <i>alterna</i>	Local
<i>Wahlenbergia stricta</i> subsp. <i>stricta</i>	Local
<i>Westringia cheelii</i>	Local
<i>Xanthorrhoea acaulis</i>	Local
<i>Xanthorrhoea australis</i>	Local
<i>Xanthorrhoea glauca</i> subsp. <i>angustifolia</i>	Local
<i>Xanthorrhoea media</i>	Local
<i>Zieria aspalathoides</i>	Local
<i>Acacia amoena</i>	Not ranked
<i>Acacia ausfeldii</i>	Not ranked
<i>Acacia brachybotrya</i>	Not ranked
<i>Acacia cremiflora</i>	Not ranked
<i>Acacia difformis</i>	Not ranked
<i>Acacia echinula</i>	Not ranked
<i>Acacia falciformis</i>	Not ranked
<i>Acacia ixodes</i>	Not ranked
<i>Acacia montana</i>	Not ranked
<i>Acacia trineura</i>	Not ranked
<i>Acacia undulifolia</i>	Not ranked
<i>Acacia vestita</i>	Not ranked
<i>Acrotriche latifolia</i>	Not ranked
<i>Adiantum hispidulum</i>	Not ranked
<i>Amaranthus mitchellii</i>	Not ranked

Name	Conservation Rank
<i>Amphibromus whitei</i>	Not ranked
<i>Aotus ericoides</i>	Not ranked
<i>Apium prostratum</i>	Not ranked
<i>Aristida anthoxanthoides</i>	Not ranked
<i>Aristida lignosa</i>	Not ranked
<i>Aristida longicollis</i>	Not ranked
<i>Aristida queenslandica</i> var <i>queenslandica</i>	Not ranked
<i>Aristida strigosa</i>	Not ranked
<i>Aristida warburgii</i>	Not ranked
<i>Asperula gunnii</i>	Not ranked
<i>Asperula subulifolia</i>	Not ranked
<i>Astrotricha latifolia</i>	Not ranked
<i>Atriplex muelleri</i>	Not ranked
<i>Atriplex</i> sp. B sensu Jacobs (1990)	Not ranked
<i>Austrodanthonia alpicola</i>	Not ranked
<i>Austrodanthonia carphoides</i>	Not ranked
<i>Austrodanthonia duttoniana</i>	Not ranked
<i>Austrodanthonia penicillata</i>	Not ranked
<i>Austrodanthonia tenuior</i>	Not ranked
<i>Austrostipa bigeniculata</i>	Not ranked
<i>Austrostipa blackii</i>	Not ranked
<i>Austrostipa elegantissima</i>	Not ranked
<i>Austrostipa mollis</i>	Not ranked
<i>Austrostipa nitida</i>	Not ranked
<i>Austrostipa nodosa</i>	Not ranked
<i>Austrostipa semibarbata</i>	Not ranked
<i>Bertya rosmarinifolia</i>	Not ranked
<i>Bertya</i> sp. D sensu Harden (1990)	Not ranked
<i>Blumea mollis</i>	Not ranked
<i>Boerhavia coccinea</i>	Not ranked
<i>Boronia pinnata</i>	Not ranked
<i>Boronia rosmarinifolia</i>	Not ranked
<i>Bossiaea buxifolia</i>	Not ranked
<i>Bothriochloa bladhii</i>	Not ranked
<i>Bothriochloa erianthoides</i>	Not ranked
<i>Brachyscome ciliaris</i>	Not ranked
<i>Brachyscome melanocarpa</i>	Not ranked
<i>Brachyscome nodosa</i>	Not ranked
<i>Brachyscome smithwhitei</i>	Not ranked
<i>Brachyscome stuartii</i>	Not ranked
<i>Brachyscome tenuiscapa</i>	Not ranked
<i>Breynia cernua</i>	Not ranked
<i>Bromus madritensis</i>	Not ranked
<i>Bulbine alata</i>	Not ranked
<i>Bulbine glauca</i>	Not ranked
<i>Bursaria longisepala</i>	Not ranked
<i>Caladenia capillata</i>	Not ranked
<i>Caladenia carnea</i>	Not ranked
<i>Caladenia catenata</i>	Not ranked
<i>Callitris gracilis</i>	Not ranked
<i>Calotis anthemoides</i>	Not ranked
<i>Calotis glandulosa</i>	Not ranked
<i>Calytrix longiflora</i>	Not ranked
<i>Camptacra barbata</i>	Not ranked
<i>Canthium buxifolium</i>	Not ranked
<i>Capillipedium spicigerum</i>	Not ranked
<i>Cassinia aculeata</i>	Not ranked
<i>Cassinia leptcephala</i>	Not ranked
<i>Cassinia</i> sp. D sensu Everett (1992)	Not ranked
<i>Cassinia theodori</i>	Not ranked
<i>Catapodium rigidum</i>	Not ranked

Name	Conservation Rank
<i>Centella asiatica</i>	Not ranked
<i>Centrolepis strigosa</i>	Not ranked
<i>Chamaesyce</i> sp. B sensu James & Harden (1990)	Not ranked
<i>Cheilanthes lasiophylla</i>	Not ranked
<i>Chenopodium auricomiforme</i>	Not ranked
<i>Chenopodium truncatum</i>	Not ranked
<i>Chloris pectinata</i>	Not ranked
<i>Choretrum</i> sp. A sensu Harden (1992)	Not ranked
<i>Cleistochloa subjuncea</i>	Not ranked
<i>Craspedia variabilis</i>	Not ranked
<i>Crassula peduncularis</i>	Not ranked
<i>Crinum pedunculatum</i>	Not ranked
<i>Crotalaria dissitiflora</i>	Not ranked
<i>Cryptandra armata</i>	Not ranked
<i>Cryptandra spinescens</i>	Not ranked
<i>Cyperus laevis</i>	Not ranked
<i>Cyperus lhotskyanus</i>	Not ranked
<i>Danthonia linkii</i>	Not ranked
<i>Derwentia velutina</i>	Not ranked
<i>Desmodium gunnii</i>	Not ranked
<i>Dianella porracea</i>	Not ranked
<i>Dichopogon</i> sp. A sensu Harden (1993)	Not ranked
<i>Digitaria orbata</i>	Not ranked
<i>Digitaria porrecta</i>	Not ranked
<i>Dillwynia phyllicoides</i>	Not ranked
<i>Dipodium atropurpureum</i>	Not ranked
<i>Diuris abbreviata</i>	Not ranked
<i>Dodonaea tenuifolia</i>	Not ranked
<i>Eleocharis cylindrostachys</i>	Not ranked
<i>Eleocharis sphacelata</i>	Not ranked
<i>Enneapogon lindleyanus</i>	Not ranked
<i>Enneapogon truncatus</i>	Not ranked
<i>Enneapogon virens</i>	Not ranked
<i>Enteropogon ramosus</i>	Not ranked
<i>Eragrostis basedowii</i>	Not ranked
<i>Eragrostis dielsii</i>	Not ranked
<i>Eragrostis microcarpa</i>	Not ranked
<i>Eremophila glabra</i>	Not ranked
<i>Eremophila maculata</i>	Not ranked
<i>Eremophila sturtii</i>	Not ranked
<i>Eriochilus cucullatus</i>	Not ranked
<i>Eriochlamys</i> sp. A sensu Brown (1992)	Not ranked
<i>Eryngium plantagineum</i>	Not ranked
<i>Eucalyptus andrewsii</i>	Not ranked
<i>Eucalyptus apothalassica</i>	Not ranked
<i>Eucalyptus caleyi</i>	Not ranked
<i>Eucalyptus moluccana</i>	Not ranked
<i>Eucalyptus panda</i>	Not ranked
<i>Eucalyptus punctata</i>	Not ranked
<i>Eucalyptus stannicola</i>	Not ranked
<i>Eucalyptus volcanica</i>	Not ranked
<i>Euphorbia drummondii</i>	Not ranked
<i>Exocarpos strictus</i>	Not ranked
<i>Fimbristylis velata</i>	Not ranked
<i>Galactia</i> sp. B sensu Gardner (1991)	Not ranked
<i>Galium liratum</i>	Not ranked
<i>Geijera paniculata</i>	Not ranked
<i>Genoplesium rufum</i>	Not ranked
<i>Glyceria australis</i>	Not ranked
<i>Glycine</i> sp. A sensu Tindale (1991)	Not ranked
<i>Gompholobium huegelii</i>	Not ranked

Name	Conservation Rank
<i>Gonocarpus humilis</i>	Not ranked
<i>Goodenia stephensonii</i>	Not ranked
<i>Hakea dactyloides</i>	Not ranked
<i>Haloragis serra</i>	Not ranked
<i>Haloragis stricta</i>	Not ranked
<i>Heliotropium species A</i>	Not ranked
<i>Hemigenia purpurea</i>	Not ranked
<i>Heteropogon contortus</i>	Not ranked
<i>Hibbertia cistoidea</i>	Not ranked
<i>Hibbertia kaputarensis</i>	Not ranked
<i>Homoranthus virgatus</i>	Not ranked
<i>Hovea heterophylla</i>	Not ranked
<i>Hybanthus stellarioides</i>	Not ranked
<i>Hydrocotyle rhombifolia</i>	Not ranked
<i>Ipomoea lonchophylla</i>	Not ranked
<i>Iseilema vaginiflorum</i>	Not ranked
<i>Isoetopsis graminifolia</i>	Not ranked
<i>Isolepis gaudichaudiana</i>	Not ranked
<i>Isolepis subtilissima</i>	Not ranked
<i>Juncus australis</i>	Not ranked
<i>Keraudrenia corollata</i>	Not ranked
<i>Kunzea obovata</i>	Not ranked
<i>Lachnagrostis aemula</i>	Not ranked
<i>Lagenifera huegelii</i>	Not ranked
<i>Lepidium hypenanthion</i>	Not ranked
<i>Lepidosperma gunnii</i>	Not ranked
<i>Leptorhynchos elongatus</i>	Not ranked
<i>Leptorhynchos panaetioides</i>	Not ranked
<i>Leptorhynchos squamatus</i>	Not ranked
<i>Leptospermum sphaerocarpum</i>	Not ranked
<i>Leucochrysum albicans</i>	Not ranked
<i>Leucopogon juniperinus</i>	Not ranked
<i>Lobelia</i> sp. aff. <i>gibbosa</i> 'succulent'	Not ranked
<i>Lomandra bracteata</i>	Not ranked
<i>Lomandra cylindrica</i>	Not ranked
<i>Luzula meridionalis</i>	Not ranked
<i>Macrozamia pauli-guilielmi</i>	Not ranked
<i>Macrozamia polymorpha</i>	Not ranked
<i>Maireana appressa</i>	Not ranked
<i>Maireana pentatropis</i>	Not ranked
<i>Marsdenia suaveolens</i>	Not ranked
<i>Mazus pumilio</i>	Not ranked
<i>Melichrus</i> sp. aff. <i>erubescens</i>	Not ranked
<i>Melichrus</i> sp.aff. <i>urceolatus</i>	Not ranked
<i>Melilotus albus</i>	Not ranked
<i>Minuria cunninghamii</i>	Not ranked
<i>Monotoca elliptica</i>	Not ranked
<i>Myriophyllum lophatum</i>	Not ranked
<i>Neurachne munroi</i>	Not ranked
<i>Notelaea johnsonii</i>	Not ranked
<i>Notelaea venosa</i>	Not ranked
<i>Notodanthonia semiannularis</i>	Not ranked
<i>Olearia floribunda</i>	Not ranked
<i>Olearia viscosa</i>	Not ranked
<i>Ozothamnus ferrugineus</i>	Not ranked
<i>Parsonsia straminea</i>	Not ranked
<i>Paspalidium criniforme</i>	Not ranked
<i>Patersonia fragilis</i>	Not ranked
<i>Pellaea calidirupium</i>	Not ranked
<i>Pellaea nana</i>	Not ranked
<i>Persoonia chamaepitys</i>	Not ranked

Name	Conservation Rank
<i>Persoonia linearis</i>	Not ranked
<i>Petalostylis labicheoides</i>	Not ranked
<i>Petrophile canescens</i>	Not ranked
<i>Phyllanthus lacunarius</i>	Not ranked
<i>Phyllanthus occidentalis</i>	Not ranked
<i>Pimelea glauca</i>	Not ranked
<i>Pimelea simplex</i>	Not ranked
<i>Pimelea strigosa</i>	Not ranked
<i>Plantago hispida</i>	Not ranked
<i>Platysace</i> sp. aff. <i>linearifolia</i>	Not ranked
<i>Pleurosorus subglandulosus</i>	Not ranked
<i>Poa fordeana</i>	Not ranked
<i>Podolepis hieracioides</i>	Not ranked
<i>Podolepis muelleri</i>	Not ranked
<i>Polycarpaea corymbosa</i>	Not ranked
<i>Prostanthera cryptandroides</i>	Not ranked
<i>Prostanthera violacea</i>	Not ranked
<i>Pterostylis cobarensis</i>	Not ranked
<i>Pterostylis nutans</i>	Not ranked
<i>Pterostylis praetermissa</i>	Not ranked
<i>Pterostylis</i> sp. B sensu Harden (1993)	Not ranked
<i>Ptilotus indivisus</i>	Not ranked
<i>Ptilotus obovatus</i>	Not ranked
<i>Pultenaea canescens</i>	Not ranked
<i>Pultenaea laxiflora</i>	Not ranked
<i>Pultenaea procumbens</i>	Not ranked
<i>Pultenaea</i> sp. C sensu Weston (1991)	Not ranked
<i>Pultenaea</i> sp. I sensu Weston (1991)	Not ranked
<i>Pultenaea spinosa</i>	Not ranked
<i>Pycnosorus chrysanthos</i>	Not ranked
<i>Pycnosorus thompsonianus</i>	Not ranked
<i>Ranunculus pentandrus</i>	Not ranked
<i>Ranunculus</i> sp. A sensu Harden (1990)	Not ranked
<i>Rhodanthe stricta</i>	Not ranked
<i>Rhynchosia australis</i>	Not ranked
<i>Rorippa laciniata</i>	Not ranked
<i>Rumex dumosus</i>	Not ranked
<i>Rytidosperma nudiflorum</i>	Not ranked
<i>Rytidosperma vickeryae</i>	Not ranked
<i>Salvia plebeia</i>	Not ranked
<i>Schizachyrium fragile</i>	Not ranked
<i>Schoenus subaphyllus</i>	Not ranked
<i>Scleranthus minusculus</i>	Not ranked
<i>Sclerolaena anisacanthoides</i>	Not ranked
<i>Sclerolaena cuneata</i>	Not ranked
<i>Sclerolaena lanicuspis</i>	Not ranked
<i>Senna clavigera</i>	Not ranked
<i>Senna notabilis</i>	Not ranked
<i>Senna odorata</i>	Not ranked
<i>Sida intricata</i>	Not ranked
<i>Sida pleiantha</i>	Not ranked
<i>Sida</i> sp. B sensu Harden (1990)	Not ranked
<i>Solanum adenophorum</i>	Not ranked
<i>Solanum americanum</i>	Not ranked
<i>Solanum elegans</i>	Not ranked
<i>Sporobolus africanus</i>	Not ranked
<i>Sporobolus contiguus</i>	Not ranked
<i>Stellaria</i> sp. D sensu Doust (1990)	Not ranked
<i>Stylidium laricifolium</i>	Not ranked
<i>Styphelia angustifolia</i>	Not ranked
<i>Styphelia laeta</i>	Not ranked

Name	Conservation Rank
<i>Styphelia tubiflora</i>	Not ranked
<i>Swainsona bracteata</i>	Not ranked
<i>Swainsona luteola</i>	Not ranked
<i>Swainsona monticola</i>	Not ranked
<i>Swainsona procumbens</i>	Not ranked
<i>Swainsona reticulata</i>	Not ranked
<i>Tephrosia brachyodon</i>	Not ranked
<i>Teucrium corymbosum</i>	Not ranked
<i>Teucrium</i> sp. A sensu Conn (1992)	Not ranked
<i>Tribulus minutus</i>	Not ranked
<i>Tylophora linearis</i>	Not ranked
<i>Urochloa foliosa</i>	Not ranked
<i>Urochloa notochthona</i>	Not ranked
<i>Velleia parvisepala</i>	Not ranked
<i>Verbena africana</i>	Not ranked
<i>Verbena gaudichaudii</i>	Not ranked
<i>Veronica gracilis</i>	Not ranked
<i>Vittadinia condyloides</i>	Not ranked
<i>Vittadinia eremaea</i>	Not ranked
<i>Wahlenbergia queenslandica</i>	Not ranked
<i>Wurmbea biglandulosa</i>	Not ranked
<i>Xanthium strumarium</i>	Not ranked
<i>Zanthoxylum pinnatum</i>	Not ranked

APPENDIX 3 – ANIMLAS AT EDGE OF RANGE

All known terrestrial vertebrate animal species of the Brigalow Belt South Bioregion of NSW that are at the edge of their range within the bioregion are listed in this appendix.

Family Name	Latin Name	English Name
AMPHIBIANS		
Hylidae	<i>Cyclorana novaehollandiae</i>	
Hylidae	<i>Cyclorana platycephala</i>	Water-holding Frog
Hylidae	<i>Cyclorana verrucosa</i>	
Hylidae	<i>Litoria alboguttata</i>	Striped Burrowing Frog
Hylidae	<i>Litoria booroolongensis</i>	Booroolong Frog
Hylidae	<i>Litoria lesueuri</i>	Lesueur's Frog
Hylidae	<i>Litoria verreauxii</i>	
Myobatrachidae	<i>Crinia sloanei</i>	Sloane's Toadlet
Myobatrachidae	<i>Limnodynastes dumerilii</i>	Eastern Banjo Frog
Myobatrachidae	<i>Limnodynastes fletcheri</i>	Long-thumbed Frog
Myobatrachidae	<i>Limnodynastes interioris</i>	Giant Banjo Frog
Myobatrachidae	<i>Limnodynastes terraereginae</i>	Northern Banjo Frog
Myobatrachidae	<i>Notaden bennettii</i>	Crucifix Frog
Myobatrachidae	<i>Pseudophryne bibronii</i>	Brown Toadlet
BIRDS		
Accipitridae	<i>Accipiter novaehollandiae</i>	Grey Goshawk
Accipitridae	<i>Aviceda subcristata</i>	Pacific Baza
Accipitridae	<i>Hamirostra melanosternon</i>	Black-breasted Buzzard
Accipitridae	<i>Lophoictinia isura</i>	Square-tailed Kite
Alcedinidae	<i>Alcedo azurea</i>	Azure Kingfisher
Anatidae	<i>Dendrocygna eytoni</i>	Plumed Whistling-Duck
Anatidae	<i>Tadorna tadornoides</i>	Australian Shelduck
Anseranatidae	<i>Anseranas semipalmata</i>	Magpie Goose
Ardeidae	<i>Ixobrychus flavicollis</i>	Black Bittern
Artamidae	<i>Artamus minor</i>	Little Woodswallow
Cacatuidae	<i>Cacatua leadbeateri</i>	Major Mitchell's Cockatoo
Cacatuidae	<i>Calyptorhynchus funereus</i>	Yellow-tailed Black-Cockatoo
Campephagidae	<i>Coracina tenuirostris</i>	Cicadabird
Caprimulgidae	<i>Eurostopodus argus</i>	Spotted Nightjar
Caprimulgidae	<i>Eurostopodus mystacalis</i>	White-throated Nightjar

Family Name	Latin Name	English Name
Centropodidae	<i>Centropus phasianinus</i>	Pheasant Coucal
Ciconiidae	<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork
Cinclosomatidae	<i>Cinclosoma punctatum</i>	Spotted Quail-thrush
Cinclosomatidae	<i>Psophodes olivaceus</i>	Eastern Whipbird
Climacteridae	<i>Climacteris erythrops</i>	Red-browed Treecreeper
Climacteridae	<i>Cormobates leucophaeus</i>	White-throated Treecreeper
Columbidae	<i>Geophaps scripta</i>	Squatter Pigeon
Columbidae	<i>Leucosarcia melanoleuca</i>	Wonga Pigeon
Corcoracidae	<i>Struthidea cinerea</i>	Apostlebird
Corvidae	<i>Corvus bennetti</i>	Little Crow
Corvidae	<i>Corvus orru</i>	Torresian Crow
Cuculidae	<i>Cacomantis variolosus</i>	Brush Cuckoo
Cuculidae	<i>Eudynamys scolopacea</i>	Common Koel
Dicruridae	<i>Dicrurus bracteatus</i>	Spangled Drongo
Dicruridae	<i>Myiagra cyanoleuca</i>	Satin Flycatcher
Dicruridae	<i>Rhipidura rufifrons</i>	Rufous Fantail
Falconidae	<i>Falco hypoleucos</i>	Grey Falcon
Glareolidae	<i>Stiltia isabella</i>	Australian Pratincole
Gruidae	<i>Grus rubicunda</i>	Brolga
Halcyonidae	<i>Todiramphus macleayii</i>	Forest Kingfisher
Maluridae	<i>Malurus leucopterus</i>	White-winged Fairy-wren
Megapodiidae	<i>Alectura lathamii</i>	Australian Brush-turkey
Megapodiidae	<i>Leipoa ocellata</i>	Malleefowl
Meliphagidae	<i>Acanthorhynchus tenuirostris</i>	Eastern Spinebill
Meliphagidae	<i>Anthochaera carunculata</i>	Red Wattlebird
Meliphagidae	<i>Certhionyx niger</i>	Black Honeyeater
Meliphagidae	<i>Certhionyx variegatus</i>	Pied Honeyeater
Meliphagidae	<i>Epthianura tricolor</i>	Crimson Chat
Meliphagidae	<i>Lichenostomus chrysops</i>	Yellow-faced Honeyeater
Meliphagidae	<i>Lichenostomus fuscus</i>	Fuscous Honeyeater
Meliphagidae	<i>Lichenostomus leucotis</i>	White-eared Honeyeater
Meliphagidae	<i>Lichenostomus melanops</i>	Yellow-tufted Honeyeater
Meliphagidae	<i>Lichenostomus ornatus</i>	Yellow-plumed Honeyeater
Meliphagidae	<i>Lichenostomus plumulus</i>	Grey-fronted Honeyeater
Meliphagidae	<i>Lichenostomus virescens</i>	Singing Honeyeater
Meliphagidae	<i>Manorina flavigula</i>	Yellow-throated Miner
Meliphagidae	<i>Manorina melanophrys</i>	Bell Miner
Meliphagidae	<i>Meliphaga lewinii</i>	Lewin's Honeyeater
Meliphagidae	<i>Melithreptus lunatus</i>	White-naped Honeyeater
Meliphagidae	<i>Myzomela sanguinolenta</i>	Scarlet Honeyeater
Meliphagidae	<i>Xanthomyza phrygia</i>	Regent Honeyeater
Menuridae	<i>Menura novaehollandiae</i>	Superb Lyrebird
Muscicapidae	<i>Zoothera lunulata</i>	Bassian Thrush
Oriolidae	<i>Sphecotheres viridis</i>	Figbird
Pachycephalidae	<i>Oreoica gutturalis</i>	Crested Bellbird
Pachycephalidae	<i>Pachycephala inornata</i>	Gilbert's Whistler
Pardalotidae	<i>Acanthiza apicalis</i>	Inland Thornbill
Pardalotidae	<i>Acanthiza lineata</i>	Striated Thornbill
Pardalotidae	<i>Gerygone mouki</i>	Brown Gerygone
Pardalotidae	<i>Hylacola pyrrhopygia</i>	Chestnut-rumped Heathwren
Pardalotidae	<i>Origma solitaria</i>	Rockwarbler
Pardalotidae	<i>Pardalotus punctatus xanthopyg</i>	Yellow-rumped Pardalote
Pardalotidae	<i>Sericornis citreogularis</i>	Yellow-throated Scrubwren

Family Name	Latin Name	English Name
Pardalotidae	<i>Sericornis sagittatus</i>	Speckled Warbler
Passeridae	<i>Neochmia temporalis</i>	Red-browed Finch
Pedionomidae	<i>Pedionomus torquatus</i>	Plains-wanderer
Petroicidae	<i>Petroica multicolor</i>	Scarlet Robin
Petroicidae	<i>Petroica phoenicea</i>	Flame Robin
Petroicidae	<i>Petroica rosea</i>	Rose Robin
Phasianidae	<i>Coturnix chinensis</i>	King Quail
Pomatostomidae	<i>Pomatostomus ruficeps</i>	Chestnut-crowned Babbler
Psittacidae	<i>Alisterus scapularis</i>	Australian King-Parrot
Psittacidae	<i>Aprosmictus erythropterus</i>	Red-winged Parrot
Psittacidae	<i>Glossopsitta concinna</i>	Musk Lorikeet
Psittacidae	<i>Glossopsitta pusilla</i>	Little Lorikeet
Psittacidae	<i>Lathamus discolor</i>	Swift Parrot
Psittacidae	<i>Neopsephotus bourkii</i>	Bourke's Parrot
Psittacidae	<i>Northiella haematogaster</i>	Blue Bonnet
Psittacidae	<i>Platycercus adscitus</i>	Pale-headed Rosella
Psittacidae	<i>Platycercus elegans</i>	Crimson Rosella
Psittacidae	<i>Platycercus eximius</i>	Eastern Rosella
Psittacidae	<i>Polytelis swainsonii</i>	Superb Parrot
Psittacidae	<i>Psephotus varius</i>	Mulga Parrot
Psittacidae	<i>Trichoglossus chlorolepidotus</i>	Scaly-breasted Lorikeet
Psittacidae	<i>Trichoglossus haematodus</i>	Rainbow Lorikeet
Ptilonorhynchidae	<i>Chlamydera maculata</i>	Spotted Bowerbird
Ptilonorhynchidae	<i>Ptilonorhynchus violaceus</i>	Satin Bowerbird
Rallidae	<i>Gallinula ventralis</i>	Black-tailed Native-hen
Strigidae	<i>Ninox strenua</i>	Powerful Owl
Turnicidae	<i>Turnix varia</i>	Painted Button-quail
Turnicidae	<i>Turnix velox</i>	Little Button-quail
Tytonidae	<i>Tyto capensis</i>	Grass Owl
MAMMALS		
Burramyidae	<i>Acrobates pygmaeus</i>	Feathertail Glider
Burramyidae	<i>Cercartetus nanus</i>	Eastern Pygmy-possum
Dasyuridae	<i>Antechinus stuartii</i>	Brown Antechinus
Dasyuridae	<i>Antechinus swainsonii</i>	Dusky Antechinus
Dasyuridae	<i>Dasyurus maculatus</i>	Spotted-tailed Quoll
Dasyuridae	<i>Planigale gilesi</i>	Paucident Planigale
Dasyuridae	<i>Planigale maculata</i>	Common Planigale
Dasyuridae	<i>Sminthopsis crassicaudata</i>	Fat-tailed Dunnart
Dasyuridae	<i>Sminthopsis macroura</i>	Stripe-faced Dunnart
Macropodidae	<i>Macropus dorsalis</i>	Black-striped Wallaby
Macropodidae	<i>Macropus rufogriseus</i>	Red-necked Wallaby
Macropodidae	<i>Macropus rufus</i>	Red Kangaroo
Macropodidae	<i>Petrogale penicillata</i>	Brush-tailed Rock-wallaby
Molossidae	<i>Mormopterus</i> sp. (big penis)	-
Molossidae	<i>Mormopterus</i> sp. (little penis)	-
Molossidae	<i>Mormopterus</i> Sp. 6	-
Muridae	<i>Pseudomys pilligaensis</i>	Pilliga Mouse
Muridae	<i>Rattus fuscipes</i>	Bush Rat
Ornithorhynchidae	<i>Ornithorhynchus anatinus</i>	Platypus
Peramelidae	<i>Perameles nasuta</i>	Long-nosed Bandicoot
Petauridae	<i>Petauroides volans</i>	Greater Glider
Petauridae	<i>Petaurus breviceps</i>	Sugar Glider
Potoroidae	<i>Aepyprymnus rufescens</i>	Rufous Bettong

Family Name	Latin Name	English Name
Pteropodidae	<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox
Rhinolophidae	<i>Rhinolophus megaphyllus</i>	Eastern Horseshoe-bat
Vespertilionidae	<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat
Vespertilionidae	<i>Chalinolobus morio</i>	Chocolate Wattled Bat
Vespertilionidae	<i>Chalinolobus picatus</i>	Little Pied Bat
Vespertilionidae	<i>Falsistrellus tasmaniensis</i>	Eastern False Pipistrelle
Vespertilionidae	<i>Miniopterus schreibersii</i>	Common Bent-wing Bat
Vespertilionidae	<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat
Vespertilionidae	<i>Scotorepens sp 1</i>	undescribed broad-nosed bat
Vespertilionidae	<i>Vespadelus darlingtoni</i>	Large Forest Bat
Vespertilionidae	<i>Vespadelus troughtoni</i>	Eastern Cave Bat
Vombatidae	<i>Vombatus ursinus</i>	Common Wombat
REPTILES		
Agamidae	<i>Physignathus lesueurii</i>	Eastern Water Dragon
Chelidae	<i>Chelodina expansa</i>	Broad-shelled River Turtle
Colubridae	<i>Dendrelaphis punctulata</i>	Green Tree Snake
Elapidae	<i>Acanthophis antarcticus</i>	Common Death Adder
Elapidae	<i>Denisonia devisi</i>	De Vis' Banded Snake
Elapidae	<i>Hemiaspis damelii</i>	Grey Snake
Elapidae	<i>Hoplocephalus bitorquatus</i>	Pale-headed Snake
Elapidae	<i>Pseudonaja nuchalis</i>	Western Brown Snake
Elapidae	<i>Rhinoplocephalus nigrescens</i>	Eastern Small-eyed Snake
Elapidae	<i>Suta suta</i>	Curl Snake
Gekkonidae	<i>Diplodactylus tessellatus</i>	Tesselated Gecko
Gekkonidae	<i>Diplodactylus vittatus</i>	Stone Gecko
Gekkonidae	<i>Gehyra dubia</i>	-
Gekkonidae	<i>Gehyra variegata</i>	Tree Dtella
Gekkonidae	<i>Oedura lesueurii</i>	Lesueur's Velvet Gecko
Gekkonidae	<i>Oedura marmorata</i>	Marbled Velvet Gecko
Gekkonidae	<i>Oedura monilis</i>	Ocellated Velvet Gecko
Gekkonidae	<i>Oedura robusta</i>	Robust Velvet Gecko
Gekkonidae	<i>Oedura tryoni</i>	Southern Spotted Velvet Gecko
Gekkonidae	<i>Underwoodisaurus milii</i>	Thick-tailed Gecko
Gekkonidae	<i>Underwoodisaurus sphyrurus</i>	-
Pygopodidae	<i>Delma plebeia</i>	-
Pygopodidae	<i>Delma tincta</i>	-
Pygopodidae	<i>Pygopus lepidopodus</i>	Common Scaly-foot
Pygopodidae	<i>Pygopus nigriceps</i>	Hooded Scaly-foot
Scincidae	<i>Anomalopus leuckartii</i>	-
Scincidae	<i>Anomalopus mackayi</i>	-
Scincidae	<i>Bassiana duperreyi</i>	
Scincidae	<i>Bassiana platynota</i>	Red-throated Skink
Scincidae	<i>Carlia tetradactyla</i>	Southern Rainbow Skink
Scincidae	<i>Cryptoblepharus carnabyi</i>	Carnaby's Wall Skink
Scincidae	<i>Cryptoblepharus virgatus</i>	Wall Lizard
Scincidae	<i>Ctenotus allotropis</i>	-
Scincidae	<i>Ctenotus taeniolatus</i>	Copper-tailed Skink
Scincidae	<i>Egernia cunninghami Population 1</i>	Cunningham's Skink - North Slopes Form
Scincidae	<i>Egernia cunninghami Population 2</i>	Cunningham's Skink - Southern Tablelands Form
Scincidae	<i>Egernia modesta</i>	-
Scincidae	<i>Egernia saxatilis saxatilis</i>	Warrumbungle's Black Rock Skink
Scincidae	<i>Egernia whitii</i>	White's Skink
Scincidae	<i>Eulamprus martini</i>	-

Family Name	Latin Name	English Name
Scincidae	<i>Eulamprus tenuis</i>	Barred-side Skink
Scincidae	<i>Hemiergis decresiensis</i>	-
Scincidae	<i>Lampropholis caligula</i>	-
Scincidae	<i>Lerista bougainvillii</i>	Bougainville's Skink
Scincidae	<i>Lygisaurus foliorum</i>	-
Scincidae	<i>Menetia greyii</i>	Grey's Skink
Scincidae	<i>Pseudemoia entrecasteauxii</i>	Tussock Skink
Scincidae	<i>Pseudemoia pagenstecheri</i>	-
Scincidae	<i>Saiphos equalis</i>	Three-toed Skink
Scincidae	<i>Trachydosaurus rugosus</i>	Shingleback
Typhlopidae	<i>Ramphotyphlops bituberculatus</i>	-
Typhlopidae	<i>Ramphotyphlops ligatus</i>	-
Typhlopidae	<i>Ramphotyphlops nigrescens</i>	-
Varanidae	<i>Varanus gouldii</i>	Gould's Goanna

APPENDIX 4: SPECIES PROFILES

This appendix contains species profiles for all terrestrial vertebrate species with conservation rank of “1” and all terrestrial plant species with conservation rank of “National” or “State” for the Brigalow Belt South Bioregion of NSW. The information is contained in a custom Microsoft Access database that is located on the CD-ROM at the back of this report. Individual profiles can be viewed or printed for each species.

FIGURES

Figure 1: The IBRA bioregions of Australia showing the Brigalow Belt South Bioregion

Figure 2: The New South Wales Section of the Brigalow Belt South Bioregion

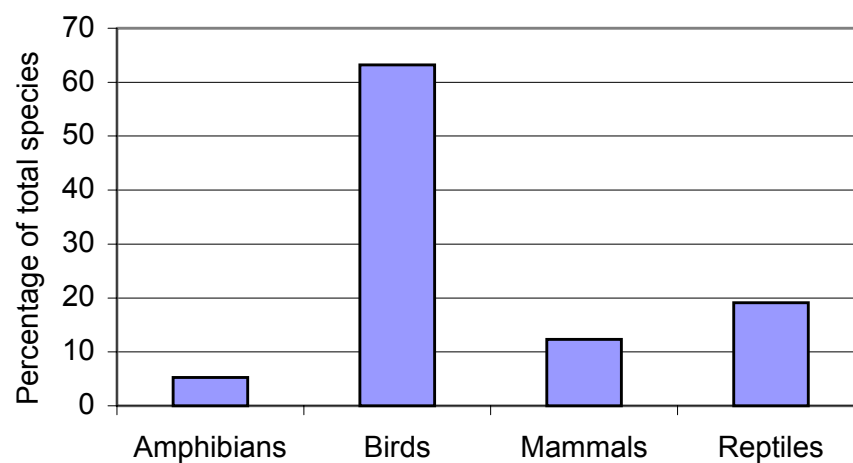


Figure 3: Percentage of terrestrial vertebrate species in taxonomic groups within the Brigalow Belt South Bioregion

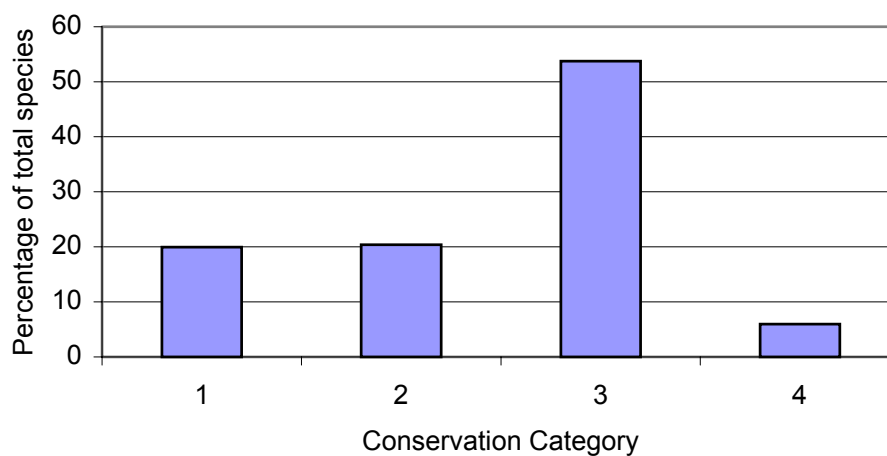


Figure 4: Percentage of terrestrial vertebrate species in each conservation category

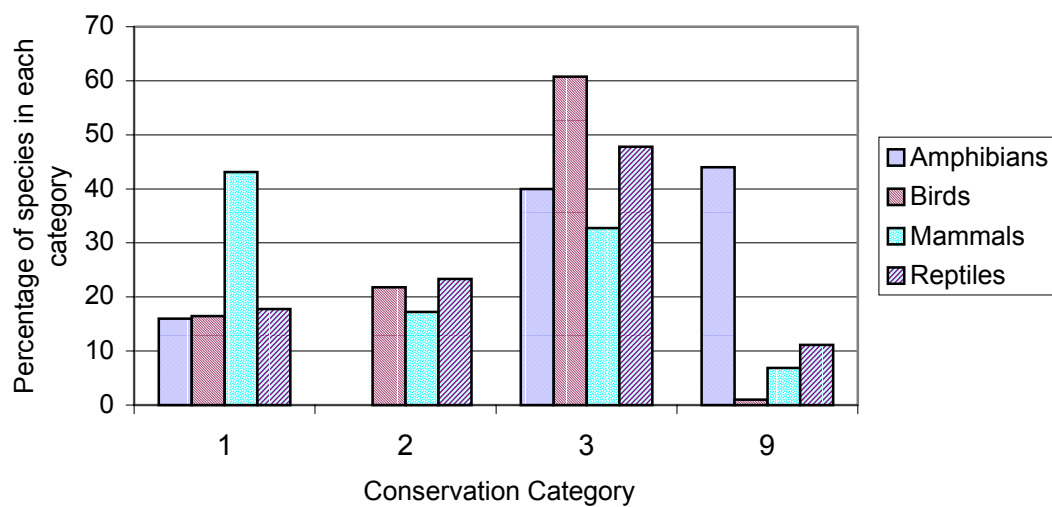


Figure 5: Percentage of species assigned to each conservation category

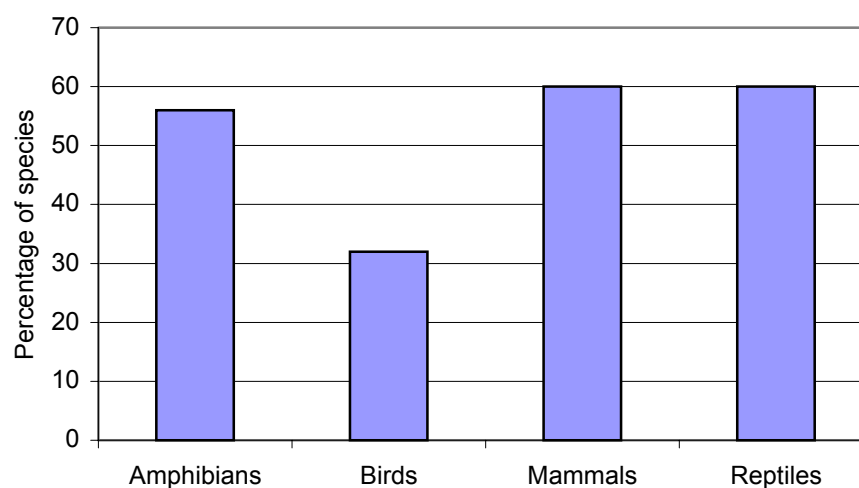


Figure 6: Percentage of species considered to be at the edge of their range in the bioregion

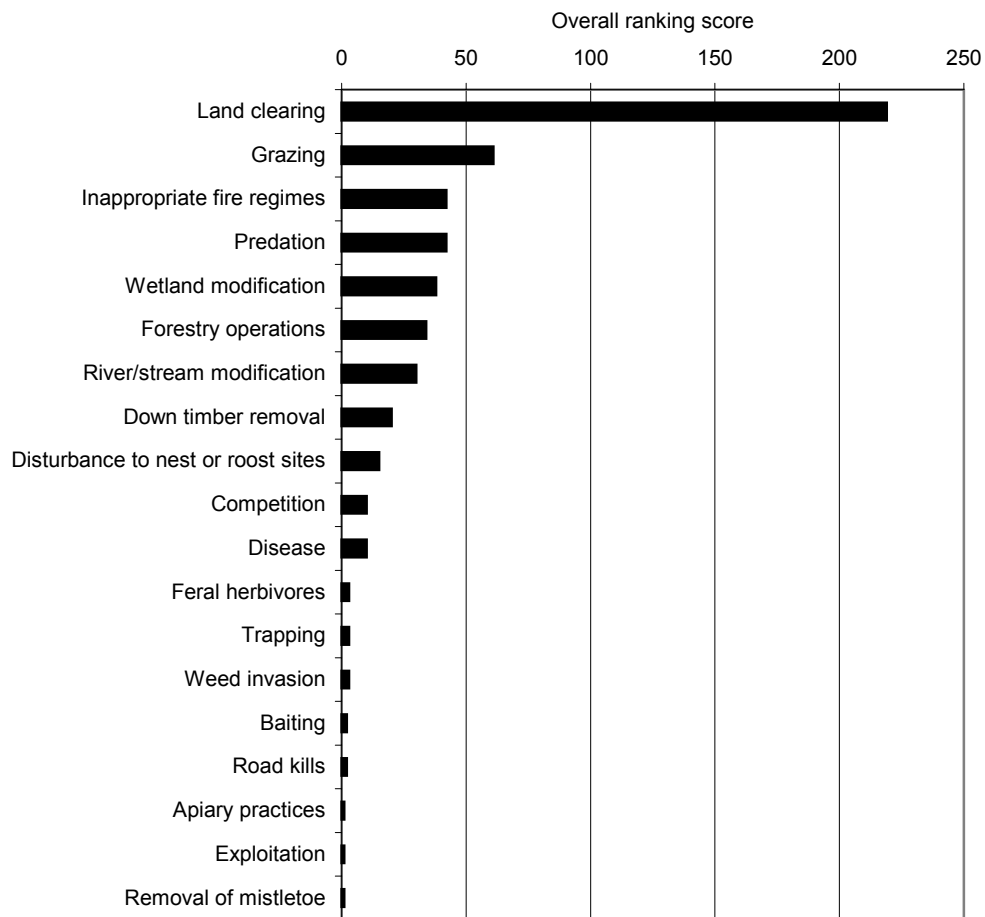


Figure 7: Overall ranked disturbances for terrestrial vertebrate fauna in the Brigalow Belt South Bioregion of NSW

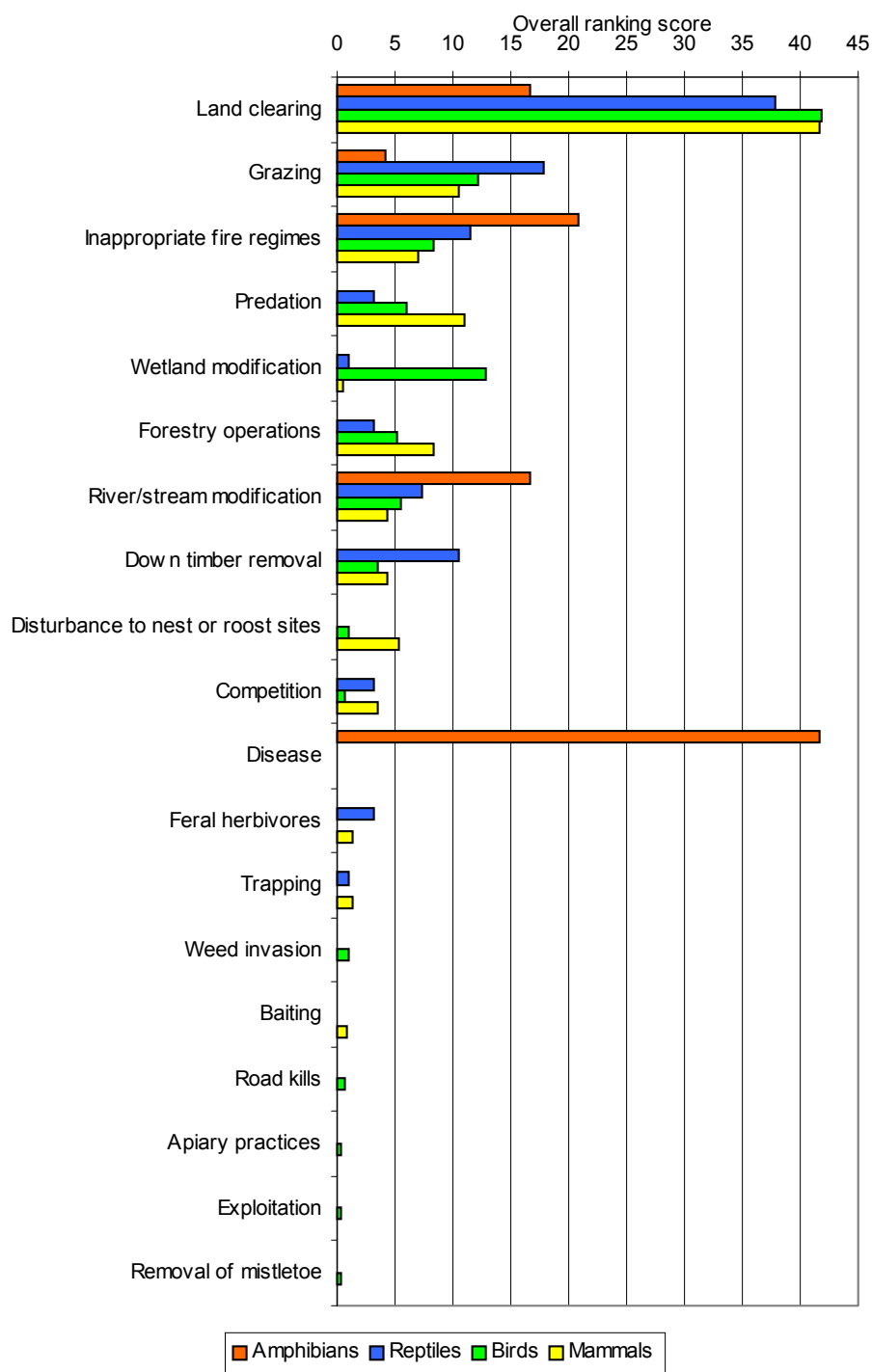


Figure 8: Ranked disturbances for terrestrial vertebrate species in the Brigalow Belt South Bioregion of NSW

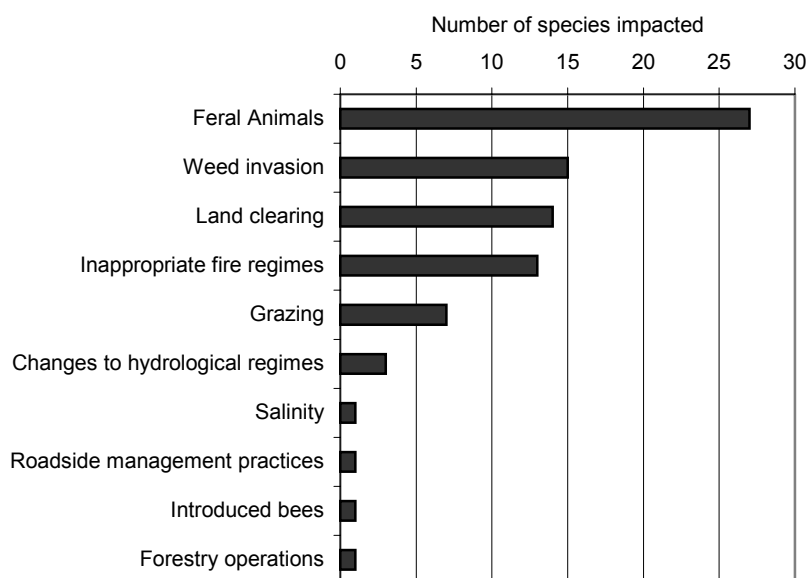


Figure 9: Number of key plant species impacted by disturbances in the Brigalow Belt South Bioregion of NSW

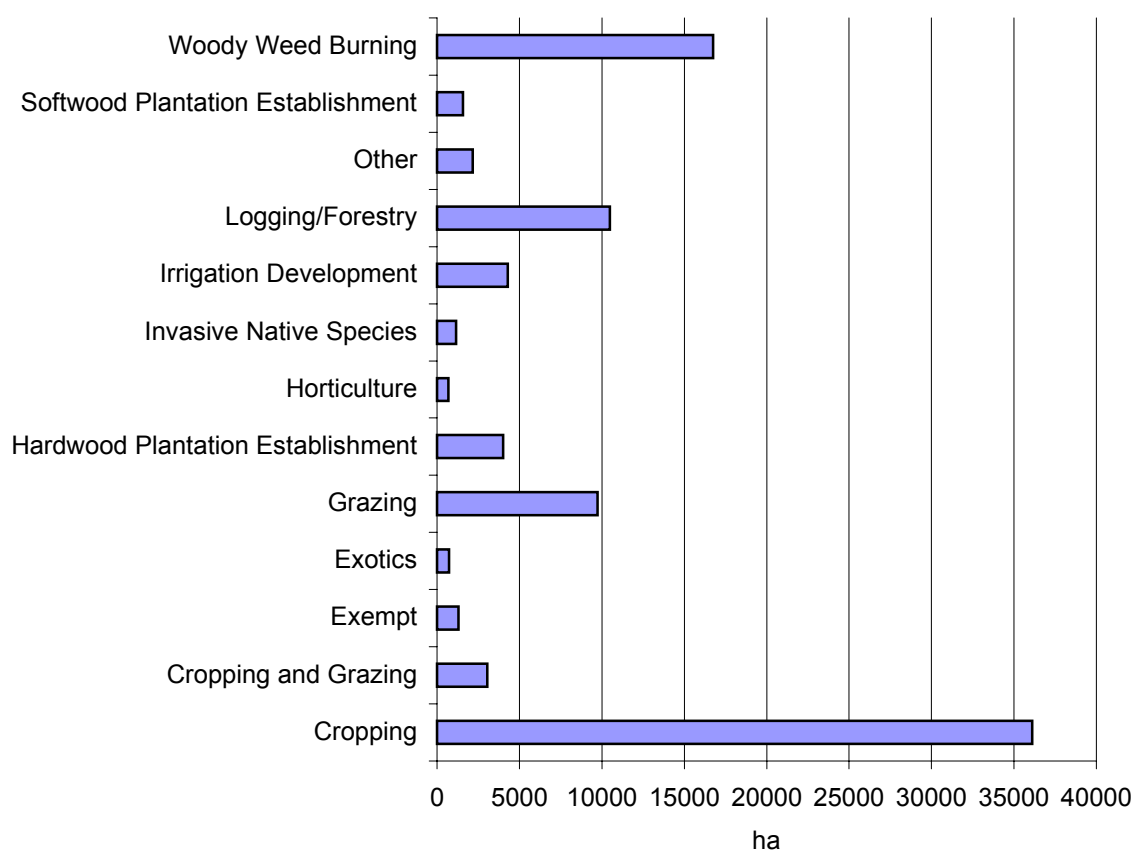


Figure 10 : Proposed land use for areas approved for clearing in 2001 within NSW (Data from DLWC)

Figure 11: 15% crown cover for timber (including a 15 km buffer)

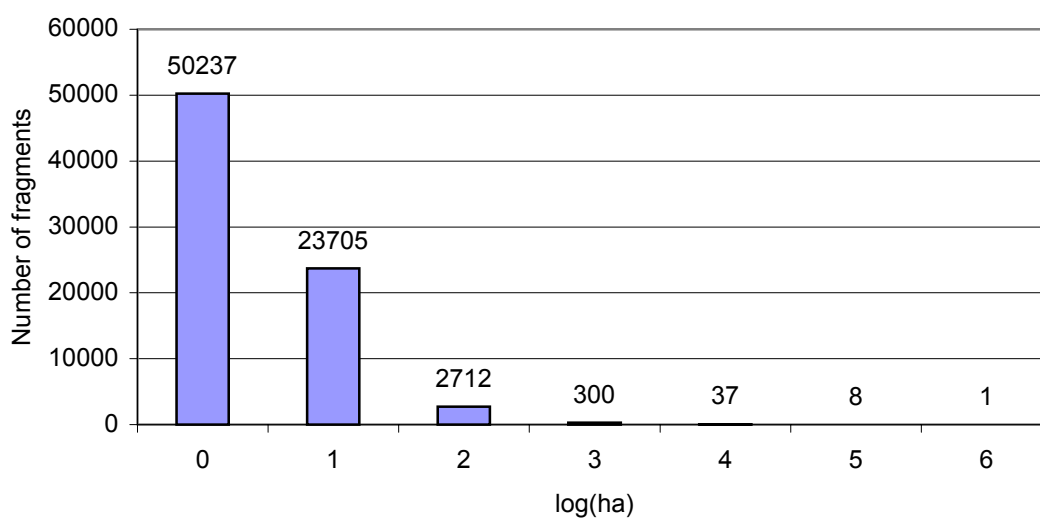


Figure 12: Number of fragments of native vegetation (15% crown cover) in each size class of fragment. Data are logged.

Figure 13: Land capability assessment

Figure 14: Patterns of disturbance within the Brigalow Belt South Bioregion of NSW

Figure 15: State Forest Estate in the Brigalow Belt South Bioregion

REFERENCES

- Adair, R.J. & Groves, R.H. 1998, *Impacts of Environmental Weeds on Biodiversity: A Review and Development of Methodology*, Environment Australia, Canberra.
- Anderson, R.H. 1961, 'Introduction', *Contributions from the New South Wales National Herbarium Flora Series*, vol 1-18, pp. 1-15.
- Anderson, R.H. 1968, *The Trees of New South Wales*, Government Printer, Sydney.
- Anon 2001, *Ministerial Condition 11 attached to the Forest Management Plan 1994-2003: Panel Report Part 1*, Department of Conservation and Land Management, Perth.
- Attiwill, P.M. 1994, 'Ecological disturbance and the conservative management of eucalypt forests in Australia', *Forest Ecology and Management*, vol 63, pp. 301-346.
- Baird, A.M. 1977, 'Regeneration after fire in Kings Park, Perth, Western Australia', *Journal of the Royal Society of Western Australia*, vol 60, pp. 1-22.
- Beckers, D. & Binns, D. 2000, *Vegetation Survey and Mapping Stage 1 (WRA 13)*, Resource and Conservation Assessment Council Western Region Assessments, Sydney.
- Bennett, A.F. 1990, *Habitat Corridors. Their Role in Wildlife Management and Conservation.*, Department of Conservation and Environment, Sydney.
- Bennett, A.F. 1993, 'Fauna Conservation in Box and Ironbark Forests: A Landscape Approach', *Victorian Naturalist*, vol 110, no 1, pp. 15-23.
- Benson, J.S. & Redpath, P.A. 1997, 'The nature of pre-European native vegetation in south-eastern Australia: a critique of Ryan, D.G., Ryan, J.R., and Starr, B.J. 1995. The Australian Landscape- Observations of explorers and early settlers.' *Cunninghamiana*, vol 5, pp. 285-329.
- Berger, L., Speare, R., Daszak, P., Green, D., Cunningham, A., Goggin, L., Slocombe, R., Ragan, M., Hyatt, A., McDonald, K., Hines, H., Lips, K., Marantelli, G. & Parkes, H. 1998, 'Chytridiomycosis causes amphibian mortality associated with population declines in the rain forests of Australia and Central America.' *Proceedings of the National Academy of Science*, vol 95, pp. 9031-9036.
- Bradfield, G.E. 1981, 'Component analysis of fire patterns in open eucalypt forest', *Australian Journal of Ecology*, vol 6, pp. 99-109.
- Bradstock, R. 1981, 'Our pheonix flora', *Australian Natural History*, vol 20, pp. 223-226.
- Braithwaite, L.W., Austing, M.P., Clayton, M., Turner, J. & Nicholls, A.O. 1989, 'On predicting the presence of birds in *Eucalyptus* forest types', *Biological Conservation*, vol 50, pp. 33-50.
- Braithwaite, L.W., Dudzinski, M.L. & Turner, J. 1983, 'Studies on the arboreal marsupial fauna of eucalypt forests being harvested fo woodpulp at Eden, New South Wales II. Relationship between the fauna density, richness and diversity, and measured variables of habitat', *Australian Wildlife Research*, vol 10, pp. 231-247.
- Briggs, J.D. & Leigh, J.H. 1995, *Rare or threatened Australian plants*, CSIRO, Canberra.
- Brooker, M.G. & Rowley, I. 1991, 'Impact of wildfire on the nesting behaviour of birds in heathland', *Wildlife Research*, vol 18, pp. 249-263.
- Burrows, N.D., Ward, B. & Cranfield, R. 2001, *Short-term impacts of logging on understorey vegetation in a jarrah forest*, A workshop on environmental effects of timber harvesting in the jarrah forests. A synthesis of recent research by the Science Division, Department of Conservation and Land Management, Manjimip.

- Catling, P.C. 1991, 'Ecological effects of prescribed burning practices on the mammals of southeastern Australia', pp 353-363 in Lunney, D. (ed) *Conservation of Australia's Forest Fauna*, Royal Zoological Society of NSW, Mosman.
- Cheney, N.P. 1981, 'Fire behaviour', pp 151-156 in Gill, A.M., Groves, R.H. & Noble, I.R. (eds) *Fire and the Australian Biota*, Australian Academy of Sciences, Canberra.
- Choquenot, D., McIlroy, J. & Korn, T. 1996, *Managing Vertebrate Pests: Feral Pigs*, Australian Government Publishing Service, Canberra.
- Christensen, P., Recher, H.F. & Hoare, J. 1981, 'Responses of open forests to fire regimes', pp 367-394 in Gill, A.M., Groves, R.H. & Noble, I.R. (eds) *Fire and the Australian Biota*, Australian Academy of Sciences, Canberra.
- Christensen, P.E. & Kimber, P.C. 1975, 'Effect of prescribed burning on the flora and fauna of south-west Australian forests', *Proceedings of the Ecological Society of Australia*, vol 9, pp. 85-106.
- Coaldrake, J.E. 1961, *Ecosystems of the coastal lowlands, Southern Queensland*, Bulletin Number 283, CSIRO, Australia.
- Cofinas, M. & Creighton, C. 2001, *Australian Native Vegetation Assessment 2001*, Environment Australia, Canberra.
- Coles, R.B. 1995, *Results of the bat survey for the northwest Cypress Pine - Ironbark FIS.*, State Forests of New South Wales, Dubbo.
- Date, E.M. & Paull, D.C. 1999, *Fauna survey of the Cypress/ironbark forests of north-west New South Wales.*, State Forests of New South Wales, Dubbo.
- Dickman, C.R. 1994, 'The Biology and Management of Native Rodents in the Arid-zone of New South Wales', vol
- Dickman, C.R., Pressey, R.L., Lim, L. & Parnaby, H.E. 1993, 'Mammals of Particular Conservation Concern in the Western Division of New-South-Wales', *Biological Conservation*, vol 65, no 3, pp. 219-248.
- Dickman, C.R. & Read, D.G. 1992, *The biology and management of dasyurids of the arid zone in NSW.*, Species Management Report, NSW NPWS, Hurstville.
- DLWC 1996, *The NSW Wetlands Management Policy*, Department of Land and Water Conservation, Sydney.
- DLWC 2002, *Native Vegetation Clearing Report*, Department of Land and Water Conservation, Sydney.
- Doherty, M., Kearns, A., Barnett, G., Sarre, A., Hochuli, D., Gibb, H. & Dickman, C.R. 2000, *The Interaction Between Habitat Condition, Ecosystem Processes and Terrestrial Biodiversity - A Review. Australia: State of the Environment, Second Technical Paper Series (Biodiversity)*, Department of the Environment and Heritage, Canberra.
- Environment Australia 1998, *Response to Disturbance of Forest Species in CRA Regions in NSW - Eden Region*, NSW CRA/RFA Steering Committee, Sydney.
- Environment Australia 1999, *Response to Disturbance of Forest Species in CRA Regions in NSW - Southern Region*, Environment Australia, Canberra.
- Environment Australia 2001, *A Directory of Important Wetlands in Australia, Third Edition.*, Environment Australia, Canberra.
- Fox, A. 1978, 'The '72 fire of Nadgee Nature Reserve', *Parks and Wildlife*, vol 2, pp. 5-24.
- Fox, B. & McKay, G.M. 1981, 'Small mammal response to pyric successional changes in eucalypt forest', *Australian Journal of Ecology*, vol 6, pp. 29-41.
- Fox, B.J. 1982, 'Fire and mammalian secondary succession in an Australian coastal heath', *Ecology*, vol 63(5), pp. 1332-1341.
- Gibbons, P. & Lindenmayer, D. 2002, *Tree Hollows and Wildlife Conservation in Australia*, CSIRO Publishing, Canberra.
- Gibbons, P. & Lindenmayer, D.B. 1997, *Conserving Hollow-dependent Fauna in Timber-production Forests*, NPWS, Hurstville.
- Gibson, N. & Kirkpatrick, J.B. 1989, 'Effects of cessation of grazing on the grasslands and grassy woodlands of the Central Plateau, Tasmania', *Australian Journal of Botany*, vol 37, pp. 55-63.

- Gilbert, J.M. 1959, 'Forest succession in the Florentine Valley, Tasmania', *Proceedings of the Royal Society of Tasmania*, vol 96, pp. 129-151.
- Gill, A.M. 1975, 'Fire and the Australian flora: a review', *Australian Forestry*, vol 38, pp. 4-25.
- Gill, A.M., Groves, R.H. & Noble, I.R. 1981, *Fire and the Australian Biota*, Australian Academy of Sciences, Canberra.
- Glanzig, A. & Kennedy, M. 2000, *From words to action: Addressing biodiversity loss, land degradation and native vegetation clearance in the 1990s - the Australian experience*, Community Biodiversity Network, Canberra.
- Graetz, R.D. & Tongway, D.J. 1986, 'Influence of grazing management on vegetation, soil structure and nutrient distribution and the infiltration of applied rainfall in a semi-arid chenopod shrubland', *Australian Journal of Ecology*, vol 11, pp. 347-360.
- Greenwood, K.L., MacLeod, D.A. & Hutchinson, K.J. 1996, *Long-term grazing effects on soil physical properties*, Proceedings of the Australian and New Zealand National Soils Conference vol.2, Australian Society of Soil Science Incorporated, Melbourne.
- Greeves, G.W., Creswell, H.P., Murphy, B.W., Gessler, P.E., Chartres, C.J., Little, I.P. & Bowman, G.M. 1995, *The Physical, Chemical and Morphological Properties of Soils in the Wheat Belt of Southern NSW and Northern Victoria*, CSIRO Division of Soils, Canberra.
- Greiner, R. 1997, *Integrated catchment management for dryland salinity control in the Liverpool Plains Catchment. A preliminary study from an economic perspective. Occasional paper No. 12/97.*, LWRDC, Canberra.
- Henzell, R. 1992, 'Goat biology and environmental impacts - implications for eradication', pp 18-24 in Best, L.W. (ed) *Feral Goat Seminar Proceedings*, South Australian National Parks and Wildlife Service, Adelaide.
- Hutchinson, M. 1996, 'Waterbirds on wetlands', pp 57-64 in Banens, R.J. & Lehane, R. (eds) *Proceedings of the 1995 Riverine Environment Research Forum*, Murray-Darling Basin Commission, Attwood, Victoria.
- Jacobs, S.W. & Pickard, J. 1981, *Plants of New South Wales. A Census of Cycads, Conifers and Angiosperms*, Royal Botanic Gardens, Sydney.
- JANIS 1997, *Nationally Agreed Criteria for the Establishment of a Comprehensive, Adequate and Representative Reserve System for Forests in Australia*, Commonwealth of Australia, Canberra.
- Jarrett, P.H. & Petrie, A.H.K. 1929, 'The vegetation of Black's Spur Region II. Pyric succession', *Journal of Ecology*, vol 17, pp. 249-281.
- Kavanagh, R.P. & Bamkin, K.L. 1995, 'Distribution of nocturnal forest birds and mammals in relation to the logging mosaic in north-eastern New South Wales, Australia', *Biological Conservation*, vol 71, pp. 41-53.
- Kavanagh, R.P., Debus, S., Tweedie, T. & Webster, T. 1995, 'Distribution of nocturnal forest birds and mammals in north-eastern New South Wales - relationships with environmental variables and management history', *Wildlife Research*, vol 22, no 3, pp. 359-1028.
- Landsberg, J., James, C.D., Morton, S.R., Hobbs, T.J., Stol, J., Drew, A. & Tongway, D.J. 1999, *The effects of artificial sources of water on rangeland biodiversity*, Biodiversity Technical Paper No. 3, Environment Australia Biodiversity Group, Canberra.
- Lemckert, F. 1999, 'Impacts of selective logging on frogs in a forested areas of northern New South Wales', *Biological Conservation*, vol 89, pp. 321-328.
- Liddlelow, G.L. 2001, *Short-term impacts of logging on birds in a jarrah forest at Kingston*, A workshop on environmental effects of timber harvesting in the jarrah forests. A synthesis of recent research by the Science Division, Department of Conservation and Land Management, Manjimip.
- Loyn, R.H., Runnalls, R.G., Forward, G.Y. & Tyers, J. 1983, 'Territorial bell miners and other birds affecting populations of insect prey', *Science*, vol 221, pp. 1411-1412.
- Lunney, D., Curtin, A., Ayers, D., Cogger, H.G. & Dickman, C.R. 1996, 'An ecological approach to identifying the endangered fauna of New South Wales', *Pacific Conservation Biology*, vol 2, pp. 212-231.

- Mackowski, C. 1984, 'The ontogeny of hollows in Blackbutt (*Eucalyptus pilularis*) and its relevance to the management of forests for possums, gliders and timber', pp 575-577 in Smith, A. & Hume, I. (eds) *Possums and Gliders*, Surrey Beatty and Sons, Sydney.
- MacNally, R. 1999, 'Habitat fragmentation and habitat loss: Secondary, cascading effects and predictability', *Australian Biologist*, vol 12, pp. 138-151.
- Meredith, C. 1984, 'Possums or poles? - the effects of silvicultural management on the possums of Chiltern State Park, northeast Victoria', pp 575-577 in Smith, A. & Hume, I. (eds) *Possums and Gliders*, Surrey Beatty and Sons, Sydney.
- Mitchell, P.B. 1991, 'Historical perspectives on some vegetation and soil changes in semi-arid New South Wales.' *Vegetation*, vol 91, pp. 169-182.
- Morgan, G. & Terrey, J. 1990, *Nature Conservation in Western New South Wales*, National Parks Association of New South Wales Inc., Sydney.
- Noble, I.R. 1986, 'Fire', pp 224-232 in Wallace, H.R. (ed) *The Ecology of the Forests and Woodlands of South Australia*, Government Printer, Adelaide.
- Norris, E.H., Mitchell, P.B. & Hart, D.M. 1991, 'Vegetation changes in the Pilliga forests: a preliminary evaluation of the evidence.' *Vegetation*, vol 91, pp. 209-218.
- NPWS 1996, *Threatened Species Assessment under the EP&A Act: The '8 Part test' of Significance*, Information Circular No 2: NPWS, Hurstville.
- NPWS 1999, *Atlas of NSW Wildlife*, NPWS, Hurstville.
- NSW National Parks and Wildlife Service 1999, *Western Data Audit and Gap Analysis*, Resource and Conservation Assessment Council, Sydney.
- NSW National Parks and Wildlife Service 2000, *Preliminary Overview of the Brigalow Belt South Bioregion (Stage 1)*, Resource and Conservation Assessment Council, Sydney.
- NSW National Parks and Wildlife Service 2001, *Pilliga Natura Reserve Fire Management Plan 2001-2006*, NSW National Parks and Wildlife Service, Northern Plains Region.
- NSW Scientific Committee 2001, *Clearing of Native Vegetation. Final Determination under the Threatened Species Conservation Act 1995.*, NSW Scientific Committee, Sydney.
- NSW Scientific Committee 2002, *Alteration to the Natural Flow Regimes of Rivers and Streams and their Floodplains and Wetlands. Final Determination under the Threatened Species Conservation Act 1995.*, NSW Scientific Committee, Sydney.
- Parkes, J.P., Henzell, R.P. & Pickles, G.S. 1996, *Managing Vertebrate Pests: Feral Goats*, Australian Government Publishing Service, Canberra.
- Paull, D.C. & Date, E.M. 1999, 'Patterns of decline in the native mammal fauna on the north-west slopes of New South Wales.' *Australian Zoologist*, vol 31, pp. 210-224.
- Pidgeon, I.M. 1938, 'The ecology of the central coast of New South Wales. II. Plant succession on the Hawkesbury Sandstone', *Proceedings of the Linnean Society of NSW*, vol 63, pp. 1-26.
- Pressey, R.L. 1993, 'Ad hoc reservations: Forward or backward steps in developing representative reserve systems?' *Conservation Biology*, vol 8, no 3, pp. 662-668.
- Purdie, R.W. 1977, 'Early stages of regeneration after burning in dry sclerophyll vegetation', *Australian Journal of Botany*, vol 25, pp. 21-46.
- Rabinowitz, D. 1981, 'Seven forms of rarity', pp 205-217 in Synge, H. (ed) *Biological Aspects of Rare Plant Conservation*, John Wiley, New York.
- Reid, J.R.W. 1999, *Threatened and declining birds in the New South Wales sheep-wheat belt: 1: Diagnosis, characteristics and management.*, Consultancy report to NSW National Parks and Wildlife Service. CSIRO Wildlife and Ecology, Canberra.
- Rolls, E. 1981, *A Million Wild Acres*, Penguin Books, Melbourne.
- Royal Botanic Gardens Sydney 2002, *The Plant Information Network System of the Royal Botanic Gardens*, Sydney. RBG Sydney.,
- Sattler, P.S. & Williams, R.D. 1999, *The Conservation Status of Queensland's Bioregional Ecosystems.*, Environmental Protection Agency, Brisbane.
- Shea, S.R. & Kitt, R.J. 1976, *The capacity of jarrah forest native legumes to fix nitrogen*, Western Australia Forestry Department Research Technical Paper, No. 21.
- Speare, R. 2001a, 'Nomination for listing of amphibian chytridiomycosis as a key threatening process under the Environment Protection and Biodiversity Conservation Act 1999.' pp

- 163-187 in Speare, R. & Steering Committee of Getting the Jump on Amphibian Disease (eds) *Developing management strategies to control amphibian diseases: Decreasing the risks due to communicable diseases.*, School of Public Health and Tropical Medicine, James Cook University., Townsville.
- Speare, R. 2001b, 'Recommendations from Workshop in Getting the Jump on Amphibian Disease. Attachment 5', pp 131-147 in Speare, R. & Steering Committee of Getting the Jump on Amphibian Disease (eds) *Developing management strategies to control amphibian diseases: Decreasing the risks due to communicable diseases.*, School of Public Health and Tropical Medicine, James Cook University, Townsville.
- Spooner, P., Lunt, I. & Robinson, W. 2002, 'Is fencing enough? The short-term effects of stock exclusion in remnant grassy woodlands in southern NSW', *Ecological Management and Restoration*, vol 3, no 2, pp. 117-125.
- Thackway, R. & Cresswell, I.D. 1995, *An Interim Biogeographic Regionalisation of Australia*, Australian Nature Conservation Agency, Canberra.
- Thompson, J. & Boyd-Law, S. 1995, *Feral goats or scapegoats*, Proceedings of the 10th Australian Vertebrate Pest Conference, Hobart.
- Threatened Species Scientific Committee 2001, *Land Clearance. Advice to the Minister for the Environment and Heritage from the Threatened Species Scientific Committee on a public nomination of a Key Threatening Process under the Environment Protection and Biodiversity Conservation Act 1999.*, Environment Australia, Canberra.
- Tisdell, C.A. 1982, *Wild Pigs: Environmental Pest or Economic Resource?*, Pergamon Press, Sydney.
- Traill, B.J. 1991, 'Box-Ironbark forests: tree hollows, wildlife and management', pp 119-124 in Lunney, D. (ed) *Conservation of Australia's Forest Fauna*, Royal Zoological Society of NSW, Sydney.
- Traill, B.J. 1993, 'Forestry, birds, mammals and management in box and ironbark forests', *Victorian Naturalist*, vol 110, no 1, pp. 11-14.
- Traill, B.J. & Duncan, S. 2000, *Status of birds in the New South Wales temperate woodlands region*, Consultancy report to the NSW National Parks and Wildlife Service by the Australian Woodlands Conservancy, Chiltern, Victoria.
- Turner, R.J. 1992, 'Effect of wildfire on birds at Weddin Mountain, New South Wales', *Corella*, vol 16, pp. 65-74.
- Wayne, A., Ward, C., Rooney, J. & Wheeler, I. 2001, *Western Ringtail Possum (Mgwayir) responses to timber harvesting at Kingston*, A workshop on environmental effects of timber harvesting in the jarrah forests. A synthesis of recent research by the Science Division, Department of Conservation and Land Management, Manjimip.
- West Gippsland Catchment Management Authority 2000, *West Gippsland Native Vegetation Plan. Management Priorities of Protection and Enhancement of Remnants and the Reconstruction of Native Vegetation Communities.*, Department of Natural Resources and Environment, Melbourne.
- Whelan, R.J. 1995, *The Ecology of Fire*, Cambridge University Press, Cambridge.
- Williams, J., Read, C., Norton, A., Dovers, S., Burgman, M., Proctor, W. & Anderson, H. 2001, *Biodiversity, Australia State of the Environment Report 2001 (Theme Report)*, CSIRO Publishing on behalf of the Department of the Environment and Heritage, Canberra.
- Williams, R.J. & Ashton, D.H. 1987, 'Effects of disturbance and grazing by cattle on the dynamics of heathland and grassland communities on the Bogong High Plains, Victoria', *Australian Journal of Botany*, vol 35, pp. 413-431.
- Willis, J.H. 1962a, *A Handbook of Plants in Victoria. Vol. 1*, Melbourne University Press, Melbourne.
- Willis, J.H. 1962b, *Land flora of Victoria. Victorian Year Book No. 76*, Commonwealth Bureau of Census and Statistics, Victoria.
- Wimbush, D.J. & Costin, A.B. 1979, 'Trends in vegetation at Kosciusko. I. Grazing trails in the subalpine zone 1957-1971', *Australian Journal of Botany*, vol 27, pp. 741-787.